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using a common source database

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Table 1 References

Chapter/Document No.	Title
None	

1 General

Changes to S1000D are brought about by Change Proposal Forms (CPF) and White Papers (WP) that are approved by the Steering Committee (SC).

1.1 Scope

Affected chapters are listed herein together with the CPFs that called for changes.

1.2 Editorial changes

Editorial changes are not changed marked.

2 Content

Highlights of changes to chapters 2, 3, 4, 5, 6, 7 and 8 (and their subchapters), are provided. For:

- chapter 2, refer to Table 2
- chapter 3, refer to Table 3
- chapter 4, refer to Table 4
- chapter 5, refer to Table 5
- chapter 6, refer to Table 6
- chapter 7, refer to Table 7
- chapter 8, refer to Table 8

Table 2 Chap 2

Chapter	Summary of changes
Chap 2.2	CPF 2015-026EPWG: – Updated Table 2 to reference http://www.w3.org/TR/xml
Chap 2.5.2	CPF 2017-008PPWG: – Removed reference to BRDP-S1-00238. BRDP does not exist.
Chap 2.5.3	CPF 2011-009DE: – Extension of BRDP-S1-00496 by element <infoNameVariant> CPF 2017-008PPWG: – BRDP corrections

Table 3 Chap 3

Chapter	Summary of changes
Chap 3.9.2.2	CPF 2011-039AA: – Removed the statement that plate nuts must not be illustrated
Chap 3.9.3	CPF 2013-068EPWG: – Removed <zoneRef>, <controlIndicatorRef>, <accessPointRef>, <identNumber> and <caption> elements from <attentionText> group declaration in appliccrossreftable.xsd schema

Chapter	Summary of changes
	CPF 2017-029BRWG: – Updated Fig 3 and Fig 4 to add <brDecisionRef>, <brDecisionPointRef> and <sourceDocRef> in <attentionText> group
Chap 3.9.4	CPF 2011-009DE: – Introduced element <infoNameVariant> as an optional child of element <dmTitle>
Chap 3.9.5.1	CPF 2011-009DE: – Introduced element <infoNameVariant> as an optional child of element <dmTitle> CPF 2018-003EPWG: – Added a note that restricts the use of “&”, “<” and “>”
Chap 3.9.5.1.1	CPF 2017-014AA: – Note added to clarify the use of IC 025 for externalization of export control policy statements
Chap 3.9.5.2.1.2	CPF 2014-015AA: – Revised to include new SCORM content package reference structure.
Chap 3.9.5.2.1.8	CPF 2011-009DE: – Introduced element <infoNameVariant> as an optional child of element <dmTitle>
Chap 3.9.5.2.1.9	CPF 2013-062DE: – Changed the description of elements <taskDuration> and <estimatedTime> to allow a maximum of two decimals for their value
Chap 3.9.5.2.1.10	CPF 2013-068EPWG: – Removed <zoneRef>, <controlIndicatorRef>, <accessPointRef>, <identNumber> and <caption> elements from <attentionText> group declaration in appliccrossreftable.xsd schema CPF 2015-026EPWG: – Updated Para 2.1.15 to clarify preserving white space and line feeds CPF 2018-022PPWG: – Corrected graphic in Fig 4 – Corrected security classification of Fig 4 CPF 2017-029BRWG: – Added the elements <brDecisionRef>, <brDecisionPointRef> and <sourceDocRef> to the textElemGroup

Chapter	Summary of changes
Chap 3.9.5.2.5	CPF 2013-062DE: – Changed the description of elements <taskDuration> and <estimatedTime> to allow a maximum of two decimals for their values CPF 2013-063DE: – Changed tolerance values to allow decimals
Chap 3.9.5.2.7	CPF 2013-069EPWG: – Changed IPD Schema to be in line with the text in the specification. Reference to BREX-S1-00090 was removed, since XML schema change enforced the BREX rule. CPF 2017-017DE: – Removed child element <subjectVariantSegment> of element <initialProvisioningProject> CPF 2017-020DE: – Amended Table 7 by the missing text element identifiers FID, ITY, TQL and TYP CPF 2017-026AA: – Changed the <usableOnCodeEquip> and <usableOnCodeAssy> elements within the <applicabilitySegment> repeatable CPF 2017-030AA: – Added the optional attribute applicRefIds to the element <referTo>
Chap 3.9.5.2.15.1	CPF 2013-062DE: – Changed the description of elements <taskDuration> and <estimatedTime> to allow a maximum of two decimals for their values
Chap 3.9.5.2.16	CPF 2011-009DE: – Introduced element <infoNameVariant> as an optional child of element <dmTitle> CPF 2019-007NN: – Added a statement to clarify that use of the attribute controlAuthorityRefs in front matter data modules is disallowed
Chap 3.9.5.3.2	CPF 2011-020S1: – Changed the attribute condRefId in the element <condIncorporation> from optional to mandatory

Table 4 Chap 4

Chapter	Summary of changes
Chap 4.4	CPF 2017-008PPWG: – Removed reference to BRDP-S1-00012. BRDP does not exist.
Chap 4.7	CPF 2013-066EPWG: – Changed definition of the attribute `issueNumber`
Chap 4.10	CPF 2017-008PPWG: – Clarified the usage of the element <`brPara`> for documenting BRDPs and the corresponding decisions
Chap 4.10.1	CPF 2017-029BRWG: – Added enhanced structures for better documentation of business rules (expanded inline references, expanded note use, and expanded figure and table usage)
Chap 4.10.2.2	CPF 2017-013AA: – Clarified usage of the attribute allowedObjectFlag
Chap 4.13.1	CPF 2017-022DE: – Corrected the criteria for updating publication self-standing data modules
Chap 4.14.2	CPF 2011-020S1: – Changed the attribute `condRefId` in the element <`condIncorporation`> from optional to mandatory
Chap 4.15.1	CPF 2014-015AA: – Revised to include new <`scormContentPackageRef`> branch within the <`scoEntryItem`> element.
Chap 4.15.3	CPF 2014-015AA: – Revised markup to include SCORM content package examples.

Table 5 Chap 5

Chapter	Summary of changes
Chap 5.3.1.3	CPF 2017-020DE: – Amended Table 3 by the missing text element identifiers FID, ITY, TQL and TYP
Chap 5.3.1.4	CPF 2011-009DE: – Introduced the element <`infoNameVariant`> as an optional child of the element <`dmTitle`>

Table 6 Chap 6

Chapter	Summary of changes
Chap 6.2.2	CPF 2011-009DE: – Introduced the element <infoNameVariant> as an optional child of the element <dmTitle> CPF 2017-008PPWG: – Removed duplicate BRDP (BRDP-S1-00570)
Chap 6.2.3.1	CPF 2011-009DE: – Introduced the element <infoNameVariant> as an optional child of the element <dmTitle>
Chap 6.2.3.2	CPF 2011-009DE: – Introduced the element <infoNameVariant> as an optional child of the element <dmTitle>
Chap 6.2.3.3	CPF 2011-009DE: – Introduced the element <infoNameVariant> as an optional child of the element <dmTitle>

Table 7 Chap 7

Chapter	Summary of changes
Chap 7.3.1.1	CPF 2011-009DE: – Introduced the element <infoNameVariant> as an optional child of the element <dmTitle> CPF 2011-020S1: – Changed the attribute condRefId in the element <condIncorporation> from optional to mandatory CPF 2013-063DE: – Changed the type of the attribute toleranceValue from integer to decimal CPF 2013-066EPWG: – Allow three, four or five digits in attribute issueNumber CPF 2013-068EPWG: – Redefined the textElemGroup and attentionText by deleting child elements <zoneRef>, <controlIndicatorRef>, <accessPointRef>, <identNumber>, <caption>, <captionGroup> CPF 2013-069EPWG: – Changed the definition of the attribute sparePartClassCode of the element <sparePartClass> to attribute type

Chapter	Summary of changes
	sparePartClassCodeAttType that restricts the permissible values to "0", "1", "2" or "6" CPF 2015-026EPWG: – Added a FIXED attribute xml:space="preserve" to element <verbatimText> CPF 2017-013AA: – Clarified usage of the attribute allowedObjectFlag CPF 2017-017DE: – Removed subjectVariantSegment from IPD CPF 2017-026AA: – Changed the elements <usableOnCodeEquip> and <usableOnCodeAssy> within the element <applicabilitySegment> to be repeatable CPF 2017-028AA: – Changed the definition of the attribute indenture of the element <catalogSeqNumber> from an nonNegativeInteger to a restricted integer CPF 2017-029AA: – Added <brDecisionRef>, <brDecisionPointRef>, and <sourceDocRef> to elements <para>, <emphasis>, <changeInline>, <title>, <listItemTerm>, <reasonForAmendment> (textElemGroup in brDoc). – Added <brDecisionRef>, <brDecisionPointRef>, and <sourceDocRef> to elements <notePara> and <attentionListItemPara> (attentionText in brDoc). – Added element <note> and fmftElemGroup (elements <figure>, <multimedia>, <foldout>, <table>) to elements <brDecision>, <brPara>. – Added element <brDecisionPointRef> to elements <brAudit>, <brAction>, and <brCurrentStatus>. – Added element <note> and fmftElemGroup to element <brDecisionPointText>. – Replaced the children textElemGroup and listElemGroup in element <brDecisionPointText> with element <para>. – Changed element <brRelatedTo> to optional. – Changed the choice in <sourceDocRef> to 1 or more. – Added element <markupExample> to element <brLevelledPara>. CPF 2017-030AA: – Added the optional attribute applicRefIds to the element <referTo>

Chapter	Summary of changes
Chap 7.3.1.3	CPF 2018-012PPWG: – Corrected the invocation declaration for the following Schemas: • Comment • DDN • DML • ICN meta data • PM • SCORM content package • Update
Chap 7.3.1.4	CPF 2011-020S1: – Changed the attribute `condRefId` in the element <`condIncorporation`> from optional to mandatory CPF2013-068DE: – Redefined the `textElemGroup` and `attentionText` by deleting child elements <`zoneRef`>, <`controlIndicatorRef`>, <`accessPointRef`>, <`identNumber`>, <`caption`>, <`captionGroup`> CPF 2017-013AA: – Clarified usage of the attribute `allowedObjectFlag` CPF 2017-017DE: – <`subjectVariantSegment`> removed. The child element <`subjectVariantSegment`> of element <`initialProvisioningProject`> was removed. It is no longer supported by S2000M. Refer to Chap 3.9.5.2.7. CPF 2017-029BRWG: – Changed all occurrences of <`brDecisionPointText`> to <`brDecisionPointText`><`para`> – Changed all occurrences of </`brDecisionPointText`> to </`para`></`brDecisionPointText`>
Chap 7.4.1.1.2	CPF 2011-009DE: – Introduced the element <`infoNameVariant`> as an optional child of the element <`dmTitle`>
Chap 7.4.2.2	CPF 2014-015AA: – Revised to include new <`scormContentPackageRef`> branch within the <`scoEntryItem`> element.
Chap 7.5.1	CPF 2013-066EPWG: – Revised CONTROLNUMBER definition

Table 8 Chap 8

Chapter	Summary of changes
Chap 8.2.1	CPF 2017-033FR: – Addition and definition of Sub-System 5 in System 06
Chap 8.2.5	CPF 2016-009AA: – Updated the definitions of System 32 and Subsystem 32-50 to include the "Maneuvering" function. Also added, "motor, control systems, power supplies or converter" to the list of items included within this System and Subsystem.
Chap 8.4.1	CPF 2013-072US: – Changed definitions for IC 022 - Business rules exchange and IC 024 - Business rules CPF 2017-014AA: – Added new information code values: • 025 - Export control policy • 026 - Regulatory policy CPF 2018-002US: – Added definition for IC 235 – Flush CPF 2018-003EPWG: – Changed “Mass & Balance” to “Mass and Balance”
Chap 8.4.2	CPF 2013-072US: – Changed definitions for IC 022 - Business rules exchange and IC 024 - Business rules CPF 2017-014AA: – Added new information code value 025 - Export control policy and information code value 026 - Regulatory policy CPF 2018-002US: – Added definition for IC 235 – Flush CPF 2018-003EPWG: – Changed “Mass & Balance” to “Mass and Balance”

3 Common changes

The following CPFs affected several chapters. Detailed lists of the affected chapters for each CPF are provided below.

– For CPF 2015-016AA, refer to Para 3.1.
– For CPF 2017-008PPWG, refer to Para 3.2.
– For CPF 2018-013PPWG, refer to Para 3.3.
– For CPF 2018-014PPWG, refer to Para 3.4.
– For CPF 2018-016PPWG, refer to Para 3.5.
– For CPF 2018-018PPWG, refer to Para 3.6.
– For CPF 2018-019PPWG, refer to Para 3.7.

– For CPF 2019-001EPWG, refer to Para 3.8.

3.1 CPF 2015-016AA - Identification of regulatory information

This CPF affected the chapters listed below:

– Chap 2.5.3
– Chap 3.9.3
– Chap 3.9.5.1
– Chap 3.9.5.1.1
– Chap 3.9.5.2.1.1
– Chap 3.9.5.2.1.2
– Chap 3.9.5.2.1.3
– Chap 3.9.5.2.1.4
– Chap 3.9.5.2.1.5
– Chap 3.9.5.2.1.6
– Chap 3.9.5.2.1.7
– Chap 3.9.5.2.1.8
– Chap 3.9.5.2.1.9
– Chap 3.9.5.2.1.10
– Chap 3.9.5.2.1.12
– Chap 3.9.5.2.1.13
– Chap 3.9.5.2.2
– Chap 3.9.5.2.3
– Chap 3.9.5.2.4
– Chap 3.9.5.2.5
– Chap 3.9.5.2.6
– Chap 3.9.5.2.7
– Chap 3.9.5.2.9.2
– Chap 3.9.5.2.9.3
– Chap 3.9.5.2.9.4
– Chap 3.9.5.2.9.5
– Chap 3.9.5.2.9.6
– Chap 3.9.5.2.9.7
– Chap 3.9.5.2.9.8
– Chap 3.9.5.2.9.9
– Chap 3.9.5.2.9.10
– Chap 3.9.5.2.9.11
– Chap 3.9.5.2.9.12
– Chap 3.9.5.2.9.13
– Chap 3.9.5.2.10.1
– Chap 3.9.5.2.10.2
– Chap 3.9.5.2.10.3
– Chap 3.9.5.2.11
– Chap 3.9.5.2.11.1
– Chap 3.9.5.2.11.2
– Chap 3.9.5.2.11.3
– Chap 3.9.5.2.11.4
– Chap 3.9.5.2.11.5
– Chap 3.9.5.2.11.6
– Chap 3.9.5.2.11.7
– Chap 3.9.5.2.11.8
– Chap 3.9.5.2.11.9
– Chap 3.9.5.2.12
– Chap 3.9.5.2.13.1

- Chap 3.9.5.2.13.2
- Chap 3.9.5.2.13.3
- Chap 3.9.5.2.13.4
- Chap 3.9.5.2.13.5
- Chap 3.9.5.2.14
- Chap 3.9.5.2.15
- Chap 3.9.5.2.15.1
- Chap 3.9.5.2.15.2
- Chap 3.9.5.2.16
- Chap 3.9.5.3
- Chap 3.9.5.3.1
- Chap 3.9.5.3.2
- Chap 3.9.5.3.3
- Chap 3.9.6.1
- Chap 4.6.1
- Chap 4.10.1
- Chap 4.10.2
- Chap 4.10.2.1
- Chap 4.10.2.2
- Chap 4.10.2.3
- Chap 6.2.2
- Chap 7.3.1.1
- Chap 7.3.1.4
- Chap 7.4.1.1.3

3.2 CPF 2017-008PPWG - BRDP editorial errors

The BRDPs that were corrected by this CPF are given in Table 9.

Table 9 CPF 2017-008PPWG BRDP corrections

BRDP No./Title	Problem	Solution
BRDP-S1-00001 - Use of "I" and "O"	Link error	Correct location: Chap 1.3, Para 6.2.5
BRDP-S1-00027 - Need of printable data	Link error	Correct location: Chap 3.9.2, Para 2.1.2
BRDP-S1-00037 - Use of LOEP or LOEDM	Link error	Correct location: Chap 3.9.4, Para 2.3
BRDP-S1-00065 - Use of the element <copyright> and source of copyright information	Link error	Correct location: Chap 3.9.5.1, Para 2.2.5.2.1
BRDP-S1-00066 - Method of populating copyright information (in each data module or in a consolidated data module)	Link error	Correct location: Chap 3.9.5.1, Para 2.2.5.2.1
BRDP-S1-00070	Text mismatch	The word "responsible" has been incorrectly removed from the title of the BRDP-S1-00070. The chapter text it is correct.
BRDP-S1-00176	Duplicate	See BRDP-S1-00570

BRDP No./Title	Problem	Solution
BRDP-S1-00197 - Values for the attribute `inspectionTypeCategory`	Link error	Correct location: Chap 3.9.5.2.5, Para 2.5.1.1.4
BRDP-S1-00199	Text mismatch	There is an error in the definition for the following BRDP inside the BRDP index in Chap 2.5.3
BRDP-S1-00204 - Use of the element <`preliminaryRqmts`> in the element <`taskDefinition`>	Link error	Correct location: Chap 3.9.5.2.5, Para 2.6.2
BRDP-S1-00307	Link error	Correct location: Chap 3.9.4, Para 11.
BRDP-S1-00369	Link error	The number in the index is Para 2.2 and in the chapter text it is Para 2.3.3 (The latter is the correct one)
BRDP-S1-00373 - Use of multiple instances of CSDB object	Link error	Correct location: Chap 4.12, Para 3.1
BRDP-S1-00405 - How to use the element field descriptions in the wiring data description Schema	Link error	Correct location: Chap 5.2.1.4, Para 1.4.2
BRDP-S1-00406 - Use of introduction data modules for wiring publications	Link error	Correct location: Chap 5.2.1.4, Para 2.2.1
BRDP-S1-00407 - Optional descriptive information for connection units	Link error	Correct location: Chap 5.2.1.4, Para 2.2.2.2
BRDP-S1-00408 - Optional descriptive information for wires and harnesses	Link error	Correct location: Chap 5.2.1.4, Para 2.2.2.3
BRDP-S1-00409 - Wiring standard practices data modules	Link error	Correct location: Chap 5.2.1.4, Para 2.2.3
BRDP-S1-00410 - Wiring diagrams in an interactive wiring publication	Link error	Correct location: Chap 5.2.1.4, Para 2.2.4.1
BRDP-S1-00411 - Harness routing drawings	Link error	Correct location: Chap 5.2.1.4, Para 2.2.5
BRDP-S1-00412 - Coding of harness installation drawing data modules	Link error	Correct location: Chap 5.2.1.4, Para 2.2.5.1
BRDP-S1-00413 - Harness installation information	Link error	Correct location: Chap 5.2.1.4, Para 2.2.5.1
BRDP-S1-00414 - Coding of harness routing drawing data modules	Link error	Correct location: Chap 5.2.1.4, Para 2.2.5.2
BRDP-S1-00415 - Equipment and panel location drawings	Link error	Correct location: Chap 5.2.1.4, Para 2.2.6
BRDP-S1-00416 - Production of electrical standard parts data	Link error	Correct location: Chap 5.2.1.4, Para 2.2.7

BRDP No./Title	Problem	Solution
BRDP-S1-00417 - Definition of required electrical equipment information	Link error	Correct location: Chap 5.2.1.4, Para 2.2.8.1
BRDP-S1-00418 - Coding of electrical equipment information data modules	Link error	Correct location: Chap 5.2.1.4, Para 2.2.8.2
BRDP-S1-00419 - Coding of harness data modules	Link error	Correct location: Chap 5.2.1.4, Para 2.2.10
BRDP-S1-00420 - Generation of harness wire list data modules	Link error	Correct location: Chap 5.2.1.4, Para 2.3.2.1
BRDP-S1-00421 - Generation of connection list data modules	Link error	Correct location: Chap 5.2.1.4, Para 2.3.2.2
BRDP-S1-00422 - Generation of plug and receptacle list data modules	Link error	Correct location: Chap 5.2.1.4, Para 2.3.2.3.1
BRDP-S1-00423 - Generation of terminal list data modules	Link error	Correct location: Chap 5.2.1.4, Para 2.3.2.3.2
BRDP-S1-00424 - Generation of splice list data modules	Link error	Correct location: Chap 5.2.1.4, Para 2.3.2.3.3
BRDP-S1-00425 - Generation of earth point list data modules	Link error	Correct location: Chap 5.2.1.4, Para 2.3.2.3.4
BRDP-S1-00433 - Separation of product frame and engine BDAR information	Link error	Correct location: Chap 5.2.1.14, Para 2.1.2
BRDP-S1-00434 - Separate data modules for utilization degradation in BDAR information sets	Link error	Correct location: Chap 5.2.1.14, Para 2.1.6
BRDP-S1-00435 - Interactive BDARP	Link error	Correct location: Chap 5.2.1.14, Para 2.3
BRDP-S1-00460 - Front matter to be included in page-oriented publications and IETP, respectively	Link error	Correct location: Chap 5.3.1.1, Para 2.2
BRDP-S1-00464 - Use of task sets in the CMP	Link error	Correct location: Chap 5.3.1.4, Para 1.5.8
BRDP-S1-00465 - Use of placeholder data modules in the CMP	Link error	Correct location: Chap 5.3.1.4, Para 1.5.13
BRDP-S1-00513 - Presentation of warnings and cautions	Link error	Correct location: Chap 6.2.2, Para 2.10.2.1
BRDP-S1-00514 - Presentation of symbols in warnings and cautions	Link error	Correct location: Chap 6.2.2, Para 2.10.2.1
BRDP-S1-00515 - Use of symbolic presentation of warnings and cautions	Link error	Correct location: Chap 6.2.2, Para 2.10.2.2
BRDP-S1-00516 - Use of numbered notes within a data module at presentation	Link error	Correct location: Chap 6.2.2, Para 2.10.4

BRDP No./Title	Problem	Solution
BRDP-S1-00524 - Presentation of the name of spares, supplies and support equipment	Link error	Correct location: Chap 6.2.2, Para 2.16
BRDP-S1-00525 - Use of the alternative method for presentation of applicability statements	Link error	Correct location: Chap 6.2.2, Para 2.17.1
BRDP-S1-00526 - Decide on highlighting the default heading and applicability statement at presentation	Link error	Correct location: Chap 6.2.2, Para 2.17.3
BRDP-S1-00557 - Reuse of the generic ICN title in data modules	Text mismatch	Chap 2.5.3 shows:
BRDP-S1-00559	Typo	There is a typo in the Definition: "capations" instead of "captions". This typo is only in the index. The chapter text is correct.
BRDP-S1-569 is not listed in the BRDP index	Missing BRDP	It can be found in Chap 6.2.2, Para 2.9.1.
BRDP-S1-00570	Link error	In BRDP index the Para number is 2.13.1 and it must be Para 2.14.
BRDP-S1-00570 is the same as BRDP-S1-00176 just in various chapters.	Duplicate	Removed duplicates

3.3 CPF 2018-013PPWG - Incorrect usage of thru

This CPF affected the chapters listed below:

- Chap 1.3
- Chap 2.3
- Chap 3.5
- Chap 3.9.5.2.1.7
- Chap 3.9.5.2.1.10
- Chap 3.9.5.2.9.2
- Chap 3.9.5.2.9.3
- Chap 3.9.5.2.9.5
- Chap 3.9.5.2.9.12
- Chap 3.9.5.2.10
- Chap 3.9.5.2.10.1
- Chap 3.9.5.2.10.2
- Chap 3.9.5.2.10.5
- Chap 3.9.5.2.11.5
- Chap 3.9.5.2.11.6
- Chap 3.9.5.2.11.7
- Chap 3.9.5.2.11.8
- Chap 3.9.5.2.11.12
- Chap 3.9.5.2.11.13
- Chap 3.9.5.2.11.14
- Chap 3.9.5.2.13.1
- Chap 3.9.5.2.13.5
- Chap 4.9.3

- Chap 4.11
- Chap 4.14.4
- Chap 5.2.1.4
- Chap 5.2.2.4
- Chap 5.2.2.7
- Chap 6.2.1
- Chap 6.4.1
- Chap 7.2
- Chap 7.3.3
- Chap 7.4.1.2
- Chap 8.5.1

3.4 CPF 2018-014PPWG - Typos, punctuation errors and format errors

This CPF affected the chapters listed below:

- Front matter, Copyright and user agreement
- Chap 2.5.3
- Chap 3.4
- Chap 3.9.3
- Chap 3.9.5.2.1.7
- Chap 3.9.5.2.1.10
- Chap 3.9.5.2.4
- Chap 3.9.5.2.13.1
- Chap 3.9.5.2.15
- Chap 5.2.1.11
- Chap 5.2.1.16
- Chap 6.2.1

3.5 CPF 2018-016PPWG - Minor editorial wording changes

This CPF affected the chapters listed below:

- Chap 2.5.2
- Chap 3.9.3
- Chap 3.9.5.2.1.4
- Chap 3.9.5.2.5
- Chap 3.9.5.2.9.3
- Chap 3.9.5.2.9.4
- Chap 3.9.5.2.13.4
- Chap 4.9.3
- Chap 4.10.1
- Chap 4.10.2.1
- Chap 4.10.2.3
- Chap 5.3.1.4

3.6 CPF 2018-018PPWG - Incorrect references

This CPF affected the chapters listed below:

- Chap 3.5
- Chap 3.9.3
- Chap 3.9.5.2.1.9
- Chap 3.9.5.2.1.10
- Chap 3.9.5.2.11.10
- Chap 3.9.5.2.15.2

- Chap 4.6.1
- Chap 4.10.1
- Chap 6.2.2
- Chap 6.2.3.3

3.7 CPF 2018-019PPWG - Missing references

This CPF affected the chapters listed below:

- Chap 3.9.5.1
- Chap 3.9.5.2.2
- Chap 3.9.5.2.4
- Chap 3.9.5.2.9.2
- Chap 3.9.5.2.9.4
- Chap 3.9.5.2.9.5
- Chap 3.9.5.2.9.6
- Chap 3.9.5.2.9.7
- Chap 3.9.5.2.9.8
- Chap 3.9.5.2.9.9
- Chap 3.9.5.2.9.10
- Chap 3.9.5.2.9.11
- Chap 3.9.5.2.9.12
- Chap 3.9.5.2.9.13
- Chap 4.5
- Chap 4.6.1

3.8 CPF 2019-001EPWG - Identification of regulatory information addendum

This CPF affected the chapters listed below:

- Chap 3.9.2.7
- Chap 3.9.5.2.2
- Chap 3.9.5.2.3
- Chap 3.9.5.2.4
- Chap 3.9.5.2.5
- Chap 3.9.5.2.6
- Chap 3.9.5.2.7
- Chap 3.9.5.2.9.1
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- Chap 3.9.5.2.17
- Chap 3.9.5.3.1
- Chap 3.9.5.3.2
- Chap 3.9.5.3.3
- Chap 4.5
- Chap 4.6.1
- Chap 4.9.1
- Chap 4.10.1
- Chap 4.13.2.2
- Chap 4.15.1
- Chap 7.3.1.1

- Chap 7.3.1.4

4 Default BREX changes

4.1 CPF 2019-004EPWG - Update BREX internal reference rule for brLevelledPara

This CPF updated the default BREX file to allow internal references to the element <brLevelledPara>.

5 Editorial changes

The editorial changes listed below were also made.

Table 10 Editorial changes

Chapter	Summary of changes
Title page	– Increased the size of the ATA e-Business Program logo.
Table of contents	– Corrected the title of Chap 7.3.1.1. – Removed an extra row after Chap 8.5.2.
Chap 3.9.5.2.1.7	– Corrected the spelling of the element <multimediaObject> in Para 2.3.2.1.
Chap 3.9.5.2.1.9	– Corrected the spelling of the word “projects” in Para 2.7.1.1.
Chap 3.9.5.2.10.1	– Corrected the spelling of the attribute altsName in Para 2.3.1.8.
Chap 3.9.5.2.10.1	– Corrected the spelling of the attribute altsName in Para 2.3.
Chap 3.9.5.2.13.1	– Replaced multiple figures to remove color shading on elements within the graphics. – Corrected the spelling of the element <lcVisionStatement> in Para 2.2.1.1. – Corrected the spelling of the element <lcMissionStatement> in Para 2.2.1.2. – Corrected the spelling of the element <lcGoalStatement> in Para 2.2.1.4. – Corrected the ICN for Fig 24.
Chap 3.9.5.2.13.5	– Corrected the spelling of the attribute commercialClassification in Para 2.2.1.5.
Chap 4.15.1	– Corrected the name of the markup element <scoEntryTitle> in Para 2.2.1.1
Chap 7.5.4	– Changed the title of the chapter to be “Information interchange – Learning Objects Metadata”, to remove the redundant use of “metadata” in the title.
Chap 7.8	– Corrected the grammar in several sentence to use proper English.
Chap 8.4.2	– Corrected the title of Figure 12 in the List of Tables.

Table of contents

The listed documents are included in Issue 5.0 of this publication.

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Chap 1.2	Scope	S1000D-A-01-02-0000-00A-040A-A	All
Chap 1.3	How to use the specification	S1000D-A-01-03-0000-00A-040A-A	All
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1 General

This chapter gives a basic overview of the S1000D purpose including the history of the development.

2 Purpose

S1000D is an international specification for the procurement and production of technical publications. While the title restricts its use to technical publications, it has been found through application that the principles of the specification can be applied to non-technical publications.

This specification was initially developed by the AeroSpace and Defence Industries Association of Europe (ASD). This issue has been jointly produced by ASD, the Aerospace Industries Association of America (AIA), and the Air Transport Association of America (ATA) together with their customers. These form the S1000D Council and the S1000D Steering Committee to establish standards for documentation agreed by the participating parties.

From Issue 2, the scope has been extended to include land and sea specific applications. The specification can also be used for the support of any type of equipment including both civil and military products. All items in this specification are referred to as "the Product".

2.1 Background

The concept of this specification was originated in the aerospace field within ASD in early 1980s. At that time, most civil aviation projects were being documented in accordance with the ATA 100 specification. Military projects in Europe were supported by documentation produced to various national military specifications, although some attempts of rationalization had been made in certain collaborative projects. Thus, by comparison, the situation for the support of civil aircraft was more stable and manageable. The multiplicity of existing military procedures and

the continual introduction of new procedures were producing ever greater problems and increased costs for industry and its military customers, as both became more reliant upon the use of complex computer-based systems in the field of technical publication support activities.

This situation, added to the increasing number of collaborative projects and the necessity to recognize the developments in Integrated Logistics Support (ILS) and in information technology, prompted the Customer and Product Support Committee (CPSC) of ASD to establish a Documentation Working Group (DWG). This DWG consisted of European industry representatives tasked to report on current documentation practices and to recommend a unified method of documentation for air vehicle projects.

The DWG recognized that the only internationally accepted specification in the aerospace field, although not formally recognized as an international standard, was ATA 100. It was therefore decided to attempt to harmonize civil and military documentation standards using ATA 100 as a source document. Many national military specifications used by the participating nations have their roots in the United States (US) Mil Specs and these were therefore to be considered. The DWG invited the nations to provide military representatives who would participate in its activities and established a subsidiary, which was designated the Augmented Documentation Working Group (ADWG).

This group realized that their attempts to harmonize specifications and to establish commonality wherever possible had the following major advantages:

- cost saving in information generation - avoidance of duplications
- more economic support planning
- cheaper deliverable publications
- uniformity of standard for participants in the project
- standard format for data exchange to exploit future developments
- enhanced interoperability
- improved opportunity for clarity - use of ASD Simplified Technical English (ASD-STE100®)
- easier and cheaper translation also possible because of ASD-STE100®

The ADWG established task groups which undertook studies of specific areas to enable the development of the CSDB proposals which are contained in this specification. The final task was the incorporation of these international CSDB proposals into this publications specification which has been agreed by the participating nations.

The ADWG was later renamed Technical Publication Specification Maintenance Group (TPSMG). Their duties have now been taken over by the S1000D Council and the S1000D Steering Committee, which have the full responsibility of maintaining the specification. The S1000D Council and the S1000D Steering Committee includes members from ministries and industry.

To take care of the rapid development of information technology, a group of specialists, the Electronic Publications Working Group (EPWG) supports the S1000D Steering Committee.

In 2003, a Memorandum of Understanding (MOU) was signed between ASD and AIA establishing the parameters for an agreement between the two organizations harmonizing US and European guidance related to technical publications data.

In 2004, the ASD signed an MOU with ADL. The two organizations are working together to harmonize the requirements of the Shareable Content Object Reference Model (SCORM).

In 2005, a MOU was signed between ASD, AIA and ATA in order to promote common, interoperable, international technical publication data in the Aerospace and Defense industries and to work in concert on the joint development and maintenance of S1000D.

In 2007, the MOU between ASD, AIA and ATA has been renewed to enable the three organizations to jointly further develop, maintain and promote the S1000D in the international arena.

Chapter 1.2

Scope

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1 General

This chapter gives a basic overview of the S1000D scope. Refer to Fig 1.

2 Scope

S1000D covers the planning and management, production, exchange, distribution and use of technical documentation that support the life cycle of any civil or military project. Projects include air, land and sea vehicles or equipment (hereafter known as the Product).

The specification adopts International Standards Organization (ISO), Continuous Acquisition and Life-cycle Support (CALS) and World Wide Web Consortium (W3C) standards, in which information is generated in a neutral format. This means that it can be implemented on different and often disparate systems. Neutrality, added to the concept of modularization, makes the specification applicable to the wider international community.

Information produced in accordance with S1000D is created in a modular form, called a "data module". A data module is defined as "the smallest self-contained information unit within a technical publication".

A data module contains the following information:

- An identification and status section with all management information
- A content section

The data module can support the following types of content and constructs:

- Applicability cross-reference information
- Business rules information
- Common information repository
- Conditions cross-reference information
- Container information
- Crew/operator information
- Descriptive information
- Fault information
- Front matter information
- IPD information
- Maintenance checklists and inspections
- Maintenance planning information
- Procedural information
- Process information
- Products cross-reference information
- Service bulletin information
- Training information
- Wiring data information
- Wiring data description information

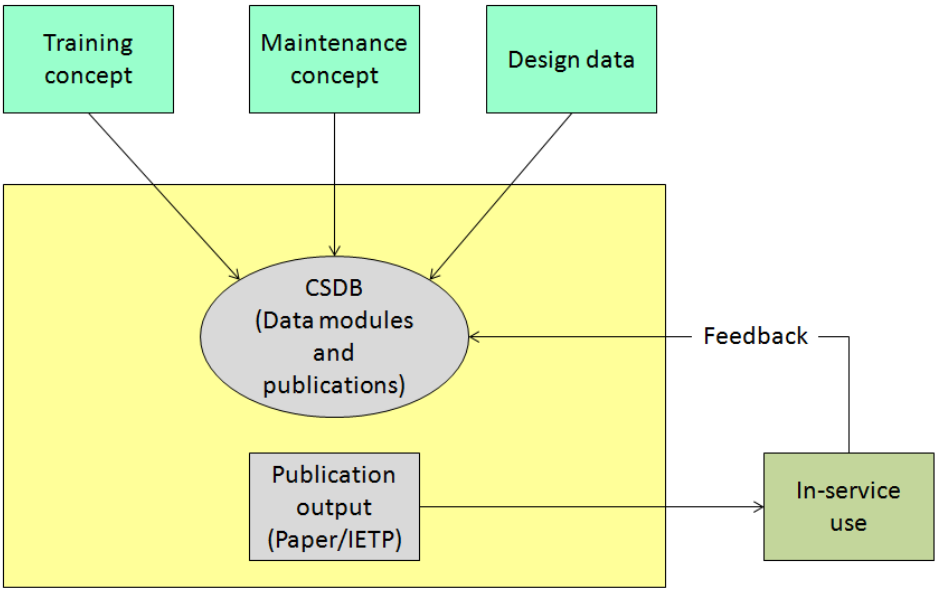
All data modules applicable to the Product are gathered and managed in a database, which is hereafter referred to as the CSDB.

A benefit of the CSDB is to enable production of platform-independent output in either page-oriented or IETP.

Data managed in S1000D is not duplicated in the CSDB. Data modules enable data to be stored once and used for multiple outputs. A single change to an individual data module can update multiple outputs and multiple deliveries.

Other benefits of using S1000D are that:

- it is based on international neutral standards
- it reduces maintenance costs for technical information
- it transforms data into configuration items
- it allows subsets of information to be generated to meet specific user needs
- it facilitates the transfer of information and electronic output between disparate systems
- many different output forms can be generated from the same base data thus ensuring safety of data and that every user regardless of output form is getting the same message
- the S1000D data module concept can be applied to legacy data
- it is non-proprietary and allows neutral delivery of data and management of data
- the specification incorporates the planning and management, production, exchange, distribution and use of data in electronic form for different types of output (from page oriented to IETP) as shown in Fig 1



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Fig 1 S1000D scope

More information on S1000D and ASD publications can be found at www.s1000d.org and www.asd-europe.org, respectively.

Chapter 1.3

How to use the specification

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Chap 9.3	Terms and definitions - Schema documentation
S2000M	International specification for material management - Integrated data processing

1 General

This chapter gives an overview of:

- the structure and content of the specification
- the basic production and delivery methods
- the fundamental reading rules

2 Field of application

S1000D is an international specification, which is designed to cover technical publication and learning information in support of any platform, system or equipment project (air, sea, land vehicle, equipment or facilities, civil or military).

The following aspects of technical publication and training information are described:

- information generation (authoring)
- management within the CSDB
- publication generation - page-oriented and IETP
- exchange of data modules, publications and training content packages
- commenting

The specification addresses two main delivery methods of technical publications and training content packages:

- Data exchange - S1000D objects (data modules and supporting objects) delivery for further processing
- Publishing - Delivery of publications and training content packages - Information ready to use

Refer to Para 5 for further details on the delivery methods.

3 Basic definitions

the Product	Any platform, system or equipment (air, sea, land vehicle, equipment or facility, civil or military)
Project	The task to develop, maintain and dispose of the Product
technical publications	Operational and maintenance documentation and data. Technical publications do not include design documentation (eg, design drawings or CAD models).
learning information	Information used in the development of training activities that facilitate learning and the development of new and existing skills.
self-contained data module	A data module which is ready to use without a need for any common information repository data modules. Refer to Para 4.
CIR-dependent data modules	A data module which needs access to one or more Common Information Repository (CIR) data modules. Refer to Para 4.

4 Self-contained vs CIR-dependent data modules

There are two basic methods of production (authoring) and delivery (publishing) of data modules and publications:

- Using self-contained data modules only. This is the basic method to deliver data modules.

– Using common information repository data modules (eg, warnings, cautions, externalized applicability annotations) as a necessary part of the delivery. This method means that the "ordinary" data modules are delivered CIR-dependent.

The CIR provides the ability to further optimize and reuse data. It does this by using:

– CIR data modules. Refer to Chap 4.13.1.
– Incremental updates of CIR data modules. Refer to Chap 4.13.2.
– Alternates. Refer to Chap 4.13.3.
– Container data modules. Refer to Chap 4.13.4.

Note

The CIR concept can be implemented in the production process as "internal repositories" and thus not necessarily as CIR data modules.

The delivery from a production environment using CIR data modules can be done in two ways:

– Self-contained data modules

  These data modules include all information needed to understand a description or fulfill the maintenance task. Data from the CIR data modules (eg, warnings, cautions, externalized applicability annotations), if used, are included (not linked) in the data modules to be delivered to the customer or end user.

  For example, if warnings, cautions and/or applicability CIR are used these must be included in the data modules to which they apply, if self-contained data modules are the deliverables.

  Note

  Only a limited set of data from the repository data modules can be included in the data modules.

  Note

  The CIR data modules can still be delivered together with the self-contained data modules as the repository data modules include useful additional/detailed information which cannot be accommodated in the data modules but used in an IETP.

– CIR-dependent data modules

  These data modules are dependent on CIR data modules as pieces of information are "removed" or externalized into one or more CIR data modules prior to delivery to the customer or end user (or an IETP application). The customer, end user or the IETP application, resolves any links before use or during use of the IETP viewer/browser.

The authoring rules differ between the two methods which are explained in the authoring chapters. Refer to Chap 3.9.5.2.1. When using CIR data modules certain information does not require authoring but would require referencing (linking) to the appropriate CIR data module. For example, the name of the support equipment being referenced (linked) to a CIR data module rather than being authored.

Refer to Chap 4.13.1 for details on the use of the CIR concept.

Refer to Chap 4.13.4 for details on the use of the container concept.

5 Delivery methods

5.1 Data exchange

The delivery method based on data exchange of S1000D objects (refer to Para 2) is used when the receiving organization has a CSDB and is expected to process the data and even include changes (eg, due to adaptation of the data modules to internal regulations and needs). The

receiver can then produce another interchange package or produce the final ready-to-use publications or SCORM content package modules. Refer to Fig 1.

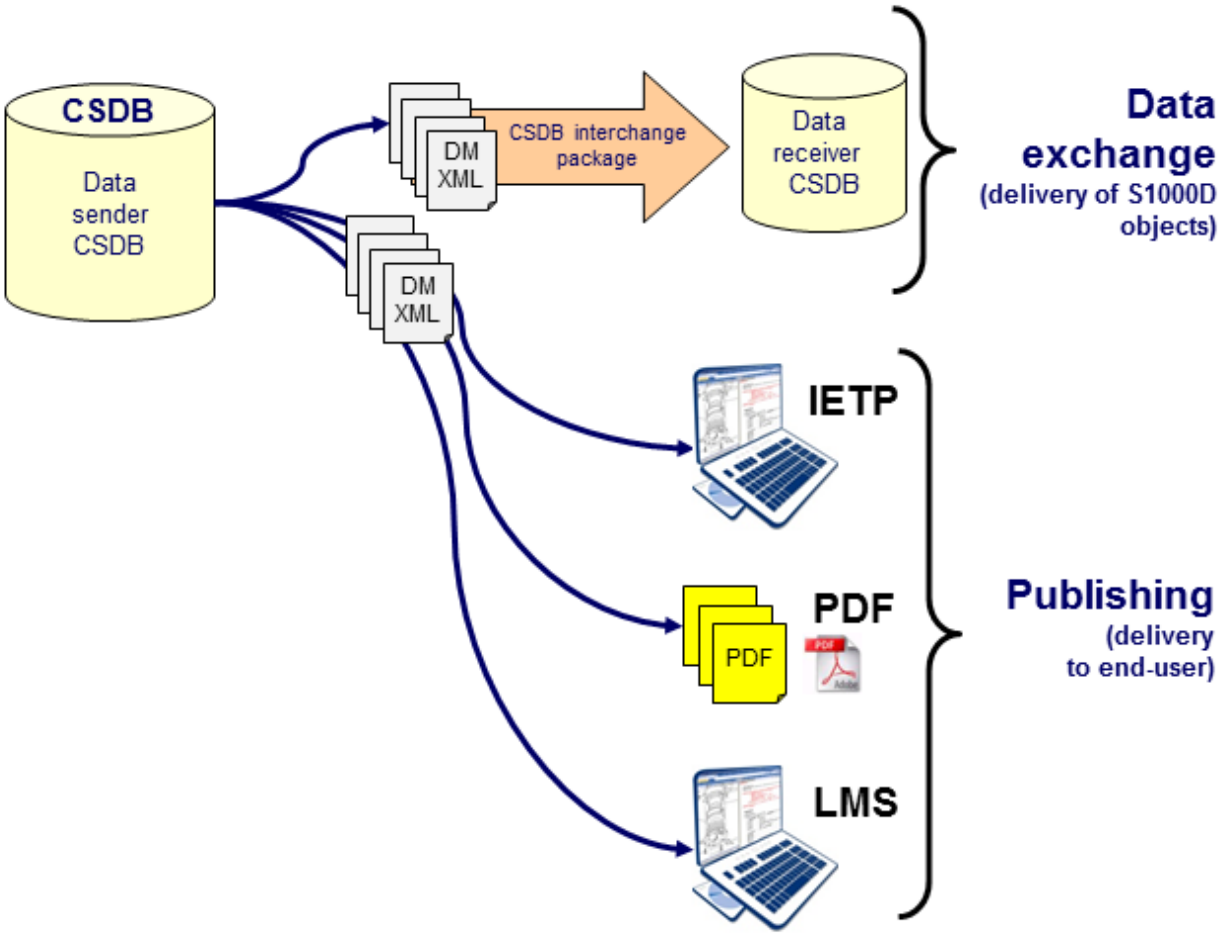
Data exchange is done between two CDSB, a sender CSDB and a receiver CSDB. The exchange could be between a subcontractor and a prime, or between a contractor and a customer.

The data exchange packages consist primarily of data modules and their associated illustrations and multimedia files. Publication modules, SCORM content package modules, and supporting files such as data dispatch notes and data management lists can also be exchanged.

The interchange of transfer packages is done as described in Chap 4.8.

5.2 Delivery of ready-to-use publications or training content packages

This method is used when the CSDB owner, contactor or customer, delivers a final ready-to-use product to the end user. It can be page-oriented publications delivered as paper publications in binders or electronic publications in PDF, the latter with some linking mechanisms. The deliverable can also be an IETP generated as described in Chap 7.4.1, or a training related product. The latter could be used as SCORM, just-in-time training, instructor or student guides.



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Fig 1 Main delivery methods

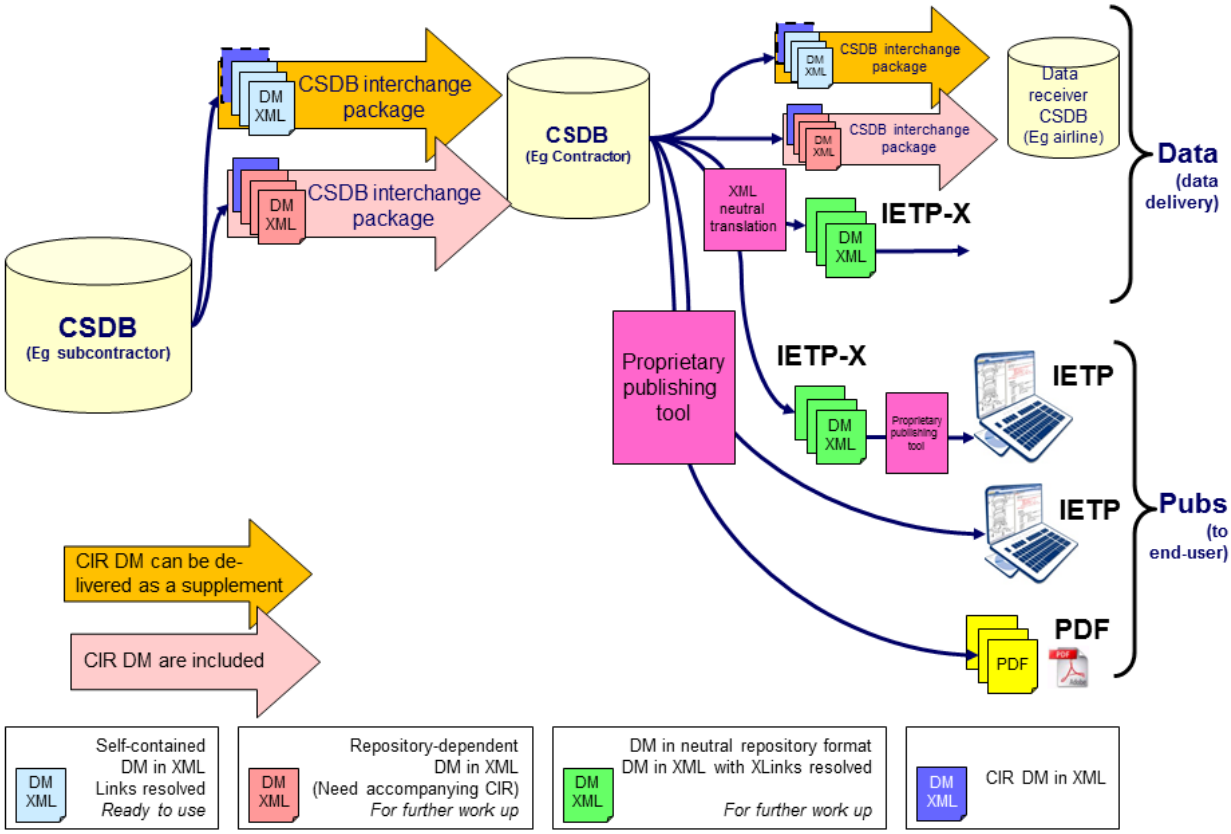
5.3 Delivery with and without CIR

The exchange of data modules can be done based on self-contained or on CIR-dependent data modules.

An interchange (transfer) package of CIR-dependent data modules must be accompanied with the relevant CIR.

An interchange package of self-standing data modules does not necessarily include any CIR. However it can be useful to exchange CIR between partners (subcontractor and contractor) to have consistent data for supplies, support equipment, warnings and cautions.

Fig 2 shows the interchange of data between different CSDB. It also briefly shows the "data transfer" from a CSDB to an end user IETP via the neutral IETP-X format described in Chap 7.4.1.



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Fig 2 Delivery methods for technical publications - Detailed view

6 Reading conventions

6.1 General

Throughout the S1000D specific conventions are used to aid common understanding and to minimize duplication. These conventions are:

Available for projects	SNS and attribute values that are available for projects or organizations to give their own specific definitions.

Not available for projects	SNS, information codes and attribute values that are not available for projects or organizations to give their own specific definitions. Projects or organizations can apply for formal definitions by the normal CPF process.
M	Mandatory The attribute affected must be given in the data module and the required entries in the construct must be populated. **Note** (M) is used in some chapters to, for example, explain the use or presentation of specific data.
O	Optional The attribute affected can be omitted if a project or organization decides. **Note** (O) is used in some chapters to, for example, explain the use or presentation of specific data.
(D)	Default value The affected markup value is the default value.
enterprise/company	Enterprise is used as the generic term when a company and/or organization is referred to. Company is used as a synonym to enterprise when a business organization is referred to. The term manufacturer (Product manufacturer, equipment manufacturer, aircraft manufacturer) and supplier are used when needed in context only. These rules are being successively introduced in S1000D.
must	Mandatory to follow the given rules.
name	The name of a "thing" such as a part, a component, an assembly. Sometimes called description, nomenclature or designation. Name is used consistently throughout S1000D.
can, could	Options to be followed by project or organization decision.

6.2 Permissible characters in codes and numbers

Throughout the S1000D the following definitions on permissible characters (alphas and numbers) when used in codes (eg, data module codes, publication module codes, learn codes, learn event codes, data management lists) and numbers (eg, issue numbers) are given below.

6.2.1 Alpha characters

The code abbreviation is "A".

The permissible characters are:

– "A" thru "Z" in uppercase. It is recommended that the use of "I" and "O" is avoided.

6.2.2 Numeric characters

The code abbreviation is "X".

The permissible characters are:

– "0" thru "9"

Note

"NN" is frequently used to indicate a numerical sequence starting from "00" or "01". Details for the interpretation are given where used in the specification.

6.2.3 Alphanumeric

The code abbreviation is "Y".

The permissible characters are:

- "0" thru "9"
- "A" thru "Z" in uppercase. It is recommended that the use of "I" and "O" is avoided.

6.2.4 Specific alpha character values

When an alpha character is given in a data module code that is intended to indicate a value, it is presented by underlining the character. For example, "A" means the value "A" and not an alpha character. "A" means an alpha character and not the value "A".

6.2.5 Use of the alpha characters "I" and "O"

Business rule decision point BRDP-S1-00001 - Use of "I" and "O":

- Decide whether and when to use the alpha characters "I" and "O".

7 Use of, and application for CAGE codes

The specification uses CAGE (Commercial And Government Entity) codes to uniquely identify enterprises and organizations. The values of some elements and attributes mandate that a registered CAGE code is used, for example, when using the identification extension in **DME** and **PME** (refer to Chap 4.12), when using the CAGE code based **ICN** (refer to Chap 4.4), when using **data management lists** (refer to Chap 4.5) and when commenting using the **Commenting Schema** (refer to Chap 4.6). To perform a **file based transfer** (refer to Chap 7.5.1) you also need a CAGE code.

As it is essential to uniquely identify parts in many cases, the specification bases the identification of those parts on the CAGE code.

Business rule decision point BRDP-S1-00002 - List of permitted CAGE codes and/or names to be used for the technical publication project:

- Create a list of permitted CAGE codes and/or names of the enterprises.

Enterprises and organizations that do not have a CAGE code, can apply for a code at their National Codification Bureau (NCB) or at:

NSPA
S2000M Administrator
L-8325 CAPELLEN
G.-D. Luxembourg
Email: Spec2000M@nspa.nato.int

8 Acronyms

Throughout the S1000D common acronyms are used to aid understanding and to minimize duplication. These acronyms are:

2D	Two Dimensional
3D	Three Dimensional
ASD	AeroSpace and Defense Industries Association of Europe

ATA	Air Transport Association
BREX	Business Rules Exchange
CAGE	Commercial And Government Entity
CGM	Computer Graphics Metafile
CIR	Common Information Repository
CPF	Change Proposal Form
CSDB	Common Source DataBase
CSN	Catalog Sequence Number
IC	Information Code
ICN	Information Control Number
IETP	Interactive Electronic Technical Publication
IPD	Illustrated Parts Data
LMS	Learning Management System
LOAP	List of Applicable Publications
LOM	Learning Object Metadata
LSA	Logistic Support Analysis
PDF	Portable Document Format
PLCS	Product Life Cycle Support
QA	Quality Assurance
SCO	Sharable Content Object
SGML	Standard Generalized Markup Language
SCORM	Sharable Content Object Reference Model
SNS	Standard Numbering System
XML	Extensible Markup Language

A list of all acronyms is given in Chap 9.2.

9 Organization of S1000D

S1000D is organized into nine chapters, which are described briefly below.

Table 2 S1000D structure overview

Chapter	Title	Description
Chap 1	Introduction to the specification	History, scope of the specification, basic definitions and change procedure

Chapter	Title	Description
Chap 2	Documentation process	Overview of the documentation process, implementation guide, business rules concept and relation with other specifications
Chap 3	Information generation	General rules which apply to technical publications that are produced on the basis of data modules and CSDB concepts
Chap 4	Information management	Data module structure, rules for interchange and updating of data modules. Concepts for using BREX, process data modules, master - customized data modules, applicability and optimizing and reuse of information
Chap 5	Information sets and publications	Common and specific requirements for information sets and publications
Chap 6	Information presentation/use	Information presentation and functionality for page oriented publications, and IETP
Chap 7	Information processing	Information for the information systems specialists, including Schemas, graphic and notation specifications, resources, resolutions and interchange conventions
Chap 8	SNS, information codes and learn codes	The listings and definitions of the maintained system/functional breakdown structures, the information codes and the learn codes
Chap 9	Terms and definitions	Glossary of terms and abbreviations, subject index and definitions for XML data elements

9.1 General breakdown of chapters

In general, all chapters are structured as follows:

- At the beginning of the chapter, there is a table of references that occur in the chapter.
- Para 1 gives a general introduction.
- Para 2 is the main body of the chapter. The main body can be broken down into several main content paragraphs. The paragraph also gives all business rules described in their context.
- Para 3 contains the markup examples, if any. Short/simple examples can also be found in the main body paragraphs.

9.2 Chap 1 - Introduction to the specification

This chapter provides general information about the specification. The scope of the specification, how to use it, how to tailor it and the way to address change request are explained.

9.3 Chap 2 - Documentation process

This chapter explains the generic documentation process. It provides an overview of the documentation process including the use of information technology and the relation to other

processes and specifications as for instance S2000M and PLCS. Through the process diagram, a reference to the corresponding chapters is also defined.

Chap 2.5 contains definition of business rules and addresses various aspects of business rules such as their classification into categories, layering, generation and use. An index of all identified business rules decision points is given in Chap 2.5.3.

9.4 Chap 3 - Information generation

This chapter provides general rules which apply to technical publications that are produced on the basis of data modules and CSDB concepts. This chapter is primarily in support of authors and illustrators.

All data modules have a basic structure which is defined in Chap 3.2.

Information sets are used to establish the required scope of the information and data module coding strategy. The use of these information sets is fully defined in Chap 3.3.

The rules for zoning and access are given in Chap 3.4.

The issues surrounding the updating of data modules are explained in Chap 3.5.

The rules for the allocation for the protective marking of data modules that reflects their security classification, etc, are detailed in Chap 3.6.

During the development and update of data modules/publications, QA procedures are required to ensure that the contents of the data modules/publications are adequate and technically accurate. Details of these procedures are given in Chap 3.7.

In order to reflect the potential breakdown of equipment, rules for disassembly are detailed in Chap 3.8.

All data modules are produced in accordance with structural rules. Authoring rules for text, illustrations and multimedia, together with front matter and warnings, cautions and notes, reinforces these structural rules which are supported by specific guidance for authoring data modules including the learning content types. These rules are given in Chap 3.9.

The chapter also includes the rules for populating the supporting data module types:

- common information repository data modules
- container data modules
- the data modules supporting the applicability model given in Chap 4.14

In all cases, the rules given in all chapters in this specification take precedence over the Schemas.

Note

The Schemas, in some constructs, allow more than is given in the narrative of the specification due to simplified Schema design and reduced maintenance.

9.5 Chap 4 - Information management

The data module code structure, rules for interchange and updating of data modules are presented. This chapter is provided in support of the project data module, illustration, publication and SCORM Content Package Module (SCPM) management.

Information management comprises the addressing, storage and handling of information objects such as data modules (Chap 4.2), illustrations and publications to enable the production and use of common technical documentation within a project.

This chapter contains the required information to establish an information database, called the CSDB (Chap 4.2), to interchange the data (Chap 4.8) and to handle publications (Chap 4.9) and training content packages (Chap 4.15) derived from the CSDB.

It also gives details about the coding of data modules (Chap 4.3) and their associated illustrations and multimedia information (Chap 4.4). It describes data management lists (Chap 4.5) used for planning, management and control of CSDB content, and defines the handling of comments on data modules and publications (Chap 4.6). The means to enable version control (Chap 4.7) of data modules, publication modules and SCORM content package modules are also described in this chapter.

The BREX (Chap 4.10) its use and the development of a project specific BREX and the use of the process data module (Chap 4.11) is explained.

Managing a multi-customer environment is described in the master-customized concept (Chap 4.12).

The chapter also includes the concept of optimizing and reuse of data (Chap 4.13). Optimizing and reuse includes handling of significant data within a data module and a mechanism to group properties related to different technical information types with the aim to reduce redundant information and to increase support consistency (the CIR data module concept). A production management mechanism to associate several data modules representing the same data with different product configuration (the container data module concept) is also described.

An applicability model is presented which can be used at many different levels, from simple to very complex. The model is capable of supporting from a static textual output to a dynamic output that is filtered for the actual configuration of the product instance. An overview and functional capabilities of the applicability model are explained (Chap 4.14).

Chap 4.15 supports the aggregation of learning content used for training and performance products. This support is managed through the use of the SCORM content package module. The SCPM document structure is based on the SCORM Content aggregation model. The SCORM content package module schema allows courseware developers to collect learning and maintenance modules into training products. The SCPM is mainly used to assist in the preparation of S1000D training materials for presentation by an SCORM compliant Learning management system.

Chap 4.16 explains how to manage a dedicated markup for content specific (technical information and paragraph significant data) and quantity data, with the aim of enabling enhanced processing and/or display of the information.

9.6 Chap 5 - Information sets and publications

This chapter contains common and specific requirements for information sets and publications, necessary to operate and maintain the Product. This chapter is primarily provided for project publication procurement, management, authors and illustrators.

An information set is the required information needed in a defined scope and depth (author's view), in the form of data modules, managed in the CSDB.

A publication is the compilation and publishing of information for a customer (user's view). This can be an IETP, a paper publication compiled from data modules or a publication with legacy data. It can be a subset of or equal to an information set, but it can also be a superset of several information sets or parts of them.

Requirements for information sets are given in Chap 5.2 and for publications in Chap 5.3.

9.7 Chap 6 - Information presentation/use

This chapter provides information presentation and use rules for page-oriented publications (Chap 6.2), and IETP (Chap 6.3). The functionality matrix for page oriented publications, both paper and screen based, together with the display of information in a non-linear fashion, are explained in Chap 6.4. This chapter is mainly provided in support of project publication procurement, management, authors, illustrators and information technology specialists.

9.8 Chap 7 - Information processing

This chapter describes the technical aspects of the Schemas, graphics and notations together with information interchange, resolution of resources and software requirements.

9.9 Chap 8 - SNS, information codes and learn codes

This chapter gives a description of a common SNS and the information codes used in the data module code.

The S1000D maintained set of SNS is given in Chap 8.2 for air vehicles, engines and equipment, tactical missiles, support equipment general land and general sea Product.

Chap 8.3 refers to examples of SNS (eg, power provision, artillery radar, software, medical and technical publication projects). These example SNS are given on the S1000D website (www.s1000d.org).

The detailed definitions of the information codes are given in Chap 8.4 and the learn/training codes are given in Chap 8.5.

9.10 Chap 9 - Terms and definitions

This chapter provides a glossary of terms (Chap 9.2.1), abbreviations and acronyms (Chap 9.2.2) used within S1000D. A subject index is also included (Chap 9.2.3). The definitions for XML data elements are given in Chap 9.3.

Chapter 1.4

How to tailor for a specific project

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Chap 1.4.1	How to tailor for a specific project - Tailoring introduction
Chap 1.4.2	How to tailor for a specific project - Conformance and compliance

1 General

This chapter gives a basic introduction to business rules and where to find information regarding tailoring of S1000D for a specific project or organization.

2 Content

Chap 1.4.1 introduces tailoring of S1000D and summarizes where to find information pertinent to tailoring. Chap 1.4.2 defines the requirements necessary to fulfill in order to stay in adherence with the specification when tailoring takes place.

Chapter 1.4.1

How to tailor for a specific project - Tailoring introduction

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Chap 2.5.3	Business rules - Index
Chap 3	Information generation
Chap 4	Information management
Chap 8	SNS, information codes and learn codes

1 General

This chapter gives a basic introduction to business rules and where to find information to tailor S1000D for a specific project or organization.

2 Content

This specification has been produced to cater for many different types of products. Therefore, to make it suitable for a given project or organization, some aspects of tailoring will be required. It is recommended that the tailored version of this specification is referred to in the project's contractual documentation. This tailoring must not affect the XML Schemas or its basic philosophies, but must be restricted to tailoring within the narrative specification.

Project business rules must be agreed between parties to document the details of the agreed tailoring of this specification. These rules must cover the requirements for optional elements, their population from specific data sources, and the use of specific values.

Chap 2.5 defines the term "business rules" and describes the standardization of the business rules scope within S1000D. Chap 2.5.1 groups various business rules into categories and introduces the construct of business rules layers that describe various organizational and project levels at which business rules are produced. Chap 2.5.2 addresses the mechanisms of business rules generation and use. Chap 2.5.3 contains a complete index of business rule decision points.

Chap 4 includes a description of the BREX mechanism provided to record and exchange specific business rules between parties involved in a project.

Chap 3 thru Chap 8 give guidance on the project and/or organization specific business rules decisions.

Chapter 1.4.2

How to tailor for a specific project - Conformance and compliance

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Chap 7.3.1.3	Data module Schema - Invocation
Chap 7.4.1	Generation of publications - IETP

Chap No./Document No.	Title
Chap 7.5	Information processing - Information interchange

1 Introduction

Implementing S1000D for an organization or a project involves tailoring of the specification. In making such tailoring it is necessary to know the type and degree of tailoring that is acceptable without leaving the S1000D concept. This chapter gives the criteria which constitute the definition of conformance and compliance to S1000D Issue 5.0. The criteria do not necessarily extend into future issues.

2 Conformance and compliance

2.1 Background and basics

S1000D provides a complete process and a set of supporting tools, such as predefined structures/XML Schema for representing different types of information. The degree of adherence to the process and tools specified by S1000D is expressed in terms of compliance and conformance to the specification.

Requirements related to conformance and compliance only apply to information exchange and delivery. The specification does not identify how a certain process step or object is handled inside a producing environment, before exposure to an external environment.

2.1.1 About certification

While S1000D defines what S1000D conformance and compliance means, it does not formally certify or endorse any third party S1000D objects, processes, software or other information products.

2.2 Definitions

In this context, the definitions in Para 2.1.1 thru Para 2.2.3 apply.

2.2.1 Definition of conformant/conformance

"Conformant" and “conformance" refer to the similarity in form of one or another object to the specification of how such an object must be formed.

Definition: An object, or a set of related objects, is conformant to S1000D if and only if it fulfills the form requirements of such an object, as specified by S1000D (eg, a data module can be conformant).

2.2.2 Definition of compliant/compliance

"Compliant" and “compliance" refer to the adherence to one or another process or procedure as defined by a specification.

Definition: A process step, a procedure, or the like, is compliant to S1000D if and only if it is carried out in accordance with what is specified by S1000D, and does not violate the criterion in Para 2.2.1 (eg, the assignment of codes to denote responsible partner companies can be compliant).

2.2.3 Definition of CSDB, CSDB management system and CSDB object

For definitions of the terms CSDB, CSDB management system and CSDB object. Refer to Chap 4.2.

2.3 Criteria

S1000D provides rules, guidance and tools covering various aspects of the documentation process. Within each aspect, the functionality is offered as a set of functions and provisions, and a set of object types.

Some requirements concerning a specific aspect can be crucial to obtain commonly comprehensible S1000D information. These requirements form a core of criteria which characterizes S1000D conformant objects and compliant processes.

In addition to the core criteria there are a number of S1000D aspects for which the specification offers a choice to the user of the specification between, on one hand, applying the provisions it offers or, on the other hand, replacing them by an alternative solution.

The S1000D aspects, for which conformance/compliance criteria can be defined, are:

- General, overall properties
- The documentation process
- The CSDB and the CSDB objects that it contains
- Exchange of data between CSDB
- Delivery and presentation of information to users in page-oriented format
- Delivery and presentation of information to users as IETP

To reflect the situation described above, the conformance and compliance criteria defined below are organized as follows:

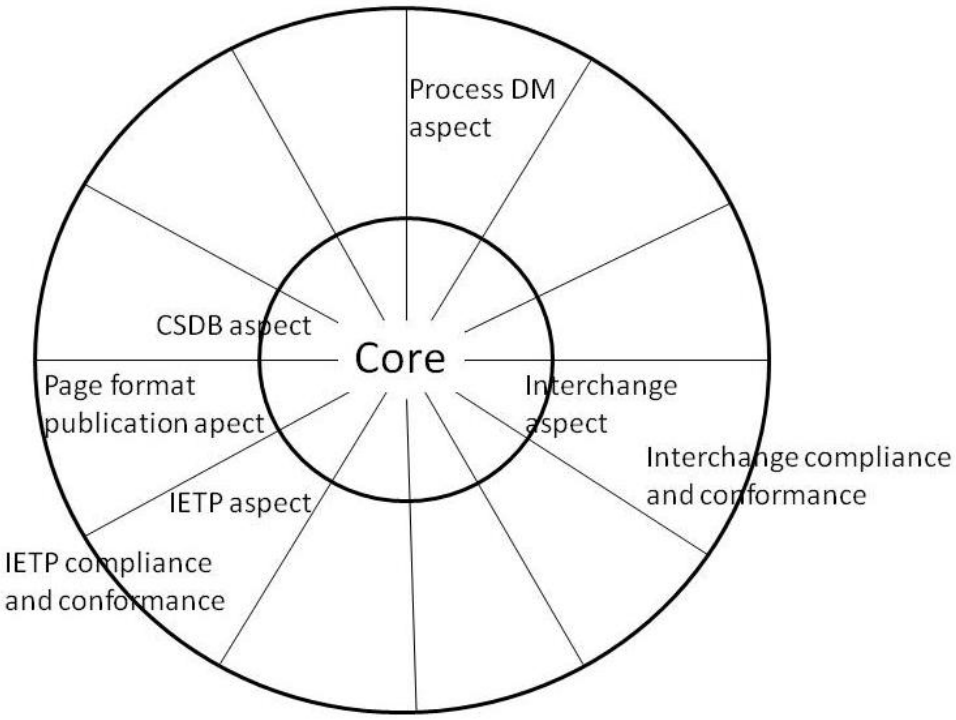
1 Core criteria

These criteria must be fulfilled to achieve S1000D conformance and compliance. Refer to Para 2.3.1.

2 Criteria on aspect options

In order to achieve conformance and/or compliance regarding the aspects concerned, certain criteria must be fulfilled per aspect. The aspects themselves, however, can be fully or partially optional. Refer to Para 2.3.2.

An aspect covers a certain functional area such as the generation of IETP, CSDB management, etc. Refer to Fig 1.



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Fig 1 Simplified illustration of aspect core vs aspect options

2.3.1 Core criteria

CSDB objects are S1000D Core conformant and related processes are S1000D Core compliant if and only if they meet the criteria given below.

2.3.1.1 General criteria

A CSDB object that fulfills the criteria herein in relation to Issue 5.0 of S1000D is “conformant to S1000D Issue 5.0" (or “S1000D Issue 5.0 conformant").

Note

Graphics and multimedia objects can potentially be conformant to several S1000D issues, since they are not controlled by the Schemas of a given S1000D issue.

2.3.1.1.1 Schemas verses specification text

S1000D properties for process, objects, etc, are defined in the specification text. XML object structures are defined by schemas.

Criterion regarding adherence to Schema and specification text:

An S1000D conformant XML object must meet the requirements defined by the applicable specification text and by the referred XML Schema. Unless explicitly supported by S1000D, an XML object must not depend on namespaces or any other XML data and feature to be fully understandable and possible to render as needed.

2.3.1.1.2 Business rules

Criterion regarding Business rules:

The business rules for a project or an organization must be defined, documented and provided to any party that needs to receive, create, manage or deliver CSDB objects to those rules.

Business rules valid for a certain level in a layered business rules structure must obey the parent level business rules. Ultimately, business rules for a project or an organization must obey the business rules specified in the S1000D default BREX data module.

A CSDB object must adhere to the business rules to which it is written and/or to which it refers.

2.3.1.2 Documentation process criteria

Criterion regarding documentation process:

To be S1000D documentation process compliant a documentation process must at a minimum fulfill the requirements described in Chap 3.9.5.1 (including subchapters) with regard to:

- Requirements for published and unpublished versions of objects
- Security and data restriction requirements
- Quality assurance requirements

2.3.1.3 CSDB and the CSDB object criteria

2.3.1.3.1 CSDB objects, general

Criteria regarding conformance to Schema:

Any of the XML objects in a CSDB must fully conform to one of the Issue 5.0 Schemas provided by S1000D (as given in the CSDB object's Schema declaration).

Refer to default the BREX rules BREX-S1-00027, BREX-S1-00028 and BREX-S1-00246, BREX-S1-00247, BREX-S1000D-00248, BREX-S1000D-00249 and BREX-S1-00250.

Any one XML object must contain a reference to an S1000D XML Schema, the structure of which it is aimed to follow as described in the specification. Refer to Chap 7.3.1.3.

2.3.1.3.2 CSDB object identification and status

Criteria regarding Identification of objects:

The identity of a CSDB object, including objects not being S1000D recognized XML objects, must fully conform to the identification data structure that applies to its object type.

Apart from the exceptions offered by the specification, the identification principle of a data module code must be applied to a data module. The identification must be built on two parts:

- The first part identifies the product item (up to and including the disassembly code variant)
- The second part identifies the type of information about the item

Criterion regarding identification codes:

A CSDB object is S1000D conformant if and only if it does not deviate from the coding schemes offered by the specification.

Criterion regarding status of objects

All XML objects exchanged from a CSDB must be populated with the set of status/metadata items required by the applied issue of S1000D.

2.3.1.3.3 CSDB object content section

Criterion regarding use of elements and attributes:

An S1000D conformant object must use the elements and attributes in accordance with the definitions expressed in S1000D including the referred XML Schema and the default BREX.

2.3.2 Criteria on aspect options

The criteria below all relate to functional aspects of S1000D which are optional. Thus, it is possible to be S1000D core compliant/conformant but choose not to be compliant/conformant with regard to various options described in the specification.

However, in order to reach S1000D conformance and/or compliance in any of the listed aspects the criteria for that aspect must be fulfilled.

Aspects not explicitly covered by the specification do not influence the degree of conformance and compliance. Further, where there is a decision point identified in the specification, projects can do whatever is within the bounds of the decision point and still be compliant/conformant.

Criterion related to process:

To be S1000D process compliant, a documentation process must apply:

- DMRL/CSL objects in accordance with Chap 4.5
- comment objects in accordance with Chap 4.6

Criterion related to transfer:

An S1000D conformant data transfer package must fulfill all the applicable requirements specified in Chap 4.8 and Chap 7.5.

Criterion related to a CSDB delivery:

An S1000D conformant CSDB data delivery package is a data package defined and transferred in accordance with Para 2.3.1.3, Chap 4.8 and Chap 7.5.

Criterion related to an IETP delivery:

An S1000D conformant IETP data package is a data package defined and transferred in accordance with Para 2.3.1.3 and which consists of objects conformant to IETP neutral repository format specified in Chap 4.8, Chap 7.4.1 and Chap 7.5.

Criterion related to page-oriented format publication:

An S1000D conformant and compliant page-oriented format data package must fulfill the requirements specified in Chap 6.2 of the specification.

Criterion related to IETP presentation:

An S1000D conformant and compliant IETP presentation must fulfill the requirements specified in Chap 6.3 of the specification.

Chapter 1.5

Request for change

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1 General

Proposals to amend S1000D must be submitted in the full knowledge that all users, both military and industrial, can be affected by changes to the specification, and will be accepted only under international agreement.

The maintenance of this specification is vested in the S1000D Steering Committee who will obtain agreement from the participating organizations prior to publication of changes. The S1000D Steering Committee considers change proposals at each meeting and can ratify them for incorporation in the specification. The S1000D Steering Committee also decides when changes will be published in S1000D.

Any queries or proposals relating to changes to the specification must be addressed to the S1000D Steering Committee using the online CPF facility which can be found at www.s1000d.org.

Proposals from the S1000D member nations and organizations must follow the process outlined below.

Copies of the specification can be obtained at www.s1000d.org.

2 Online change proposals

2.1 Convention

The online change proposal facility uses two conventions for CPF, which are explained in detail on the web site:

Proposal	A CPF that is in draft
CPF	A CPF that is formally submitted to the S1000D Steering Committee

2.2 Tiers

There are two tiers to the online CPF facility. These are explained in detail on the web site. The lower tier is used for drafting proposals and the upper tier is used for S1000D Steering Committee review of formal CPFs. The upper tier is available for public view, so that members can see what changes are being proposed.

2.3 Groups

Access to the lower tier is obtained by being a member of a group. Groups are made up by nation and organization and comprise their members. A CPF can only be submitted by these groups. It is possible to be a member of more than one group. See your national or organizational representative, which are listed on the web site, to become a member of a group.

2.4 Roles

Within each group, only the administrator role can promote a draft CPF to a formal status of "New" for the S1000D Steering Committee to review.

2.5 CPF cycle

2.5.1 Creation

There is a process that is explained in detail on the web site. This creates the proposal in the national or organizational lower tier.

2.5.2 Workflow

There are two types of workflow:

- Pre-submittal
- S1000D Steering Committee

2.5.2.1 Pre-submittal workflow

The pre-submittal is where draft proposals are developed. Group administrators can set pre-submittal statuses to suit their own group's workflow.

2.5.2.2 S1000D Steering Committee workflow

The S1000D Steering Committee workflow moves through the statuses that are defined on the website.

Chapter 2

Documentation process

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Chapter	Data module title	Data module code	Applic
Chap 2	Documentation process	S1000D-A-02-00-0000-00A-009A-A	All
Chap 2.1	Documentation process - Overview	S1000D-A-02-01-0000-00A-040A-A	All
Chap 2.2	Documentation process - Use of standards	S1000D-A-02-02-0000-00A-040A-A	All
Chap 2.3	Documentation process - Relations to other processes and standards	S1000D-A-02-03-0000-00A-040A-A	All
Chap 2.4	Documentation process - Implementation guide	S1000D-A-02-04-0000-00A-040A-A	All
Chap 2.5	Documentation process - Business rules	S1000D-A-02-05-0000-00A-040A-A	All
Chap 2.5.1	Business rules - Categories and layers	S1000D-A-02-05-0100-00A-040A-A	All
Chap 2.5.2	Business rules - Generation and use	S1000D-A-02-05-0200-00A-040A-A	All
Chap 2.5.3	Business rules - Business rule decision points index	S1000D-A-02-05-0300-00A-040A-A	All

Chapter 2.1

Documentation process - Overview

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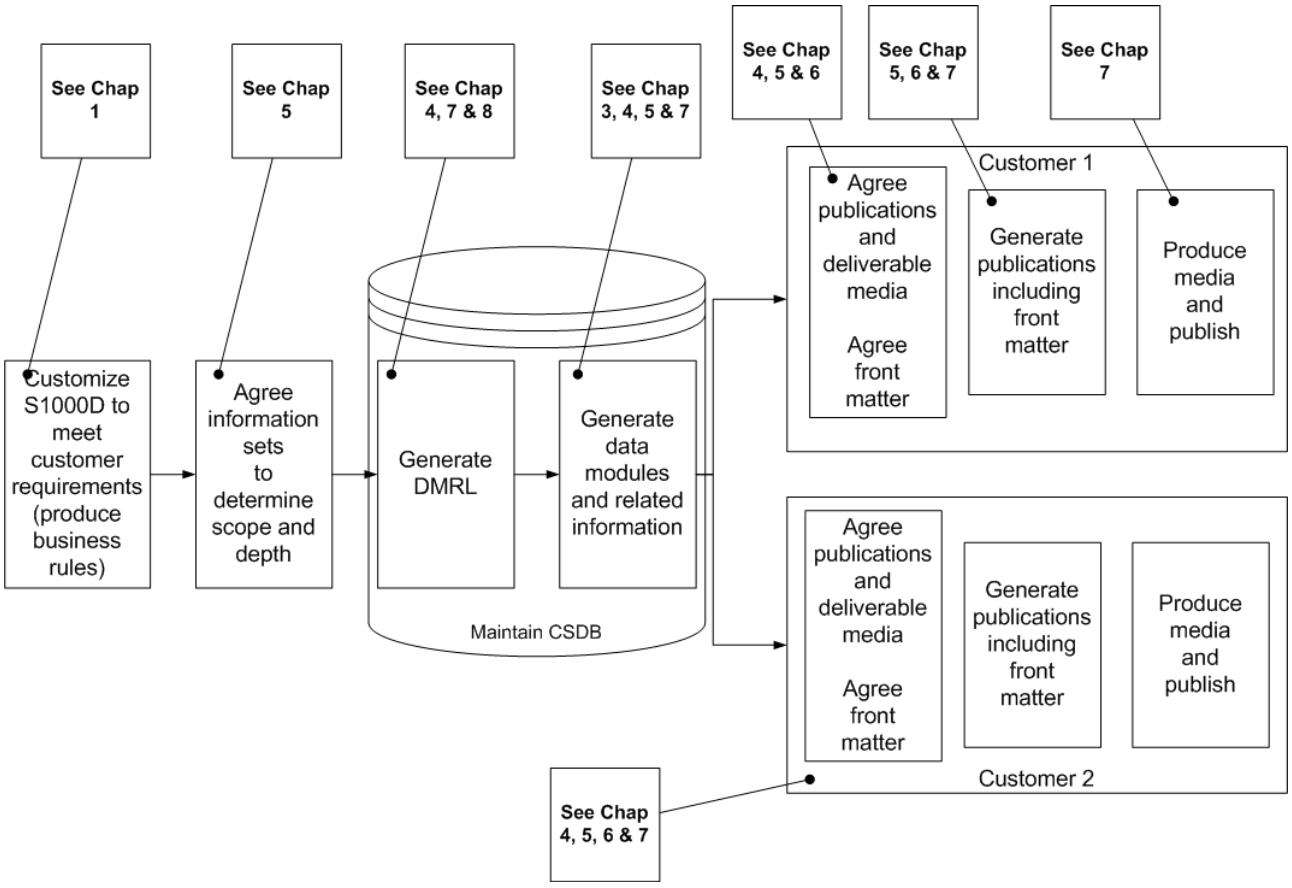
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None	

1 General

To assist with the S1000D process, a basic overview which shows where specific chapters are relevant is given.

2 Process

The basic process is shown in Fig 1. This is a basic representation that does not detail all the supplier/customer interfaces or CSDB status checking.



ICN-AE-A-020100-A-U8025-00081-A-02-1

Fig 1 Basic S1000D process

Chapter 2.2

Documentation process - Use of standards

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1 General

Table 2 lists a description of the standards and specifications that are referenced in S1000D.

2 Referenced standards and specifications

Table 2 Referenced standards and specifications

Number	Title	Issue/Version
C-M(2002)49	NATO Security Policy (Security within the North Atlantic Treaty Organisation)	
IEEE Std 1484.12.1-2002	Standard for Learning Object Metadata	
ISO 10303-239 (PLCS)	STEP - Standard for Product data representation and exchange. Application Protocol AP239 - Product Life Cycle Support (PLCS)	Edition 1
ISO/IEC 10918	Information technology - Digital compression and coding of continuous-tone still images (JPEG)	1994, 1995, 1997, 1999, 2005
ISO/IEC 15948	Information technology - Computer graphics and image processing - Portable Network Graphics (PNG): Functional specification	2004

Number	Title	Issue/Version
ISO 12639	Graphic technology - Prepress digital data exchange - Tag image file format for image technology (TIFF/IT)	2004, Amd 1:2007
ISO 3166-1	Codes for the representation of names of countries and their subdivisions - Part 1: Country codes. The lists of all short country names and alpha-2 code elements officially published by ISO are updated whenever a change of country name and/or alpha-2 code element is made in ISO 3166-1.	2006, 2007, 2008
ISO 32000-1	Document management - Portable document format - Part 1: PDF 1.7	2008
IEC 60617	Graphical symbols for diagrams	2011
ISO 6093	Information processing - Representation of numerical values in character strings for information interchange	1985
ISO 639-1	Codes for the representation of names of languages - Part 1: Alpha-2 code	2002
ISO/IEC 80000-1	Quantities and units - Part 1: General	2009, 2011
ISO/IEC 80000-2	Quantities and units - Part 2. Mathematical signs and symbols to be used in the natural sciences and technology	2009
ISO 8601	Data elements and interchange formats - Information interchange - Representation of dates and times	2004
ISO/IEC 8632-1	Information technology - Computer Graphics - Metafile for the storage and transfer of picture description information (CGM) - Part 1: Functional specification	1999, 2006, 2007
ISO/IEC 8632-3	Information technology - Computer Graphics - Metafile for the storage and transfer of picture description information (CGM) - Part 3: Binary encoding	1999
Adobe TIFF 6.0	Tagged Image File Format	Revision 6.0, June 1992
CompuServe GIF 89a	Graphics Interchange Format	Version 89a, 1990
PDF Reference	Adobe Portable Document Format	Version 1.3 or later
OASIS Technical Resolution 9401	Entity Management	1997
OASIS XML Catalogs	XML Catalogs	V1.1, October 2005
http://www.oasis-open.org/specs/a502.htm	OASIS Technical Memorandum TM 9502:1995 (CALS Table Model Document Type Definition)	

Number	Title	Issue/Version
REC-rdf-syntax-grammar-20040210	W3C Recommendation: RDF/XML Syntax Specification (Revised)	2004
Extensible Markup Language (XML) 1.0 (Fifth Edition)	Extensible Markup Language (XML)	Version 1.0
REC-webcgm21-20100301	W3C Recommendation: WebCGM 2.1	Version 2.1, 2010
REC-xlink11-20100506	W3C Recommendation: XML Linking Language (XLink) Version 1.1	Version 1.1, 2010
REC-xml-20081126	W3C Recommendation: Extensible Markup Language (XML) 1.0 (Fifth Edition)	Version 1.0, 2008
REC-xml11-20060816	W3C Recommendation: Extensible Markup Language (XML) 1.1 (Second Edition)	Version 1.1, 2006
REC-xmlbase-20090128	W3C Recommendation: XML Base (Second Edition)	2009
REC-xml-names-20091208	W3C Recommendation: Namespaces in XML 1.0 (Third Edition)	Version 1.0, 2009
REC-xml-names11-20060816	W3C Recommendation: Namespaces in XML 1.1 (Second Edition)	Version 1.1, 2006
REC-xmlschema-1-20041028	W3C Recommendation: XML Schema Part 1: Structures Second Edition	2004
REC-xmlschema-2-20041028	W3C Recommendation: XML Schema Part 2: Datatypes Second Edition	2004
REC-xmlschema11-1-20120405	W3C Recommendation: W3C XML Schema Definition Language (XSD) 1.1 Part 1: Structures	Version 1.1, 2012
REC-xmlschema11-2-20120405	W3C Recommendation: W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes	Version 1.1, 2012
REC-xml-stylesheet-20101028	W3C Recommendation: Associating Style Sheets with XML documents 1.0 (Second Edition)	Version 1.0, 2010
REC-xpath20-20101214	W3C Recommendation: XML Path Language (XPath) 2.0 (Second Edition)	Version 2.0, 2010
REC-xptr-element-20030325	W3C Recommendation: XPointer element() Scheme	2003
REC-xptr-framework-20030325	W3C Recommendation: XPointer Framework	2003
REC-xptr-xmlns-20030325	W3C Recommendation: XPointer xmlns() Scheme	2003
REC-xsl11-20061205	W3C Recommendation: Extensible Stylesheet Language (XSL)	Version 1.1, 2006
REC-xslt20-20070123	W3C Recommendation: XSL Transformations (XSLT) Version 2.0	Version 2.0, 2007

Number	Title	Issue/Version
RFC-2483- January 1999	IETF Recommendation: URI Resolution Services Necessary for Uniform Resource Name (URN) Resolution	1999
RFC-2396- August 1998	IETF Recommendation: Uniform Resource Identifiers (URI) Generic Syntax	1998
RFC-2413-September 1998	IETF Recommendation: Dublin Core Metadata for Resource Discovery	1998
RFC-3986- January 2005	IETF Recommendation: Uniform Resource Identifiers (URI) Generic Syntax	2005
RFC-3987- January 2005	IETF Recommendation: Internationalized Resource Identifiers (IRIs)	2005
RFC-5013- August 2007	IETF Recommendation: The Dublin Core Metadata Element Set	2007
SCORM 2004	SCORM 2004 4th Edition	
STANAG Number 3430	North Atlantic Treaty Organisation (NATO) Standardisation Agreement for Air vehicle cross-servicing guide	Edition 7
MIL-PRF-28002C	Raster Graphics Representation in Binary Format, Requirements for: CCITT Gr 4	
MSG-3	Operator/Manufacturer Scheduled Maintenance Development	
S2000M	International specification for material management - Integrated data processing	
S3000L	International specification for Logistics Support Analysis - LSA	
S4000P	International specification for developing and continuously improving preventive maintenance	
ASD-STE100	Simplified Technical English (ASD-STE100®)	

Chapter 2.3

Documentation process - Relations to other processes and standards

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Chap 3.9.5.2.7	Content section - Parts information
Chap 3.9.5.2.13	Content section - Learning data module
Chap 5.3.1.3	Common requirements - Illustrated parts data
ISO 10303 AP 239 - PLCS	STEP - Standard for Product data representation and exchange. Application Protocol AP239 - Product Life Cycle Support (PLCS)
S2000M	International specification for material management - Integrated data processing
SCORM	SCORM 2004

1 General

The relationship between the S1000D process and processes from other specifications and standards such as S2000M, ISO 10303 AP 239 (PLCS) and SCORM is briefly addressed here.

2 S2000M

Both S1000D and S2000M use the same rules for model identification coding. They also both use the same illustration rules as defined in Chap 3.9.2.

There are two methods for producing an IPD, historically known as the Illustrated Parts Catalog (IPC):

- the "traditional" method (ie, compilation by authors from parts source data or generated/supported from project specific parts databases)
- the extraction from an S2000M database

These methods are described in detail in Chap 3.9.5.2.7 and Chap 5.3.1.3.

3 ISO 10303 AP 239 - PLCS

A set of data exchange specifications to establish the relationship between S1000D and PLCS is under development.

4 SCORM

The relationship between S1000D and SCORM has been established so that training content can be developed using the data module concepts of S1000D. Specifically, the learning data module captures five different learning information types, and the SCO content data module corresponds to the sharable content objects of SCORM. Refer to Chap 3.9.5.2.13. Also, to provide the link to the SCORM LMS, connectivity is provided through the LOM in the SCORM content package module.

Information about SCORM can be found at www.adlnet.gov.

Chapter 2.4

Documentation process - Implementation guide

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None	

1 General

An implementation guide will offer guidance for S1000D implementation in its various facets.

The implementation guide will be included in a future issue of this specification.

Chapter 2.5

Documentation process - Business rules

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Chap 2.5.2	Business rules - Generation and use
Chap 2.5.3	Business rules - Index

1 General

The goal of this chapter is to categorize various types of information contained in business rules specified by a project or an organization. This chapter also addresses the standardization of S1000D business rules generation and use within an S1000D project.

Chap 2.5.1 introduces and explains business rules categories and layers.

Chap 2.5.2 describes the methods for business rules generation and use.

Chap 2.5.3 contains an index of all identified business rule decision points.

2 Business rules

2.1 Definition

Business rules are decisions that are made by a project or an organization on how to implement S1000D. Business rules cover all aspects of S1000D and are not limited to authoring or illustrating. They can also address issues that are not defined in S1000D such as rules related to how S1000D interfaces with other standards, specifications and business processes that are related to its implementation.

2.2 Business rules decision points

Throughout the specification, in particular the authoring chapters, business rule decision points have, wherever possible, been identified. However, in many cases, there could be places where

no BRDP was identified but a decision must still be made. Projects and organizations must still decide for themselves whether certain business rule decisions must be made in these cases.

Chapter 2.5.1

Business rules - Categories and layers

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Chap 2.4	Documentation process - Implementation guide
Chap 3.4	Information generation - Zoning and access
Chap 4.12	Information management - Multiple instances of CSDB objects
Chap 5	Information sets and publications
Chap 6.2	Information presentation and use - Page-oriented publications
Chap 6.2.2	Page-oriented publications - Typography and layout elements
Chap 6.4	Information presentation and use - Functionality
S2000M	International specification for material management - Integrated data processing
ASD-STE100	Simplified Technical English (ASD-STE100®)

1 General

This chapter gives the concepts of business rules categories and layers that exist in S1000D.

Grouping business rules into categories will help projects and organizations to differentiate between, and understand, the relevance of various business rules, as well as to be able to group them in certain classes. This classification is made to help standardize business rules scope.

S1000D recognizes that a number of decisions related to its implementation are made not only on a project level but often also on an organizational level (eg, national Ministries or Departments of Defense (MoD or DoD), international consortia such as Civil Aviation Working Group (CAWG)). The structure and content of business rules between projects and various organizations can differ considerably.

In support of the business rule categories, a layered model of business rules is introduced.

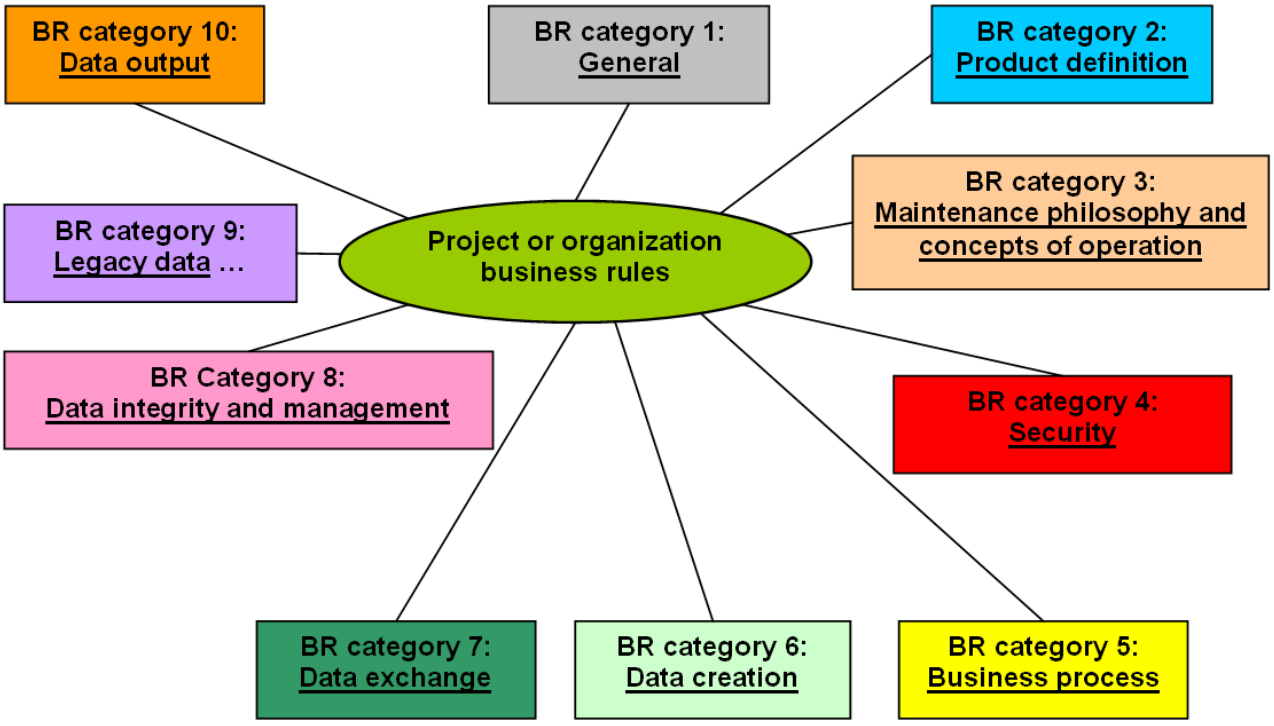
Introduction of the layered model implies that business rules can be written not only for a project but also for an organization. Various layers of business rules can also be arranged in a certain hierarchy that is appropriate for the implementation. Each layer of this hierarchy represents some of the business rules decisions to be made by a project or an organization.

It is possible that business rules on different layers contain redundant and/or conflicting business rules. Additionally, the layered structure of business rules usually has a tree-like structure rather than a one-dimensional layered form. Any change in a higher level business rule required by a lower level of the business rules hierarchy can be in conflict with the related business rules of the other layers. Para 5 of this chapter points out various conflicting aspects in business rules creation and provides guidance as well as recommendations to avoid these conflicts.

2 Business rules categories

A business rules category is a unique grouping that describes rules applicable to product definition, maintenance philosophy, concepts of operation, security, business processes, data creation, data exchange, data integrity, data output and/or legacy data conversion, management, handling and other issues.

Ten different business rule categories have been identified. These categories are defined to ensure that business rules developers consider all major business rules decisions within S1000D. Each sample business rule is assigned to one business rules category. Some business rules can belong to one or more categories. Apart from that, the business rule categories cannot be considered in isolation from each other. They relate to and complement each other (eg, data exchange, data integrity and management business rule categories as shown in Para 2.8, as well as data creation and data output business rule categories as shown in Para 2.10). The business rule categories are identified in Fig 1.



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Fig 1 Business rule categories

The examples given after the definitions of each business rules category in Para 2.1 thru Para 2.10 are not exhaustive and are only intended to provide the reader with a guide how these categories of rules can be covered. The word "must" means in this example that a certain business rule must be followed only by this particular example project or organization.

2.1 Business rules category 1 - General business rules

2.1.1 Definition

General business rules cover all decisions made by a project or organizations that are not covered by any of the specific business rule categories below. They serve as overall decisions for the implementation of S1000D.

These decisions include but are not limited to:

- decision on which issue of S1000D to be implemented
- identification of the parts of S1000D to be used and implemented in the project
- definition of terms used throughout the project, so there is a clear understanding of their meanings

2.1.2 Examples

- **Decision example on an organizational level:** The technical documentation of all new vehicles must be produced to S1000D Issue 4.0 or higher.
- **Decision example on a project level:** The whole technical documentation in this project must be realized on the basis of S1000D Issue 2.1. Exceptions/Additions: Authoring rules for wiring will be adopted from S1000D Issue 2.2. Layout rules will be implemented on the basis of S1000D Issue 2.3.

2.1.3 Business rules category 1 - General

The following business rules are basic rules and must be decided upon before any other business rules can be addressed:

Business rule decision point BRDP-S1-00003 - Issue of S1000D to be used:

- Decide which issue or issues of S1000D to be used.

Business rule decision point BRDP-S1-00004 - Information sets to be used:

- Decide which information sets, given in S1000D and/or project specific, to be used.

Business rule decision point BRDP-S1-00005 - Publications to be produced:

- Decide which publications to be produced.

Business rule decision point BRDP-S1-00006 - Schemas to be used:

- Decide which Schemas to be used and in which information set they are to be used.

Business rule decision point BRDP-S1-00007 - Use of optional elements and attributes:

- Decide whether and how to use each optional element and attribute in its structural context.

Business rule decision point BRDP-S1-00008 - Possible deliverables:

- Decide on the possible deliverables, such as:
  - S1000D objects (eg, data modules, publication modules, illustration sheets and multimedia objects, data management lists) using file based transfer. Refer to Chap 7.5.1.
  - Page-oriented publications and/or interactive electronic technical publications

2.2 Business rules category 2 - Product definition business rules

2.2.1 Definition

Product definition business rules cover the data module coding strategy related to how the Product is broken down (eg, physical or functional). Included is the definition of the model identification codes to be used in the Product and its subsystems. Supplier subsystems and identifications also need to be considered.

The project specific SNS is normally defined in conjunction with the product breakdown structures defined by engineering or design. The SNS specification is a set of information that is produced to detail these rules.

Applicability rules are also defined in this category.

Additionally, definition of zones and access points fall under this category.

To summarize, the product definition business rules include but are not limited to:

- model identification codes for the Product and its subsystems and components
- system difference code
- material item category code
- SNS specification (decision on which SNS scheme to be chosen or defined)
- disassembly code
- disassembly code variant
- applicability rules
- zoning rules
- access rules

2.2.2 Examples

- The rules for the data module coding strategy related to the product breakdown are defined in the project BREX data module
- The permissible model identification codes for this project are "1B" for airframe, "E2" for engine
- A list of SNS together with technical names and data module types is given in the data module with data module code DMC-YY-Y-YY- …
- The rules for applicability are as follows:
  - The model of bicycle must be "Brook trekker" or "Mountain storm"
  - The version of bicycle must be "Mk1" or "Mk9"
  - The serial number must be "001" thru "999"
- The zones and access points follow the rules for zoning and access given in Chap 3.4 or are detailed in a specific document for the Product defined here by the project

2.3 Business rules category 3 - Maintenance philosophy and concepts of operation business rules

2.3.1 Definition

Maintenance philosophy and concepts of operation business rules cover the types of information that a project or an organization requires. They include for example a list or detailed specification[1] of chosen information sets, an information codes specification which details the information codes, and information names that describe the data module content.

A definition of the required item location codes is also included.

[1] It is up to the project or the organization to decide where within this business rules category the detailed information is maintained.

The maintenance philosophy and concepts of operation business rules are determined by the contract (eg, is first, second and third maintenance level information to be delivered?).

Definition of these rules must be performed in conjunction with operation, maintainability, repair and other aspects of LSA.

The data module coding strategy for the definition of information codes, information code variants and item location codes is included in this category. This ensures that the information codes, information code variants and item location codes match with the product definitions for each level within the breakdown of the technical documentation decided upon within the general business rules category (business rules category 1).

Training and skill levels are also defined or identified by this category.

To summarize, the maintenance philosophy and concepts of operation business rules include but are not limited to:

- list of relevant information sets given in Chap 5 or modified information sets
- detailed specifications of project specific information sets
- list or detailed specification of information codes and information names to be used in the project
- item location codes to be used
- specification of the depth of information to be delivered in accordance with the maintenance level
- matching the information codes and item location codes to the breakdown part of the data module code, as defined within the product definition business rules (business rules category 2)
- decision on how to apply information code variants
- training and skill levels

2.3.2 Examples

- A list of allowed information codes together with information names and data module types is given in …
- The mapping between the breakdown part of the data module code (model identification code, system difference code, SNS, disassembly code and disassembly code variant) and the information part (information code, item code variant and item location code) of the data module code as well as the data module types is given in …

2.4 Business rules category 4 - Security business rules

2.4.1 Definition

Security business rules cover all security issues and intellectual property rights. They include security classifications, copyright markings, use or disclosure restrictions, destruction instructions and any other data restrictions.

There are also issues concerning data creation access. For example in multi-partner projects, the Product is broken down into areas of responsibility. It is possible that the organization of the multiple partners means that write access can be provided only to the design authority of a data module.

The rules concerning data access during production must be considered here (eg, who is allowed to edit a data module or an illustration?). It is important that these rules are established first. These rules do not explain job roles, positions and accountability/responsibility but define which roles have what rights with respect to viewing, creating and modifying data.

Special consideration must be given to national security restrictions.

The creation of security business rules is performed using the project security instructions.

To summarize, the security business rules include but are not limited to:

- security classifications and the definitions of their use
- copyright markings
- use of disclosure
- destruction instructions and suitable methods
- national security restrictions
- specific project security instructions (if available)
- other restrictions
- specification of access to various "classes" of data modules

2.4.2 Examples

- The values of the security classification attribute and their interpretation are listed in Table …
- LP Compressor data modules must always be North Atlantic Treaty Organization (NATO) Restricted …
- Inline security markings must not be used
- Only Company A's authors are allowed to edit/view data modules with responsible partner Company B when they are located in the Peterborough office
- Data modules marked "NATO Restricted" must not be exchanged with Company C

2.5 Business rules category 5 - Business process business rules

2.5.1 Definition

Business process business rules cover how technical publications development is coordinated with other disciplines within an organization or within the project level at that organization or the project as a whole. For example, they describe the rules and relationships with LSA, S2000M specification, compliant initial provisioning, engineering/design and training (eg, SCORM conformance).

The rules for QA must be considered as well as the interaction between the organization, its partners and suppliers.

When there is a requirement to produce training content using S1000D, rules must be established that satisfy both the content development needs of instructional designers (on the learning side) and the authors (on the maintenance and operation side) who support a common system.

In addition, business rules and processes must be established to ensure that instructional designers and technical writers collaborate to preplan for reusable content.

These rules also take into account the data module coding strategy to achieve:

- the optimal reusable data granularity for screen presentation in learning products and the system maintenance philosophy for presentation in IETP
- the development of maintenance, operational and learning content for use in interactive multimedia and simulations
- the process of developing the appropriate amount of data modules that meet the intended need of a SCO in SCORM
- the relationship between data module/publication module codes and the requirements for learning content registration

To summarize, the business process business rules include but are not limited to:

- input and output definition of other disciplines into technical publications
- order of project hierarchy for deliverables and input from subcontractors
- agreed upon workflow procedures between manufacturer, subcontractor and customer
- approved integration methods with external systems (eg, logistic databases)
- verification rules with respect to interaction between the organization, its partners and suppliers related to QA
- preplanning, reusability and interoperability rules

2.5.2 Examples

- When mapping LSA task codes to data module codes, the following rules apply …
- Graphics extracted from CAD systems must use these parameters for use in publications ...
- When a data module is ready for exchange, it must receive a verification certificate from engineering. After this is received, mark the data module as first verified
- When the customer supplies a verification certificate, increment the issue number of the data module with issue type "status" and set QA to second verified
- The data module is ready for QA at this specific point and these are the steps to be followed for verification
- Initial provisioning data must be coded in conformance with S2000M Issue 6.0
- The values of the following elements and attributes in the IPD Schema must be imported from S2000M Issue 4.0, Chapter 1 Initial provisioning
- Training data modules must use only the following learn codes …

2.6 Business rules category 6 - Data creation business rules

Data creation business rules give information about the creation of text, illustrations and multimedia objects.

The data creation business rules include:

- rules for creating textual data
- rules for creating graphics, 3D content and multimedia objects

2.6.1 Business rules category 6a - Data creation business rules - Text

2.6.1.1 Definition

Text creation business rules consist of rules and guidelines (including terminology rules such as language and dictionaries, and the order of preference) for maximizing the amount of reuse that can be achieved within technical publications, and between technical publications and supporting training content.

Text creation business rules provide rules and guidance on how the technical and learning content is to be developed. They also specify for example, the use of dictionaries, how numbers must be expressed, how the author must refer to technical terms, how multimedia, maintenance, operational and learning content is to support IETP and training, and the establishment and use of a terminology database.

Markup business rules provide information about which markup elements and attributes must be used and populated. These rules are often project or organization specific.

To summarize, the data creation business rules for text include but are not limited to:

- writing rules (including terminology rules, use of dictionaries, rules for numbers, etc)
- markup rules
- requirements for text incorporation in multimedia objects

2.6.1.2 Examples

- The Simplified Technical English (STE) dictionary, ASD-STE100, must be used.
- The list of technical terms is given in …
- All fault data modules must have their fault codes listed in the fault code index
- Names used in the list of support equipment, list of spares and list of supplies must be the full name as specified in the S2000M database. When referring to these tools, spares or supplies in the procedure, use these corresponding names.
- The applicability block markup requirements are …
- The element <techStandard> must not be used

2.6.2 Business rules category 6b - Data creation business rules - Illustrations and multimedia

2.6.2.1 Definition

Illustration and multimedia creation business rules cover the creation of illustrations and multimedia objects. They are divided into style, detail and data format.

Data style rules for illustrations and multimedia objects govern characteristics such as illustration sizes, use of color, line weights, fonts, projection methods (isometric or trimetric).

The rules for illustrations cover for example the use of hotspots.

Data format rules cover the formats in which the information must be stored. For a CGM illustration, this will cover the elements that are permitted (eg, coordinate types, polylines, restricted text). For raster images it can include the resolution and orientation. It is often difficult to separate style from format.

To summarize, the data creation business rules for illustrations and multimedia objects include but are not limited to:

- graphic style rules
- interactivity detail rules
- multimedia format rules
- linking rules

2.6.2.2 Examples

- The rules for 2D are …
- The rules for 3D are …
- Trimetric projection must be used for …
- Photographs are permitted for ...
- Joint Photographic Experts Group (JPEG) format must be used for …
- The image size must be …
- Raster image resolution must be a minimum of 300dpi
- Simulations will be produced in Flash™

2.7 Business rules category 7 - Data exchange business rules

2.7.1 Definition

The rules for how data must be exchanged between partners and customers are covered in business rules category 7. This includes for example the use of data dispatch notes and how data management requirement lists as well as CSDB status lists are used. The rules in this category include how the S1000D file based transfer protocol is used, the frequency of data exchanges, if unverified data are exchanged, the rules for data module and graphic issue numbers, and the acceptance and rejection criteria.

To summarize, the data exchange business rules include but are not limited to:

- rules for use of data dispatch notes
- rules for the use of data management requirements lists
- rules for CSDB status lists
- rules for the usage of the file based transfer protocol
- agreement on the frequency of data exchanges
- rules for data module issue numbers
- rules for information objects coded with an ICN
- agreed to criteria for acceptance and rejection

Business rule decision point BRDP-S1-00009 - Frequency of data exchanges:

- Decide on the frequency of data exchanges.

2.7.2 Examples

- Data must be exchanged using the S1000D file based transfer method
- Comments and data management lists must be exchanged in separate packages
- The data dispatch note must conform to the following business rules …
- Data module deliveries will occur once per calendar month
- Following each exchange, a CSDB status list must be produced and verified before any further exchanges can occur. The business rules for CSDB status lists are …
- The exchange of unverified information is not allowed

2.8 Business rules category 8 - Data integrity and management business rules

2.8.1 Definition

Data integrity and management business rules enforce the referential integrity within the CSDB. Closely coupled with the data exchange business rules (refer to Para 2.7), they cover how data is managed by both the creator and the customer.

If necessary, this category can include rules defining processes for submission and acceptance of non-compliant data when suppliers are unable to produce S1000D compliant data.

The workflow business rules (both internal and external) and the rules for QA are also covered in this category. These are also connected to the data exchange business rules.

To summarize, the data integrity and management business rules include but are not limited to:

- workflow business rules (both internal and external)
- QA business rules

2.8.2 Examples

- Gaps in data module issue numbers are not allowed
- No data modules will be accepted unless all referenced illustrations are contained in the exchange package
- All data modules and graphics must pass the business rules criteria before they can be accepted

2.9 Business rules category 9 - Legacy data conversion, management and handling business rules

2.9.1 Definition

Legacy data conversion, management and handling business rules are quite separate from the other categories outlined above and can be considered (to some extent) as being outside of the scope of S1000D. They cover rules for converting data from say, an ATA iSpec 2200 project, to data modules and will vary from project to project depending on the format of the source data (word processor, paper, SGML, XML), and how the target data modules must be treated.

To summarize, the legacy data conversion business rules include but are not limited to:

- conversion rules including mapping between elements and attributes of source and target specifications
- rules for inclusion of legacy information in a technical publication

2.9.2 Examples

- Maintenance handbooks will be converted into data modules using the descriptive and procedural schemas
- The following ICN codes apply to the operator's handbook No. XYZ

2.10 Business rules category 10 - Data output business rules

2.10.1 Definition

Data output business rules specify the output formats for S1000D data. These formats can include page-oriented (eg, paper, pdf) formats, IETP formats, multimedia formats and SCORM

formats. The decision regarding which portion of the data will be published, and in what formats, must be agreed and written within these business rules.

These rules include details on how to style element and attribute content. The data creation business rules (especially for text, business rules category 6a) are strongly related to this business rules category. For example, the authors need to know in which elements there is generated text in order to avoid authoring redundancies and inconsistencies after publication generation.

Where required, a project functionality matrix is created according to the recommendations given by the S1000D functionality matrix (refer to Chap 6.4). Decisions made in completing a project functionality matrix will have direct impact on data output rules.

To summarize, data output business rules include but are not limited to:

- decisions regarding which portion must be in paper (or page-oriented) and which in IETP
- presentation rules for paper (or page-oriented) and IETP output
- decisions regarding which data modules will be output in SCORM format
- decisions regarding which data modules will be output in simulations
- look and feel business rules

2.10.2 Examples

- The S1000D standard page-oriented layout in Chap 6.2 must be used for page-oriented presentations
- For hardcopies printed from the IETP, the following time expiry message must be printed on inner margin of every page: "This page is a working copy. Must not be used after 2017-03-15".
- All learning data modules will be output in SCORM format
- Maintenance data will be incorporated into system simulations
- Warnings must be according to the symbolic warning type described in Chap 6.2.2
- Random list item elements that have prefix "pfXX" must have a 26 pt bullet character (•) printed before the item or the first bullet of the item
- The page size for printed output is A4 and A3 for foldouts

3 Sequence of business rules generation

An exact timeline for project business rules production can be defined only by a project or an organization (by the latter often only to some extent). This specification can only give an example for the sequence of business rules elaboration. Fig 2 presents such an example.

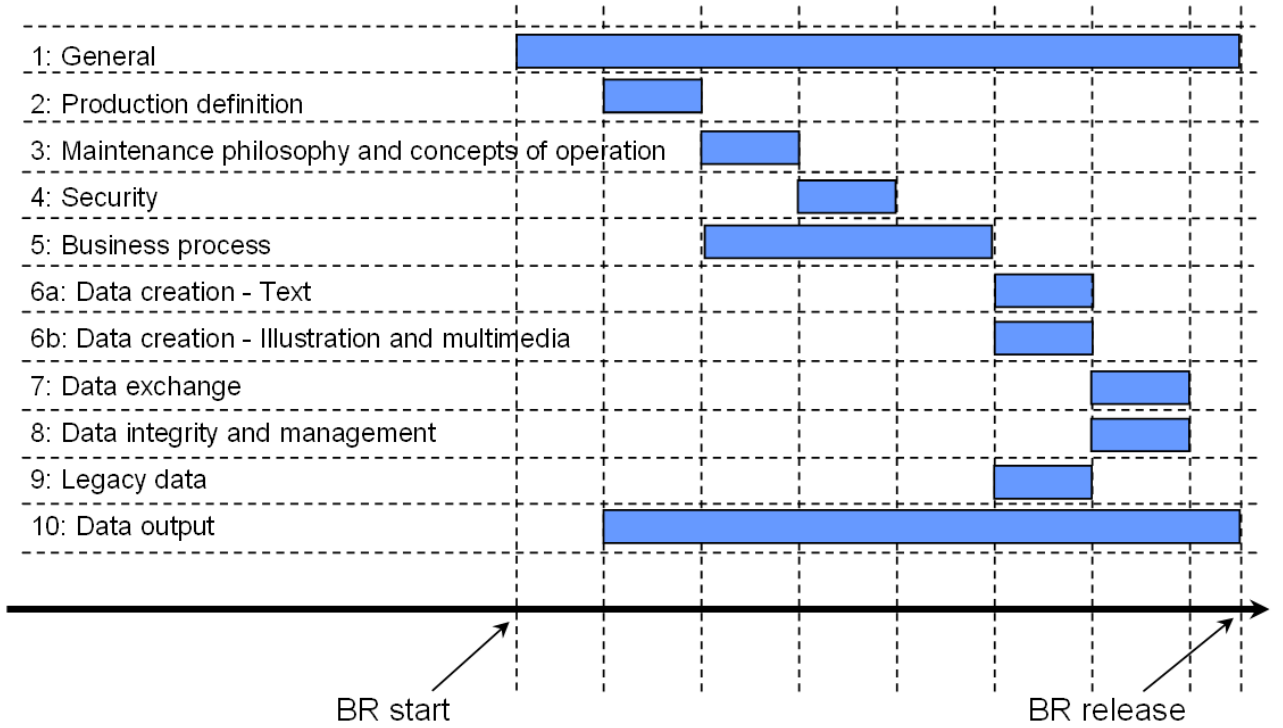


Fig 2 Example sequence of business rules production relative to the business rule categories

Fig 2 illustrates the example sequence of the business rules generation process in relation to business rule categories. It neither implies when business rules are generated nor does it indicate when authoring of technical data begins. These issues will be discussed in more detail in the implementation guide. Refer to Chap 2.4.

At this point, it is important to emphasize that it is up to the project or the organization to decide when to produce a certain category of business rules. In general, the following recommendation applies:

– the more thorough the business rule planning before contracting and content development, the more successful the implementation

In practice, various experiences have been gathered:

– thorough contracts that include required project business rule decisions on model identification codes, on SNS structures
– brief contracts for technical documentation claiming only S1000D conformance and leaving many decisions up to a later stage in the project (eg, authoring)

The success of both depends on the communication and agreement practices between the project partners.

It is also important to stress the dynamic life of business rules. They must be reviewed on a regular basis throughout the lifecycle of a Product and must be updated accordingly.

Another important issue is that some business rules and parts of them can only be written after the acquisition process is completed. This is not only limited to acquisition but also changes throughout the lifecycle.

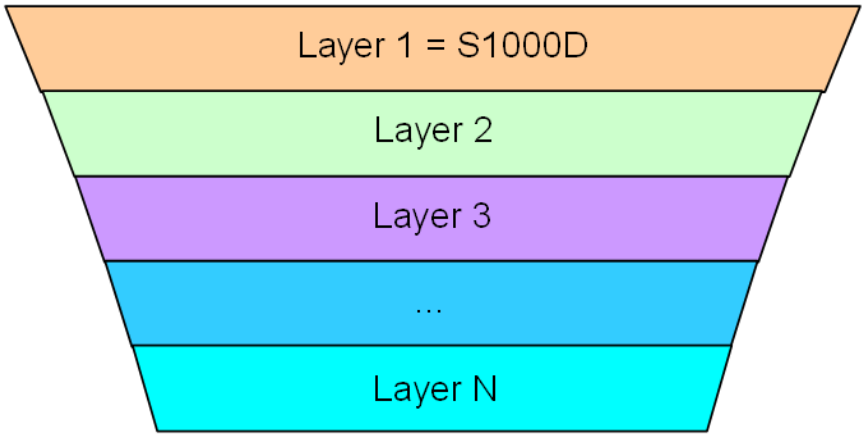
4 Business rules layers

4.1 Definition

A business rules layer indicates the level of stakeholders within the hierarchy to which the business rules apply.

4.2 Business rules layered model

The layering of business rules can be shown as a layered model with each layer "inheriting", "extending" and "profiling" the upper layer. Fig 3 shows a general view of the layered model. Layer 2 to Layer N very in accordance with the organization and/or project structure. The core of the uppermost layer of the model is always represented by S1000D itself. Progressing through the "lower" layers, the number of business rules grows and the number of decision points remaining decreases. The reason for this is that an organization and/or a project inherits all business rules from the upper layer and decides which of the remaining decision points are relevant at their level. The goal is to have all decisions made prior to reaching the author's level and at the very least to keep any decisions at the author's level to a minimum.



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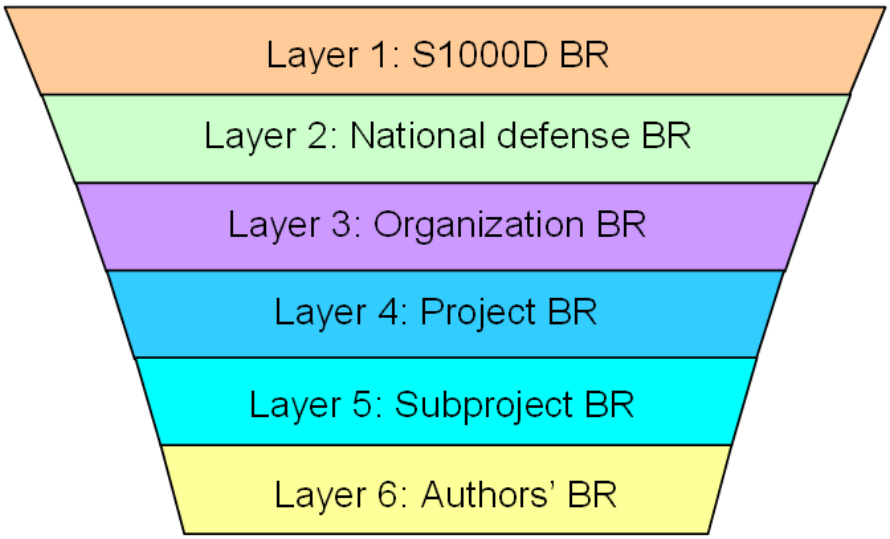
Fig 3 The layered business rules model

The project or the organization can add or define their own decision points at their layer.

Every available decision point must be considered at each layer.

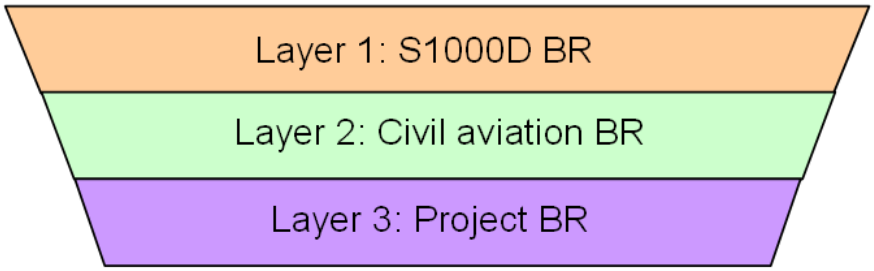
Fig 4 and Fig 5 show examples of the layered business rules model for a defense and a civil aviation project, respectively.

In the example of Fig 4 the organization (department) level is below national defense business rules (eg, business rules of Air Force, Army and Navy organizations or departments). The "lowest" layer (in this example the authors' business rules) must only contain minimum open decision points.



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Fig 4 Example of a six-layered defense business rules model

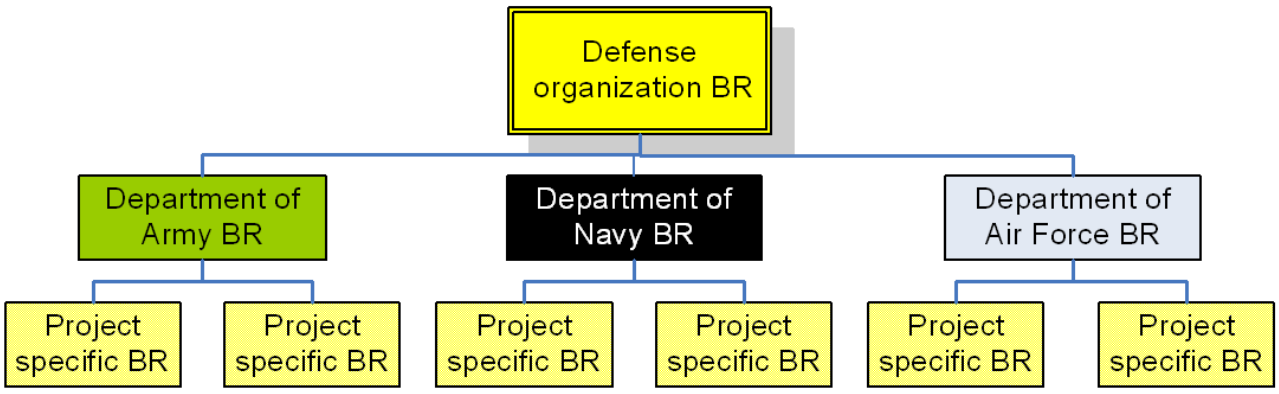


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Fig 5 Example of a three-layered civil business rules model

The civil aviation business rule layer is used to define a comprehensive set of business rules that will remain consistent across all civil aviation industry applications. The project layer is used to define project specific business rules not previously covered.

Layering is only one dimension of the business rules "cascading" structure. An alternative representation of business rules is a tree-like structure. Fig 6 presents an example of such a tree-like business rules structure. Along the "vertical" axis in this figure, the layering as shown in Fig 4 can be easily recognized. Across the figure, "branches" representing various "parallel" departments/organizations (in Fig 6: Army, Navy and Air Force) with their own projects situated at the same level with their "counterparts" but having different "commitments", can be clearly seen. All of them inherit business rules of the upper level and make their own independent decisions on the remaining decision points. Although these business rules seem to be perfectly independent from each other at a first glance, a change of national MoD/DoD rules, for example raised by one of the departments, will require review and agreement by the other departments.



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Fig 6 Example of a defense tree-like business rules model

5 Resolving conflicting business rules

As described above in Para 4, the business rules in the lower ("children") layers must adopt or must be conformant to the business rules of the higher (their "parent") layer. This can for example cause a problem when the same technical data are delivered to more than one customer. In some cases, due to conflicting business rules, data modules must be rewritten, filtered or processed to make the data module variants conform to the rules demanded by each customer. Refer to Chap 4.12.

Consider the national defense layer shown in Fig 4. For a multi-national project, it is most likely that the business rules demanded by each nation are different to various other nations' DoDs/MoDs. In other words, there is again a "tree"-like business rules structure with "branches" situated at the same layer but having separate business rules definitions for this particular layer. This kind of situation can demand a potential rewrite of information. The amount of the information to be rewritten can be considerable. In order to avoid or diminish this effect, common areas between national business rules are recommended to be considered and harmonized/brought into consensus for a given project before any authoring commences.

Similar problems can occur in the project layers when the same Product is used in different projects (refer to Fig 7 for an example). Consider an engine that is used in different airframes where one airframe manufacturer imposes different rules than another. Another example is when a given Product is used for both civil and military use, which can mean data rewrites. A consensus/harmonization to minimize data rewrites for a given project is vital.

Before any authoring or implementation of S1000D begins on a project, all stakeholders who have their own business rules must reach consensus on the business rules to be deployed for that project.

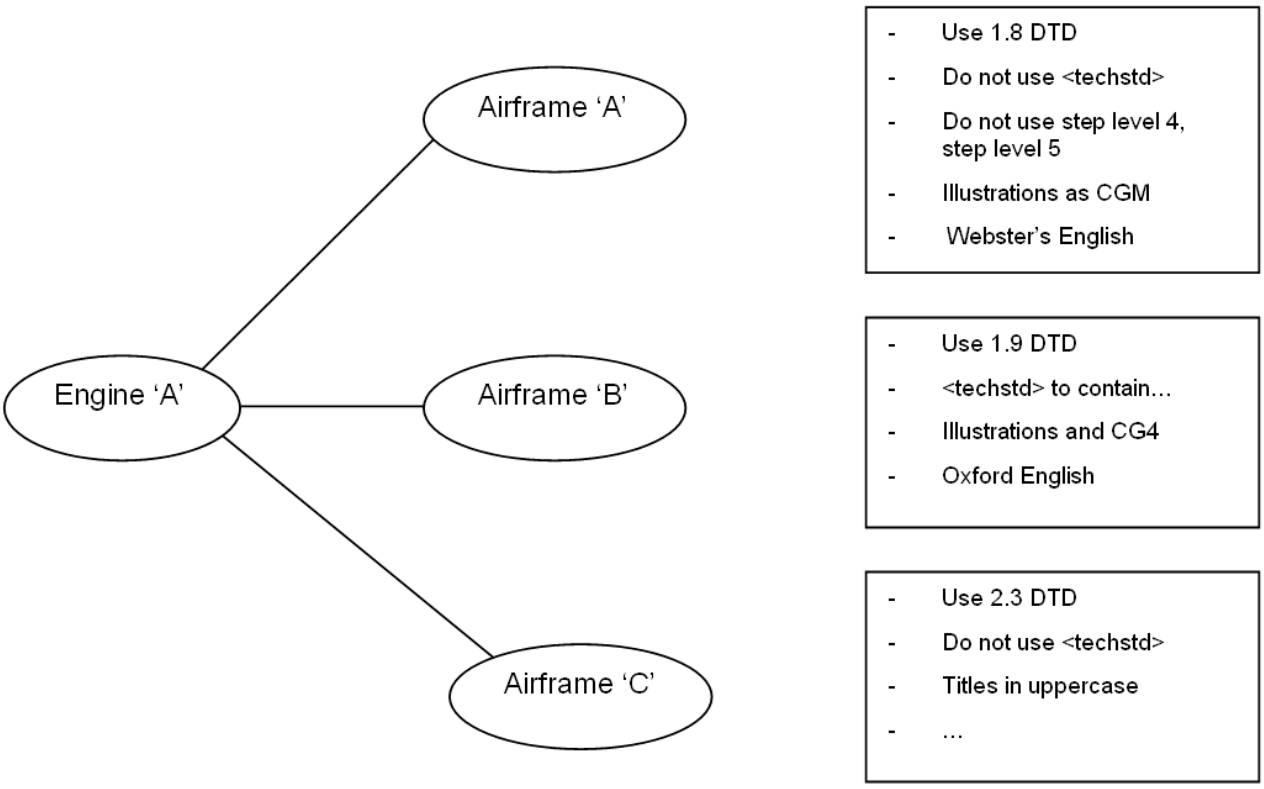
This has adverse effects on costs and data redundancy. Business rule developers must keep this in mind. Lower layers (if available) must be taken in consideration while producing business rules at a given layer. If possible, participants from all layers must be involved in the production of the business rules. Developers of business rules must carefully consider the impact on reuse between projects and the potential for multiple customers and users of project data.

When S1000D data already exists for a product, and that product is installed on a new product (for example, the same ejection seat used in different airframes), due to the high costs of duplicating and maintaining multiple versions of the same data, S1000D strongly recommends that this data is reused without changes to the business rules that govern the data that already exists.

As a minimum requirement, the higher layers are responsible for informing the lower layers on their business rules. For example, organizations must provide information to projects, which organizational business rules must be followed and which decision points are up to the projects.

When projects are presented with conflicting business rules from multiple customers or parent organizations, projects must resolve these conflicts. These conflicts must be resolved by:

- coordinating a change or waiver to the conflicting rules with one or more of the customers or parent organizations
- producing data modules to comply with each set of rules



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Fig 7 Example of business rules conflicts

Chapter 2.5.2

Business rules - Generation and use

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Table 1 References

Chap No./Document No.	Title
Chap 2.5.1	Business rules - Categories and layers
Chap 2.5.3	Business rules - Business rule decision points index
Chap 4.10	Information management - Business rules exchange
Chap 4.10.1	Business rules exchange - Business rules document data module

1 General

This chapter explains the business rules production process and its use.

2 Business rules production

2.1 General

This chapter gives the production process for a business rules publication and use case for business rule constructs. The process can be amended to include specific business rules assigned by the project.

A business rule publication comprises multiple documents that contain guidance, policy, project specific information and business rules summarized in the BREX data module. A business rules index, and related business rules generation (audit) reports can also be a part of a business rules publication. Refer to Chap 4.10.1.

A business rules publication can be defined at each layer of the business rules hierarchy. Refer to Chap 2.5.1.

2.2 Generation of business rules publications

2.2.1 Major steps in producing business rules

The following describes the business rules production process. The process can be amended to include project specific requirements.

1 Identify stakeholders

2 Decide on the layers for business rules documentation

3 Decide on the structure of the business rules publications and how they should be presented

4 Use the BRDP index (Chap 2.5.3) to make the following decisions:

- BRDP-S1-00003, Which Issue(s) of S1000D are to be used
- BRDP-S1-00004, Which information sets are to be used
- BRDP-S1-00005, Which publications are to be produced
- BRDP-S1-00006, The Schemas that are to be used

Note

The decisions on these BRDP must be considered together as they are related, and they depend on the available S1000D environments as well as on the budget of the project or the organizations concerned.

5 If used define the priority for each decision made on each BRDP. This priority sets the sequence of the business rule decisions definition. That is, it indicates the necessary order to address each business rule. Refer to Chap 4.10.1.

6 If used define the business rule severity level for each business rule decision. The business rule severity level indicates the impact magnitude, if a certain business rule is broken. Business rule severity must not be confused with business rule decision point priority. Refer to Chap 4.10.1.

7 Define remaining business rules decisions using BRDP index (Chap 2.5.3). BRDP relationships can determine whether or not a BRDP is applicable. For example, determining the use of the element <`wireType`> (BRDP-S1-00239) is not necessary when the project has determined that the use of the wiring data description data module is not required. A BRDP that is not required for a project must be annotated accordingly. Refer to Chap 4.10.1.

8 Review all S1000D chapters to determine if any further decisions have to be made which do not have a specific BRDP. Record all the decisions in the business rules document data module.

9 Define non-context business rules decisions and how they are documented and checked. An example of a non-context BRDP is a decision regarding the frequency of data exchanges between partners.

10 Define use cases for each business rules decision and, if necessary, also for BRDP. In general there will be more than one use case for each BRDP and for each of its business rules decisions. These uses cases can vary from customer products, technical publications, which the given business rules publication addresses, to various roles of the personnel involved in the production and use of technical publications. The use cases must be captured by using applicability on business rules paragraph (containing all the information for the given BRDP) and on business rules decisions. The use cases will be defined on business rules decisions. Differentiation between the applicability of various business rules decision points, especially of project and/or organization specific BRDP, might be necessary. Refer to Para 3.

11 Produce business rules documents and verify them with stakeholders

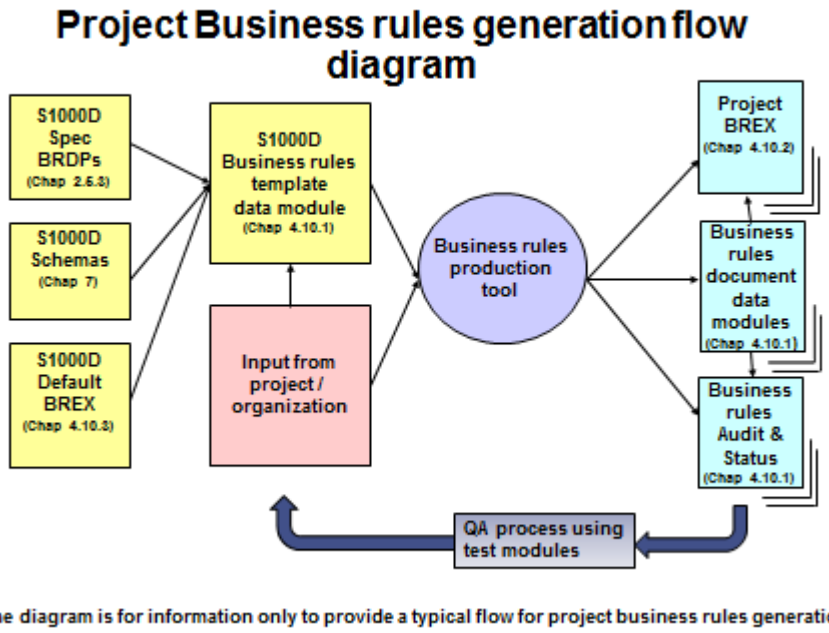
12 Produce test data, test and evaluation plan and verify the business rules

13 Decide on the life cycle maintenance of the project business rules to include:

- a review process
- an assessment on schedule and cost impact
- the update frequency
- the ownership and governance process
- responsibilities
- update process

2.2.2 Business rules generation process

Fig 1 shows how a typical process for business rules generation looks like following the process in Para 2.2.1.



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Fig 1 Typical project business rules generation flow diagram

3 Business rules documents and their use

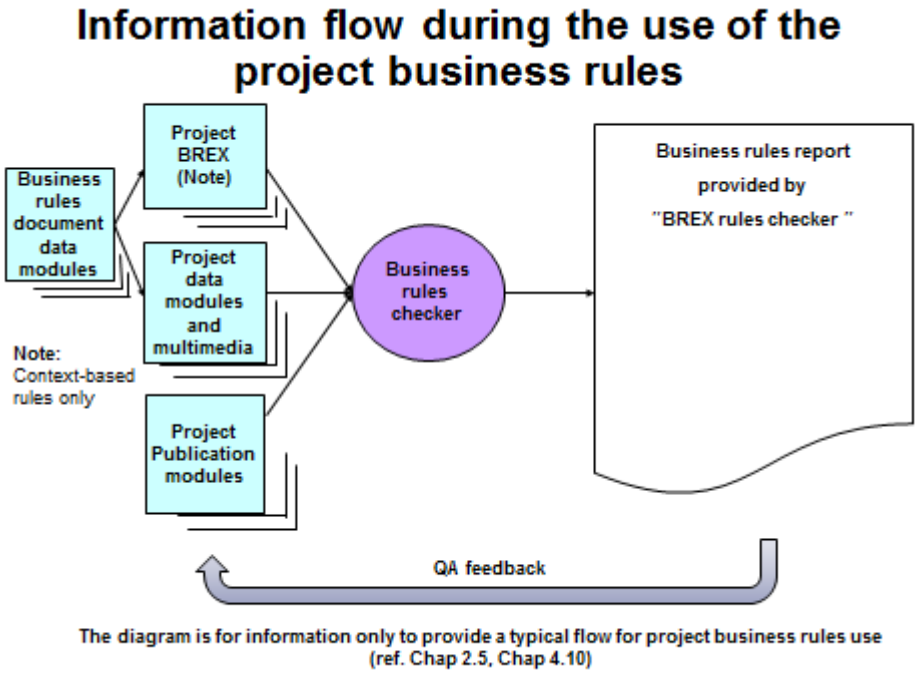
3.1 Business rules documents

The business rules document data module is used to create guidance information to be used by the project through life. Example documents are:

- Data authoring style guide
- Illustrator's style guide
- Security rules and procedures
- SNS definitions
- Information codes
- Data exchange processes

3.2 Business rules usage

Fig 2 shows how business rules are typically used.



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Fig 2 Information flow during the use of the project business rules

Typical project business rules use process for context based rules only:

- Single or multiple business rules document data modules are used as input for the project BREX generation
- BREX checker uses project BREX and project data modules and publication modules as input
- BREX checker output provides list of checked data modules, publication modules, and error reports showing business rules violations
- BREX output report is used as feedback to correct erroneous data

Chapter 2.5.3

Business rules - Business rule decision points index

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1 General

The Business Rule Decision Point (BRDP) index provides a list of every identified BRDP within S1000D. The BRDP index enables organizations and projects to define Business Rules (BR) that reference the unique ID for each BRDP. The ID for each BRDP is permanently assigned and provides a method for organizations and projects to manage BR as new issues of S1000D are released.

Each Business Rule Decision Point (BRDP) is identified in S1000D as follows:

Business rule decision point BRDP-S1-NNNNN – Title of the decision point:

– Description of the decision point.

where:

– S1 indicates that the decision point originated in S1000D
– NNNNN is a unique number assigned by S1000D to each decision point in the specification

Note

This number will not change between Issues of this specification. Any new BRDP will be assigned a completely new unique number.

Organizations can create and manage organization-specific decision points to ensure that all projects within the organization generate business rules for organization-specific decision points. S1000D strongly recommends that organizations prefix BRDP with the organization's CAGE code. The same applies to BRDP specific to all levels of projects. S1000D uses the prefix "S1" for this purpose.

Organization-specific IDs for BRDP in the case when CAGE code is used must conform to the format:

BRDP-XXXXX-NNNNN

Where:

- XXXXX is the organization's CAGE code
- NNNNN is a unique number assigned by the organization to each decision point

Note

This number must not change between issues of the organizational/project business rules. Any new BRDP must be assigned a completely new unique number.

If the given organization does not have a CAGE code, then it must generate a code that will not be confused with CAGE code and that will be consistently used for all business rules it creates. This alternative code must be shorter or longer than 5 characters. If the prefix is 5 characters long, then it indicates that it is a CAGE code.

If a chapter is not included in the following tables, that chapter contains no BRDP.

2 Business rule decision points index

Table 2 Chap 1 - Business rule decision points index

BRDP reference Location	BRDP unique identifier	BRDP title	BRDP definition
Chapter 1.3 Para 6.2.5	BRDP-S1-00001	Use of "I" and "O"	Decide whether and when to use the alpha characters "I" and "O".
Chapter 1.3 Para 7	BRDP-S1-00002	List of permitted CAGE codes and/or names to be used for the technical publication project	Create a list of permitted CAGE codes and/or names of the enterprises.

Table 3 Chap 2 - Business rule decision points index

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 2.5.1 Para 2.1.3	BRDP-S1-00003	Issue of S1000D to be used	Decide which issue or issues of S1000D to be used.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 2.5.1 Para 2.1.3	BRDP-S1-00003	Issue of S1000D to be used	Decide which issue or issues of S1000D to be used.
Chap 2.5.1 Para 2.1.3	BRDP-S1-00004	Information sets to be used	Decide which information sets, given in S1000D and/or project specific, to be used.
Chap 2.5.1 Para 2.1.3	BRDP-S1-00005	Publications to be produced	Decide which publications to be produced.
Chap 2.5.1 Para 2.1.3	BRDP-S1-00006	Schemas to be used	Decide which Schemas to be used and in which information set they are to be used.
Chap 2.5.1 Para 2.1.3	BRDP-S1-00007	Use of optional elements and attributes	Decide whether and how to use each optional element and attribute in its structural context.
Chap 2.5.1 Para 2.1.3	BRDP-S1-00008	Possible deliverables	Decide on the possible deliverables, such as: – S1000D objects (eg, data modules, publication modules, illustration sheets and multimedia objects, data management lists) using file based transfer. Refer to Chap 7.5.1. – Page-oriented publications and/or interactive electronic technical publications

Table 4 Chap 3 - Business rule decision points index

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.4 Para 2	BRDP-S1-00010	Zone and access point identification system	Decide whether to use a zoning and access identification system.
Chap 3.4 Para 2.1.1	BRDP-S1-00011	Method for zoning and identifying access points	Decide which method to use for zoning and identifying access points.
Chap 3.6 Para 2.1.4	BRDP-S1-00016	Marking security classifications	Decide on how the security classifications will be marked and/or indicated.
Chap 3.6 Para 2.4	BRDP-S1-00013	Use and markings of security classifications (attribute `securityClassification`)	Determine how the security classifications will be used.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.6 Para 2.4	BRDP-S1-00014	Application of caveats	Determine if the policies that apply to security marking, instructions, etc, and decide how those markings are required to be applied within the given project.
Chap 3.6 Para 2.5	BRDP-S1-00015	Retention of security classification changes	Decide on the retention of security classification changes.
Chap 3.6 Para 2.5	BRDP-S1-00553	Retention of derivative classifications changes	Decide on the retention of derivative classifications changes.
Chap 3.7 Para 2.1	BRDP-S1-00017	Rules for quality assurance	Identify the project quality assurance rules and how those rules affect the methods used to perform quality assurance of the data modules/technical publications.
Chap 3.7 Para 2.2.2	BRDP-S1-00018	Rules for first and second verification	Decide on the rules for first and second verification. For example, such a rule might be that all data modules that have a safety related procedure must have first verification carried out "On object".
Chap 3.7 Para 2.4	BRDP-S1-00019	Review cycle process	Decide on the review cycle processes and procedures.
Chap 3.9.1 Para 2.1	BRDP-S1-00020	Specify the language	Decide which language to use for producing data modules.
Chap 3.9.1 Para 2.1	BRDP-S1-00021	Use of ASD-STE100®	When producing data modules in English, decide whether to use ASD-STE100®.
Chap 3.9.1 Para 2.1	BRDP-S1-00022	Standard dictionary	Decide which standard dictionary to use for producing data modules.
Chap 3.9.1 Para 2.1	BRDP-S1-00023	Use of a terminology database or glossary	Decide whether to use a terminology database or a glossary. If used, agree on its content and management.
Chap 3.9.1 Para 2.2	BRDP-S1-00024	Use of a standard list of abbreviations	Decide whether to use a standard list of abbreviations. If used, agree on its content and management.
Chap 3.9.1 Para 2.5	BRDP-S1-00025	Unit of measure	Identify the standard to use for both primary and secondary units of measure.
Chap 3.9.1 Para 2.9	BRDP-S1-00026	Highlighting text	Decide which method to use to highlight text.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.2 Para 2.1.2	BRDP-S1-00027	Need of printable data	Decide which parts of the documentation (data modules and publications including IETP) need to be printable.
Chap 3.9.2.1 Para 2	BRDP-S1-00028	Engineering numbers and revision status within the illustration reproduction area	Decide if schematics derived from engineering drawings include the original drawing number and revision status within the illustration reproduction area.
Chap 3.9.2.1 Para 2.2.2.1	BRDP-S1-00029	Use of color in the final deliverable	Decide whether to use color in the final deliverable.
Chap 3.9.2.1 Para 2.2.2.2	BRDP-S1-00554	Illustration annotations written in upper or sentence case	Decide whether to write illustration annotations in upper or lower case.
Chap 3.9.2.1 Para 2.8	BRDP-S1-00555	Inclusion of the ICN in the illustration	Decide whether to allow the ICN to be included in the illustration.
Chap 3.9.2.3 Para 2.2.3	BRDP-S1-00556	Use color line art	Decide whether to allow the use of color line art.
Chap 3.9.2.7 Para 2.1.1.3.1	BRDP-S1-00557	Reuse of the generic ICN title in data modules	Decide if the generic ICN title given in the ICN metadata file can be used to populate figure and multimedia titles in data modules.
Chap 3.9.3 Para 2	BRDP-S1-00030	Use of general warnings, cautions and notes as separate data modules	Decide whether to produce general warnings, cautions and notes in separate descriptive data modules.
Chap 3.9.3 Para 2	BRDP-S1-00031	Use of warning and/or caution collections	Decide whether to use warning and/or caution collections, internal or external.
Chap 3.9.3 Para 2.1	BRDP-S1-00032	Use of the attribute `vitalWarningFlag`	Decide whether and how to use the attribute `vitalWarningFlag`.
Chap 3.9.3 Para 2.1	BRDP-S1-00033	Use of the attribute `warningType`	Decide whether and how to use the attribute `warningType`.
Chap 3.9.3 Para 2.2	BRDP-S1-00034	Use of the attribute `cautionType`	Decide whether and how to use the attribute `cautionType`.
Chap 3.9.3 Para 2.3	BRDP-S1-00035	Use of the attribute `noteType`	Decide whether and how to use the attribute `noteType`.
Chap 3.9.4 Para 2.3	BRDP-S1-00037	Use of LOEP or LOEDM	Decide whether to use the LOEP or the LOEDM.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.4 Para 2.5.2	BRDP-S1-00042	Use of Highlights with updating instructions	Decide whether to use Highlights with updating instructions.
Chap 3.9.4 Para 2.11	BRDP-S1-00046	Use of linear or hierarchically subdivided Table of contents	Decide whether to use a linear or a hierarchically subdivided Table of contents.
Chap 3.9.4 Para 2.11	BRDP-S1-00305	Data modules within a publication listed in the Table of contents	Decide whether the listed publications within the Table of contents also have to be listed by their individual data modules.
Chap 3.9.4 Para 2.11	BRDP-S1-00307	Inclusion of the number of pages in the Table of contents	Decide whether to include the number of pages in the Table of contents entries.
Chap 3.9.5.1 Para 2.1.2.1	BRDP-S1-00049	Definition of the issue date	Decide on the definition of the issue date.
Chap 3.9.5.1 Para 2.1.2.2.2	BRDP-S1-00052	Allocation of the information codes and the information names	Decide which information codes and associated information names will be used.
Chap 3.9.5.1 Para 2.2	BRDP-S1-00053	Data module change/revised ratio	Decide on the threshold that a data module is considered revised rather than changed.
Chap 3.9.5.1 Para 2.2.3	BRDP-S1-00054	Use and definitions of the attributes `commercialClassification` and `caveat`	Decide on the use and definitions of the attributes `commercialClassification` and `caveat`.
Chap 3.9.5.1 Para 2.2.3	BRDP-S1-00055	Priorities and relationships of the security attributes `securityClassification`, `commercialClassification` and `caveat`	Decide on the priorities and relationships between the attributes `securityClassification`, `commercialClassification` and `caveat` if they are used.
Chap 3.9.5.1 Para 2.2.4	BRDP-S1-00558	Use of the element <`derivativeClassification`> within data modules	Decide whether and how to use the element <`derivativeClassification`> .
Chap 3.9.5.1 Para 2.2.5.2.1	BRDP-S1-00065	Use of the element <`copyright`> and source of copyright information	Decide whether and how to use the element <`copyright`>. Any copyright information must be obtained from the relevant authority.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.1 Para 2.2.5.2.1	BRDP-S1-00066	Method of populating copyright information (in each data module or in a consolidated data module)	Decide whether to populate copyright information in each data module or whether to cross-reference to a copyright data module. **Note** While choosing the population method, assess the impact of changes to copyright information on updating of data modules.
Chap 3.9.5.1 Para 2.2.8	BRDP-S1-00070	Use of the element <enterpriseName> and/or the attribute enterpriseCode for the responsible partner company	Decide whether to use the element <enterpriseName> and/or the attribute enterpriseCode to capture the name and CAGE code, respectively, of the responsible partner company. If the name is used it must be done consistently and be mandatory for the project.
Chap 3.9.5.1 Para 2.2.9	BRDP-S1-00071	Use of the element <enterpriseName> and/or the attribute enterpriseCode for the originator	Decide whether to use the element <enterpriseName> and/or the attribute enterpriseCode to capture the name and CAGE code respectively, of the originator. If the name is used it must be done consistently and be mandatory for the project.
Chap 3.9.5.1 Para 2.2.13.1	BRDP-S1-00077	Exchange of draft data modules	Decide whether the project will allow the exchange of draft data modules.
Chap 3.9.5.2.1.1 Para 2.2	BRDP-S1-00089	Standard sentences for reasons for update	Decide whether standard sentences for reasons for update are to be used.
Chap 3.9.5.2.1.1 Para 2.2	BRDP-S1-00090	Use of reason for update in conjunction with the production process	Decide whether the element <reasonForUpdate> is used during the production process.
Chap 3.9.5.2.1.1 Para 2.2	BRDP-S1-00091	Use of applicability information	Decide whether it is permissible to differentiate reasons for update based on Product configuration.
Chap 3.9.5.2.1.1 Para 2.5	BRDP-S1-00092	Use of change marks for tables	Decide whether and how to use change marks for tables.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.1.1 Para 2.6	BRDP-S1-00093	Use of change marks for figures	Decide whether and how to use change marks for figures.
Chap 3.9.5.2.1.2 Para 2.1	BRDP-S1-00094	Extent of cross-referencing	Decide on the extent of cross-referencing within data modules and the methods used for populating the various attributes.
Chap 3.9.5.2.1.2 Para 2.1	BRDP-S1-00095	Use of the element <internalRef> in titles	Use of the element <internalRef> in titles is strongly discouraged. However, decide whether to use cross-references in titles.
Chap 3.9.5.2.1.2 Para 2.1	BRDP-S1-00096	Use of the attribute targetTitle	Decide whether to use the attribute targetTitle. When used (populated), it is a tooltip in a viewer application.
Chap 3.9.5.2.1.2 Para 2.1	BRDP-S1-00098	Use of the textual content of the element <internalRef> in cross-references	Decide whether to use the textual content of the element <internalRef>. When used (populated), it must be presented.
Chap 3.9.5.2.1.2 Para 2.1	BRDP-S1-00099	Use of the "identifiers" given in the elements <reqSupportEquips>, <reqSupplies>, <reqSpares> or <workLocation>	Decide whether to use any of the "identifiers" given in the elements <reqSupportEquips>, <reqSupplies>, <reqSpares> or <workLocation> as the presented link (textual content of the element <internalRef>), or as a tooltip in a viewer application (value of the attribute targetTitle). **Note** The "identifiers" can be derived from the content of the child elements or the attributes of the four elements.
Chap 3.9.5.2.1.2 Para 2.1	BRDP-S1-00100	Use of the attribute internalRefTargetType	Decide whether to use the attribute internalRefTargetType, which values to use and allocate suitable definitions to the values. Refer to Chap 3.9.6.1.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.1.2 Para 2.1.1	BRDP-S1-00101	Define the format of the cross-reference attributes `id` and `internalRefId`	Decide whether the values of the cross-reference attributes `id` and `internalRefId` must be prefixed by alpha characters that identify the type of the target element. Example: – Structure: Prefix followed by a hyphen and a four-digit number to make it unique within the data module (eg, "par-0001") Prefixes: – "fig" for figures and alternates – "tab" for tables – "mma" for multimedia and alternates – "sup" for supplies – "seq" for support equipment – "spa" for spares – "par" for levelled paragraphs and alternates – "stp" for steps of procedure, fault isolation, etc, and alternates – "gra" for graphics (multiple sheets) – "mmo" for multimedia objects – "hot" for hotspots (eg, "fig-0001-hot-0002") – "pme" for parameters – "zon" for zones – "wla" for work locations – "mat" for single material or material sets"msl" for material set lists – "acp" for access points **Note** The four-digit number has no connection to, for example, the figure or table number which is generated for data module presentation. For example, the value of the attribute `id` can be "fig-0345" for "Fig 1". Refer to Para 2.1. **Note** Refer to Chap 3.9.5.2.1.10 for the equivalent business rule decision point regarding footnotes. Example: "ftn-0001".

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.1.2 Para 2.7	BRDP-S1-00106	Population of the element <refs>	Decide if and how the element <refs> is populated. If populated, the order of items in the list must be specified.
Chap 3.9.5.2.1.2 Para 2.8	BRDP-S1-00107	Define the words before and after the reference elements	Define the words before and after the elements <dmRef>, <pmRef> and <externalPubRef>. This is important as it has implications on the stylesheets used. Example: For one implementation, the stylesheet can automatically generate the words "Refer to data module: "when it recognizes the element <dmRef>. This will cause problems if the author has written "Refer to" within the paragraph before the element <dmRef>.
Chap 3.9.5.2.1.4 Para 1	BRDP-S1-00559	Caption style guide	Decide on a project style guide to be used for captions.
Chap 3.9.5.2.1.4 Para 2.2.1	BRDP-S1-00117	Inline use of captions	Decide whether inline captions affect the text line spacing and how this is defined.
Chap 3.9.5.2.1.5 Para 2	BRDP-S1-00118	Use of the element <title>	Decide how to use the element <title> and on which elements.
Chap 3.9.5.2.1.5 Para 2	BRDP-S1-00119	Use of cross-references from titles	Decide whether to allow cross-referencing from titles.
Chap 3.9.5.2.1.5 Para 2	BRDP-S1-00120	Use of titles for the elements <levelledPara> and <proceduralStep> from sublevel six thru eight for legacy data	Decide whether titles can be included for the elements <levelledPara> and <proceduralStep> from sublevel six thru eight when converting legacy data to S1000D.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.1.6 Para 2.3	BRDP-S1-00121	Use of standard table types	Decide if a list of standard table types applies to the project (eg, inspection, examination) and define what the business rules are for these types in terms of their presentation requirements and certain textual values (eg, titles and heading row values). Each of these standard types must have a defined value that can be applied to the table's attribute `tabstyle`.
Chap 3.9.5.2.1.6 Para 2.4	BRDP-S1-00122	Use of tables as graphics	Decide if tables represented as graphics are allowed, and if they are, in what situations they can be used.
Chap 3.9.5.2.1.6 Para 2.6	BRDP-S1-00123	Use of applicability information of various table child elements - attribute `applicRefId` of the element <`table`>	Decide whether and how to use the attribute `applicRefId` of various <`table`> child elements. The child elements can be differentiated based on Product configuration.
Chap 3.9.5.2.1.7 Para 2.2.1.2	BRDP-S1-00128	Types of legends	Decide on the strategy for legends, if used. Legends can appear as part of the illustration or as text using the element <`legend`>. The advantage of making the legend part of the text is that: – the same illustration can have different legends wherever it appears (eg, in multi-language projects) – the text of the element <`legend`> can be searched (this might not be the case if the legend is part of the illustration) – items in the illustration can be linked to the legend by the use of hotspots – the legend in the text can save space on the illustration (particularly when the legends are long)
Chap 3.9.5.2.1.7 Para 2.3.1	BRDP-S1-00129	Suitability of multimedia use	Decide whether using multimedia is suitable for the environment in which the project will operate.
Chap 3.9.5.2.1.7 Para 2.3.2.1	BRDP-S1-00130	Permitted types of multimedia	Decide what types of multimedia objects are permitted.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.1.7 Para 2.4	BRDP-S1-00131	Use of foldouts	Decide whether to use the element <foldout> and, if used, where its use is allowed (eg, within specific information sets). **Note** It is only used for page-oriented publications, as it will not have an effect in the screen view of an IETP.
Chap 3.9.5.2.1.8 Para 2.3	BRDP-S1-00132	Use of hotspots	Decide whether and how to use hotspots as follows: – If hotspots are to be used, decide whether hotspots can be used to link to graphical objects from local text. – If hotspots are to be used, decide whether hotspots can be used to link from graphical objects to other graphical objects or local text. – If hotspots are to be used, decide whether hotspots can be used to link from graphical objects to other data modules.
Chap 3.9.5.2.1.8 Para 2.8	BRDP-S1-00133	Use of the element <parameter>	Decide whether to use the element <parameter> and how to use it. If used, specify the attributes to be used within the project or organization.
Chap 3.9.5.2.1.9 Para 2	BRDP-S1-00134	Use of the element <preliminaryRqmts>	Decide whether to use the element <preliminaryRqmts> in maintenance planning, fault isolation, maintenance checklist and/or process data modules.
Chap 3.9.5.2.1.9 Para 2.1.2	BRDP-S1-00135	Use of the element <workAreaLocationGroup> in the element <preliminaryRqmts>	Decide whether and how to use the element <workAreaLocationGroup>. The possibility of duplication and mismatch of data given in the maintenance planning information must be taken into account.
Chap 3.9.5.2.1.9 Para 2.1.2.1	BRDP-S1-00136	Use of the element <workLocation> in the element <preliminaryRqmts>	Decide whether and how to use the element <workLocation>. If used, decide the data module types with which it will be used.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.1.9 Para 2.1.2.1.1	BRDP-S1-00137	Use of the element <workArea> in the element <preliminaryRqmts>	Decide whether and how to use the element <workArea>. If used, decide which data module types to use it.
Chap 3.9.5.2.1.9 Para 2.1.2.1.2	BRDP-S1-00138	Use of the element <installationLocation> in the element <preliminaryRqmts>	Decide whether and how to use the element <installationLocation>. If used, decide which data module types to use it.
Chap 3.9.5.2.1.9 Para 2.1.2.1.3	BRDP-S1-00139	Use of the element <productItem> in the element <preliminaryRqmts>	Decide whether and how to use the element <productItem>. If used, decide which data module types to use it.
Chap 3.9.5.2.1.9 Para 2.1.2.1.3	BRDP-S1-00140	Use of the attribute productItemName in the element <preliminaryRqmts>	Decide whether and how to use the attribute productItemName.
Chap 3.9.5.2.1.9 Para 2.1.2.1.3	BRDP-S1-00141	Use of the attribute productItemType in the element <preliminaryRqmts>	Decide whether and how to use the attribute productItemType.
Chap 3.9.5.2.1.9 Para 2.1.3	BRDP-S1-00142	Use of the element <taskDuration> in the element <preliminaryRqmts>	Decide whether and how to use the element <taskDuration>. The possibility of duplication and mismatch of data given in the maintenance planning information must be taken into account.
Chap 3.9.5.2.1.9 Para 2.2.4	BRDP-S1-00143	Inclusion of a circuit breaker list as part of the required conditions - (element <reqCondCircuitBreaker>)	Decide if circuit breaker lists are allowed in required conditions and thus the use of the element, or if all the circuit breaker settings must be part of the steps. In this latter case, the element <circuitBreakerDescrGroup> in steps content can be used.
Chap 3.9.5.2.1.9 Para 2.3	BRDP-S1-00144	Use of the element <reqPersons> in the element <preliminaryRqmts>	Decide whether and how to use the element <reqPersons>. For example, use either the element <personnel> or <person> or use both elements.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.1.9 Para 2.3.1.1	BRDP-S1-00145	Values for the attribute `personCategoryCode` in the element <preliminaryRqmts>	Define a list of skill categories/types (eg, Airframe, Electrical, Avionic, Engine).
Chap 3.9.5.2.1.9 Para 2.3.1.3	BRDP-S1-00146	Values for the element <trade> in the context of the element <preliminaryRqmts>	If trades are required, define a list of trades/trade codes.
Chap 3.9.5.2.1.9 Para 2.4.1	BRDP-S1-00147	Use of the element <reqTechInfoGroup> in the element <preliminaryRqmts>	Decide whether and how to use the element <reqTechInfoGroup>.
Chap 3.9.5.2.1.9 Para 2.5	BRDP-S1-00149	Listing of standard tools in Preliminary requirements	Decide what types of standard tools or toolkits to be identified and listed in the table "Support equipment".
Chap 3.9.5.2.1.9 Para 2.5.1	BRDP-S1-00150	Use of the attribute `id` on the element <supportEquipDescr> in the element <preliminaryRqmts>	Decide whether to link from the body of the procedure to the support equipment listed in Preliminary requirements. **Note** The attribute `id` on the element <supportEquipDescr> is used to establish the link between the two and will guarantee consistent use of identification throughout the procedure. The use of cross-references is encouraged.
Chap 3.9.5.2.1.9 Para 2.5.1	BRDP-S1-00151	Use of the attribute `materialUsage` in the element <supportEquipDescr>, the element <supplyDescr> and the element <spareDescr> context	Decide whether to use the attribute `materialUsage` in the elements <supportEquipDescr>, <supplyDescr> and <spareDescr> context and what values to be used.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.1.9 Para 2.5.1.3	BRDP-S1-00152	Use of identification elements in the element <supportEquipDescr>, the element <supplyDescr> and the element <spareDescr> context	Decide which of the elements <catalogSeqNumberRef>, <natoStockNumber>, <identNumber>, <toolRef>, <supplyRef>, <supplyRqmtRef>, <partRef>, <functionalItemRef> and <materialSetRef> to use for identification and how to populate these elements.
Chap 3.9.5.2.1.9 Para 2.6.1	BRDP-S1-00155	Use of the attribute id on the element <supplyDescr> in the element <preliminaryRqmts>	Decide whether to use the attribute id to create cross-references from the procedure to the supplies listed in Preliminary requirements. The attribute id on the element <supplyDescr> is used to establish the link between the two and will guarantee consistent use of identification throughout the procedure. The use of cross-references is encouraged.
Chap 3.9.5.2.1.9 Para 2.7.1	BRDP-S1-00156	Use of the attribute id on the element <sparesDescr> in the element <preliminaryRqmts>	Decide whether to use the attribute id to create cross-references from the procedure to the spares listed in Preliminary requirements. The attribute id on the element <sparesDescr> is used to establish the link between the two and will guarantee consistent identification throughout the procedure. The use of cross-references is encouraged.
Chap 3.9.5.2.1.9 Para 3.1	BRDP-S1-00157	Use of the element <closeRqmts> in the process data modules	Decide whether to use the element <closeRqmts> in the process data modules.
Chap 3.9.5.2.1.10 Para 2.1.1	BRDP-S1-00158	Use of the attribute circuitBreakerAction in text element <circuitBreakerRef>	Decide whether to use the attribute circuitBreakerAction. If used, establish writing rules to ensure that authors will be consistent in the paragraph text and the value of the attribute itself.
Chap 3.9.5.2.1.10 Para 2.1.1	BRDP-S1-00159	Use of the attribute checkSum in text element <circuitBreakerRef>	Decide whether to use and how to populate the attribute checkSum.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.1.10 Para 2.1.3	BRDP-S1-00160	Types of inline significant data to markup using the attribute `significantParaDataType` in the text element <`inlineSignificantData`>	Decide whether to use the attribute `significantParaDataType` and which types of data to mark up and in what contexts. **Note** It must also be considered that data modules can be less portable if the paragraph significant data types are extended in the BREX file past the standard types.
Chap 3.9.5.2.1.10 Para 2.1.4.1	BRDP-S1-00163	Use of the value (element <`quantityValue`>) and tolerance (element <`quantityTolerance`>) decomposition in the text element <`quantity`>	Decide whether and how to use to use the element <`quantityValue`> and the element <`quantityTolerance`> decomposition.
Chap 3.9.5.2.1.10 Para 2.1.4.1	BRDP-S1-00164	Unit of measure to be used	If using the value and tolerance decomposition, decide at which level of the markup the attribute `quantityUnitOfMeasure` must be included. Allowable locations are on the parent element <`quantityGroup`> which applies to all child elements or on the individual child elements <`quantityValue`> and <`quantityTolerance`>. A consistent usage of the attribute `quantityUnitOfMeasure` is required to produce a consistent display or printout to the user.
Chap 3.9.5.2.1.10 Para 2.1.5	BRDP-S1-00166	Use of the element <`zoneRef`>	Decide whether and how to use the element <`zoneRef`>. Consideration for duplication and mismatch of data given in the maintenance planning information has to be taken.
Chap 3.9.5.2.1.10 Para 2.1.6	BRDP-S1-00167	Use of the element <`accessPointRef`>	Decide whether and how to use the element <`accessPointRef`>. Consideration for duplication and mismatch of data given in the maintenance planning information has to be taken.
Chap 3.9.5.2.1.10 Para 2.1.7	BRDP-S1-00169	Use of the text element <`indexFlag`>	Decide whether a publishing index is required and to what index level.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.1.10 Para 2.1.9	BRDP-S1-00171	Use of the symbols	Decide whether and how to use symbols using the text element <symbol>.
Chap 3.9.5.2.1.10 Para 2.1.12	BRDP-S1-00172	Use of footnotes	Decide whether and how to use the text element <footnote> and when used, decide whether the use of footnotes is limited to regular text and titles (inline) and/or to tables (table footnotes).
Chap 3.9.5.2.1.10 Para 2.1.12	BRDP-S1-00173	Types of footnote markers	Decide on the types of footnote markers (attribute footnoteMark) to use. It is recommended to use: – only one type of footnote marker for each of the table footnotes and the inline footnotes throughout a project – superscripted numbers for both
Chap 3.9.5.2.1.10 Para 2.5.3	BRDP-S1-00560	Identification of parts	Decide whether the project can use OEM renamed part numbers instead of part numbers allocated by the part design authority in the attribute partNumberValue.
Chap 3.9.5.2.1.12 Para 2.1	BRDP-S1-00177	Use of common information	Decide whether to use the element <commonInfo> in business rules exchange, common repositories, fault, maintenance checklist, maintenance planning, procedural, process, and service bulletin data modules. If decided to be used, then determine the circumstances for its use for each related data module type, and give guidance and rules that will make sure it is consistently used.
Chap 3.9.5.2.1.12 Para 2.1.1.2	BRDP-S1-00178	Markup method for common information text	Decide which markup method to use for common information text: – the method containing <note>, <para> and <commonInfoDescrPara> or – the method containing only <commonInfoDescrPara>

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.2 Para 2.4	BRDP-S1-00180	Maximum number of subordinate levelled paragraphs in a descriptive data module	Decide on the maximum number of levelled paragraphs allowed in a descriptive data module. Exceeding five levels of depth is strongly discouraged in development of new data. It is recommended that additional levels are only used in a conversion effort where the existing data is authored to this depth (maximum eight levels) and restructuring of data is not feasible.
Chap 3.9.5.2.2 Para 2.4	BRDP-S1-00181	Minimum levelled para occurrences	Decide whether to impose a minimum of two occurrences of child elements <levelledPara> and/or <levelledParaAlts>.
Chap 3.9.5.2.3 Para 2.4	BRDP-S1-00185	Use of the alternates concept within the element <mainProcedure>	Decide whether to use the alternates concept for steps, figures and multimedia within the element <mainProcedure>. This concerns the child elements <proceduralStepAlts> (refer to Para 2.4.2), <figureAlts> (refer to Chap 3.9.5.2.1.7) and <multimediaAlts> (refer to Chap 3.9.5.2.1.7).
Chap 3.9.5.2.3 Para 2.4.1	BRDP-S1-00186	Maximum number of step levels in a procedure	Decide on the maximum number of step levels allowed in a procedure. Exceeding five levels of depth is strongly discouraged in development of new data. It is recommended that additional levels are only used in a conversion effort where the existing data is authored to this depth (maximum eight levels) and restructuring of data is not feasible.
Chap 3.9.5.2.3 Para 2.4.1	BRDP-S1-00187	Minimum number of substeps in a step	Decide whether to allow for a single substep, or to insist on a minimum of two substeps in a step. **Note** The Schema allows for a single substep.
Chap 3.9.5.2.4 Para 2.5.7.1.5	BRDP-S1-00192	Use of correlation fault concept	Decide whether to use the correlated fault concept.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.4 Para 2.5.7.1.5	BRDP-S1-00193	Use of correlated fault messages and warnings	Decide how to populate the elements <warningMalfunction>, <assocWarningMalfunction> and <bitMessage> when using the correlated fault concept.
Chap 3.9.5.2.4 Para 2.5.7.1.5	BRDP-S1-00194	Use of detection and description information elements	Decide whether the repetition of the detection and description information for the basic fault which has been correlated (elements <faultDescr> and <detectionInfo>) is used. Projects can consider that the detection and description information can for example be populated during IETP generation by picking up the information in the detected fault list data module describing the basic faults.
Chap 3.9.5.2.4 Para 2.6.1.2	BRDP-S1-00195	Use of the attribute independentCheck on the elements <isolationProcedure>, <isolationStep> and <isolationProcedureEnd>	Decide whether to use the attribute independentCheck, which values to use and allocate suitable definitions.
Chap 3.9.5.2.5 Para 2.4	BRDP-S1-00562	Use of the top-level preliminary requirements construct for maintenance inspections	Decide whether to use the top-level preliminary requirements for maintenance inspections.
Chap 3.9.5.2.5 Para 2.5.1.1.4	BRDP-S1-00197	Values for the attribute inspectionTypeCategory	Decide which values to use for the attribute inspectionTypeCategory and allocate suitable definitions.
Chap 3.9.5.2.5 Para 2.5.2	BRDP-S1-00198	Methodology of assigning tasks into the element <taskGroup>	Decide on a methodology of assigning tasks to groups.
Chap 3.9.5.2.5 Para 2.5.2.1.3	BRDP-S1-00199	Values for the attribute markerType	Decide which values to use for the attribute markerType and allocate suitable definitions.
Chap 3.9.5.2.5 Para 2.6.1	BRDP-S1-00202	Values for the attribute sourceOfRqmt	Decide which values to use for the attribute sourceOfRqmt and allocate suitable definitions.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.5 Para 2.6.2	BRDP-S1-00204	Use of the element <preliminaryRqmts> in the element <taskDefinition>	Decide whether to use the element <preliminaryRqmts> in the context of task definition.
Chap 3.9.5.2.5 Para 2.8.2	BRDP-S1-00563	Use of the attribute timeLimitCategoryValue	In case standard descriptions are not applicable, describe how the values "1" and "2", respectively, will be used for the attribute timeLimitCategoryValue.
Chap 3.9.5.2.7 Para 2.5.5	BRDP-S1-00219	Use of the element <partSegment> in the element <itemSeqNumber>	Decide whether to use the element <partSegment> to store the part data in the IPD data module each time the part is listed or store the part data once externally in the part CIR data module. **Note** The element <partSegment> must be used for S2000M IPD data modules.
Chap 3.9.5.2.7 Para 2.5.5.3.4	BRDP-S1-00221	Use of the element <physicalSecurityPilferageCode> in the element <techData> within the element <itemSeqNumber>	Decide whether and how to use the element <physicalSecurityPilferageCode>. S2000M lists the possible codes in the data definition for physical security pilferage code (PSC).
Chap 3.9.5.2.7 Para 2.5.5.3.7	BRDP-S1-00222	Use of the attribute unitOfMeasure in the element <unitOfIssueQualificationSegment> within the element <techData>	Decide on the range and definitions of the values for the attribute unitOfMeasure. **Note** When the IPD data modules are created from S2000M, the list of allowed unit of measure (UOM) values must contain those defined in the data definition in S2000M. When S2000M is used, it is strongly recommended to use the S2000M UOM values throughout the project.
Chap 3.9.5.2.7 Para 2.5.5.4.3	BRDP-S1-00223	Use of the element <optionalPart> in the element <partRefGroup> within the element <itemSeqNumber>	Decide on the method of identification of the optional part.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.7 Para 2.5.5.4.4	BRDP-S1-00224	Use of the element <preferredSparePart> in the element <partRefGroup> within the element <itemSeqNumber>	Decide on the method of identification of the preferred spare part.
Chap 3.9.5.2.7 Para 2.5.5.4.5	BRDP-S1-00225	Use of the element <alteredFromPart> in the element <partRefGroup> within the element <itemSeqNumber>	Decide on the method of identification of the altered from part.
Chap 3.9.5.2.7 Para 2.5.5.4.7	BRDP-S1-00226	Use of the element <localFabricationMaterial>	Decide on the method of identification of the local fabrication material.
Chap 3.9.5.2.7 Para 2.5.7.1	BRDP-S1-00229	Use of the element <usableOnCodeEquip> in the element <applicabilitySegment> within the element <itemSeqNumber>	Decide whether and how to use the element <usableOnCodeEquip>. If used, decide on the values and their definitions. S2000M lists the possible codes and their usage in the data definition for usable on code equipment (UCE).
Chap 3.9.5.2.7 Para 2.5.7.2	BRDP-S1-00230	Use of the element <usableOnCodeAssy> in the element <applicabilitySegment> within the element <itemSeqNumber>	Decide whether and how to use the element <usableOnCodeAssy>. If used, decide on the values and their definitions. S2000M lists the possible codes and their usage in the data definition for usable on code assembly (UCA).
Chap 3.9.5.2.7 Para 2.5.7.3	BRDP-S1-00231	Use of the element <interchangeability> in the element <applicabilitySegment> within the element <itemSeqNumber>	Decide whether and how to use the element <interchangeability>. If used, decide on the values and their definitions. S2000M lists the possible codes and their usage in the definition for interchangeability (ICY).
Chap 3.9.5.2.7 Para 2.5.9.2	BRDP-S1-00232	Use of the element <service> in the element <locationRcmdSegment> within the element <itemSeqNumber>	Decide on the values and definitions of the third character of the element <service>.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.7 Para 2.5.9.3	BRDP-S1-00233	Use of the element <sourceMaintRecoverability> in the element <locationRcmdSegment> within the element <itemSeqNumber>	Decide which values to use for the sixth character of the element <sourceMaintRecoverability> and allocate suitable definitions.
Chap 3.9.5.2.7 Para 2.5.9.4	BRDP-S1-00234	Use of the element <modelVersion> in the element <locationRcmdSegment> within the element <itemSeqNumber>	Decide whether and how to use the element <modelVersion>. If used, decide on the values and their definitions.
Chap 3.9.5.2.7 Para 2.5.9.5	BRDP-S1-00235	Use of the element <effectivity> in the element <locationRcmdSegment> within the element <itemSeqNumber>	Decide whether and how to use the element <effectivity>. If used, decide on its range and the definition of the values to be used.
Chap 3.9.5.2.7 Para 2.5.12	BRDP-S1-00237	Use of BREX to define the non-S2000M elements	Decide whether to use BREX for the definition of the non-S2000M elements.
Chap 3.9.5.2.9.2 Para 2.3.1.1	BRDP-S1-00239	Use of the element <wireType>	Decide on the definition of wire type content/codes.
Chap 3.9.5.2.9.2 Para 2.3.4	BRDP-S1-00240	Use of the element <wireSeqNumber>	Decide whether and how to use the wire sequential number. **Note** The element <wireSeqNumber> must be used if the wire sequential number is not given in the element <wireNumber>.
Chap 3.9.5.2.9.4 Para 2.6.1	BRDP-S1-00241	Use of the element <electricalEquipConnection>	Decide whether and how to use electrical equipment connection information, in particular define the values of attribute connectionType consistently.
Chap 3.9.5.2.10.1 Para 2.3.1.9	BRDP-S1-00244	Use of applicability for variables in process data modules	Decide on the level of applicability filtering. This is established based on viewer capability and portability of the data.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.10.2 Para 2.2	BRDP-S1-00246	Use of dialogs to declare unassigned variables in process data modules	Decide whether to use a dialog to assign values to an unassigned variable.
Chap 3.9.5.2.10.2 Para 2.2	BRDP-S1-00247	Use of default values in a dialog in process data modules	Decide whether a variable default value will be displayed in a dialog.
Chap 3.9.5.2.10.3 Para 2.2	BRDP-S1-00248	Use of the attribute `variableName` in the element <`variable`> in process data modules	Decide on naming conventions to be used in setting variable names.
Chap 3.9.5.2.10.3 Para 2.2	BRDP-S1-00249	Use of the attribute `variableType` in the element <`variable`> in process data modules	Decide whether to use the attribute `variableType` and decide on the rules for selection of the defined values.
Chap 3.9.5.2.11.1 Para 2.1.1.6	BRDP-S1-00251	Use of the attribute `altNumber` in the functional items CIR	Decide whether to use the attribute `altNumber`, which values to use and allocate suitable definitions to the values.
Chap 3.9.5.2.11.2 Para 2.1.1.4	BRDP-S1-00252	Use of the attribute `altNumber` in the circuit breakers CIR	Decide whether to use the attribute `altNumber`, which values to use and allocate suitable definitions to the values.
Chap 3.9.5.2.11.4 Para 2.1.1.2	BRDP-S1-00253	Use of the attribute `zoneRefType`	Decide which values (eg, subzones) to use for the attribute `zoneRefType` and allocate suitable definitions to the values.
Chap 3.9.5.2.11.4 Para 2.1.1.4	BRDP-S1-00254	Use of the attribute `altNumber` in the zones CIR	Decide whether to use the attribute `altNumber`, which values to use and allocate suitable definitions to the values.
Chap 3.9.5.2.11.5 Para 2.1.1.2	BRDP-S1-00255	Use of the attribute `accessPointRefType`	Decide which values (eg, subaccess points) to use for the attribute `accessPointRefType` and allocate suitable definitions to the values.
Chap 3.9.5.2.11.5 Para 2.1.1.4	BRDP-S1-00256	Use of the attribute `altNumber` in the access points CIR	Decide whether to use the attribute `altNumber`, which values to use and allocate suitable definitions to the values.
Chap 3.9.5.2.11.9 Para 2.1.1.2	BRDP-S1-00260	Use of the attribute `toolRefType` in the tools CIR	Decide which values to use for the attribute `toolRefType` and allocate suitable definitions to the values.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.11.9 Para 2.1.1.4	BRDP-S1-00261	Use of the attribute `altNumber` in the tools CIR	Decide whether to use the attribute `altNumber`, which values to use and allocate suitable definitions to the values.
Chap 3.9.5.2.11.9 Para 2.1.1.4.2	BRDP-S1-00262	Use of the attribute `taskCategoryCode` in the tools CIR	Decide which values (eg, servicing, maintenance, overhaul, repair) to use for the attribute `taskCategoryCode` and allocate suitable definitions to the values.
Chap 3.9.5.2.11.10 Para 2.1.1.1	BRDP-S1-00263	Use of the attribute `systemDiffCode` in the element <`functionalPhysicalAreaIdent`>	Decide whether to apply the system difference code in the functional and/or physical areas CIR data module.
Chap 3.9.5.2.11.10 Para 2.1.1.1	BRDP-S1-00264	Use of the attributes `disassyCode` and `disassyCodeVariant` in the element <`functionalPhysicalAreaIdent`>	Decide whether to apply the disassembly code and disassembly variant code in the functional and/or physical areas CIR data module.
Chap 3.9.5.2.13 Para 2.3	BRDP-S1-00561	Use of titles in the Learning data module	In the substructures of the Learning data module, decide to what extent optional occurrences of the element <`title`> can be used and how given titles and generated titles must be presented to achieve a readable presentation of the information.
Chap 3.9.5.2.13.1 Para 2	BRDP-S1-00267	Conducting a performance analysis	Decide whether to conduct a performance analysis to determine factors that can affect performance and gaps in job performance or a training needs analysis to determine training requirements.
Chap 3.9.5.2.13.1 Para 2	BRDP-S1-00268	Developing learning objectives	Decide whether to develop learning objectives in accordance with task analysis items. Learning objectives ought to be developed in accordance with task analysis items that support system maintenance and operational procedures. Aligning learning objectives with task analysis items in the early content preplanning stages will foster reusable data and content alignment. Refer to Chap 3.9.7 for content preplanning discussions.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.13.1 Para 2	BRDP-S1-00269	Packaging lesson plans in SCORM content package modules	Decide whether to package lesson plans in SCORM content package modules.
Chap 3.9.5.2.13.1 Para 2.2	BRDP-S1-00270	Define life cycle need for performance analysis data	Define the life cycle need for analysis information and requirements resulting from a performance analysis for the client organization and human performance system affected by the product.
Chap 3.9.5.2.13.1 Para 2.2	BRDP-S1-00271	Define life cycle need for training needs analysis data	Define the life cycle need for analysis information and requirements resulting from a training needs analysis for a training intervention.
Chap 3.9.5.2.13.5 Para 2.4	BRDP-S1-00273	Use of the attribute `weightingFactor`	Decide whether to assign weighted values to individual interactions.
Chap 3.9.5.2.13.5 Para 2.4	BRDP-S1-00274	Use of the attribute attempts	Decide whether to allow multiple response attempts for interaction items.
Chap 3.9.5.2.14 Para 2.3.1.3.5	BRDP-S1-00279	Define maximum number of steps levels in <`checkListProcedure`>	Projects must decide the maximum number of step levels allowed.
Chap 3.9.5.2.15 Para 2.3.3.2	BRDP-S1-00280	Use of the attribute `sbTopicType` in the element <`sbTopic`> within the element <`sbRevisionInfo`>	Decide which topic types are mandatory, which are optional, and on the sequence in which the corresponding element <`sbTopic`> must be given in the element <`sbRevisionInfo`>. Refer to Chap 3.9.6.1.
Chap 3.9.5.2.15 Para 2.3.4	BRDP-S1-00281	Use of the attribute `sbTopicType` in element <`sbTopic`> within the element the element <`sbSummary`>	Decide which topic types are mandatory, which are optional, and on the sequence in which the corresponding element <`sbTopic`> must be given in the element <`sbSummary`>. Refer to Chap 3.9.6.1.
Chap 3.9.5.2.15 Para 2.3.5	BRDP-S1-00282	Use of the attribute `sbTopicType` in the element <`sbTopic`> within the element the element <`sbPlanningInfo`>	Decide which topic types are mandatory, which are optional, and on the sequence in which the corresponding element <`sbTopic`> must be given in the element <`sbPlanningInfo`>. Refer to Chap 3.9.6.1.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.15 Para 2.3.8	BRDP-S1-00283	Use of the attribute sbTopicType in the element <sbTopic> wthin the element <sbAdditionalInfo>	Decide which topic types are mandatory, which are optional, and on the sequence in which the corresponding element <sbTopic> must be given in the element <sbAdditionalInfo>. Refer to Chap 3.9.6.1.
Chap 3.9.5.2.15.2 Para 2.1.1.1	BRDP-S1-00287	Use of the element <sbProcurementInfo> in the element <sbMaterialSet>, the element <sbSupportEquipSet>, the element <sbIndividualSupportEquip>, the element <sbSupplySet>, the element: <sbIndividualSupply>, the element <sbSpareSet> and the element <sbIndividualSpare>	Decide whether the use of the element <sbProcurementInfo> is allowed within the element <sbMaterialSet> the definitions of individual material sets (ie, <sbSupportEquipSet>, <sbSupplySet> and <sbSpareSet>) the definitions of individual spares, supplies and support equipment (ie, <sbIndividualSupportEquip> ,<sbIndividualSupply> and <sbIndividualSpare>)

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.15.2 Para 2.1.1.2	BRDP-S1-00288	Use of the element <sbIndustrySupport> in the element <sbMaterialSet>, the element <sbSupportEquipSet>, the element <sbIndividualSupportEquip>, the element <sbSupplySet>, the element <sbIndividualSupply>, the element <sbSpareSet>, the element <sbIndividualSpare>, the element <sbRemovedSpareSet>, the element <sbIndividualRemovedSpare>	Decide whether the use of the element <sbIndustrySupport> is allowed within the element <sbMaterialSet> the definitions of individual material sets (ie, <sbSupportEquipSet>, <sbSupplySet> , <sbSpareSet> and <sbRemovedSpareSet>) the definitions of individual spares, supplies, support equipment and removed spares (ie, <sbIndividualSupportEquip> , <sbIndividualSupply>, <sbIndividualSpare> and <sbIndividualRemovedSpare>)
Chap 3.9.5.2.16 Para 2.3.1.1	BRDP-S1-00294	Content of the element <productIntroName>	Decide whether to use the element <productIntroName>.
Chap 3.9.5.2.16 Para 2.3.1.6	BRDP-S1-00295	Use of the element <productAndModel>	Decide whether and how to use the element <productAndModel> and its child elements.
Chap 3.9.5.2.16 Para 2.3.1.9	BRDP-S1-00296	Use of the element <dataRestrictions> in the element <frontMatterTitlePage>	Decide whether and how to use the element <dataRestrictions> and its child elements.
Chap 3.9.5.2.16 Para 2.3.1.11	BRDP-S1-00297	Use of the element <enterpriseSpec> in the element <frontMatterTitlePage>	Decide whether and how to use the element <enterpriseSpec>.
Chap 3.9.5.2.16 Para 2.3.1.12	BRDP-S1-00298	Use of the element <enterpriseLogo>	Decide whether to use the element <enterpriseLogo> and if it is populated from the element <logo> given in the Identification and status section.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.16 Para 2.3.1.14	BRDP-S1-00299	Method of populating the element <publisherLogo>	Decide whether and how to use the element <logo> in the Identification and status section to populate the element <publisherLogo>.
Chap 3.9.5.2.16 Para 2.3.1.15.1	BRDP-S1-00300	Use of the attribute barCodeSymbology	Decide whether to use the attribute barCodeSymbology and which barcode symbology to be used.
Chap 3.9.5.2.16 Para 2.3.1.16	BRDP-S1-00301	Use of the element <frontMatterInfo>	Decide whether and how to use the element <frontMatterInfo> including the allowed values of the attribute frontMatterInfoType and their interpretation as titles at presentation. Refer to Chap 3.9.6.1. **Note** The content given in the element <title> takes precedence over the interpretation of the value of the attribute frontMatterInfoType.
Chap 3.9.5.2.16 Para 2.3.1.16.1	BRDP-S1-00302	Use of the element <title> in the element <frontMatterInfo>	Decide whether to use the content of the element <title> or the interpretation of the value of the attribute frontMatterInfoType as the title of the Front matter information.
Chap 3.9.5.2.16 Para 2.3.2.2	BRDP-S1-00303	Use the element <reducedPara> in the element <frontMatterTableOfContent>	Decide whether to use the introductory paragraph and on the wording of any standard phrase.
Chap 3.9.5.2.16 Para 2.3.3.1	BRDP-S1-00309	Use the element <reducedPara> in the element <frontMatterList>	Decide whether to use the introductory paragraph and on the wording of any standard phrase for each of the front matter list.
Chap 3.9.5.2.16 Para 2.3.3.2.8	BRDP-S1-00310	How to store total number of pages for S1000D publications	Decide on the use of <footnoteRemarks> to store the total number of pages for a complete S1000D publication.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.2.16 Para 2.3.3.2.9	BRDP-S1-00311	How to store total number of pages for non-S1000D publications	Decide on the use of <footnoteRemarks> to store the total number of pages for a complete non-S1000D publication.
Chap 3.9.5.2.17 Para 2.3	BRDP-S1-00313	Use of the element <contentDescription> in the element <scoContent>	Decide whether and how to use the element <contentDescription> (eg, to add information about the training resource).
Chap 3.9.5.2.17 Para 2.3	BRDP-S1-00314	Use of the element <contentDescription> in the element <trainingStep>	Decide whether and how to use the element <contentDescription> (eg, to add information about the content defined in the training step).
Chap 3.9.5.2.17 Para 2.3.2	BRDP-S1-00315	Use of the element <contentDescription>	Decide whether the optional element <contentDescription> must be used to add information about the content defined in the training step.
Chap 3.9.5.3 Para 2.2	BRDP-S1-00316	Use of the element <applic> in the data module status and content	Decide how to use the element <applic> and to populate its child elements and attributes across the project or the organization.
Chap 3.9.5.3 Para 2.2.1	BRDP-S1-00317	Use of the element <displayText> in the element <applic>	Decide whether the element <displayText> is populated by the technical author or generated from the computable branch or some other source when using the human-readable branch of applicability.
Chap 3.9.5.3 Para 2.2.2.2	BRDP-S1-00318	Use of the attribute applicDisplayClass within the element <applic>	Decide whether to use the attribute applicDisplayClass when using the computable applicability annotation branch.
Chap 3.9.5.3 Para 2.2.2.2	BRDP-S1-00319	Use of textual applicability annotations in the element <assert> in the element <evaluate>	Decide if textual applicability annotations are allowed in the element <assert> when using the computable applicability annotation branch or if every element <assert> must reference a declared product attribute or condition.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.3.1 Para 2.3.1	BRDP-S1-00320	Use of the attribute valuePattern and the element <enumeration> or to use open text when using ACT	Decide whether to specify the allowable values for a product attribute achieved by using both the attribute valuePattern and the element <enumeration> or to allow open text without using the attribute valuePattern and the element <enumeration>.
Chap 3.9.5.3.1 Para 2.3.1.1	BRDP-S1-00321	Use of the element <displayName> in the element <productAttribute> when using ACT	Decide whether to use the element <displayName>.
Chap 3.9.5.3.1 Para 2.3.1.4	BRDP-S1-00322	Method of defining multiple values or ranges for the element <enumeration> in the ACT	Decide whether to use a single element <enumeration> containing the entire set or to use multiple elements <enumeration> which each contains only one value or range.
Chap 3.9.5.3.2 Para 2.3.1	BRDP-S1-00323	Use of the attribute valuePattern and the element <enumeration> or to use open text when using CCT	Decide whether to specify the allowable values for a product attribute achieved by using both the attribute valuePattern and the element <enumeration> or to allow open text without using the attribute valuePattern and the element <enumeration>.
Chap 3.9.5.3.2 Para 2.3.1.2	BRDP-S1-00324	Method of defining multiple values or ranges for the element <enumeration> in the CCT	Decide whether to use a single element <enumeration> containing the entire set or to use multiple elements <enumeration> which each contain only one value or range.
Chap 3.9.5.3.2 Para 2.4.1.1	BRDP-S1-00325	Use of the element <displayName> in the element <productAttribute> when using CCT	Decide whether to use the element <displayName>.
Chap 3.9.5.3.2 Para 2.4.1.6	BRDP-S1-00326	Constraining conditions by use of the element <dependency> in the element <cond> in the CCT	Decide whether to constrain allowable conditions based on other condition values by use of the element <dependency>.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 3.9.5.3.3 Para 2.3.1	BRDP-S1-00327	Product attributes and conditions to include in the PCT	Decide which product attributes and conditions to include in the PCT. Conditions that represent operational or environmental properties will usually not be included in the PCT as they are not associated with a product instance.
Chap 3.9.6 Para 2.2	BRDP-S1-00328	Translation of the "S1000D interpretation" of configurable attribute values	Decide whether to translate and use the "S1000D interpretation" of configurable attribute values in the languages adopted by the project. **Note** At no time must a project allocate values outside the ranges given in the subchapters.
Chap 3.9.6.1 Para 2	BRDP-S1-00329	Application of project specific values for configurable attributes	Decide whether to use any project specific attribute values, which values to use and allocate suitable definitions and interpretations. **Note** There are specific business rules decision points for some of the configurable attributes given in the authoring chapters. Refer to Chap 3.9.5 and its subchapters.
Chap 3.9.6.2 Para 2	BRDP-S1-00330	Application of project specific values for the attribute `quantityUnitOfMeasure`	Decide whether any project specific attribute values are needed for the attribute `quantityUnitOfMeasure`. If needed, decide which project specific values to use for the attribute `quantityUnitOfMeasure` and allocate suitable project interpretations.

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BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 4.3 Para 2.1	BRDP-S1-00331	Data module coding strategy	Decide on the data module coding strategy to use for the Product and/or the project.
Chap 4.3.1 Para 2.1	BRDP-S1-00332	Allocation of Product model identification code	Decide which model identification codes to use for the Product and/or project.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 4.3.1 Para 2.1	BRDP-S1-00333	Allow the use of one or several model identification codes	Decide whether to allow the use of one or several model identification codes.
Chap 4.3.2 Para 2	BRDP-S1-00334	Allocation of system difference code	Decide which system difference code values to be used for the Product.
Chap 4.3.2 Para 2.1	BRDP-S1-00335	UOC as system difference code	Decide whether to use UOC as the system difference code.
Chap 4.3.3 Para 2.1	BRDP-S1-00336	Product SNS structure	Decide which SNS structure to use for the Product.
Chap 4.3.3 Para 2.2.2	BRDP-S1-00337	Use of the material item category code	Decide whether to use the material item category code.
Chap 4.3.3 Para 2.2.4	BRDP-S1-00338	Number of characters in assembly code	Decide whether to use two or four characters for unit or assembly.
Chap 4.3.3 Para 2.3.2	BRDP-S1-00339	Responsible partner company codes for non-chapterized illustrated parts data modules	Decide which responsible partner company codes to use for non-chapterized illustrated parts data modules.
Chap 4.3.3 Para 2.3.3	BRDP-S1-00340	Responsible partner company codes for non-chapterized, non-S2000M illustrated parts data modules	Decide which responsible partner company codes to use for non-chapterized, non-S2000M illustrated parts data modules.
Chap 4.3.3 Para 2.3.3	BRDP-S1-00341	Unique identifier for non-chapterized, non-S2000M illustrated parts data modules	Decide which unique identifiers to use for non-chapterized, non-S2000M illustrated parts data modules.
Chap 4.3.5 Para 2	BRDP-S1-00342	Use of the disassembly code variant	Decide whether to use one, two or three characters for the disassembly code variant and how to populate.
Chap 4.4 Para 2	BRDP-S1-00344	Use of CAGE code and/or model identification code based ICN	Decide which method to be used for the ICN.
Chap 4.4 Para 2.2.4	BRDP-S1-00348	Allocation of responsible partner company codes for model identification code based ICN	Decide which values on responsible partner company codes to be used.
Chap 4.5 Para 2.1	BRDP-S1-00350	Use of data management requirement list	Decide whether to use the data management requirement list for specification and exchange of CSDB planning information.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 4.5 Para 2.1	BRDP-S1-00351	Object types to be listed in the data management requirement list	Decide whether to list publication modules and/or IPD illustrations in the data management requirement list.
Chap 4.5 Para 3.1	BRDP-S1-00352	Use of CSDB status list	Decide whether to use the CSDB status list for exchange of CSDB status information.
Chap 4.5 Para 3.1	BRDP-S1-00353	Objects types to be tracked by the CSDB status list	Decide what CSDB objects types must be tracked in the CSDB status list, and at a minimum these must be data modules, illustrations/multimedia objects and publication modules.
Chap 4.5 Para 3.2.2	BRDP-S1-00354	CSDB object issues to be included in the CSDB status list	Decide whether to include only the latest issues of CSDB objects or all issues in the CSDB status list.
Chap 4.5 Para 4.1.1.2	BRDP-S1-00355	Data management requirement list issue date	Decide whether the issue date of a data management requirement list must be the input date (the release to CSDB date), the cut-off date for the information, the planning date or some other more appropriate date.
Chap 4.6 Para 2	BRDP-S1-00356	Use of the comment form	Decide whether to use the comment form. **Note** Control authority references must not be used in comments.
Chap 4.6.2 Para 2.2	BRDP-S1-00359	Allowed file types for attachments to comment forms	Decide which file types are allowed for attachments to comment forms.
Chap 4.8 Para 2.1.2	BRDP-S1-00545	File formats for information objects	Decide which file formats to use.
Chap 4.8 Para 2.1.2.2	BRDP-S1-00360	Raster graphic resolution	Decide which resolution to use for raster graphics.
Chap 4.8 Para 2.1.2.3	BRDP-S1-00361	Use of photographs	Decide whether photographs will be used. If used, for what purposes.
Chap 4.9.2 Para 2.1.2	BRDP-S1-00365	Use of the attribute `pmIssuer`	Decide on the use of the attribute `pmIssuer`.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 4.10.1 Para 2.3	BRDP-S1-00564	Single or multiple business rules document	Decide whether to use a single or multiple business rules document data module to capture business rules. If multiple data modules are needed, identify which rules will go into which data module. Refer to Para 3.1.
Chap 4.10.1 Para 4.3	BRDP-S1-00565	Level of depth of business rules document data modules	Decide whether to exceed five levels of depth for new data.
Chap 4.10.1 Para 4.4	BRDP-S1-00566	Identification numbering	Decide on the numbering scheme for the attribute `brDecisionIdentNumber` and the attribute `id` as applicable.
Chap 4.10.1 Para 4.4.4.1	BRDP-S1-00567	Standardized responses to describe business rules decision values	Decide whether to use standardized sentences to describe business rules decision values or not. If the decision is to use standardized responses, decide which responses must be taken from text describing BRDP values defined in the specification or by the project/organization. It is also necessary to identify which responses must be defined beyond what is already defined within the specification. If standardized responses for business rules decision values are defined, decide whether all possible business rules decision values are covered or whether there will be cases when a business rules author will need to define text for business rules decision values during business rules production.
Chap 4.10.2 Para 2.2	BRDP-S1-00367	Use of layered BREX data modules	Decide whether to apply a layered BREX data module structure. This decision is related to, but not entirely dependent on, whether a layered business rules structure applies.
Chap 4.10.2 Para 2.3.2	BRDP-S1-00369	Use of the BREX data module to exchange SNS	Decide whether to use the BREX data module for exchange of information on the applied SNS.
Chap 4.10.2.2 Para 2.2	BRDP-S1-00370	Include restrictions in using various illustration, multimedia object or other data information formats	Decide whether to use the BREX data module to impose any restrictions in the use of various formats for illustrations, multimedia objects or other data.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 4.10.2.4 Para 2	BRDP-S1-00368	Applicable sets of business rules	Decide which set or sets of business rules are allowed within the given project or the organization. Accordingly, decide which BREX data modules will be used to reflect those business rules.
Chap 4.12 Para 3.1	BRDP-S1-00373	Use of multiple instances of CSDB object	Decide whether to generate multiple instances of CSDB objects to generate several customized instances of any one object issue. If so, decide how the attributes `extensionProducer` and `extensionCode` must be used.
Chap 4.13.1 Para 1.5	BRDP-S1-00374	Use of the CIR concept (internal databases for common information)	Decide whether to use the CIR concept.
Chap 4.13.1 Para 1.5	BRDP-S1-00376	Internal/External use of CIR data modules	Decide whether the CIR data modules must be used only internally to the manufacturer or integrator, as part of the production/integration environment ("internal repositories") or if the CIR data modules are also a deliverable to the customer.
Chap 4.13.1 Para 1.5	BRDP-S1-00377	Types of CIR data modules to be used	Decide which CIR data module types to be used. In order to avoid any redundancy and inconsistency, care must be paid on some types, depending on other project specific decisions, for example tailoring of the S2000M (IPD data modules vs parts CIR data module).
Chap 4.13.1 Para 1.5	BRDP-S1-00378	Delivery of CIR-dependent data module	Decide whether CIR-dependent data modules are delivered to customer, as it implies a specific process to retrieve the self-standing data modules from the CIR-dependent data module and the CIR data module.
Chap 4.13.1 Para 1.5	BRDP-S1-00379	Publishing of CIR data modules	Decide whether and which CIR data module types to be published.
Chap 4.13.1 Para 4	BRDP-S1-00380	Use of one or several data modules for a CIR type	Decide whether there is one single or several data modules for a dedicated type of CIR data module within a project or an organization, or for a specific model identification code.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 4.13.1 Para 5.1.2	BRDP-S1-00381	Use of implicit or explicit reference method to CIR data module	Decide whether to use implicit or explicit references, or both, between content specific data elements and the CIR data modules. **Note** It is recommended to use only one method to avoid difficulties which can appear during the publishing process.
Chap 4.13.3 Para 2	BRDP-S1-00382	Use of alternates groups in data module content	Decide whether to use alternates group elements. If used, specify which groups and in which data modules types.
Chap 4.13.3 Para 2	BRDP-S1-00383	Mix of alternates groups and elements	Decide whether alternates groups and elements can be mixed in a given structure.
Chap 4.13.4 Para 2.3.2	BRDP-S1-00385	Identification of container data module	Decide which identification method to use for container data modules. The chosen method must be used systematically.
Chap 4.13.4 Para 2.5	BRDP-S1-00386	Use of applicability within container data module content	Decide whether applicability annotations are duplicated from the referenced data modules to the container data module.
Chap 4.14 Para 2.1.2	BRDP-S1-00387	Use of applicability	Decide if the project or the organization will use applicability.
Chap 4.14 Para 2.1.2	BRDP-S1-00388	Applicability functionality	Define the required functionality for applicability.
Chap 4.14 Para 2.1.2	BRDP-S1-00389	Use of applicability data module types (ACT, CCT and PCT)	If functionality is limited to print and static display, decide if applicability data module types (ACT, CCT and PCT) will be used.
Chap 4.14 Para 2.1.2.1	BRDP-S1-00390	Product attribute and conditions naming and identification scheme	Define a consistent naming and identification scheme for product attributes and conditions, when ACT and CCT data modules are implemented.
Chap 4.14 Para 2.1.2.5	BRDP-S1-00391	Presentation of content that is not applicable	Specify the method that content is presented which is not valid for the current maintenance context. The content can be removed, hidden or de-emphasized in some manner.
Chap 4.14 Para 2.1.3	BRDP-S1-00392	Providing the human-readable part of applicability	Decide whether to also provide the human-readable part of applicability or rely on the viewer to build the human-readable part, when providing the computer processing part of applicability.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 4.14 Para 2.2.1	BRDP-S1-00393	Number of ACT, CCT and PCT data module instances	Decide whether to provide one instance of each data module types (ACT, CCT and PCT) or to segregate the project or the organization into multiple instances of each data module type, and the method for segregation.
Chap 4.14.1 Para 2.1.1	BRDP-S1-00394	Classifying product attributes and conditions in an ACT data module	Decide how to divide the properties of the Product into product attributes or condition types.
Chap 4.14.1 Para 2.1.1	BRDP-S1-00395	Configuration management of product attributes in an ACT data module	Decide on the extent of configuration management and editing access to be applied to product attributes within an ACT data module.
Chap 4.14.2 Para 2.3	BRDP-S1-00396	Use of the incorporation status list in a CCT data module	Decide whether to use the incorporation status list in the CCT data module.
Chap 4.14.3 Para 2.3	BRDP-S1-00397	Scope of the product instances in a PCT data module	Decide which product instances are contained in a PCT data module. Options include listing all product instances in-service or listing only the product instances within an organization.
Chap 4.14.3 Para 2.4	BRDP-S1-00398	Use of a published or a temporary PCT data module	Decide whether to publish a static issue of the PCT data module or use the data module as a temporary input between an external system and a viewer.
Chap 4.14.3 Para 2.4	BRDP-S1-00399	Management of the product instance configurations in PCT data modules	Decide how to maintain the list of product instance configuration specifications and the associated values for product attributes and conditions.
Chap 4.14.4 Para 1	BRDP-S1-00400	Use of the ACT catalog data module	Decide whether to use the ACT catalog data module.
Chap 4.14.4 Para 5	BRDP-S1-00401	Internal or external definition of supplier applicability attributes	Decide whether the supplier applicability attributes are defined in the ACT data module or if the supplier definition is used.
Chap 4.16 Para 2.1.1.3	BRDP-S1-00403	Technical information object properties to be included in the data module at delivery	Decide which properties associated to the technical information objects (eg, names, short names) to store within the data module when delivered.

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BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 5.2.1.3.1 Para 2.3.1.2	BRDP-S1-00404	Applicable systems for land and sea products	Decide the applicable systems for land and sea products.
Chap 5.2.1.4 Para 1.4.2	BRDP-S1-00405	How to use the element field descriptions in the wiring data description Schema	Decide how to use the element field descriptions of the wiring data description Schema in an interactive wiring publication.
Chap 5.2.1.4 Para 2.2.1	BRDP-S1-00406	Use of introduction data modules for wiring publications	Decide whether to produce introduction data modules for wiring publications. If required, the scope of these introduction data modules must be defined.
Chap 5.2.1.4 Para 2.2.2.2	BRDP-S1-00407	Optional descriptive information for connection units	Decide whether to produce descriptive information for connection units including illustrations and tables.
Chap 5.2.1.4 Para 2.2.2.3	BRDP-S1-00408	Optional descriptive information for wires and harnesses	Decide whether to produce descriptive information for wires and harnesses including illustrations and tables.
Chap 5.2.1.4 Para 2.2.3	BRDP-S1-00409	Wiring standard practices data modules	Define source and scope of wiring standard practices data modules. Decide whether to prepare standard wiring practice information as procedural or descriptive data modules.
Chap 5.2.1.4 Para 2.2.4.1	BRDP-S1-00410	Wiring diagrams in an interactive wiring publication	Decide whether to produce wiring diagrams for an interactive wiring publication.
Chap 5.2.1.4 Para 2.2.5	BRDP-S1-00411	Harness routing drawings	Decide whether harness routing drawings are to be simplified and how their layout must look like.
Chap 5.2.1.4 Para 2.2.5.1	BRDP-S1-00412	Coding of harness installation drawing data modules	Decide whether to code harness installation drawing data modules by using zone information. If decided to use zone information for the coding, the structure of the data module code is possibly not appropriate. In this case, it must be decided on changes of the proposed structure for the Product (eg, population of the zone information in the unit or assembly group of the SNS instead of in the subsystem/sub-subsystem group).

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 5.2.1.4 Para 2.2.5.1	BRDP-S1-00413	Harness installation information	Decide whether to prepare harness installation information for each major area in list form in addition to or instead of harness installation and routing drawings.
Chap 5.2.1.4 Para 2.2.5.2	BRDP-S1-00414	Coding of harness routing drawing data modules	Decide whether to code harness routing drawing data modules by using zone information. If decided to use zone information for the coding, the structure of the data module code is possibly not appropriate. In this case, it must be decided on changes of the proposed structure for the Product (eg, population of the zone information in the unit or assembly group of the SNS instead of in the subsystem/sub-subsystem group).
Chap 5.2.1.4 Para 2.2.6	BRDP-S1-00415	Equipment and panel location drawings	Decide whether to produce separate data modules containing equipment and panel location illustrations.
Chap 5.2.1.4 Para 2.2.7	BRDP-S1-00416	Production of electrical standard parts data	Decide whether to produce data modules containing electrical standard parts data.
Chap 5.2.1.4 Para 2.2.8.1	BRDP-S1-00417	Definition of required electrical equipment information	Define the required information for each electrical or electronic item of equipment that has electrical connections.
Chap 5.2.1.4 Para 2.2.8.2	BRDP-S1-00418	Coding of electrical equipment information data modules	Decide whether to code electrical equipment information data modules by using zone information. If decided to use zone information for the coding, the structure of the data module code is possibly not appropriate. In this case, it must be decided on changes of the proposed structure for the Product (eg, population of the zone information in the unit or assembly group of the SNS instead of in the subsystem/sub-subsystem group).
Chap 5.2.1.4 Para 2.2.10	BRDP-S1-00419	Coding of harness data modules	Decide whether to code harness data modules by using zone information. If decided to use zone information for the coding, the structure of the data module code is possibly not appropriate. In this case, it must be decided on changes of the proposed structure for the Product (eg, population of the zone information in the unit or assembly group of the SNS instead of in the subsystem/sub-subsystem group).

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 5.2.1.4 Para 2.3.2.1	BRDP-S1-00420	Generation of harness wire list data modules	Decide whether and how to generate harness wire list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.
Chap 5.2.1.4 Para 2.3.2.2	BRDP-S1-00421	Generation of connection list data modules	Decide whether and how to generate connection list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.
Chap 5.2.1.4 Para 2.3.2.3.1	BRDP-S1-00422	Generation of plug and receptacle list data modules	Decide whether and how to generate harness plug and receptacle list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.
Chap 5.2.1.4 Para 2.3.2.3.2	BRDP-S1-00423	Generation of terminal list data modules	Decide whether and how to generate terminal list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.
Chap 5.2.1.4 Para 2.3.2.3.3	BRDP-S1-00424	Generation of splice list data modules	Decide whether and how to generate splice list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.
Chap 5.2.1.4 Para 2.3.2.3.4	BRDP-S1-00425	Generation of earth point list data modules	Decide whether and how to generate earth point list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.
Chap 5.2.1.9 Para 2.2.1	BRDP-S1-00427	Level of detail to be provided in the technical descriptions in Equipment information sets	Decide what level of detail to provide in the functional and technical descriptions.
Chap 5.2.1.9 Para 2.2.3	BRDP-S1-00428	Use of Wiring Schema in Equipment information sets	Decide whether the Wiring data Schema and the Wiring data description Schema are to be used or not. Interactive wiring publication functionalities are only to be made available if the Wiring Schema is used. Refer to Chap 3.9.5.2.9.
Chap 5.2.1.9 Para 2.4	BRDP-S1-00429	Level of detail to be provided in the maintenance and servicing data modules in Equipment information sets	Decide what level of detail to provide in the maintenance and servicing data modules.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 5.2.1.9 Para 2.4.3	BRDP-S1-00430	Use of consolidated lists for Support equipment, Consumables, materials, expendables, etc, in Equipment information sets	Decide whether to use consolidated lists for Support equipment, Consumables, materials, expendables, etc.
Chap 5.2.1.9 Para 2.4.3	BRDP-S1-00431	Use of equivalent substitutes in Equipment information sets	Decide whether to allow the use equivalent substitutes for support equipment, consumables, materials and expendables.
Chap 5.2.1.9 Para 2.5	BRDP-S1-00432	Level of detail to be provided in the IPD data modules in Equipment information sets	Decide what level of detail to provide in the IPD data modules.
Chap 5.2.1.14 Para 2.1.2	BRDP-S1-00433	Separation of product frame and engine BDAR information in the BDARP	Decide whether to separate the BDARP into product frame and engine BDAR information.
Chap 5.2.1.14 Para 2.1.6	BRDP-S1-00434	Separate data modules for utilization degradation in BDAR information sets	Decide whether to prepare separate data modules for degradation information, or to include this information in the damage assessment data modules.
Chap 5.2.1.14 Para 2.3	BRDP-S1-00435	Interactive BDARP	Decide whether to produce an interactive BDARP and define the required functionalities.
Chap 5.2.1.16 Para 2.2.2.1	BRDP-S1-00436	Use of external material information in Service bulletins	Decide whether material information must be a part of the "core" SB data module or if it can (depending on the volume) be presented in one or more referenced separate SB data modules. Refer to Fig 2.
Chap 5.2.1.16 Para 2.2.4	BRDP-S1-00437	Treatment of alert and standard Service bulletins	Decide whether or not to allow classifying Service bulletins as Alert.
Chap 5.2.1.16 Para 2.2.5	BRDP-S1-00438	Service bulletin compliance categories	Decide whether to use the four compliance categories or to define others.
Chap 5.2.1.16 Para 2.2.6.1.4	BRDP-S1-00439	Minimum impact on weight in Service bulletins	Decide the threshold for minimum impact on weight that must be reported in a Service bulletin.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 5.2.1.16 Para 2.2.6.1.4	BRDP-S1-00440	Minimum impact on balance in Service bulletins	Decide the threshold for minimum impact on balance that must be reported in a Service bulletin.
Chap 5.2.1.16 Para 2.2.6.1.4	BRDP-S1-00441	Minimum impact on electrical load to be reported in Service bulletins	Decide the threshold for minimum impact on electrical load that must be reported in a Service bulletin.
Chap 5.2.1.16 Para 2.2.6.1.4	BRDP-S1-00442	Definitions and use of maintenance and operational publications in Service bulletins	Decide on the precise definitions of "maintenance publications" and "operational publications" and whether to separate them into different listings in the Impact on publications.
Chap 5.2.1.20 Para 1.2	BRDP-S1-00445	Use of a set of publication list data modules or a publication module for the LOAP	Decide whether to use a set of publication list data modules or a publication module to list the applicable publications and other documents including individual data modules.
Chap 5.2.1.20 Para 1.2	BRDP-S1-00446	Schema to use for the publication list data modules of the LOAP	Decide whether to use the front matter Schema or the descriptive Schema for the publication list data modules.
Chap 5.2.1.20 Para 1.2	BRDP-S1-00447	One consolidated or several separate publication list data modules for the LOAP	Decide whether to deliver the publications and documents listed in one data module/publication module (with one or more lists presented as tables) or as separate data modules/publication modules (eg, by operational publications or maintenance publications).
Chap 5.2.1.20 Para 2.2.1	BRDP-S1-00448	Inclusion of unpublished publications and documents in the LOAP	Decide whether to include publications and documents those are not published. **Note** When used as a contractual document, all publications and documents, published or not, must be included.
Chap 5.2.1.20 Para 2.2.2.4	BRDP-S1-00449	Markup of the publication entry as a link in the LOAP	Decide whether to markup the publication entry as a link when using the descriptive Schema.
Chap 5.2.1.20 Para 2.2.2.4	BRDP-S1-00450	Include the manufacturer's part number or reference number in the LOAP	Decide whether to include and present the manufacturer's part number or reference number.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 5.2.1.20 Para 2.2.2.4	BRDP-S1-00451	Use of language in the LOAP	Decide whether to include and present the language of the publication or document in the entries.
Chap 5.2.2.4 Para 1.3.2	BRDP-S1-00452	Additional information in parts lists for engine maintenance information sets	Decide whether to indicate additional information under the heading of the parts list "Remarks" (eg, modification number applicable to the item).
Chap 5.2.2.7 Para 2.2.3.8.6	BRDP-S1-00453	Standards of performance data in aircrew information	Decide on the standards of performance to be used in the calculation.
Chap 5.2.2.7 Para 2.2.4.2	BRDP-S1-00455	Select model for checklist for structures in aircrew information	Decide which of the two models are used to structure checklists.
Chap 5.2.2.7 Para 2.2.4.7	BRDP-S1-00456	Order of drills in aircrew information	Decide whether the order of drills will be project specific. Limitations and operating data required by the project must be included.
Chap 5.2.2.7 Para 2.2.4.7	BRDP-S1-00457	Supplementing the order of drills in aircrew information	Decide whether to supplement the order of drills checklist listing.
Chap 5.2.2.7 Para 2.2.4.8	BRDP-S1-00458	Numbering of checks within drills in aircrew information	Decide on the numbering of checks within each drill.
Chap 5.2.3.1 Para 1.2.2	BRDP-S1-00459	Description types for Land/Sea Products for the crew/operators	Decide on the description types to be used: functional, physical breakdown, or external equipment.
Chap 5.3.1.1 Para 2.2	BRDP-S1-00426	Schema to be used for front matter data modules	Decide which Schemas to be used to capture the different front matter data module types.
Chap 5.3.1.1 Para 2.2	BRDP-S1-00460	Front matter to be included in page-oriented publications and IETP, respectively	Decide which front matter is to be included (mandatory or optional) in each of the page-oriented publications and in the IETP. The decisions must be based on the rules given in Chap 3.9.4.
Chap 5.3.1.1 Para 2.2	BRDP-S1-00461	Front matter information codes	Decide which front matter information codes to use, the basic (eg, IC 00R) or the alternative (eg, IC 002).
Chap 5.3.1.3 Para 1.2	BRDP-S1-00462	IPD as a standalone publication	Decide if the IPD must be produced as a stand-alone publication or the IPD data modules included in another publication (eg, an equipment maintenance publication including IPD).

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 5.3.1.4 Para 1.5.8	BRDP-S1-00464	Use of task sets in the CMP	Decide whether to use task sets in the CMP.
Chap 5.3.1.4 Para 1.5.13	BRDP-S1-00465	Use of placeholder data modules in the CMP	Decide whether "placeholder" data modules are required for those topics where data is not required or necessary.
Chap 5.3.1.4 Para 2.2.1	BRDP-S1-00466	Front matter to be used in the CMP	Decide what front matter data modules to be used and their content.
Chap 5.3.1.4 Para 2.2.9	BRDP-S1-00468	Incorporating Service bulletins into the CMP	Decide on the updating frequency for incorporating Service bulletins into the CMP.
Chap 5.3.1.4 Para 2.3.2.1	BRDP-S1-00470	Inclusion of maintenance planning information in the CMP	Decide whether to include maintenance planning information in the CMP.
Chap 5.3.1.4 Para 2.3.2.2	BRDP-S1-00471	Inclusion of removal and installation information in the CMP	Decide whether to include removal and installation information in the CMP.
Chap 5.3.1.4 Para 2.3.2.5	BRDP-S1-00472	Inclusion of test support data in the CMP	Decide whether to include manufacturer's test support data and, if so, decide the format of the data.

Table 7 Chap 6 - Business rule decision points index

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 6.2 Para 1	BRDP-S1-00473	Use of the S1000D standard page-oriented presentation chapters	Decide whether to use the S1000D standard page-oriented presentation given in Chap 6.2.2 and Chap 6.2.3 or to use any other rules for presentation to meet specific project or organization requirements. The business rules must specify all the requirements needed to contract the desired presentation.
Chap 6.2.1 Para 1	BRDP-S1-00474	Use of mirrored headers and footers	Decide whether to use mirrored headers and footers.
Chap 6.2.1 Para 2.1	BRDP-S1-00475	Page size	Decide which page size to be used (including sizes when foldouts are allowed) per publication.
Chap 6.2.1 Para 2.1	BRDP-S1-00476	Presentation of foldouts in page-oriented publications	Decide where (eg, interspersed or at the end of the publication) the foldouts must be located in page-oriented publications.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 6.2.1 Para 2.2	BRDP-S1-00477	Presentation of inwork markings	Decide whether to present the inwork markings. The details must be documented.
Chap 6.2.1 Para 2.3	BRDP-S1-00478	Presentation of "Produced by" - "Printed in"	Decide whether to present the responsible producer of the page-oriented output and/or where the publication was printed.
Chap 6.2.1 Para 2.4.1.1	BRDP-S1-00479	Presentation of publication module code	Decide whether to use the S1000D standard page-oriented presentation rules for the publication module code or to create project or organization specific rules for its positioning and style within the header.
Chap 6.2.1 Para 2.4.1.2	BRDP-S1-00480	Presentation of data module code	Decide whether to use the S1000D standard page-oriented presentation rules for the data module code or to create project or organization specific rules for its positioning and style within the footer.
Chap 6.2.1 Para 2.4.1.3	BRDP-S1-00481	Presentation of issue date	Decide whether to use S1000D standard page-oriented presentation rules for the issue date or to create project or organization specific rules for its positioning in the bottom of the footer.
Chap 6.2.1 Para 2.4.1.4	BRDP-S1-00482	Presentation of page number	Decide whether to use the S1000D standard page-oriented presentation rules for the page number or to create project or organization specific rules for its positioning in the footer.
Chap 6.2.1 Para 2.4.1.4	BRDP-S1-00483	Page numbering of foldout pages	Decide whether to use double numbering of pages when printed on one (right-hand) side only (eg, 11/12, 13/14).
Chap 6.2.1 Para 2.4.1.5	BRDP-S1-00484	Presentation of applicability annotation	Decide whether to use the S1000D standard page-oriented presentation rules for the applicability annotation or to create project or organization specific rules for the presentation.
Chap 6.2.1 Para 2.4.2	BRDP-S1-00485	Presentation of security markings	Decide whether to present the security markings in sentence case instead of in uppercase.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 6.2.1 Para 2.4.2	BRDP-S1-00486	Presentation of commercial classification and/or caveat as security markings	Decide whether to use the commercial classification (value of attribute `commercialClassification`) and/or national caveat (value of attribute `caveat`) as an alternative to the security classification (value of the attribute `securityClassification`).
Chap 6.2.1 Para 2.4.2	BRDP-S1-00568	Presentation of derivative classification markings	Decide whether to use and when to use the derivative classification (value of the <`classificationAction`> elements within the <`classificationActionGroup`> defined by the IDREF in the attribute `derivativeClassificationRefId`).
Chap 6.2.1 Para 2.4.2	BRDP-S1-00487	Exclude presentation of security markings for unclassified publications	Decide whether to exclude the presentation of security markings for unclassified publications.
Chap 6.2.1 Para 2.4.3	BRDP-S1-00488	Presentation of safety classification	Decide whether to use the S1000D standard page-oriented presentation rules for the safety classification (attribute `safetyLabel` of the element <`productSafety`>) or to create project or organization specific rules for the presentation.
Chap 6.2.1 Para 2.4.4	BRDP-S1-00489	Presentation of the element <`logo`>	Decide whether to present any of the logotypes given in the element <`logo`> and how this element is presented (eg, size, color).
Chap 6.2.1 Para 2.4.5	BRDP-S1-00490	Presentation of "End of data module" statement	Decide on the text that will be used to identify the end of a data module, either "End of data module" or "End of" followed by the data module title.
Chap 6.2.1 Para 2.4.5	BRDP-S1-00491	Placement of the end of data module statement	Decide whether to present the "End of" statement in the footer or in the body of the page.
Chap 6.2.1 Para 2.5	BRDP-S1-00492	Use of double column text	Decide whether to use double column text, and under what circumstances. Typography for double column page layout must be documented.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 6.2.1 Para 2.6.1	BRDP-S1-00493	Double sided printing of foldout pages	Decide whether to use double sided printing on foldout pages. **Note** A3L paper in A3L binders are normally printed on both sides.
Chap 6.2.2 Para 2.3.1	BRDP-S1-00494	Presentation of the procedural step titles from the element <proceduralStep>	Decide whether to present the titles for the element <proceduralStep> and to which level.
Chap 6.2.2 Para 2.3.1	BRDP-S1-00495	Presentation of the crew drill step titles from the element <crewDrillStep>	Decide whether to present the titles for the element <crewDrillStep> and to which level. **Note** Presentation of the titles for steps on level six thru level eight are not given. The use of these elements is discouraged and their use and presentation are project decisions.
Chap 6.2.2 Para 2.3.1	BRDP-S1-00496	Presentation of the document title	Decide whether to present the document title as a Centerhead No. 1 and a Centerhead No. 2 or as a Centerhead No. 1 only (including the elements <techName>, <infoName> and <infoNameVariant>).
Chap 6.2.2 Para 2.3.2.2.1	BRDP-S1-00497	Number of sidehead levels to be presented in the Table of contents	Decide whether to present more than three sidehead levels in the table of contents. The allowed number of sidehead levels must be stated in the business rules.
Chap 6.2.2 Para 2.3.2.2.2	BRDP-S1-00498	Presentation of List of tables	Decide whether to present the List of tables.
Chap 6.2.2 Para 2.3.2.2.2	BRDP-S1-00499	Present the prefix "Table" in the List of tables	Decide whether to present the prefix "Table" before the table number in the List of tables.
Chap 6.2.2 Para 2.3.2.2.3	BRDP-S1-00500	Presentation of List of figures	Decide whether to present the List of figures.
Chap 6.2.2 Para 2.3.2.2.3	BRDP-S1-00501	Present the prefix "Fig" in the List of figures	Decide whether to present the prefix "Fig" before the figure number in the List of figures.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 6.2.2 Para 2.3.2.3	BRDP-S1-00502	Presentation (layout) of titles	Decide whether to use the S1000D standard presentation rules for titles (Sidehead 1 thru Sidehead 5 or if used thru Sidehead 8) or to create project or organization specific rules such as type size, leading and justification.
Chap 6.2.2 Para 2.3.2.3	BRDP-S1-00503	Presentation of the leveled para titles from the element <levelledPara> on level six thru eight	Decide whether to present the titles for the element <levelledPara> on level six thru eight.
Chap 6.2.2 Para 2.3.2.4	BRDP-S1-00504	Use of the alternative method for labeling procedural steps at presentation	Decide whether to use the preferred or the alternative method for labeling procedural steps.
Chap 6.2.2 Para 2.4	BRDP-S1-00505	Presentation of paragraphs of text	Decide whether to use the recommended presentation rules for type size, spacing and justification.
Chap 6.2.2 Para 2.5	BRDP-S1-00506	Presentation of hierarchical indented steps, when used without titles in procedural steps	Decide whether to use hierarchical indented steps, when used without titles.
Chap 6.2.2 Para 2.6.2.1	BRDP-S1-00507	Prefixes to be used for random lists at presentation	Decide whether to use a consistent set of prefixes for random list throughout the project.
Chap 6.2.2 Para 2.7.1	BRDP-S1-00508	Presentation of footnote numbers	Decide whether to present the footnote markers as superscripted numbers (default) or as numbers presented within parenthesis.
Chap 6.2.2 Para 2.7.2	BRDP-S1-00509	Presentation of inline footnotes	Decide whether to present the inline footnotes at the bottom of the page (default) or at the end of the data module.
Chap 6.2.2 Para 2.7.3	BRDP-S1-00510	Presentation of table footnotes	Decide whether to present the footnotes on the relevant page, if the table is split over several pages. Refer to Fig 2 and Fig 3.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 6.2.2 Para 2.8.1	BRDP-S1-00511	Presentation of vertical lines in formal tables	Decide whether to, in exceptional cases, allow presentation of vertical lines in formal table. **Note** The rendering of the table must be based on the elements and attributes in the XML files. The author must apply elements and attributes as defined in Chap 3.9.5.2.1.6 in order to achieve the layout described in this chapter.
Chap 6.2.2 Para 2.9.1	BRDP-S1-00512	Use of the alternative individual numbering of multi sheet illustrations at presentation	Decide whether to use one of the alternative methods for individual numbering of multi sheet illustrations. The chosen method must be used throughout the project.
Chap 6.2.2 Para 2.9.1	BRDP-S1-00569	Presentation of ICN	Decide whether to present the ICN (content of attribute `infoEntityIdent`) for each illustration.
Chap 6.2.2 Para 2.10.2.1	BRDP-S1-00513	Presentation of warnings and cautions	Decide whether to use the alternative rule to present the warnings before the step/para number. **Note** Projects must be aware of potential hazards when allowing step numbers to follow the warning and ensure that there is a clear connection in the presentation between the warning and the associated steps.
Chap 6.2.2 Para 2.10.2.1	BRDP-S1-00514	Presentation of symbols in warnings and cautions	Decide whether to present symbols in warnings and cautions. The symbols must be standardized and documented.
Chap 6.2.2 Para 2.10.2.2	BRDP-S1-00515	Use of symbolic presentation of warnings and cautions	Decide whether to use symbolic presentations of warnings and cautions.
Chap 6.2.2 Para 2.10.4	BRDP-S1-00516	Use of numbered notes within a data module at presentation	Decide whether to use numbered notes within a data module.
Chap 6.2.2 Para 2.13.1	BRDP-S1-00517	Display of change marks	Decide whether to display change marks.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 6.2.2 Para 2.13.1	BRDP-S1-00518	Presentation of change marks	Decide whether to use an alternative visual presentation as change marker.
Chap 6.2.2 Para 2.13.1	BRDP-S1-00519	Presentation of change marking of individual table rows	Decide whether to present change marks for individual table rows.
Chap 6.2.2 Para 2.14	BRDP-S1-00570	Presentation of control authority content	Decide how to present control authority content using the attribute `controlAuthorityRefs`.
Chap 6.2.2 Para 2.15.1	BRDP-S1-00520	Presentation of data module titles in the reference table	Decide whether to present the data module title in the reference table ("Table 1 References").
Chap 6.2.2 Para 2.15.1	BRDP-S1-00521	Presentation of publication module/non-S1000D publication titles in the reference table	Decide whether to present the title (element <`pmTitle`>/<`externalPubTitle`>) or the short title (element <`shortPmTitle`>/<`shortExternalPubTitle`>), or both, in the reference table ("Table 1 References").
Chap 6.2.2 Para 2.15.1	BRDP-S1-00522	Order of presentation of references in the reference table	Decide in which order the referenced document is presented in the reference table ("Table 1 References"): In order of appearance, alphabetical order, data modules before publications, etc.
Chap 6.2.2 Para 2.15.2	BRDP-S1-00523	Inline presentation of non-S1000D publication titles	Decide whether to present the external publication code (element <`externalPubCode`>), the title (element <`externalPubTitle`>) or the short title (element <`shortExternalPubTitle`>) as the inline reference.
Chap 6.2.2 Para 2.16	BRDP-S1-00097	Presentation of the target titles in cross-references	Decide whether to present the target titles given in the element <`title`>. **Note** Presentation of the titles depends on the presentation system and its settings.
Chap 6.2.2 Para 2.16	BRDP-S1-00524	Presentation of the name of spares, supplies and support equipment	Decide whether to present the name (element <`name`>) or the abbreviated alternate name (element <`shortName`>), as the cross-reference in the text.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 6.2.2 Para 2.17.1	BRDP-S1-00525	Use of the alternative method for presentation of applicability statements	Decide whether to use the preferred or the alternative method for presentation of applicability statements.
Chap 6.2.2 Para 2.17.3	BRDP-S1-00526	Decide on highlighting the applicability default heading and statement at presentation	Decide whether to highlight (blue and bold) the default heading and applicability statement at presentation.
Chap 6.2.3.1 Para 2.2	BRDP-S1-00527	Elements and attributes to be presented on the Title page	Decide which elements and attributes to be presented on the Title page. **Note** The decisions must be coordinated/based on the decisions taken for the Business rules decision points given in Chap 3.9.4 and Chap 3.9.5.2.16.
Chap 6.2.3.1 Para 2.2	BRDP-S1-00528	Size of the product illustration on the Title page	Decide on the height of the product illustration on the Title page, if used.
Chap 6.2.3.1 Para 2.3	BRDP-S1-00529	Elements and attributes to be presented on the Table of contents page	Decide which elements and attributes to be presented on the Table of contents page. **Note** The decisions must be coordinated/based on the decisions taken for the Business rules decision points given in Chap 3.9.4 and Chap 3.9.5.2.16.
Chap 6.2.3.1 Para 2.3	BRDP-S1-00571	Number of levels in Table of contents	Decide on the number of levels to be presented in Table of contents.
Chap 6.2.3.1 Para 2.4	BRDP-S1-00530	Elements and attributes to be presented on the List of effective pages	Decide which elements and attributes to be presented on the List of effective pages. **Note** The decisions must be coordinated/based on the decisions taken for the Business rules decision points given in Chap 3.9.4 and Chap 3.9.5.2.16.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 6.2.3.1 Para 2.5	BRDP-S1-00531	Elements and attributes to be presented on the List of effective data modules	Decide which elements and attributes to be presented on the List of effective data modules. **Note** The decisions must be coordinated/based on the decisions taken for the Business rules decision points given in Chap 3.9.4 and Chap 3.9.5.2.16.
Chap 6.2.3.1 Para 2.7	BRDP-S1-00532	Elements and attributes to be presented on the Highlights data modules	Decide which elements and attributes to be presented on the Highlights data modules. **Note** The decisions must be coordinated/based on the decisions taken for the Business rules decision points given in Chap 3.9.4 and Chap 3.9.5.2.16.
Chap 6.2.3.3 Para 1	BRDP-S1-00572	Presentation of data module code extension in references and tables	Decide whether and when to present the DME in references and tables.
Chap 6.2.3.3 Para 1	BRDP-S1-00573	Presentation of issue number of the data module or the technical publication in references and tables	Decide whether and when to present the issue number of the data module or the technical publication in references and tables.
Chap 6.2.3.3 Para 2.5.1	BRDP-S1-00574	Presentation of Production management data	Decide whether to present Production management data.
Chap 6.2.3.3 Para 2.5.5.2	BRDP-S1-00575	Presentation of Name and Alternate name	Decide whether to present only Name or both Name and Alternate name in the list of support equipment. When an Alternate name is used, this is the name that is presented in the data module when referred to by its attribute `internalRefId`.
Chap 6.3 Para 2	BRDP-S1-00533	Use of rules and guidance for IETP	Decide whether to use the rules and guidance for look and feel, and printed output from an IETP detailed in Chap 6.3.1 or an alternate output specification.
Chap 6.3.1 Para 2.4.2	BRDP-S1-00534	Main menu bar functions in the IETP viewer	Decide which, if any, of the basic set of main menu bar functions to mandate.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 6.3.1 Para 2.4.2.6	BRDP-S1-00535	Printing of classified data	Decide whether to allow the printing of classified data. If not allowed, the print function must be disabled when classified data is presented in the IETP viewer.
Chap 6.3.1 Para 2.4.3	BRDP-S1-00536	Additional information bar in the IETP viewer	Decide on the use of an additional information bar. If used, it must be decided which information to be available in the additional information bar.
Chap 6.4.1 Para 2.1.1.12	BRDP-S1-00537	Use of the functionality matrix	Decide whether to use the functionality matrix. If used, fill in the functionality matrix. Refer to Chap 6.4.2.
Chap 6.4.1 Para 2.3.4	BRDP-S1-00538	Modification of the functionality matrix due to selection of information sets	Decide on which modifications are needed in the functionality matrix due to the selection of information sets. Refer to BRDP-S1-00004.
Chap 6.4.1 Para 2.4.12.3	BRDP-S1-00539	Selection of functionality using the functionality matrix	Decide on which functionality is required in the technical publications.

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Chap 7.4.3 Para 2.1	BRDP-S1-00540	Population of the element <externalPubCode>	Decide the preferred syntax to identify legacy data by a publication code.
Chap 7.4.3 Para 2.1	BRDP-S1-00541	Use of the attribute pubCodingScheme	Decide whether to use the attribute pubCodingScheme. If used, decide on the set of allowed coding schemes and the syntax of those schemes.
Chap 7.4.3 Para 2.3	BRDP-S1-00542	Method to include legacy information in an IETP	Decide whether to include legacy information by encapsulating it in data modules or by referencing it as external publications using the publication module.
Chap 7.4.3 Para 2.3	BRDP-S1-00543	IETP reference format	Decide the syntax and semantics of the links established to reference legacy data.
Chap 7.5.1 Para 2.1	BRDP-S1-00544	Use of data compression techniques	Decide whether to use compression techniques on files being transferred and which techniques to be used.

BRDP reference location	BRDP unique identifier	BRDP title	BRDP definition
Chap 7.8 Para 2.3	BRDP-S1-00547	Format of generated display text	Decide on the format for generating the displayed applicability annotation from the computable applicability annotation that will best fulfill industry and/or customer display requirements.
Chap 7.8 Para 2.4.3	BRDP-S1-00548	Modifying an assigned product attribute value in the PCT.	Decide if modifications to PCT assigned values are allowed.

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Chap 8.4 Para 2.1	BRDP-S1-00550	Allocation of project specific information codes	Decide and agree on allocation of project specific information codes and give them short and full definitions.
Chap 8.4 Para 3	BRDP-S1-00551	Translation of information code definitions	Decide whether to translate and use the information code definitions in the languages adopted by the project.
Chap 8.5 Para 3	BRDP-S1-00552	Translation of learn code definitions	Decide whether to translate and use the learn code definitions in the languages adopted by the project.

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Information generation

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Chapter 3.1

Information generation - Introduction

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1 General

This chapter provides an introduction to the chapters that describe how information is generated in an S1000D project.

2 Content

Information required to support the Product must be produced, as discrete pieces of information called data modules, and stored in a CSDB as described in Chap 4.2.

This chapter provides general rules, which apply to technical information produced in that manner.

All data modules have a basic structure which is fully defined in Chap 3.2.

Information sets are used to establish the required scope of the information and data module coding strategy. The use of information sets is fully defined in Chap 3.3. Depth of information is defined as a combination of the breakdown (as represented by the SNS and disassembly code and described in Chap 4.3.3 and Chap 4.3.4) and the requirements of the Product maintenance policy.

For the purposes of dividing the Product into zones for maintenance and detailing access, the rules are given in Chap 3.4.

The issues surrounding the updating of data modules are explained in Chap 3.5.

The rules for the allocation for the protective marking of data modules that reflects their security classification, etc are detailed in Chap 3.6.

During the development and update of data modules/publications, QA procedures are required to ensure that the contents of the data modules are adequate and technically accurate. Details of these procedures are given in Chap 3.7.

Data modules must reflect the breakdown of the Product. The initial breakdown is described by the SNS. Further disassembly is then as detailed in Chap 3.8.

All data modules are produced in accordance with structural rules. These are reinforced by writing and illustration rules, together with front matter and warnings, cautions and notes. The rules are supported by specific guidance for authoring data modules. These rules are given in Chap 3.9.

Chapter 3.2

Information generation - Data modules

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Chap 3.9.5.3	Data modules - Applicability

1 General

This chapter explains the general structure of a data module. There are a number of data module types, which are appropriate for use in the production of all technical information required in operation and maintenance of the Product.

2 Basic structure

All data modules have a basic structure, which is comprised of two sections:

- identification and status section, which is defined in Chap 3.9.5.1
- content section, which is defined in Chap 3.9.5.2

2.1 Identification and status section

The identification and status section is the first part of a data module.

It contains identification data (eg, data module code, title, issue number, issue date, language) and status data (eg, security classification, responsible partner company and originator, applicability, technical standard, QA status, skill, reason for update). Specific details are given in Chap 3.9.5.1.

The identification and status section provides data that can be used for:

- management of the data module within the CSDB
- management of the use of applicability
- management of the quality control process
- management and control of retrieval functions
- automatic compilation of sets or subsets of information
- general information for users accessing the CSDB

2.1.1 Applicability

The overall applicability for an entire data module is captured in the identification and status section and is explained in Chap 3.9.5.3.

2.1.2 Security classification

The general rules for security classifications are explained in Chap 3.6. The detailed application of security classifications for an entire data module is captured in the identification and status section and is explained in Chap 3.9.5.1.

2.1.3 Quality assurance

The process for QA is explained in Chap 3.7.

2.1.4 Reason for update

The reason for update can be used to record the reason for developing the initial issue of a data module or the reason for any changes made to the data module. Refer to Chap 3.9.5.2.1.1.

2.2 Content section

The content section is the second part of a data module. It contains the text and illustrations that is presented to the user. The different types of the content section and their use are described in Chap 3.9.5.2.

2.2.1 Applicability

Content applicability can be allocated to elements within the content section. Refer to Chap 3.9.5.3.

2.2.2 Security classification

A security classification can be allocated to elements within the content section. Refer to Chap 3.9.5.2.1.

2.2.3 Reason for change

Within the content section, changes can be identified and this can include the reason for change. Details of how to apply change is explained in Chap 3.9.5.2.1.1.

Chapter 3.3

Information generation - Information sets

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Chap 5.2.1.11	Common information sets - Cargo loading information
Chap 5.2.1.12	Common information sets - Stores loading information
Chap 5.2.1.13	Common information sets - Role change information
Chap 5.2.1.14	Common information sets - Battle damage assessment and repair information
Chap 5.2.1.15	Common information sets - Illustrated tool and support equipment information
Chap 5.2.1.16	Common information sets - Service bulletins
Chap 5.2.1.17	Common information sets - Material data
Chap 5.2.1.18	Common information sets - Common information and data
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Chap 5.2.1.21	Common information sets - Maintenance checklists and inspections
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Chap 5.2.3	Information sets - Land/Sea specific information sets
Chap 5.3	Information sets and publications - Publications

1 General

The complete production process involves agreeing the purpose, scope and depth of the technical information, establishing the business rules for data module coding, generating a data module requirement list, producing and publishing the data modules. Information sets are provided to assist the generation part of the process.

2 Information sets

These define the purpose, scope and depth of the technical information that is to be produced for operation and maintenance of the Product and subsequently establishing the basic data module requirement list. The content of information sets is described in Chap 5.2. They can also be used for the definition of the publications that are generated as the final deliverable, as described in Chap 5.3.

2.1 Common information sets

A number of information sets are considered to be appropriate for use on the Product. These information sets are shown in Table 2 and explained in Chap 5.2.1.

Table 2 Common information sets

Information set	Chapter
Crew/Operator information	Chap 5.2.1.1
Description and operation	Chap 5.2.1.2
Maintenance procedures	Chap 5.2.1.3.1

Information set	Chapter
Fault isolation	Chap 5.2.1.3.2
Non-destructive testing	Chap 5.2.1.3.3
Corrosion control	Chap 5.2.1.3.4
Storage	Chap 5.2.1.3.5
Wiring data	Chap 5.2.1.4
Illustrated parts data	Chap 5.2.1.5
Maintenance planning information	Chap 5.2.1.6
Mass and balance information	Chap 5.2.1.7
Recovery information	Chap 5.2.1.8
Equipment information	Chap 5.2.1.9
Weapon loading information	Chap 5.2.1.10
Cargo loading information	Chap 5.2.1.11
Stores loading information	Chap 5.2.1.12
Role change information	Chap 5.2.1.13
Battle damage assessment and repair information	Chap 5.2.1.14
Illustrated tool and support equipment information	Chap 5.2.1.15
Service bulletins	Chap 5.2.1.16
Material data	Chap 5.2.1.17
Common information and data	Chap 5.2.1.18
Training	Chap 5.2.1.19
List of applicable publications	Chap 5.2.1.20
Maintenance checklists and inspections	Chap 5.2.1.21

2.2 Information sets for air systems

The additional specific information sets for air systems are given in Chap 5.2.2.

2.3 Information sets for land and sea systems

Since the range of the Product within land/sea systems is so varied, it is impracticable to define one suite of information sets that is appropriate to all land/sea systems. Therefore, for land/sea systems, the project or the organization must define the information sets that are appropriate to their projects. However, to assist with this, a suite of information sets has been provided which can be used. In either case, the project specific information sets must be agreed between the customer and the contractor.

The concepts for the additional information sets for land/sea systems are given in Chap 5.2.3.

Chapter 3.4

Information generation - Zoning and access

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Chap 3.4.2	Zoning and access - Land systems
Chap 3.4.3	Zoning and access - Sea systems
Chap 3.4.3.1	Sea systems - Surface ships
Chap 3.4.3.2	Sea systems - Submarines

1 General

When indicating the location of the Product equipment, assemblies, access doors and panels, ports, etc within data modules and identifying locations for maintenance planning, the Product is divided into areas and sub-areas known as zones.

When zoning and access information is a requirement for data modules, the principles and requirements as provided in this chapter must be used by the Product contractor's design authorities in the design stage of the project.

Zoning and access identification systems can vary between types of the Product, due to different manufacturing build systems.

Chap 3.4.1 gives the rules for air systems.

Chap 3.4.2 gives the rules for land systems.

Chap 3.4.3 gives the general rules for sea systems.

Chap 3.4.3.1 gives the rules for surface ships.

Chap 3.4.3.2 gives the rules for submarines.

2 Zoning requirements

The zoning identification system must be simple, logical in arrangement and suitable for inclusion in data processing systems.

A zone is identified by a standard number consisting of three digits. The first digit is used to indicate the major structural area of the Product. The second digit indicates zones and on which side of the center line (if any) the zone is located. Odd digits apply to left side facing forward, even digits to right side. Zones which are situated over the center line can be allocated numbers which are odd or even. The third digit is used to indicate sub-zones.

Fuselages/hull zones must be allocated longitudinally from forward to aft. Vertical allocation is for the Product with a floor as separation between upper and lower compartments upwards or downwards from that floor and for other types of the Product from the top to the bottom.

Major structural components such as entrance doors, cargo doors, landing gear, landing gear doors, control surfaces, chassis, bulkheads, etc must have individual zone numbers.

Wherever possible, the boundaries of zones can be related to actual physical boundaries of compartments or components such as wing spars, ribs, fuselage/hull frames, turrets, bulkheads or longerons, areas of skin or control surface edges.

Compatibility must be maintained between all versions of the Product wherever possible. Major changes in construction will necessitate the allocation of new zone numbers specific to the version.

Zone charts and diagrams must clearly indicate zone boundaries and their station numbers. A physical description of the zone boundaries must be provided.

Zoning allocation in the fuselage/hull must not divide major compartments, which are separately zoned.

Zone boundaries must embrace related structures such as door frames. A door frame for a specific door must not be divided between zones.

Doors such as cabin doors, cargo doors and main landing gear doors are themselves zones.

Business rule decision point BRDP-S1-00010 - Zone and access point identification system:

- Decide whether to use a zoning and access identification system.

2.1 Identification of access points

2.1.1 General

Typical access points are: doors, panels, hatches, fillets, fairings, internal floor and ceiling panels, cargo hold linings, etc. If an access point has an identifier on it, this must be used to identify it in data modules.

Note

Not all Products have identifiers on the actual access points. If not, they must be assigned a number in data modules.

Business rule decision point BRDP-S1-00011 - Method for zoning and identifying access points:

- Decide which method to use for zoning and identifying access points.

2.1.2 Diagrams and tables

Access identification diagrams must be given in the data modules, which clearly illustrate the position of access points on the Product. Associated tables giving the access point identifier (cross-referenced to the access diagram), and the Product indicate an access point that gives access to (if applicable), can also be a requirement. These tables can be prepared using the descriptive data module type.

2.1.3 Access points numbering requirements

Access points must be numbered in association with the Product zoning system.

Letters I and O must not be used in letter suffix or preceding letter coding sequence.

Blow out doors and tank vents are not normally assigned specific access point identifiers.

Access points in the fuselage center line must be coded with left hand designators.

Access points in vertical stabilizer or rudder must be coded from bottom to top.

Access points which are situated in more than one zone must be allocated the zone number of the lowest zone involved.

If a small access point is located in a larger access point, the larger point must be coded first.

An access point on a zone boundary (eg, a bulkhead) must be allocated the zone number of the side of the bulkhead from which the door or panel is removed.

Chapter 3.4.1

Zoning and access - Air systems

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Table 1 References

Chap No./Document No.	Title
Chap 3.4	Information generation - Zoning and access

1 General

The general rules for zoning and access are given at Chap 3.4.

2 Zoning and access

2.1 Methods of identifying zones

2.1.1 Specific zoning requirements

Wing zones must be allocated from the root to the tip and from the forward to aft. This method of allocation is also to apply to horizontal and vertical stabilizers and to all auxiliary stabilizers and strakes.

Wing leading and trailing edges, wheel wells, fuel tanks, accessory (mission equipment) compartments, the flight compartment/cockpit, toilets, galleys and other possible areas of congestion during maintenance must be suitably zoned to define the work area.

Areas between aerodynamic components and the fuselage, enclosed by fillets, must be considered fuselage zones.

When the air vehicle design incorporates a center wing, which is located within, or is integral with, the fuselage, the center wing must be considered a fuselage zone.

2.1.2 Zone identification

As already indicated, within the requirements of zoning, different zone identification systems can be applied. The following examples of zoning systems are typical for a transport air vehicle (method A), for a fighter air vehicle (method B), and for a helicopter (method C).

2.1.2.1 Method A

Method A is shown in Fig 1. The major areas must be identified as shown in Table 2.

Table 2 Major areas (zones) - Method A

Major area (zone) (Standard number grouping)	Area
100	Lower half of fuselage, below the main cabin deck rearward to the aft pressure bulkhead
200	Upper half of fuselage, above the main cabin deck rearwards to the aft pressure bulkhead
300	Empennage
400	Power plants and engine pylons
500	Left wing
600	Right wing
700	Landing gear and associated doors
800	Doors (load carrying, pressure barrier or latching)

Major area (zone) (Standard number grouping)	Area
900	Reserved for major differences in models, versions or series of the same air vehicle type not covered by the standard number groupings

Zones in major areas (eg, 200, 300) must be subdivided into zones using the second element digit of the standard number grouping. As an example, zone 300 can be subdivided as shown in Table 3.

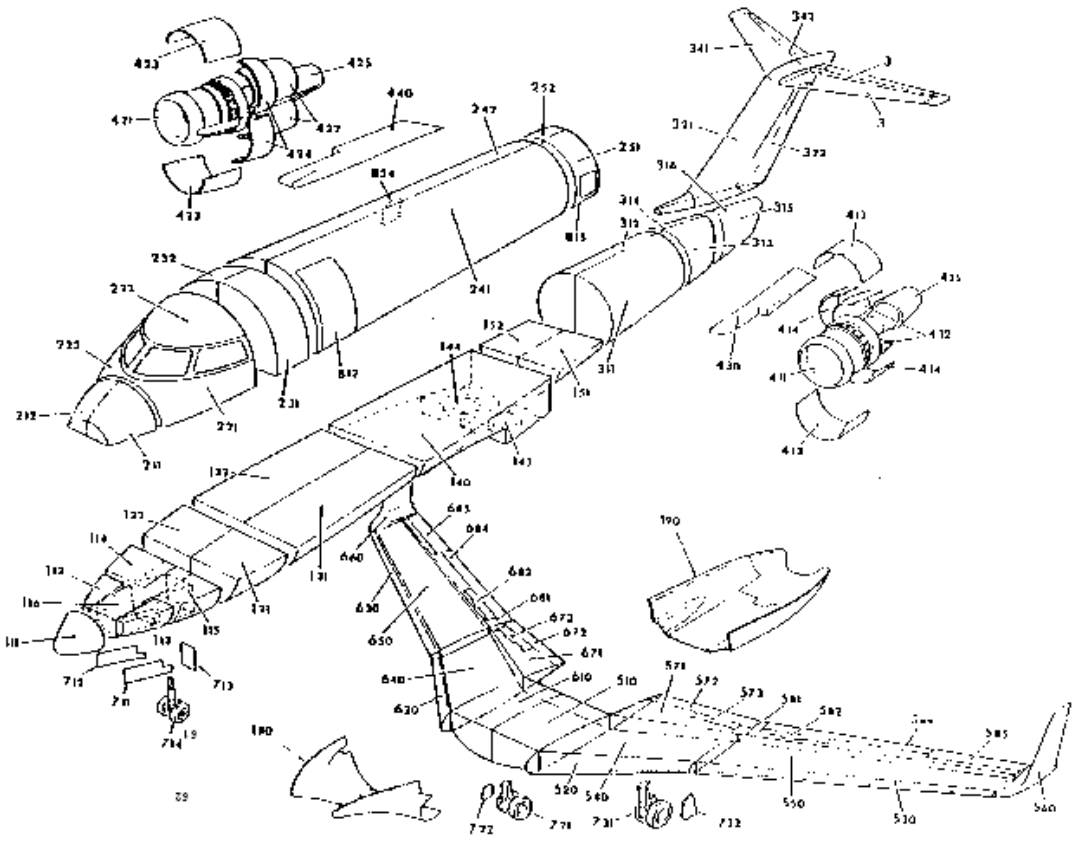
Table 3 Major sub-zones

Major zone	Major sub-zone	Area
300		Empennage
	310	- Fuselage aft of the pressure bulkhead
	320	- Right vertical stabilizer and rudder
	330	- Left vertical stabilizer and rudder
	340	- Right horizontal stabilizer and elevator
	350	- Left horizontal stabilizer and elevator

The major sub-zones must be subdivided into zones using the third element digit. A possible subdivision of a major sub-zone is given in Table 4.

Table 4 Zone No.

Major sub-zone	Zone No.	Area
320		Right vertical stabilizer and rudder
	321	- Right vertical stabilizer leading edge
	322	- Right vertical stabilizer auxiliary spar to front spar
	323	- Right vertical stabilizer front spar to rear spar
	324	- Lower rudder
	326	- Upper rudder
	327	- Right vertical stabilizer tip



Major zone 100 fuselage under floor
Major zone 200 fuselage above floor
Major zone 300 empennage
Major zone 400 power plants and pylons
Major zone 500 left wing
Major zone 600 right wing
Major zone 700 landing gear and landing gear doors
Major zone 800 doors (passenger/crew, baggage and emergency)

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Fig 1 Zoning of a transport air vehicle - Example of method A

2.1.2.2 Method B

Method B is shown in Fig 2. The major areas must be identified as shown in Table 5.

Table 5 Major areas (zones) - Method B

Major area (zone) (Standard number grouping)	Area
100	Front fuselage
200	Center fuselage
300	Rear fuselage
400	Wings
500	Tail (empennage) unit
600	Pylons/Stubwings
700	Canards/Strakes
800	Doors (load carrying, pressure barrier or latching)
900	Reserved for major differences in models, versions or series of the same air vehicle type not covered by the standard number groupings

Zones in major areas (eg, 200, 300) must be subdivided into zones using the second element digit of the standard number grouping. As an example, zone 100 can be subdivided as shown in Table 6.

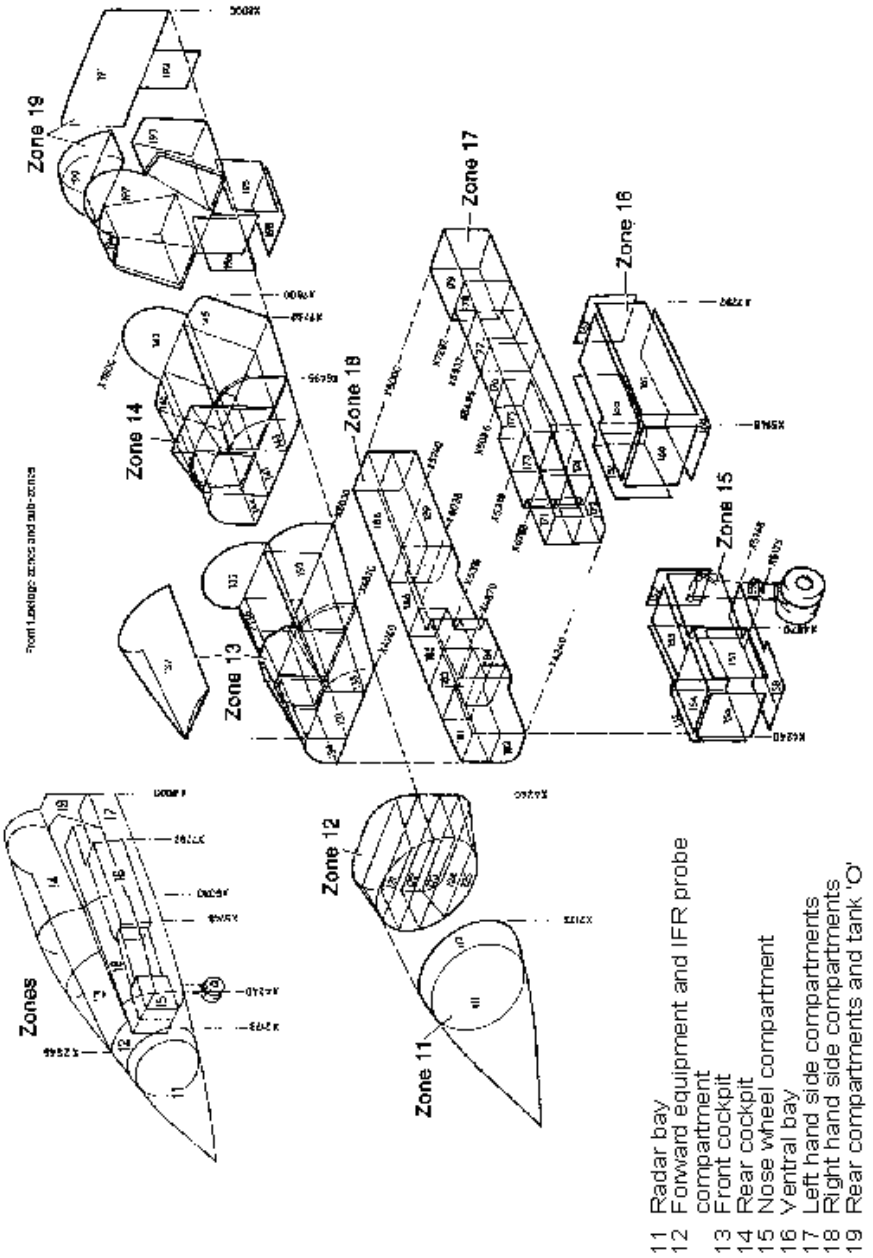
Table 6 Major sub-zones

Major zone	Major sub-zone	Area
100		Front fuselage
	110	- Radar bay
	120	- Forward equipment and IFR probe compartment
	130	- Front cockpit
	140	- Rear cockpit
	150	- Nose wheel compartment
	160	- Ventral bay
	170	- Left hand side compartment
	180	- Right hand side compartment
	190	- Rear compartment and tank

The major sub-zones must be subdivided into zones using the third element digit. A possible subdivision of a major sub-zone is shown in Table 7.

Table 7 Zone No.

Major sub-zone	Zone No.	Area
120		Forward equipment and IFR probe compartment
	121	- Electronic rack 1
	122	- Electronic rack 2
	123	- Electronic rack 4



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Fig 2 Zoning of a fighter air vehicle - Example of method B

2.1.2.3 Method C

Method C is shown in Fig 3. The major areas must be identified as shown in Table 8.

Table 8 Major areas (zones) - Method C

Major area (zone) (Standard number grouping)	Area
100	Fuselage
200	Cockpit
300	Aft section
400	Power plants, transmissions and rotors
500	Left (multipurpose) wing
600	Right (multipurpose) wing
700	Landing gear
800	Specific mission equipment
900	Reserved for major differences in models, versions or series of the same air vehicle type not covered by the standard number groupings

Zones in major areas (eg, 200, 300) must be subdivided into zones using the second element digit of the standard number grouping. As an example, zone 300 can be subdivided as shown in Table 9.

Table 9 Major sub-zone

Major zone	Major sub-zones	Area
300		Aft section
	310	- Empennage structure with vertical wing
	320	- Rear vertical fin, tail and tail wheel fairing
	330	- Left horizontal stabilizer with horizontal stabilizer fin
	340	- Right horizontal stabilizer with horizontal stabilizer fin
	350	- Upper vertical fin

The major sub-zones must be subdivided into zones using the third element digit. A possible subdivision of a major sub-zone is shown in Table 10.

Table 10 Zone No.

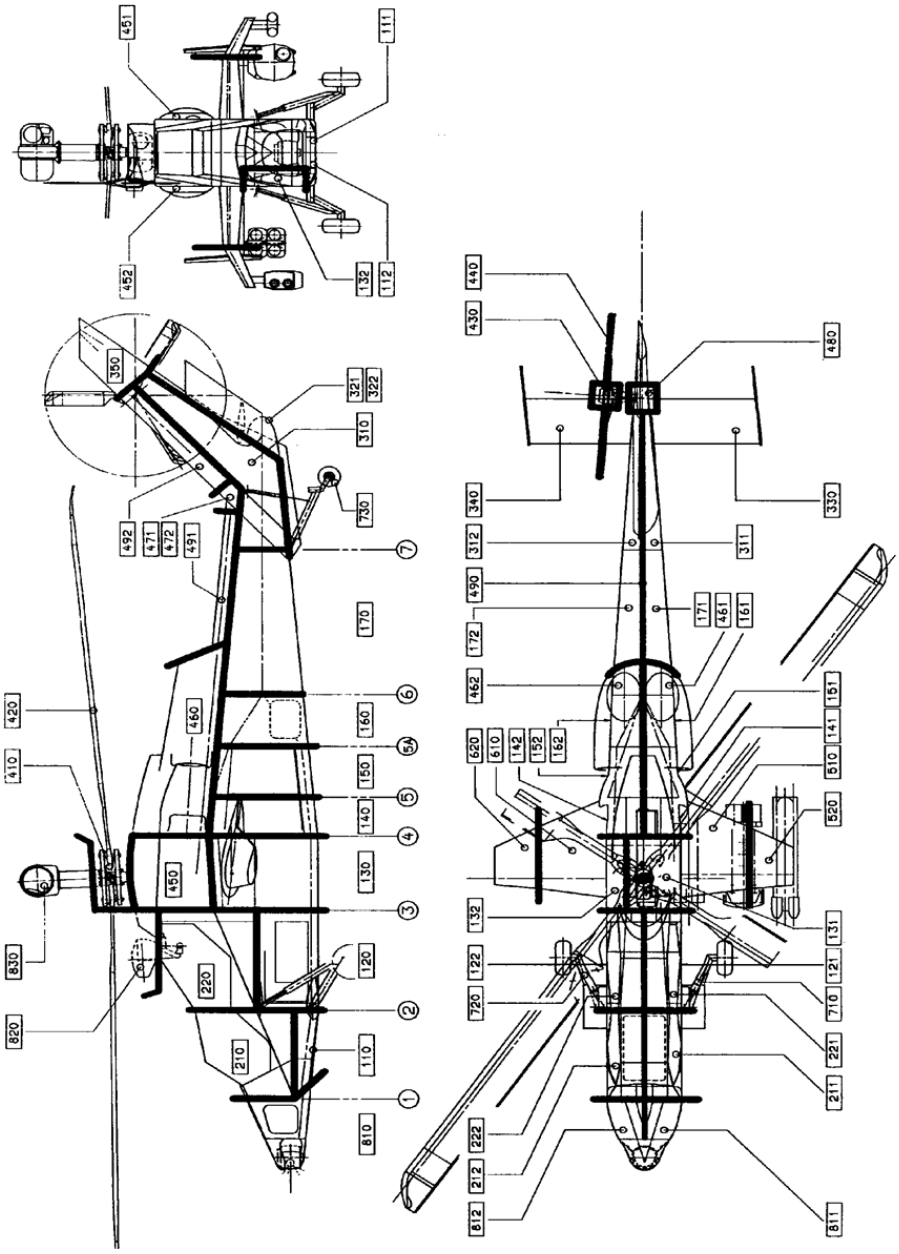
Major sub-zone	Zone No.	Area
320		Rear vertical fin, tail and tail wheel fairing

Major sub-zone	Zone No.	Area
	321	- Right vertical fin leading edge
	322	- Right vertical tail fairing
	323	- Right vertical tail wheel fairing

The zoning arrangements must permit definition of a work task or inspection area. The zone identifications can be applied to external inspections to define the limit of area to be inspected.

Example:

- Zone 300 - Inspect external structure (Empennage)
- Zone 320 - Inspect external structure (Right vertical stabilizer and rudder)
- Zone 321 - Inspect external structure (Right vertical stabilizer leading edge)



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Fig 3 Zoning of a helicopter - Example of method C

2.2 Methods for identifying access points

As already indicated, different access point numbering systems can be applied. The two following methods are given as examples. Method One is typical for a transport air vehicle (reference method A for zoning) and method Two for a fighter air vehicle (reference method B for zoning). For a helicopter either method One or method Two can be used.

2.2.1 Method One

Method One is shown in Fig 4. The identifier is built up using the three-digit number of the zone in which the access point is located, followed by a basic two letter suffix and an additional third suffix letter as necessary.

The first of the two suffix letters is the primary identifier and is allocated in a logical sequence, (ie, inboard to outboard, or forward to aft, beginning with "A" in each zone).

The second suffix letter is the locator, which differentiates the access provision in relation to the zone in the air vehicle, if required.

Example:

- T - Top
- B - Bottom
- L - Left hand
- R - Right hand
- Z - Internal

A third suffix letter can be used to further identify floor, wall or ceiling panels.

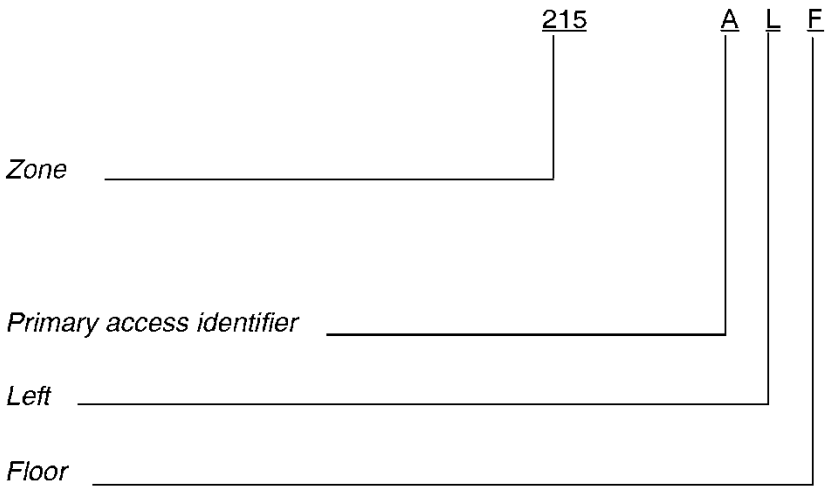
Example:

- F and G* Floor panels
- W and X* Wall or side panels
- C and D* Ceiling panels

* When the F, W or C combinations have been used the letters G, X and D will be used to replace them.

Access points located symmetrically on opposite side of the air vehicle must be assigned the same letter designators, even though the zone numbers can be different (eg, 521CB for the left wing, 621CB for the right wing).

Fig 4 shows an example of a code applied to a left hand floor panel located in zone 215.



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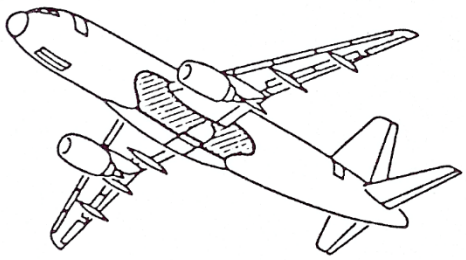
Fig 4 Access codes - Example of method One

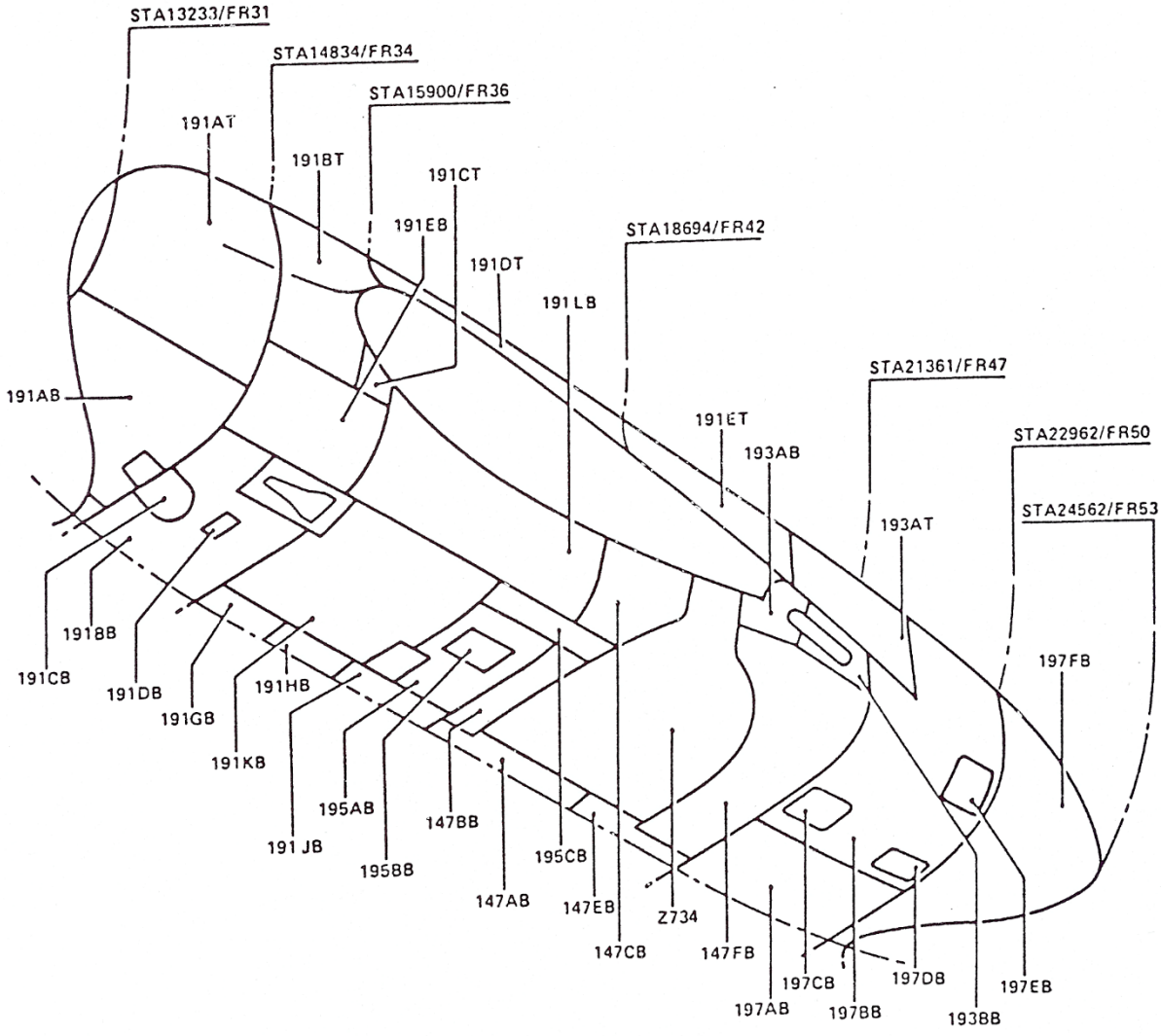
This is panel A in the left side of the floor of zone 215, upper fuselage.

Table 11 shows further examples of access codes using only two suffix letters.

Table 11 Access codes - Examples of method One

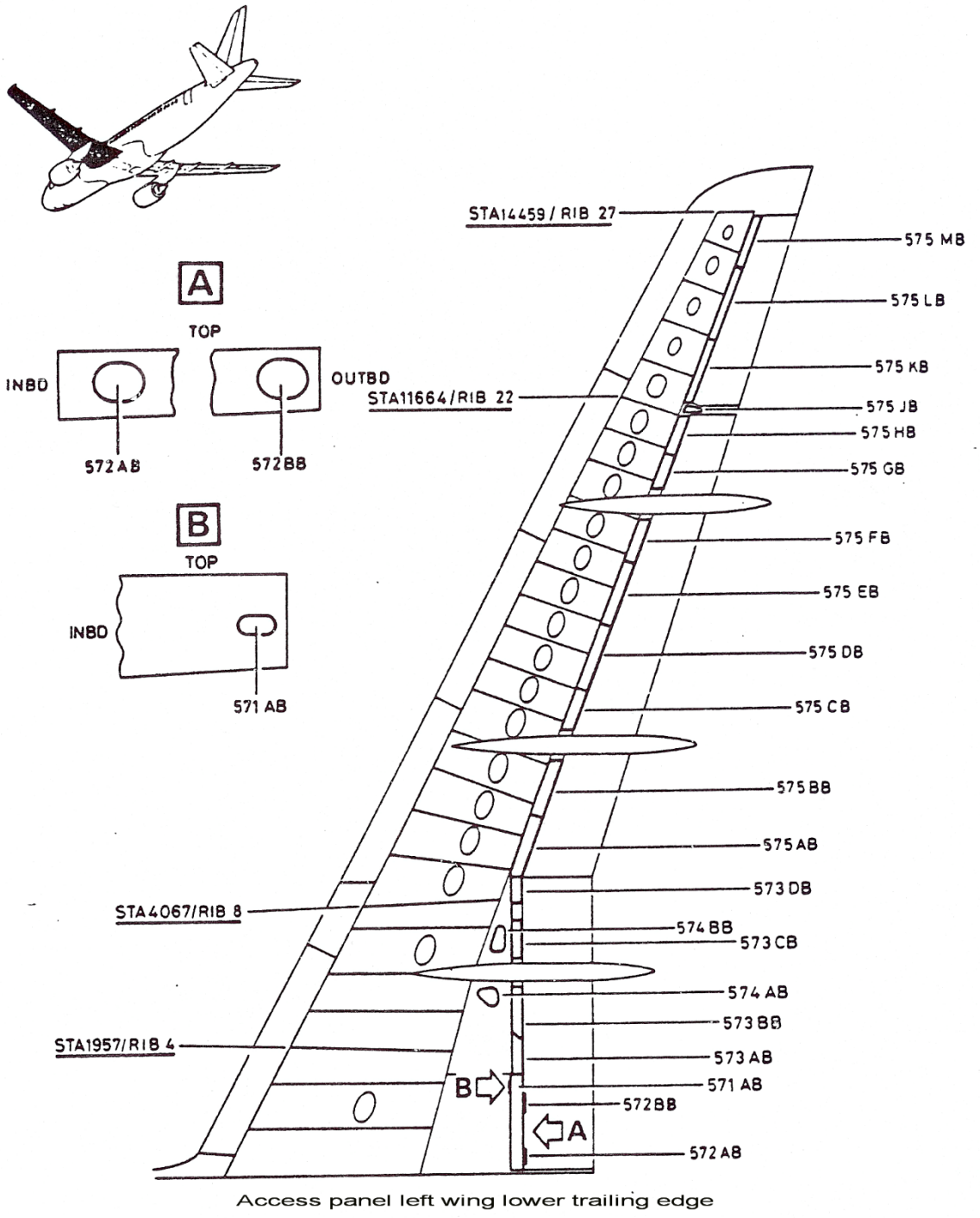
Panel No Zone	Suffix	
521	AT	Panel A in zone 521 Top (of the wing)
521	CB	Panel C in zone 521 Bottom (of the wing)
321	AL	Panel A in zone 321 Left side (vertical stabilizer)
321	AZ	Panel Z in zone 321 Interior (vertical stabilizer)





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Fig 5 Access point location diagram for a transport air vehicle - Example of method One (Sheet 1 of 2)



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Fig 5 Access point location diagram for a transport air vehicle - Example of method One (Sheet 2 of 2)

2.2.2 Method Two

Method Two is shown in Fig 6. The identifier is built up using:

- a letter
- a three-digit number
- a second letter

The first letter indicates where the access point is located:

- T - Top (for body and upper surface of the wing)
- B - Bottom (for body and lower surface of the wing)
- L - Left Hand
- R - Right Hand

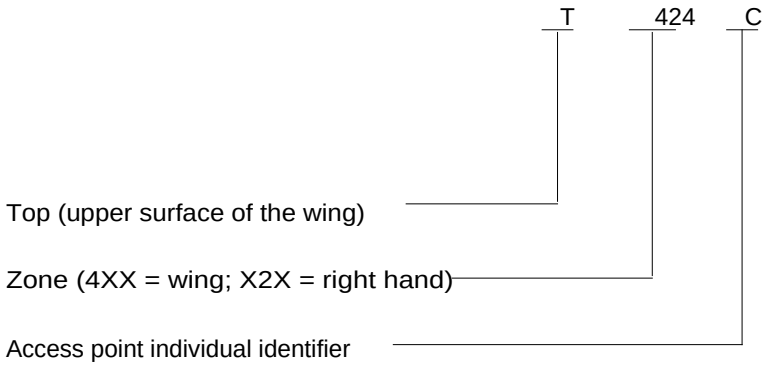
The three-digit number is the zone identifier in which the access point is located.

The second letter identifies each individual access point in the zone. This letter is allocated in a logical sequence, (ie, inboard to outboard or forward to aft, beginning with "A" in each zone).

Note

In some cases, the access point (like a panel) can be located in another larger one (a bay door, for instance). In these cases, it is recommended to use letters starting from "S" for these secondary access points.

Fig 6 shows an example of a code applied to a panel located on top of the right hand wing.



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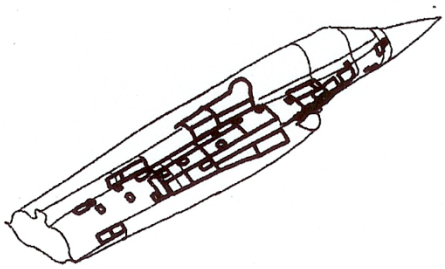
Fig 6 Access codes - Example of method Two

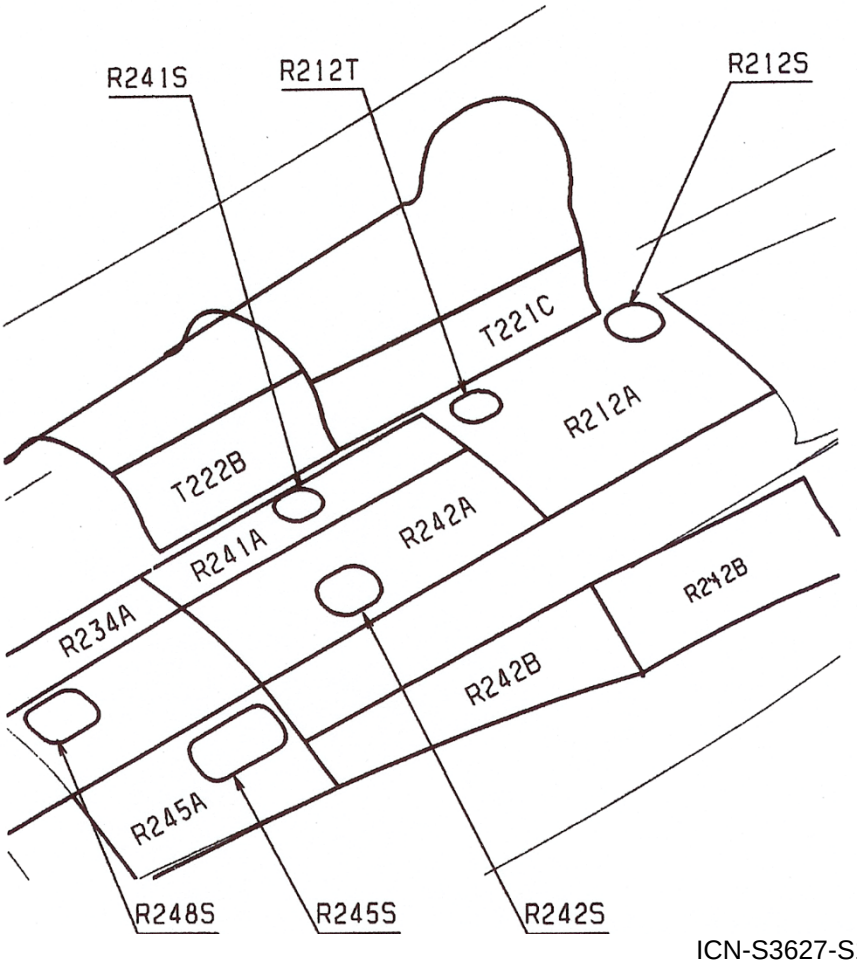
Table 12 shows further examples of access codes for method Two.

Table 12 Access codes - Example of method Two

Panel No. Prefix	Zone	Suffix	
T	123	A	Panel A in zone 123 (at the top of the front fuselage)
T	123	B	Panel B in zone 123 (at the top of the front fuselage)

Panel No. Prefix	Zone	Suffix	
B	422	B	Panel B in zone 422 (at the bottom of the right hand wing)
L	231	A	Panel A in zone 231 (left hand in the central part of the fuselage)
L	231	S	Panel S in zone 231 (left hand in the central part of the fuselage, access located in a major one)





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Fig 7 Access point location diagram for a fighter air vehicle - Example of method Two

2.3 Engine zones and identification of engine-mounted airborne equipment and access ports

2.3.1 General

The identification of engine zones, engine-mounted airborne equipment and engine access ports must be included in engine and engine-related data modules/technical publications. All appropriate data modules/technical publications must contain specific statements on how

engine zones, engine-mounted airborne equipment and access ports can be easily identified. These statements must be included in the data modules/technical publications containing description and operation. Illustrations or tables must be used where necessary to give the locations.

2.3.2 Requirements

The main areas of the engine must be indicated by name based on their function (eg, combustion chamber, low-pressure turbine).

Main bearings must be numbered sequentially by location. These numbers can then be used to identify the bearings, their associated housings, seal or other ancillary items.

Location references such as left, right, clockwise, counterclockwise, upper, lower, apply to the engine as viewed from the aft (exhaust) end with the engine in its normally installed position.

Location of engine-mounted equipment/items, interior access ports combustion chambers (turbines), and cylinders (piston engines), must be identified by location and clock position (eg, diffuser case, three o'clock).

Chapter 3.4.2

Zoning and access - Land systems

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Chap 3.4	Information generation - Zoning and access

1 General

The general rules for zoning and access are given at Chap 3.4.

2 Zoning

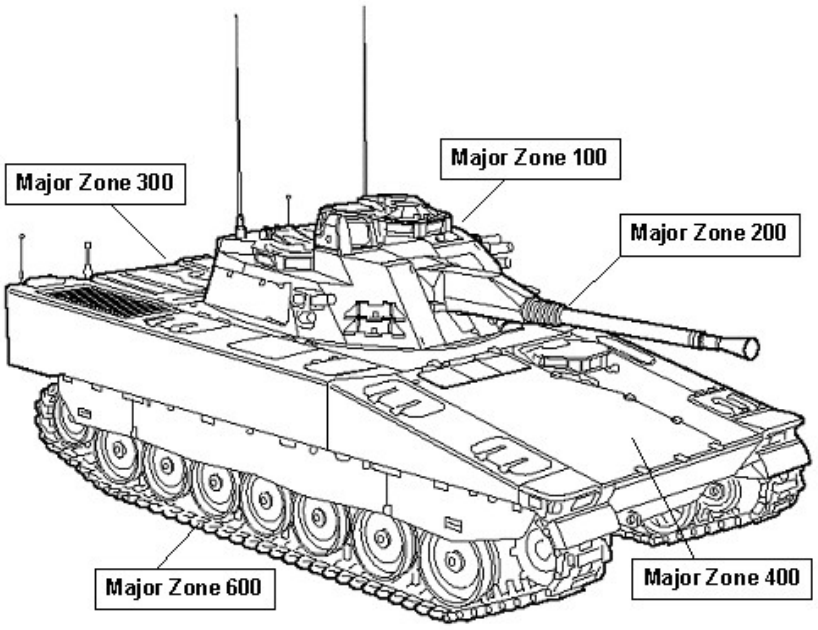
2.1 Example of zoning a land vehicle

2.1.1 Major zones

Major zones must be allocated to major physical structures, bulkheads, etc, and numbered using the left hand digit of the zone identification number (100, 200, 300, etc) as illustrated in the example at Table 2 and Fig 1 and Fig 2, below:

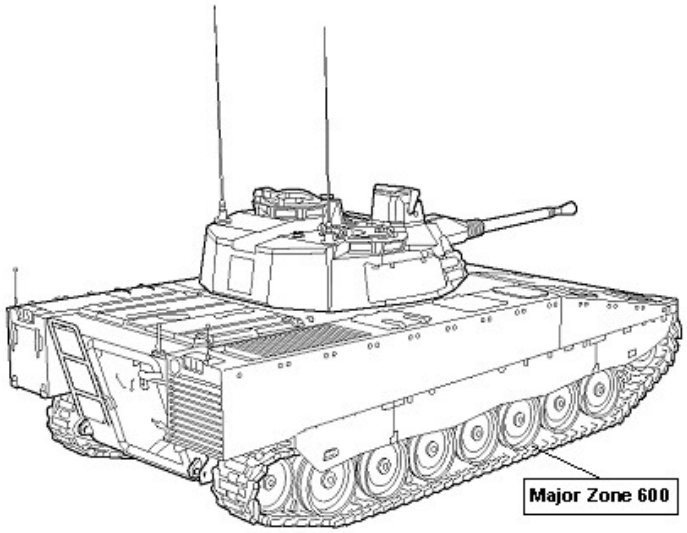
Table 2 Major zone identification numbers

Major zone	Area
100	Turret
200	Elevating mass assembly
300	Hull aft of fighting compartment bulkhead
400	Hull fwd of fighting compartment bulkhead
500	Left track, drive and suspension
600	Right track, drive and suspension



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Fig 1 Example of zoning a combat vehicle (major zones) - 1



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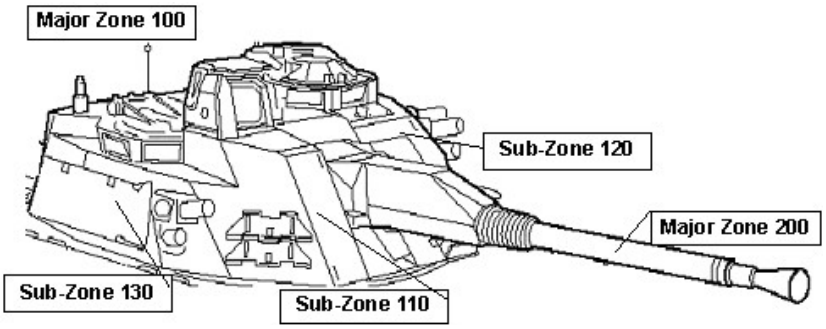
Fig 2 Example of zoning a combat vehicle (major zones) - 2

2.1.2 Sub-zones

Major zone areas (100, 200, 300, etc) must be subdivided into sub-zones using the second digit of the allotted zone number (10, 20, 30, etc) as shown in the example at Table 3 and Fig 3, below.

Table 3 Sub-zone identification numbers

Major zone	Sub-zone	Area
100		Turret
	110	Turret front right side, external
	120	Turret front left side, external
	130	Turret rear right side, external
	140	Turret rear left side, external
	150	Turret front right side, internal
	160	Turret front left side, internal
	170	Turret rear right side, internal
	180	Turret rear left side, internal



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Fig 3 Example of zoning a combat vehicle (sub-zones)

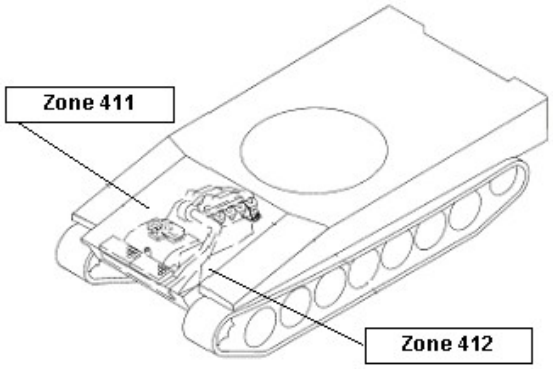
2.1.3 Zones

Sub-zone areas (10, 20, 30, etc), where necessary, must be further subdivided into zones using the first digit of the allotted zone number (1, 2, 3, etc) as detailed in the example at Table 4 and Fig 4, below.

Table 4 Zone identification numbers

Major zone	Sub-zone	Zone	Zone area
400			Power pack

Major zone	Sub-zone	Zone	Zone area
	410		Power pack compartment
		411	Coolant pump bulkhead
		412	Starter motor bulkhead



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Fig 4 Example of zoning a combat vehicle (zones)

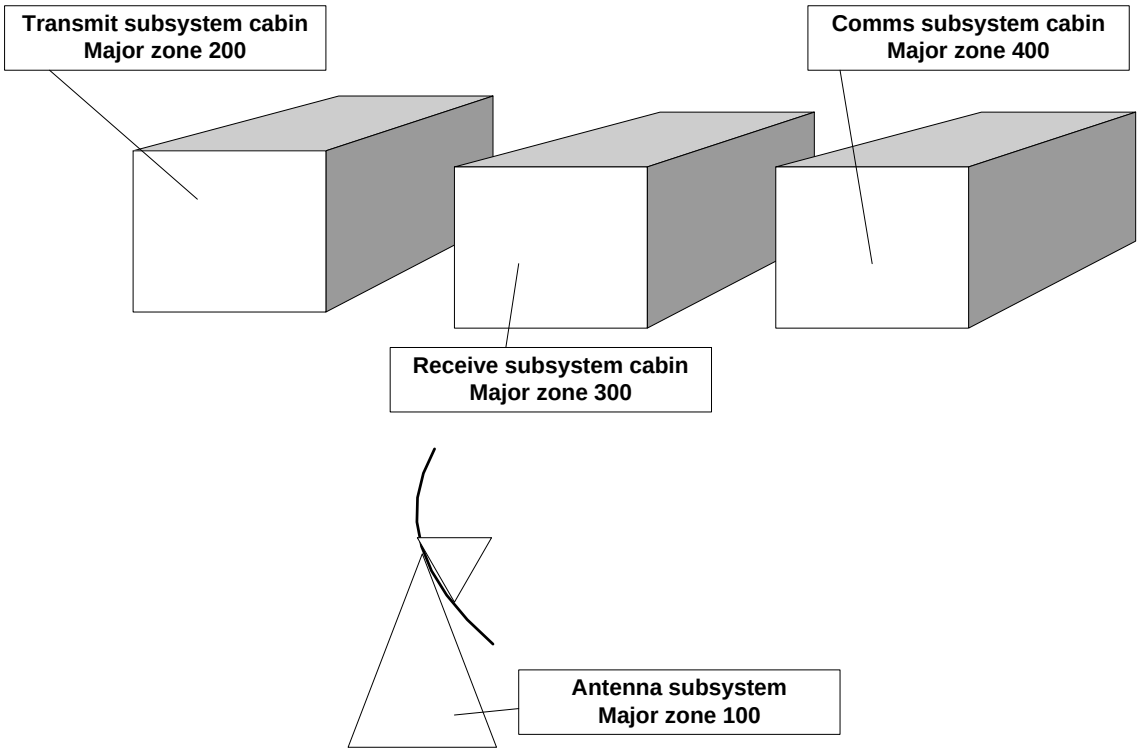
2.2 Example of zoning a ground based facility

2.2.1 Major zones

Major zones must be allocated to major physical structures, buildings, etc, and numbered using the left hand digit of the zone identification number (100, 200, 300, etc) as detailed in Table 5 and Fig 5.

Table 5 Major zone identification number

Major zone	Area
100	Antenna
200	Transmit subsystem cabin
300	Receive subsystem cabin
400	Communications subsystem cabin



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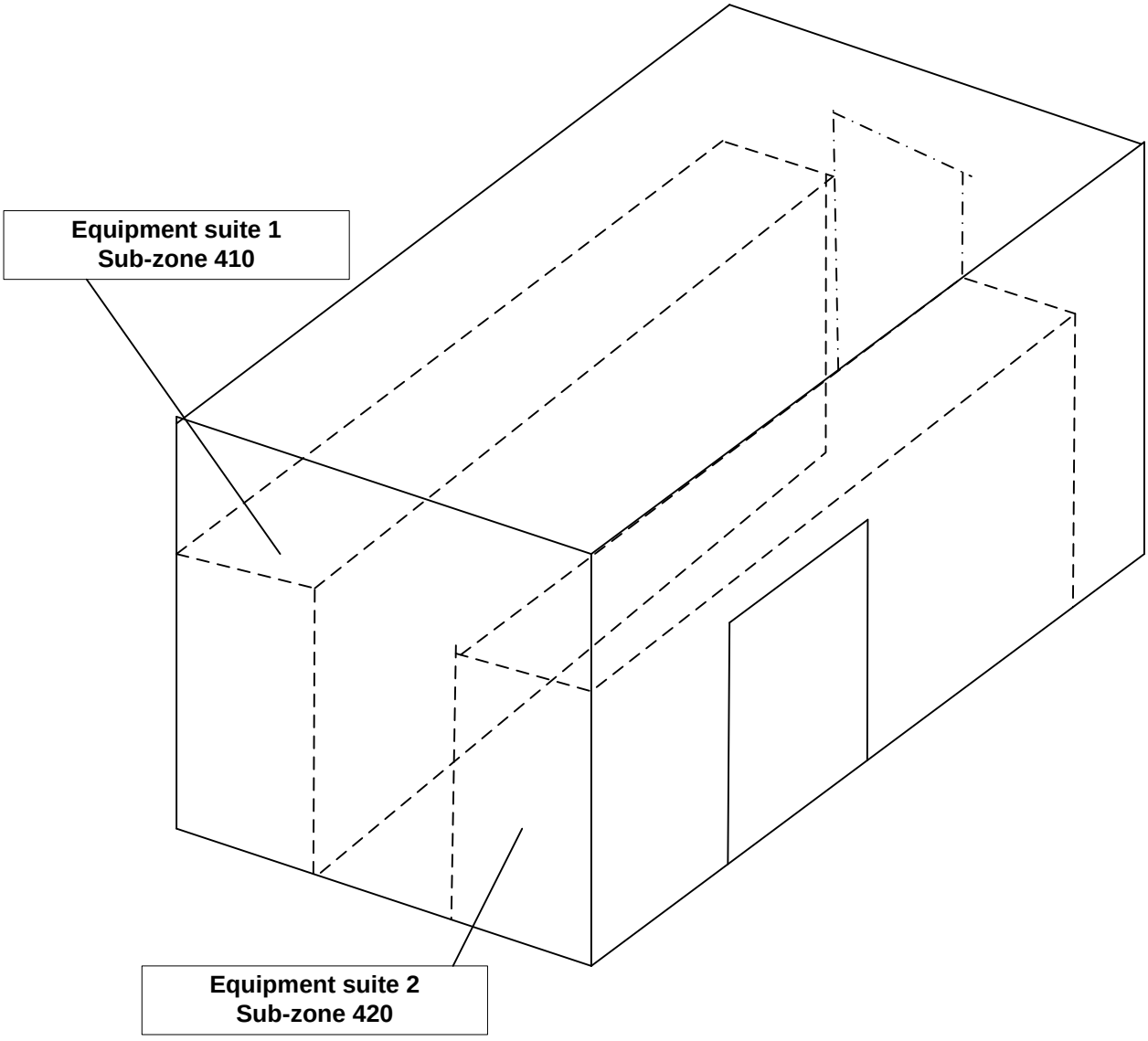
Fig 5 Example of zoning a satellite communications facility (major zones)

2.2.2 Sub-zones

Major zone areas must be subdivided into sub-zones using the second digit of the allotted zone number as detailed in the example at Table 6 and Fig 6.

Table 6 Sub-zone identification number

Major zone	Sub-zone	Area
400		Communications subsystem cabin
	410	Equipment suite 1
	420	Equipment suite 2



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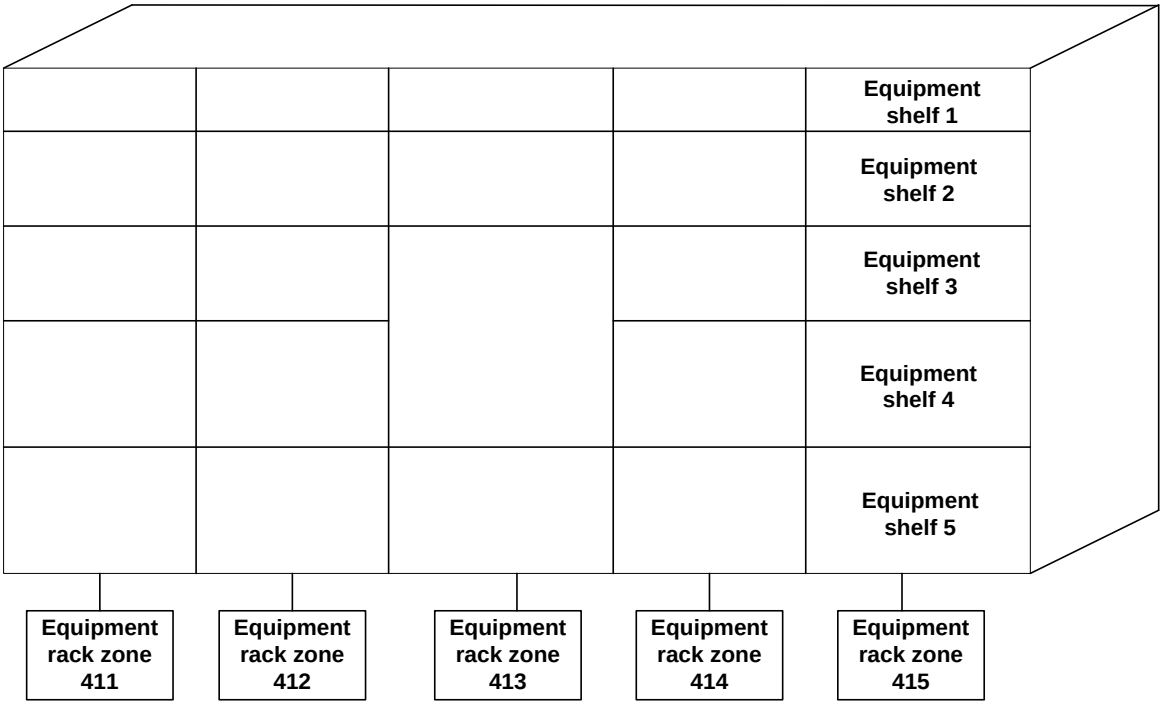
Fig 6 Example of zoning a satellite communications facility (sub-zones)

2.2.3 Zones

Sub-zone areas, where necessary, must be further subdivided into zones using the first digit of the allotted zone number (1000, 2000, 3000, etc) as shown in Table 7 and Fig 7.

Table 7 Zone Identification Numbers

Sub-zone	Zone No.	Area
410		
	411	Equipment suite 1, rack 1
	412	Equipment suite 1, rack 2
	413	Equipment suite 1, rack 3
	414	Equipment suite 1, rack 4
	415	Equipment suite 1, rack 5



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Fig 7 Example of zoning a satellite communications facility (zones)

2.3 Identification of access points

2.3.1 General

Typical access points are: doors, panels, hatches, fillets, fairings, internal floor and ceiling panels, cargo hold linings, etc. If an access point has an identifier on it, this must be used to identify it in data modules.

Note

Not all Products have identifiers on the actual access points. If not, they must be assigned a number in data modules.

2.3.2 Diagrams and tables

Access identification diagrams must be given in the data modules, which clearly illustrate the position of access points on the Product. Associated tables giving the access point identifier (cross-referenced to the access diagram), and the Product indicate an access point that gives access to (if applicable), can also be a requirement. These tables can be prepared using the descriptive data module type.

2.3.3 Access points numbering requirements

Access points must be numbered in association with the Product zoning system.

Letters I and O must not be used in letter suffix or preceding letter coding sequence.

Blow out doors and tank vents are not normally assigned specific access points identifiers.

Access points in the fuselage center line must be coded with left hand designators.

Access points in vertical stabilizer or rudder must be coded from bottom to top.

Access points which are situated in more than one zone must be allocated the zone number of the lowest zone involved.

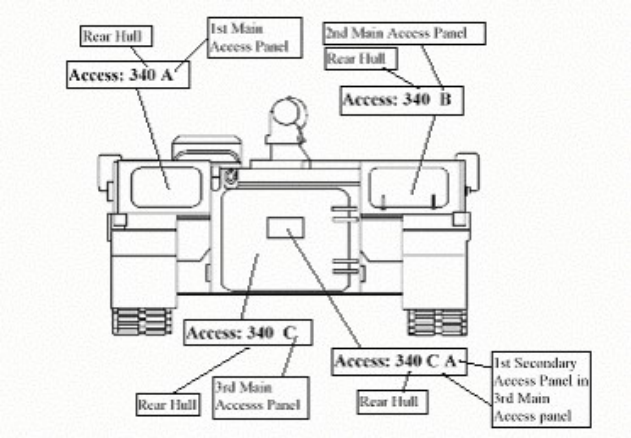
If a small access point is located in a larger access point, the larger point must be coded first.

An access point on a zone boundary (eg, a bulkhead must be allocated the zone number of the side of the bulkhead from which the door or panel is removed).

Access points must be numbered in association with the zoning system detailed above. The access point identifier must consist of the three-digit zone number followed by a three-letter access reference (letters I and O must not be used).

2.3.4 Access identifier

The access identifier must comprise up to three characters to indicate primary, secondary and minor access points. Each character of the access reference number must be allocated in a logical sequence (eg, front to back, left to right, clockwise), beginning with "A" in each zone to identify discrete access points. The first character must indicate main or primary access points/panels. Where a secondary access panel is mounted within a primary access panel, it must be designated using the second character of the access reference number. Minor access points within a secondary access panel must be indicated using the third character of the access identifier. An example of the application of access codes is shown at Fig 8.



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Fig 8 Example of access codes for a combat vehicle

2.3.5 Location references

Location references such as "left", "right", "clockwise", "upper", etc, must apply to the system, as viewed from the rear of the platform, in the normal direction of travel. The position of mounted equipment/items, etc must be identified by location and "clock position" (eg, crank case, three o'clock).

2.3.6 Example of access for a ground based facility

2.3.6.1 Access

For electronic installations and assemblies (eg, radio room, computer center, portable radio), access points must be numbered in association with the zoning system detailed above. The access point identifier must consist of the zone number followed by a three-letter access reference (letters I and O must not be used). For smaller electronic assemblies (eg, circuit boards), the access code can be used to provide a location matrix, with the horizontal axis numbered from 1 to 99 as the first two characters of the location code and the vertical axis lettered from A to Z as the third character of the access code.

2.3.6.2 Location reference

Location references such as "left", "right", "clockwise", "upper" must be applied as viewed from the front of the system, from an operator's viewpoint. For large fixed systems, location references must use points of the compass (eg, South west) and floors (eg, Ground floor). Positioning of mounted equipment/items, etc, can be identified by location and "clock position" (eg, on/off switch, four o'clock). For location references on circuit boards and diagrams, the representation must be such that the main signal/data flow is from left to right.

Chapter 3.4.3

Zoning and access – Sea systems

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Chap 3.4.3.1	Sea systems - Surface ships
Chap 3.4.3.2	Sea systems - Submarines

1 General

The general rules for zoning and access are given in Chap 3.4.

There are significant differences between the zoning and access identification systems to be used on surface ships and submarines.

The rules for zoning and access for surface ships are given at Chap 3.4.3.1.

The rules for zoning and access for submarines are given at Chap 3.4.3.2.

The specific method of applying zoning and access to surface ships and submarines must be decided on an individual platform basis, following these general rules.

2 Zoning and access

Separate systems for zoning and access allocations must be used for surface ships and submarines.

2.1 Surface ships

On surface ships, the term zoning must be associated with the Nuclear, Biological, Chemical Damage (NBCD) control function where areas are defined and equipped during the ship build

stage to limit the effects of fire, flooding, contamination or other damage. The aim is to divide the ship into self-contained survival zones.

2.2 Submarines

In submarines, the term zoning must associated with the Damage Control Headquarters (DCHQ) considerations used in the identification of compartments and access points. The aim is to divide the submarine into a number of zones with water-tight boundaries between them.

2.3 Location markings

In surface ships, a system of location markings based on three-dimensional geographic co-ordinates must be used to identify compartments and access arrangements. For submarines the location markings must be based on the deck, bulkhead and frame numbers, and on the names of the compartments.

Chapter 3.4.3.1

Sea systems - Surface ships

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Chap No./Document No.	Title
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Chap 3.4.3	Zoning and access - Sea systems

1 General

The general rules for zoning and access are given in Chap 3.4.

The general rules for zoning and access for sea systems are given in Chap 3.4.3.

2 Zoning and access - Surface ships

2.1 Zoning

Zoning is employed to help avoid the loss of an important system capability through the effects of fire, flooding, the spread of toxic gases or damage caused by a consequence of an attack resulting in the spread of primary and secondary weapon effects.

Zoning is achieved by selecting main transverse bulkheads which continue up beyond the weather-deck/forecastle/flight deck to the uppermost decks in the superstructure. These bulkheads must be designated zone boundaries and are coincident with the main watertight bulkheads (which reach up to No. 1 deck) and continue up through the superstructure as fire bulkheads.

In consideration of zoning for NBCD purposes, zones must be sufficiently self-contained to operate for continuous periods of up to 12 hours with the zone boundaries closed down. For this, each zone is normally provided with autonomous systems for the following:

- Electrical power generation (with fuel supply)
- Electrical power distribution
- Chilled water and weapon cooling systems
- Fire pumps and firefighting arrangements
- Flood and firefighting water removal and draining
- Internal communications
- Machinery and damage surveillance and control
- Smoke containment and removal
- Ventilation, air conditioning and a chilled water distribution system
- Collective NBCD protection and air filtration
- Emergency support for the crew
- Compressed air distribution

The number, autonomy, size and arrangement of zones in any ship, depends on operational, technical and financial considerations. At the design phase, the operational value of the greater degree of protection provided by a larger number of zones is balanced against the cost of the additional subdivision required to support them. The requirement for personnel and environment support systems to cross zone boundaries is also a factor in deciding how zoning must be arranged.

2.2 Access

2.2.1 Access points

Access points on the hull of a vessel are, by their nature, limited and therefore do not need specific identification. Within the compartments of a vessel, equipment is not generally hidden behind panels and thus locations must be identified by their relation to appropriate Frame / Frames within a compartment.

2.3 Location markings

Location markings must be used to uniquely identify all watertight compartments, trunks, doors and hatches and other fittings which can affect the watertight or gastight integrity of the ship. The marking system must include the non-watertight compartments that are important or are in frequent use.

Location markings must provide a means of indicating any position rapidly and without ambiguity. They must provide a system whereby the position of any incident, such as fire or

damage, can be accurately identified. The system shown in Fig 1 thru Fig 4 is logical and can be applied to any ship regardless of size and complexity of subdivision.

2.3.1 Deck numbering

The subdivision of a surface vessel must be achieved by the use of decks to divide the ship horizontally from the weather-deck/forecastle/flight deck (No. 1 deck) to the inner bottom and the superstructure. Main transverse bulkheads are used to divide the vessel lengthways into main sections. A main transverse bulkhead is defined as a bulkhead that is continuous from the keel to the underside of the weather-deck/forecastle/flight deck.

Decks must be numbered consecutively downwards to the outer bottom starting with the weather-deck/forecastle/flight deck as No. 1 deck. Decks above the weather-deck/forecastle/flight deck must be numbered commencing with No. 01, 02 and so on consecutively upwards.

2.3.2 Ship sections

Main sections formed by transverse watertight bulkheads must be identified by characters from the phonetic alphabet starting with A, B, C, etc, from forward to aft.

Note

To avoid confusion, I and O are not to be used.

Watertight compartments formed by transverse bulkheads within these main section compartments, must be given suffixes starting A, B, C, etc, from forward, or Z, Y, X, etc, from aft, as well as the marking of the main section.

2.3.3 Longitudinal bulkheads

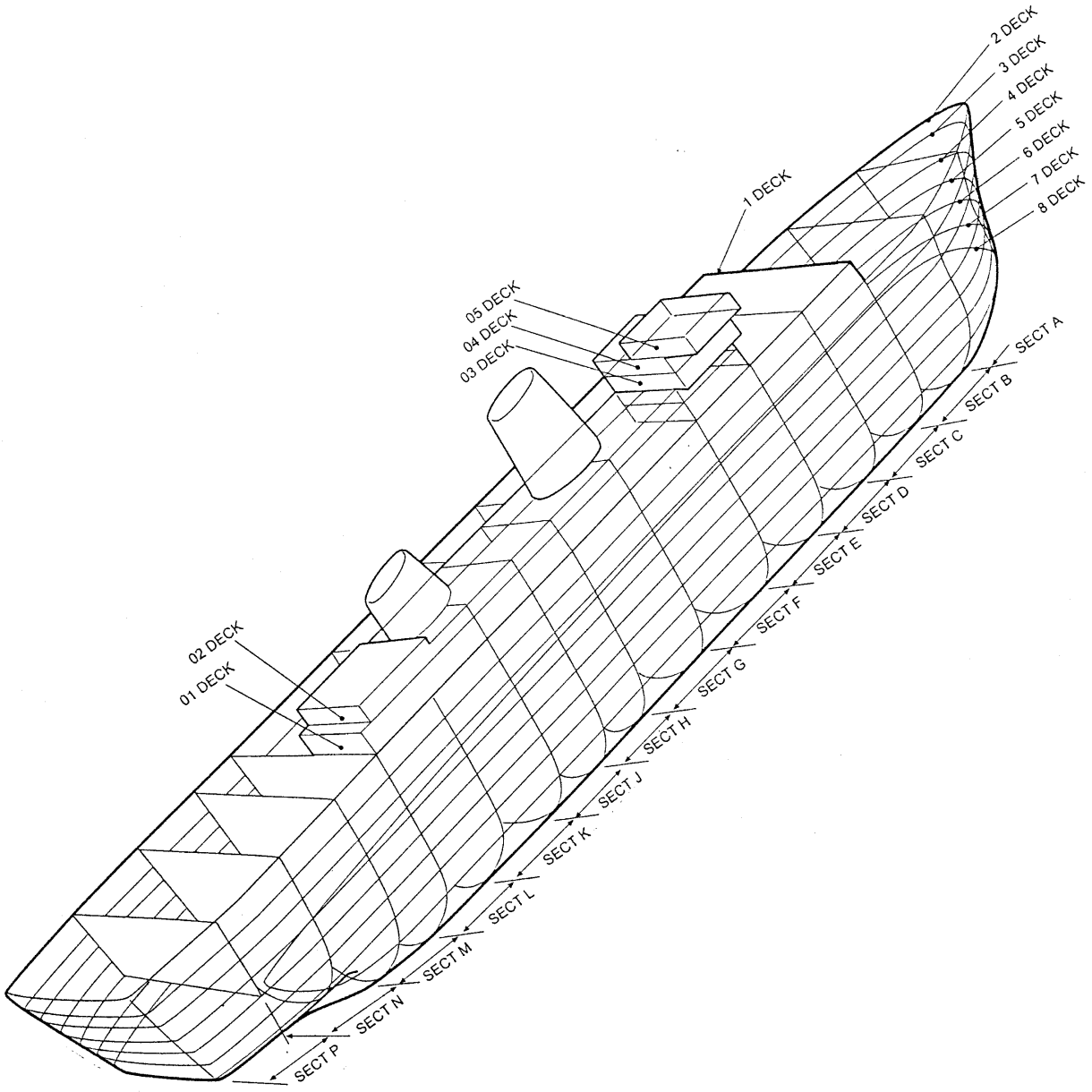
Where longitudinal bulkheads divide a main section compartment, positions relative to the center line of the vessel must be identified using a numbering system from the center line outwards, with even numbers (2, 4, 6, etc) to port and odd numbers (1, 3, 5, etc) to starboard. Access points must also be identified in a manner which complements the location system.

2.3.4 Doors and hatches

Doors must generally bear the marking of the compartment to which they give access. Hatches must bear the numbers of the decks in which they are cut, followed by the horizontal co-ordinates of the compartments to which they give access (eg, Hatch 5DY is in deck No. 5 and gives access to compartment 6DY). Where two or more doors or hatches (cut in the same deck) give access to the same compartment they must be distinguished with the words PORT (or STARBOARD) and/or FORWARD (or AFT) in abbreviated form after the marking. As an example, hatch “5DY Stbd” is the starboard hatch of a pair giving access to compartment 6DY.

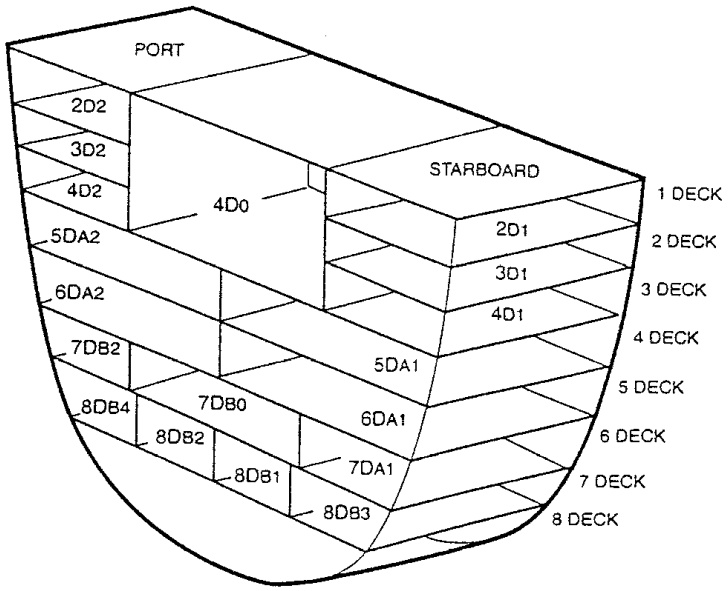
2.3.5 Coding of equipment items

Location coding of equipment items inside compartments must follow the practices described at Para 2.3.



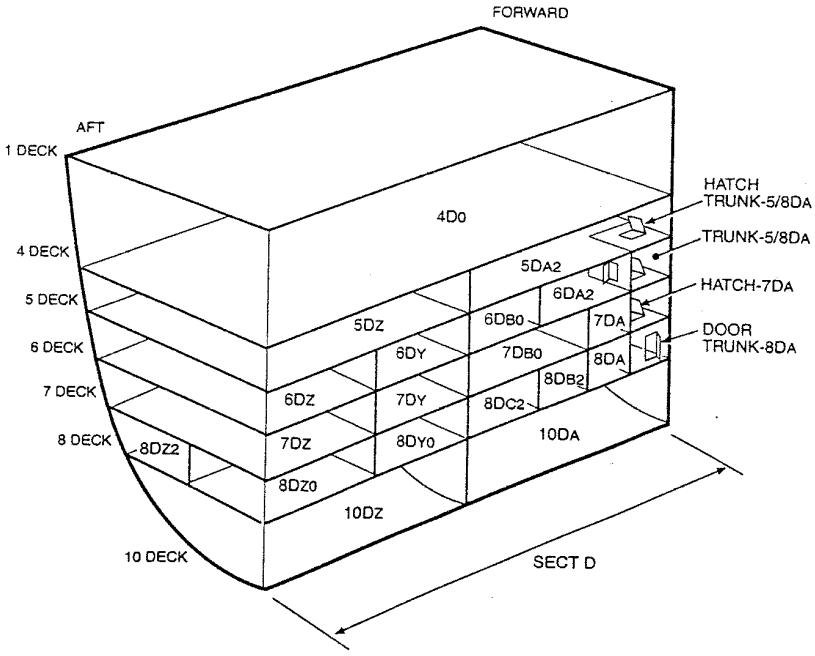
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Fig 1 Surface ships - Decks and main sections



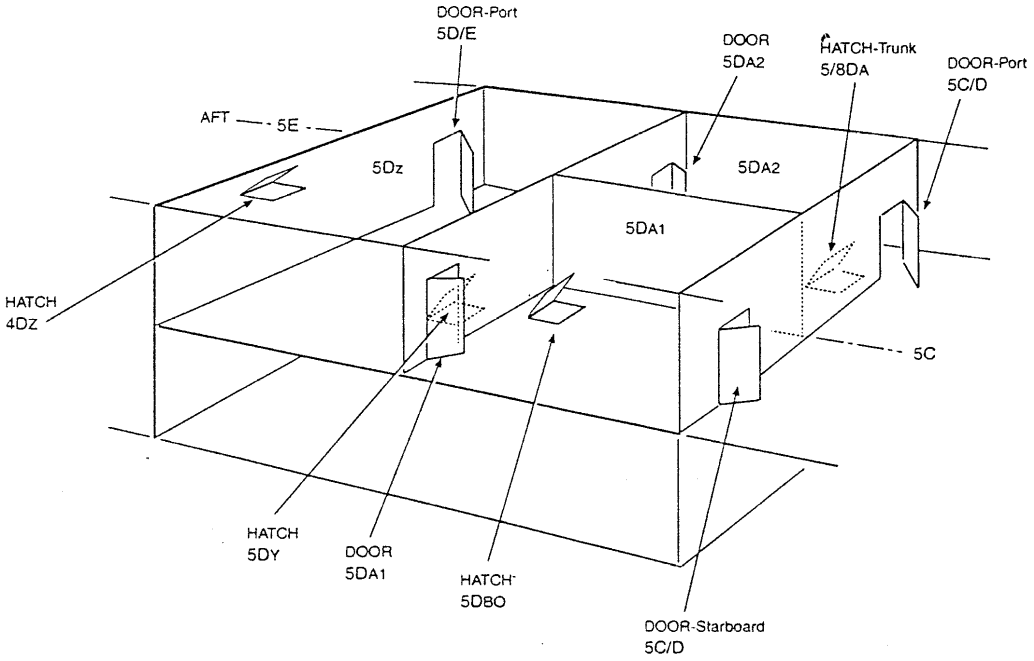
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Fig 2 Surface ships - Compartment references



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Fig 3 Surface ships - Compartments with trunk



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Fig 4 Surface ships - Doors and hatches

2.4 Zoning and access marking examples

The following give examples of the rules and practices to be followed in marking the various types of zoning and access markings.

2.4.1 Compartment markings

Fig 2 and Fig 3 show typical identifications for various ships compartments. The specific rules to be followed are given below.

- Compartment location marking positions: These must be placed to be visible from all entrances. If this is not possible with a single mark, the marking must be repeated to enable identification from all entrances. The markings must be made up in accordance with the following rules.
- First character (Number): Deck number. Decks must be numbered 1, 2, 3, etc, downwards from No. 1 deck (forecastle, weather-deck or flight deck), and 01, 02, 03 decks above No. 1 deck.
- Second character (Letter): Section. Sections are the overall lengths between the main transverse bulkheads. They must be lettered A, B, C, etc, from forward to aft. (I and O are not to be used).
- Third character (Letter): Compartment, fwd/aft position. Compartments are the enclosed divisions within sections. They must be lettered A, B, C, etc, from the forward end of the section, or Z, Y, X, etc, from the aft end of the section. The size of the lettering must be reduced from the first two characters.
- Fourth character (Number): Compartment, athwart-ships position. Position of compartment from centerline. They must be numbered 1, 3, 5, etc, to starboard and 2, 4, 6, etc, to port. A compartment on the centerline must be numbered 0.
- Suffix (Numbers): Internal watertight compartments. Suffix -00 used for a single compartment. Suffixes -100, -200, etc, for two or more contained compartments. Odd numbers to starboard, even numbers to port.

Marking examples: 2BA3 indicates a compartment on No. 2 deck at the forward end of B section. It is the second compartment to starboard of the centerline. An internal watertight compartment inside the main compartment must be marked as 2BA3-00. Two internal compartments must be marked 2BA3-100 and 2BA3-200.

2.4.2 Door markings

Fig 4 shows the marking methods that must be used on doors. The specific rules that must be followed are given below.

- Door marking position: Both sides, upper corner or hinged edge.
- Door marking rules: Doors must bear the marking of the compartment to which they give access. If a compartment has two doors, they must be marked PORT, STBD or FWD, AFT as appropriate.
- Doors in main transverse bulkheads separating lettered sections: These must have the deck number and both section letters in alphabetical order.

Marking examples: Marking 2PB indicates a door giving access to compartment 2PB. Marking 2D/E indicates a door connecting D and E sections on No. 2 deck.

2.4.3 Hatch markings

Fig 4 shows the marking methods that must be used on hatches. The specific rules that must be followed are given below.

- Hatch marking position: Near corner on hinged side.
- First characters (Number): Deck in which hatch is cut.
- Remaining characters (letters and numbers): to give fore/aft and athwart-ships position of compartment to which the hatch gives access. The section letter must be the same size as the deck number. The remaining characters must be of reduced size.
- Where two hatches give access to the same compartment, the markings must be qualified by PORT/STBD or FWD/AFT.

Marking example: Marking 2DA1 indicates a hatch on No. 2 deck giving access to a No. 3 deck compartment in fore/aft section D and compartment co-ordinates A1.

2.4.4 Fixed manholes

The marking must show the compartment to which a manhole gives access. Manholes in hatches must not be marked and must be referred to as Manhole in Hatch 6GZ4.

Marking example: Marking 6GZ4 indicates a manhole giving access to compartment 6GZ4.

2.4.5 Trunks

Trunks must be marked on each separate section of the trunk.

The trunk must carry the deck number of the top hatch or door, plus the marking of the compartment at the bottom of the trunk.

Each hatch in a trunk and each intermediate door must have its own deck number, plus the marking of the compartment at the bottom of the trunk. The word TRUNK must be marked on all hatches and doors giving access to the trunk.

Marking example: Marking 1/5DA indicates a trunk running from No. 1 deck thru No. 5 deck, compartment 5DA.

2.4.6 Frame station numbers

Frame stations must be numbered at main transverse bulkheads and also must be marked as needed in conspicuous positions on bulkheads.

Marking example: 17 indicates a main transverse bulkhead at the seventeenth frame section from the foremost frame.

2.4.7 Other side markings

Must be marked on bulkheads forming perimeter of dangerous compartments (eg, magazines, machinery spaces and flammable stores). Also, in multiple section ships, these must be marked on the main bulkheads below the lowest communications deck.

Marking example: MAGAZINE OS indicates a bulkhead surrounding a compartment containing a magazine.

2.4.8 Compartments below

Must be marked as needed above hatchways to indicate compartments gained thereby. Instead of the marking COMPARTMENTS BELOW, an arrow can be used if desired.

Marking example: COMPARTMENTS BELOW.

2.4.9 Temperature monitoring marks

Marking must be applied to external boundaries of high-risk (fire, explosion, etc) compartments.

Chapter 3.4.3.2

Sea systems - Submarines

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Chap 3.4.3	Zoning and access - Sea systems

1 General

The general rules for zoning and access are given in Chap 3.4.

The general rules for zoning and access for sea systems are given in Chap 3.4.3.

2 Zoning and access

2.1 Zoning

Submarines must be subdivided into a number of zones with water-tight boundaries between them. The following rules must be applied:

- Smoke-tight boundaries must be positioned between each high fire risk area and each high value compartment (eg, operations rooms, computer rooms, navigational equipment compartments).
- Decks must be continuous to smoke-tight boundaries.
- Where smoke-tight boundaries cross passageways, smoke curtains must be fitted.
- Where a hatch or main watertight door forms part of a smoke-tight boundary, a smoke curtain must be fitted to allow a fire to be fought with an open door/hatch.

2.2 Access

Access points on the hull of a submarine are by their nature limited and therefore do not need specific identification. Within the compartments of a submarine, equipment is not generally hidden behind panels and thus locations must be identified by their relation to appropriate frame numbers within a compartment.

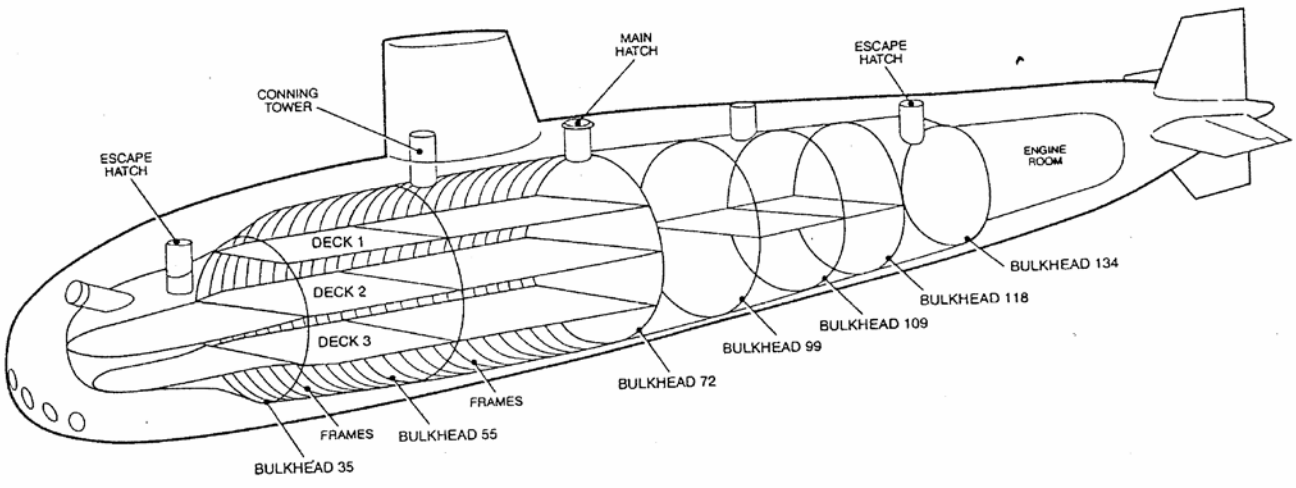
2.3 Location markings

The identification of locations in submarines is necessarily different to that of surface vessels, mainly due to their design and size. The training programs for submarine crews differ from surface ship practice to accommodate this. Submarines do not have the NBCD requirements that apply to surface vessels, and zoning must be determined around the DCHQ practices. Also, stability considerations mean that submarines do not have watertight longitudinal divisions.

The system of determining and identifying compartment and access point locations in submarines must be defined by the deck, bulkhead, frame-numbers, and whether the location is to port or starboard of, or on the centerline of the submarine.

Physical markings other than for bulkheads and frames must not be made within submarines. A location defined from bulkheads and frames must guide personnel to close proximity of a specified location. To support this, submarine training requires that crews have a degree of familiarity with the layout of a submarine in order that they are able to determine their position from their surroundings and are able to identify which compartments surround their present position.

For equipment items location coding inside compartments must follow these rules.



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Fig 1 Submarines - Zoning and access

Chapter 3.5

Information generation - Updating data modules

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Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 4.13.2	Optimizing and reuse - Incremental update of CIR data modules

1 General

There are rules governing the information required to update and release data modules. Different methods are used to indicate the different types of update. Apart from new data modules, there are five different types of update given in the attribute `issueType`:

- status
- changed
- revised
- deleted
- reinstated, of which there are three types:
  - status
  - changed
  - revised

Note

The rules in this chapter also apply to publication modules and SCORM content package modules.

2 Updating data modules

2.1 Reasons

Data modules can be updated because of for example:

- information not available at the initial issue of the data modules
- use of new items
- use of new consumables
- new information gained through operational experience
- changes resulting from technical publications improvement reports
- changes to software
- modifications/alterations, service bulletins, special technical instructions and similar documents
- changes as a result of QA checks
- changes as a result of the electronic review function
- other data needing to be added or revised

For a detailed explanation of how the use of Common Information Repository (CIR) data modules affect the update process of data modules, refer to Chap 4.13.2.

2.2 Use of change marks and highlights

Data modules that are of type "changed" (refer to Para 2.3.3.2) or "reinstated and changed" (refer to Para 2.3.3.5) have changes marked with change mark elements and attributes. Refer to Chap 3.9.5.2.1.1.

Changes that change the content of elements use the change markup within those elements. Refer to Chap 3.9.5.2.1.1.

For the detailed descriptions of and rules for the use of the elements and attributes that indicate changes, refer to Chap 3.9.5.2.1.1.

The reasons for any changes to a data module are summarized and recorded in the identification and status section. This text is used for creation of the front matter data module called Highlights.

2.3 Use of issue and inwork numbers

2.3.1 Issue numbers

For every release of a data module, the issue number (attribute `issueNumber`) must be incremented by one. For a detailed description of the elements and attributes for issue information. Refer to Chap 3.9.5.1.

2.3.2 Inwork numbers

The ability to track drafting of changed information during the information generation process is facilitated using an inwork number (attribute `inWork`). The process of drafting is indicated by incrementing the inwork number. For a detailed description of the elements and attributes for issue information. Refer to Chap 3.9.5.1.

2.3.3 Issue type

Each issue of a data module is assigned an issue type (attribute `issueType`). Refer to Chap 3.9.5.1.

2.3.3.1 New data modules
New data modules must have their issue set to an integer and inwork number set to “00”. Refer to Chap 3.9.5.1.

2.3.3.2 Changed data modules
A change is that form of updating a data module which affects only parts of an existing data module. A change can affect the content section or can be required solely to update an element or attribute in the identification and status section (eg, the applicability or to give the new QA status).

2.3.3.3 Revised data modules
A revised data module is one which has been completely reworked.

2.3.3.4 Deleted data modules
A deletion of a data module may be necessary (eg, whenever a described configuration no longer exists). In such case the data module is retained in the CSDB and marked as deleted, rather than physically being deleted.

2.3.3.5 Reinstated data modules
Reinstating a data module is the action of restoring a deleted data module and making it available for use. If a data module is reinstated, the issue number at the time of deletion must be incremented by one at the time of release.

Chapter 3.6

Information generation - Security and data restrictions

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Chap 3.9.6.1	Attributes - Project configurable values
Chap 6	Information presentation and use
C-M(2002)49	NATO Security Policy (Security within the North Atlantic Treaty Organisation)

1 General

Data modules include four types of information relating to security. These are classification, caveats, instructions and information.

2 Security and data restrictions

2.1 Security

2.1.1 Security classification

Classifications include restrictive and commercial markings. A classification is a category, class or grade assigned to defense information or material, in relation to the degree of danger to security that would result from its unauthorized disclosure, excluding restrictive markings.

2.1.1.1 International defense organization classifications

International defense organizations can have their own definitions for security classifications. The security classifications for the North Atlantic Treaty Organization (NATO) are defined in Security Policy (C-M(2002)49).

2.1.1.2 National classifications

National classifications will be specified by the policy for each nation. How security classifications will be used and marked will be determined by the project.

2.1.2 National caveats

A national caveat is a restrictive marking (eg, UK/US EYES ONLY) or security code word that is applied to complement an appropriate security classification which is normally not lower than confidential.

Data modules/technical publications which require national caveats are permitted. The national caveat is normally used to restrict the data modules/technical publications to named persons or authorized nominees.

2.1.3 Commercial security classification

A commercial security classification is a category or grade, such as "Commercial In Confidence", assigned to company or government department information or material to indicate the degree of danger to the company or government department security that would result from its unauthorized disclosure. It also an indication of the standard of protection required to guard against unauthorized disclosure, excluding restrictive markings. A commercial security classification is normally used by a company to protect information or material relating to government contracts which have not been awarded.

Whilst these classifications would not normally be used for data modules/technical publications there can be occasions where, at the start of a project, data modules are produced and given commercial security classifications before a NATO/national security classification has been allocated by the project or organization. The originator of the data module should take advice from either the project or organization security instructions or the company security controller on the use of the particular commercial security classification and the precautions to be taken with the information and material. As soon as a government contract has been agreed to, the NATO or national security classification becomes effective.

The retention of this classification within a data module, throughout its life is to be determined by the project or organization.

2.1.4 Restrictive markings

Restrictive markings are additions to the security classification of data modules/technical publications. The restrictive markings that are available for data modules are national caveats (including international defense organization markings), commercial markings and export controls, distribution, handling and destruction. The markings are used to indicate that the handling and distribution of the data module/technical publication is restricted to those

categories of persons authorized to have access to the information contained therein. The security markings on data modules/technical publications are always a combination of the security classification and any restrictive marking.

Security code words must be defined within the project.

Business rule decision point BRDP-S1-00016 - Marking security classifications:

– Decide on how the security classifications will be marked and/or indicated.

2.2 Instructions

This information type gives specific instructions relating to the data module.

2.2.1 Distribution

The distribution requirements, including export control notices, which apply to a data module, dependent on its security classification and user rights must be recorded within the data module. The distribution is recorded and approval for copying and must be obtained from either the originator or the company security controller.

2.2.2 Export control

The project or organization security instructions will normally give the instructions for the control of export of data modules. Where appropriate, these are recorded in the data module. If there are no project security instructions, the company security controller should be contacted for advice.

2.2.3 Handling

The project or organization security instructions will normally give the instructions for handling, including storage, of classified data modules/technical publications. If there are no project security instructions, the company security controller should be contacted for advice.

2.2.4 Destruction

The project or organization security instructions will normally give instructions on how to destroy classified data modules/technical publications when they are no longer required. If there are no project security instructions, the company security controller should be contacted for advice. Paper classified data modules/technical publications (including drafts, spoilt work, etc) are normally destroyed by either shredding or burning. Unwanted copies of classified data modules/technical publications must be given the appropriate security protection until they are destroyed; once they are destroyed, certificates are signed and retained.

2.2.5 Use or disclosure

The project or organization security instructions will normally give the instructions for the intended use or disclosure of the data module.

2.2.6 Supersedure

The project or organization security instructions will normally give the instructions for notices that the data module or publication supersedes other data modules or publications.

2.3 Information

This information includes copyright, policy reference and conditions that can apply to a data module.

2.3.1 Copyright

A marking that is used to give copyright information like the copyright mark [©] followed by the year, or years, and the copyright holder.

2.3.2 Policy reference

This is a reference to the appropriate security policy documentation.

2.3.3 Conditions

These are any specific conditions that can apply such as changing security classifications as a result of aggregation of data.

2.4 Classifying data modules/technical publications

It is the responsibility of the originator to classify the data module/technical publication according to the total content, (ie, classified according to the highest classified information or material they contain). For example, a data module/technical publication containing information or material classified between restricted and secret must be classified as secret.

Persons who reproduce, extract, or summarize classified information, or who apply classification markings derived from source material or as directed by a classification guide, need not possess originator classification authority. Persons who apply these derivative classification markings must be identified by name and position, or by personal identifier, in a manner that is immediately apparent for each derivative classification action. They must observe and respect original classification decisions and carry forward to any newly created documents the pertinent classification markings.

Normally the originator of the data module/technical publication would classify data module/technical publications according to the security classification of the source data used in their production. If the originator or derivative classifier is in doubt as to the correct security classification, advice should be sought from either the project or organization security instructions or the company security controller. Some projects can stipulate a maximum security classification for the data modules/technical publications. It is the responsibility of the originator or derivative classifier to make sure that this maximum security requirement is not exceeded.

Business rule decision point BRDP-S1-00013 – Use and markings of security classifications (attribute `securityClassification`):

- Determine how the security classifications will be used.

Business rule decision point BRDP-S1-00014 - Application of caveats:

- Determine if the policies that apply to security marking, instructions, etc, and decide how those markings are required to be applied within the given project.

2.5 Changes in security classification

Although data modules/technical publications would have been given a correct security classification when originated, they can require changes for a number of reasons:

- The result of a security review their security classification can be downgraded
- The result of adding new classified information, data modules/technical publications can require their security classification upgraded
- The classification of data modules can also be affected by the aggregation of data modules into a CSDB

It is the responsibility of the originator or derivative classifier of the data module/technical publication to upgrade or downgrade data module/technical publications according to their new content. Advice can be taken from either the project or organization security instructions or the company security controller. When changing the security classification of data modules/technical publications, the originator must always take into account the maximum security requirement for the project or organization. Refer to Para 2.1.4 and Para 2.2. Changes to the security classification of data modules are considered a status change to the data module and is to be recorded within the data module in accordance with Chap 3.5.

Business rule decision point BRDP-S1-00015 - Retention of security classification changes:

- Decide on the retention of security classification changes.

Business rule decision point BRDP-S1-00553 - Retention of derivative classifications changes:

– Decide on the retention of derivative classifications changes.

2.6 Presentation

Refer to Chap 6 for the presentation of security markings, data restrictions and derivative classifications in technical publications.

2.7 Control

The project or organization security instructions will normally give the instructions for the control of classified data modules/technical publications. If there are no project security instructions, the company security controller should be contacted for advice. Examples of the control of classified data modules/technical publications are:

– Classified data modules/technical publications should be seen only by authorized persons who have a need to see them. Control of classified data modules/technical publications helps to:

  - reduce the risk of breaches of security, either by deliberate action or carelessness
  - assist in investigations into breaches of security
  - reinforce the "need to know" principle

– All classified data modules/technical publications should be accountable; a system should be adopted which makes sure that all classified data modules/technical publications do not go astray and that a designated person is responsible for their inception or receipt until their destruction
– At set periodicities, spot/total checks of classified data modules/technical publications should be carried out

2.8 Common source database

The classification of data modules when aggregated into a CSDB would normally be as high as the highest security classified data module. However, there are occasions where the aggregation of data modules requires that the security classification is, in fact, higher than the highest classification. Projects should refer to project security instructions on this matter. If there are no project security instructions the company security controller should be consulted.

2.9 Emergency planning

It is recommended that plans be developed for the protection, removal, or destruction of classified material in case of fire, natural disaster, civil disturbance, terrorist activities, or enemy action, to minimize the risk of its compromise. The level of detail and amount of testing and rehearsal of these plans should be determined by an assessment of the risk of hostile action, natural disaster, or terrorist activity that might place the information in jeopardy.

Chapter 3.7

Information generation - Quality assurance

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 4.6	Information management - Comment

1 General

The QA of data modules/technical publications is the collection of checking activities that are carried out to ensure that the contents are fit for purpose and technically accurate. These checking activities can vary, especially for aerospace systems between civil and military programs.

2 Quality assurance

2.1 Quality assurance application

Business rule decision point BRDP-S1-00017 - Rules for quality assurance:

- Identify the project quality assurance rules and how those rules affect the methods used to perform quality assurance of the data modules/technical publications.

2.1.1 Quality assurance for air programs

Military air QA differs from the civil air QA in that each of the military customers can set its own requirements which have to be complied with by the contractor/industry. Civil customers and civil aviation airworthiness authorities' requirements are, that the manufacturer's organization leads to the required quality of data modules/technical publications which must comply with acceptable rules such as those detailed in the ATA e-Business Program series of specifications.

In military projects, fitness for use checking is carried out by the contractor (first verification) and optionally by the customer (second verification) whereas in civil projects, this checking is the responsibility of the contractor.

2.1.2 Quality assurance for land and sea systems

The QA requirements for both military and civil programs in land and sea applications are defined by the customer. Therefore, the degree of the application of QA detailed in this chapter is to be decided by the project or organization.

2.1.3 In-process review - Military

An In-Process Review (IPR) is an optional review by the customer of data modules/technical publications that are being produced by the contractor for the Product. The main function of the in-process review is for the customer to give guidance to the contractor. Normally in-process review activities are initiated by the customer but they can also be requested by the contractor when assistance or clarification is required. The in-process review ensures that the data modules/technical publications are being prepared to the required scope, depth and timescale in accordance with the contract and the applicable specifications.

2.1.4 First QA review - Civil

First QA review is the process by which the contractor's QA organization verifies that the produced output adequately and accurately complies with the requirements set by the rules of the project or organization and the applicable specifications.

2.1.5 First verification - Civil and military

First verification (sometimes known as validation) is the process by which the contractor validates that the data modules/technical publications are:

- the correct data modules/technical publications
- fit for purpose
- adequately describe the Product
- technically accurate
- safe to use by the customer

First verification is certified by the contractor for all military programs. For civil aerospace programs, the first verification must satisfy the civil aviation airworthiness authority of the contractor.

2.1.6 Second verification - Military

Second verification is the optional process by which the customer carries out a practical demonstration of the data modules/technical publications, supplied by the contractor, to make sure that the technical information is adequate to permit the efficient and safe use of the Product. Responsibility for the technical accuracy of the information remains with the contractor.

2.2 The quality assurance process

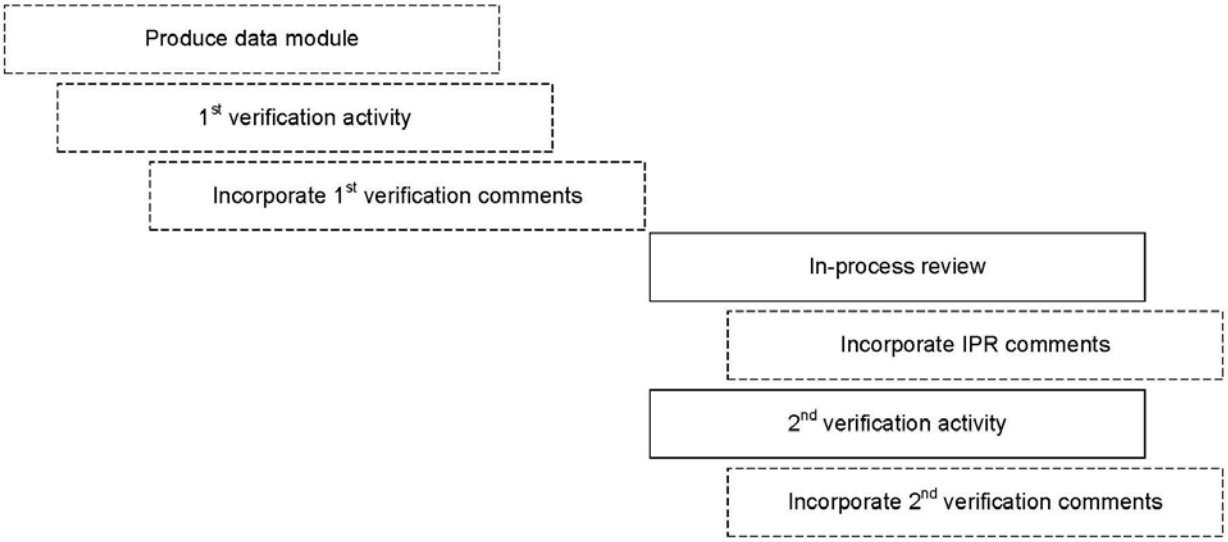
To ensure that the data modules/technical publications are produced in accordance with the customer's requirements, the contractor must include in his production procedures the appropriate control of quality. The assurance of quality must be substantiated by evidence that the quality control is maintained and that "in-house" checks and first verification have been carried out. As part of this QA, the customer can review the contractor's quality control, including the "in-house" checks and first verification, to ensure that the required quality is achieved by the contractor.

2.2.1 Quality assurance program

The contractor must produce and maintain a documented QA program for the technical information that is contracted for. The program must be reviewed as necessary to ensure that it remains effective and describes, in sufficient detail, the procedures that ensure that the data modules/technical publications that are being produced are technical accurate, safe to use and meet the requirements in terms of scope, depth and timescales.

The QA program should take into account such areas as:

- development, preparation, maintenance and distribution of procedures for the preparation, "in-house" checks and first verification of the data modules/technical publications
- co-ordination with design, production, product support and other such departments to ensure that the source data used to produce the data modules/technical publications is to the required standard
- the establishment and maintenance of a system for identifying the QA status and technical standard of the technical data being prepared for the data modules/technical publications during all preparation stages
- the establishment of first verification procedures and "in-house" checks to determine the adequacy and accuracy of the data modules/technical publications during the development stages
- formal in-process review (military) or first QA reviews (civil) to make sure that the data modules/technical publications are adequate and comply with the specifications for both content and production
- first verification of the data modules/technical publications. Refer to Para 2.1.5
- commenting, recording and reporting on issues raised during the production process and the in-service phase of the Product. This can be achieved by using the commenting process explained in Chap 4.6
- establishing the correct security classification for data modules in accordance with the project or organization security guidelines
- a detailed schedule that shows the timing and sequence of the various stages throughout the production and in-service phases. An outline example of such a schedule, for a project or an organization, is shown at Fig 1, where the dotted line boxes indicate supplier activity and the solid line boxes indicate customer activity. In this example, the in-process review activity takes place after the first verification and the second verification takes place during the in-process review. Alternatively, the second verification activity could take place during first verification or after the in-process review.



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Fig 1 Outline schedule - Example

2.2.2 Implementation of the quality assurance program

The contractor must prepare a schedule which will permit the customer or the appropriate release authority to carry out in-process review (military) or QA checks (civil) of the data modules/technical publications. In-process review (military) or QA checks (civil) can also be requested by the contractor when assistance or clarification is required.

Data modules/technical publications produced for military programs by the contractor can be subject to second verification, either at the contractor's premises or the customer's premises. Second verification by the customer does not absolve the contractor from carrying out first verification and must not be used by the contractor as evidence of effective QA if done at the contractor's premises.

Data modules/technical publications can require second verification at the contractor's premises so as to prove practical applicability to the satisfaction of the appropriate release authority or the customer.

In certain cases, first and second verification can be combined into one process of technical verification, and can be applied to all data modules/technical publications, upon agreement between the contractor and the customer in these processes.

Business rule decision point BRDP-S1-00018 - Rules for first and second verification:

– Decide on the rules for first and second verification. For example, such a rule might be that all data modules that have a safety related procedure must have first verification carried out "On object".

2.2.3 Methods of first verification

The method of first verification of draft data modules/technical publications depends on the type of technical information they contain. Some drafts can be checked against items of design documentation such as drawings, test schedules etc. This is known as "Table top" first verification. Other drafts, such as those containing procedural steps, can require a practical demonstration of the procedure. This is known as "On object" first verification. Other drafts can require that both types of first verification are carried out.

The contractor must use his engineering judgment in deciding which first verification method is to be used. The technical need for the type of first verification can have to be weighed against

economic considerations in respect of time, safety and other prevailing factors but in all cases, is to be carried out.

The contractor in military programs must submit his first verification proposals to the customer for agreement.

2.2.4 Practical demonstration of first verification

A practical demonstration of first verification of a procedure must be carried out in sequence and under conditions that provide reasonable assurance of the suitability of the procedure under normal customer conditions. Use must be made of the appropriate approved tools/test equipment, if available.

The customer must be informed of any situations where a contractor in military programs is not able to carry out first verification because of the lack of facilities. This could occur, for example, when separately developed Product and test equipment come together for the first time after the Product has been delivered to the customer. In these cases, the first verification must be carried out as soon as possible.

For civil programs, data modules/technical publications containing procedural information for airborne equipment must be shop first verified. Should this not be possible before the issue of the data modules/technical publications to the customer, it is permissible to carry out the first verification by simulation. All procedures that have been first verified by simulation, however, must have a practical demonstration at the earliest possible time.

2.2.5 Methods of second verification

The methods of second verification are table top, on object or both, in the same way as first verification. The application of these methods must be determined by the project or organization.

2.3 Indicating QA in data modules

As data modules progress through the production phase to the in-service phase their QA status is recorded. Whilst in production, the elements of QA are populated to indicate that a data module is:

- unverified which indicates that the data module is effectively in draft
- first verified with the type being set to one of:
  - table top
  - on object
  - table top and on object
- second verified with the type being set to one of:
  - table top
  - on object
  - table top and on object

When a data module is changed and, therefore requires re-verification, the QA status is set back to unverified.

Data modules that are changed between releases must have those changes tracked using the elements and attributes for issue information.

For a detailed explanation of the rules for the population of these elements and their attributes, refer to Chap 3.9.5.1.

2.4 Review cycle examples

The nature of modern complex projects means that they also often have complex contractual arrangements. The examples given at Para 2.4.1 and Para 2.4.2, are intended as examples

only and that the project or the organization must establish and detail their own processes and procedures.

Business rule decision point BRDP-S1-00019 - Review cycle process:

– Decide on the review cycle processes and procedures.

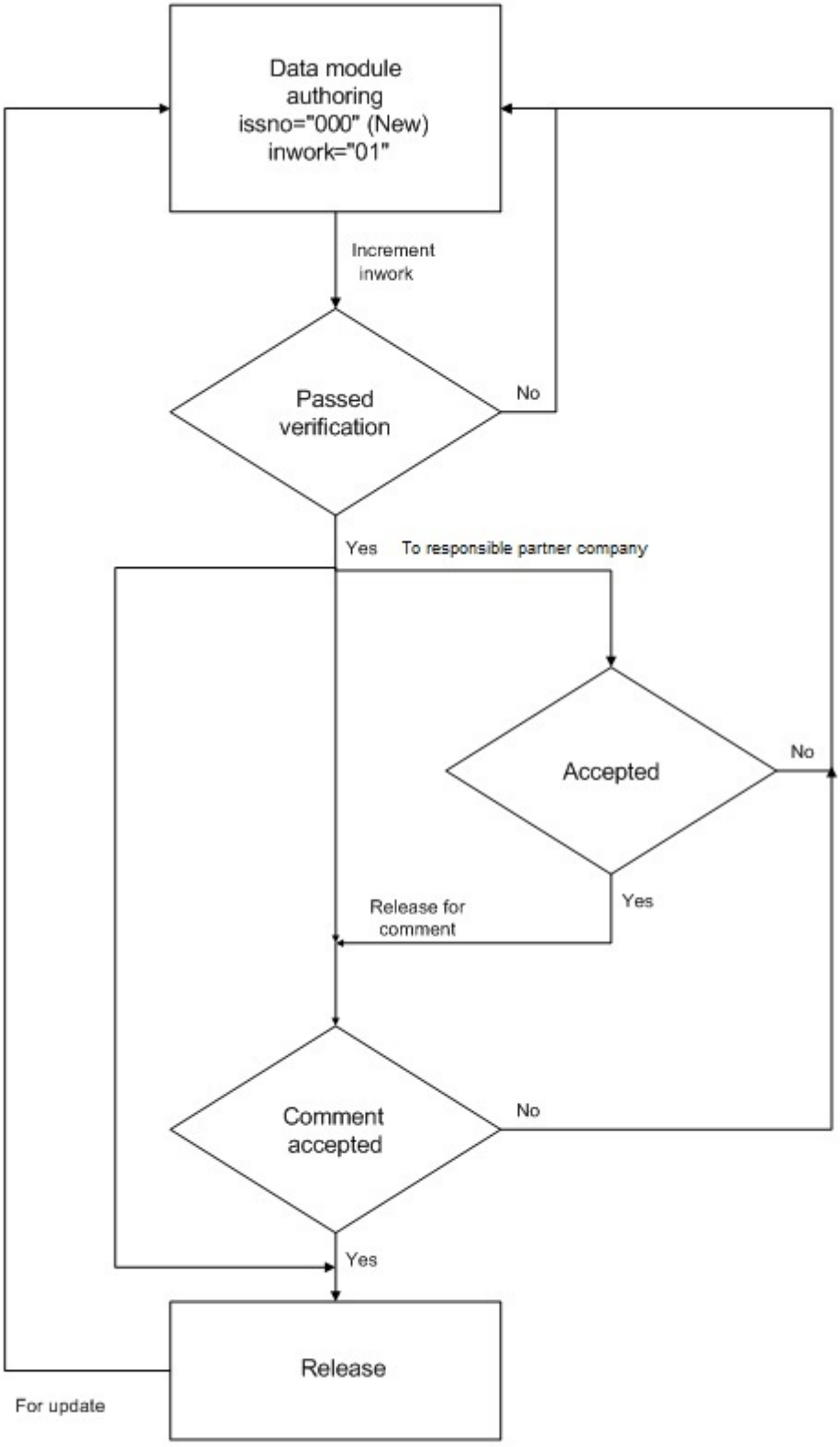
2.4.1 Simple example

In the case of the simple project that has one supplier, one customer and one Product, the review cycle is relatively simple as shown in Fig 2.

2.4.2 Complex example

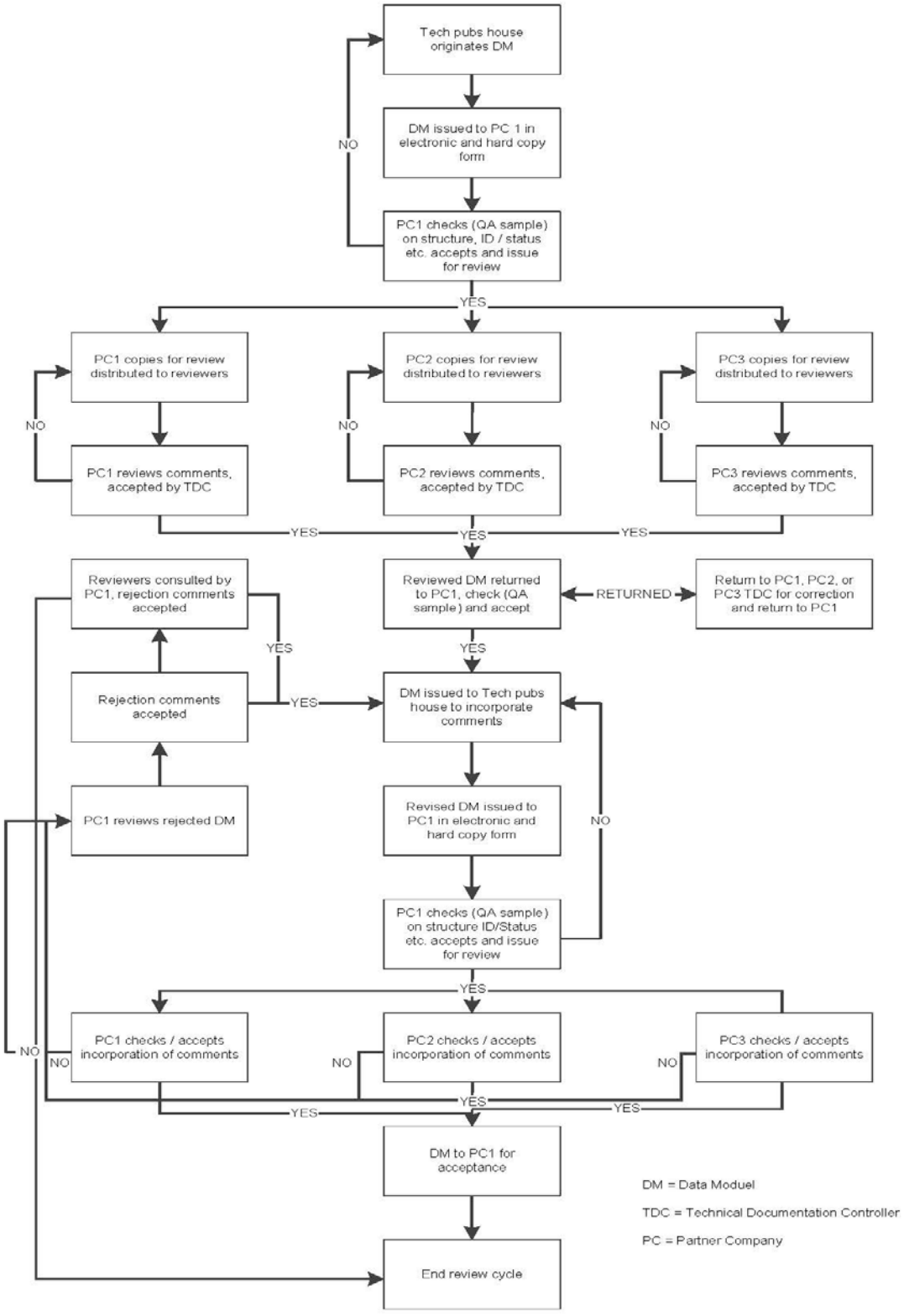
In more complex contractual arrangements, a consortium of companies could be responsible for the whole project. The example shown in Fig 3 contains less detail than that of Fig 2 as there are three partner companies who are each a design authority for a contributing part of the Product and one of them, in this example Partner Company 1 (PC1), has the lead function for technical publications. This lead company has decided to outsource the production of data modules to a “Tech pubs house”.

As lead technical publications function, PC1 has the responsibility to the project for the QA aspects of all data modules that are produced in support of all three contributing companies. Therefore, it is PC1 who must ensure that all three contributing companies (PC2 and PC3) become involved in validating that the correct data modules have been produced and that those that have been produced are technically accurate and safe to use.



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Fig 2 Simple QA review cycle - Example



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Fig 3 Complex QA review cycle - Example

Chapter 3.8

Information generation - Disassembly principles

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1 General

The disassembly principles have a basic principle supported by three rules.

2 Disassembly principles

2.1 Basic principle

The disassembling principle is based on the consecutive numbering of assemblies obtained during equipment disassembly and subsequent maintenance activities. The assemblies numbered are subsequently allocated their own set of data modules. The allocation of "00" is reserved for the complete equipment followed by sequential numbering in accordance with this chapter.

Note

The numbering sequence is not necessarily inline with any step by step maintenance task.

2.2 Rules for numbering assemblies

Assemblies need to be numbered, using the disassembly code, only if one or more of the following three conditions apply:

2.2.1 Rule No. 1

The first condition for numbering an assembly, using the disassembly code, is the performance of further maintenance actions on that assembly. If there are no maintenance actions performed on an assembly, that assembly will not be allocated a number or a set of data modules.

2.2.2 Rule No. 2

The second condition for the allocation of a number, using the disassembly code, is the complexity of an assembly. Simple assemblies may not need data modules. This is to prevent unnecessary breakdown of maintenance information.

2.2.3 Rule No. 3

In addition and to prevent unnecessary breakdown, a number is allocated, using the disassembly code, only in such cases where the volume of maintenance information relating to maintenance actions to be taken is sufficient to warrant an individual data module to be prepared.

2.3 Assemblies and parts

As a rule disassembly generates parts, which happens when an assembly is disassembled. Since maintenance actions might sometimes be applicable to parts as well as assemblies, the following rule applies:

– If maintenance actions on parts need to be performed, the information must be included in the data module of the assembly to which the parts belong, unless the issue of separate data modules is justified. The same applies to those assemblies which are not allocated an individual number in accordance with rules No. 2 and No.3, above, despite maintenance actions being required.

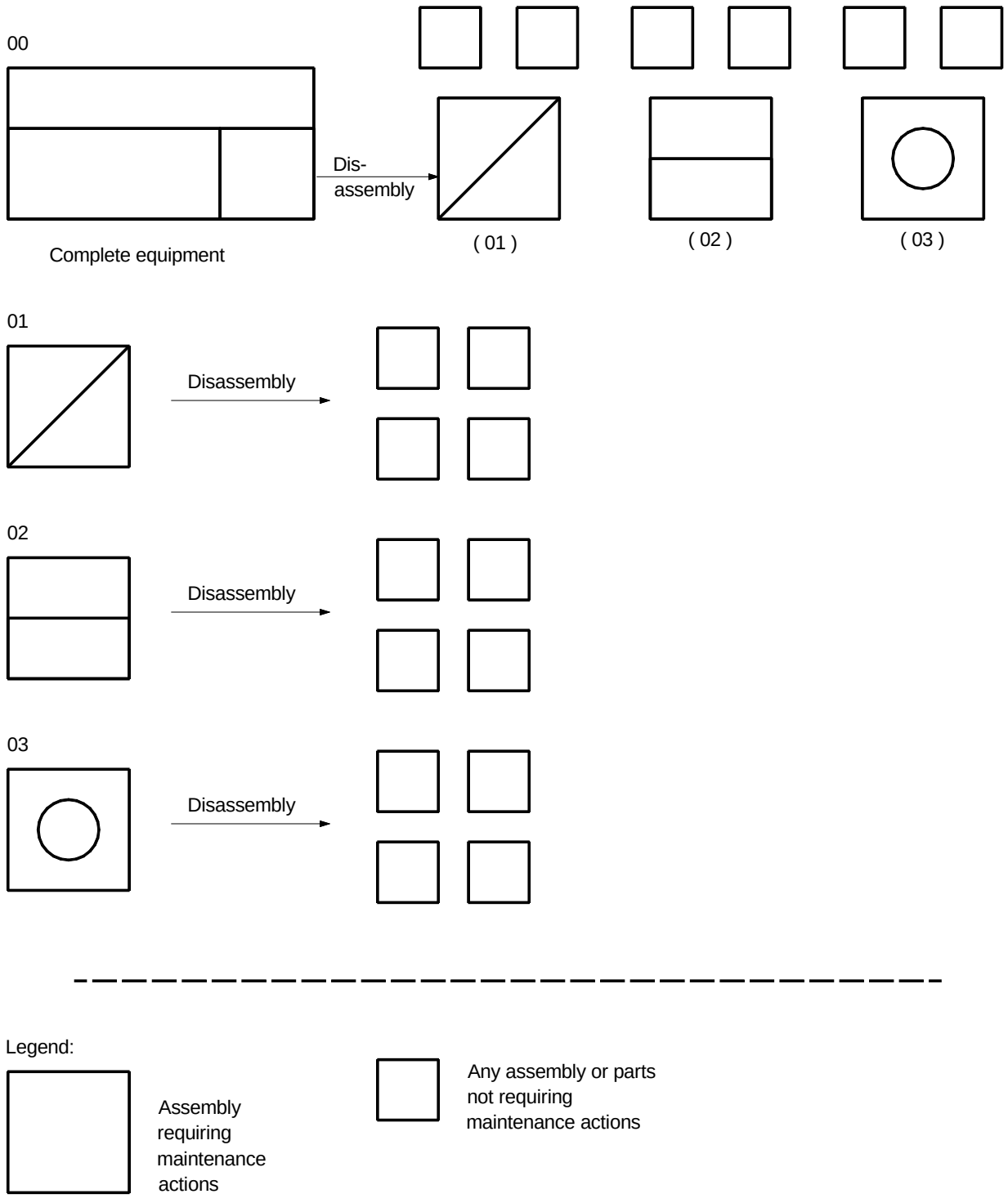
2.4 Symbolic explanation

2.4.1 Simple example

A simple symbolic example is shown in Fig 1. Based on the complete equipment, the process of disassembly into assemblies and parts is described. The following assemblies/parts are obtained during disassembly of the complete equipment (ie, the subject being disassembled (disassembly code = "00")):

- three assemblies, which are subject to further maintenance actions
- six assemblies/parts, which do not require maintenance

In this case, all of the three assemblies, which are subject to further maintenance actions, will be numbered in accordance with the three rules given in Para 2.2. The disassembly code for these will be allocated the numeric characters "01", "02" and "03" and will thus be provided with a separate set of data modules each; the sets will be marked with the subjects of disassembly: "01", "02" or "03". Under the maintenance actions, these three subjects of disassembly will be further disassembled into assemblies/parts that do not require further maintenance actions.



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Fig 1 Disassembling principle - Simple example

2.4.2 Complex example

A complex symbolic example is shown in Fig 2. Based on the complete equipment (ie, the subject being disassembled (disassembly code = "00")) all pipes, hoses and cables will be removed during the first step of disassembly. In this case, they are not subject to further maintenance actions.

The equipment, less the pipes, hoses and cables (which have previously been removed) is subject to further maintenance actions and, therefore, the disassembly code is allocated the numeric characters "01". In accordance with the maintenance activity (as described in the set of data modules) another step of disassembly is undertaken; removal of accessories. The removal of the three accessories will generate four assemblies in total, all of which are subject to further maintenance actions and, therefore, have their disassembly codes allocated a number. The accessories will have their disassembly codes set to "02", "03" and "04", and the remaining assembly will have its disassembly code set to "05".

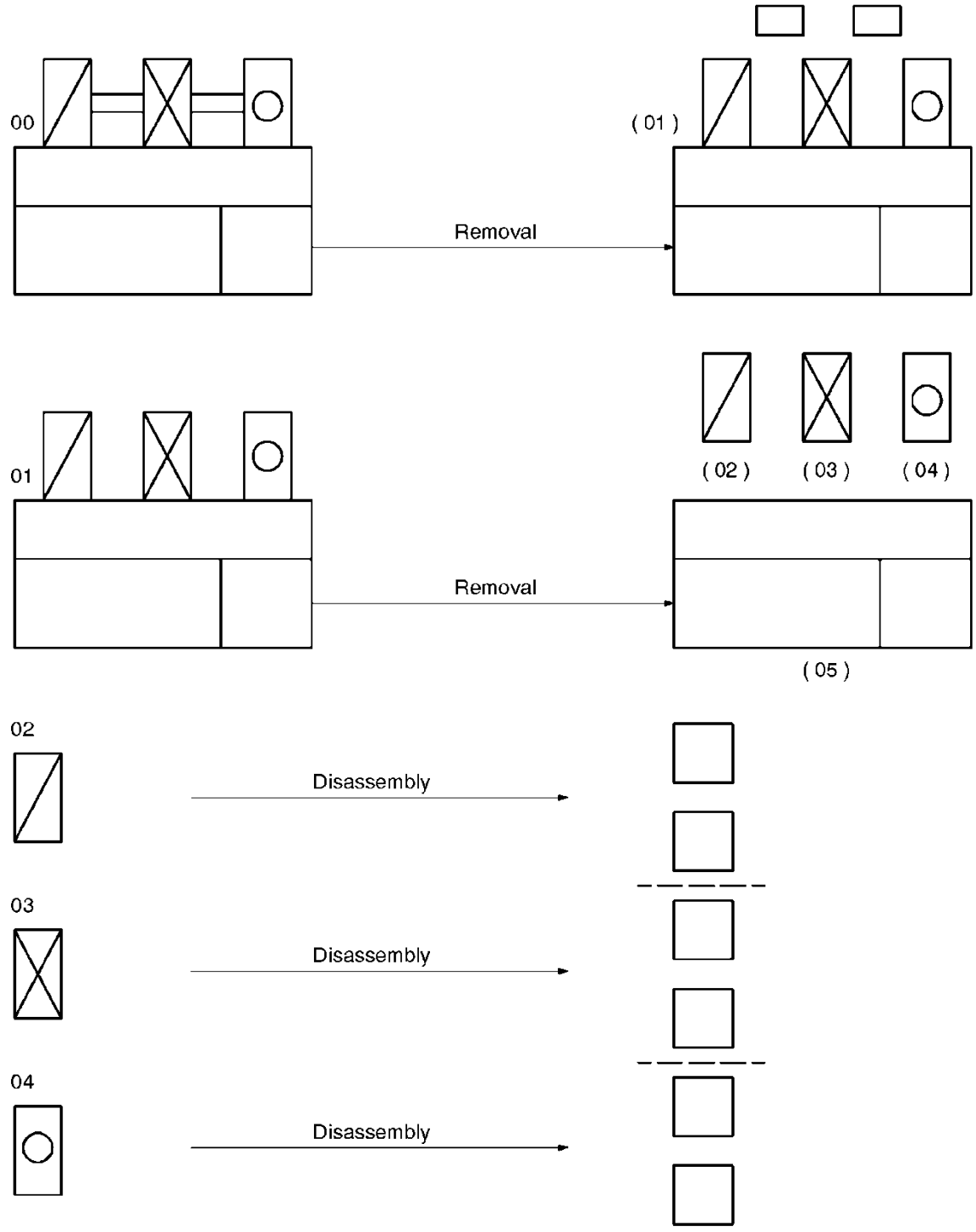
For each of the four assemblies, there is a separate set of data modules which will be identified with the appropriate setting of disassembly code to "02", "03", "04" and "05", as appropriate. Under the appropriate maintenance actions, accessories are further disassembled as shown, that is, into assemblies/parts that do not require further maintenance actions.

The subject of disassembly, "05", is more complex in structure. Under maintenance actions, it is further disassembled into three subassemblies which in turn are subject to maintenance actions. This gives further data modules with their of disassembly codes set to "06", "07" and "08", respectively, to support each of the disassembled items.

The subjects of disassembly, "06" and "07", are further disassembled under the appropriate maintenance actions, with an additional assembly requiring maintenance actions resulting in each case, (ie, subjects of disassembly "09" and "10").

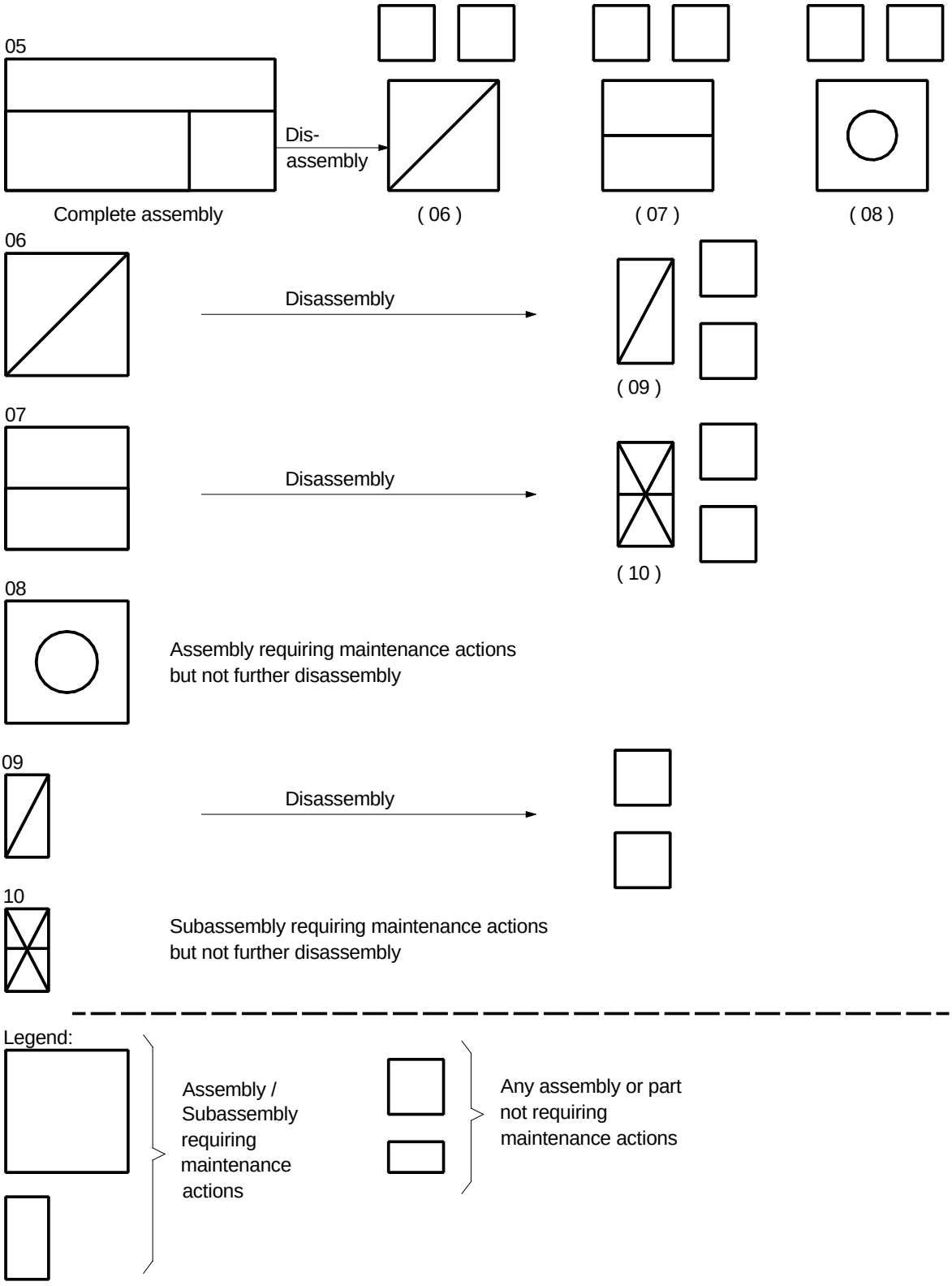
There is no need to disassemble subject of disassembly "08" any further for the maintenance actions. There is, however, a requirement for a set of data modules as the assembly requires maintenance actions.

Finally, the subject of disassembly "09" is subjected to final disassembly within the scope of the appropriate set of data modules. The subject of disassembly "10" is not disassembled further but is itself subject to maintenance actions.



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Fig 2 Disassembling principle - Complex example (Sheet 1 of 2)



ICN-S3627-S1000D0723-001-01

Fig 2 Disassembling principle - Complex example (Sheet 2 of 2)

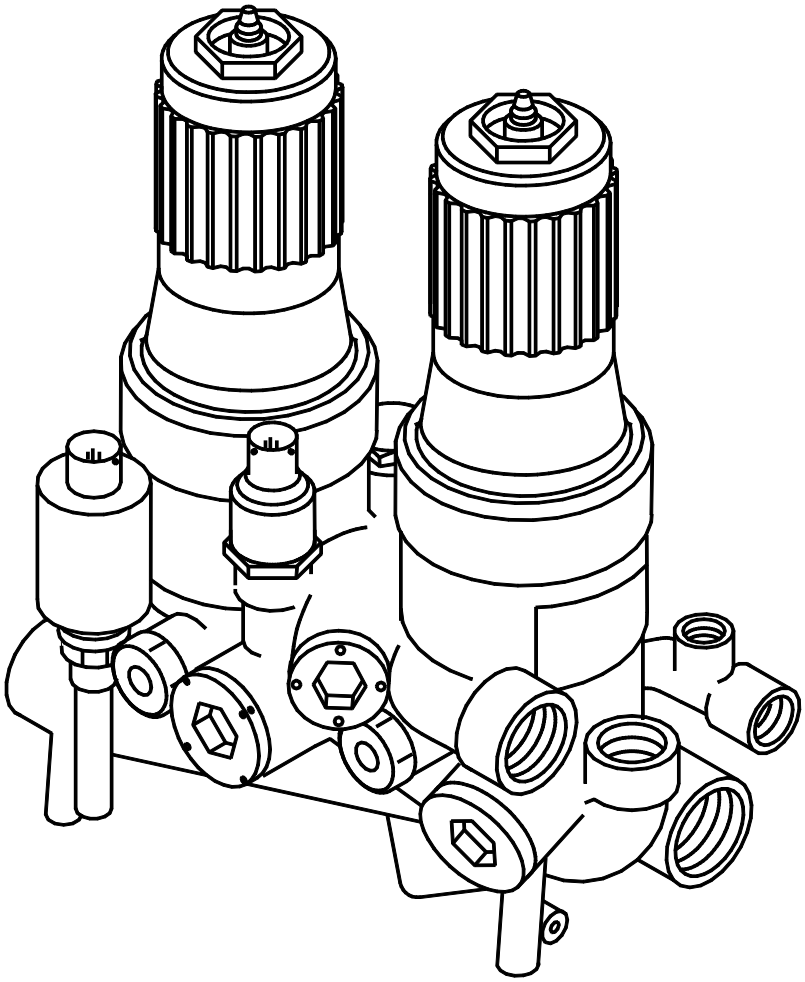
2.5 Examples

2.5.1 Example 1 - Hydraulic assembly

All information (ie, the supporting set of data modules) relating to the complete hydraulic assembly has its disassembly code set to "00" in accordance with the rules for the subject of disassembling as shown in Fig 3. The assignment of further disassembly codes in support of items further disassembled, for example, can be found under Information Code "041" (constructional description, refer to Fig 4).

In this case, assemblies without a number require no further maintenance actions. The number of further disassembled subjects is, therefore, seven ("01" thru "07"). The disassembling of the hydraulic assembly itself is also a maintenance action which relates to the complete equipment and will, therefore, be coded using disassembly code "00" as shown in Fig 5.

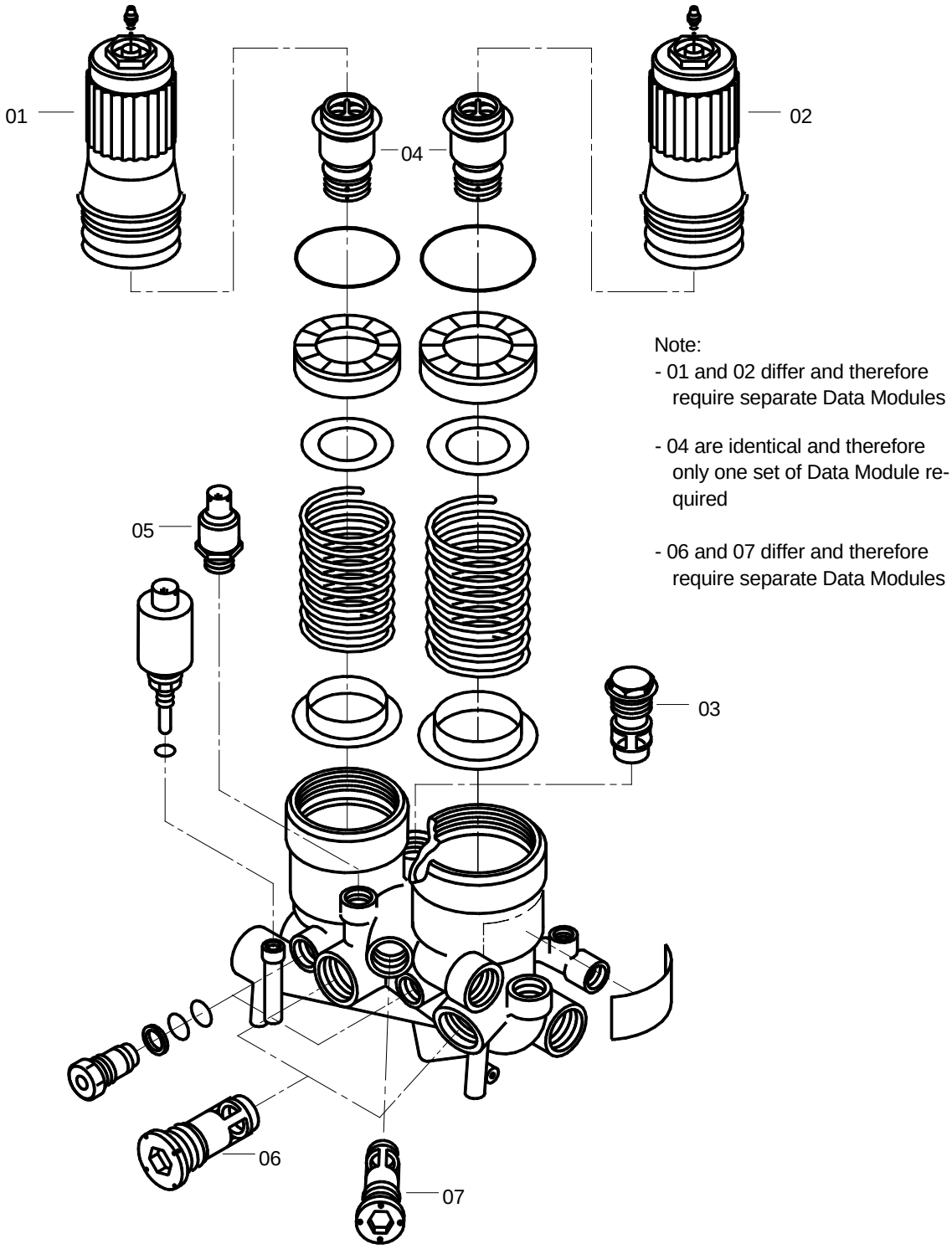
The disassembled subjects "01" thru "07" are allocated their own set of data modules, each of which is coded using the respective disassembly code setting ("01" thru "07"). In this example, the disassembled subjects "01" thru "07" are further disassembled within the scope of maintenance actions. The pertinent figures and data module codes for these disassembly actions are shown in Fig 6 thru Fig 12.



This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 00A - 041A - C (Constructional Description)

ICN-S3627-S1000D0724-001-01

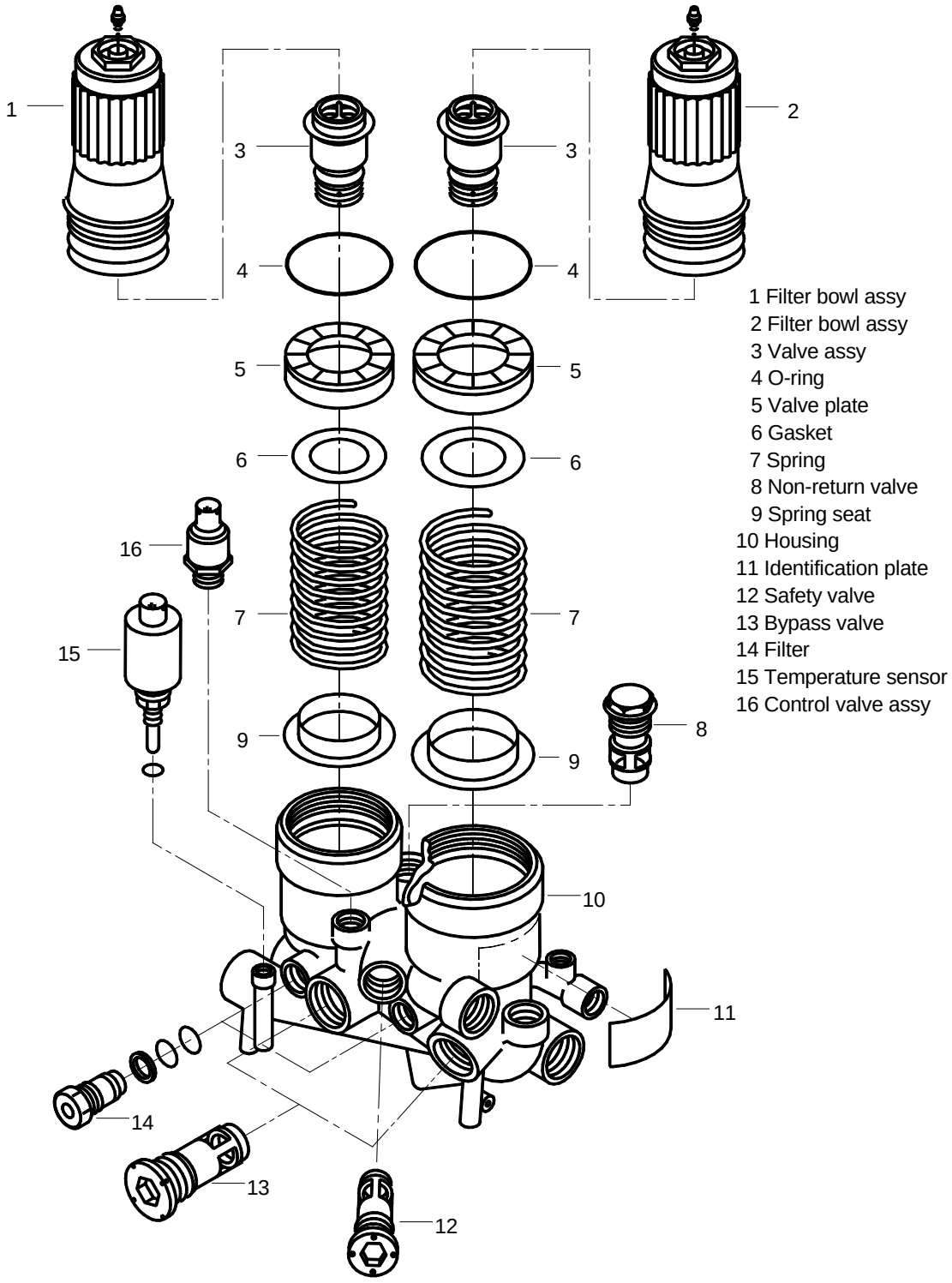
Fig 3 Disassembly code 00 (Removed complete component)



This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 00A - 041A - C (Disassembling)

ICN-S3627-S1000D0725-001-01

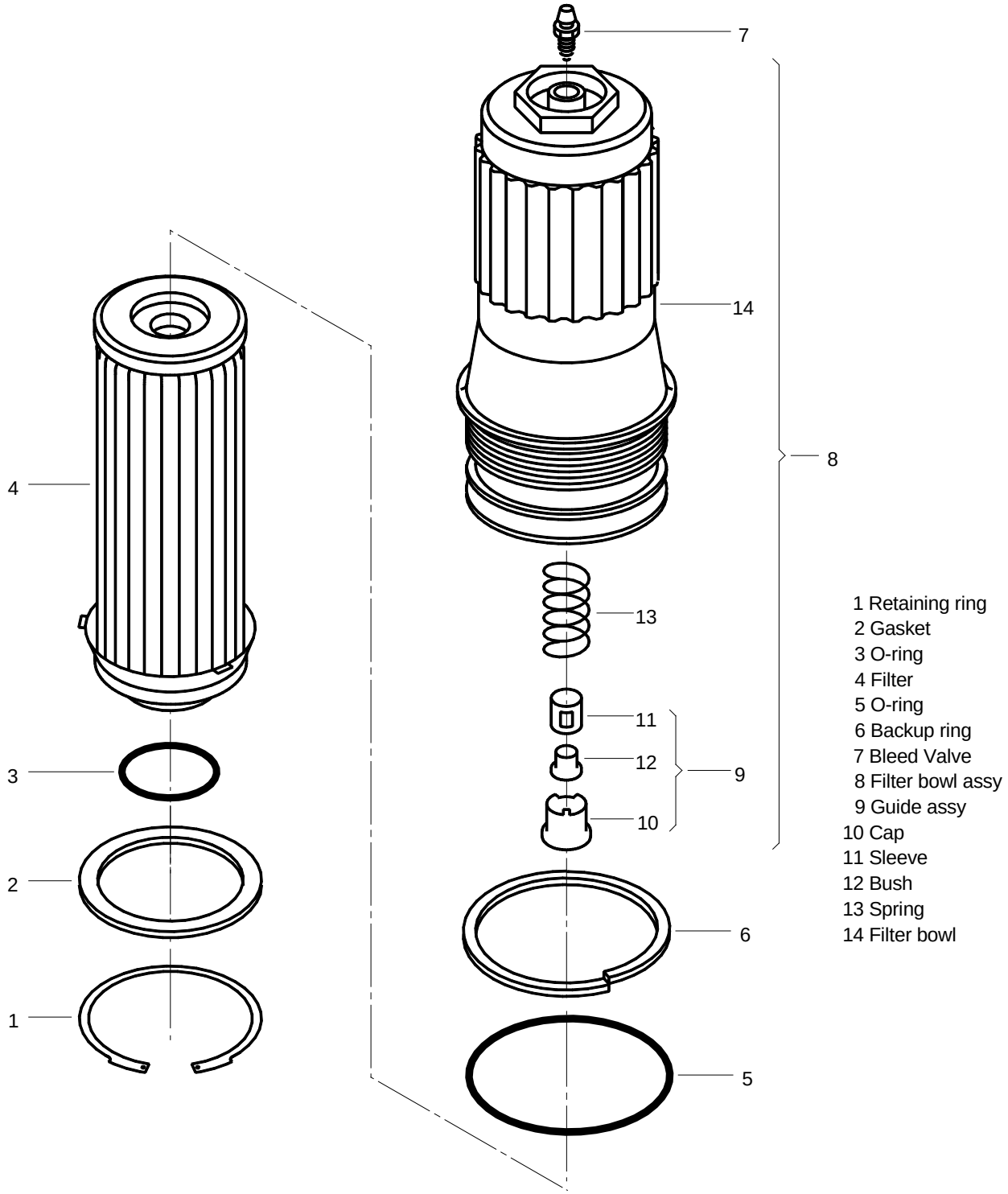
Fig 4 Disassembly code 00 (Assignment of subjects of disassembly)



This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 00A - 530A - C (Disassembling)

ICN-S3627-S1000D0726-001-01

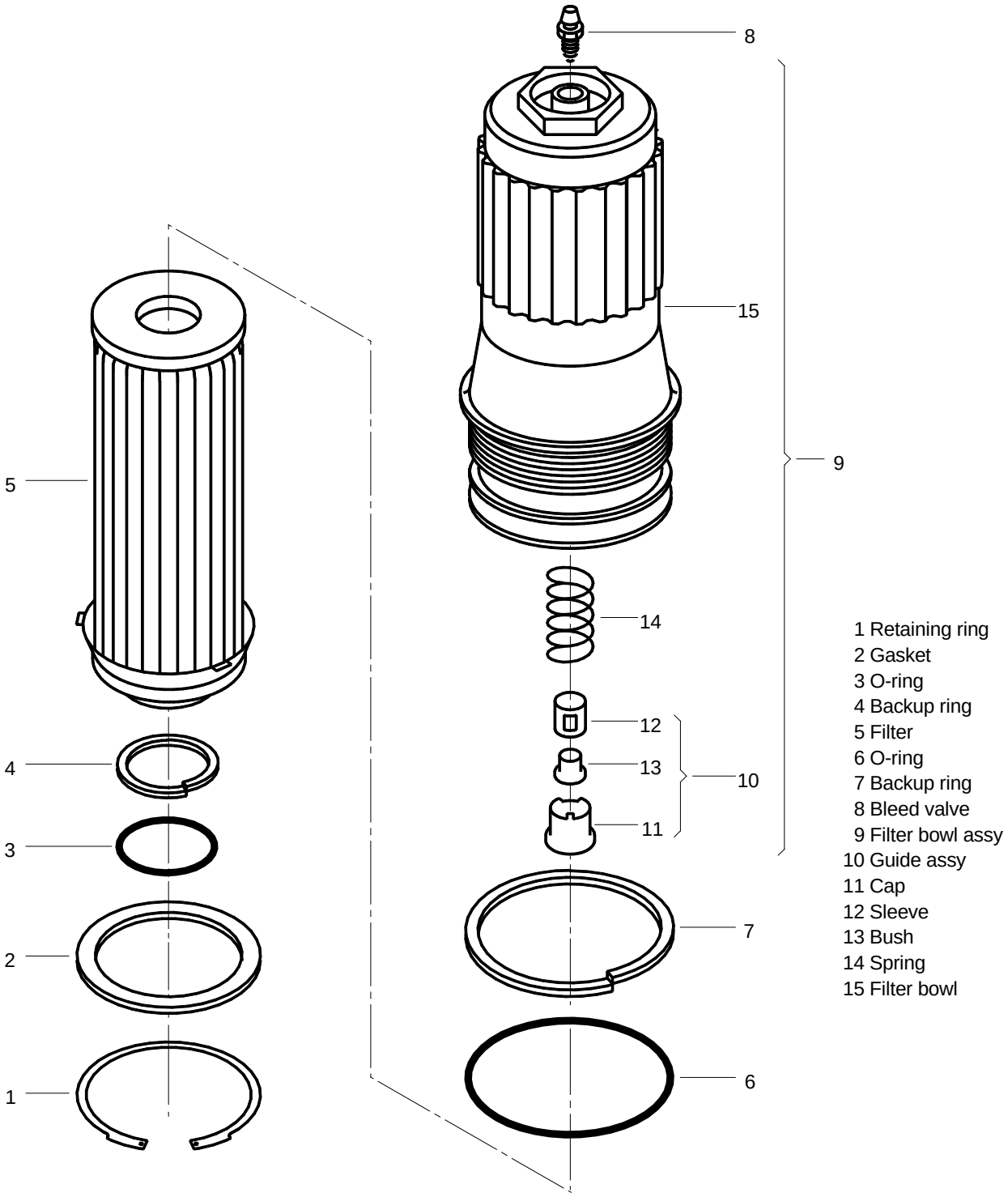
Fig 5 Disassembly code 00 (Component breakdown)



This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 01A - 530A - C (Disassembling)

ICN-S3627-S1000D0727-001-01

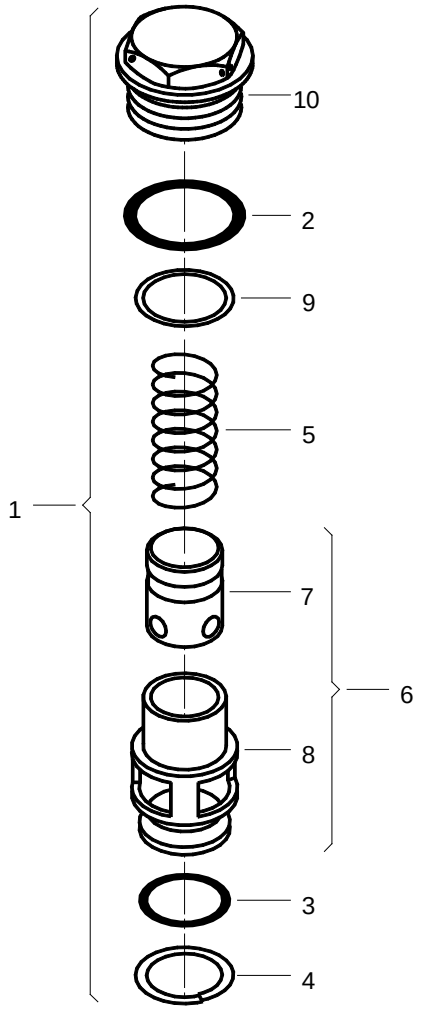
Fig 6 Subject of disassembly 01



This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 02A - 530A - C (Disassembling)

ICN-S3627-S1000D0728-001-01

Fig 7 Subject of disassembly 02

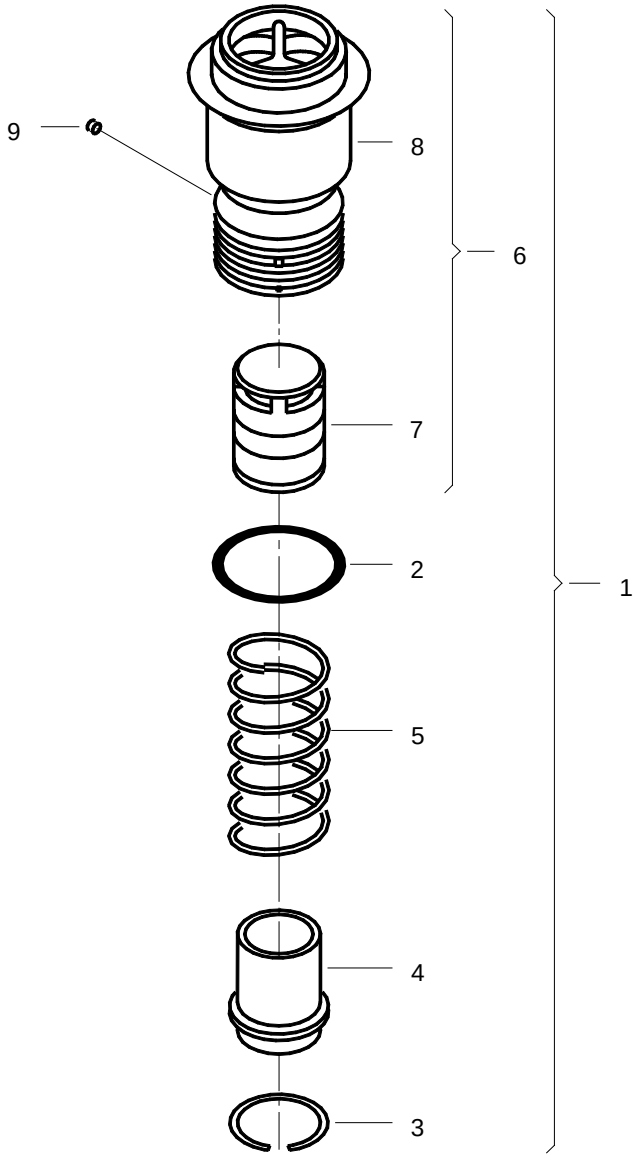


1 Non-return valve
2 O-ring
3 O-ring
4 Backup ring
5 Spring
6 Spool assy
7 Piston valve
8 Valve sleeve
9 Retaining ring
10 Plug

This figure will be on of the figures contained in Data Module
YY - A - XX-XX-XX - 03A - 530A - C (Disassembling)

ICN-S3627-S1000D0729-001-01

Fig 8 Subject of disassembly 03

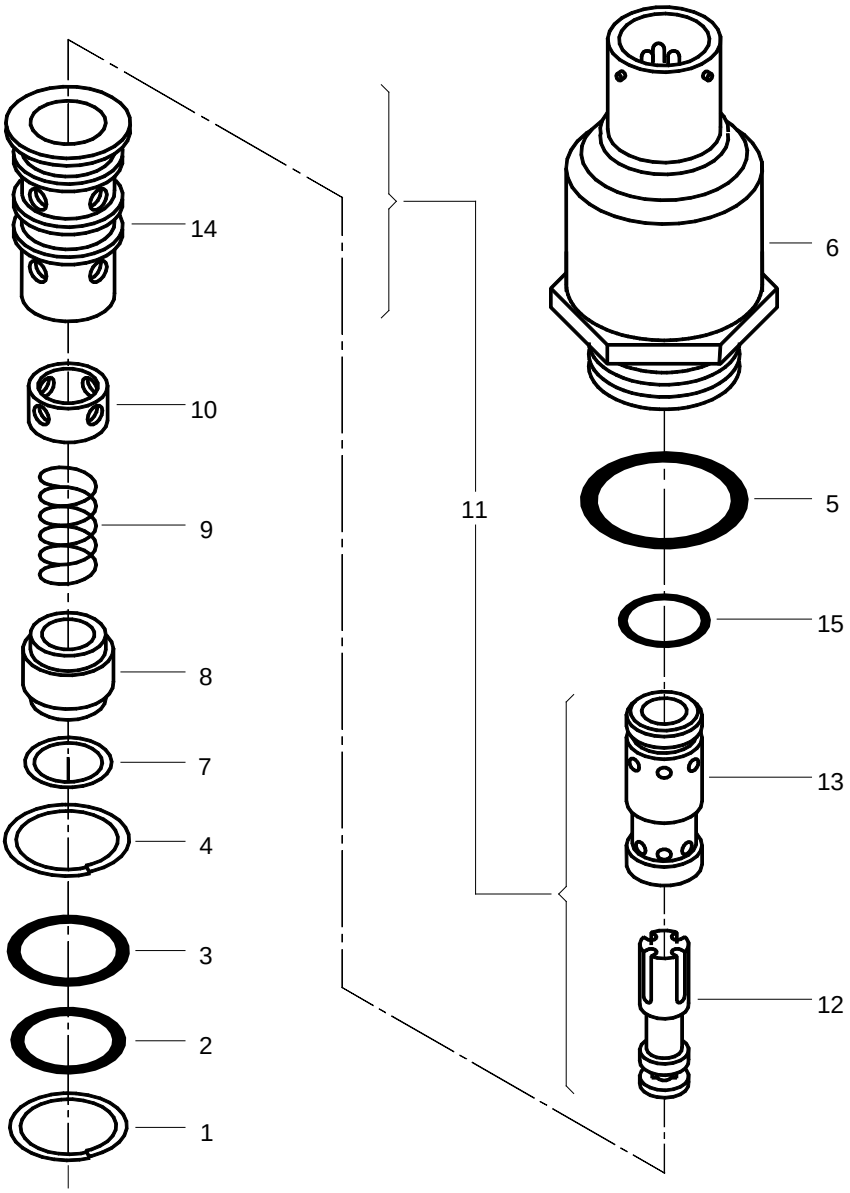


1 Valve assy
2 O-ring
3 Retaining ring
4 Distance sleeve
5 Spring
6 Piston and valve assy
7 Piston valve
8 Valve housing
9 Plug

This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 04A - 530A - C (Disassembling)

ICN-S3627-S1000D0730-001-01

Fig 9 Subject of disassembly 04

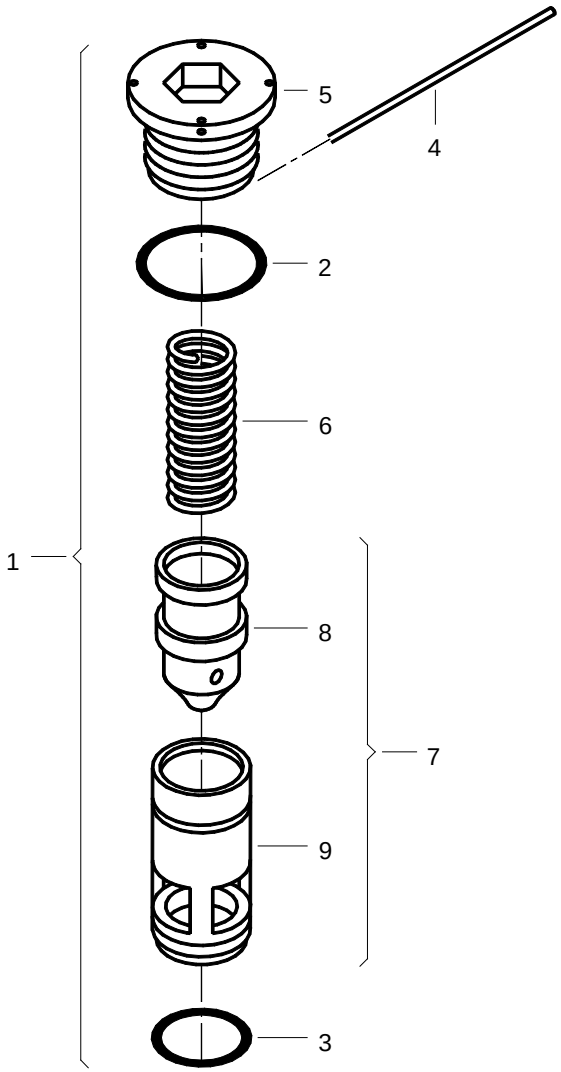


1 Backup ring
2 O-ring
3 O-ring
4 Backup ring
5 O-ring
6 Valve
7 Locking ring
8 Sleeve
9 Spring
10 Sleeve
11 Spool assy
(composed of
parts 12, 13, 14)
12 Spool
13 Sleeve
14 Housing
15 O-ring

This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 05A - 530A - C (Disassembling)

ICN-S3627-S1000D0731-001-01

Fig 10 Subject of disassembly 05

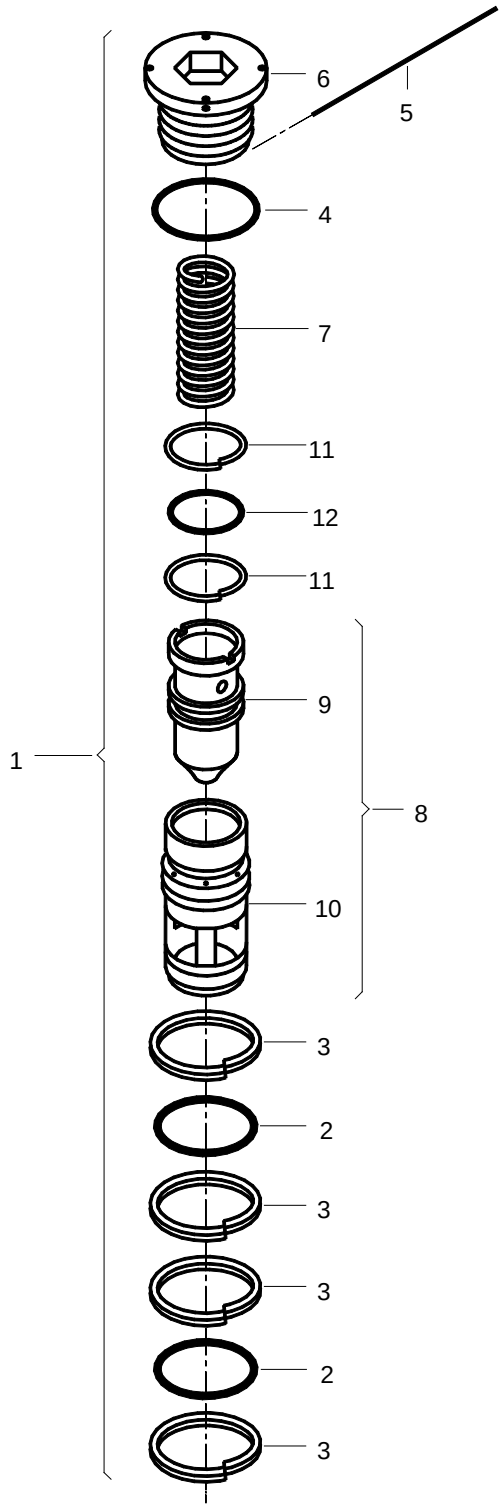


1 Bypass valve
2 O-ring
3 O-ring
4 Pin
5 Plug
6 Spring
7 Spool assy
8 Piston valve
9 Valve sleeve

This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 05A - 530A - C (Disassembling)

ICN-S3627-S1000D0732-001-01

Fig 11 Subject of disassembly 06



1 Bypass valve
2 O-ring
3 Backup ring
4 O-ring
5 Pin
6 Plug
7 Spring
8 Spool assy
9 Piston valve
10 Valve sleeve
11 Backup ring
12 O-ring

This figure will be one of the figures contained in Data Module
YY - A - XX-XX-XX - 07A - 530A - C (Disassembling)

ICN-S3627-S1000D0733-001-01

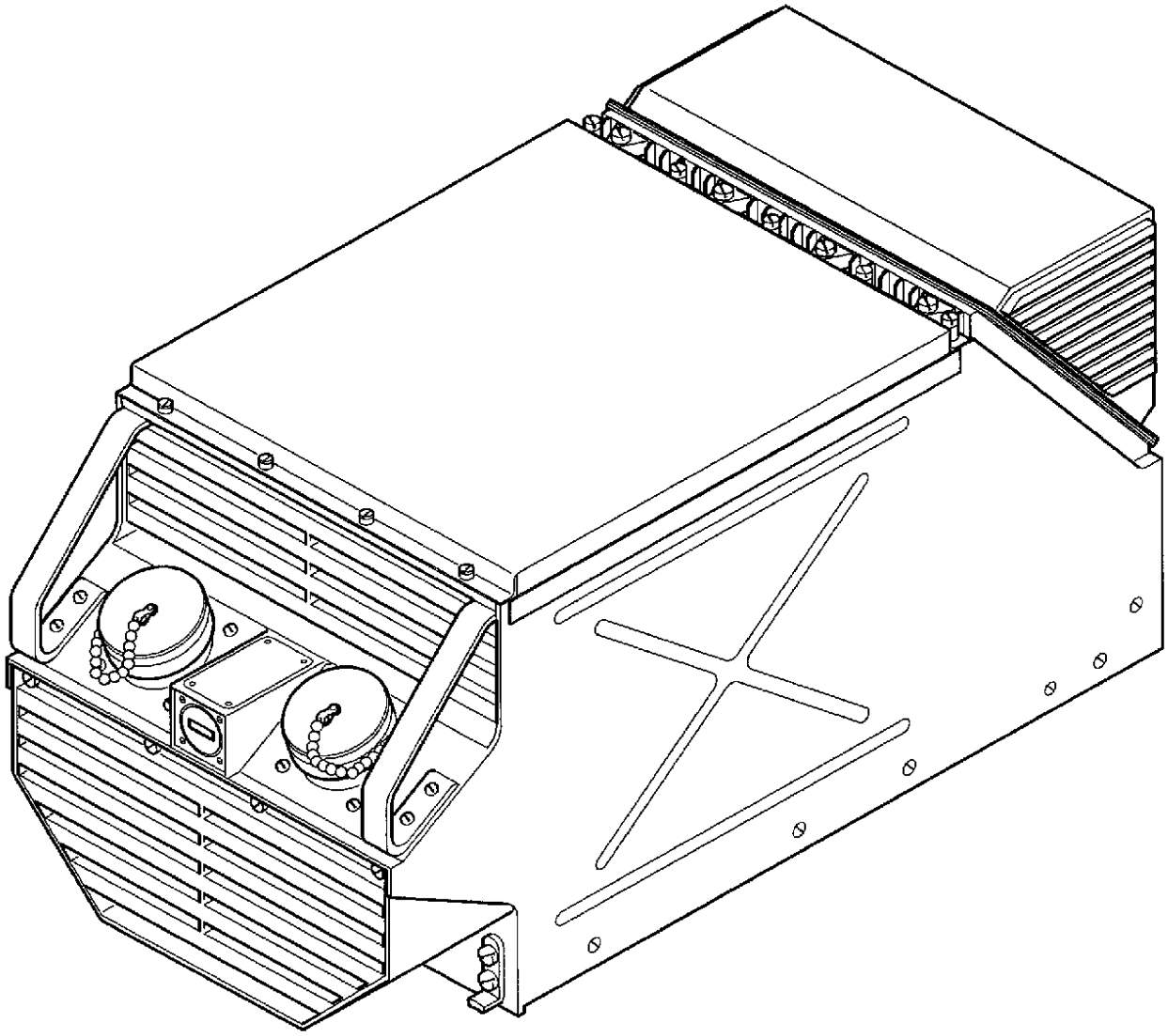
Fig 12 Subject of disassembly 07

2.5.2 Example 2 - AFDS computer

The removed complete computer, (disassembly code "00"), is shown in Fig 13. Fig 14 shows further disassembled subjects.

As a particular feature of this example, assembly "01" is disassembled into two further subassemblies, "14" and "15" as shown in Fig 14. Both subassemblies are subject to maintenance actions.

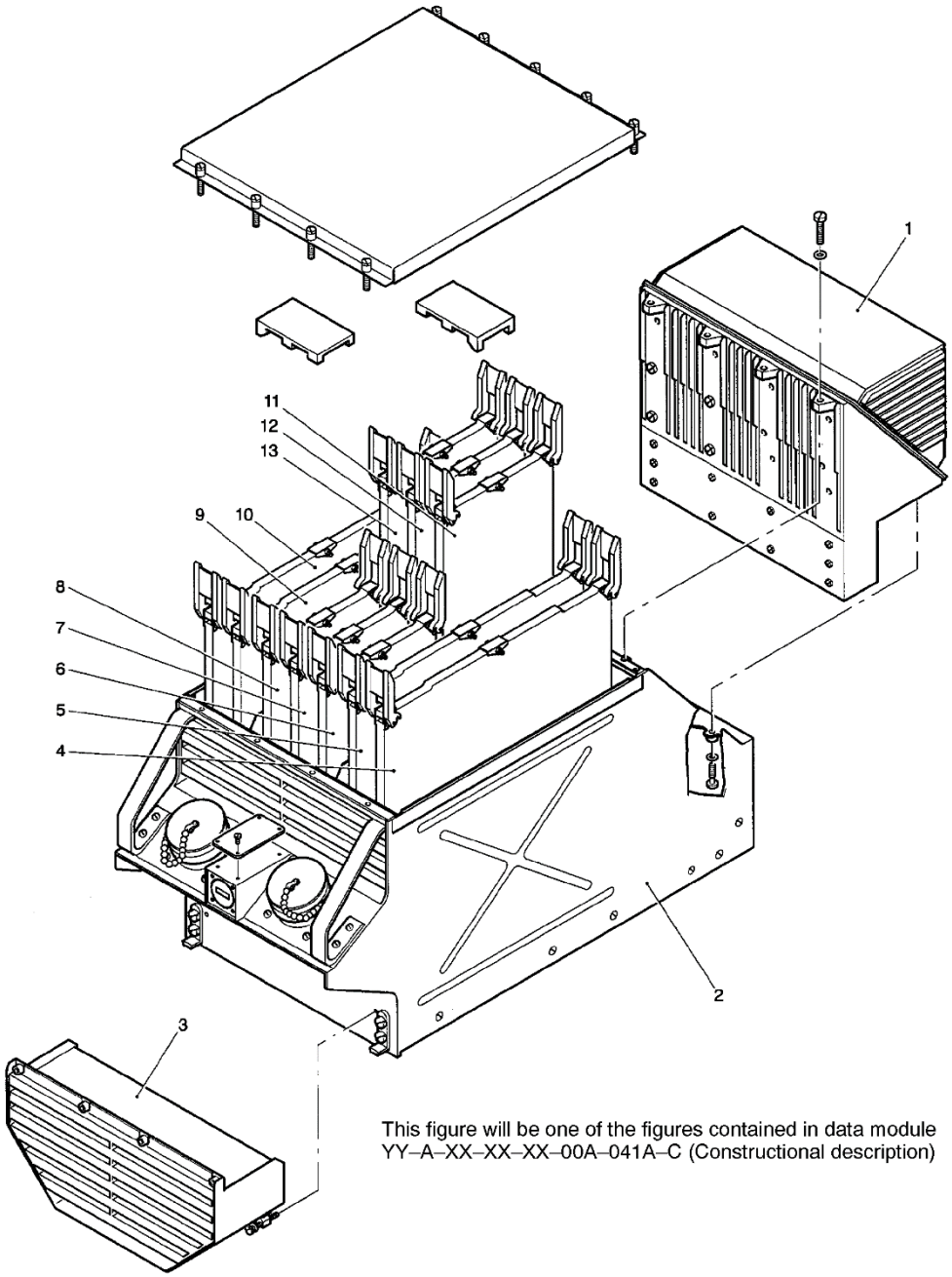
The disassembly of the complete computer into its assemblies is as shown in Fig 15, and the disassembly of the subject with the disassembly code set to "01" is shown in Fig 16. Further disassembly of subjects with disassembly codes set to "02" and "03", are shown in Fig 17 and Fig 18, respectively.



This figure will be one of the figures contained in data module
YY-A-XX-XX-XX-00A-041A-C (Constructional description)

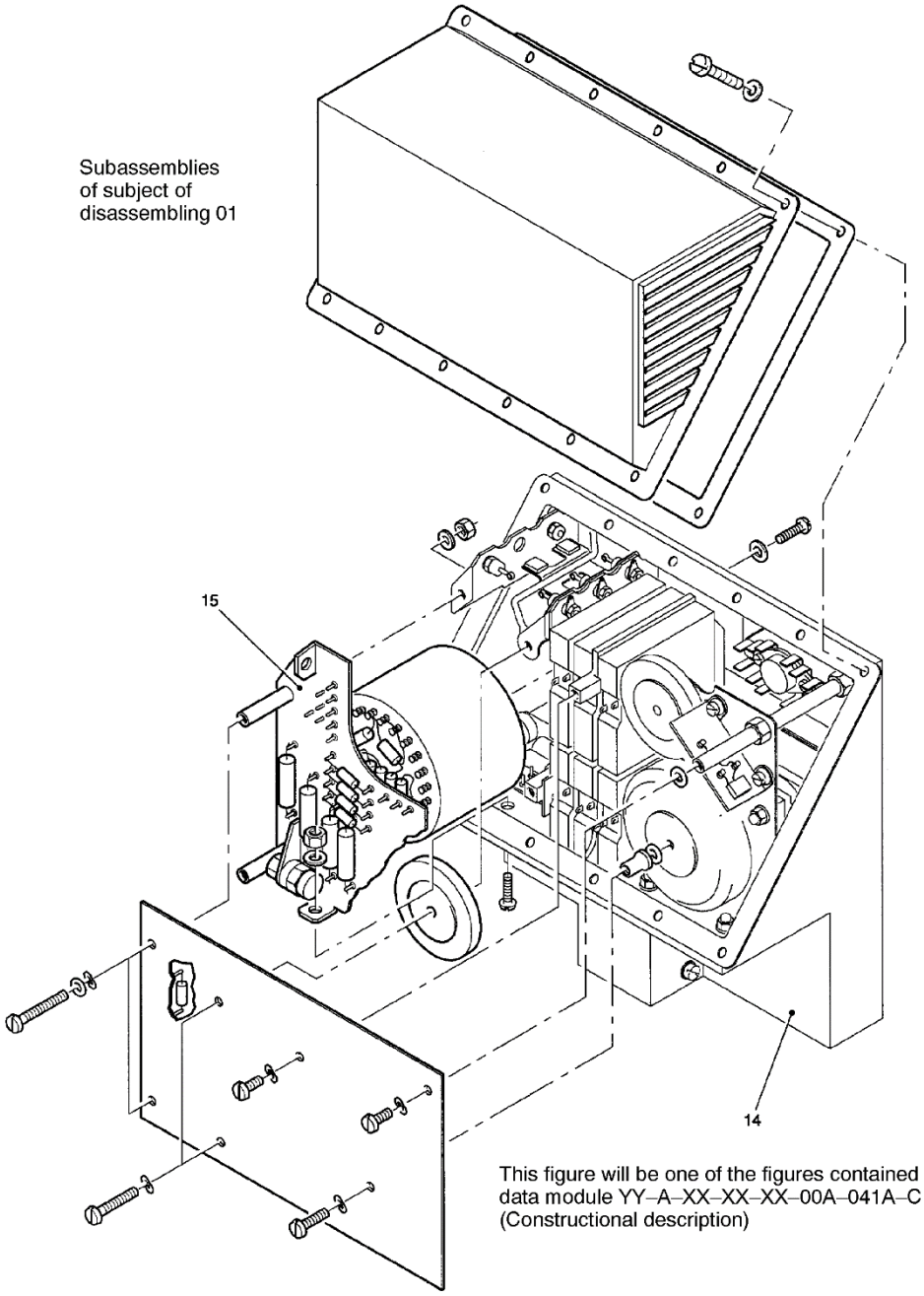
ICN-S3627-S1000D0734-001-01

Fig 13 Disassembly code 00 (Removed complete component)



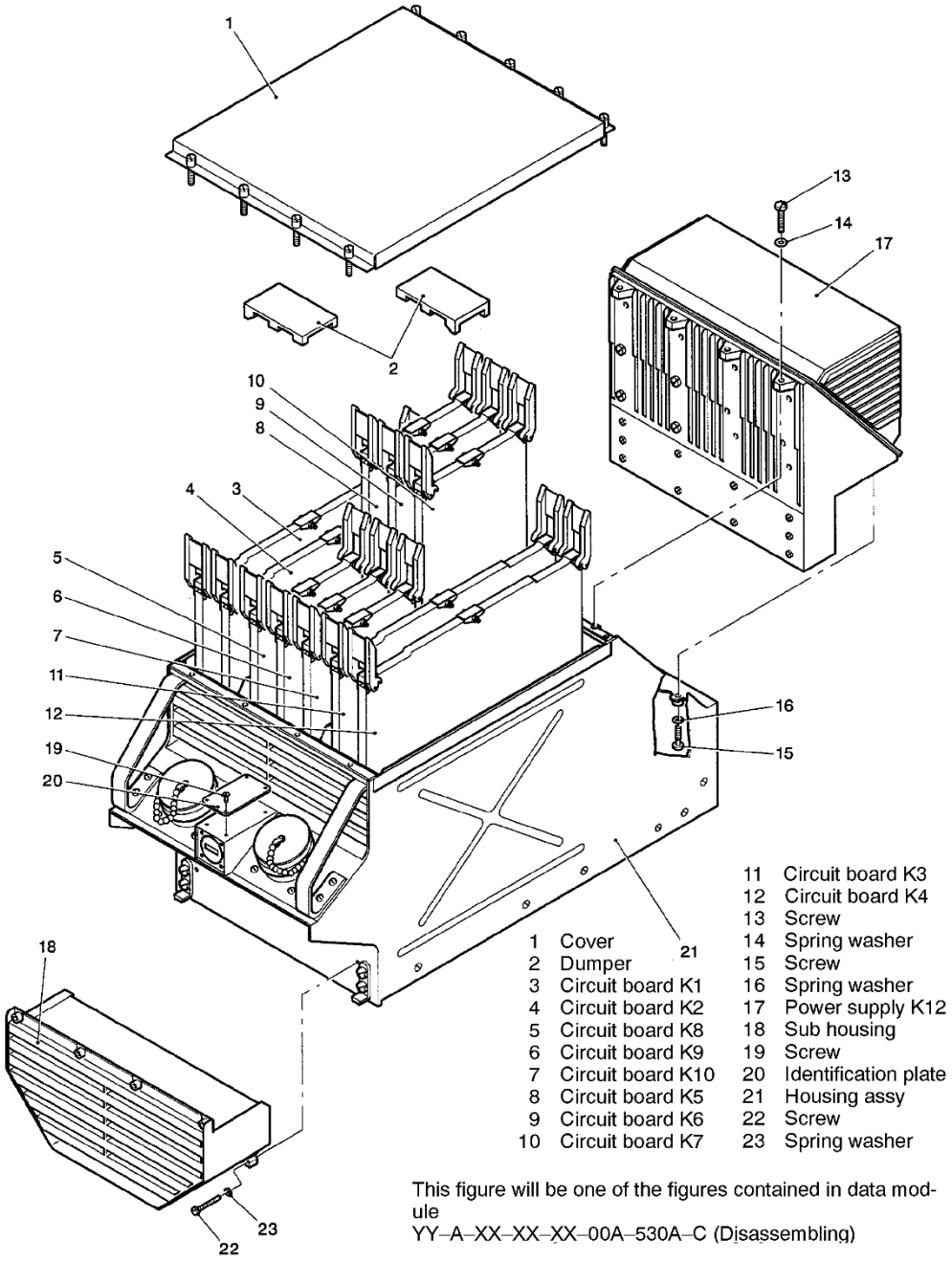
ICN-S3627-S1000D0735-001-01

Fig 14 Disassembly code 00 (Assignment of subjects of disassembly) (Sheet 1 of 2)



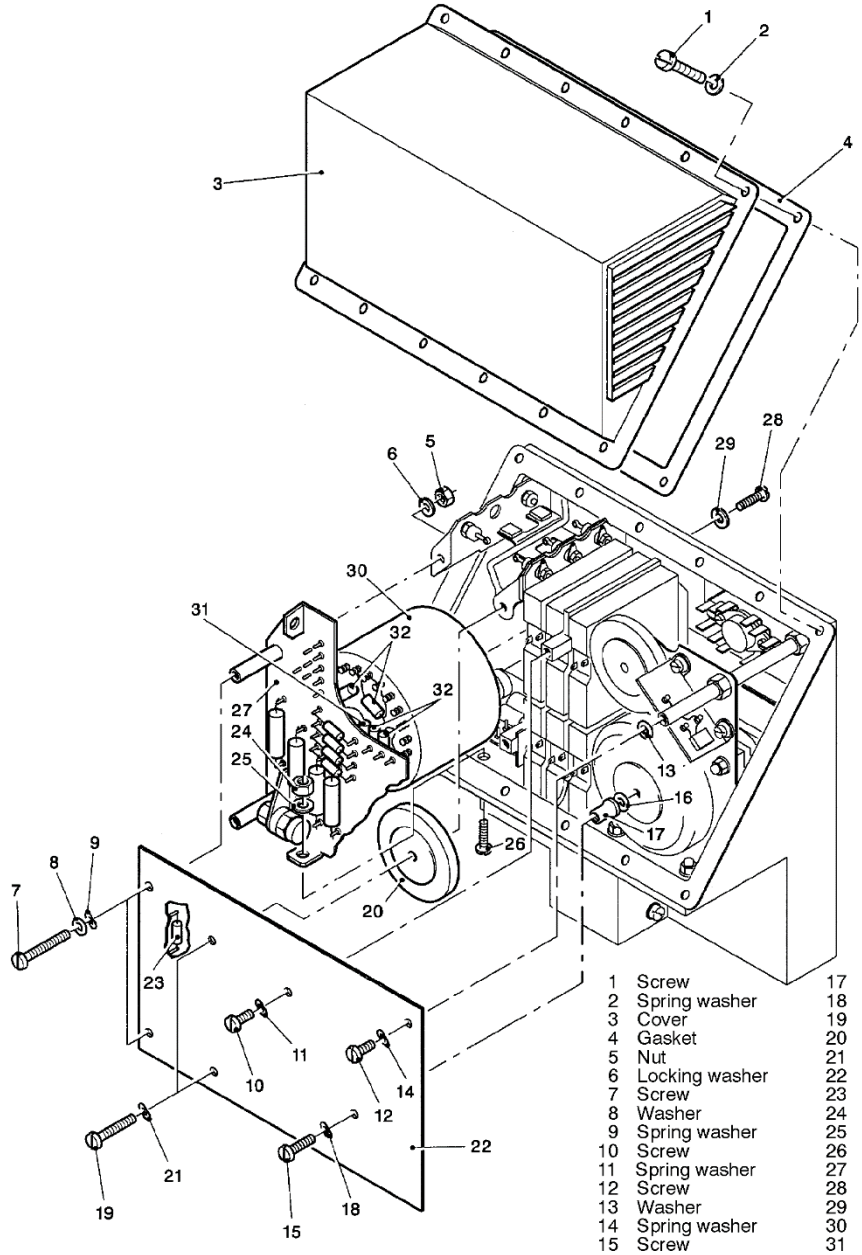
ICN-S3627-S1000D0736-001-01

Fig 14 Disassembly code 00 (Assignment of subjects of disassembly) (Sheet 2 of 2)



ICN-S3627-S1000D0737-001-01

Fig 15 Disassembly code 00 (Component breakdown)

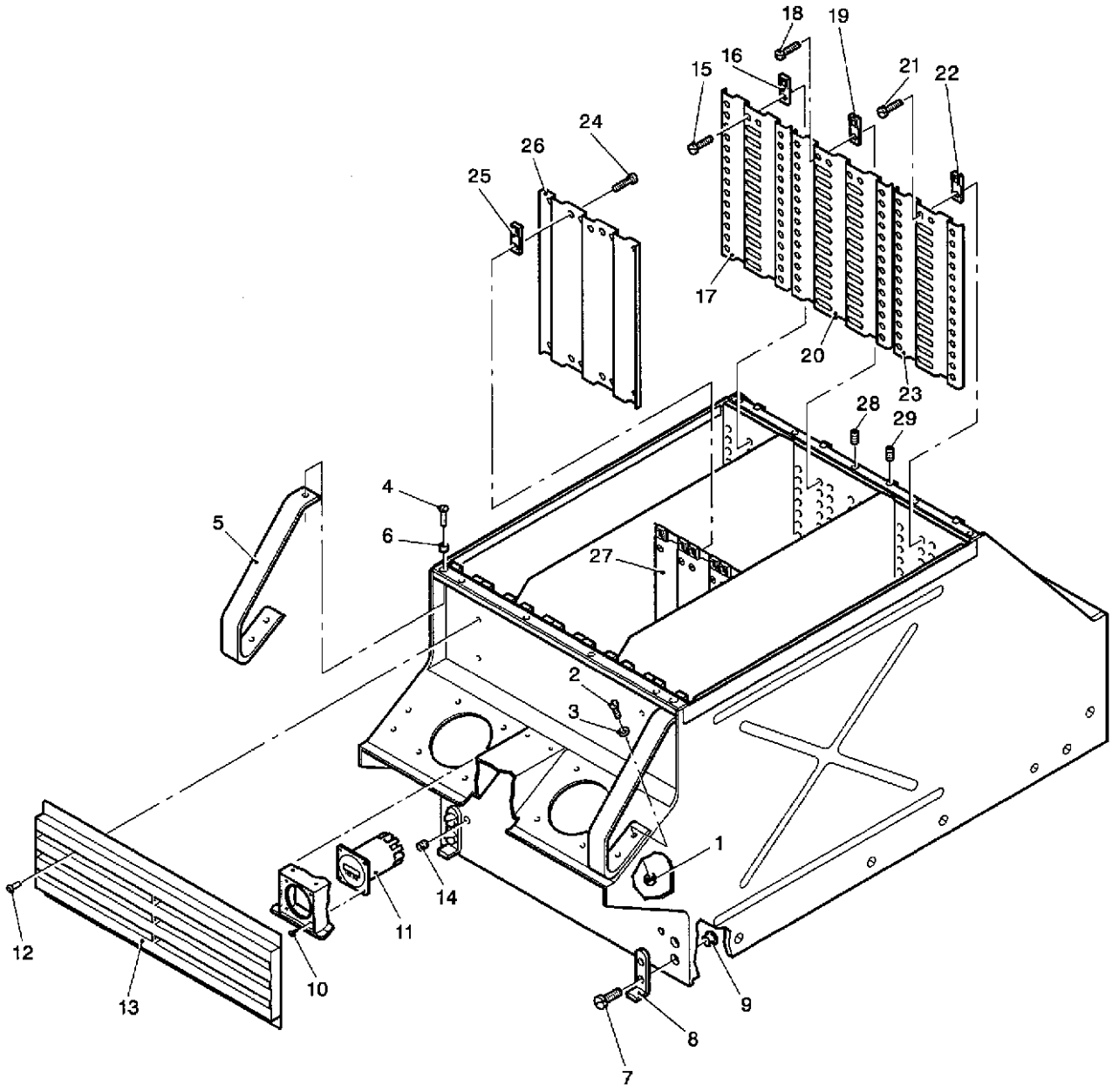


1	Screw	17	Distance sleeve
2	Spring washer	18	Spring washer
3	Cover	19	Screw
4	Gasket	20	Choke L4
5	Nut	21	Spring washer
6	Locking washer	22	Circuit board
7	Screw	23	Resistor R24
8	Washer	24	Nut
9	Spring washer	25	Spring washer
10	Screw	26	Screw
11	Spring washer	27	Circuit board
12	Screw	28	Screw
13	Washer	29	Washer
14	Spring washer	30	Transformer T1
15	Screw	31	Capacitor C11
16	Insulating washer	32	Capacitors C3

This figure will be one of the figures contained in data module
YY–A–XX–XX–XX–01A–530A–C (Disassembling)

ICN-S3627-S1000D0738-001-01

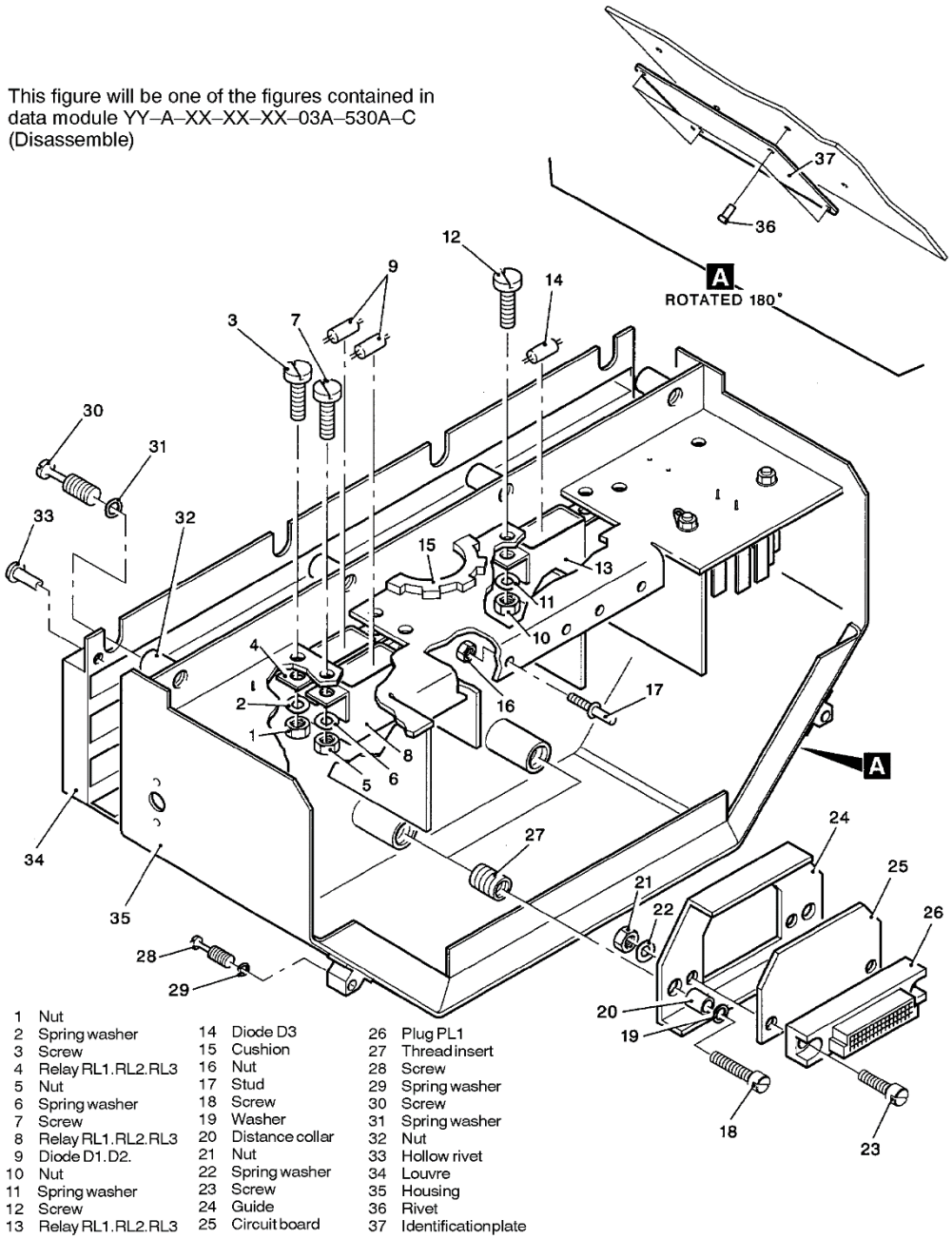
Fig 16 Subject of disassembly 01



1 Nut
2 Screw
3 Spring washer
4 Screw
5 Handle
6 Thread insert
7 Screw
8 Fixing lug
9 Threaded bush
10 Screw
11 Locking unit
12 Hollow rivet
13 Louvre
14 Thread insert
15 Screw
16 Stop
17 Guide plate
18 Screw
19 Stop
20 Guide plate
21 Screw
22 Stop
23 Guide plate
24 Screw
25 Stop
26 Guide plate
27 Guide plate
28 Thread insert
29 Thread insert

ICN-S3627-S1000D0739-001-01

Fig 17 Subject of disassembly 02



ICN-S3627-S1000D0740-001-01

Fig 18 Subject of disassembly 03

Chapter 3.9

Information generation - Authoring

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Chap 3.9.2	Authoring - Illustration rules and multimedia
Chap 3.9.3	Authoring - Warnings, cautions and notes
Chap 3.9.4	Authoring - Front matter
Chap 3.9.5	Authoring - Data modules
Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2	Data modules - Content section

1 General

To assist with authoring in a CSDB environment general guidance is given. Authoring in this environment is fundamentally different from traditional processes. There are rules, which are generic and applied to all data module types. There are other rules that are applied to specific data module types.

1.1 Purpose

The purpose of this chapter is to introduce the rules for authoring.

1.2 Scope

All authoring aspects for all data module types are covered in the subchapters of this chapter. In most cases there are business rules decision points associated with the data modules types on

which the project or the organization will have to make a decision. Chap 2.5 gives guidance on business rules.

2 Authoring

The rules and guidance for authoring are given in the following chapters:

- Chap 3.9.1 provides the general writing rules to be followed in the preparation of text. The rules set out the guidance for the preparation of operator and maintenance information.
- Illustrations are prepared to help the reader's understanding of the text, by amplifying and clarifying it and avoiding lengthy explanations. The rules for illustrations are detailed in Chap 3.9.2.
- Definitions, creation and use of warnings, cautions and notes are given in Chap 3.9.3.
- Chap 3.9.4 gives the rules for the creation of front matter data modules.
- Chap 3.9.5 explains markup including the basic XML terms and definitions.
- Definitions, creation, use and rules for the elements and attributes for the identification and status section are given in Chap 3.9.5.1.
- All the rules for the different data module types are given in Chap 3.9.5.2.

Chapter 3.9.1

Authoring - General writing rules

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Chap 3.9.5.2.1.5	Common constructs - Titles
Chap 5	Information sets and publications
Chap 6.2	Information presentation and use - Page-oriented publications
Chap 6.3	Information presentation and use - IETP
ASD-STE100	Simplified Technical English (ASD-STE100®)
ISO 6093	Information processing - Representation of numerical values in character strings for information interchange

Chap No./Document No.	Title
ISO/IEC 80000-2	Quantities and units - Part 2. Mathematical signs and symbols to be used in the natural sciences and technology

1 General

There are three methods of producing data modules:

- document production using traditional editing or What You See Is What You Get (WYSIWYG) systems
- XML production
- database driven production

The traditional production requires the author to manually enter most of the information, including titles/headings, etc. Headers and footers, table of contents and other introductory lists are typed or auto-generated by the system. The author also selects the right element in the template (style sheet) to get the correct presentation.

By using an XML based editor, the author can concentrate on the content of the information, within the bounds of the structure. The presentation (including headers, footers, introductory lists, if page-oriented presentation) is delegated to the production and presentation application.

S1000D facilitates the first two production methods for all types of data modules. However, the third method can be used for the production of any non-text oriented data modules, (ie, IPD, wiring data and maintenance planning data, fault, common information repository data).

Chap 3.2 and Chap 3.9.5 define the structures available to the author when creating a document. Chap 6.2 provides the detailed rules and examples of S1000D standard presentations for page-oriented publications. Chap 6.3 provides basic rules for look and feeling of IETP.

This chapter describes the basic writing rules for creating information in data modules.

Note

Chap 6.2 shows the presentation of page-oriented publications. However the structure (the use of text and graphics components) explained in this chapter are valid and independent of the presentation form.

2 General writing rules

2.1 Language

The project or the organization must specify the language in which the data modules are written. If that language is English, then it is recommended to use the writing rules and vocabulary in ASD Simplified Technical English, ASD-STE100® (formerly known as AECMA Simplified English, AECMA Document No. PSC-85-16598).

Business rule decision point BRDP-S1-00020 - Specify the language:

- Decide which language to use for producing data modules.

Business rule decision point BRDP-S1-00021 - Use of ASD-STE100®:

- When producing data modules in English, decide whether to use ASD-STE100®.

A standard dictionary must also be designated by the project or the organization. If the maintenance data for the data modules is required in the English language, it is recommended that the Merriam-Webster's Dictionary be used as the standard.

Business rule decision point BRDP-S1-00022 - Standard dictionary:

- Decide which standard dictionary to use for producing data modules.

If specific maintenance terminology is required, it is recommended that either a terminology database, or project glossary of such terminology is produced or cross-references are made to existing glossaries/specifications. It is essential that the maintenance terminology be agreed to, by all disciplines within the project. Ideally, this will include the Product names and task short descriptions.

Business rule decision point BRDP-S1-00023 - Use of a terminology database or glossary:

- Decide whether to use a terminology database or a glossary. If used, agree on its content and management.

2.2 Abbreviations

An abbreviation is a shortened form of a word, expression or phrase and is used to conserve space and time. To ensure consistency throughout all the project documentation (including data modules), it is recommended that either a standard list of abbreviations be produced at the start of the project or existing abbreviation standards used both of which can be included in the project terminology database. Some suggested general rules on the use of abbreviations are given below:

- only use an abbreviation when its meaning will be clear to the reader. When in doubt spell it out.
- wherever possible, use abbreviations that conform to a recognized standard used by, or made available to, the customer
- abbreviations not in common use, or not to a recognized standard, but which are used frequently, can be put in brackets after the word, expression or phrase, when used for the first time. Thereafter the abbreviation can be used.
- use the same abbreviation for the singular and plural
- do not use full stops [.] in abbreviations except for where their omission would create ambiguity (eg, "No." for number and "in." for inch to avoid confusion with "no" and "in"). Stops are also not required for contractions (eg, "Mk" for a specific mark) or for shortened identifications, acronyms, (eg, "North Atlantic Treaty Organization (NATO)" for the North Atlantic Treaty organization and "STN" for Special Technical Notice).
- avoid the use of abbreviations in contents lists, titles etc wherever possible (eg, "Operation of the HLWSCU" is meaningless unless you know that the HLWSCU is the High Lift Wing Sweep Control Unit). However, for air systems SNS 24-20 in this specification, use "Alternating Current (AC) Generation", and this abbreviation must be used.
- abbreviations used on placards, labels and signs must be replicated in data modules, even though they may not conform to recognized standards or these suggested rules. If the text given on placards, labels and signs is shown in uppercase letters, then the text must be written in uppercase letters in the related text in the data module (eg, "Put the warning placard DO NOT OPERATE THE LANDING GEAR on the landing gear handle", "Connect the ground electrical connector to the OUTLET SUPPLY receptacle on the leak test set"). This does not apply to the text that is given on tools.
- a list of all non common abbreviations, which are not among the recognized standards required by the customer, can be included in the data module (Information code "005" can be used to list abbreviations)

Business rule decision point BRDP-S1-00024 - Use of a standard list of abbreviations:

- Decide whether to use a standard list of abbreviations. If used, agree on its content and management.

2.3 Information affected by modification

Information must be provided on any changes introduced by modification to the build standard of the Product. Data modules affected by such information must be arranged so that, when all Products are modified, non-applicable information can be removed without an entire rewrite of the data modules.

2.4 Numeric values

2.4.1 General

Wherever possible, the rules concerning the expression of numerical values must be in compliance with International Standards Organization (ISO) 6093 Information processing - Representation of numerical values in character strings for information interchange.

Unless otherwise stated, all numeric values (eg, speeds, Mach numbers, accelerations, temperatures, altitudes) quoted must be as indicated on the equipment.

When a range of values is associated with a unit, the unit symbol must be repeated after each number (eg, "2,3 mm to 7,8 mm"). When a value followed by a tolerance is expressed, both must be in the same units, but the unit need only be placed after the complete expression. The mathematical presentation (eg, "12 ± 1 mm") is the preferred one. However, if this is not possible, the complete expression (eg, "12 plus or minus 1 mm") can also be used.

Numbers from one to nine normally must be expressed as words when used in text, except when used in a dimensional sense or for reference purposes. Numbers of 10 and over must be expressed in Arabic numerals except where ambiguity might otherwise result (eg, "two hundred and fifty 27 mm cartridges").

2.4.2 Fractions

The use of a fraction can be avoided, by using decimal notation or words, except where indicators or controls are marked in vulgar fractions. Fractions must be presented in text using the slash [/] character, with one space separating a whole number from a fraction (eg, 1 1/2). When super- and sub-script are used, then there must be no space between the whole number and the fraction (eg, 1½).

2.4.3 Separators

The decimal separator is a comma [,] in compliance with ISO/IEC 80000-2 (Quantities and units - Part 2. Mathematical signs and symbols to be used in the natural sciences and technology). This separator must be used together with International System (SI) units, refer to Para 2.5. A dot [.] must be used as the decimal separator for Imperial or United States (US) units.

- SI-units comma [,]
- Imperial-US/units dot [.]

Numbers less than unity have their decimal separator preceded by a zero in all cases (eg, 0,012).

Very large or very small numbers expressed to a reasonably small number of significant figures, can be conveniently set out when written manually as multiples of a power of ten to simplify their presentation.

Examples:

- 2998000000 becomes 2,998 x 109

or

- 0,000000000006624 becomes 6,624 x 10-12

Presentation of numbers generated from, for example, a database, can vary according to the system being used.

2.5 Unit of measure

Projects must determine the standard of measurement used (eg, International System (SI) units, Imperial units, or US customary units). The standard of measurement selected (the primary units) must be used consistently throughout all data modules for a given project. If the equipment, instrument, or tool, etc, is calibrated in alternate units, these must be presented as the primary units.

Business rule decision point BRDP-S1-00025 - Unit of measure:

- Identify the standard to use for both primary and secondary units of measure.

If an additional unit of measure is selected by the project, the primary units must be followed by the secondary unit conversion in brackets [( )] unless the equipment, instrument, or tool, etc, is calibrated in the secondary units. In that case, the equipment-specific units must be presented first, followed by the primary units in brackets.

Any conversion necessary is to be rounded up or down to a corresponding number of significant figures. The one exception to this rule is the case of nautical miles.

General rules for presenting unit symbols are:

- when in doubt, spell the name of the unit out (use the spelling meter and liter)
- do not use the point after the unit symbol (use for example A = Ampere, mm = millimeter)
- do not use an "s" for plurals
- put a one-character space between the unit quantity and the unit symbol
- use the units given on gauges, indicators, etc, as the primary unit
- the rules for separators given in Para 2.4.3 must be followed

Note

In Europe the EU Council Directive 99/103/EEC and its updates must be followed.

2.6 Names

To ensure consistency throughout all project documentation, including data modules, it is recommended that standard names (for products, equipment, components, assemblies, parts, etc) be used throughout all disciplines of the project. Normally, engineering drawings are the source data for names. The drawings are used as the verified source data to produce, for example, the IPD data modules.

Markings on controls must be quoted as marked. Where a control selection exists but is not actually marked, it must be described fully.

Consistency of names must always be maintained between text and illustrations in data modules. Terminology that conveys the purpose, function, or nature of an item irrelevant to a procedure requirement should not be used. For example, the spoiler center wing input quadrant need not be called such in a procedural step to insert a rig pin. The presence of an illustration showing the location of the quadrant enables the step to be written simply (eg, "Insert the rig pin in the quadrant" or "Insert the rig pin") when there is only one quadrant and one rig pin. Modifiers are only necessary when more than one item of the same name is acted upon in the same procedure.

2.7 Basic punctuation rules

ASD-STE100® is recommended as a guide for the use of punctuation marks in maintenance data. ASD-STE100® states that semicolon [;] is not permitted. Specific rules for lists are given in Chap 3.9.5.2.1.3 and for titles in Chap 3.9.5.2.1.5.

2.8 Use of uppercase

All text including all titles must be written in sentence case (only the first letter in a sentence is given in uppercase). Sentence case or, where appropriate, all uppercase must be used for

specific abbreviations, acronyms or expressions within the title or sentence. The following examples are specific expressions:

- Chap, Para, Fig, Table, WARNING, CAUTION and Note
- titles with a "hyphen" must use an initial uppercase after the dash (eg, "Corrosion control - Rudder")
- titles with a "slash" [/] must use an initial uppercase after the slash if it is the first set of words in a sentence (eg, "Crew/Operator must …")
- titles of an information set or a publication must be written with initial uppercase (eg, Weapon loading, Description and operation). Refer to Chap 5.
- when explaining an acronym the first time in a data module the corresponding initials must be in uppercase (eg, CPF)

Placards, labels and signs must be replicated, including uppercase, when referenced in data modules. Refer to Para 2.2.

2.9 Highlighted text

To highlight a word, an expression or a sentence, bold text is the preferred method. Alternatively, the use of color is permitted. Uppercase, italic or underlining are not permitted to highlight text, except for legacy data.

Note

Exceptions are the captions WARNING which are underlined and bold and CAUTION which are bold. Refer to Chap 3.9.3.

Business rule decision point BRDP-S1-00026 - Highlighting text:

- Decide which method to use to highlight text.

Chapter 3.9.2

Authoring - Illustration rules and multimedia

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Chap 3.9.2.4	Illustration rules and multimedia - Multimedia, General
Chap 3.9.2.5	Illustration rules and multimedia - Interactive 3D content
Chap 3.9.2.6	Illustration rules and multimedia - e-learning and SCORM
Chap 7.3.3	CSDB objects - Multimedia
S2000M	International specification S2000M for material management - Integrated data processing

1 General

General guidance and rules on authoring illustrations and multimedia objects is addressed here. The rules are given in more detail in:

- Chap 3.9.2.1 provides the primary rules for the creation of 2D illustrations with basic illustration examples.
- Chap 3.9.2.2 defines and explains navigation and configuration of illustrations.

- Chap 3.9.2.3 covers the use of color in illustrations and photographic images.
- Chap 3.9.2.4 provides the primary rules and details the minimum standards for the creation of audio, video, animation 2D or 3D multimedia objects with basic examples provided.
- Chap 3.9.2.5 covers 3D multimedia objects including dynamic and interactive technical content.
- Chap 3.9.2.6 provides information on the acquisition and use of multimedia, e-learning, and SCORM data (available in future issues of this specification).

2 Project guidance

The delivery of many different media types with a wide range of project requirements in mind is addressed here. As a result, where this chapter cannot mandate output media types, it will give guidance and specifies minimum requirements. It is strongly recommended that projects use open specifications when delivering multimedia. Proprietary types are discouraged as a media object types (refer to Chap 7.3.3). It is also essential that project business rules governing the delivery of media object types are in agreement with exchange and maintenance strategies in place and specified in the configuration file.

2.1 Illustration rules - Introduction

Illustrations must be prepared to amplify and clarify the text and to avoid lengthy explanations. They must be located as close as possible to the related portions of the text.

2.1.1 Legacy illustrations

It is the intent of S1000D to maintain as much commonality among illustrations as possible. Consistent positioning, rendering, navigation and symbologies will assist in the understanding of illustration and text information in an efficient manner.

These rules have been developed primarily for use on new projects/programs but illustrations that conform to previous S1000D and ATA e-Business Program illustration rules can, on the discretion of the illustration originator, be used to support reuse and/or for cost reasons. However, the principles of the primary rules of illustrations given in Chap 3.9.2.1 must be fulfilled.

2.1.2 Printable data

Before the production of project documentation begins, the parts of the documentation which have to be printable must be defined. It must also be clarified if the customer is in a position to provide all end users with the technology to use electronic publication functionality such as color displays and color printing. When printing colored illustrations using black and white is required, the print medium must be able to handle the file content.

Business rule decision point BRDP-S1-00027 - Need of printable data:

- Decide which parts of the documentation (data modules and publications including IETP) need to be printable.

Chap 3.9.2.1 gives rules and guidance for the production of illustrations which have to be presented on paper or on screen. The basic set of rules is common for both environments but specific rules also apply. The final requirements must be considered within the project business rules.

2.1.3 IPD Illustrations

The rules applied to IPD illustrations can also be used for the production of illustrations during the initial provisioning process. Refer to S2000M.

The illustrations used in the IPD publication are identified as "Figures". The purpose of these figures is to clearly depict the detailed parts in disassembly order. If one illustration page is insufficient for the presentation of an assembly, a figure is spread over several illustration sheets.

2.2 Multimedia - Introduction

The implementation of multimedia elements to projects requires testing in the role in which it will be used and support environment in which it will operate. Consideration must be given to display backgrounds, colors and presentation methods used. Working conditions such as lighting, weather and noise levels can have a major impact on the ability to use or understand the presentation. All media projects must be appropriately tested before delivery. Once all these factors have been considered and defined in the project requirements plan, agreement can then be reached on the user interface and delivery methods to be deployed.

Chapter 3.9.2.1

Illustration rules and multimedia - Illustrations, General

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Chap 4.4	Information management - Information control number
Chap 4.8	Information management - Interchange of data modules
Chap 6.2.2	Page-oriented publications - Typography and layout elements
Chap 6.3.1	IETP - Output specification

1 General

Primary rules for the creation of 2D illustrations with basic illustration examples are provided below.

2 The primary rules of illustration

There are two basic principles regarding illustrations:

- Illustrations must communicate to the user in a simple, clear and economical way and visually enhance the technical information required by the user.
- Illustrations must be prepared in accordance with the text and other information in data modules, such that the end user receives the maximum amount of information (description of systems, components, operation, task execution, etc).

The following gives general guidance to help the illustrator and publication designer create illustrated information:

- The information given must provide the end user with the maximum information for the output media (on paper or IETP) used.
- Illustrations must be prepared to present the view and scale that is most favorable for the user.

- Illustrated parts must be clearly identifiable to the user and annotated appropriately. If required for clarification, use a location drawing (refer to Chap 3.9.2.2) and/or direction indicators.
- Location arrows, leader lines, annotations, etc, must be clearly shown and free from surrounding detail.
- Reusability and uniformity are of prime importance for clarity and the complete set of information. Uses of "typical" and "natural" views for similar equipment are important elements in a good illustration.
- The illustrations must be clear, showing only the detail required and what is being described to the user. The inclusion of unnecessary details, such as shaded areas, as well as the presentation of detailed parts not visible in the perspective view by using broken lines, must be avoided. Fig 1, Fig 2, Fig 3, Fig 4, Fig 5, Fig 6 and Fig 7 give the general rules for the clarity of illustrations. The exact presentation of details, such as threads on screws or their head style, can be omitted. Limit the artistic effects, do not use shadow effects. The use of artistic embellishment must be limited and only used to add visual clarity for the user.
- The level of detail in the illustration must be measured, simple and relevant to the amount of information that the end user can process. Highly detailed source material like 3D Computer-Aided Design (CAD) data, digital mockups or 2D drawings can risk complex and unnecessary modifications.
- Always construct the layouts, building the illustrations logically and in sequence in accordance with Chap 3.9.2.2.
- Graphics must be produced to a realistic and sensible size. Whenever the scale of a graphic does not allow small detail to be clearly shown, these details must be enlarged.
- Where the disassembly order or detail parts can be properly identified from the plan view representation of a production drawing, that representation must also be used in the illustration. This form is applicable to items such as hose assemblies, control rods, clamps, instrument panels, circuit boards or support equipment. Refer to Fig 9, Fig 10, Fig 11 and Fig 12.
- Do not overcrowd the illustration reproduction area.
- If several identical parts are used in the same assembly, only one of them needs to be illustrated if it is possible to positively allocate them to their respective location and/or orientation.
- Wiring or system diagrams, schematics or other charts where symbols are used are also acceptable as an illustration if they provide for the proper identification of the detail parts. Refer to the black and white example in Chap 3.9.2.3.
- The project must decide if schematics derived from engineering drawings include the original drawing number and revision status within the illustration reproduction area.
- Present graphics in accordance with the output media.
- Consider final requirements within project business rules.

Business rule decision point BRDP-S1-00028 - Engineering numbers and revision status within the illustration reproduction area:

- Decide if schematics derived from engineering drawings include the original drawing number and revision status within the illustration reproduction area.

2.1 Mode of presentation

2.1.1 Specific rules and recommendations for illustrations in page-orientated publications

For ease of reading and cross-referencing, the preferred layout is portrait (IPD illustrations are always to be in portrait layout). Foldouts or landscape are only allowed as exceptions, as defined in the project business rules.

2.1.2 Specific rules and recommendations for IETP illustrations

In comparison to the page orientated (paper) documentation, the following deciding restrictions are no longer relevant or additional possibilities are available for screen presentation:

- Fundamentally, no constant, printable page layouts are required. Only the necessary illustration part is displayed on the screen in the required size. However, the need for printing of data module pages or the illustration itself must be considered.
- Objects are named to facilitate easy reference to multiple components of an illustration that have the same name. For example, graphic objects can be given a name applicable to a certain configuration with the same name. It can also be useful to name sets of hotspots that need to be turned on and off. Naming schemes and groupings must be coordinated.
- Information regarding graphic object identifiers, names or coordinates that will be referenced in an IETP must be documented and communicated in such a manner that hotspots can be defined.
- The use of color to show the clarity of important information has priority.
- All forms of picture presentation can be used, such as color photographs, bitmaps of 3D models and electronic legacy data providing that they are in accordance with the data format in this specification.

2.2 Illustration sizes, line weights, typeface and type size

2.2.1 Illustration sizes and orientation

The following illustration sizes can be used in data modules: full page, flexi height and landscape fold out. The final illustration reproduction areas are given in Table 2. If scaling of an illustration is required to fit a legacy illustration into an S1000D illustration reproduction area, it must be scaled proportionally to preserve aspect ratios.

Table 2 Illustration reproduction areas

Page sizes	A4 and US A size publications	A5 publications	US 5 inch x 8 inch publications
Full page	170 mm x 222 mm[1]	120 mm x 157 mm	105 mm x 137 mm
Flexi height	170 mm x (45 mm thru 210 mm)[2]	120 mm x (30 mm thru 175 mm)	105 mm x (25 mm thru 137 mm)
Fold out	360 mm x 222 mm	254 mm x 157 mm	222 mm x 137 mm

1 Illustrations primarily to be used in illustrated parts data must always be full page A4 (ie, 170 mm x 222 mm).
2 Using a height of 210 mm allows for a heading on the top of the page.

For illustrations used as symbols in the text, the illustration reproduction area is the symbol size.

The preferred illustration reproduction area sizes, defined in Table 2, are used as a guideline when producing IETP illustrations. The preferred orientation is portrait. However the final size and orientation of an illustration for an IETP must be designed and delivered in accordance with the individual project. The project or the organization must bear in mind the need for printouts from the IETP.

2.2.2 Line and text style

Line weights, typeface, type sizes, symbols in illustration representation and general standards are all defined in this chapter as they would appear at a scale of 1:1 in a page-oriented presentation.

2.2.2.1 Line weights and line types

Black and white illustrations. Line weights and line types in illustrations must be prepared according to the rules shown in Table 3, Table 4 and Fig 1.

Color line illustrations. Line weights and line types in illustrations must be prepared according to the rules shown in Table 3, Table 4 and Fig 2 and/or Fig 3. Illustration of items, leader lines and highlighted items will be black, but other line types can be dark blue. Refer to Chap 3.9.2.3.

Note

The dashed (170 mm x 222 mm) border line in Fig 1, Fig 2 and Fig 3 gives the illustration reproduction area and can be used to check the scale.

The distance between two lines must at least be equal to the sum of the weights of these lines.

Business rule decision point BRDP-S1-00029 - Use of color in the final deliverable:

– Decide whether to use color in the final deliverable.

Table 3 gives a summary of line weights and best practice of their primary use.

Table 3 Lines - Their primary use and weights

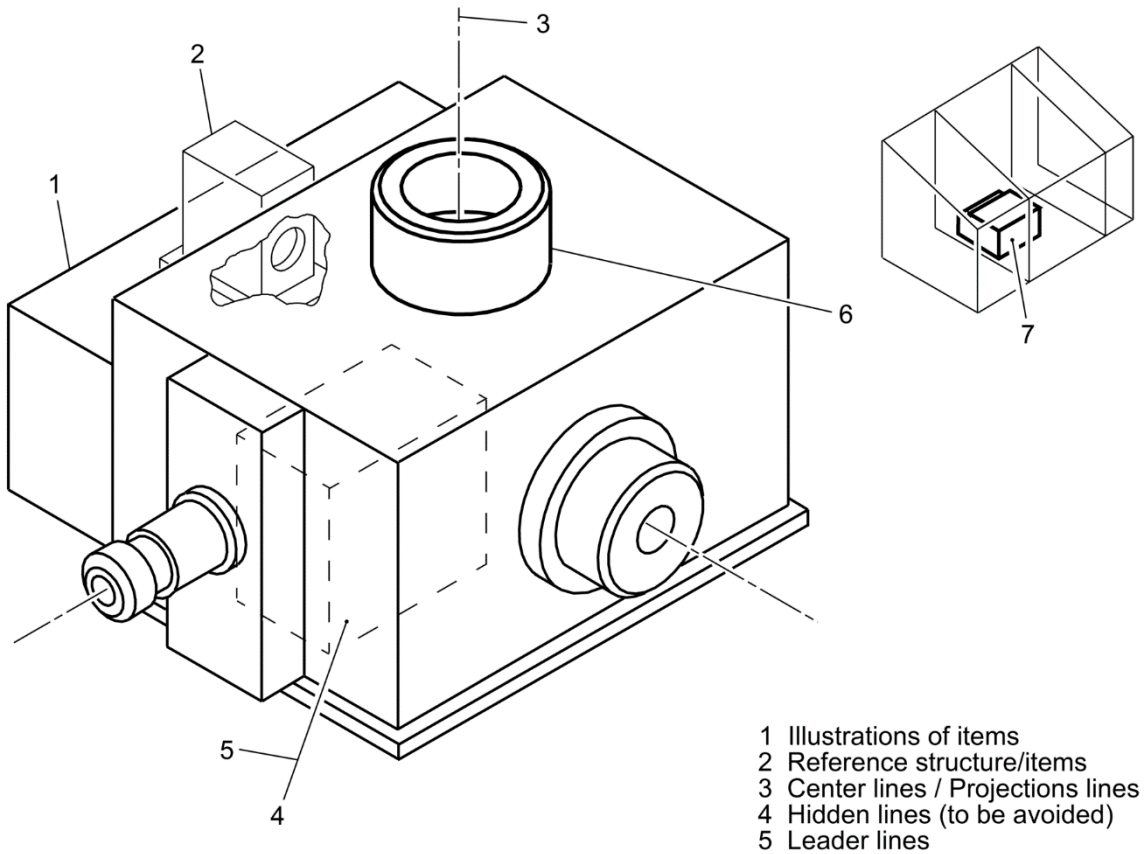
Line weight use	Line weight	Remark	Line type
Illustration of items	0,18 mm[1]/0,35 mm[2]	Represents the primary objects.	Type 1
Reference structure/items	0,18 mm (or 0,25 mm)	Represents objects on the illustration which are reference to primary objects.	Type 1
Center/Projection lines	0,18 mm (or 0,25 mm)	Show the axial flow of part assemblies. Center/Projection lines must not cross other Center/Projection lines.	Type 4
Hidden lines	0,18 mm (or 0,25 mm)	Use Type 2 to represent objects in simplified form (obscured from view). Will only be used when clarification is required. Type 3 can be used when clarification is required on smaller objects when hidden lines are not appropriate.	Type 2 or Type 3
Leader lines	0,18 mm (or 0,25 mm)	Used to connect objects to the callout text.	Type 1
Highlighted item	0,5 mm		Type 1
Highlighted reference structure	0,5 mm		Type 1

1 0,18 mm applies to color illustrations using two line weights. Refer to Fig 1.

2 0,35 mm applies to color illustrations and black/white illustrations using three line weights. Refer to Fig 2 and Fig 3 respectively.

Table 4 Line type definition

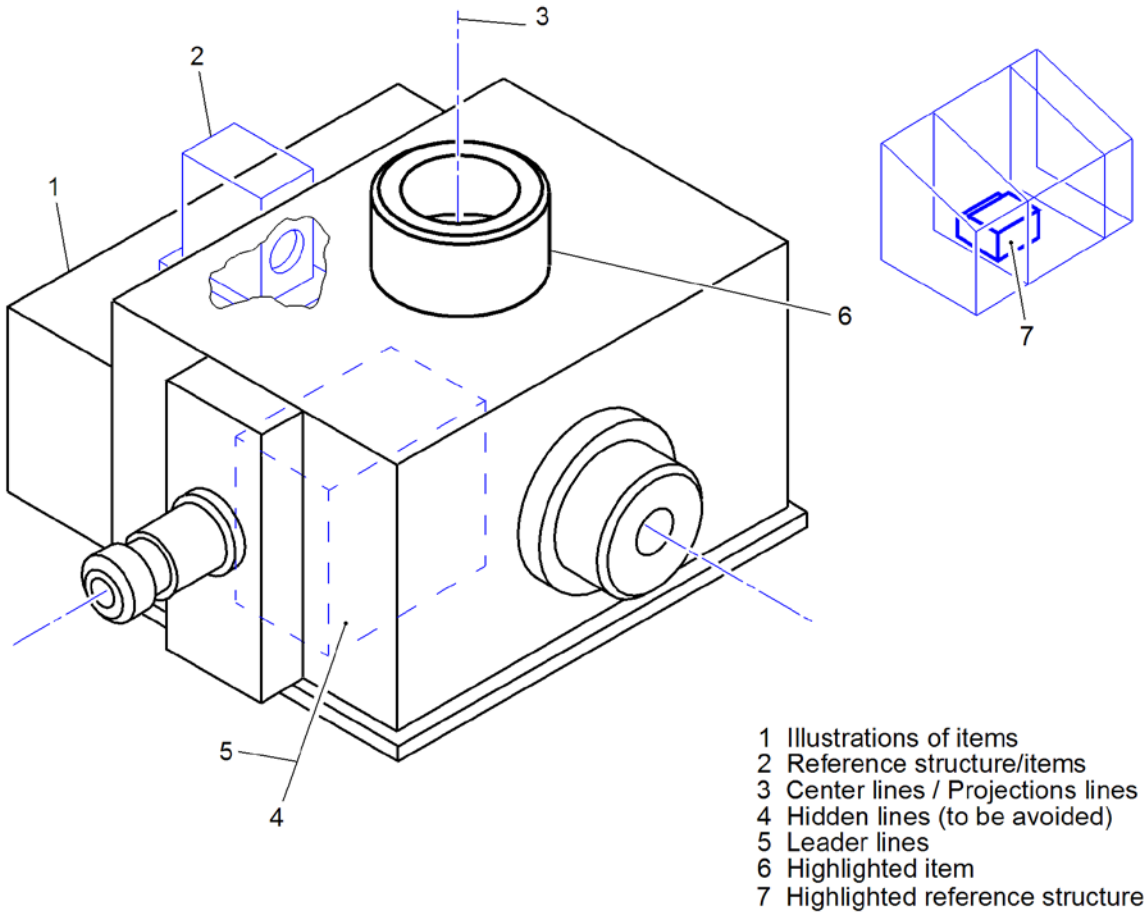
Line type	Definition
Type 1 - Solid	Solid
Type 2 - Dash	A segment = 1,0 mm. 3 On - 1 Off.
Type 3 - Dot	A segment = 0,5 mm. 2 On - 1 Off.
Type 4 - Dash-dot	A segment = 0,635 mm. 10 On -1 Off - 2 On - 1 Off.



1 Illustrations of items
2 Reference structure/items
3 Center lines / Projections lines
4 Hidden lines (to be avoided)
5 Leader lines
6 Highlighted item
7 Highlighted reference structure

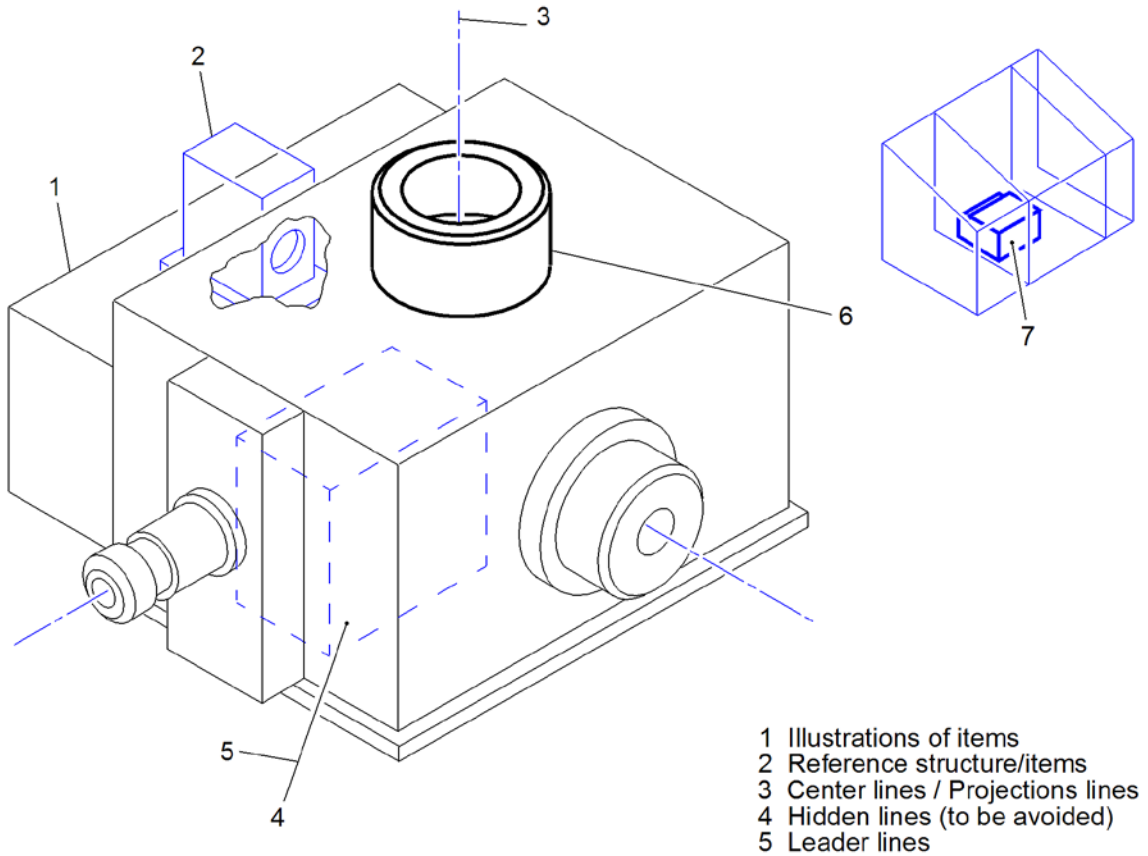
ICN-C0419-S1000D0317-001-01

Fig 1 Black and white illustrations - General rules, 3 line weights



ICN-C0419-S1000D0318-001-01

Fig 2 Color illustrations - General rules, 3 line weights



1 Illustrations of items
2 Reference structure/items
3 Center lines / Projections lines
4 Hidden lines (to be avoided)
5 Leader lines
6 Highlighted item
7 Highlighted reference structure

ICN-C0419-S1000D0319-001-01

Fig 3 Color illustrations - General rules, 2 line weights

2.2.2.2 Text style

For text annotations, item numbers, etc, the font must be of Sanserif type (eg, Univers, Helvetica, Arial).

The preferred annotation specifics are defined in Table 5.

The type sizes comparison between point size and cap-height is given in Table 6.

The basic rules for use of capitals (upper case characters) and highlighting of text apply. Refer to Chap 3.9.1.

Business rule decision point BRDP-S1-00554 - Illustration annotations written in upper or sentence case:

– Decide whether to write illustration annotations in upper or lower case.

Table 5 Preferred annotation specifics

Annotation category	Cap-height	Point size	Case	Style	Remark
Dimension	2,0/2,5 mm	8 pt/10 pt			Unit of measure
Callouts	2,0/2,5 mm	8 pt/10 pt	Upper/Sentence case. Use upper case letters for item number variants.		Nomenclature with leader line
Item numbers	2,0/2,5 mm	8 pt/10 pt			Item/Index numbers can include optional alpha characters.
Note	2,0/2,5 mm	8 pt/10 pt	Upper/Sentence case	Left justified. The word “Note” or “Notes” can be in bold.	Notes and general statements. Preferred method is to have the note title in 10 pt bold.
Legends	2,0/2,5 mm	8 pt/10 pt	Upper/Sentence case	Left justified. The word “Legend” can be in bold.	Explanation of parts on illustration (body text and/or graphical) Preferred method is to have the legend title in 10 pt bold.
Detail locators and section locators	3,5 mm	14 pt	Upper case	Bold	A letter associated with a detail by a leader or section. Referenced to the equivalent capital letter detail or section identifier for navigation between views, details or sections.

Annotation category	Cap-height	Point size	Case	Style	Remark
Detail identifiers and section identifiers	3,5/4,0 mm	14 pt/16 pt	Upper case	Bold	Positioned below the detail or section view
Titles/ Subtitles (identification of view)	2,0/2,5 mm	8 pt/10 pt	Upper case		Identification of a view or subtitle to a view with an identifier
Continuation reference (gotoref)	2,0/2,5 mm	8 pt/10 pt	Upper case		Continuation references that navigate through multiple sheets or within a sheet contain a single digit alpha or numeric.
Flagref	2,0/2,5 mm	8 pt/10 pt	Upper case		Multiple general notes, each preceded by a symbol containing a two digit numeric
Applicability	2,0/2,5 mm	8 pt/10 pt	Upper case only		Notes pertaining to applicability preceded by a symbol containing a two digit numeric

Warnings and cautions must not be given in any illustration. Refer to Chap 3.9.3.

Exception is made for wiring diagrams or a similar situation where the text style is ruled by the settings in the diagram generating application.

Table 6 Point size vs cap-height

Size	Point size	Cap-height
Small	8 pt	2,0 mm
Medium	10 pt	2,5 mm
Large	14 pt	3,5 mm
Extra large	16 pt	4,0 mm

The point sizes are approximate and will vary based on the particular font that is used. It is best practice to use the cap-height dimensions.

2.3 Symbols

The use of symbols must strive for consistency in line weight.

2.3.1 International System of units (SI units) and symbols

In general, the International System of Units (SI units) and International Organization for Standardization (ISO) standards apply as stated in the writing rules. Projects however, can specify additional standards.

2.3.2 General symbols

General symbols for illustrations and photographs (eg, arrows and direction indicators) must be prepared in accordance with the examples given in Fig 4, Fig 5, Fig 6 and Fig 7.

2.3.2.1 Arrow heads

It is recommended that arrow heads be drawn in accordance with ISO 129-1. Refer to Fig 4 (Sheet 3 of 3).

2.3.2.2 Brackets

The legs on the brackets must be 2 mm in length for brackets that are 100 mm or less in length, and 5 mm for the longer brackets.

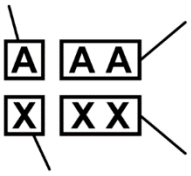
2.4 Halo

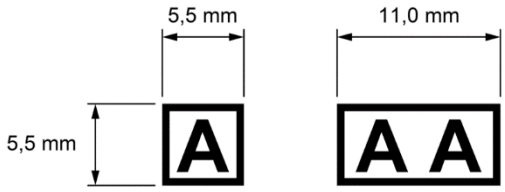
To clarify the readability of an illustration it is necessary to emphasize (eg, the path of a leader line to a component when they intersect other geometry inline drawings and photographs). This is achieved by the use of a halo:

- on each side of leader lines, hidden lines, center/projection lines and reference structure/item lines
- around dimension arrows, brackets, direction arrows, multipliers, etc

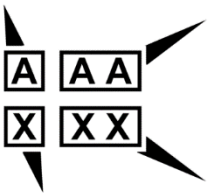
The halo must be approximately 1 mm on each side of the general symbols. Refer to Fig 7.

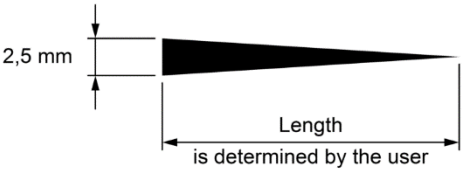
Detail locators (Leader)
Text: 3,5 mm, 14 pt, bold
Lines: 0,5 mm, solid





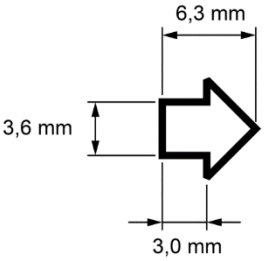
Detail locator (Tapered arrow)
Text: 3,5 mm, 14 pt, bold
Lines: 0,5 mm, solid





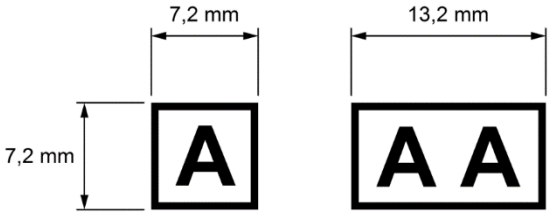
Detail locator (Leader)
Text: 3,5 mm, 14 pt, bold
Lines: 0,5 mm, solid



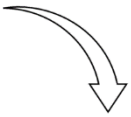


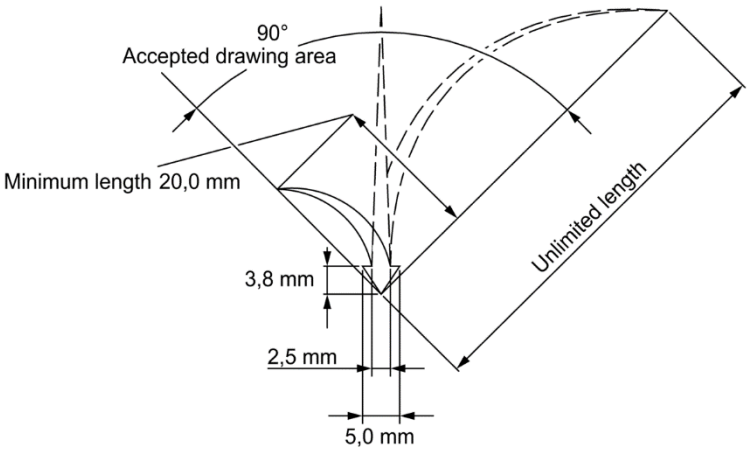
Detail identifier
Text: 3,5/4,0 mm, 14/16 pt, bold
Lines: 0,5 mm, solid





Sweep arrow
Lines: 0,18 mm, solid
(or 0,25 mm)

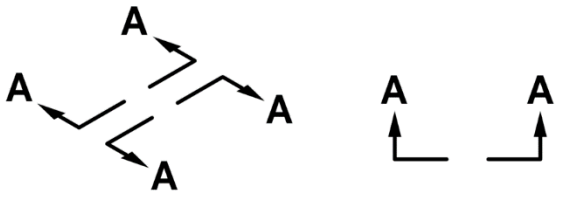


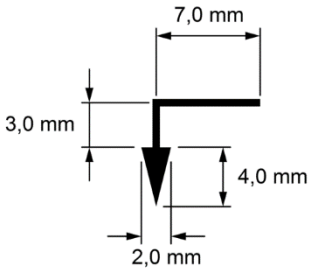


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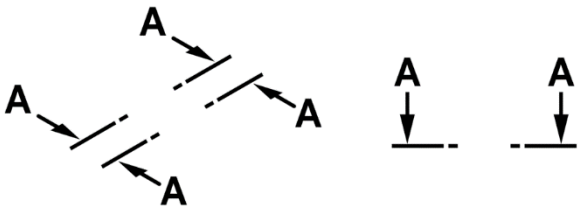
Fig 4 General symbols (Sheet 1 of 3)

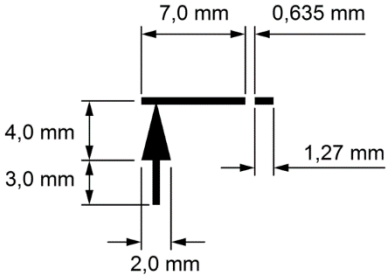
Section locator (Option 1)
Text: 3,5 mm, 14 pt, bold
Lines: 0,5 mm, solid





Section locator (Option 2)
Text: 3,5 mm, 14 pt, bold
Lines: 0,5 mm, solid

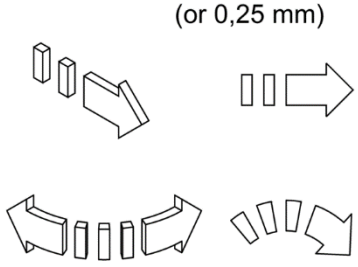


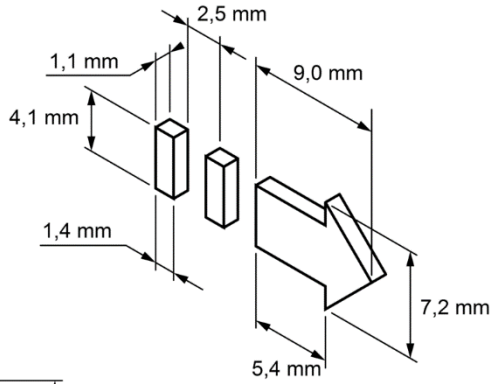


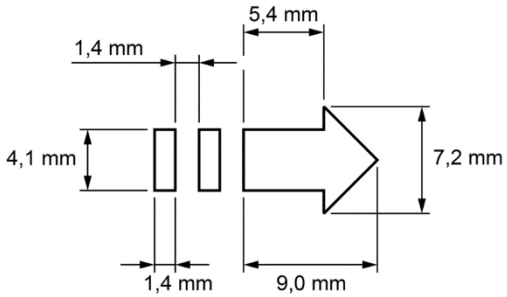
Section identifier (Common)
Text: 3,5/4,0 mm, 14/16 pt, bold

A-A **A-A**

Motion arrows
Lines: 0,18 mm, solid
(or 0,25 mm)



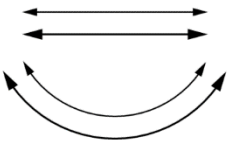


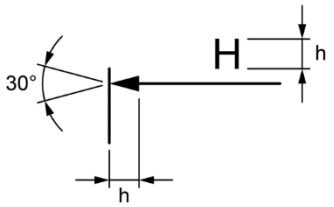


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Fig 4 General symbols (Sheet 2 of 3)

Dimension arrows (in accordance to ISO 129-1)
Text (h): 2,0/2,5 mm, 8/10 pt
Lines: 0,18 mm, solid
(or 0,25 mm)

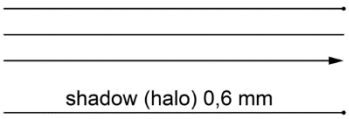




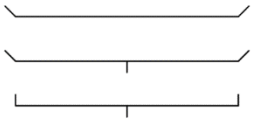
Notes and general statements
Text: 2,0/2,5 mm, 8/10 pt
Lines: 0,18 mm, solid
(or 0,25 mm)

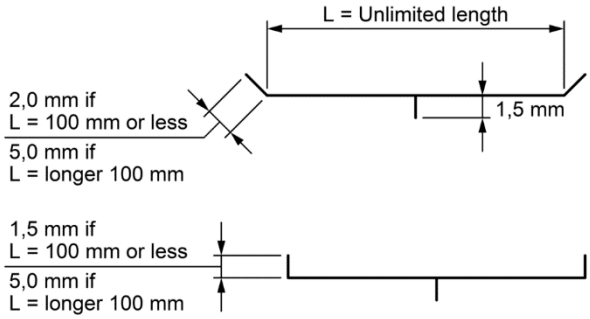
LH SHOWN 3,36 mm

Leader lines
Lines: 0,18 mm, solid
(or 0,25 mm)



Brackets
Lines: 0,18 mm, solid
(or 0,25 mm)

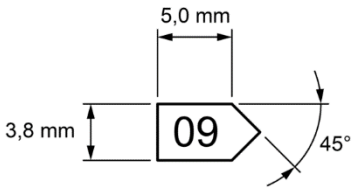




Flagref (Notes), applicability symbols, continuation reference (Pipes, wirings, etc.)
Text: 2,0/2,5 mm, 8/10 pt
Lines: 0,18 mm, solid
(or 0,25 mm)

09

01 Sheet 4 13 Sheet 11

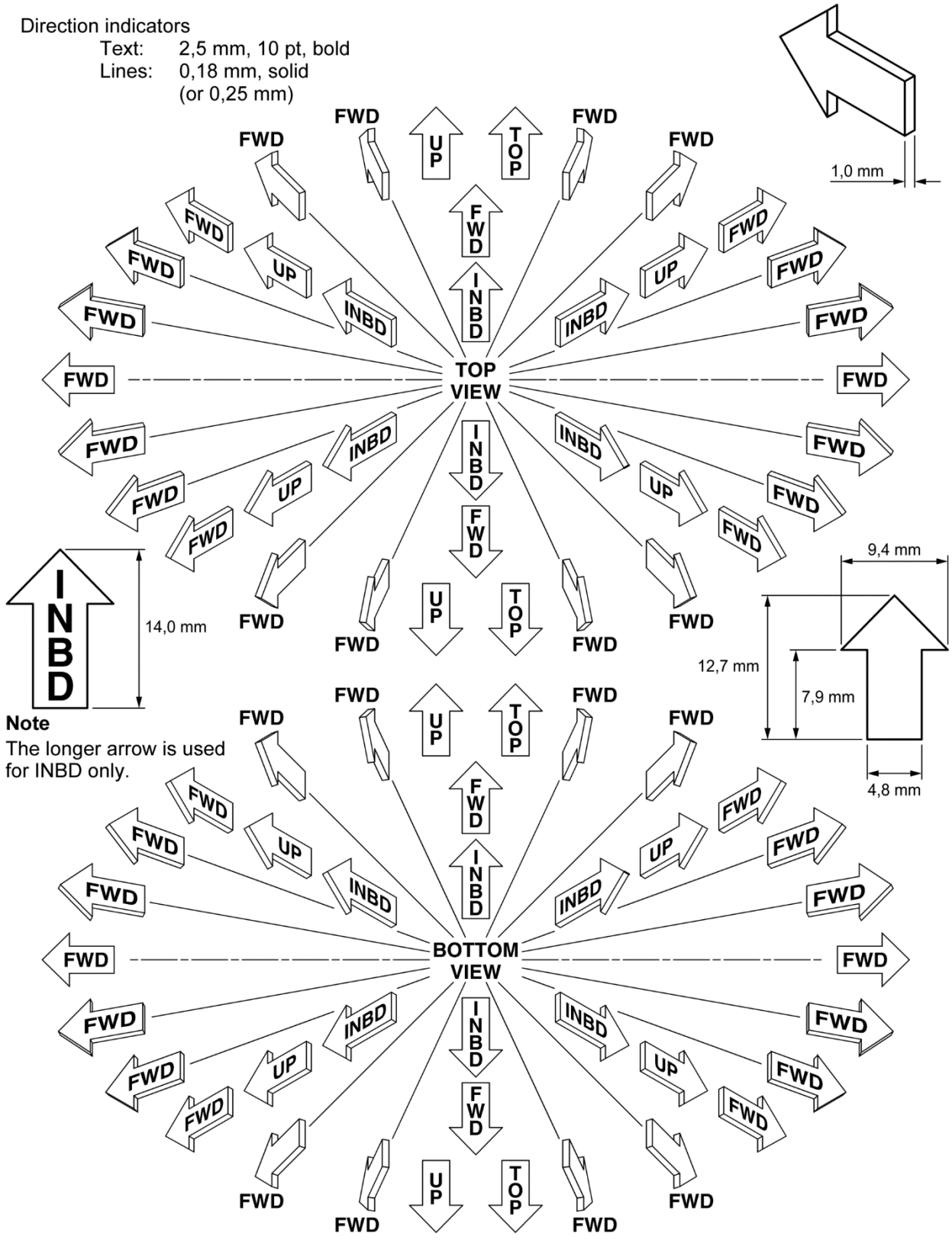


Item numbers, reference designators, multipliers
Text: 2,0/2,5 mm, 8/10 pt

1 2 3 4 5 6 7 8 9 0 14E 2513VB 15 x2 15E x2
A B C D E

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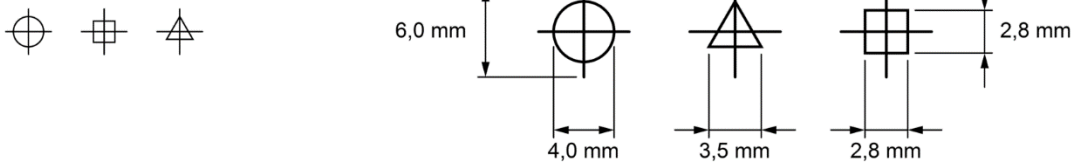
Fig 4 General symbols (Sheet 3 of 3)

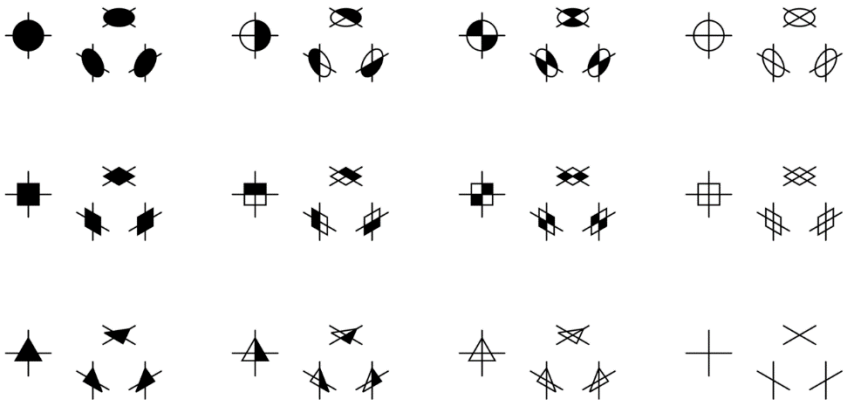


ICN-C0419-S1000D0322-001-01

Fig 5 General symbols - Direction indicators

Fastener and rivet locations
Lines: 0,18 mm, solid
(or 0,25 mm)

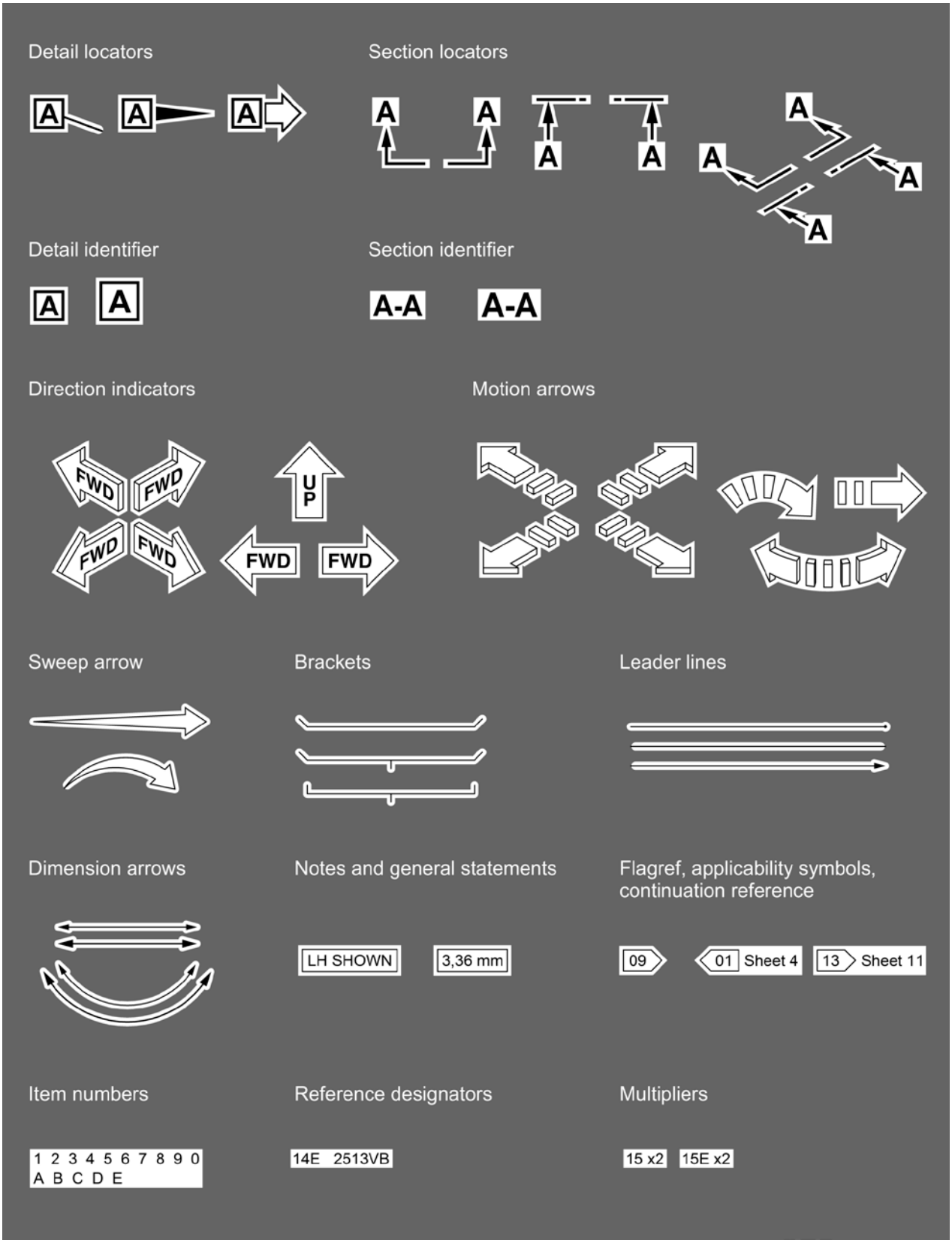




Note
Fastener and rivet symbols can be used instead of item numbers. Each symbol can be used as needed, but shall be accompanied by a legend describing the symbol item/part number relationship.

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Fig 6 General symbols - Fastener and rivet locations



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Fig 7 General symbols - Use of halos

2.5 Type of illustrations

Normally, illustrations are prepared as line drawings. Subject to agreement with the customer, full color illustrations, photographs and monochrome (half tones) can be used, provided they meet all requirements to show clear details. Again, cognizance must be taken of any project output requirements. The following types of drawings are used:

- **Isometric projection** (30°/30°, ellipse 35°) - This is the preferred 3-dimensional drawing method for detail, exploded views or larger installations and must remain in the classical LTF (left top forward) orientation. Refer to Fig 1, Fig 2 and Fig 3.
- The **exploded view** of IPD illustrations must be shown in the correct disassembly order. If necessary, details can be shown in a different isometric orientation.
- As an alternative, **trimetric projection** can be used.
- **Perspective** - Normally used only for abnormally large components such as aircraft fuselage, wing sections and tail assemblies. Perspective can also be used for location drawings. For technical publications, the orientation of the mechanics viewpoint is permitted.
- **Orthographic projections** - These 2-dimensional illustrations are used each time this kind of presentation adequately serves the purpose.
- **Diagrams/Schematics** - This type of presentation is used to explain the operation of a system or a circuit.
- **Graphs** - This type of representation is used to explain the relation between various parameters.

2.6 Resolution for illustrations

The preferred resolution for illustrations is 300 dots per inch (dpi). The data standards definitions for the incorporation of images are described in Chap 4.8.

2.7 Use of hatch styles, solids, raster and pattern fills

To highlight areas, show flows, or to differentiate materials, hatch styles, solid, raster or pattern fills are used. When using color fills, bear the output demands in mind.

The recommended hatch styles, solids, raster and pattern fills are given in Fig 8.

Hatches: The CGM Version 3 "Hatch Style Definition" element allows for the definition of a hatch style and associates it with an index by which it can be used within the graphic.

The indexes are negative, to avoid conflict with standardized or registered values.

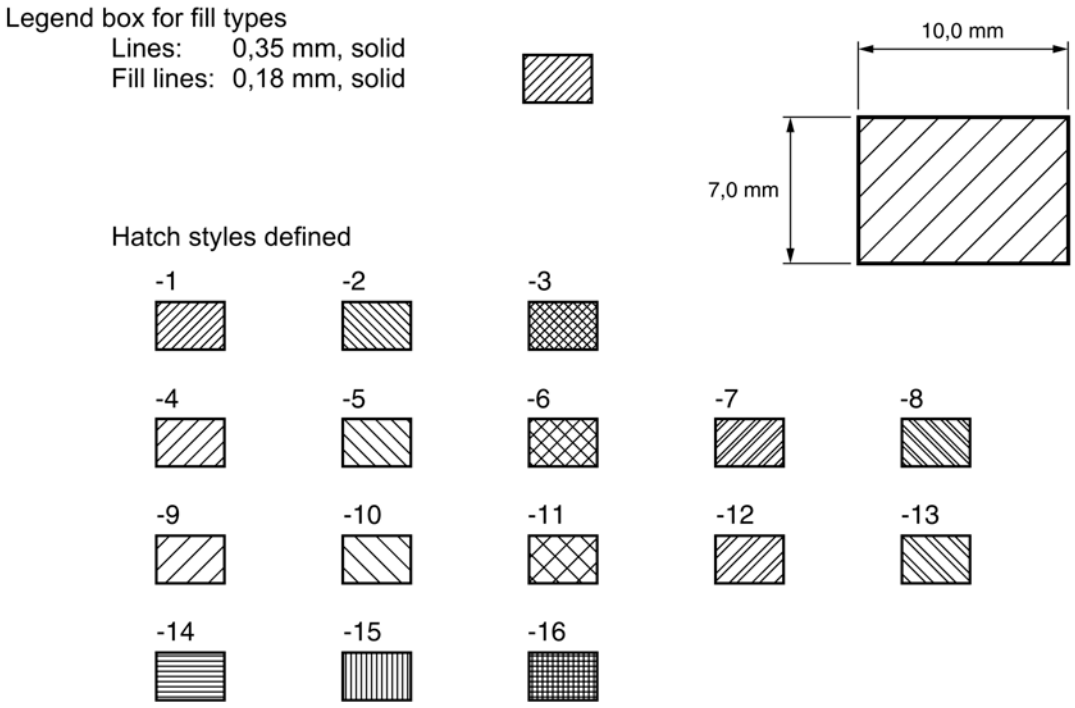
The duty cycle length settings, given in Table 4, are based on a unit of 0,0254 mm. Table 7 gives the hatch style definition settings.

At presentation, the scaling of hatch patterns must remain constant throughout enlargement/reduction to ensure the hatch pattern remain recognizable despite of the level of zoom employed.

Solids: This fill type allows for the use of color values to indicate filled areas.

Raster: This fill type allows for the use of a predefined raster to indicate filled areas.

Pattern: This fill type allows tiled designs represented as a bitmap. Standard pattern indexes have not been defined.



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Fig 8 Hatch styles

Table 7 Hatch style definition settings

Hatch index	Style indicator	Hatch directions	Duty cycle length	Number of hatch lines	List of gap width	List of line types
-1	Parallel	45	28 units	1	4	1
-2	Parallel	135	28 units	1	4	1
-3	Cross	45, 135	28 units	1	4	1, 1
-4	Parallel	45	49 units	1	7	1
-5	Parallel	135	49 units	1	7	1
-6	Cross	45, 135	49 units	1	7	1, 1
-7	Parallel	45	70 units	2	3, 7	1
-8	Parallel	135	70 units	2	3, 7	1
-9	Parallel	45	70 units	1	10	1
-10	Parallel	135	70 units	1	10	1
-11	Cross	45, 135	70 units	1	10	1, 1
-12	Parallel	45	98 units	2	4, 10	1
-13	Parallel	135	98 units	2	4, 10	1
-14	Parallel	0	49 units	1	7	1

Hatch index	Style indicator	Hatch directions	Duty cycle length	Number of hatch lines	List of gap width	List of line types
-15	Parallel	90	49 units	1	7	1
-16	Cross	0, 90	49 units	1	7	1

2.8 Information Control Number - ICN

Each illustration must be allocated an ICN.

In order to avoid redundancy, an illustration sheet can be referred to in different contexts. Thus, an illustration sheet can belong to different figures with different titles.

The ICN addresses an illustration sheet including its update status independently of the status of a data module or publication where it is used within a figure.

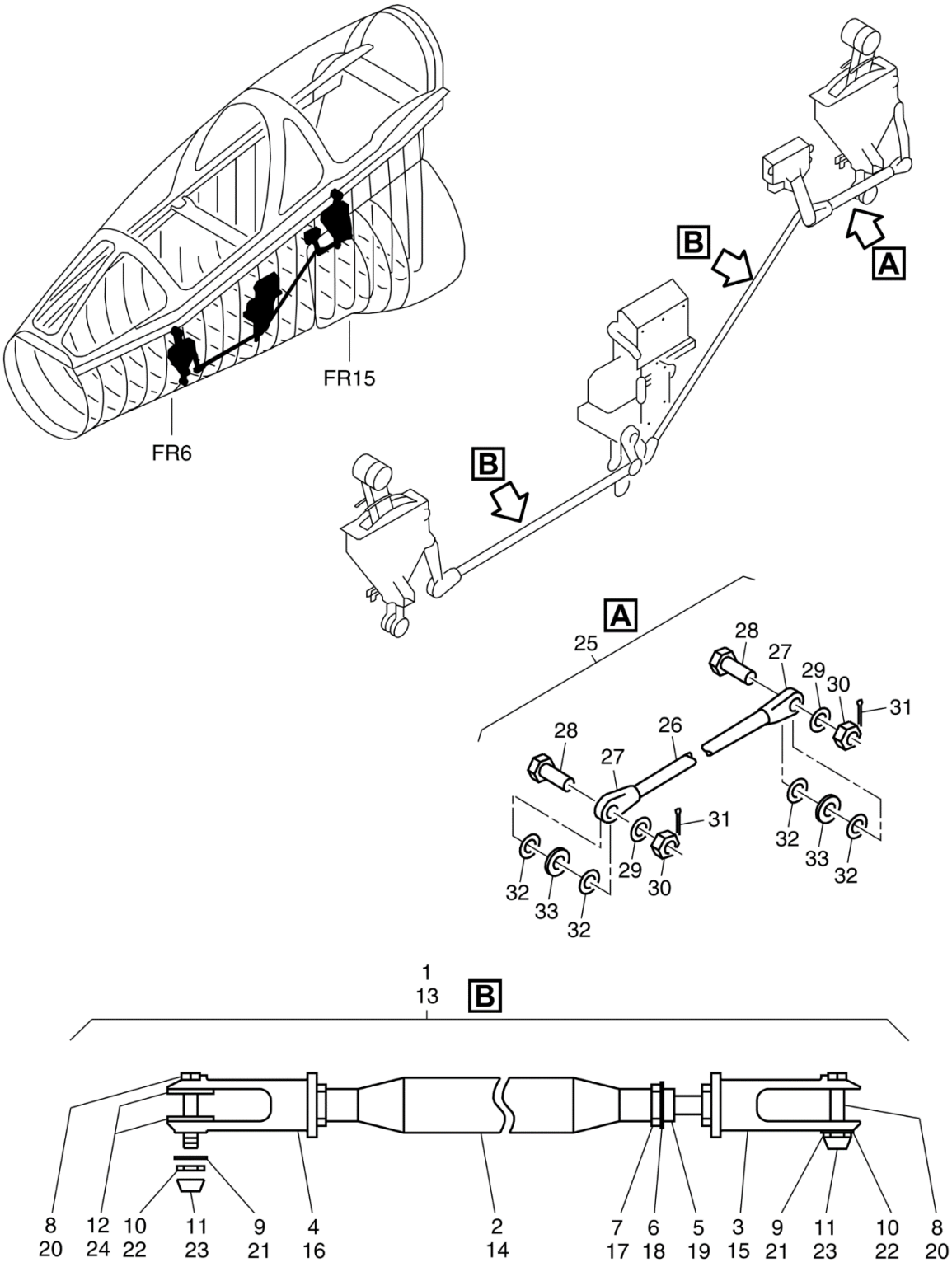
The details describing the use of the ICN and its breakdown are laid down in Chap 4.4. Refer to Chap 6.2.2 and Chap 6.3.1 for ICN presentation rules.

Business rule decision point BRDP-S1-00555 – Inclusion of the ICN in the illustration:

– Decide whether to allow the ICN to be included in the illustration.

2.9 Reference illustrations/structure

Reference illustrations (phantom representation) of structure and assemblies which are not part of the assembly to be illustrated, but which show assembly relationship, must be shown using reference structure line weights or defined colors without item numbers and leader lines. Wherever possible, reference illustrations are not itemized. Refer to Fig 1, Fig 2, Fig 3 and Fig 9 in Chap 3.9.2.3.



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Fig 9 Item tabulation of similar content - Example

2.10 Callouts and leader lines

2.10.1 General

Callouts can be written as annotations (direct annotations) or as item numbers (indirect annotations). If item numbers are used, they must be explained in a legend within the illustration reproduction area or in the related text. The indirect method of annotations is preferred, especially if the data module or technical publication has to be translated. Refer to Chap 3.9.2.2 and Chap 3.9.2.3.

General guidelines for item numbers:

- Use a separate graphical text element (in a sensitive area) for each item number. This applies equally to tabulated items and multiple indexing (refer to Fig 9 or Fig 12).
- Use three separate graphical text elements for mirrored items, the first for the opening bracket, the second for the item number and the third for the closing bracket (refer to Chap 3.9.2.2).
- Use upper case letters for item number variants. Refer to Chap 3.9.2.2.

If it is necessary to quantify an item number (attaching parts), use lower case multiplier "x" as shown in Chap 3.9.2.2.

General guidelines for multipliers:

- Put the multiplier and the appropriate quantity to the right of the respective item number.
- Leave a space between the item number and the multiplier information (eg, "1 x3").
- Use two separate graphical text elements (in sensitive areas) in the illustration.
- Do not use multipliers if an item is cross-referenced and shown more than once, regardless if the item number is the same or different.

Examples of multiplier presentations are shown in Chap 3.9.2.2. For the text style of callouts refer to Para 2.2.2.2 and Fig 1, Fig 2 and Fig 3.

Leader lines must:

- be as short as practical
- be stopped with a dot when entering a part
- only have arrowheads in exceptional circumstances to promote clarity (eg, in graphs)
- be "laid free" (halo) to clarify the path to the component when they intersect other geometry.

It is preferred that leader lines touch the part. If the leader line does not touch the part a gap of 2x the line thickness must be used.

Avoid vertical and horizontal angles in orthographic views. Isometric angles must be avoided in isometric views to prevent confusion with object lines.

2.10.2 Item numbers and leader lines in IPD illustrations

In addition to the above, the following rules apply for the annotation of IPD illustrations:

The number of locations shown in the illustration must correspond with the quantity per next higher assembly indicated in the text for the item. This requirement can be achieved by the following methods:

- by illustrating and separately referencing the different locations of an item. Refer to Fig 13 [26].
- by the number of leader lines (more than one leader line pointing to the same item number). Refer to Fig 13 [28].
- by the number of identical key characters (letters) if a detail illustration applies to more than one location. Refer to Chap 3.9.2.2 and Fig 13 [A].

– by using the multiplier "x" after the item number followed by the appropriate quantity. This procedure is permissible only if all locations cannot be shown (refer to Fig 13 [4]) or where, for practical and economic reasons, it is desirable to omit additional reference lines (eg, where installation locations are clearly identifiable but the extensive use of additional information such as repetitive item numbers, detail illustrations, etc, would make an illustration unnecessarily difficult to read). Refer to Chap 3.9.2.2.

If hotspots are needed for the production of the IETP IPD information set, links between the illustration and the IPD data can be provided using the element <hotspot> in accordance with Chap 3.9.5.2.1.8.

2.11 Center lines/projection lines

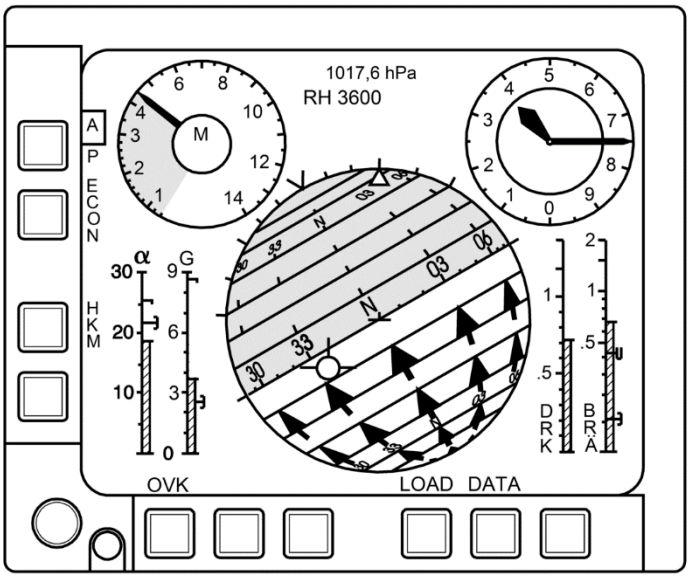
Center lines/projection lines are used in illustrations to indicate how detail parts and assemblies match.

The projection line must be routed through at least one hole, or to a prominent reference point of the detail part/assembly.

Projection and center lines must be "laid free" at the intersection with other geometry.

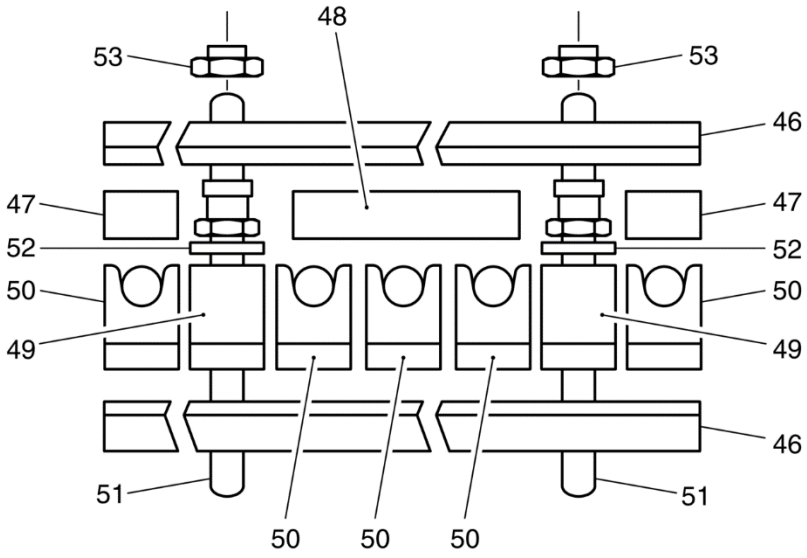
The center line represents the imaginary line through a center of an item/assembly.

If possible, projection lines/center lines must be without bends or 90° turns.



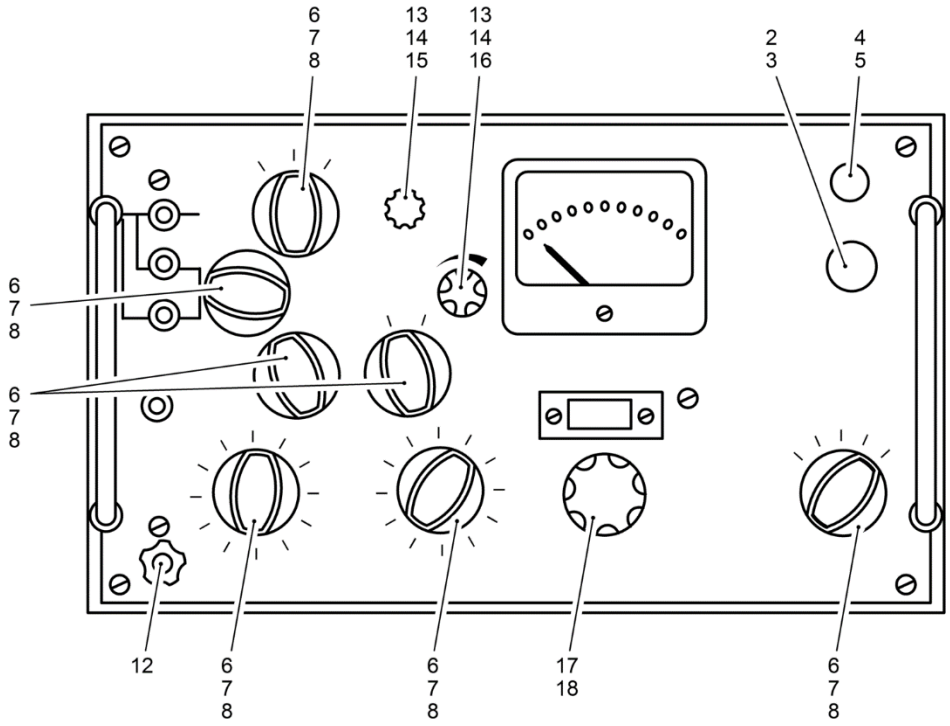
ICN-C0419-S1000D0329-001-01

Fig 10 Cathode Ray Tube (CRT) screen - Example



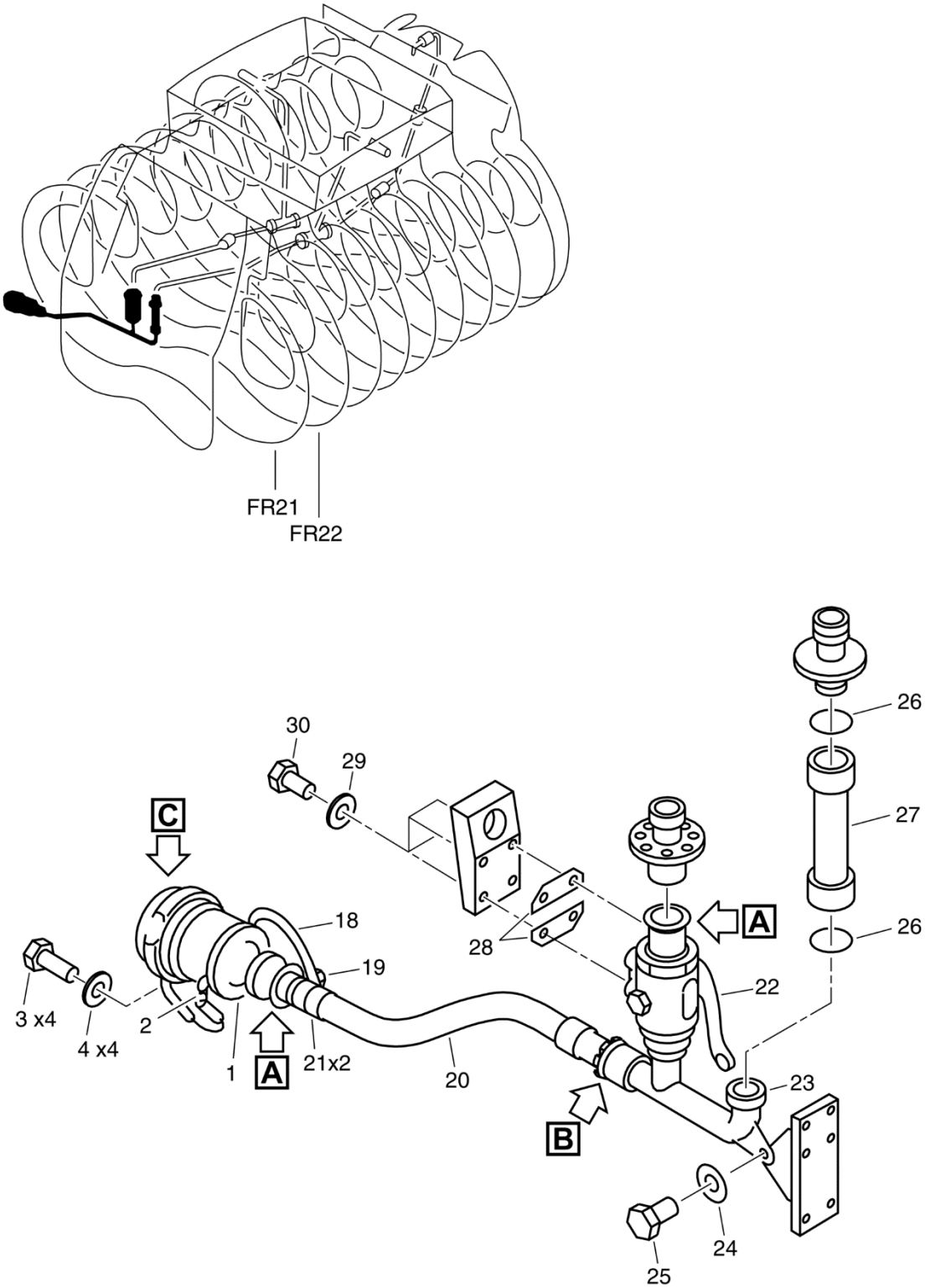
ICN-C0419-S1000D0330-001-01

Fig 11 Plan view schematic with clamps - Example



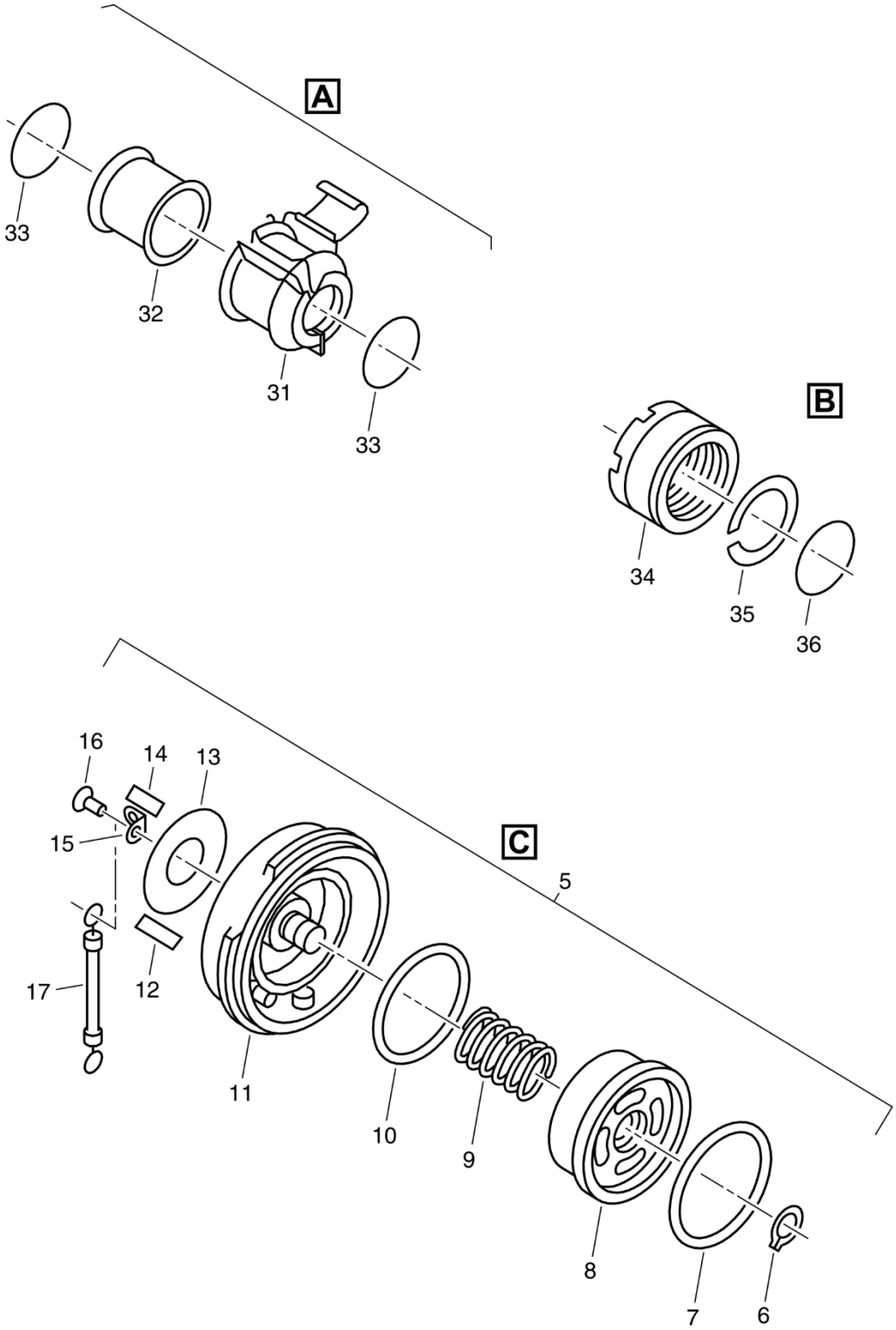
ICN-C0419-S1000D0331-001-01

Fig 12 Plan view support equipment - Example



ICN-C0419-S1000D0332-001-01

Fig 13 Navigation within IPD, more than one sheet (Sheet 1 of 2) - Example



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Fig 13 Navigation within IPD, more than one sheet (Sheet 2 of 2) - Example

Chapter 3.9.2.2

Illustration rules and multimedia - Navigation and configuration

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References

Table 1 References

Chap No./Document No.	Title
Chap 3.9.2.1	Illustration rules and multimedia - Illustrations, General
Chap 3.9.2.3	Illustration rules and multimedia - Use of color and photographs
Chap 3.9.5.2.1.8	Common constructs - Hotspots
Chap 7.3.2	CSDB objects - Graphics
S2000M	International specification for material management - Integrated data processing

1 General

This chapter defines and explains navigation and configuration of illustrations. It must be used in conjunction with Chap 3.9.2.1.

2 Navigation and configuration content

This chapter covers various aspects, production, and use of navigation symbols with rules and guidance for the configuration of illustrations.

2.1 Navigation rules

2.1.1 Use of hotspots

Hotspots are sensitive areas in illustrations necessary for creation of links used to navigate within technical publications. This area can be activated by hyperlinks from:

- text in a data module to one area of an illustration
- text in a data module to several areas of an illustration
- one area of an illustration to the data module text
- one area of an illustration to another area of the same illustration
- one area of an illustration to an area of another illustration
- one area of an illustration to another data module
- one area of an illustration to parts information

The sensitive area can be represented by:

- callout numbers (can include the leader line)
- the itemized graphic elements or their surface
- callout numbers including leader lines and itemized graphic elements (or their surface)

Highlighting the sensitive area by touching with the cursor is a viewer constraint. Examples of sensitive areas and their presentation are given in Fig 1.

Sensitive areas	Presentation	Type	Example given in
21 x2	21 x2	Multiplier	Chap 3.9.2.1
87R	87R	Reference Designator	Fig 10
13 14 15	13 14 15	Item number	Chap 3.9.2.1
1 3216VE	1 3216VE	Item number + reference designator	Fig 11
(7)	(7)	Item number for mirrored item	Fig 2
= Sensitive areas = A distance of approximately one blank [ ] to separate the sensitive area from the multiplier or reference designator			

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Fig 1 Sensitive areas and their presentation - Examples

A hotspot can be turned on or off by changing the visibility of the sensitive area. A hotspot is considered visible unless the attribute `visibility` of element <`hotspot`> overrides the default.

To set up links between data module text and illustrations, or between illustrations, cross-reference identifiers are necessary. The required target address is the identifier of the hotspot within the illustration.

The sensitive area is defined by using the WebCGM Application Structure (APS) attribute `region`. The display area of the target in a graphic is defined by the WebCGM APS attribute `viewcontext`.

For the creation of hotspots and the control of dynamic behavior of the illustration, the S1000D CGM profile defined in Chap 7.3.2 applies. The methods of implementing and using hotspots are given in Chap 3.9.5.2.1.8.

2.1.2 Graphical access

The graphical access to information in an IETP can be achieved with illustrations and hotspots to relevant data modules. This is helpful if the user knows the item but not the name or naming conventions.

As well as using the table of contents via viewer to get access to the applicable part of the document, the user can also use illustrations in different detailed sections. This is achieved by the use of hotspot technology and the applicable detailed illustrations as described in Chap 3.9.5.2.1.8. This chapter includes the concept of defining and accessing information about an illustration in addition to its visual image for the purpose of hyperlink and navigation.

2.2 Figure title and number

In order to establish the relationship to the text of a data module or publication, illustrations must be given figure numbers and titles. The figure number reflects the sequence in the data module or publication.

For IPD illustrations, the figure title must be identical with the description for part given against the item number "0" (zero) of the figure.

Figure titles are part of the data module or publication text.

Figure numbers must be generated on output only.

The figure number, followed by the title, must be centered below the illustration, outside the illustration reproduction area. The figure number and the title must be separated with two blanks. If an illustration requires several illustration sheets, the note (Sheet X of Y) must be added at the end of the title as shown in Chap 3.9.2.1. Figure number, title, and note are not to exceed two lines.

Illustrations used as symbols (element <symbol>) are not to be given a figure number, figure title, nor have the ICN presented/printed.

As an alternative to the basic method:

– Fig 12 Navigation within IPD (Sheet 1 of 2) and Fig 12 Navigation within IPD (Sheet 2 of 2)

an individual figure number can be appended to each illustration sheet, eg:

– Fig 7.1 Computer (Sheet 1 of 2) and Fig 7.2 Computer (Sheet 2 of 2)
– Fig 2 Pump (ACDC) (Sheet 1 of 2) and Fig 3 Pump (ACDC) (Sheet 2 of 2)

Note

Both methods are used in this specification.

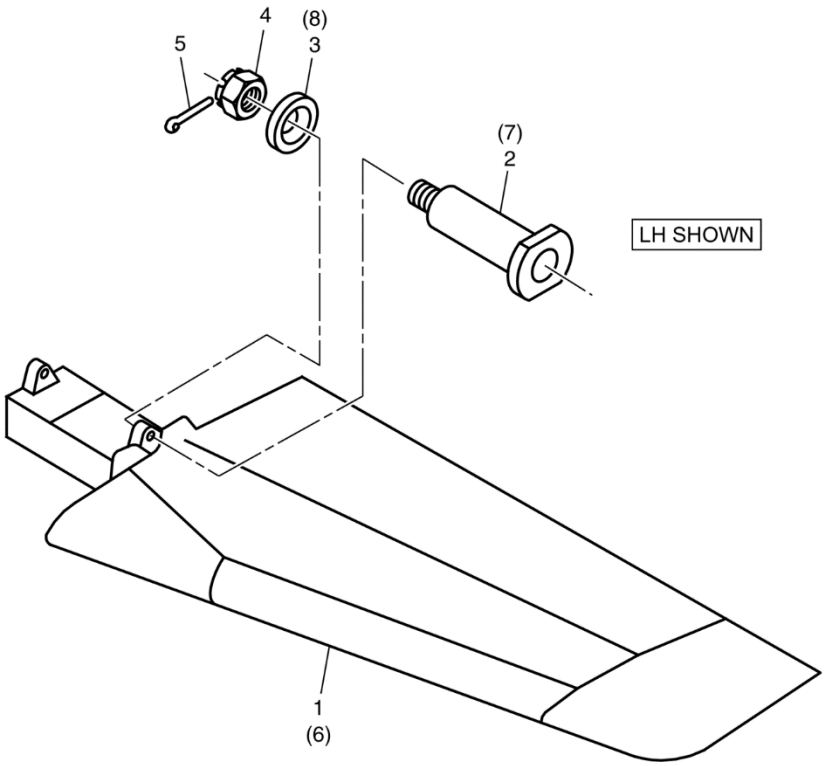
2.3 Location drawings

The location drawing normally appears in the upper left corner of the illustration. It shows the position of the assembly relative to the vehicle/equipment/assembly and represents the view most favorable for the illustration. In the case of airframes and engines, this can be supplemented by adding stations (STA), zones (Z), or frame (FR) areas.

The part to be pointed out in a location illustration or photograph can be identified by darkening the outlines, blackening or standard blue or using tints. Location illustrations are not required where the illustrated system or assembly can be positively located. Refer to Fig 2.

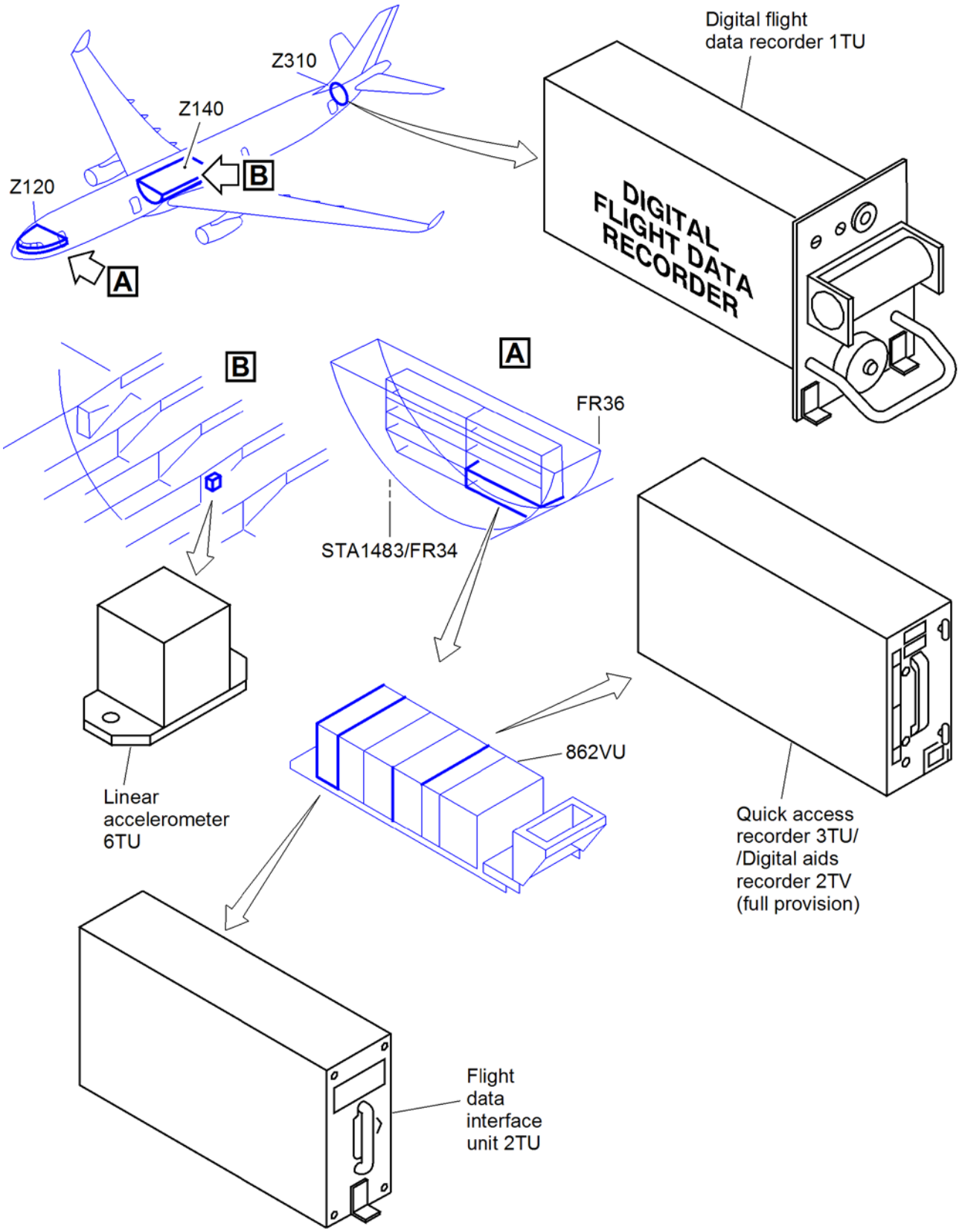
If a detail part can be properly identified in an overall view, the illustration of the part does not need to be exploded. Refer to Chap 3.9.2.1.

Examples are shown on Fig 3, Fig 4, Fig 5, Fig 7, Fig 8 and in Chap 3.9.2.1 and Chap 3.9.2.3.



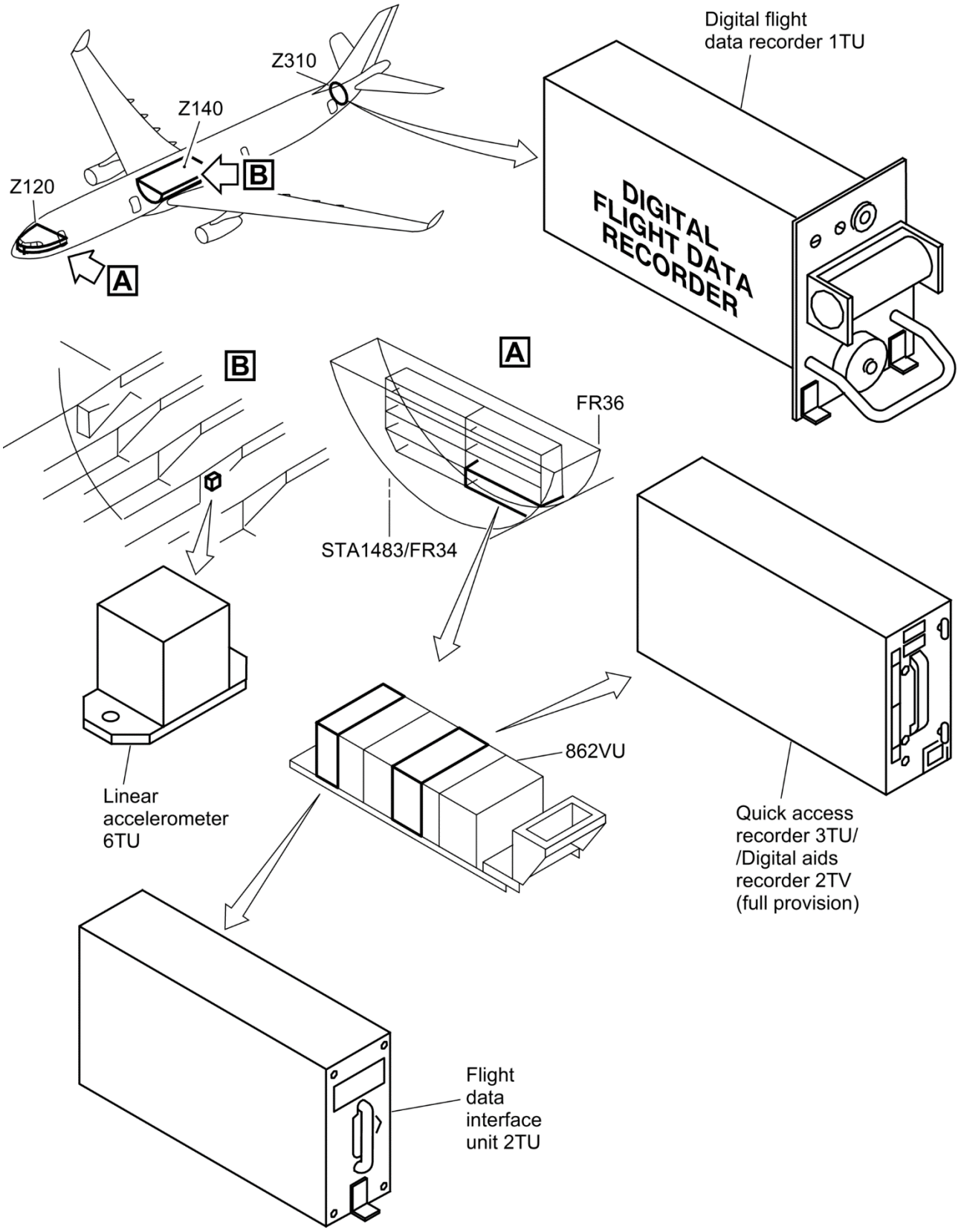
ICN-C0419-S1000D0335-001-01

Fig 2 Mirrored items and detail without location - Example



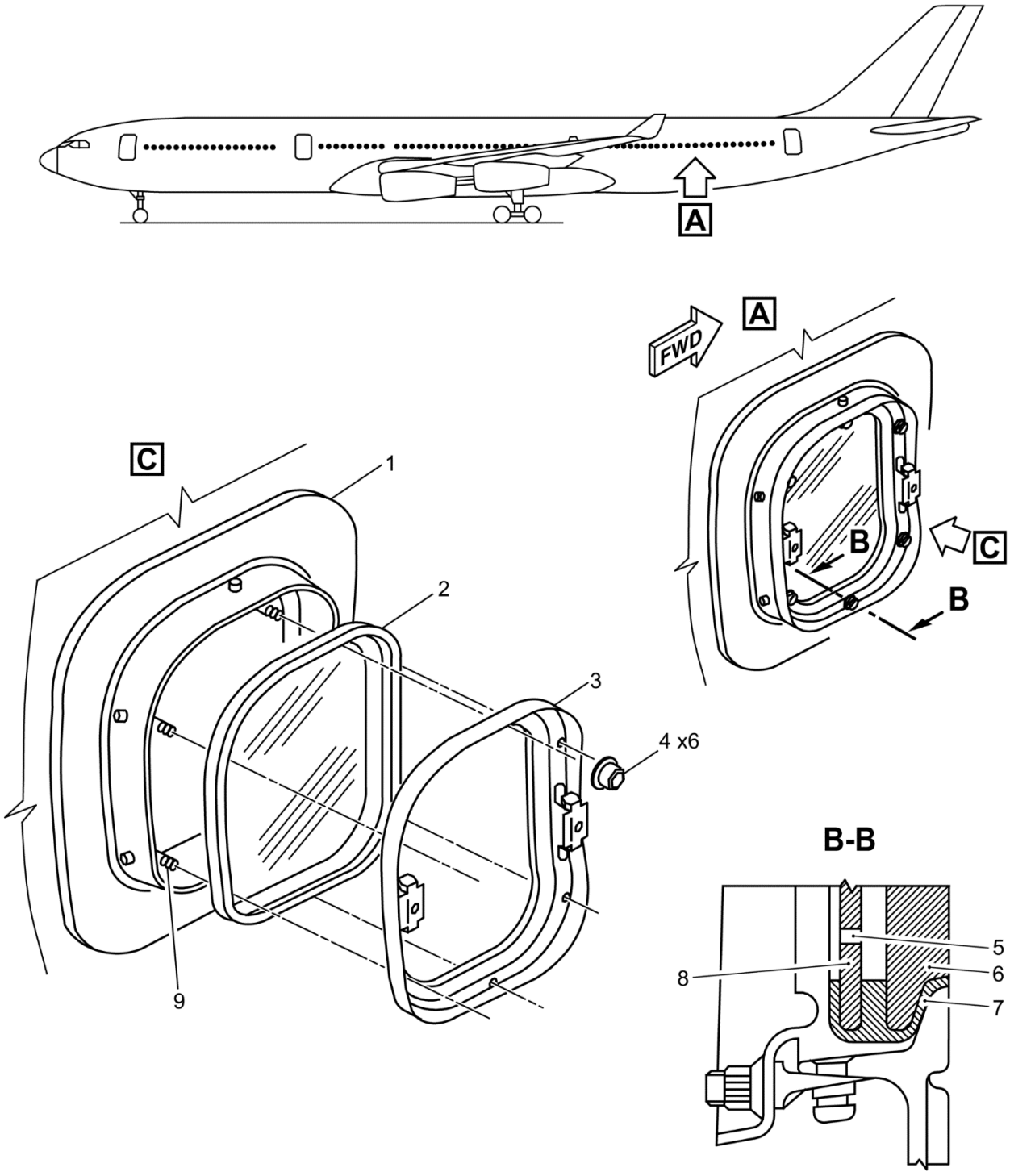
ICN-C0419-S1000D0336-001-01

Fig 3 Use of views for typical navigation - Color example



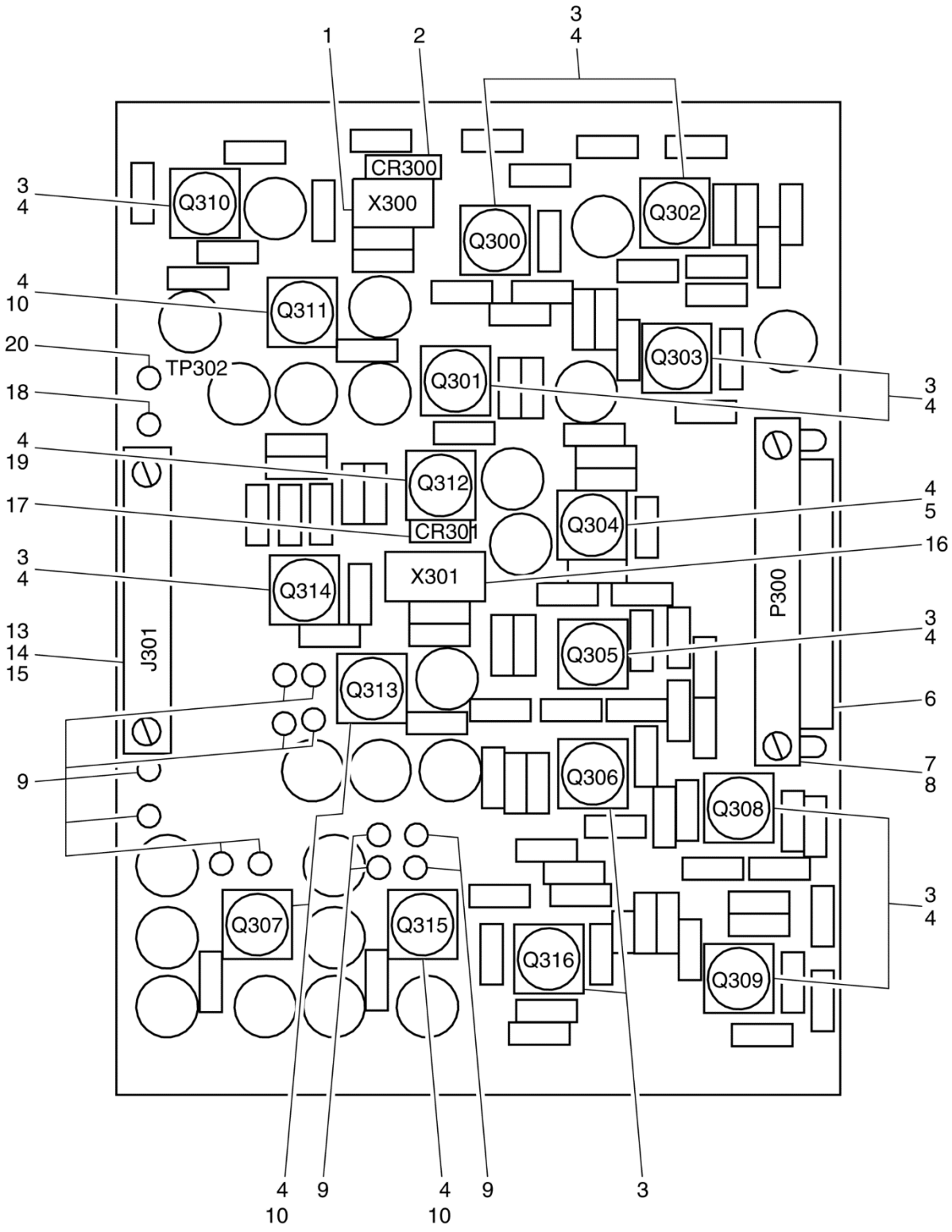
ICN-C0419-S1000D0337-001-01

Fig 4 Use of views for typical navigation - Black and white example



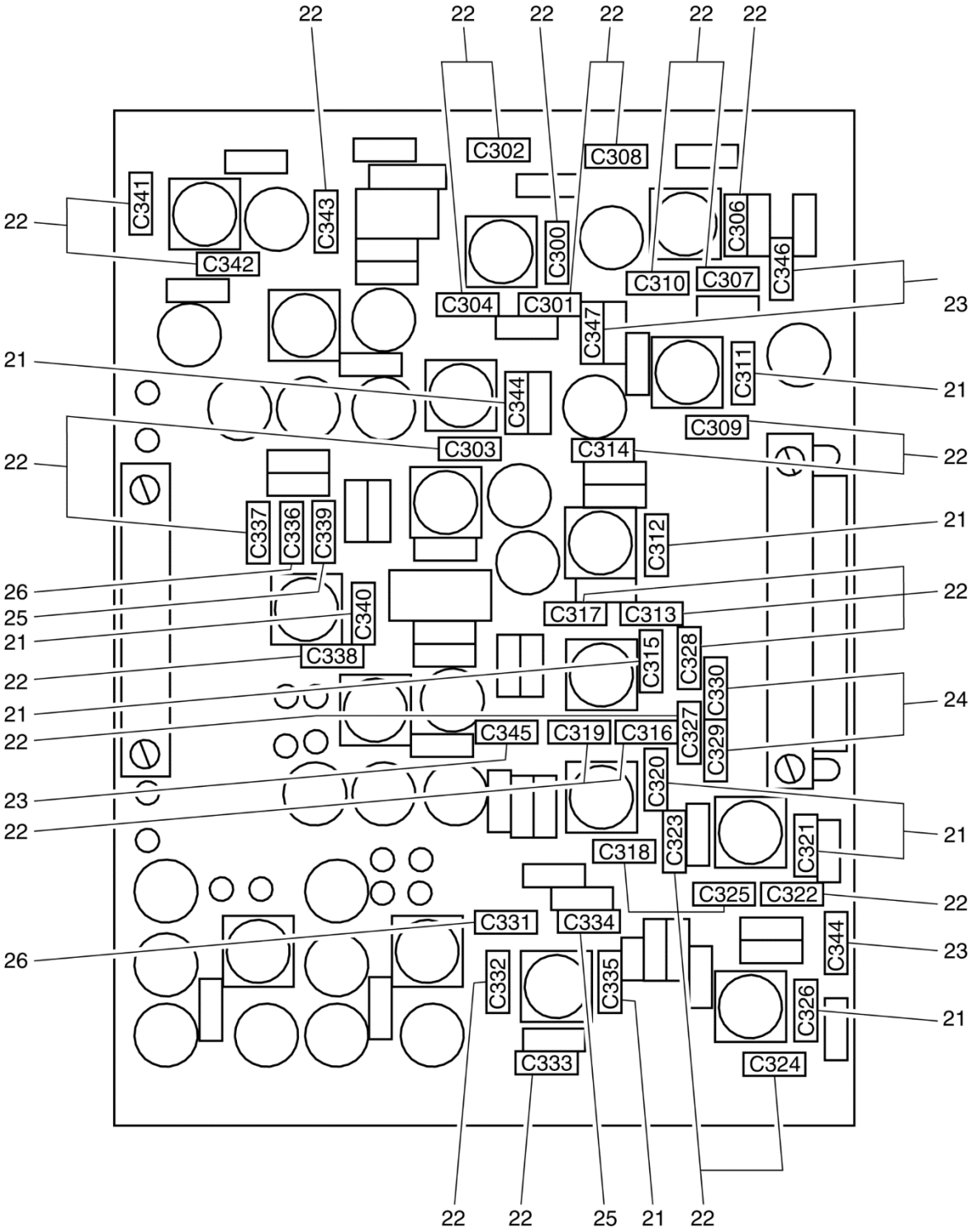
ICN-C0419-S1000D0338-001-01

Fig 5 Typical navigation from general view to section - Example



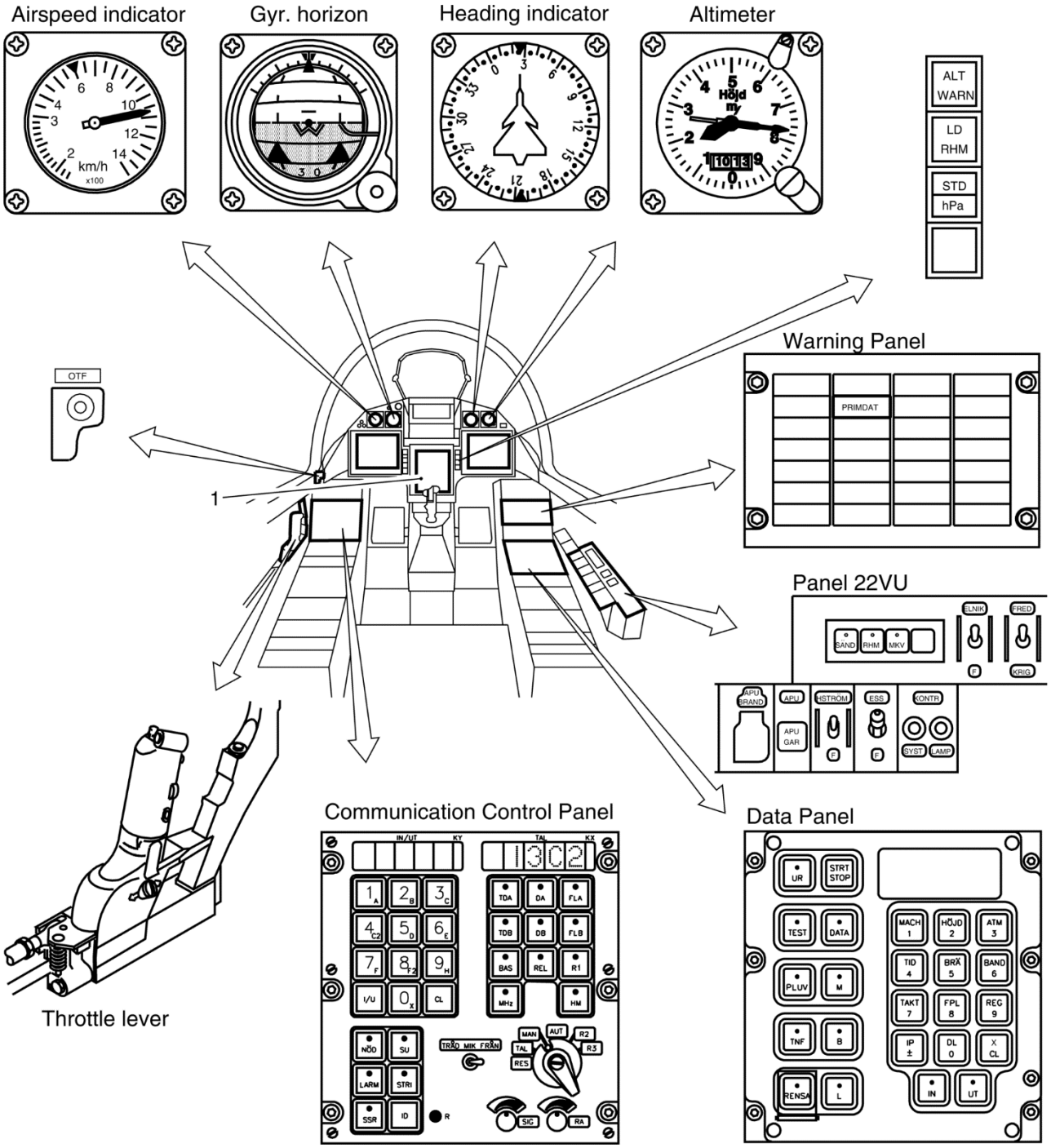
ICN-C0419-S1000D0339-001-01

Fig 6 Identification of components on complex circuit board - Example (Sheet 1 of 2)



ICN-C0419-S1000D0340-001-01

Fig 6 Identification of components on complex circuit board - Example (Sheet 2 of 2)



ICN-C0419-S1000D0341-001-01

Fig 7 Cockpit presentation - Example

2.4 Illustration of views, details and sections

2.4.1 General

If a display of enlarged views, details, and sections is required, they must be located on the illustration in alphabetic order. It is preferable to start in the top right corner of the illustration with View A/Detail A/Section A-A (whichever applies) and proceed, if possible, in a clockwise mode locating as necessary.

Section cut-lines and section arrows must conform to the perspective of the view.

For location of hidden details not visible on main views, use broken locating arrows.

Use general symbols for presentation in accordance with Chap 3.9.2.1.

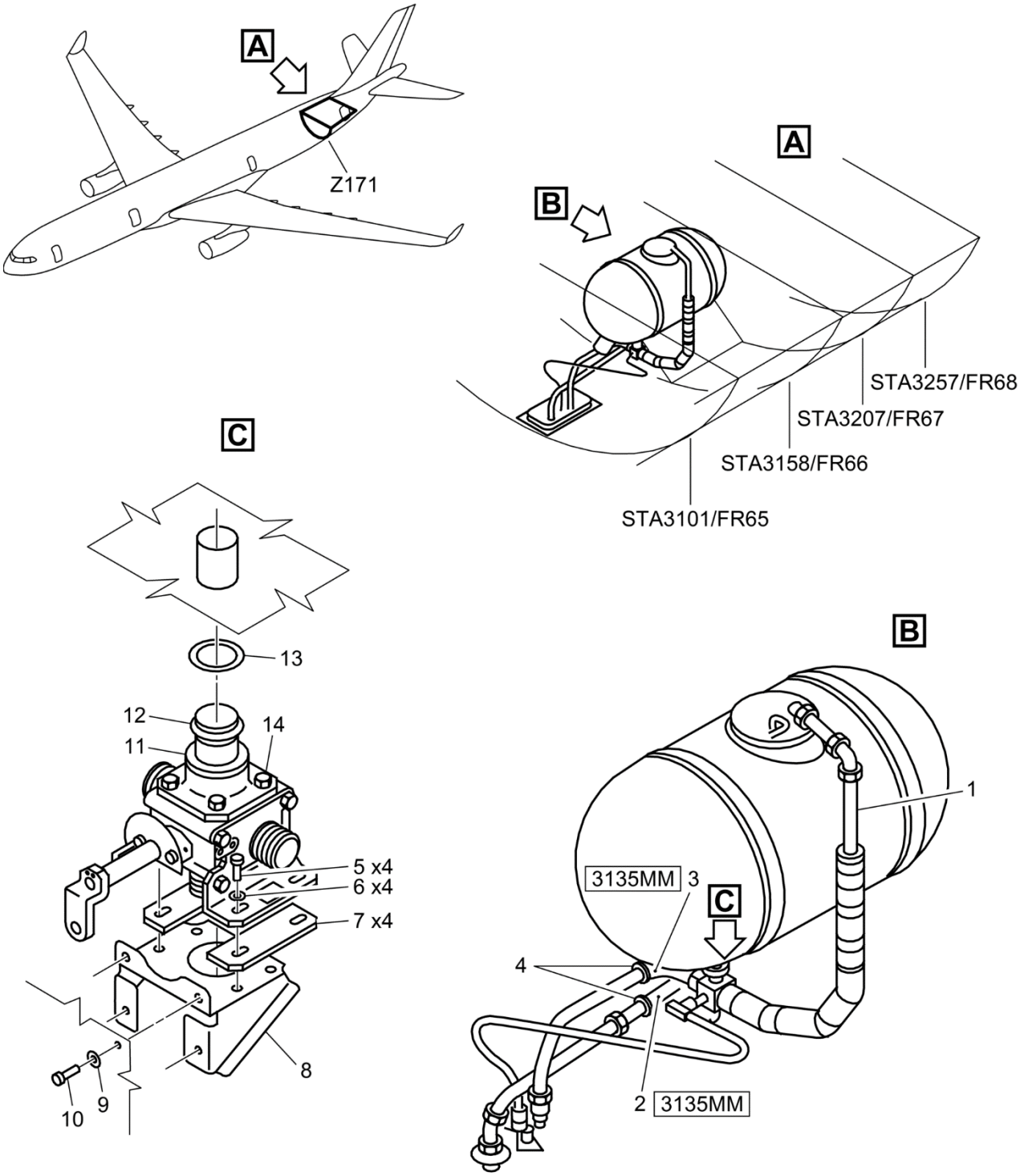
Examples are shown on Fig 3, Fig 4, Fig 5 and Fig 7.

2.4.2 IPD illustrations

The allocation of the capital letter identifying the "assembled item" is necessary where the "assembled items" cannot be shown in the main illustration (either they have a single collective part number, and therefore attract an item number, or not).

A location drawing refers out by means of an arrowhead and capital letter to a detailed illustration of an assembly (refer to Para 2.3). This assembly also has its own part number and therefore an item number, both, the capital letter and the item number will appear as shown in Chap 3.9.2.1.

If several separate detail part illustrations are necessary within the same figure, they must be initially identified on the first illustration sheet of the figure (ie, in the main illustration). The detail part illustrations can then appear on additional illustration sheets, if necessary.



ICN-C0419-S1000D0342-001-01

Fig 8 Navigation via frame stations - Example

2.5 Identification of electrical and electronic components

2.5.1 General

If electrical or electronic components require identification by circuit reference designators, the designators must either be included in a legend and/or within the associated text, but not included within the illustration itself.

In the case of orthographic illustrations (eg, a printed-circuit board) item numbers applied within the boundary of the component or by leader lines can be used. Examples are shown in Fig 6, Fig 8 and Fig 9.

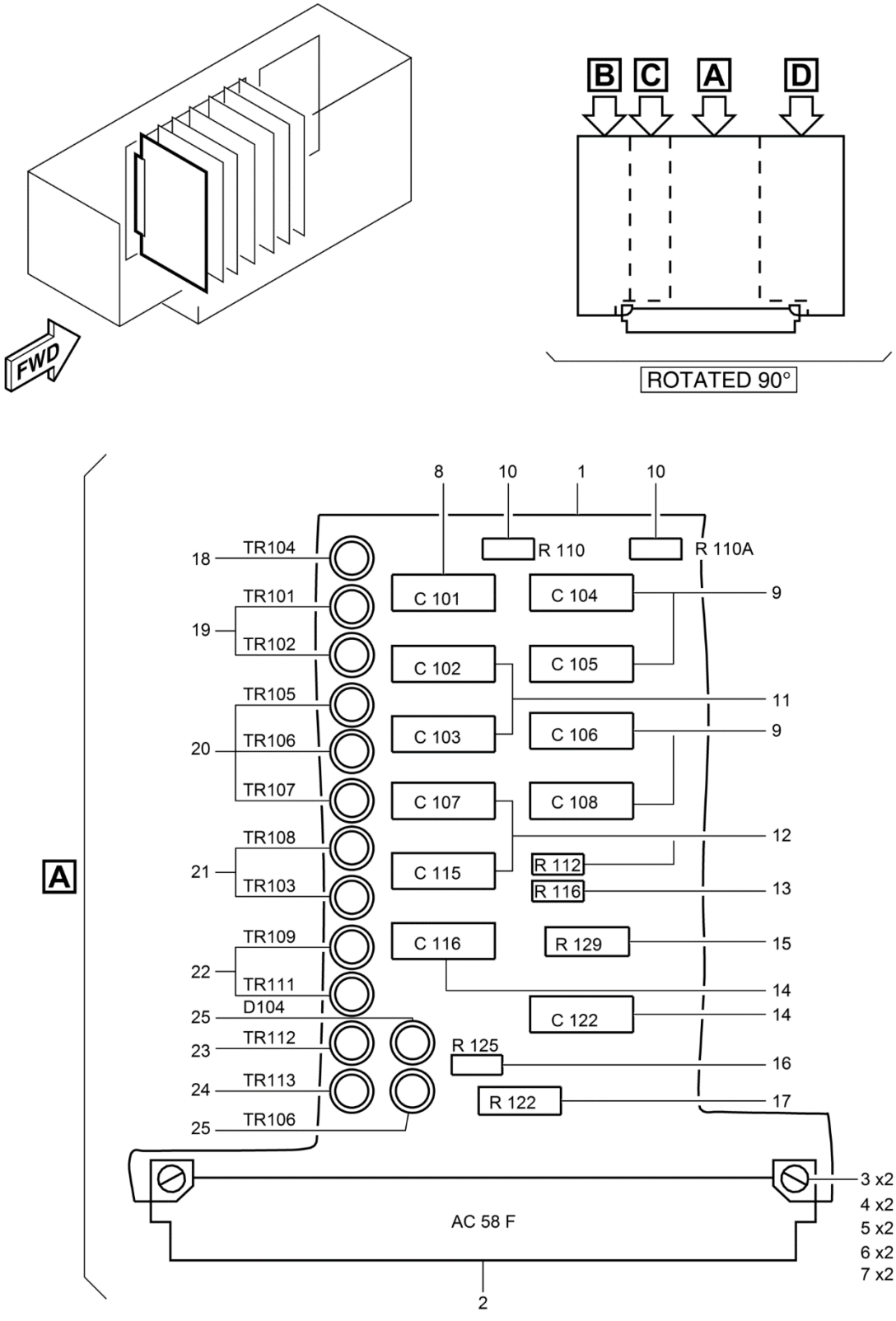
2.5.2 IPD illustrations

Electrical components in IPD illustrations must not be referred to in a legend or associated text. If annotations of the reference designators make an illustration difficult to read because of the congestion of annotations, an illustration must be repeated on several illustration sheets. Each sheet will identify a different range of the total number of components.

In an isometric view, the reference designator must be positioned near the item number of the relevant component.

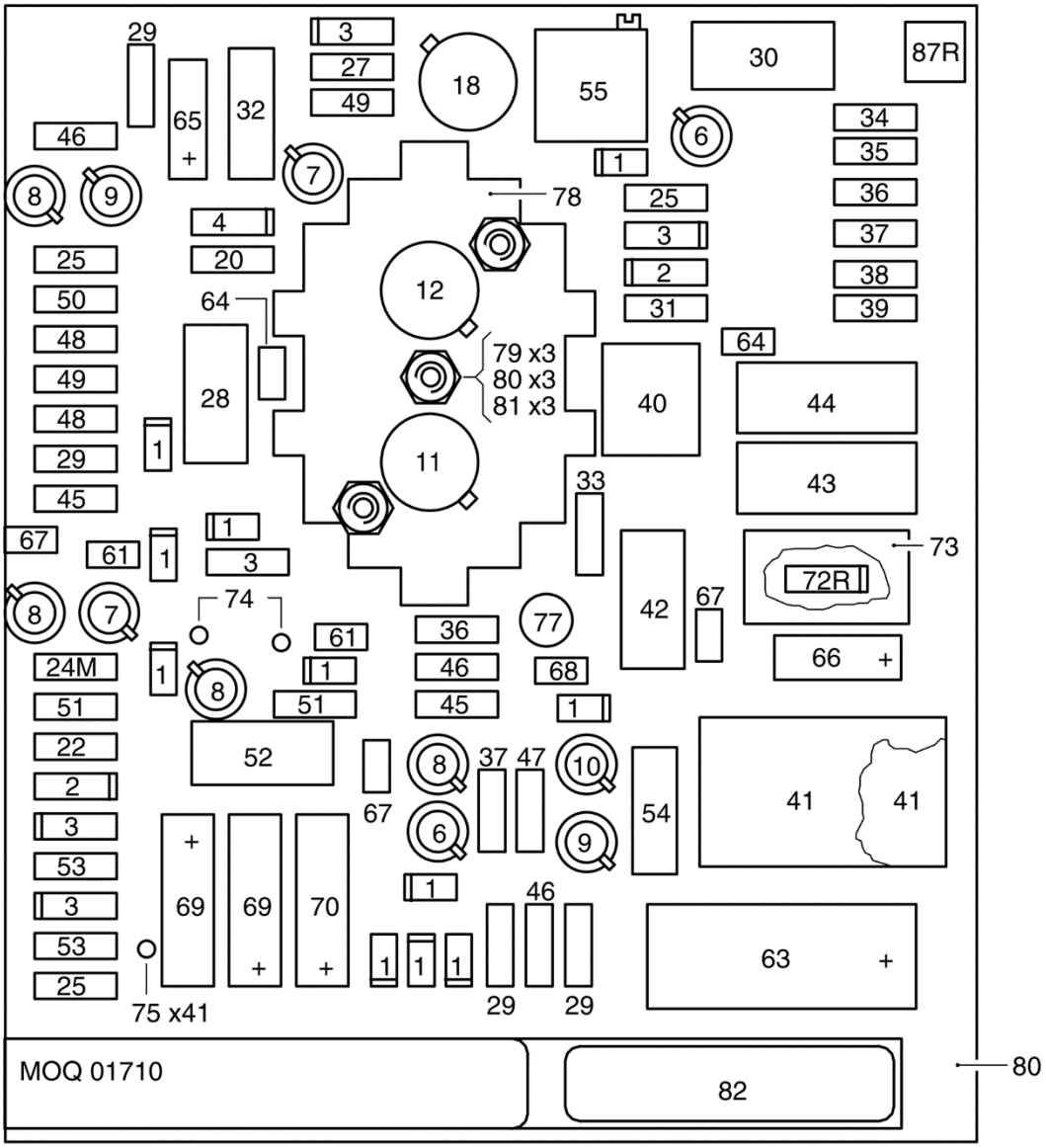
If the illustrated size of components is insufficient for each to be annotated, the reference designators can be assigned to the components by the use of reference lines or by arranging them besides the component in such a way that their relationship to the component is clearly recognizable.

The use of reference designators does not replace the need for item numbers. Refer to Fig 10.



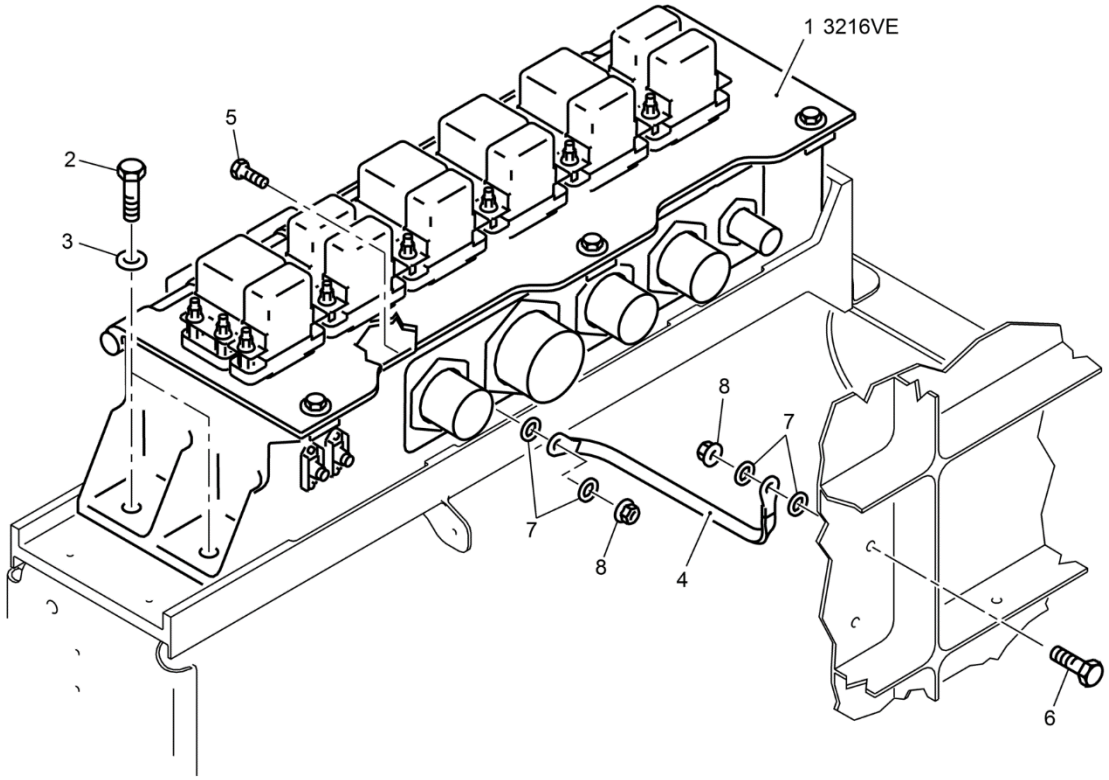
ICN-C0419-S1000D0343-001-01

Fig 9 Identification of components on simple circuit board - Example



ICN-C0419-S1000D0344-001-01

Fig 10 Identification of components on complex circuit board using direct method - Example



ICN-C0419-S1000D0345-001-01

Fig 11 Reference designator and item number- IPD example

2.6 Mirrored items

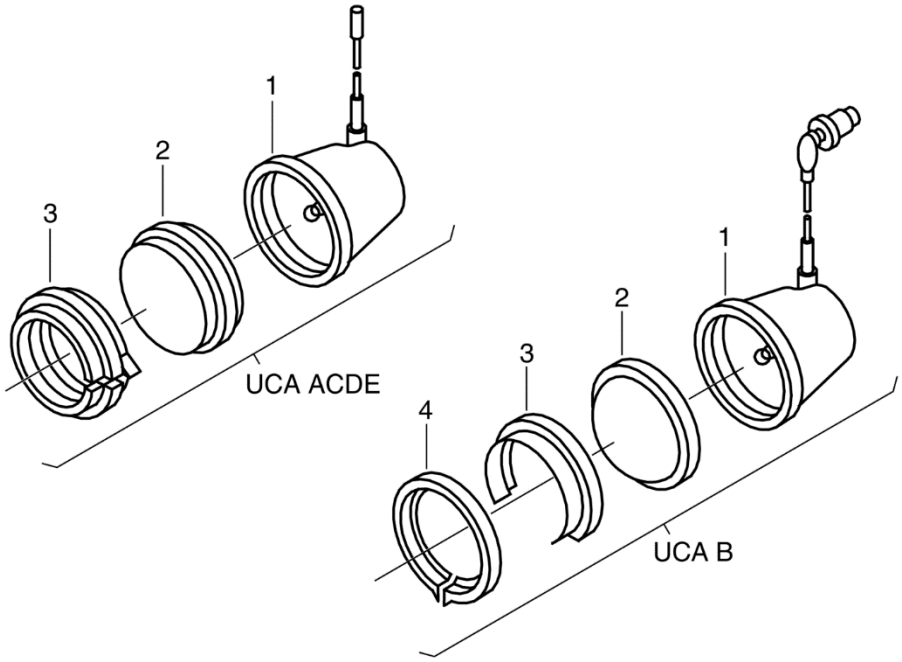
Illustrate the Left Hand (LH)/Top (TOP)/Forward (FWD) part only. If item numbers of the part not shown are different, then they can be contained within brackets below or above the item number of the illustrated part. The leader line must go to the item number of the part which is illustrated.

A deviation from this rule is permitted if the mirrored parts differ in detail or if for evaluation, it is preferable to illustrate another part (eg, a right-hand part).

Appropriate references to the detail parts of a mirrored item, such as "LH only", "Right Hand (RH) only", "LH shown", "RH shown", can be included in the illustration. An example is given in Fig 2.

2.7 Illustration of different configurations

Illustrated configuration deviations normally record the appropriate Usable on Code Assembly (UCA), or Usable on Code Equipment (UCE) next to the detail part concerned. Refer to Fig 12 and also S2000M.



ICN-C0419-S1000D0346-001-01

Fig 12 Different configurations - Example

2.8 Item tabulation

In cases where visually similar components appear at a number of different locations within one figure, it is permissible to illustrate them only once. The locations and the item numbers can be indicated by multiple indexing or tabulation on the illustration. Refer to Chap 3.9.2.1.

2.9 Attaching parts (IPD illustrations)

If a number of identical attaching parts is used for a detail part or assembly, the installation locations of all attaching parts must be identified in accordance with Para 2.3.

If the order of sequence of the attaching parts cannot be discerned from the illustration - but if it is absolutely necessary for comprehension - a breakdown example in the sequence of removal must be given.

Where identical attaching parts are fitted at several locations, but the orientation differs, the illustrations must be annotated to show the correct orientation at each fitment point.

Chapter 3.9.2.3

Illustration rules and multimedia - Use of color and photographs

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References

Table 1 References

Chap No./Document No.	Title
Chap 3.9.2	Authoring - Illustration rules and multimedia
Chap 3.9.2.1	Illustration rules and multimedia - Illustrations, General
Chap 3.9.2.2	Illustration rules and multimedia - Navigation and configuration
Chap 7.3.2	CSDB objects - Graphics

1 General

The electronic environment presents opportunities for the enhancement of graphical technical data by introducing color and photographic images. This chapter contains the required information and rules to produce and deliver color illustrations and photographic images to visually improve the users' interpretations of technical data.

2 Use of color and photographs

2.1 Rules and recommendations for color illustrations

The introduction of color has a profound effect in the way in which we can deliver technical information to the user. However, along with all the benefits it brings, caution must be used in the application of color in critical information situations. The following rules and recommendations must be used:

- In critical information situations, colors must be supported with another method of identification, distinctive symbols, markings, banding or wording. Refer to Fig 7, Fig 10 and Chap 3.9.2.1.
- If color is used and assigned a unique meaning to perform a described procedure then no more than six colors must be used. More than six and the user will experience difficulty remembering the entire assigned color scheme and this is detrimental to carrying out the described task. However this does not mean that only six colors can be used in any one project, it means that careful consideration must be given when assigning specific colors and meaning to a task. Refer to Table 2 and Fig 1.
- The cultural color conventions must not be disobeyed, red is for danger, yellow for warning and green for safe or exit. Red and yellow must be reserved for alerts, warnings and selective highlighting. Refer to Table 3.
- Color must be used consistently throughout an IETP and in printed material preserving conventional practices and arrangements
- Where color is used in unusual environments, (eg, artificial illumination, night vision goggles, red lighting and emergency situations) the ability to display correctly as intended or appear as designed in printed material must be ensured
- The implementation of color requires testing in the role in which it must be used and support in the environment in which it will operate. Consideration must be given to backgrounds used, or which colors are positioned next to each other. Colors will appear different, lighter or darker, because of effects on color hue.
- For aircrew publications, the illustrations must use the appropriate color if the use of color on the displays has a semantic meaning. Refer to Fig 3.
- If appropriate, consideration must be given to the visual compatibility and color accuracy with operational equipment or controls with the color information contained in IETP illustrations

- If line drawings are produced from 3D engineering drawings, they are only modified to show important details more clearly. Different thickness of lines is not necessary in an IETP. The difference between the reference structure and callout parts must be presented by the different colors in the illustrations and defined in the project business rules.

2.1.1 Photographs

Photographs are still raster images, generated through one of the following methods:

- film or digital photography
- digital scanning
- nondestructive test methods
- computer generation

Photographs include photo-realistic computer generated images. Refer to Fig 2, Fig 3 and Fig 4.

Photographs can be used equivalent to line art illustrations, if the creation is more economic and applicable for:

- aged illustrated parts documentation
- maintenance tasks of crowded compartments
- training documentation
- documentation of non-destructive test results

2.2 Use of color

The prime objective of this section is to define the use of color, ensure uniformity and to deliver color accuracy in displayed and printed technical publications. However, this section cannot define a "fits all" easy solution to color by assigning a unique or tight inflexible meaning to a whole spectrum of colors. This is unwise following careful research into color use and the resulting complexities of color behavior in unusual or special lighting environments.

Therefore with due consideration of too many factors, the following eleven color specification and guidance was produced. Refer to Fig 1.

2.2.1 The S1000D standard color palette

Table 2 gives the recommended S1000D standard color palette defined in Red/Green/Blue (RGB), Pantone and Cyan/Magenta/Yellow/Key (CMYK) values. The use of these colors is subject to the same guidelines and considerations as given in Para 2.1.

Table 2 The S1000D standard color palette

Color	RGB value	Pantone value[1]	CMYK value[1]			
Red	R255	Red 032	C 0%	M 100%	Y 100%	K 0%
Yellow	R255 G255	Yellow	C 0%	M 0%	Y 100%	K 0%
Blue	B255	300	C 100%	M 43%	Y 0%	K 0%
Green	G255	375	C 43%	M 0%	Y 79%	K 0%
Orange[2]	R255 G102	1585	C 0%	M 60%	Y 94%	K 0%
Amber[2]	R255 G153	1385	C 0%	M 38%	Y 94%	K 0%
Cyan	G255 B255	304	C 31%	M 0%	Y 6%	K 0%
Magenta	R255 B255	238	C 18%	M 83%	Y 0%	K 0%
Light blue	R204 G255 B255	566	C 23%	M 0%	Y 10%	K 0%

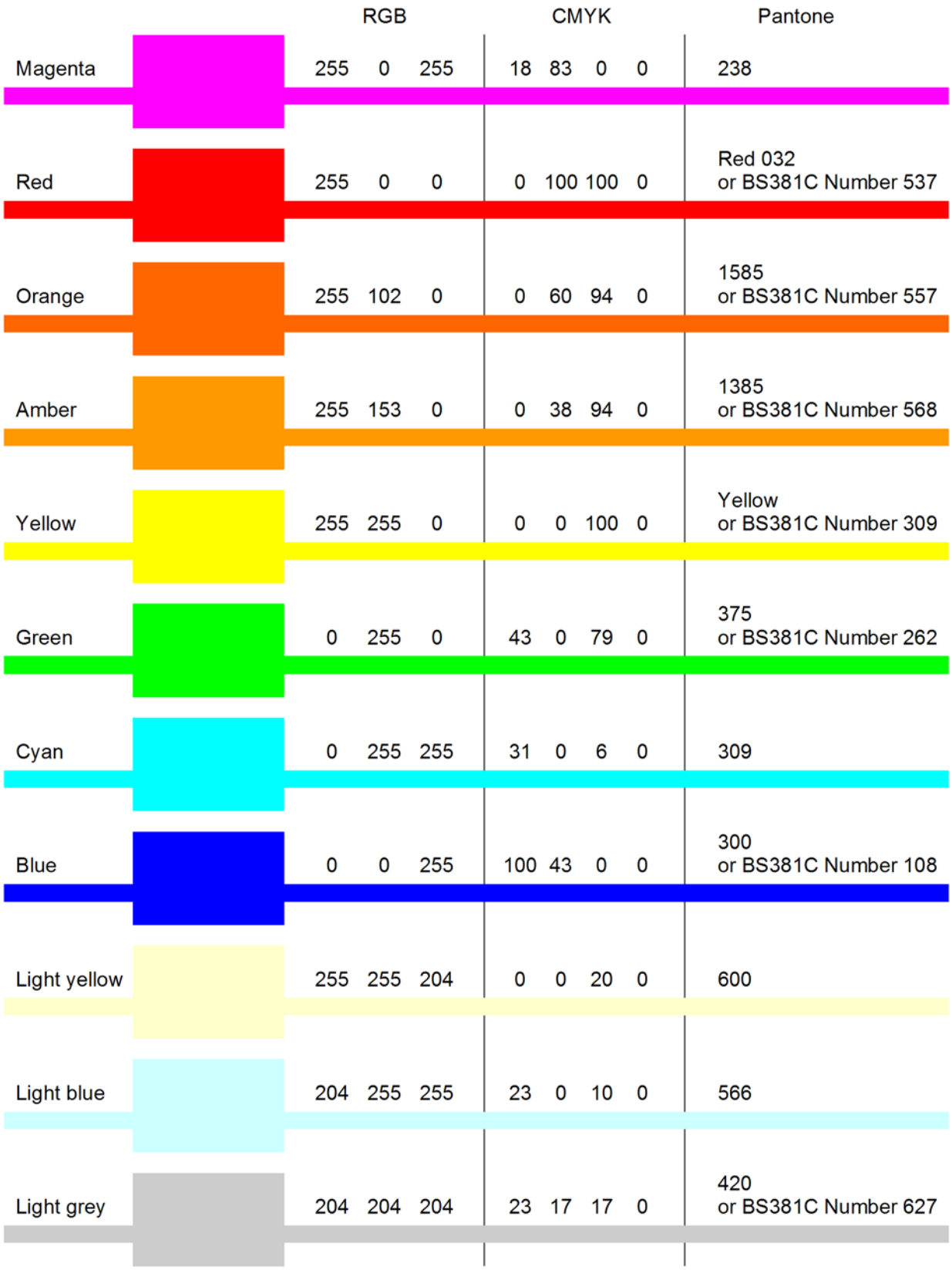
Color	RGB value	Pantone value[1]	CMYK value[1]			
Light yellow	R255 G255 B204	600	C 0%	M 0%	Y 20%	K 0%
Light grey	R204 G204 B204	420	C 23%	M 17%	Y 17%	K 0%

1 The Pantone and CMYK values are currently only a suggestion

2 It is recommended that orange and amber are not used together. In grayscale, amber appears as a darker grey than light blue or light grey. Refer to Fig 7 and Fig 10.

As appropriate, colors introduced into projects must be prepared according to the rules in Para 2.2.2 and as detailed in the standard color palette detailed above in Table 2. Refer also to the illustration examples shown in Fig 5, Fig 6 and Fig 7. The use of this color palette can also be applied to legacy projects.

Table 3 provides guidance for selecting colors.



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Fig 1 Standard color palette

2.2.2 The use of fill color to represent a hierarchy of structure

If fill color is used, it must represent the following hierarchy of structure. This means that colors used for an individual part will change between detail views, in accordance with its status within that view.

Refer to Fig 6 and Fig 7, where a part that is removed in a particular view will, along with its attaching parts, be light blue. Other parts within the main assembly can be removed in subsequent views and these will be highlighted in light grey.

Along with the appropriate navigational symbols, this will guide the user to the relevant detail view. In this view, the items to be removed and their attaching parts are now colored light blue. The original light blue assembly now represents background structure and is therefore shown in light yellow. This process can be repeated as necessary until the required stratum of information is attained.

If a project adopts hierarchical color representation for structure, then this process must be maintained throughout the life of that project.

Table 3 Use of fill color

Color	Used for
Red	The color red is used for critical alerts, emergency information, warnings (fuel, danger areas, conflict alert, compressed gas, locked or guard levers). Use this color sparingly. Refer to Para 2.1 and Fig 7.
Yellow	The color yellow is used for warnings, cautions and emergency rescue points (emergency controls: yellow used with diagonal black bands).
Blue	The color blue is used for referencing, navigation and special symbols (associated system colors: Hydraulics, Hydraulic power). Refer to Fig 8.
Green	Safe and Exit (associated system colors: Power plant, breathing oxygen)
Orange	The color orange is used for warnings and danger areas (associated system colors: Pneumatics, Electrical and lubrication)
Amber	The color amber is used for flight control warnings, cautions for heavy, hot, fragile items and tools. Amber is also used to indicate tools that must be removed before returning to service (associated system colors: Electrical power). Refer to Fig 7.
Cyan	The color cyan is used for hidden lines (associated system colors: Flight controls)
Magenta	The color magenta is used to highlight parts or zones on the main locator view and frames sections. It is applied as line art, outlining the subject items using a 0,50 mm line weight. It is only used on the initial locator view as a starting point for subsequent navigation through a figure and frames sections (associated system colors: Oxygen). Refer to Fig 9.
Light blue	The color light blue is used for all detail items and attaching parts and is applied as a fill to the relevant parts/area and represents the final stage of the navigation process where the parts is called out for identification or a removal/installation procedure. Refer to Fig 9.
Light yellow	The color light yellow is used for all reference items and structure, locator views and peripheral information. It is applied as a "fill" to the relevant parts/area and is used to differentiate background information from detail. Refer to Fig 6 and Fig 9.

Color	Used for
Light grey	The color light grey is used for main subjects on the locator view and on any intermediate sub-locator views. It is applied as a "fill" to the relevant parts/area that, combined with the relevant navigation symbols, guides the user to the appropriate detail views. Refer to Fig 6 and Fig 9.
Black	The color black is used for all line art on detail parts and reference items, leader lines, hatching, dimensioning and text (in a hierarchical structure).

2.2.3 The use of color line art

The basic color for line art is black. A project can choose to use other line colors to represent things such as hidden lines, or objects that require attention. A project or an organization must define the semantics of the line colors and must use them consistently throughout the life of a project.

Business rule decision point BRDP-S1-00556 - Use color line art:

- Decide whether to allow the use of color line art.

2.2.4 The use of non-standard colors

The application of non-standard colors must be used in accordance with the rules given in Para 2.1. Careful consideration must be given to maintaining sufficient color variance between details in multi-colored illustrations, wiring diagrams, maps and flow diagrams requiring an extended range of colors.

2.3 Use of photographs

Photographs and photo-realistic computer generated images can be used provided they meet all requirements given in Chap 7.3.2 and the primary illustration rules given in Chap 3.9.2. The following rules also apply:

- Text, annotations and symbology overlaid on photographs must be kept to a minimum and important consideration must be given to potential changes.
- If text is required to be within the photographic image, then it must be placed in a white box and existing illustration rules apply. Refer to examples in Fig 2.
- Photo manipulation, highlighting and masking to show only the detail required or what is being described to the user can be used. The image must be prepared with its proportions constrained and present a view and scale that is most favorable for the user. Line illustration and color rules still apply.
- Hotspots can be used in photographic images to create links used to navigate within technical publications. This area can be activated by hyperlinks, refer to Chap 3.9.2.2.

For the use of leader lines, refer to Chap 3.9.2.2.

Careful consideration must also be given to the file sizes of photographic images within paper and IETP deliverables. If the final publication, including the photographic images, must be printed then the original images in question must be saved and stored in accordance with the industry standards. This ensures that a quality image is printed and delivered to the customer and also allows future manipulation and amendments to be easily made.

Photographic images used in the production of an IETP must also be maintained as stated above, however the final delivery to the customer is at screen resolution. For further guidance refer to the examples given in Fig 2.

2.3.1 Embedding of color photographs or color line artwork

The location photograph example image (top left) is 276 kilobytes in size and displayed at 72 dots per inch (dpi). Refer to Fig 2. The main image on the page is 546 kilobytes at 72 dpi and

both images are linked and not embedded in the original file to assist smoother and quicker handling. A design for print A4 version including both images at 300 dpi of Fig 2 has a delivered file size of 20 megabytes.

2.4 Use of color in 3D content

The following applies and gives guidance in the use of color, control within a 3D multimedia scene or presentation. As the production of 3D content frequently consists of using engineering 3D models with close ties to the manufacturing process, source models may not be compliant or fully conform to the use of color in the IETP. The expense associated with re-coloring to conform to a projects business rules can be mitigated using techniques which assign consistent color schemes automatically to 3D objects. This problem exists throughout the life-cycle, whenever a product modification is implemented; it is therefore recommended that projects define a color scheme to be used across the whole program.

It is recommended that where applicable, the following rules are applied to all 3D objects and all color applied to their surfaces. These color rules are not applicable to video images of equipment or parts, however any superimposed items, such as highlighting or navigation symbols must be in accordance with these rules.

- projects or organizations need to agree on hardware, viewers, and devices displaying colored 3D objects
- each color device has a finite color capability. Therefore projects or organizations must consider both the capabilities of the hardware and software when implementing a color scheme.
- color must be used consistently throughout the 3D presentations
- for animated 2D color illustrations, the colors must be in accordance with the 2D color section of this chapter. Refer to Para 2.2.
- color gamut differences must be tested within the project use environment
- red must be avoided unless it means danger. Any parts that would pose a danger or hazard to the user must be colored red, with the appropriate warning attached. Refer to Para 2.2.2.
- amber must be avoided unless it means caution. Any parts that would cause a danger or hazard to the equipment must be colored amber, with the appropriate caution attached. Refer to Para 2.2.2.
- for realistic rendered surfaces of equipment or parts, the color rules generally do not apply. All color applied to 3D objects must add value to the user's visual interpretation.

The 3D environment background color is a project or organization decision. However it is recommended that the chosen color is used consistently and be of a neutral light shade that does not interfere with the application of the above rules, default black or a gradient background.

If a project or an organization has a requirement to print a 3D scene then due consideration must be given to the choice of color and background when printing. For example, it can be expedient to turn off the background and switch the view to illustration mode to print.

2.4.1 Gradient background for 3D environment

Using gradient backgrounds in a 3D environment gives the advantage that the background color varies, which gives depth to the scene and helps illustrate opacity (colors, shadows, and highlights) in the 3D content. This gives the feeling of a much more realistic environment, since normal radiosity comes from the ground as well as the sky. Gradient backgrounds may also be used to give a situational feel to the 3D content, such as; sunrise, blue sky, or greenery on the ground, without the cost of building a 3D scene. Many 3D software packages have a built-in gradient backdrop option.

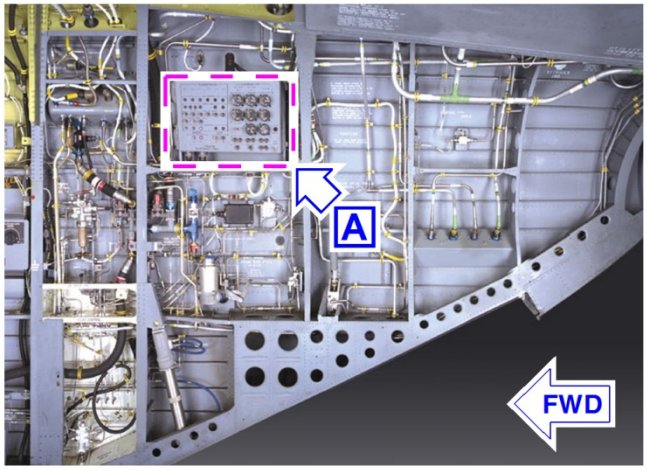
2.4.2 Color and lighting

Within a 3D environment, color is the visual interpretation of the various wavelengths of reflected or refracted light, and the color of an object is dependent on the position of that object

within a given light source. Refer to lighting in Chap 3.9.2.5. Color can be precisely measured and accurately reproduced. However the type of light, its position in relationship to the object, and the reflective index of the surface material affect the final color. These variations must be controlled when using colored 3D objects and creating virtual environments. Readability, identifiable objects and clear user understanding of a single scene or sequences must not be lost because of poor color presentation.

2.4.3 Color and critical information

In critical information situations, colors can be supported with another method of identification; distinctive symbols, markings, banding or wording within the 3D content.



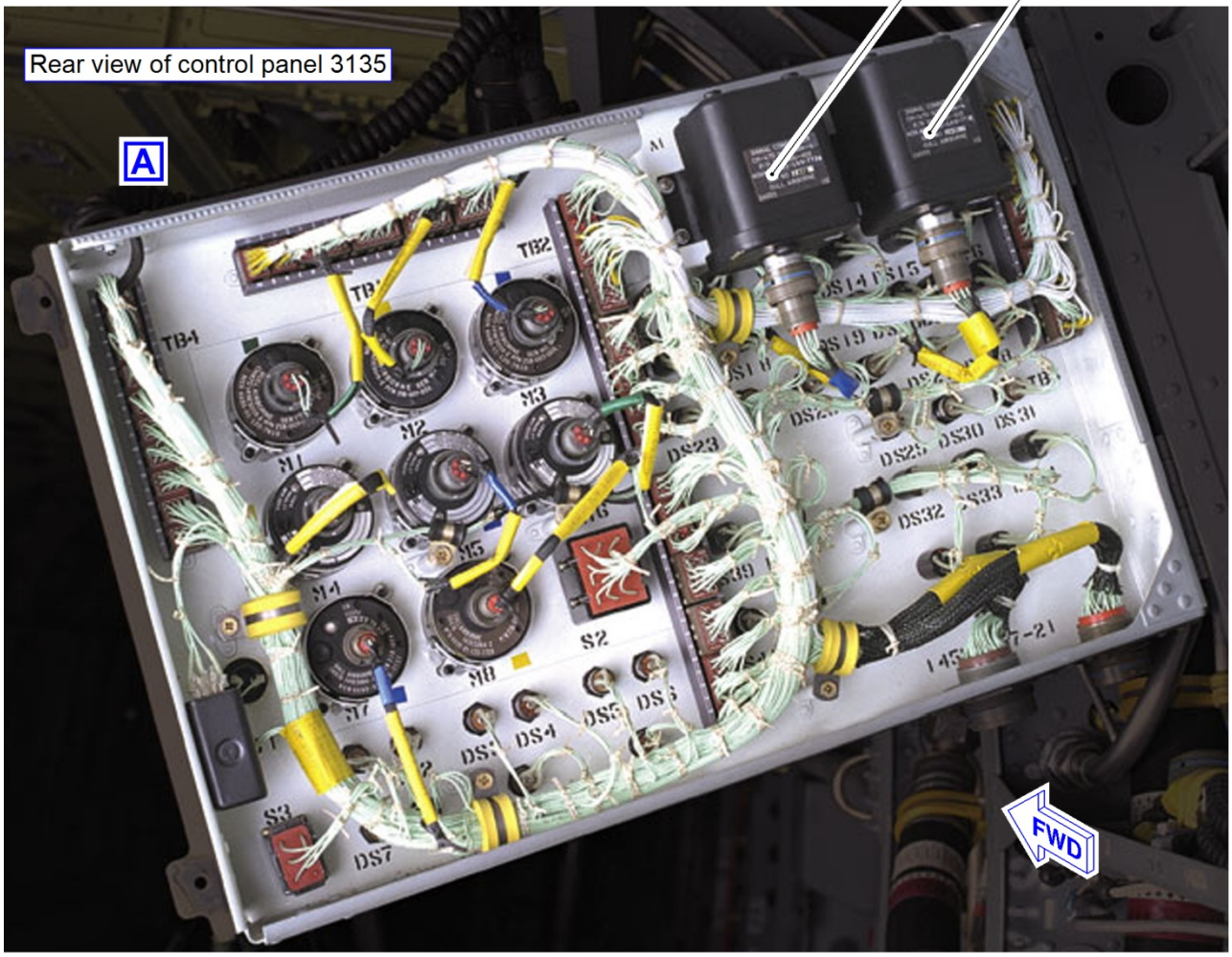
Location Photograph Example (85mm X 61mm)

STA 502

STA 534

Module A

Module B



Note: Equipment panel is shown at the correct angle to viewer

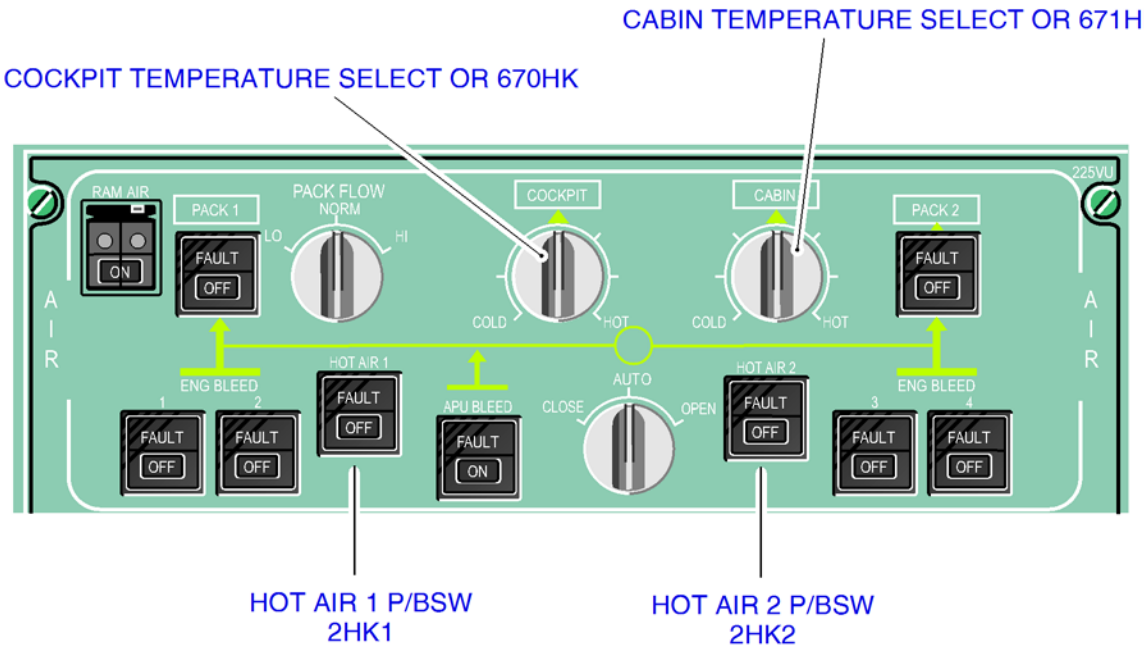
ICN-C0419-S1000D0348-001-01

Fig 2 Use of a photographic image with locator view - Color example



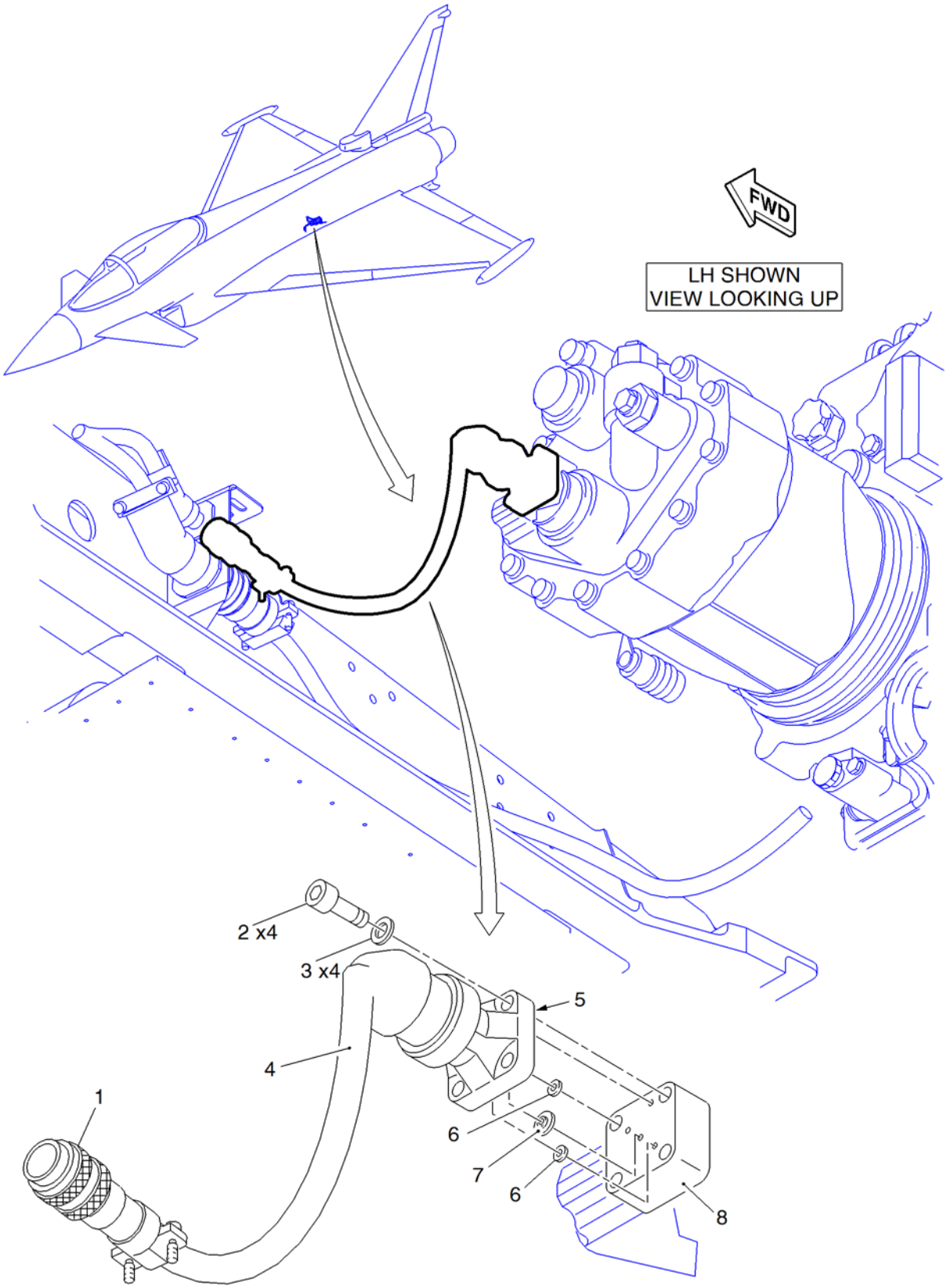
ICN-C0419-S1000D0349-001-01

Fig 3 Cathode Ray Tube (CRT) screen generated image - Color example



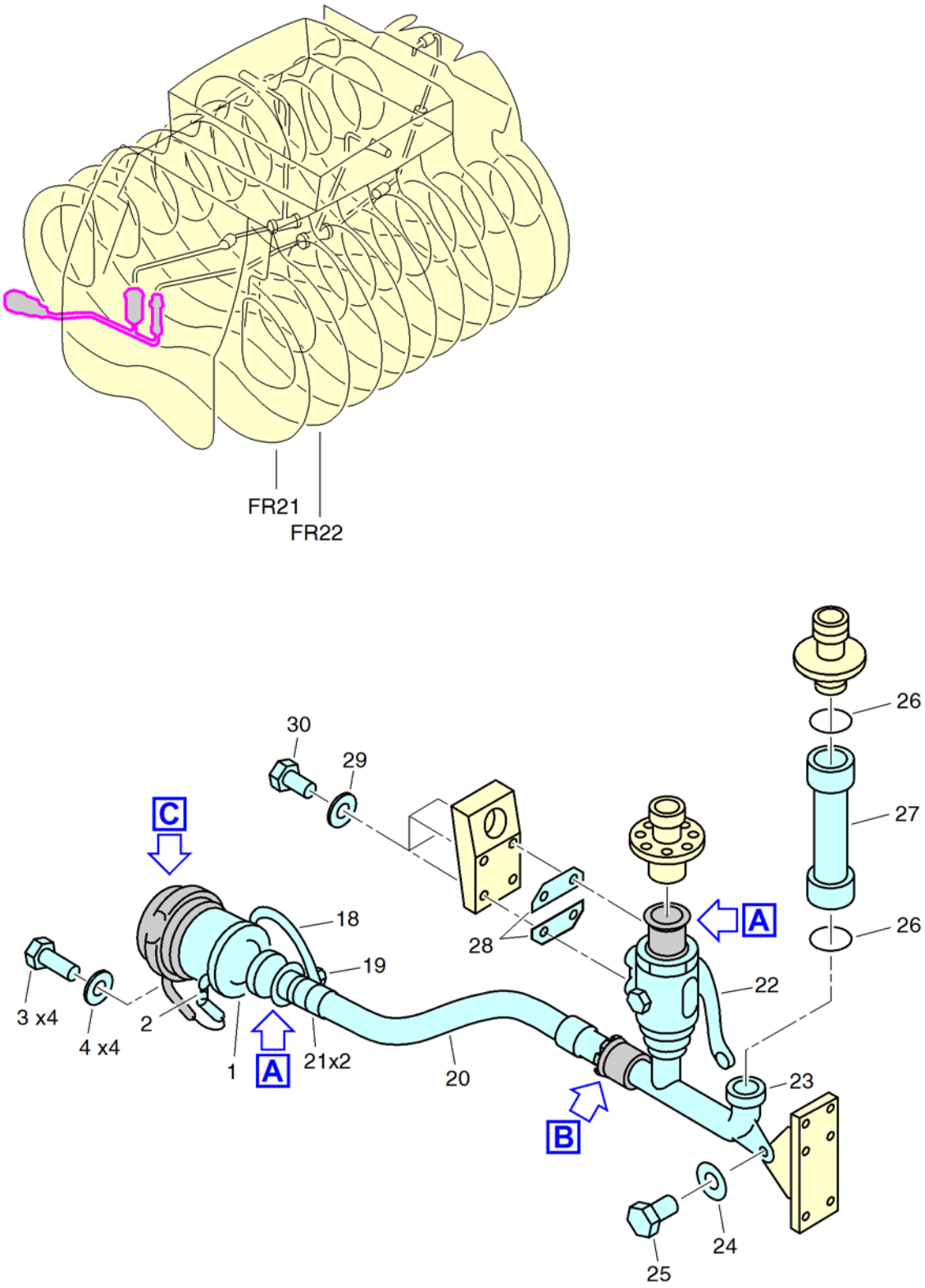
ICN-C0419-S1000D0350-001-01

Fig 4 Photo-realistic computer generated image - Color example



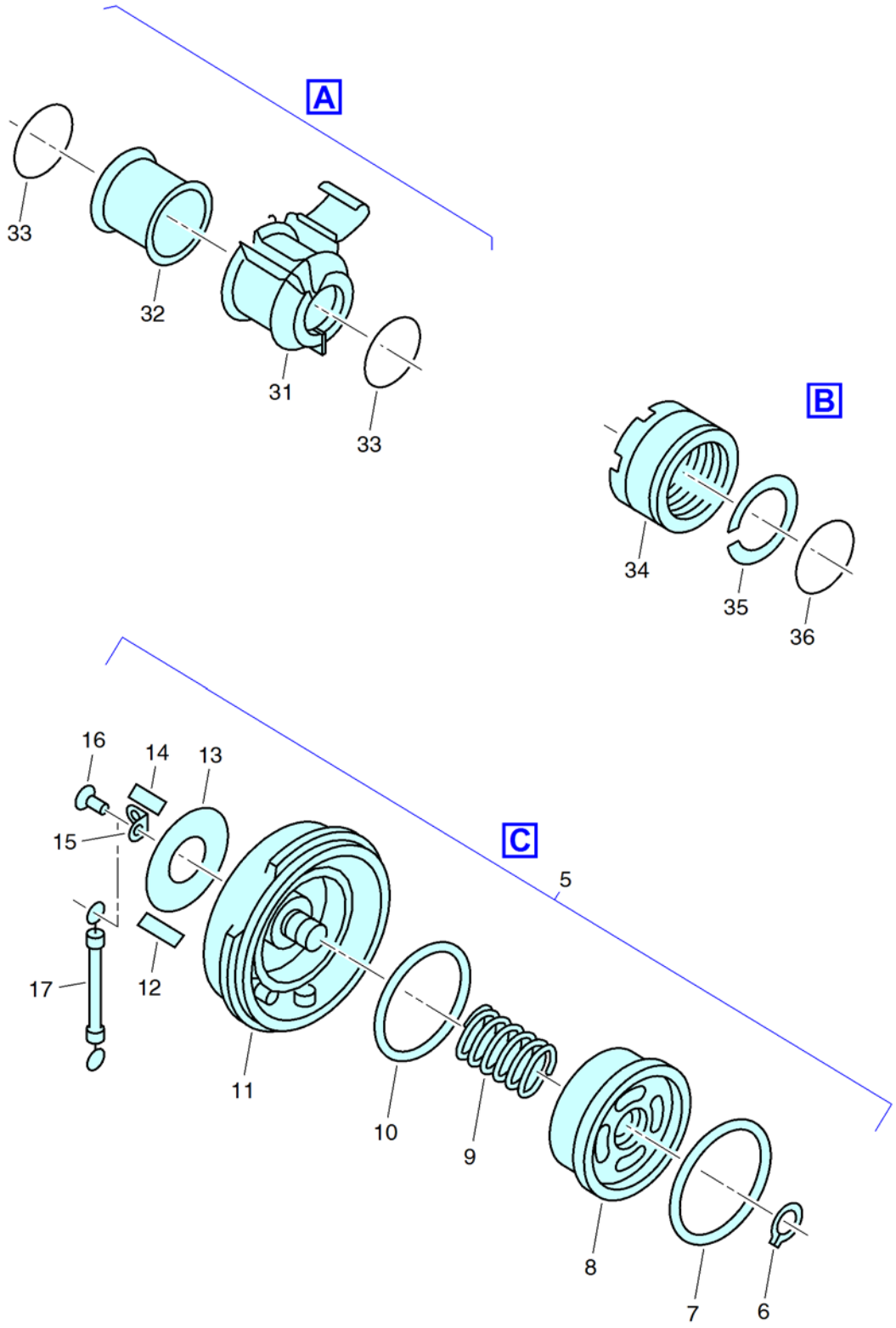
ICN-C0419-S1000D0351-001-01

Fig 5 Use of two line weights - Color example



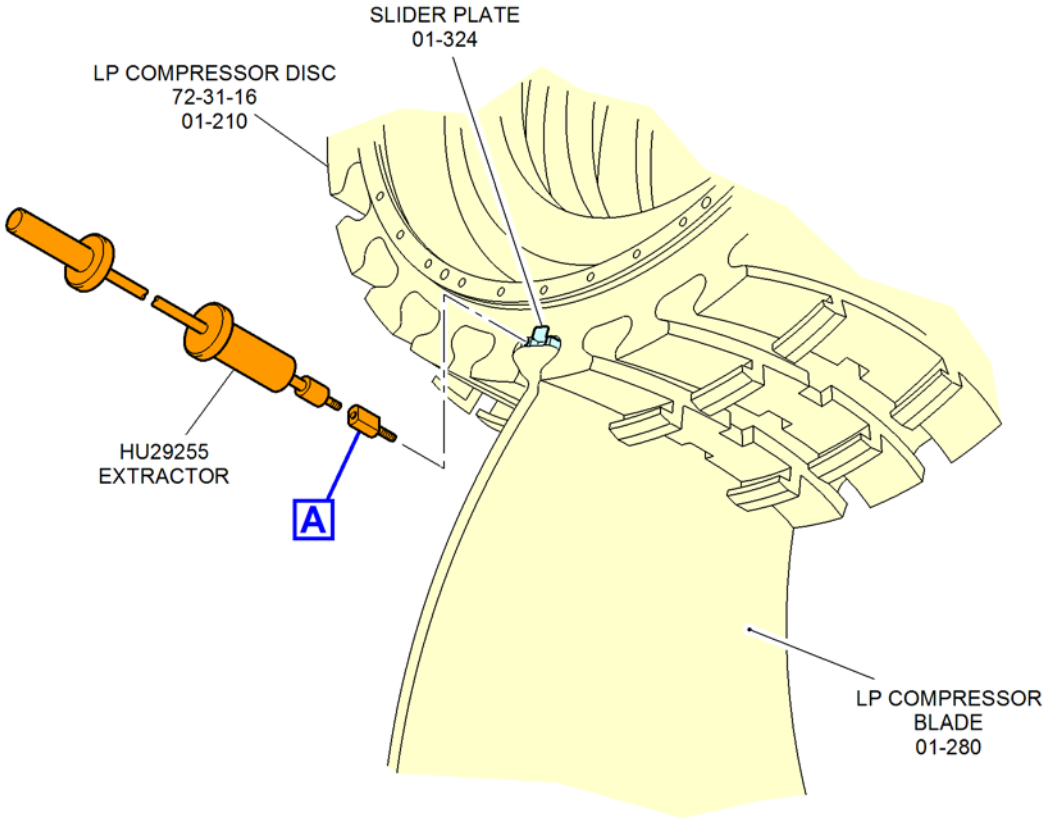
ICN-C0419-S1000D0352-001-01

Fig 6 Navigation within IPD in color using more than one sheet (Sheet 1 of 2) - Example

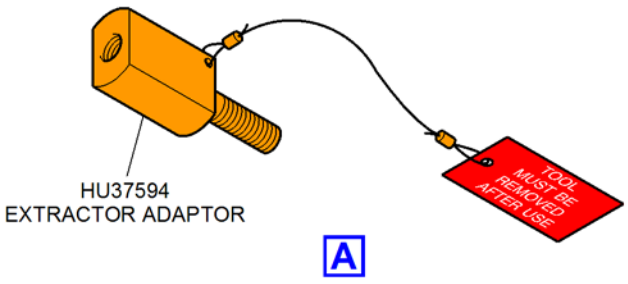


ICN-C0419-S1000D0353-001-01

Fig 6 Navigation within IPD in color using more than one sheet (Sheet 2 of 2) - Example

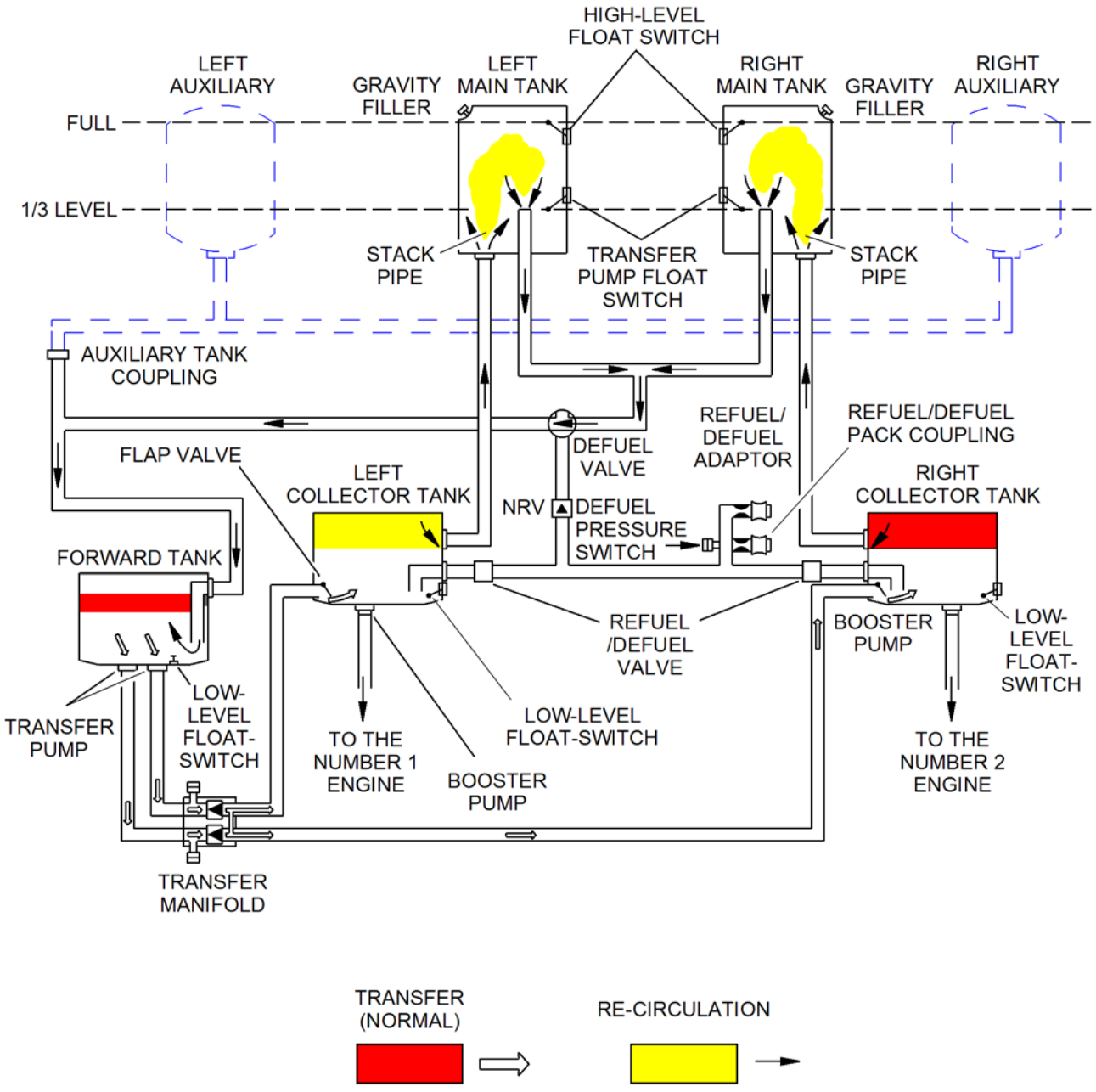


NOTE:
All IPC Fig/Item numbers are 72-31-11 unless identified differently



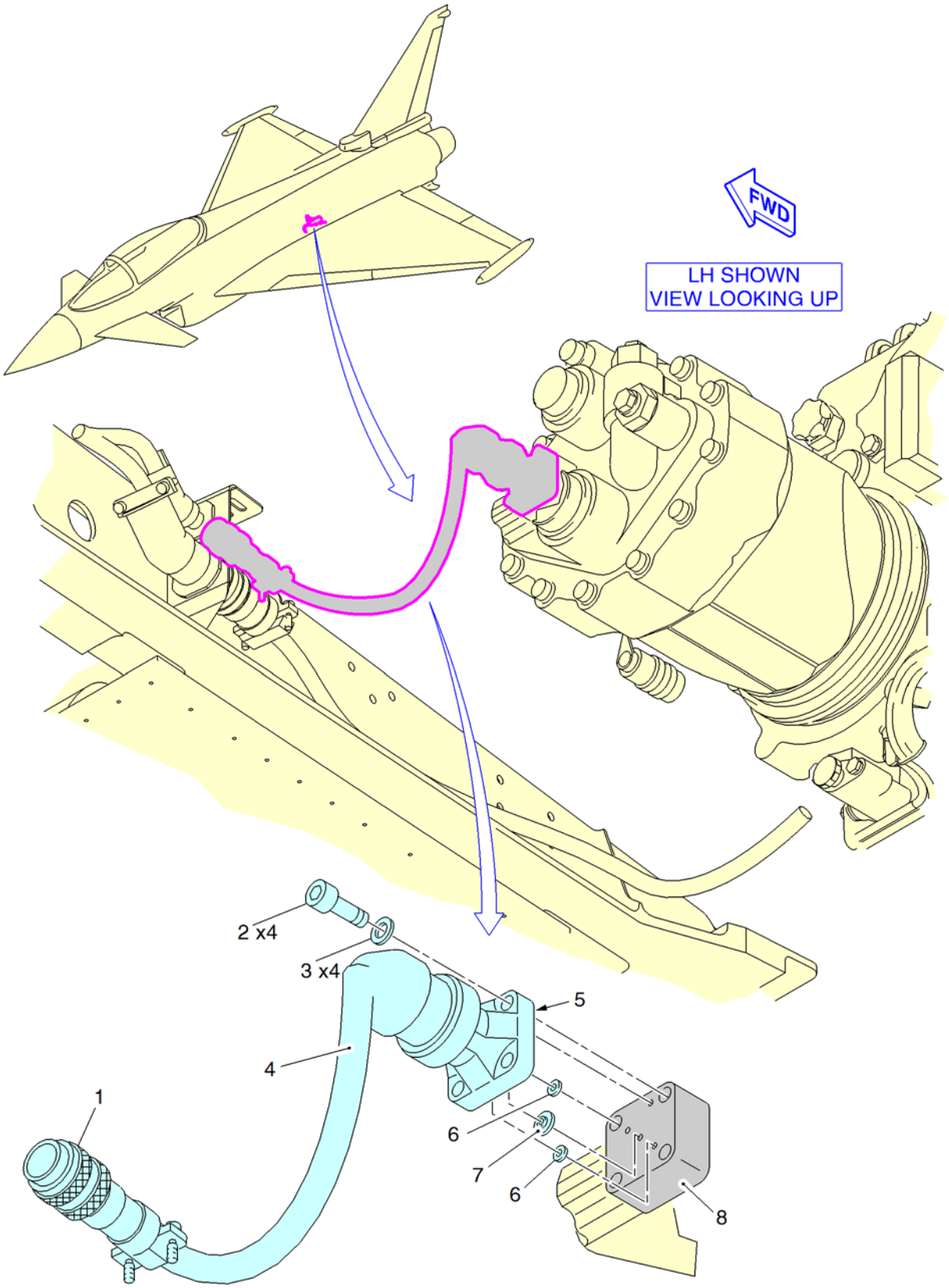
ICN-C0419-S1000D0354-001-01

Fig 7 Use of amber and red colors - Example



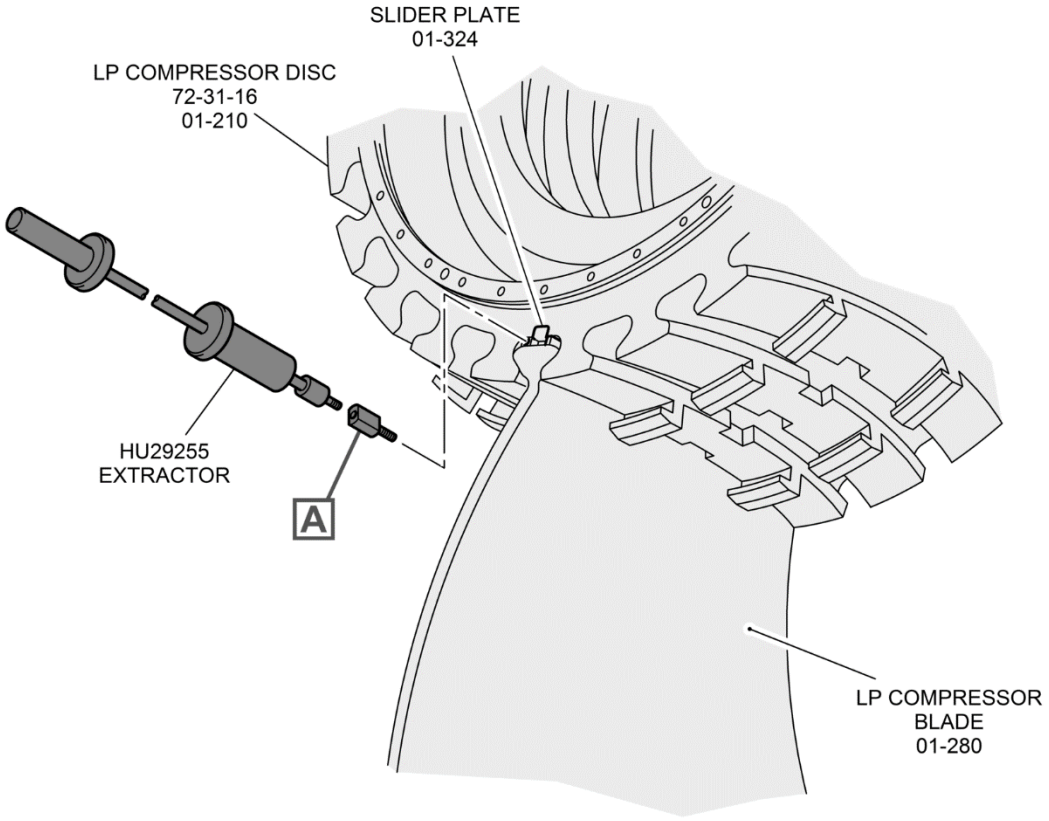
ICN-C0419-S1000D0355-001-01

Fig 8 Schematic diagram using color - Example

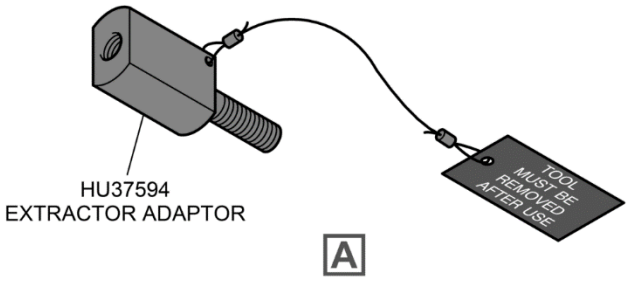


ICN-C0419-S1000D0356-001-01

Fig 9 Highlighting parts and zones on the main locator view - Color example



NOTE:
All IPC Fig/Item numbers are 72-31-11 unless identified differently



ICN-C0419-S1000D0357-001-01

Fig 10 Use of amber and red colors in grayscale image - Example

Chapter 3.9.2.4

Illustration rules and multimedia - Multimedia, General

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Chap 3.9.2.1	Illustration rules and multimedia - Illustrations, General
Chap 3.9.2.3	Illustration rules and multimedia - Use of color and photographs

Chap 3.9.2.5	Illustration rules and multimedia - Interactive 3D content
Chap 3.9.5.2.1.8	Common constructs - Hotspots
Chap 6.2	Information presentation and use - Page-oriented publications
Chap 6.3.1	IETP - Output specification
Chap 7.3.3	CSDB objects - Multimedia
Chap 3.7	Information generation - Quality assurance
Chap 7.5.1	Information interchange - File based transfer
ASD-STE100	Simplified Technical English (ASD-STE100®)

1 General

Multimedia objects and their presentation are used in support of technical textual data. They must be considered secondary and not used in place of verified text. All multimedia insertions must go through the formal S1000D verification process.

2 Rules and general practices

Refer to Chap 6.3.1 for additional guidance when building project or organization requirements for the inclusion of multimedia objects in an IETP in accordance with the following principles:

- All multimedia objects must be developed and produced from a validated source of technical information. Individual multimedia objects must be validated before delivery in accordance with the project or organization business rules.
- Multimedia objects must be developed and produced for the chosen viewer or display platforms used.
- International copyright and intellectual property laws must not be infringed.
- Requirements for media element support, ie, plug-ins and viewers, must be defined in the project or organization specific rules for non-textual data.
- The original source data used to construct the multimedia and any native files must be maintained for reusability.
- An indication that the media is loading and its progress must be visible to the user.

It is also recommended that:

- all multimedia objects obey the color conventions. Refer to Chap 3.9.2.3.
- consistency in the use of color be applied across a project or an organization
- all multimedia objects are built in individual parts. A portion of a media object that carries out a specific function (eg, sounds, images, action codes or video sections) can be used alone or combined with the other parts.
- embedded multimedia objects are designed to display within the main content area as described in Chap 6.3.1. This chapter must also be applied to standalone full screen media objects.

2.1 Types of media

The range of media types considered suitable for incorporation into IETP systems includes:

- audio
- video
- animation
- 3D content

2.1.1 Audio

Audio can be a sound track, audible effect or a pure narrative that is heard to support, warn or clarify a procedure, diagnosis steps and/or actions. All three of these audio objects can be embedded or externally linked with displayed media.

The recommended uses of audio are:

- natural sounds to clarify the result of actions
- audio that will enhance video, adding information required in performing the displayed actions
- user controlled audio narration from validated technical documentation to enhance user understanding
- aural warnings and audible alarms heard such as, on the flight deck or procedural queue to an action.

2.1.2 Video

The term video in this case means real life moving images of equipment actions, procedural steps or a captured live event. These clips can include audio narration or a sound track. It is recommended that video objects are linked to and not embedded within other media objects.

The recommended uses of video are:

- real images to clarify a complex or rarely required maintenance procedure
- demonstrations
- embedded training
- presentations

2.1.3 Animation

Animation is a result of the change in an object's behavior within a 2D or 3D scene. This can be a result of user interaction or running a predetermined script. Animated 2D and 3D objects, where appropriate, must comply with Chap 3.9.2.

2.1.3.1 Object behavior

Object behavior is defined as the set of functions, methods, or actions an object can perform. Changes in object behavior result from being called by a parameter, another media object or by being directly touched with the cursor. This can visually change the object's appearance in the user view context, animate the object or play other media objects. There are two types, dynamic and pre-scripted. These types of interactivity or actions can be handled by the application or the specified viewer. The following are examples of object behavior:

- Display a text string, screen tips.
- Display other menu options.
- Swap image or restore original image.
- Start and stop object animations.
- Play audio, beep or start or stop audio files.
- Control and perform object or media transitions.
- Using an object as the target of an action.
- Linking to frames, views or other objects.

2.1.3.1.1 Dynamic behavior

Dynamic behavior is when a user or other external data source provides input that will modify the course of events and change an object's behavior within a multimedia presentation sequence. Some examples are:

- the user-selected movement of media elements to clarify a complex disassembly or assembly procedure
- the assisted equipment or system navigation using multiple objects or active areas
- the movement around or positioning of equipment with hidden or difficult component views

- the life-like kinematic simulation of assemblies moving together based on user input
- the selection of one or more logical paths within the multimedia presentation by the user

2.1.3.1.2 Pre-scripted behavior

Pre-scripted behavior is when a user offers no input to changes in object behavior within a multimedia presentation sequence. The behavior happens much like a movie. These are the visualization and interactive emulation of user equipment using pre-determined or animated illustrations. Some examples are:

- the movement of media elements to clarify a complex disassembly or assembly procedure (without user interaction)
- the illustration of equipment movement and linkage or electrical and liquid flow processes
- the demonstration of the principles of science and the states of transition
- the illustration of change over a timeline

The following rules and techniques are for the production of pre-scripted behaviors:

- Equipment visualization must be an accurate representation of user equipment.
- Views and scale must be typical and natural.
- Interactive actions and operation sequences must be logical and accurate.
- when audio objects are used for pre-scripted behaviors. Refer to Para 2.2.
- must be simple, built in a modular form and tested thoroughly before inclusion
- must correctly mimic the operational equipment

2.1.4 3D content

Three-dimensional (3D) content is multimedia that presents the user with 3D views of the data, which can include animation. Refer to Chap 3.9.2.5.

2.2 Producing audio

The following rules and techniques are for the production of sound tracks, audible effects and audio narration.

The following basic set of rules is common for all three cases but specific rules apply:

- International copyright and intellectual property laws must not be infringed on sound tracks or audio effects, or use copyright free where possible.
- Users must be made aware that audible warnings are contained within media projects.
- Single audio tracks or multi tracked sounds must be preserved in their native form and remain separated from visual media.
- Master recordings must be managed in accordance with Para 2.2.2.
- Media projects must determine whether a sound is internally placed or linked for final delivery. It is recommended that small audio files frequently recurring are handled internally, example beeps or clicks; larger sound tracks or short voice instructions are linked and placed externally. Each method has advantages for different situations and requires testing before the final build and delivery.
- All voice-overs and emulated warnings must maintain accurate diction and natural recognition during loading and streaming. Voice processing must be avoided.
- It is recommended that Simplified Technical English® (ASD-STE100) is used for all narrations or the appropriate technical language.
- Slang must not be used and strong dialects are to be avoided.
- Audio synchronizing with visual media must be automatic with cue points embedded corresponding with text or action being displayed.
- Audio production and technical capture settings must be noted and documented.
- The higher the sample rate of audio the better the quality and the lower the audio data noise.

2.2.1 Audio capture - Two channel or stereo

All recording must be made taking the modulation up to as near the operating level as possible, ie, zero = 0 dB (digital system) or zero volume unit meter, 100 % (on combined or analogue systems). This will avoid clipping/distortion (eg, sound too quiet or too loud). All subsequent audio editing or processing must be carried out on the system that preserves the quality set by the master recording with a production master being produced at the same quality as the master.

The peak program meter can be set for a particular arrangement, but must reflect a fully modulated recording, ie, modulation taken up to the full operating level of the sound equipment:

- Audio master voice recording must be recorded in an acoustically inert environment which causes little or no coloration to the narrator's voice and is sound proofed against extraneous noise.
- Steps must be taken to ensure sound purity, by using an appropriate microphone to suit the narrator's voice. It is vital that these constants are adhered to, so that retakes recorded at a later date will seamlessly match the master recording.
- Audio mastering minimum standard (origination) to be compatible with video standards or audio for CD disc. For video this must be recorded on a system (capture) capable of a sample rate of 48 kHz at 16 bit (dual channel).
- Mastering for CD music disc only must be carried out on a system recording at 44 kHz at 16 bit CD audio encoding file.
- Care must be taken at post production stage when using both audio and video within the same project. Different embedded sampling rates may not be compatible within certain applications.
- Changing from one sample rate to another must be avoided as this needs to be carried out via a process that will anti-alias the sound, and changing file formats causes problems of subtle distortion.
- It is recommended that all stages of the electronic equipment chain and media do not introduce more than 0,1 % total harmonic distortion, collectively.
- It is recommended that audio master recording editing objects for short voice instructions are prepared according to the business rules and to the multimedia example set.
- Archiving of master recording and publication module must be maintained and it is recommended that compression is applied to a copy of the publication module in accordance with the requirements of the project or the organization.
- Short audio compressed objects for short voice instructions must be prepared according to the project or organization business rules.
- The minimum compression rate with the appropriate encoding/codec for narrowband or broadband audio material must be used to maintain accurate diction and natural sound recognition. Refer to Chap 7.3.3.
- It is recommended that a free or an open source codec is used.

2.2.2 Bandwidth

For minimum and maximum streaming bit rates for audio files hosted on a network refer to Chap 7.3.3.

2.2.3 Audio required noise levels

Audio levels must be recorded (captured) at the maximum levels possible without being over-recorded (clipping). It is recommended to control set levels when recording multi-narrator sessions to stop peak overload on one voice which might result in under-recording others.

The maximum system noise within a master recording must be better than -65 dB and a post-production master a minimum of -60 dB to reduce "hissing".

Noise reduction system (Dolby) encoded information must not be included in the master recording, or any other media.

It is vital that all steps be taken to limit voice "messing" and transient noises (door bang) to have as "soft an edge" as possible so that quantization noise is not a factor when subsequent compression is applied, as this will result in distortion.

It is also important to minimize room acoustic from being recorded by using "close mic-ing" techniques, when not using sound booths, but by using this technique, all "wind pop" must be eliminated. "Close proximity bass effect" must be controlled, typically 12 dB/octave roll off at 80 Hz on the microphone or at the recording chain input.

All steps must be taken to minimize "noises off", background sounds on location, thus saving corrective editing.

General sound coloration must be controlled, for example, no sound like "it's coming up a drain". The use of lip microphones is only permitted in high ambient conditions and where it is part of the production.

2.3 Producing video

The following rules and techniques are for the production of video objects which also can include narration and or sound tracks. The following basic set of rules is common for both cases but specific rules apply.

To be effective, a video object for technical publications must be produced in accordance with the following principles:

- International copyright and intellectual property laws must not be infringed on sound tracks or audio effects.
- Lighting and picture quality must maintain natural color representation throughout the presentation.
- The use of artificial lighting in the production of video presentations must not, where color is of technical relevance, display incorrectly and its natural appearance must be ensured.
- The location and parts must be clearly identifiable to the user. If required for clarification, a location or positioning video image and/or direction indicators must be used.
- Video images must be prepared to represent the natural view and scale that is realistic to the user. Different angles or cut-away views must be explained to the user.
- Individual video objects must be produced in parallel with textual instruction to complement each other.
- Textual technical data is to be avoided and not embedded in video objects or referenced outside the file.
- Artistic fades, blends or graphical effects must be avoided unless they contribute to the technical content of the multimedia. Technical clips or training video productions must only use simple cuts, standard fades and basic blend.
- It is recommended that the use of freeze frames or mixing live actions with animated objects within video presentations is limited and only used to add visual clarity and value for the user.
- If suitable, a video object can serve more than one purpose (eg, assembly/dismantling).
- Captured images must be stable and free from rapid movements that may cause blurring of the image.

2.3.1 Video capture

It is recommended that a digital uncompressed video source is used and captured at the rates detailed in Chap 7.3.3 and that audio to be two channels set to 48 kHz 16 bit fully modulated, with a compression ratio of no greater than 5:1.

2.3.2 Low bandwidth network streaming

For on-demand narrowband video streams, it is recommended that:

- the maximum bit rate defined in Chap 7.3.3 is not exceeded
- higher bit rates are only used for two minutes or less video clips

- a 34 kbps stream as a minimum is used, which can include other streams up to the maximum bit rate if multi-bit rate streaming. The maximum bit rate must not be exceeded.

2.3.3 Broad bandwidth network streaming

The following restrictions are recommended for on-demand high bandwidth video streams:

- Maximum bit rate as defined in Chap 7.3.3 is not exceeded.

2.3.4 Video picture output

A digital platform is recommended for the production master output, MiniDV - MPEG-2 MP@ML profile as minimum is required. Once mastered, a copy of the video can be compressed to the customer requirement, hence made ready for the appropriate network.

The following video output sizes are recommended:

- Individual video objects, steps or scenes do not exceed two minutes.
- Masters are produced at the highest possible resolution and quality to enable output appropriate to the delivery device and to support further editing or modification and eliminate the need for up-scaling, while future proofing for further delivery developments that permit higher resolution delivery.

It is recommended that all outputs be set to a variable bit rate and tailored to project delivery.

2.3.5 Controlling video objects

User control of interactive video objects can be achieved using the agreed media player or interface specified in the project or organization business rules.

2.4 Producing animation

The following rules and techniques are for the production of animated objects. Animation is the S1000D preferred option to deliver an extended range of multimedia objects to the user. User control of object behaviors must be achieved using the agreed media player or interface specified in the project or organization business rules.

Object behaviors in animations must be prepared in accordance with the business rules and the multimedia example set. To be effective, animations for technical publications must be produced in accordance with the recommended principles below:

- Color illustrated animated assembly sequences must comply with the agreed color convention. During animated sequences callouts must remain static and not interfere with the animated sequence.
- Common symbols, buttons, transitions and action scripts must be maintained in layers and stored in module form for reusability.
- Asset libraries must be used to assist global changes or updates.
- Shared object libraries must be used.
- Textual objects must be 12 pt with fonts embedded for better anti-aliasing.

2.5 Media labeling

Standalone media must be authored in accordance with the general rules for multimedia. Delivery must be in accordance with the rules for interchange. Any introductory details and naming convention requirements must be defined. Refer to Chap 7.5.1.

Media labeling must:

- include a title, conventional naming, contact, authority, security caveat, expires date stamped
- include an introductory page to contain a description of the content
- have a table of contents that contains hypertext links to all references

- have permissions and releases for persons presented in media productions, in accordance with the applicable laws of the country or states in which the media was developed
- have any reusable objects defined with tailored metadata

The principles for creating a user interface are given in the following paragraphs.

2.5.1 User interface visual structure ("look and feel")

The following rules and techniques are for the production of a user interface, whether external to, or embedded within the IETP. The interface must be produced in accordance with Chap 6.3.1, taking into account the items listed below. For information on viewer controls and controls within textual information, refer to Chap 6.3.1. A user interface must:

- have OK or Start buttons as required
- use standard objects and icons
- have a clear start or user launched point for all media objects
- provide control within the media window or by external means
- have set screen sizes or frame sizes throughout
- have standardized navigational information (eg, the same order and the same position throughout)
- have consistent layout and structures (eg, in order of the basic functions or maintenance task (with no buttons))
- have consistent buttons with an alternative text tag
- have textual information or lettering that is minimum of 12 pt and is in accordance with Chap 3.9.2.1
- have descriptive alternative text for images (eg, ALT tags in web deliverables)
- use color and backgrounds in accordance with Chap 3.9.2.3
- have Exit, Stop and Pause buttons as required
- ensure that callouts, nomenclature, symbols, etc, remain readable during all animated sequences
- ensure that callouts, nomenclature, symbols, etc, appear in the last frame of the sequence to simplify locations and ensure legibility when content is rotated, moved, or the camera moved

2.5.2 Production guidelines

These guidelines will assist the multimedia designer to maintain a consistent user interface for data presentation. It is recommended that the designer adopt the following techniques:

- Automatic definition of the size and position of the windows.
- Use of a symbolic map to show "where you are" and the route taken.
- Provision of pictorial access (a graphical menu) to the product system structure and data.
- Ensure consistency in the use.
- Establish a consistent substructure or series of templates.
- Appropriate user interfaces and skill levels for users with creditable use cases and scenarios.

2.5.3 User interfaces

User interfaces must be appropriate to the scenario and the user’s skill level.

All multimedia must incorporate methods of navigation, either within the multimedia, or as a viewer function. The nature and content of each application will dictate the navigation features provided. The project or the organization can choose to hide these controls in some scenarios. The basic (minimum) navigation functions are:

- Frame forward/backward.
- Start/Stop and Pause.
- Home, Quit or Exit and Menu.
- Volume controls - On/Off.

2.5.4 Warnings and cautions

The presentation of warnings and cautions must conform to the general requirements as given in Chap 6.2 and Chap 6.3.1.

2.6 Using color in multimedia

The rules and techniques for the use of color in all visual multimedia objects are detailed in Chap 3.9.2.3.

2.7 Using multimedia for navigation

The following rules and techniques are for the production of parameters, scripted actions and object behavior within media presentations. This paragraph must be used in conjunction with Chap 3.9.5.2.1.8, Chap 6.3.1 and Chap 7.3.3 to build project or organization requirements for image or object driven navigation of content, or actions within multimedia presentations.

2.7.1 Using parameters

Within multimedia, the element <parameter> is used to fulfil a similar function to that of the element <hotspot> within a graphic. The element <parameter> can be used to control the behavior of objects that may or may not be displayed on the screen. For example, it is not possible to use hotspots to control a sound file, which obviously does not appear on the screen. A hotspot is, by definition, a sensitive area on the screen, and whereas the element <parameter> can be utilized to use sensitive areas, it can also be used for other purposes such as changing views, running sequences, and controlling object behaviors. For further guidance on the use of the element <parameter>, refer to Chap 3.9.5.2.1.8.

2.7.2 Scripted actions

Scripted actions add interactivity to multimedia presentations. They are generated and embedded by the production application and used by the specified viewer. The uses of these scripts are essential and control a media object in response to specified user situations or interactive conditions. Scripted actions can generate or control object behavior as described in Para 2.7.3. They must be simple, built in a modular form and tested thoroughly before inclusion.

2.7.3 Object behavior

Object behavior is a result of a call from another media object or being directly touched with the cursor. This can visually change the object's appearance in the user view context, animate the object or play other media objects. These types of interactivity or actions can be handled by the application or specified viewer. The following object behaviors are allowed:

- Display a text string, screen tips.
- Display other menu options.
- Swap image or restore original image.
- Start and stop object animations.
- Play audio, beep or start or stop audio files.
- Control and perform object or media transitions.
- Using an object as the target of an action.
- Linking to frames, views or other objects.

Chapter 3.9.2.5

Illustration rules and multimedia - Interactive 3D content

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Chap 6.3.1	IETP - Output specification
Chap 7.3.3	CSDB objects - Multimedia

1 General

Basic requirements for the use and production of interactive three-dimensional (3D) technical content are given here. Multimedia elements and presentations produced in accordance with this chapter can be used in support of textual technical data.

1.1 Purpose

The specification does not impose or recommend any specific data format for 3D. The purpose of this chapter is to deliver advice on the use of 3D technical publications. Projects must define the technical solution for 3D and any associated processes, taking into account that these will have to be maintained throughout the life-cycle of the Product. This chapter is to be used in conjunction with Chap 3.9.2.3, Chap 3.9.2.4, Chap 3.9.5.2.1.8, Chap 6.3.1 and Chap 7.3.3 to formulate project requirements for inclusion of 3D content into an IETP. The basic principles are:

- 3D content must be developed and produced from source information that reflects the equipment build standard.
- The production and delivery processes must be in accordance with the business rules.
- 3D content must be developed and produced to function on the specific viewer or display platforms (eg, embedded equipment display system used on the project).
- The presentation and interaction of 2D and 3D is allowed.
- The requirements for media element support and viewers must be defined in the project specific rules for non-textual data.
- Color in 3D data must be in accordance with the rules described in Chap 3.9.2.3.

2 3D content

3D content is defined as 3D data generated from validated 3D models. The content is considered interactive when a user is allowed controlled movements, and/or changing one or more of the viewing parameters (eg, scale/rotate and the control of levels of detail). Projects are advised that 3D data, which can include all the viewable detail, can be tailored to the project requirements and/or the environment in which it is used. 3D content can contain Product manufacturing information associated with the 3D geometry, and Product structure that defines the relationship of individual 3D objects. (eg, textual information, part numbers and clickable events).

The recommended use of 3D content is:

- to provide the user a richer sense of the relationships of assembled parts to one another
- to enable the movement or positioning of equipment to show hidden or difficult component views
- to enable partial viewing of a large assembly

2.1 Rules and general practices

This chapter is to be used in conjunction with Chap 3.9.2.4 and Chap 6.3.1 to build project requirements for the inclusion of interactive 3D content in an IETP and in accordance with the principles below:

- All interactive 3D content or technical media must be developed and produced from a validated source of technical information. The production and delivery processes must be validated in accordance with the project rules.
- All interactive 3D content must be developed and produced for the chosen project viewer or display platforms used.
- The requirements for media element support and viewers must be defined in the project specific rules for non-textual data.
- All interactive 3D content must obey color conventions in accordance with Chap 3.9.2.3.
- All interactive 3D content or technical media must be produced in accordance with the multimedia example set.

3 Production of 3D content

Specialized authoring software is necessary for 3D content production. Its primary function is to produce 3D content in accordance with the project business rules. It is anticipated that most projects will use such software to transform original CAD and PLM data, and add information to 3D content.

The consistency of production and viewing specifications is paramount. Production of 3D content has to ensure that the content will contain the information needed to implement the project requirements for end user viewing. While the choice of an end user viewer is formally an IETP issue, it is driven by the end user functions requirement and the chosen 3D format. It must be noted that 3D content can contain more information than is actually delivered to the end user. For example, PLM information or attributes that exist in source data cannot be displayable with the chosen viewing software, but must be retained in the 3D data for future use.

The data format defined for delivery to the CSDB is not necessarily the data format used for end user display. The 3D data can be converted to the required format during the publishing process, however it must be noted that these conversions might remove advanced functionalities, and can unintentionally modify the intent of the author. It therefore follows that the choice of 3D format limits, and in some cases defines, the choice for authoring and end user viewing software.

3.1 Technical solution

S1000D does not recommend any specific technical solution, however it does advise that the chosen technical solution is defined in the project business rules. It is the project's responsibility to define the technical solution. A technical solution is the association of:

- 3D format or formats, which will be supported by the project's IETP and other systems
- a precise technical specification of the requirements for 3D objects to be delivered to the CSDB
- 3D objects delivered to the CSDB, to be compliant with the project's allowed formats
- the specification of end user functions, to be implemented by the viewing software (3D viewer)
- the publishing process

When taking into account the entire lifecycle of 3D data, the choice of the supported format, or formats, is the most important decision regarding 3D implementation. It is recommended that the project makes the choice and documents the complete technical solution, as well as deciding on the IETP viewing software, before commencing production of any 3D content. The main criteria which must be taken into account when making this choice are:

- long-term support of the data format, authoring and viewing software
- compatibility with the PLM and CAD used in the project
- compatibility with expected viewing resources on the end user client side
- update and configuration management methodology

3.2 3D scene

The production of 3D content creates 3D multimedia objects, which must be compliant with the project's allowed formats. A 3D multimedia object represents a 3D scene, as defined formally in most 3D graphic libraries and software. A 3D scene is primarily defined as a set of 3D objects. Each 3D scene must also contain a set of observational conditions, such as viewpoint and lighting conditions, although observational conditions might be modified by the user using the viewer capabilities. This set of observational conditions must contain at least the initial condition which will be used for the initial display of the scene to ensure the correct display of the scene, and to ensure the delivery of any mandatory information to the user. The 3D scene can also include complementary information, dependent on the 3D format specifications:

- viewpoints
- lights
- alternative positions
- movement path
- kinematics
- animations
- etc

3.3 Implementation

Currently, 3D is delivered in the same manner as 2D (ie, using a single file for each use instance). Future developments might address the issue of providing parts geometry across multiple use instances. Projects are advised to consider this when developing the project's multimedia solution, particularly when looking at web delivery.

There are two major steps in 3D production. The first step is gathering or making available the 3D elements with their geometry and attributes, the subset of the Product to be displayed, in general an assembly of parts. This is done by an extraction of the 3D data, CAD or digital mockup, and if required, tooling can be added. The second step is creating the 3D scene (eg, a view that the user will actually see) that is the initial and alternative observation conditions such as viewpoint, field of view, and lighting. It includes static information such as the position of parts, dynamic information or scenario, such as part animation (path, visibility, transparency, etc) and includes any object behavior. This data can usually be modified by the end user using viewer capabilities, which provide control of the basic 3D functions.

It is recommended that existing 3D source data be used to generate 3D content. The content must be visually representative in scale to other visible objects, yet not necessarily dimensionally accurate to manufacturing specifications. The following rules apply:

- Textual information and callouts in a 3D environment must remain horizontal and facing the user.
- Animated removal or tool actions must appear realistic when viewed by the user.
- Animated moving parts or actions that represent a danger and/or hazard to the maintainer must display warnings and cautions in accordance with Chap 6.3.1. Textual data can also be used to warn the user.

- Projects must agree to the levels of detail and accuracy of the 3D content, bearing in mind copyright and intellectual property right issues.
- Considerations must be given to the consistency of the behavior of any parts removed.

3.4 Detail in 3D content

The level of detail used on 3D object surfaces must be measured, simple and relevant to the amount of information that the end user requires. 3D objects must be clearly presented to the user while omitting unnecessary detail. The inclusion of unnecessary 3D objects and higher than necessary levels of details on objects must be avoided, while striking a balance with the effort and cost of removing the detail. Examples of this include 3D objects such as standard rivets, the number of screw threads, or their head style, which might be omitted, or limited and only used to add visual clarity.

3.5 Lifecycle of 3D data

3D data is the basis of modern engineering and manufacturing, therefore the integration of CAD or digital mockup data into the technical publications process as 3D content is essential. This integration means that the data will influence the process of 3D content creation throughout the lifecycle of technical publications. Basic or raw 3D data objects are generally not sufficient for use in technical publications and will usually require automated and/or manual transformations.

Further to this, the update from source data to existing content cannot always be fully automated. Manual rework of content during updates can seldom be avoided. For example, if a locator has been added to the 3D content, or a color scheme has been applied to the content, this will invariably be lost during any automated update process.

It is recommended that projects clearly define usage and delivery, and control the creation process and all transformation processes. Regular verification of these processes must be conducted to ensure that 3D data remains valid throughout the lifecycle of the Product.

Projects and organizations must be aware of the differences between the as designed, as built, and as maintained data to ensure that processes are clearly defined for timely and accurate configuration control of both the source data and the 3D content. It is therefore essential that business rules are put in place prior to the commencement of any project to cover both the automated and manual processes.

4 Reference structure and assembly tree

Reference information and callouts in 3D can be used to provide the user context as to location and position of the presentation subject. The use of locators, reference structure, highlights and transparency of objects can also be used to provide context.

4.1 Locators

3D globally changes the viewing paradigm and offers new capabilities and viewing functionalities, which enable the user to understand easily the location of the 3D content within the equipment or system. Locators can be used to inform the user of the location of the 3D content within the equipment or system and can also be used to show the view or location when navigating that content. Projects must decide on the use and style of locators.

Locators can be provided, in association with a 3D content, to inform the user of content location, even when 3D functions are not available, for example, when users print the documentation.

3D locators are typically smaller, simplified, separate views than that of the 3D content, designed to show the location of the 3D content in relation to its higher assemblies. 3D locator views are solely for the purpose of orienting the user and must rotate with the view where the viewer supports that function.

4.2 Reference structure

A reference structure can be utilized to give context to the location of the presentation, but only those items that are necessary to give context and/or location are required. Reference structure is secondary information to that of the 3D content within the 3D scene. It is not usually shown in its entirety and is less detailed. Reference structure is the “surrounding” information and is designed to show the access and detailed location of the 3D content in relation to its higher assemblies.

4.3 Assembly tree

Assembly trees can be utilized to navigate the 3D content and give context to an assembly or parts location within the content. The tree can also be used to toggle visibility and highlight specific parts and assemblies, zoom to a part and provide information about the model. The attributes attached to each node can be utilized, to better define the parts (ie, number of children, part number, name, bill of materials ID, etc) and/or provide a source or target for hyperlinks.

5 Rendering

Rendering is the process of applying surface textures and lighting effects to the 3D content. It is important that the graphics card used by the project’s hardware supports the display rendering technologies that the project's chosen software might use. All project requirements for functional controls including rendering, viewing, lighting and transparency need to be supported by the viewer software. It is therefore important that projects consider the hardware and software before implementing the use of any 3D content.

5.1 Rendering principles

The realism of a 3D scene depends on the lighting, shading and texturing of the 3D content’s rendering software. The basic functions of lighting and shading as implemented in currently available rendering software are generally well suited for technical publication purposes. The core functions, such as geometric transformations and pixel computation, are implemented using specific hardware and the graphic card of the computer. It also enables polygon based rendering software to provide a high performance display on standard computers, even for complex scenes.

Lighting functions simulate different types of lights:

- Ambient light has no position or direction. It illuminates equally on all the surfaces, regardless of orientation.
- Directional light represents positioned light sources. Each light source illuminates each point of a surface taking into account the relative direction of incident lighting and the vector normal to the surface at the considered point. Multiples and different light sources can be present in the 3D scene.
- Emissive lighting is light associated to the object. It enables the simulation of glowing objects, but is seldom used.

Lighting data including light sources and their properties are associated to the scene as viewpoint default values, and are always provided to ensure the scene will be displayed correctly. In most viewers, lighting data can be changed by the end user from the menus provided. Projects must decide if this feature is available to users in individual scenarios, however to achieve this, the viewer must support the displaying and hiding of menus.

Projects can add additional lights to the 3D content file in object-based viewing software, however to guarantee consistency of lighting and shadow, it is recommended that the software’s own standard lighting is used. Display performance will be affected with the introduction of user controlled lighting options. Therefore it is recommended to avoid this. To support or assist in low lighting, at night, or very bright environments, control of the lighting scheme can be used.

5.2 Visual attributes of the objects

The properties of objects are defined during the authoring of 3D content. Usually these properties cannot be changed by the end user of technical publications. The main considerations for lighting on 3D surfaces are how much light is reflected or absorbed. Shading defines how light is reflected by the object surface, while surface color, texture, diffusion, specularity and glossiness are all important factors. Flat shading applies a constant color to each polygon, while smooth shading interpolates illumination variations. This enables representation of smooth surfaces with a limited number of polygons. If a project uses realistic photorealism object surface rendering, then the lighting scheme must maintain readability within the scene and throughout all sequences.

For a higher level of realism, specific properties of a material can be simulated by using specific algorithms. Examples of these include diffuse reflection, specular reflection for shiny surfaces, light emission, or transparency.

5.3 Realistic mapping, texture and materials

Texture mapping allows the possibility of increasing the realism of a 3D scene. This technique applies images on polygons, providing a much higher level of detail, without requiring more processing resources for geometric computation. This will, however, require more resources for pixel computation (shading). If an even higher level of realism is required, specific rendering software can be used. If texture maps are applied, it is recommended to use formats that create the smallest file size.

Software providing extremely good levels of realism is now widely available. Projects must be aware that high rendering functions use more sophisticated algorithms, data structure, and computing resources on the client side. Therefore this level of requirement is not recommended for technical publications. It can slow down the viewer performance and increase download times, and must therefore be used sparingly, especially if the product is a web deliverable. Projects must therefore exercise care when choosing a viewer as many file formats support only standard and multi/sub-object materials. With regard to the treatment of object surfaces, only the following are to be controllable:

- diffuse, ambient, and specular lighting
- one texture map per object, which must be in the diffuse channel
- transparency
- reflectiveness, but not reflectiveness strength

The project must ensure that all delivered lighting types are supported by the viewing software.

5.4 Transparency

Transparency is a basic rendering function, supported by almost all 3D formats and associated viewers. In terms of 3D content production it is a specific visual attribute of the material. Its usage provides realism of rendering of objects which are actually transparent.

Transparency can also be used dynamically during viewing. The viewer has the capability to change the transparency of objects in the scene on given criteria, for example, to provide to the user a view of the context of the presentation subject. This usage of transparency and its specifications is a viewer issue and does not impact on production.

Transparent objects can be selected by the user or during an animated presentation, only if required. Semi-transparent objects are also allowed and are used in the same way. Levels of invisibility, transparency and applied color must be tested especially when being displayed in unusual environments. Examples of this include artificial illumination, views through night vision goggles, under red lighting, and/or other emergency lighting and shadow situations.

6 3D environments

For consistency, it is recommended that projects specify how equipment, assemblies and parts are arranged in the following environments:

- training
- maintenance
- parts
- operator support

Parts and assemblies relevant to a particular equipment configuration or procedural steps must be identified and associated within the current definition of the equipment configuration. The use case and quality of the project's 3D data, along with the tools used, will ultimately determine the level of detail and how the 3D content is presented in each hardware and software environment.

7 Defined view modes

Control of camera positions on objects, predefined user views and representation of geometry are the key to adding value to any 3D content. Rules and guidance on these topics is given here. To ensure consistency of presentations, projects must agree on standard levels of object detail and representation (eg, opaque, semi-transparent, surface mapping, etc). The initial type of view mode used must be appropriate to the task requirement and the user's visual needs. The type of view selected and the navigation aids must be clearly displayed within the project's viewer.

The views defined below set the minimum requirements detailing the initial camera position(s) and angle(s), clipping distance, and the representation of objects. The selection by the user highlighting a part, parts or assembly within a tree structure or in the viewing screen must enable the selected objects to be used as a reference point for view transformations. Views must reflect the intended view of the author and be appropriate to the task being presented.

7.1 Standard views

The following standard views are recommended to assist navigation and equipment orientation:

- isometric
- front
- back
- top
- left
- right

The default standard representation of the 3D objects must be appropriate to the environment it is displayed in, and must be defined in the project business rules. Other standard viewing functionality which can be applied by a project includes:

- the ability to fit selected equipment into the viewing screen
- the ability to reset the view, thus enabling the user to re-orientate and return to the original view or initial presentation of the selected objects or parts

7.1.1 Isometric view

This is the preferred 3D content viewing method and must remain in the left, top and forward orientation, unless it is more beneficial to show from the user's point of view (access view) or otherwise determined by the project.

7.2 Access view

This is the initial view or normal object or equipment orientation to the user with a realistic viewpoint presented. This position must be the first camera position before commencing step

through procedures. Objects and parts must have solid surfaces and colored in accordance with Chap 3.9.2.3. It is recommended that all equipment access points have predefined views.

7.3 Disassembly view

In 3D, new functions can be easily implemented, enabling the user to manipulate parts, but generally, these functions do not grant that disassembly order will be correct. Reference disassembles have to be produced as needed to provide the user reliable information. Depending on functional capabilities of the technical solution, multiple disassembly views and disassembly animation can be provided for better understanding.

For each view, parts are moved manually, and relative positions of parts are stored in a specific data structure. Software functions which automate the disassembly can also be used, if the result is satisfactory.

Projects must consider print requirements when implementing IPD figures, and must ensure that an illustration view is available for printing.

8 Control of 3D behavior

While embedding 3D behavior in the 3D content does remove the requirement for external controlling scripts, the use of external scripts will facilitate reuse. Ultimately it is the used hardware and software that will determine the method of behavior control. Projects must therefore determine the functionality of the software and the use of behavior for the manipulation of parts and assemblies. Inclusion of 3D behavior gives projects greater latitude in developing object or frame based functionally within a presentation.

8.1 3D content control

All 3D content must incorporate methods of control. Project viewers will dictate the control features provided. Basic suggested functional controls are:

- step forward/backward
- start/stop and pause
- fit to screen
- reset global default viewing settings
- restart, quit or exit

Other examples of optional controls are:

- sequence rotation, automatically
- user controlled rotation or action
- auto repeat of rotations and/or sequences
- removal and parking of objects, while parts and assemblies must be identifiable and must have unique identification within the 3D environment
- introduction of object tools to demonstrate adjustment, disassembly and assembly of equipment parts
- additional information selection (optional)

8.2 Warnings and cautions

If warnings and cautions are required in 3D content they must conform to the requirements for presentation. Refer to Chap 6.2 and Chap 6.3.1. Warnings and cautions used and appearing in or with 3D content must be displayed, but can be acknowledged by the user in accordance with project requirements. All warnings and cautions being displayed must appear clearly in the field of view of the user. It is recommended that warnings and cautions are addressable objects.

Note

Some 3D content and viewers might be unable to support the acknowledgment and display of warnings and cautions. Where this occurs, textual warnings and cautions must be used.

8.3 Navigation and linking

Navigation within 3D content can be achieved by creating sensitive objects or defined shapes using a series of nodes or addressable groups.

Specific shapes, objects or parts build inline within an equipment structure can be addressed and given a link to navigate. Sensitive specific shapes, objects or parts can also be used to control animated step procedures or predetermined movement within technical publications.

These objects can be activated by hyperlinks from:

- text in a data module to one area of an object
- text in a data module to several areas of an object
- one area of an object to the data module text
- one area of an object to another area of the same object
- one area or object of a multimedia scene to another object of a multimedia scene, data module, or any valid reference that can be in a data module
- one area or object to another object in the same multimedia scene

The sensitive area can be represented by:

- visible image region (or invisible before a cursor event)
- color objects used in accordance with Chap 3.9.2.3
- navigation symbols or callout numbers, can include the leader line
- buttons with or without text objects
- itemized objects or their surfaces

Sensitive areas can be turned on or off by changing the visibility of the sensitive area. For further information on the use of sensitive areas and for linking by using the element parameter and its attributes, refer to Chap 3.9.5.2.1.8.

9 Textual information

Text can be used within the 3D viewer or window. Depending on the project requirements, examples of text within the 3D viewer or window are:

- text labels using text leaders
- mouseovers
- watermarks or background text
- text for information, instructions, warnings and cautions
- user inputted comments or notes

Text must be bill boarded (always facing the user), and the text size must remain constant whenever user zooms in or out of the 3D scene. The text leader line width must remain constant during the zooming process. Text must be a vector element, so that it will remain clear. The use of bitmaps for text is not recommended. Text must not overlap or cover up other text in the default view of 3D content, however, if a user rotates a 3D object, text can cover other text when the scene is being rotated or objects are moved, but must not cover other text when static.

It is recommended that text is not hard coded and is structured such that it can be externally updated, or database driven to support future updating. This also applies to text displayed as the result of mouseovers. It is recommended that projects consider allowing users to turn the display text on or off where it is practicable to do so, while also considering the use of mouseovers as substitute text labels when the text labels are turned off. Text labels can be displayed outside of the 3D viewer or window to supplement text labels or mouseovers within the 3D viewer or window.

Textual technical descriptions and procedures within the 3D content must be avoided and must be referenced from outside the 3D content via a sensitive object or shape. Any textual information included or referenced from outside the 3D content must remain in a facing plane.

Chapter 3.9.2.6

Illustration rules and multimedia - e-learning and SCORM

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1 General

The rules and guidelines for the use of illustrations and multimedia in e-learning and SCORM data will be included in a future issue of this specification.

Chapter 3.9.2.7

Illustration rules and multimedia - ICN metadata file

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Chap 4.8	Information management - Interchange of data modules

1 General

In order to allow proper management of illustrations and multimedia objects in the CSDB there is a possibility to store and exchange metadata information about an ICN object, ie an illustration or a multimedia object, in an ICN metadata file.

The ICN metadata file is connected to its corresponding ICN object by the identity, which is derived from the ICN concerned.

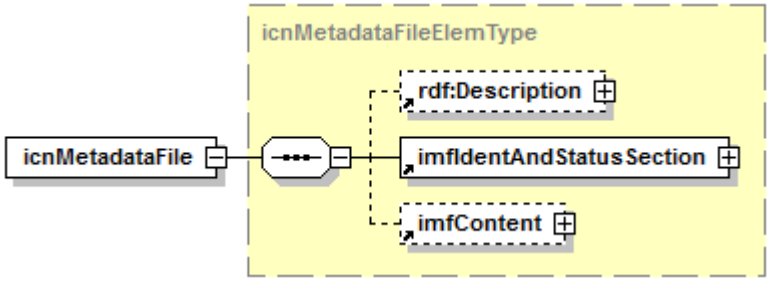
2 ICN metadata file

The ICN metadata file contains metadata related to an ICN object, ie, illustration or multimedia object. For information about coding of the file, refer to Para 2.3

Description: The element <icnMetadataFile> contains the whole ICN metadata file. The ICN metadata file is not a data module so it has its own definition. Like data modules, the ICN metadata file is split into two parts:

- the identification and status section
- the content

Markup element: <icnMetadataFile>



ICN-SYU52-AASER00010-001-01

Fig 1 Element <icnMetadataFile>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

- <rdf:description>
- <imfIdentAndStatusSection>. Refer to Para 2.1.
- <imfContent>. Refer to Para 2.2.

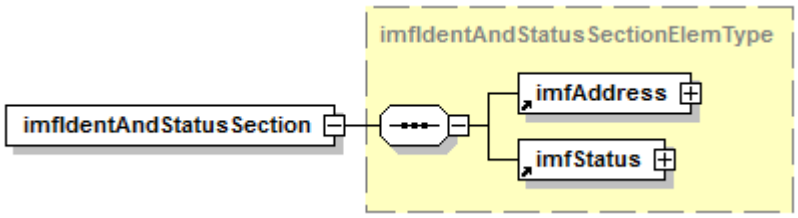
Note

Control authority references must not be used in ICN metadata.

2.1 ICN metadata file identification and status section

Description: The element <imfIdentAndStatusSection> contains the identification elements of the ICN metadata file and its status information.

Markup element: <imfIdentAndStatusSection>



ICN-SYU52-AASER00011-001-01

Fig 2 Element <imfIdentAndStatusSection>

Attributes:

– None

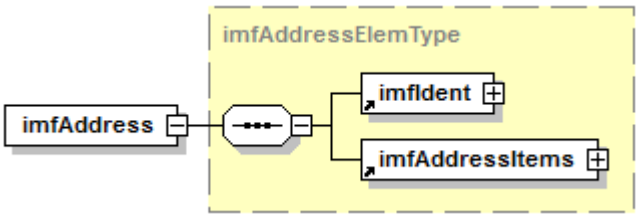
Child elements:

– <imfAddress>. Refer to Para 2.1.1.
– <imfStatus>. Refer to Para 2.1.2.

2.1.1 ICN metadata file address

Description: The element <imfAddress> contains the information needed to identify the ICN metadata file.

Markup element: <imfAddress>



ICN-SYU52-AASER00012-001-01

Fig 3 Element <imfAddress>

Attributes:

– None

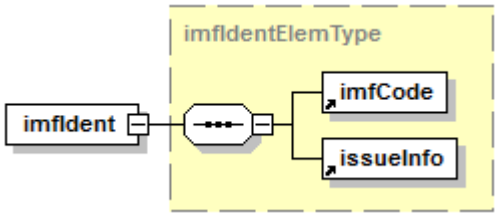
Child elements:

– <imfIdent>. Refer to Para 2.1.1.1.
– <imfAddressItems>. Refer to Para 2.1.1.3.

2.1.1.1 ICN metadata file identification

Description: The element <imfIdent> contains the unique identification of the ICN metadata file.

Markup element: <imfIdent>



ICN-SYU52-AASER00013-001-01

Fig 4 Element <imfIdent>

Attributes:

– None

Child elements:

– <imfCode>. Refer to Para 2.1.1.2.
– <issueInfo>, the issue information of the ICN metadata file itself, which can differ from the issue number contained in the information control number of the multimedia or graphic object. Refer to Chap 3.9.5.1.

2.1.1.2 ICN metadata file code

Description: The element <imfCode> contains the core items of the ICN metadata file identification.

Markup element: <imfCode>

Attributes:

– imfIdentIcn (M), the ICN of the multimedia object or graphic object to which the metadata apply, the prefix "ICN-" excluded.

Child elements:

– None

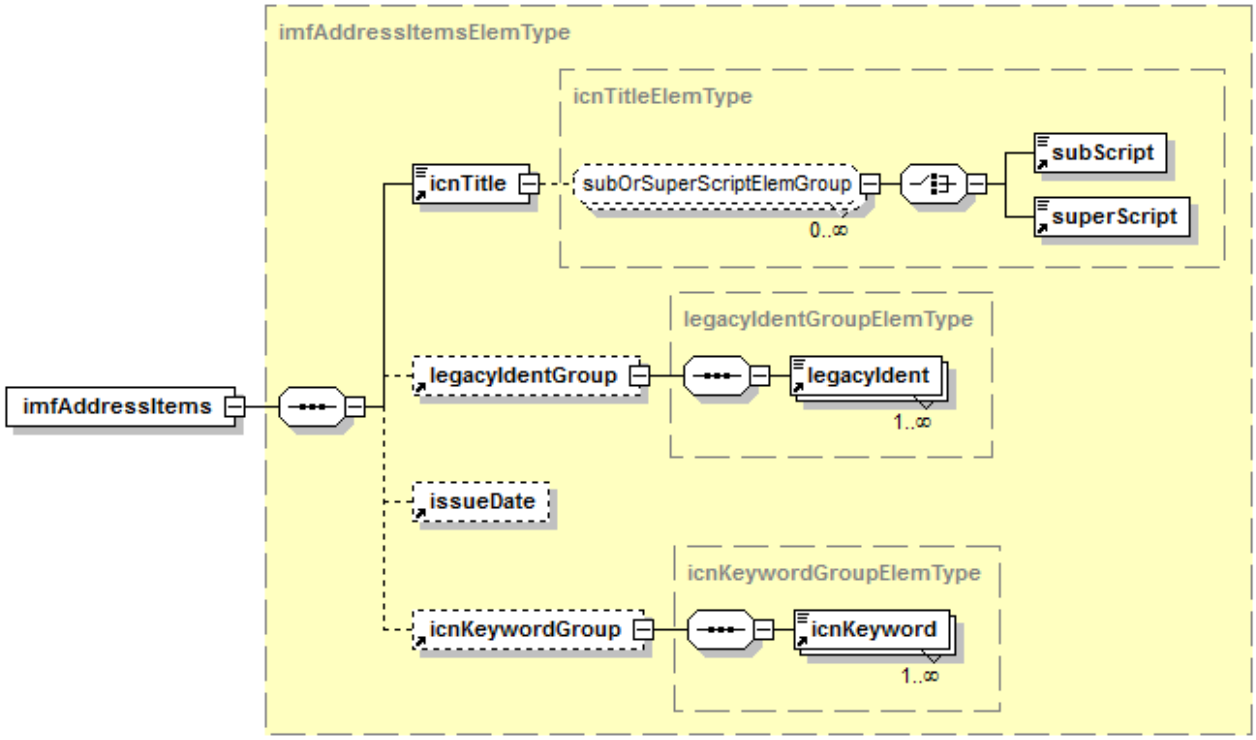
Markup example:

```
<imfCode imfIdentIcn="YY-Y-YYYYYY-Y-YYYYY-YYYYY-A-XXX-XX"/>
```

2.1.1.3 ICN metadata file supplementary address items

Description: The element <imfAddressItems> contains information that is supplementary to the ICN metadata file identification, but not part of the unique identifier.

Markup element: <imfAddressItems>



ICN-SYU52-AASER00014-001-01

Fig 5 Element <imfAddressItems>

Attributes:

– None

Child elements:

– <icnTitle>. Refer to Para 2.1.1.3.1.
– <legacyIdentGroup> Refer to Para 2.1.1.3.2.
– <issueDate>. Refer to Chap 3.9.5.1.
– <icnKeywordGroup> Refer to Para 2.1.1.3.4.

2.1.1.3.1 ICN title

Description: The element <icnTitle> contains the title of the ICN object to which the ICN metadata file is related. This title is a generic title of the ICN object aimed to support management of the object. It is not necessarily relevant in any specific context where the ICN object is used, such as in the element <figure>.

Markup element: <icnTitle>

Attributes:

– None

Child elements:

– <subscript>. Refer to Chap 3.9.5.2.1.10.
– <superscript>. Refer to Chap 3.9.5.2.1.10.

Business rule decision point BRDP-S1-00557 - Reuse of the generic ICN title in data modules

– Decide if the generic ICN title given in the ICN metadata file can be used to populate figure and multimedia titles in data modules.

Markup example:

```
<icnTitle>Engine X<subScript>5</subScript></icnTitle>
```

2.1.1.3.2 Legacy identifications of ICN

Description: The element <legacyIdentGroup> contains legacy identifications of the ICN when such exist.

Markup element: <legacyIdentGroup>

Attributes:

– None

Child elements:

– <legacyIdent>. Refer to Para 2.1.1.3.3.

2.1.1.3.3 Legacy ICN identification

Description: The element <legacyIdent> contains one legacy identity of the ICN.

Markup element: <legacyIdent>

Attributes:

– legacyOrigin (O), an annotation indicating from where the legacy identification originates

Child elements:

– None

Markup example:

```
<legacyIdent legacyOrigin="ILLDB">Ill-2014-08-
04_12345</legacyIdent>
```

2.1.1.3.4 List of ICN keywords

Description: The element <icnKeywordGroup> contains one or several keywords that classify the ICN object in various respects. The keywords can be used for characterizing the ICN object in order to facilitate efficient searching for it in a CSDB.

Markup element: <icnKeywordGroup>

Child elements:

– <icnKeyword>. Refer to Para 2.1.1.3.5.

2.1.1.3.5 ICN keyword

Description: The element <icnKeyword> contains a single keyword that classifies the ICN object in various respects and can be used to find the object when it is stored in a repository of ICN objects.

Markup element: <icnKeyword>

Attributes:

– None

Child elements:

– None

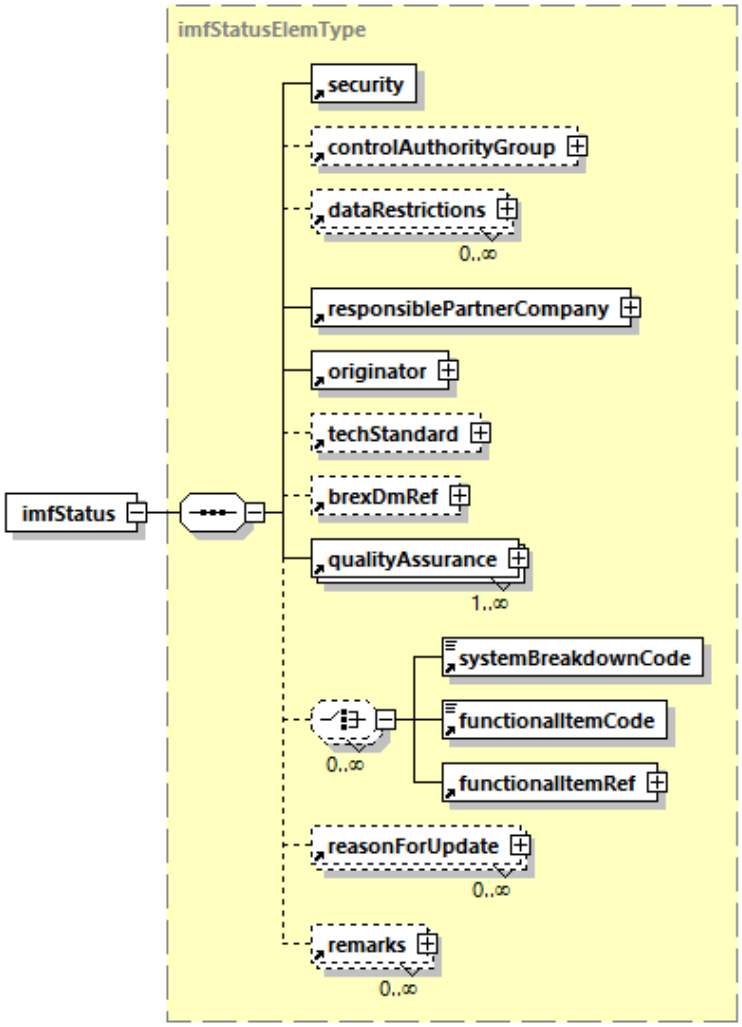
Markup example:

```
<icnKeywordGroup>
<icnKeyword>Hawk</icnKeyword>
<icnKeyword>Cockpit</icnKeyword>
</icnKeywordGroup>
```

2.1.2 ICN metadata file status section

Description: The element <imfStatus> contains the status information pertinent to the ICN object. It is understood that these metadata are similarly valid for the ICN metadata file. This implies, for example, that if an ICN object is classified, then the metadata contained in a corresponding ICN metadata file must also be regarded classified.

Markup element: <imfStatus>



ICN-SYU52-AASER00015-002-01

Fig 6 Element <imfStatus>

Attributes:

– None

Child elements:

– <security>. Refer to Chap 3.9.5.1.
– <controlAuthorityGroup>. Refer to Chap 3.9.5.1.
– <dataRestrictions>. Refer to Chap 3.9.5.1.
– <responiblePartnerCompany>. Refer to Chap 3.9.5.1.
– <originator>. Refer to Chap 3.9.5.1.
– <techStandard>. Refer to Chap 3.9.5.1.
– <brexDmRef>. Refer to Chap 3.9.5.1.
– <qualityAssurance>. Refer to Chap 3.9.5.1.
– <systemBreakdownCode>. Refer to Chap 3.9.5.1.
– <functionalItemCode. Refer to Chap 3.9.5.1.
– <functionalItemRef>. Refer to Chap 3.9.5.1.
– <reasonForUpdate>. Refer to Chap 3.9.5.1.

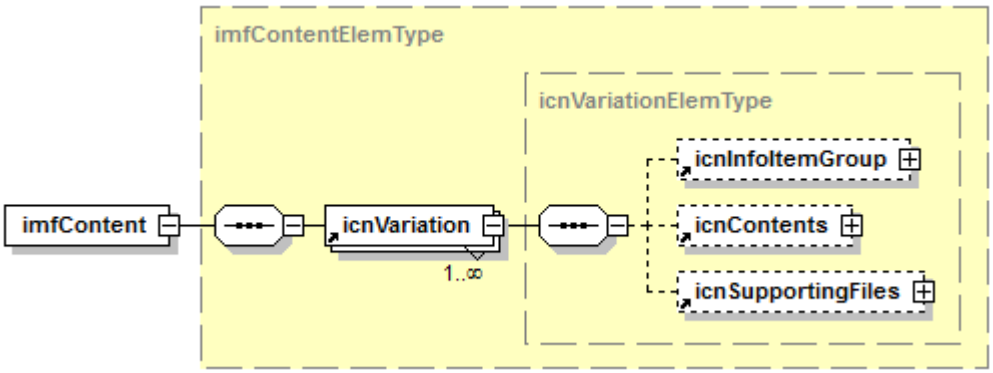
– <remarks>. Refer to Chap 3.9.5.1.

2.2 ICN metadata file content

Description: The element <imfContent> contains the metadata supporting invocation and use of the ICN object in various contexts.

One and the same ICN object can exist in different formats/notations, usually because different presentation media raise different requirements. This can be reflected by use of several occurrences of the child element.

Markup element: <imfContent>



ICN-SYU52-AASER00016-001-01

Fig 7 Element <imfContent>

Attributes:

– None

Child elements:

– <icnVariation>. Refer to Para 2.2.1.

2.2.1 ICN metadata covering all applied formats

Description: The element <icnVariation> contains the metadata for one specific format/notation of an ICN object.

Markup element: <icnVariation>

Attributes:

– `fileExtension` (O), the file extension of the format/notation to which the contained set of metadata relates. If the attribute is not used, the metadata will be considered generally valid for the ICN file. Metadata given for a specific format/notation will override any corresponding generally given metadata. Refer to Chap 4.8 for more details about formats/notations.

Child elements:

– <icnInfoItemGroup>. Refer to Para 2.2.1.1.
– <icnContents>. Refer to Para 2.2.1.2.
– <icnSupportingFiles>. Refer to Para 2.2.1.3.

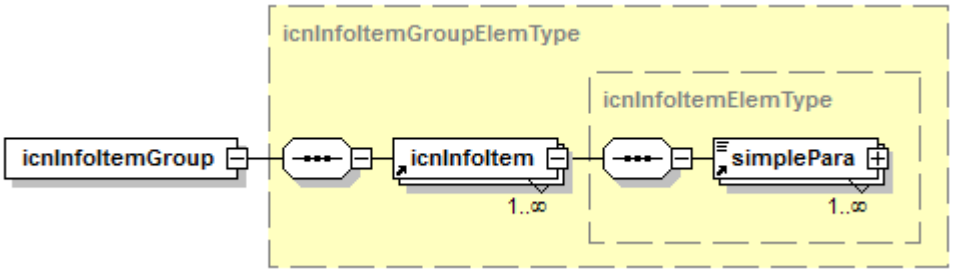
Markup example:

```
<imfContent>
<!-- Generally applicable metadata -->
<icnVariation>...</icnVariation>
<!-- Metadata only applicable to the tif variant -->
<icnVariation fileExtension=”tif”>...</icnVariation>
</imfContent>
```

2.2.1.1 ICN metadata item information

Description: The element <icnInfoItemGroup> contains the various types of metadata items that are useful to identify and manage the ICN.

Markup element: <icnInfoItemGroup>



ICN-SYU52-AASER00017-001-01

Fig 8 Element <icnInfoItemGroup>

Attributes:

– None

Child elements:

<icnInfoItem>. Refer to Para 2.2.1.1.1.

2.2.1.1.1 ICN metadata item

Description: The element <icnInfoItem> contains one metadata item associated to the ICN.

Markup element: <icnInfoItem>

Attributes:

– icnInfoItemType (M), the type of metadata item that is contained in the element. The attribute can have one of the following values:

- "iiit01" thru "iiit99". Refer to Chap 3.9.6.1.

Child elements:

<simplePara>. Refer to Chap 3.9.5.2.1.10.

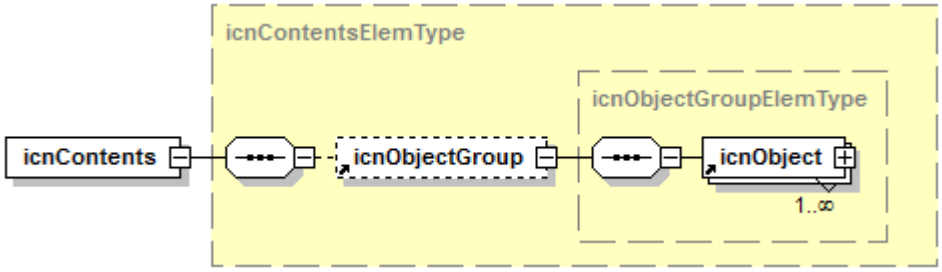
Markup example:

```
<icnInfoItem
icnInfoItemType="iiit02"><simplePara>100Mb</simplePara></icnInfo
Item>
```

2.2.1.2 ICN object contents

Description: The element <icnContents> contains metadata related to the ICN object to enable it to be invoked and presented in a specific context (eg, in a data module).

Markup element: <icnContents>



ICN-SYU52-AASER00018-001-01

Fig 9 Element <icnContent>

Attributes:

– None

Child elements:

– <icnObjectGroup>, contains specification of identifiable objects within the content of a multimedia/graphics file. Refer to Para 2.2.1.2.1.

2.2.1.2.1 Multimedia or graphics objects in the ICN file

Description: The element <icnObjectGroup> identifies the objects in the multimedia or graphics information as needed to achieve an intended interaction between the ICN file content and the XML in which it is invoked.

Markup element: <icnObjectGroup>

Attributes:

– None

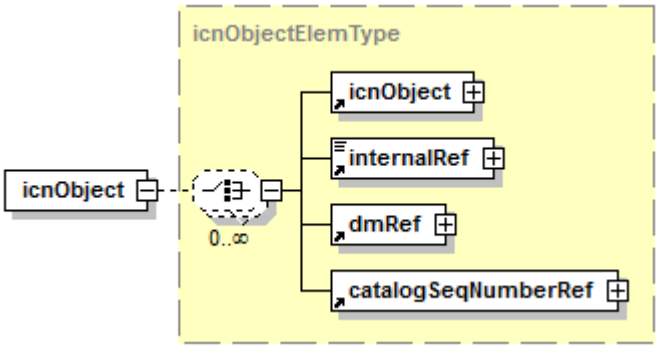
Child elements:

– <icnObject>, information about one specified object within a multimedia or graphic file. Refer to Para 2.2.1.2.2.

2.2.1.2.2 ICN object description

Description: The element <icnObject> contains the description of one identifiable object in multimedia or graphics information. This description can be recursive, specifying that one object is hierarchically related to other objects.

Markup element: <icnObject>



ICN-SYU52-AASER00019-001-01

Fig 10 Element <icnObject>

Attributes:

- id (O), the identifier of the element <icnObject>. Refer to Chap 3.9.5.2.1.2.
- icnObjectIdent (O), the identity by which the object is identified within the multimedia or graphics file
- icnObjectName (O), the name that has been assigned to the object within the multimedia or graphics file
- icnObjectType (O), to the classification of the ICN object
- icnObjectTitle (O), to the title of the ICN object (eg, to be used as tool tip on mouse-over)
- objectDescr (O), the description of the object (eg, indicating what it is and/or for what it is relevant, similar to how the attribute is used in a hotspot. Rerefer to Chap 3.9.5.2.1.8).
- objectCoordinates (O), the coordinates of a region in 2D defined by a closed polygon represented by a comma separated list of coordinates in the form "x1, y1, ..., xn, yn" where each (x,y)-pair defines a point of the closed polygon in absolute pixel coordinates. In 3D a solid is represented by a closed set of surfaces where each surface is defined by a closed polygon/region in 3D space, given in the form "x1, y1, z1,..., xn, yn, zn" where each (x,y,z)-triple defines a point of the closed polygon. All surfaces must be defined such that they share every boundary segment with one other surface.

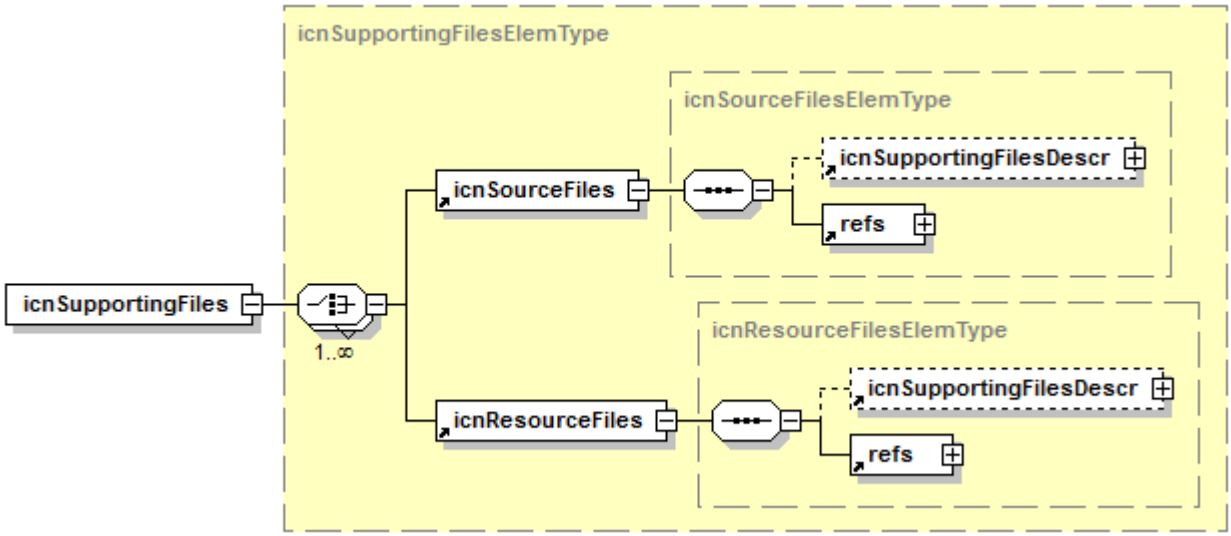
Child elements:

- <icnObject>, the hierarchy of objects contained in objects
- <internalRef>, the relations between different objects in an graphic object or multimedia object (eg, to allow that clicking one object will result in the referenced object to be highlighted or the current view to change). Refer to Chap 3.9.5.2.1.2.
- <dmRef>. Refer to Chap 3.9.5.2.1.2.
- <catalogSeqNumberRef>. Refer to Chap 3.9.5.2.7.

2.2.1.3 Files supporting the ICN

Description: The element <icnSupportingFiles> enables source and/or resource files to be referenced and associated with the ICN when the ICN content is processed and/or presented.

Markup element: <icnSupportingFiles>



ICN-SYU52-AASER00020-001-01

Fig 11 Element <icnSupportingFiles>

Attributes:

– None

Child elements:

– <icnSourceFiles>, the references to the additional resource files associated with the ICN, making it a complete unit. Refer to Para 2.2.1.3.1.
– <icnResourceFiles>, the references to the additional source files associated with the ICN, making it a complete unit. Refer to Para 2.2.1.3.2.

2.2.1.3.1 Associated source files

Description: This element <icnSourceFiles> enables additional source files associated with the ICN to be referenced, making it a complete unit.

Markup element: <icnSourceFiles>

Attributes:

– icnSourceFileType (M), the type of source files concerned. The attribute is project configurable. Refer to Chap 3.9.6.1.

Child elements:

– <icnSupportingFilesDescr>, the description of the supporting files. Refer to Para 2.2.1.3.3.
– <refs>. Refer to Chap 3.9.5.2.1.2.

2.2.1.3.2 Associated resource files

Description: The element <icnResourceFiles> enables associated resource files to be referenced when the ICN content is presented or used.

Markup element: <icnResourceFiles>

Attributes:

– icnResourceFileType (M), the type of resource files concerned. The attribute is project configurable. Refer to Chap 3.9.6.1.

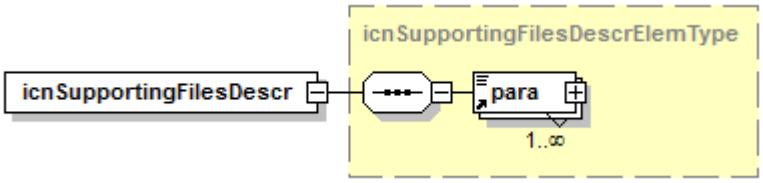
Child elements:

- <icnSupportingFilesDescr>, the description of the supporting files. Refer to Para 2.2.1.3.3.
- <refs>. Refer to Chap 3.9.5.2.1.2.

2.2.1.3.3 Description of supporting files

Description: The element <icnSupportingFilesDescr> contains a description of a collection of files associated to an ICN.

Markup element: <icnSupportingFilesDescr>



ICN-SYU52-AASER00021-001-01

Fig 12 Element <icnSupportingFilesDescr>

Attributes:

- None

Child elements:

- <para>. Refer to Chap 3.9.5.2.1.10.

2.3 ICN metadata file coding

The ICN metadata file identification is derived from the corresponding ICN object identification. It also allows for its own revision marking, that does not necessarily have to be synchronous with the issue marking of the ICN object itself. Thus, the identity consists of:

- the prefix "IMF", followed by a hyphen
- the ICN, except the prefix "ICN-" and the extension annotation, followed by an underscore
- the issue number of the ICN metadata file, followed by a hyphen
- the inwork number of the ICN metadata file
- the extension code, ie, ".xml" since the metadata file is an xml file

Examples:

The ICN metadata file name for an object with the CAGE code based identity ICN-YYYYY-YYYYY-XXX-XX is:

- IMF-YYYYY-YYYYY-XXX-XX_JJJ-WW.XML

where JJJ is the issue number of the file and WW is the inwork number.

Correspondingly, the ICN metadata file name for an object with the model identification based identity ICN-YY-Y-YYYYYY-Y-YYYYY-YYYYY-A-XXX-XX is:

- IMF-YY-Y-YYYYYY-Y-YYYYY-YYYYY-A-XXX-XX_JJJ-WW.XML

Chapter 3.9.3

Authoring - Warnings, cautions and notes

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Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.6.1	Attributes - Project configurable values
Chap 4.10.1	Business rules exchange - Business rules document data module
Chap 6.2.2	Page-oriented publications - Typography and layout elements

1 General

Definitions and rules for warnings, cautions and notes are given here.

1.1 Warnings

Warnings are used in data modules and technical publications to alert the user that possible hazards are associated with the materials/processes/procedures/limits. These can cause death or injury in any form if the instructions in the operational or procedural task are not followed precisely. Warnings describe the hazards and the possible impact.

1.2 Cautions

Cautions are used in data modules and technical publications to alert the user that damage to the Product is possible if the instructions in the operational or procedural task are not followed precisely. Cautions describe the hazards and possible impact.

1.3 Notes

Notes are used in data modules and technical publications to provide the user with additional information, which is helpful but does not belong to the immediate subject. Operational and procedural tasks can be made easier by the use of notes, but when used, they do not take the place of operational or procedural information.

1.4 Safety conditions

Warnings and cautions that apply to the whole instruction must be contained or referenced in the Preliminary requirements - Safety conditions. Refer to Chap 3.9.5.2.1.9.

Warnings must precede cautions, and cautions must precede notes.

1.5 General warnings, cautions and notes

Warnings cautions and notes that apply to the Product or part thereof can be captured in descriptive data modules using the information code 012 (General warnings and cautions and related safety data).

1.6 Presentation

Examples of the presentation of warnings, cautions and notes are given in Chap 6.2.2.

2 Content

Warnings and cautions can be located:

- in one or more separate descriptive data modules using the information code 012 in the data module code. Refer to Para 1.5.
- in Preliminary requirements (element <preliminaryRqmts>) - Safety conditions (element <reqSafety>) of a procedural data module. Refer to Para 1.4.
- within operational and maintenance procedures at the element level of a data module. Warnings and cautions must be placed directly preceding the paragraph to which they pertain.
- in an internal collection (within the data module using the element <warningsAndCautions>) or in an external collection (referring to a common information repository using the element <warningsAndCautionsRef>). Refer to Para 2.4.

Notes can be placed either before or after the paragraph to which they pertain or in the Preliminary requirements - Safety conditions of a procedural data module. Refer to Para 1.4.

Business rule decision point BRDP-S1-00030 - Use of general warnings, cautions and notes as separate data modules:

- Decide whether to produce general warnings, cautions and notes in separate descriptive data modules.

Business rule decision point BRDP-S1-00031 - Use of warning and/or caution collections:

- Decide whether to use warning and/or caution collections, internal or external.

2.1 Warnings

Description: The element <warning> is used to contain hazard information that can cause personal injury or death.

Warnings in data modules must always precede the text where the hazard arises (for details see below) and must always precede cautions and notes.

Warnings of a general nature which are applicable throughout a procedure can precede the instruction to save repeating the warning before each of the individual steps of the maintenance task where the hazard arises. Refer to Para 2.1.2.

The default heading **WARNING** must begin the warning followed by symbols, if any. Refer to Chap 6.2.2 for examples.

Note

The default heading **WARNING** is not entered in the data modules when data modules are written in an XML editor or a What You See Is What You Get (WYSIWYG)-editor with an automatic function for presentation of legends. If not, the author must make sure that the default heading is included.

Warnings must not be numbered. Warnings must be the first item within that step/para.

Note

There are two methods to present warnings. Refer to Chap 6.2.2.

Note

Warnings must not be used for purely descriptive information (eg, data modules with information code 040). This does not prohibit the use of warnings in a descriptive data module for the production of content such as a summary of warnings.

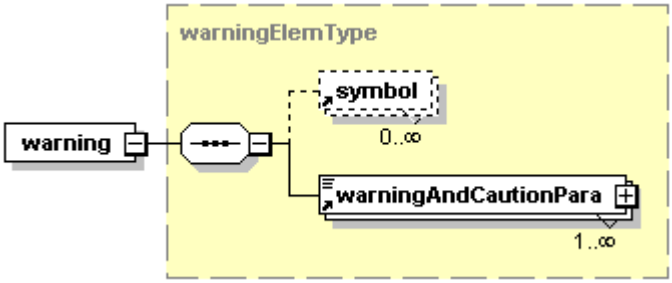
Note

Warnings in business rules document data modules are strongly discouraged. The attribute `brSeverityLevel` must be used instead.

The following rule must be followed:

– Warnings that pertain to parent elements are also applicable to all of their child elements.

Markup element: <`warning`>



ICN-S3627-S1000D0567-001-01

Fig 1 Element <`warning`>

Attributes:

– `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
– `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Note

The attribute `id` is required when authoring a warning and caution collection. Refer to Para 2.4.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- warningType (O), the type of warning (eg, Electric shock, Chemical substance)
- internalRefId (O), the target id. Refer to Chap 3.9.5.2.1.2.
- vitalWarningFlag (O), the indicator whether the warning is vital. The attribute vitalWarningFlag can have one of the following values:
  - "0" - a non-vital warning
  - "1" - a vital warning

  Note
  If the attribute vitalWarningFlag is used, the meaning of value "1" must be clearly stated. Compliance with country legislation and rules must be ensured.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <symbol>. Refer to Chap 3.9.5.2.1.10.
- <warningAndCautionPara> . Refer to Para 2.1.2.

Business rule decision point BRDP-S1-00032 - Use of the attribute vitalWarningFlag:

- Decide whether and how to use the attribute vitalWarningFlag.

Business rule decision point BRDP-S1-00033 - Use of the attribute warningType:

- Decide whether and how to use the attribute warningType.

Markup example:

```
<warning>
<warningAndCautionPara>Do not ride with a cracked
stem.</warningAndCautionPara>
</warning>
```

2.1.1 Symbol

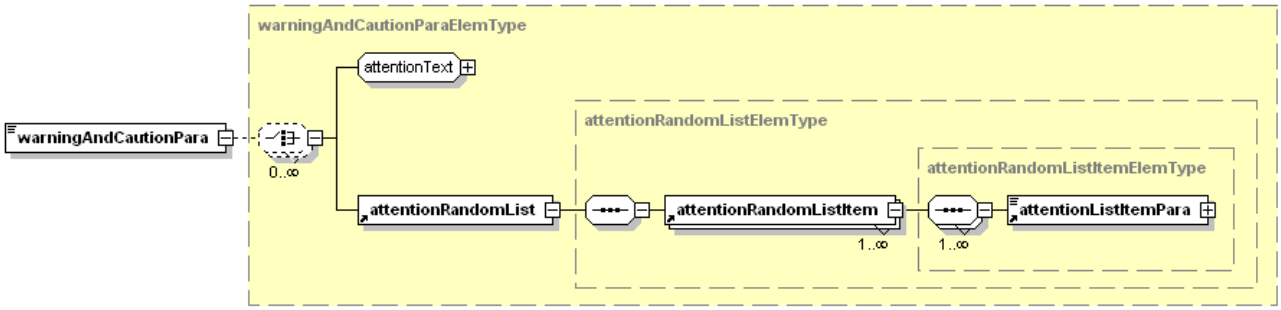
The element <symbol> must be populated in accordance with Chap 3.9.5.2.1.10.

Warnings and cautions can be emphasized with one or more symbols using the element <symbol>. It is recommended to use International Organization for Standardization (ISO) pictograms.

2.1.2 Warning and caution para

Description: The element <warningAndCautionPara> contains the warning or caution text.

Markup element: <warningAndCautionPara>



ICN-S3627-S1000D0525-001-01

Fig 2 Element <warningAndCautionPara>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Note

The attribute `id` is required when authoring a warning and caution collection. Refer to Para 2.4.

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

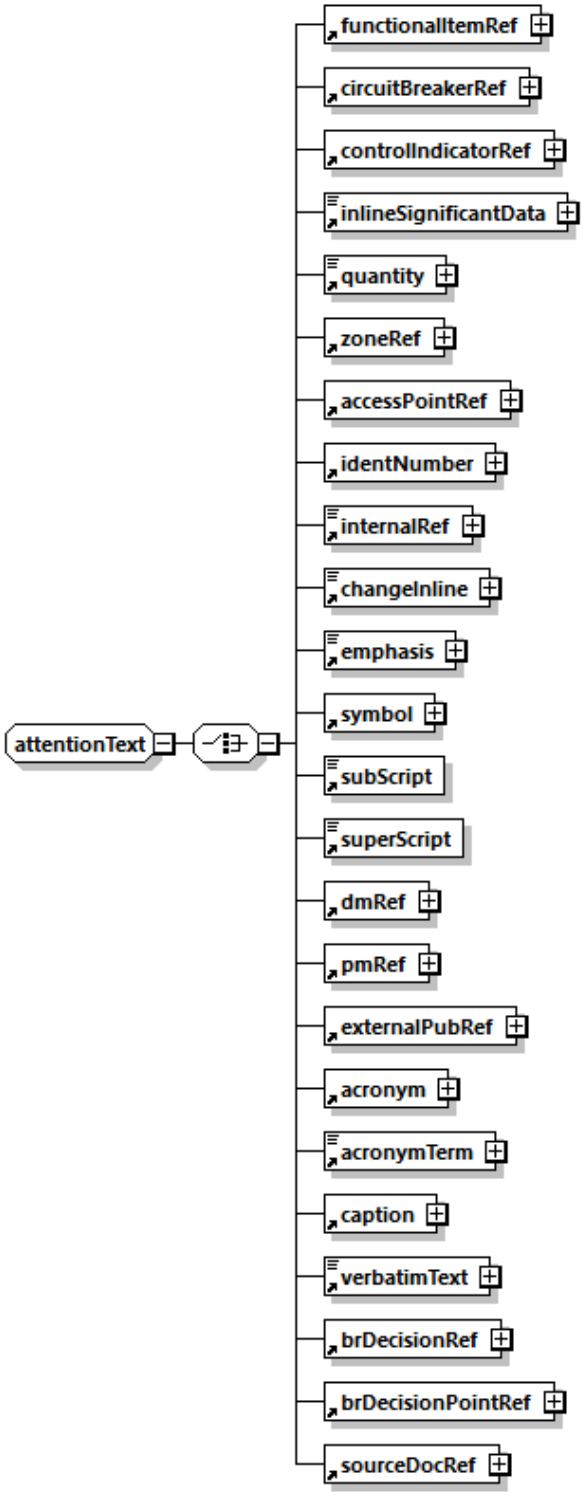
- <`attentionRandomList`>. Refer to Para 2.1.2.2.
- The child elements of the group `attentionText` applicable to the actual data module type. Refer to Para 2.1.2.1.

Markup example:

```
<warningAndCautionPara>If you operate the front brake without
the rear brake you can cause a crash.</warningAndCautionPara>
```

2.1.2.1 The group `attentionText`

The content of the group `attentionText` varies depending on the data module type, but the name of the group is the same for all data module types. The full (maximum) content of the group `attentionText` is shown in Fig 3.



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Fig 3 The group `attentionText`

The content of the three different warning/caution/note paragraph types are detailed in Fig 4 . The figure provides the element name, which data module types the element is available in, and which child elements are available in that context.

The description of the content of the child elements is given in Chap 3.9.5.2.1.10.

Element [group]	Data module type (Schema) in which the element occurs	Available child elements (grey indicates available)																												
		functionalItemRef	circuitBreakerRef	controlIndicatorRef	inlineSignificantData	quantity	zoneRef	accessPointRef	identNumber	internalRef	indexFlag	changeInline	emphasis	symbol	subScript	superScript	dmRef	pmRef	externalPubRef	footnote	footnoteRef	acronym	acronymTerm	captionGroup	caption	verbatimText	brDecisionRef	brDecisionPointRef	sourceDocRef
<warningAndCautionPara> [attentionText]	brex checklist crew descript learning sb scocontent	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■			■	■		■	■			
<warningAndCautionPara> [attentionText]	comrep fault proced process schedul	■	■	■	■	■				■		■	■	■	■	■	■	■	■			■	■			■			
<warningAndCautionPara> [attentionText]	update	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■			■	■			■			
<attentionListItemPara> <notePara> [attentionText]	brDoc	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■			■	■		■	■	■	■	■
<attentionListItemPara> <notePara> [attentionText]	brex checklist container crew descript frontmatter learning pm sb scocontent scormcontentpackage wrngdata wrngflds	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■			■	■		■	■			
<attentionListItemPara> [attentionText]	comrep fault ipd proced process schedul	■	■	■	■	■				■		■	■	■	■	■	■	■	■			■	■			■			
<attentionListItemPara> <notePara> [attentionText]	applicrossreftable condcrossreftable prdcrossreftable	■	■		■	■				■		■	■	■	■	■	■	■	■			■	■			■			
<attentionListItemPara> <notePara> [attentionText]	update	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■			■	■			■			

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Fig 4 Paragraph models and available child elements

2.1.2.2 Attention random list

Description: The element <attentionRandomList> contains the list items.

There are two types of attention random lists:

- simple - recognized by the value "pf01" of the attribute listItemPrefix giving just an indented item without a prefix
- unordered - the lists recognized by the value "pf03" or "pf07" of the attribute listItemPrefix giving the following prefix: [-] or [●], respectively

The difference between a simple random list and an unordered random list becomes visible when presented. Refer to Chap 6.2.2.

Only one level of attention random lists is allowed.

Markup element: <attentionRandomList>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `listItemPrefix` (O), the indicator whether the list is a simple list or an unordered list, thus giving the prefix for presentation. Refer to Chap 3.9.6.1. The attribute `listItemPrefix` can have one of the following values:
  - "`pf01`" - no prefix (just an indenture)
  - "`pf03`" - prefix [-] used in notes only
  - "`pf07`" - prefix [●] used in warnings and cautions only

  Note
  One of the prefix values "`pf01`", "`pf03`" or "`pf07`" must be chosen instead of the default prefix value "`pf02`".
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`attentionRandomListItem`>. Refer to Para 2.1.2.2.1.

2.1.2.2.1 Attention random list item

Description: The element <`attentionRandomListItem`> contains one list item of an attention random list.

Each list item can consist of one or more paragraphs.

Note
To enable more than one paragraph, the Schema allows a list item to contain one or more paragraphs. Use the child element <`attentionListItemPara`> if your list item has more than one paragraph.

Markup element: <`attentionRandomListItem`>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O) `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <attentionListItemPara>. Refer to Para 2.1.2.2.2.

2.1.2.2.2 Attention list item para

Description: The element <attentionListItemPara> contains the list item paragraphs.

Markup element: <attentionListItemPara>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- Includes the child elements of the group attentionText applicable to the actual data module type. Refer to Para 2.1.2.1.

Markup example:

```
<attentionRandomList listItemPrefix="pf07">
<attentionRandomListItem>
<attentionListItemPara>First attention random list bullit first
paragraph</attentionListItemPara>
<attentionListItemPara>First attention random list bullit second
paragraph</attentionListItemPara>
</attentionRandomListItem>
<attentionRandomListItem>
<attentionListItemPara>Second attention random list bullit first
paragraph.</attentionListItemPara>
</attentionRandomListItem>
</attentionRandomList>
```

2.2 Cautions

Description: The element <caution> contains hazard information that can cause damage to the Product.

Cautions in data modules must always precede the text where the hazard arises and must always precede notes.

Cautions of a general nature, however, which are applicable throughout an instruction, can precede the instruction to save repeating the caution before each of the individual steps of the maintenance task where the hazard arises. Refer to Para 2.1.2.

The default heading **CAUTION** must begin the caution followed by symbols, if any. Refer to Chap 6.2.2 for examples.

Note

The default heading **CAUTION** is not entered in the data modules when data modules are written in an XML editor or a WYSIWYG-editor with an automatic function for presentation of legends. If not, the author must make sure that the default heading is included.

Cautions must not be numbered. Cautions must be the first item within that step/para if there are no warnings, because warnings must always precede cautions.

The scope of cautions follows the same rules as for warnings. Refer to Para 2.1.

Note

There are two methods to present cautions. Refer to Chap 6.2.2.

Note

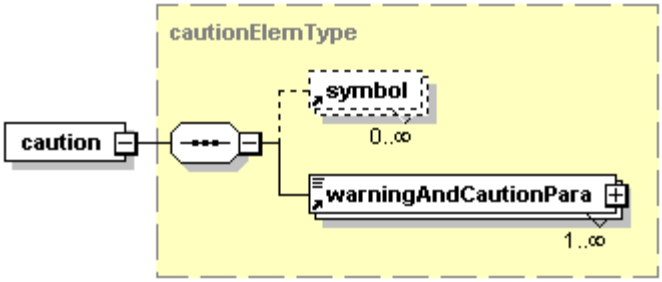
Cautions must not be used for purely descriptive information (eg, data modules with information code 040). This does not prohibit the use of cautions in a descriptive data module for the production of content such as a summary of cautions.

Note

Cautions in business rules document data modules are strongly discouraged. The attribute `brSeverityLevel` must be used instead.

The content of the element <`caution`> is given by a combination of the same child elements and attributes as used by the element <`warning`> except for the absence of the attribute `vitalWarningFlag`. Refer to Para 2.1.

Markup element: <`caution`>



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Fig 5 Element <`caution`>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

  Note

  The attribute `id` is required when authoring a warning and caution collection. Refer to Para 2.4.

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `cautionType` (O), the type of caution
- `internalRefId` (O), the target id. Refer to Chap 3.9.5.2.1.2.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`symbol`>. Refer to Chap 3.9.5.2.1.10.
- <`warningAndCautionPara`>. Refer to Para 2.1.2.

Business rule decision point BRDP-S1-00034 - Use of the attribute `cautionType`:

- Decide whether and how to use the attribute `cautionType`.

Markup example:

```
<caution>
<warningAndCautionPara>Do not use a
<internalRef internalRefId="seq-0001"
internalRefTargetType="irtt05"></internalRef>
 that has high pressure. A water hose that has high pressure can
cause some parts to become loose or full of
water.</warningAndCautionPara>
</caution>
```

2.3 Notes

Description: The element <`note`> contains additional information that can be useful to the user.

Normally, notes in data modules must follow the text to which they refer. In certain circumstances, it can be necessary to allow for notes to precede the text to which they refer to. In this case, projects must declare the use of notes in their business rules.

Notes must always follow warnings and cautions.

Notes of a general nature, which are applicable throughout an instruction, can precede the instruction to save repeating the note throughout the instruction.

The production of notes as individual data modules is not recommended.

The default heading **Note** must begin the note. If the notes are numbered, then the default heading **Note X** must begin the note. Refer to examples in Chap 6.2.2.

Note

The default heading **Note** is not entered in the data modules when data modules are written in an XML editor or a WYSIWYG-editor with an automatic function for presentation of legends. If not, the author must make sure that the default heading is included.

If there is more than one note they can, by project decision, be numbered to enable cross-references to be made to them within the text.

A note can comprise of:

- symbols
- one or more paragraphs
- one or more random (unordered) lists at one level only
- one sequential (ordered) list at one level only

It is however recommended to keep notes as simple as possible.

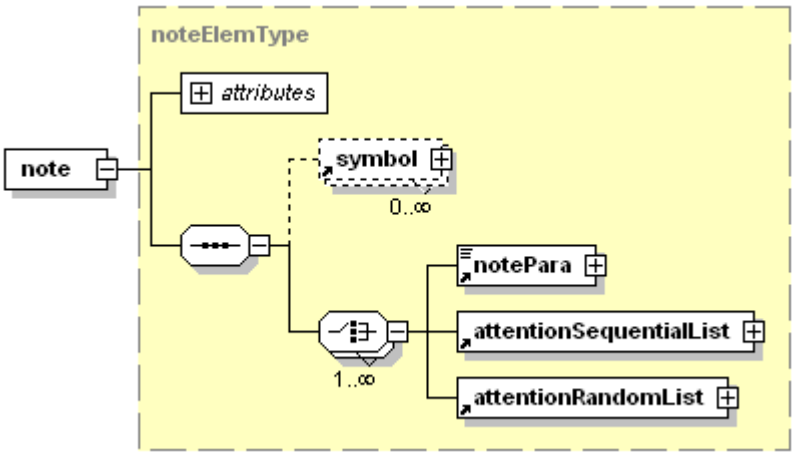
The use of attention sequential lists and attention random lists is discouraged. Refer to Para 2.3.2 and Para 2.1.2.2.

There can be instances where notes are applicable to complete steps/paras or substeps/subparas, including their substeps/subparas. In those circumstances, notes must be the first item within that step/para provided there are no warnings or cautions. Otherwise warnings and cautions take precedence. Notes must follow the step/para number and title, if any, and precede any text.

The scope of notes follows the same rules as for warnings. Refer to Para 2.1.

The content of the element <note> is given by a combination of the same child elements and attributes as for the element <warning> (refer to Para 2.1), except for the absence of the attribute vitalWarningFlag and the addition of sequential lists.

Markup element: <note>



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Fig 6 Element <note>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- noteType (O), the type of note
- internalRefId (O), the target id of the note. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <symbol>. Refer to Chap 3.9.5.2.1.10.

and one of the following is required:

- <notePara>. Refer to Para 2.3.1.

- <attentionSequentialList>. Refer to Para 2.3.2.
- <attentionRandomList>. Refer to Para 2.1.2.2.

Business rule decision point BRDP-S1-00035 - Use of the attribute noteType:

- Decide whether and how to use the attribute noteType.

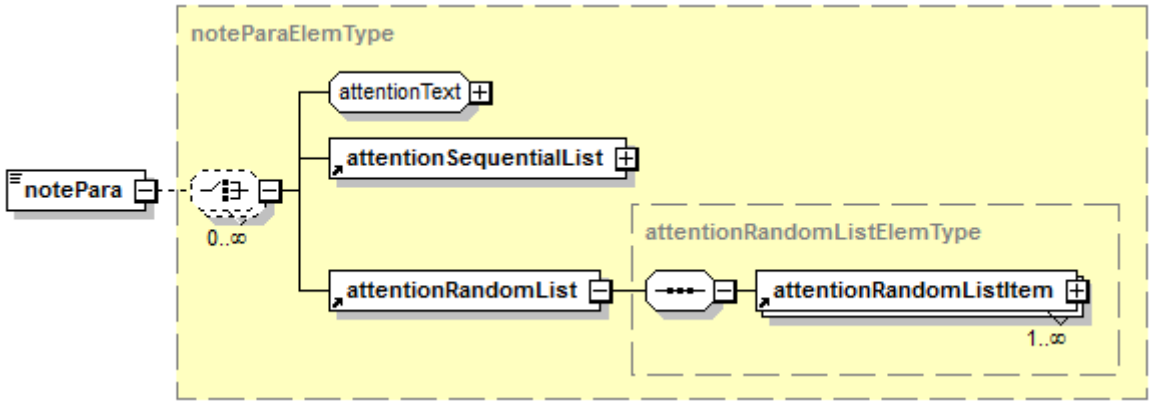
Markup example:

```
<note>
<notePara>The stem must point forward in alignment with the
wheel.</notePara>
</note>
```

2.3.1 Note para

Description: The element <notePara> contains the note text.

Markup element: <notePara>



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Fig 7 Element <notePara>

Attributes:

- Includes the same set of attributes as the element <attentionListItemPara>. Refer to Para 2.1.2.2.2.

Child elements:

- <attentionSequentialList>. Refer to Para 2.3.2.
- <attentionRandomList>. Refer to Para 2.1.2.2.
- The child elements of the group attentionText applicable to the actual data module type. Refer to Para 2.1.2.1.

Markup example:

```
<notePara>It is not necessary to remove the handlebar for this
procedure.</notePara>
```

2.3.2 Attention sequential list

Description: The element <attentionSequentialList> contains an attention sequential (ordered) list in a note. An attention sequential list, when presented, has numbers before the list items. Refer to Chap 6.2.2.

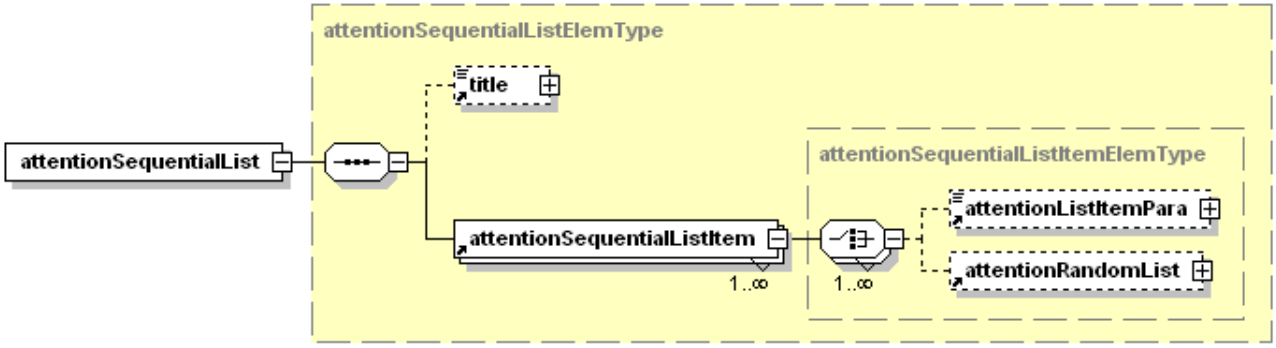
In the attention sequential list, a list item can consist of one or more paragraphs.

A sequential list, when presented, is numbered with arabic numerals. Refer to Chap 6.2.2.

Only one attention sequential list is allowed in a Note.

Attention sequential lists are limited to one level.

Markup element: <attentionSequentialList>



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Fig 8 Element <attentionSequentialList>

Attributes:

– Includes the same set of attributes as the element <attentionListItemPara>. Refer to Para 2.1.2.2.2.

Child elements:

– <title>. Refer to Chap 3.9.5.2.1.5.
– <attentionSequentialListItem>. Refer to Para 2.3.2.1.

2.3.2.1 Attention sequential list item

Description: The element <attentionSequentialListItem> contains one list item of an attention sequential list item and can consist of one or more paragraphs.

Markup element: <attentionSequentialListItem>

Attributes:

– Includes the same set of attributes as the element <attentionRandomListItem>. Refer to Para 2.1.2.2.1.

Child elements:

– <attentionListItemPara>. Refer to Para 2.1.2.2.2.
– <attentionRandomList>. Refer to Para 2.1.2.2.

Markup example:

```
<attentionSequentialList>
<attentionSequentialListItem>
<attentionListItemPara>First list item
paragraph</attentionListItemPara>
</attentionSequentialListItem>
<attentionSequentialListItem>
```

```
<attentionListItemPara>Second list item
paragraph.</attentionListItemPara>
</attentionSequentialListItem>
</attentionSequentialList>
```

2.4 Warning and caution collections

Warnings and cautions can be collected within the data module where they are used (refer to Para 2.4.1) or within a warning or a caution common information repository in case of warning and caution externalization. Refer to Para 2.4.2.

2.4.1 Internal collection

When collected within the data module where the warnings and cautions occur, the element <warningsAndCautions> must be used.

Description: The element <warningsAndCautions> contains the collection of warnings and cautions used within a data module. Each warning or caution is authored separately within the element <warningsAndCautions>. Warnings and cautions can thus be authored once in a data module and then referenced as needed.

The collection (element <warningsAndCautions>) must not include warnings or cautions that do not occur within the data module.

Note

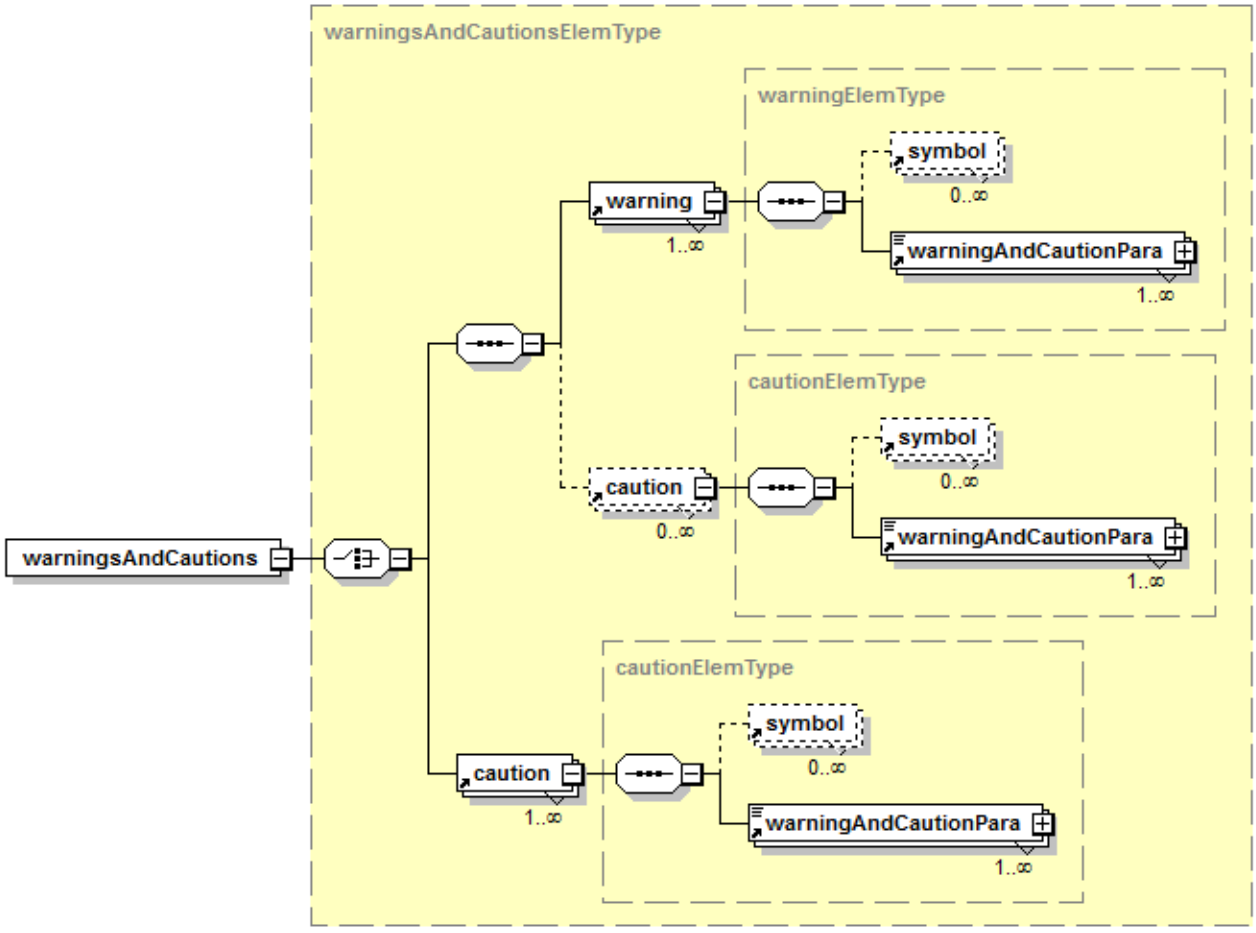
The collection can be used in combination with warnings and cautions that are authored individually at the element level of a data module. The collection is useful to store common (or multi-use) alerts while local (or single-use) alerts can be authored as needed.

The collection of warnings and cautions is referenced by the use of the attributes warningRefs or cautionRefs, respectively, which are permitted on the following elements:

- <brLevelledPara>. Refer to Chap 4.10.1.
- <crewDrill>. Refer to Chap 3.9.5.2.6.
- <crewDrillStep>. Refer to Chap 3.9.5.2.6.
- <crewRefCard>. Refer to Chap 3.9.5.2.6.
- <checkListPara>. Refer to Chap 3.9.5.2.14.
- <checkListStep>. Refer to Chap 3.9.5.2.14.
- <commonInfoDescrPara>. Refer to Chap 3.9.5.2.1.12.
- <descrCrew>. Refer to Chap 3.9.5.2.6.
- <description>. Refer to Chap 3.9.5.2.2.
- <entry>. Refer to Chap 3.9.5.2.1.6.
- <isolationProcedureEnd>. Refer to Chap 3.9.5.2.4.
- <isolationStep>. Refer to Chap 3.9.5.2.4.
- <levelledPara>. Refer to Chap 3.9.5.2.2.
- <proceduralStep>. Refer to Chap 3.9.5.2.3.
- <safetyRqmts>. Refer to Chap 3.9.5.2.1.9.
- <sb>. Refer to Chap 3.9.5.2.15.
- <sbTopicContent>. Refer to Chap 3.9.5.2.15.
- <scoContent>. Refer to Chap 3.9.5.2.17.

The attribute warningRefs is populated with the identification (attribute id) assigned to the applicable warning within the collection (element <warningsAndCautions>).

The attribute cautionRefs is populated with the identification (attribute id) assigned to the applicable caution within the collection (element <warningsAndCautions>).



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Fig 9 Element <warningsAndCautions>

Markup element: <warningsAndCautions>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <warning>, whose attribute id must be used when authored within the collection. Refer to Para 2.1.
- <caution>, whose attribute id must be used when authored within the collection. Refer to Para 2.2.

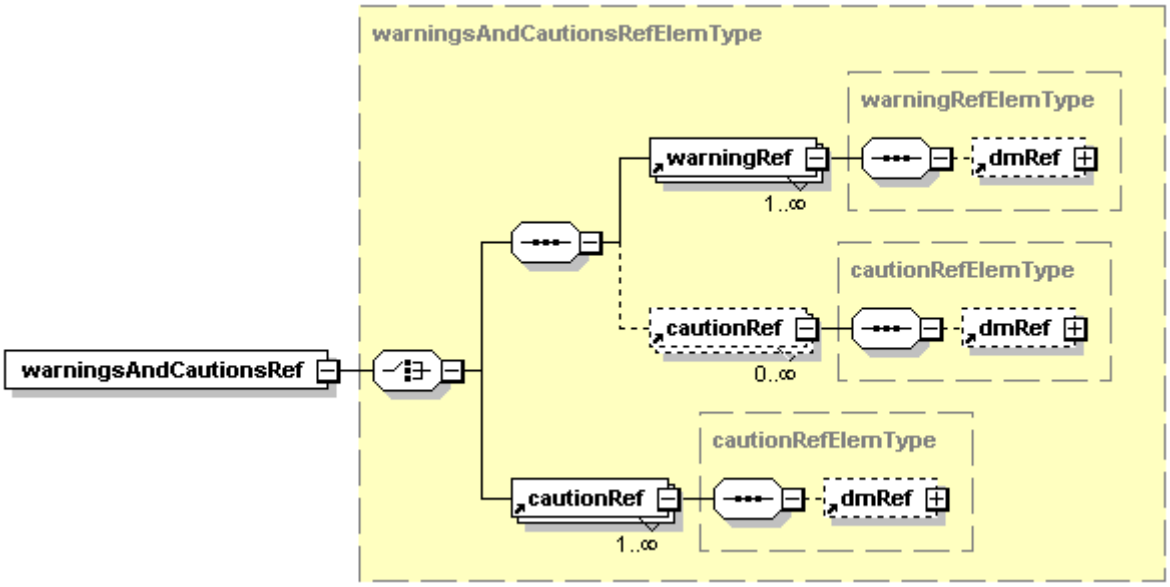
Markup example:

```
<warningsAndCautions>
<warning id="warn-0001">
<warningAndCautionPara>The first warning in the collection of
warnings and cautions, used multiple times within the data
module.</warningAndCautionPara>
</warning>
<warning id="warn-0002">
<warningAndCautionPara>The second warning in the collection of
warnings and cautions, used multiple times within the data
module.</warningAndCautionPara>
</warning>
<caution id="caut-0001">
<warningAndCautionPara>The first caution in the collection of
warnings and cautions, used multiple times within the data
module.</warningAndCautionPara>
</caution>
</warningsAndCautions>
...
<reqSafety>
<safetyRqmts warningRefs="warn-0001" cautionRefs="caut-0001">
<warning>
<warningAndCautionPara>Some other warning, not included in the
collection.</warningAndCautionPara>
</warning>
</safetyRqmts>
</reqSafety>
...
<table>
<tgroup cols="2">
<tbody>
<row>
<entry warningRefs="warn-0001 warn-0002" cautionRefs="caut-
0001"></entry>
<entry>
<caution>
<warningAndCautionPara>A caution that is used only once and
authored in the applicable table entry.</warningAndCautionPara>
</caution>
</entry>
</row>
</tbody>
</tgroup>
</table>
```

2.4.2 External collection

When collected into a warning and/or caution common information repository, the element <warningsAndCautionsRef> must be used.

Description: The element <warningsAndCautionsRef> contains the references to the warnings or cautions, which are valid for this data module and stored externally into a warning and/or caution common information repository.



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Fig 10 Element <warningsAndCautionsRef>

Markup element: <warningsAndCautionsRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <warningRef>, references a warning stored in a warning common information repository. Refer to Chap 3.9.5.2.1.13.
- <cautionRef>, references a caution stored in a caution common information repository. Refer to Chap 3.9.5.2.1.13.

3 Examples

The following example shows the element <warningsAndCautionsRef> in a procedural data module and the accompanying warning and caution common information repositories.

The procedural data module:

```
<content>
<warningsAndCautionsRef>
<warningRef id="warn-0001" warningIdentNumber="warning-001">
<dmRef><dmRefIdent><dmCode modelIdentCode="S1000DLIGHTING"
systemDiffCode="AAA" systemCode="D00" subSystemCode="0"
```

```
subSubSystemCode="0" assyCode="00" disassyCode="01"
disassyCodeVariant="AA" infoCode="012" infoCodeVariant="A"
itemLocationCode="A"/></dmRefIdent></dmRef></warningRef>
<cautionRef id="caut-0001" cautionIdentNumber="caution-001">
<dmRef><dmRefIdent><dmCode modelIdentCode="S1000DLIGHTING"
systemDiffCode="AAA" systemCode="D00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" disassyCode="02"
disassyCodeVariant="AA" infoCode="012" infoCodeVariant="A"
itemLocationCode="A"/></dmRefIdent></dmRef></cautionRef>
<cautionRef id="caut-0002" cautionIdentNumber="caution-002">
<dmRef><dmRefIdent><dmCode modelIdentCode="S1000DLIGHTING"
systemDiffCode="AAA" systemCode="D00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" disassyCode="02"
disassyCodeVariant="AA" infoCode="012" infoCodeVariant="A"
itemLocationCode="A"/></dmRefIdent></dmRef></cautionRef>
</warningsAndCautionsRef>
<procedure>
<preliminaryRqmts>
...
<safetyRqmts cautionRefs="caut-0001 caut-0002"
warningRefs="warn-0001"></safetyRqmts>
```

The warning common information repository data module:

```
<content>
<commonRepository>
<warningRepository>
<warningSpec>
<warningIdent warningIdentNumber="warning-001"></warningIdent>
<warningAndCautionPara>Make sure that the bulb is cool before
you replace it.</warningAndCautionPara>
</warningSpec>
<warningSpec>
<warningIdent warningIdentNumber="warning-002"></warningIdent>
<warningAndCautionPara>Make sure the light glass is not broken
before handling it.</warningAndCautionPara>
</warningSpec>
...
</warningRepository>
</commonRepository>
</content>
```

The caution common information repository data module:

```
<content>
<commonRepository>
<cautionRepository>
<cautionSpec>
<cautionIdent cautionIdentNumber="caution-001"></cautionIdent>
<warningAndCautionPara>Do not touch the glass of the
bulb.</warningAndCautionPara>
</cautionSpec>
<cautionSpec>
<cautionIdent cautionIdentNumber="caution-002"></cautionIdent>
```

```
<warningAndCautionPara>Make sure that the glass is clean before
installing it on the light.</warningAndCautionPara>
</cautionSpec>
...
</cautionRepository>
</commonRepository>
</content>
```

Chapter 3.9.4

Authoring - Front matter

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Chap 3.9.5.3.1	Applicability - Applicability cross-reference table
Chap 3.9.5.3.2	Applicability - Conditions cross-reference table
Chap 3.9.5.3.3	Applicability - Products cross-reference table
Chap 4.14.1	Applicability - Applicability cross-reference table
Chap 4.14.2	Applicability - Conditions cross-reference table

Chap 4.14.3	Applicability - Products cross-reference table
Chap 5.2.1.18	Common information sets - Common information and data
Chap 5.3.1.1	Common requirements - Front matter
Chap 6.2.1	Page-oriented publications - Page layout, paper publications, headers and footers
Chap 6.2.3.1	Layout rules and examples - Front matter data modules

1 General

This chapter contains the basic rules and guidance for authoring front matter in a data module environment. Front matter data modules can be created automatically or manually by an author, or by a mix of automation and authoring. By using the dedicated Front matter Schema the below listed front matter data modules can be automatically created.

The detailed rules and guidance for using the Front matter Schema are given in Chap 3.9.5.2.16. The Front matter Schema is currently designed for:

- Title page - TITLE
- Table of contents - TOC
- List of effective pages - LOEP
- List of effective data modules - LOEDM
- Highlights - HIGH with or without updating instructions

The remaining front matter data modules must use the Descriptive Schema except for Applicability Cross-reference Table (ACT), Conditions Cross-reference Table (CCT) and Products Cross-reference Table (PCT) which have their own Schemas.

Each publication or volume thereof can have a set of front matter as given in Chap 5.3.1.1. Refer to BRDP-S1-00460.

Examples for page-oriented front matter are given in Chap 6.2.3.1 if not otherwise stated.

Issue number and date must be the same for the publication and all new or re-issued front matter data modules.

2 Front matter

2.1 Title page

The title page contains, if applicable, the following information:

- Product, project or any commercial name (optional). This information must be agreed upon between the publication producer and the customer.
- publication title/volume
- publication module code
- page identification = data module code
- issue number and issue date of the publication
- project's logotype (optional)
- security classification
- restriction instructions (optional)
- barcode (optional)
- publisher (publishing authority)
- manufacturer's information (optional)

The Front matter Schema allows for capturing more information than listed above, which by project decision can be presented on the title page or be available for interactive presentation. Refer to Chap 3.9.5.2.16.

Issue date of the publication (issue date of the title page data module) and security markings follow the rules for page layout. Refer to Chap 6.2.1.

The security marking must represent the highest classified information in the publication or volume.

The title page must be reissued with each issue.

2.2 List of effective pages

The List of Effective Pages (LOEP), if used, identifies each page in the page-oriented publication contents by giving the:

- data module code
- page number
- issue date and/or issue number
- applicability (optional)

All new (additional) or changed pages must be marked with:

- N = New page
- C = Changed page

Where:

"N" indicates a new page. This means that this page is an additional page compared with the last issue of the publication.

"C" indicates a changed page. This means that this page has some form of technical or editorial (including layout and new date) change compared with the last issue of the publication.

The LOEP must present the issue number and date of the actual publication.

If a project decides to use LOEP instead of List of Effective Data Modules (LOEDM), the LOEP must be reissued with each issue of the publication.

2.3 List of effective data modules

The LOEDM must list all data modules included in the publication by giving the:

- data module title (<techName> - <infoName>, <infoNameVariant>)
- data module code
- issue date and/or issue number
- number of pages (optional)
- applicability (optional)

All new (additional) or changed data modules must be marked with:

- N = New data module
- C = Changed or revised data module

Where:

"N" indicates a new data module. This means that this data module is an additional data module compared with the last issue of the publication.

"C" indicates a changed or revised data module. This means that this data module has some form of technical or editorial (including layout and new date) change compared with the last issue of the publication.

Note

N and C must be considered from a publication issue view.

The entries must be listed in the order in which they appear in the publication.

The LOEDM must present the issue number and date of the actual publication.

The LOEDM must be reissued with each issue. By project decision the LOEDM can be replaced by an LOEP.

Business rule decision point BRDP-S1-00037 - Use of LOEP or LOEDM:

- Decide whether to use the LOEP or the LOEDM.

2.4 Change record

The change record is intended to provide a continuous record of the state of each individual copy of the publication. The change record must only be reissued when all of the initial change record predefined issues are filled in.

2.5 Highlights

2.5.1 General

The highlights give the reasons for the changes of the data modules in each issue, using the content of the elements <reasonForUpdate>. The highlights must give the:

- data module code
- reason for change

The highlights must not list the changes in:

- Title page
- List of effective pages
- List of effective data modules
- Change record
- Table of contents

The entries must be listed in the order in which they appear in the publication.

The highlights data module must present the issue number and date of the actual publication.

When used, the highlights is issued with each issue of the publication or volume.

Note

The initial issue (first issue) of a publication does not need a highlight data module.

2.5.2 Highlights with updating instructions

A variant of a highlights data module is a "highlights with updating instructions" data module for paper publications. This variant includes instructions for the updating of the publication. In addition to the list of highlights (refer to Para 2.5.1), a table giving the following information must be added:

- data module code
- data module title (<techName> - <infoName>, <infoNameVariant>)
- issue date or issue number
- number of pages (optional)
- applicability (optional)

All data modules which are removed from previous issue and to be inserted in the new issue must be marked:

- R = Remove data module

- I = Insert data module

Business rule decision point BRDP-S1-00042 - Use of Highlights with updating instructions:

- Decide whether to use Highlights with updating instructions.

2.6 Access illustration

Access illustrations are a set of illustrations that can be included to support the navigation of the publication. Access illustrations must be used in an IETP only.

2.7 List of abbreviations

The List of Abbreviations (LOA) lists the non-standard abbreviations used in a publication. An example of a LOA is given in Chap 5.2.1.18.

2.8 List of terms

The List of Terms (LOT) lists the non-standard terms used in a publication. An example of a LOT is given in Chap 5.2.1.18.

2.9 List of symbols

The List of Symbols (LOS) lists the non-standard symbols used in a publication. An example of a LOS is given in Chap 5.2.1.18.

2.10 Technical standard record

Incorporated technical changes can be presented in a Technical Standard Record (TSR). The list is presented as an informal table.

TSR must not be used in the IPD.

2.11 Table of contents

The Table of Contents (TOC) must list all data modules and publications included in the publication by giving the:

- data module/publication module/external publication title (<techName> - <infoName>, <infoNameVariant>/<pmTitle>/<externalPubTitle>)
- data module/publication module/external publication code
- issue date and/or issue number
- number of pages (optional)
- applicability (optional)

The entries must be presented in the order in which they appear in the publication.

The TOC must not include the front matter data modules Title page, LOEDM, LOEP, Change Record (CR) or TOC itself.

The entries in the TOC can be hierarchically subdivided. Refer to Chap 3.9.5.2.16.

If the publication is divided with tab dividers a TOC also can be given to each chapter or part.

Recommendation: It is recommended to prepare and include a Table of contents data module in the publication when a LOEP is used.

Business rule decision point BRDP-S1-00046 - Use of linear or hierarchically subdivided Table of contents:

- Decide whether to use a linear or a hierarchically subdivided Table of contents.

Business rule decision point BRDP-S1-00305 - Data modules within a publication listed in the Table of contents:

– Decide whether the listed publications within the Table of contents also have to be listed by their individual data modules.

Business rule decision point BRDP-S1-00307 - Inclusion of the number of pages in the Table of contents:

– Decide whether to include the number of pages in the Table of contents entries.

2.12 List of applicable specifications and documentation

Specifications and documents which are necessary to read or follow when using the publication can be presented in a List of Applicable Specifications and Documentation (LOASD). An example of a LOASD is given in Chap 5.2.1.18.

LOASD must not be used in the IPD.

2.13 List of support equipment

The List of Support Equipment (LOSE) lists the required support equipment necessary to perform the tasks described in the publication.

LOSE must not be used in the IPD.

2.14 List of supplies

The List of Supplies (LOSU) lists the required supplies necessary to perform the tasks described in the publication.

LOSU must not be used in the IPD.

2.15 List of spares

The List of Spares (LOSP) lists the required spares necessary to perform the tasks described in the publication.

LOSP must not be used in the IPD.

2.16 List of illustrations

The List of Illustrations (LOI) lists all illustrations contained in the publication and includes:

– ICN
– Title

2.17 Product cross-reference table

The Product Cross-reference Table (PCT) lists the products concerned by the publication. Each product is associated with the corresponding product sets and other data related to the operation of the product.

The general mechanisms of the PCT are described in Chap 4.14.3.

There is a dedicated data module Schema for the PCT. Refer to Chap 3.9.5.3.3.

A display example is available in Chap 6.2.3.1.

2.18 Conditions cross-reference table

The Conditions Cross-reference Table (CCT) lists the technical conditions impacting the publication. Each technical condition is associated with a status according to products and other data related to the technical condition itself.

The general mechanisms of the CCT are described in Chap 4.14.2.

There is a dedicated data module Schema for the CCT. Refer to Chap 3.9.5.3.2.

A display example is available in Chap 6.2.3.1.

2.19 Applicability cross-reference table

The general mechanisms of the Applicability Cross-reference Table (ACT) are described in Chap 4.14.1.

There is a dedicated data module Schema for the ACT. Refer to Chap 3.9.5.3.1. A display example is available in Chap 6.2.3.1.

Chapter 3.9.5

Authoring - Data modules

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References

Table 1 References

Chap No./Document No.	Title
Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2	Data modules - Content section
Chap 3.9.5.3	Data modules - Applicability
REC-xml-20081126	W3C Recommendation: Extensible Markup Language (XML) 1.0 (Fifth Edition) Version 1.0, 2008

1 General

This chapter gives the user brief definitions to some of the most common XML terms used in this specification. The markup examples that are included in the chapter are XML markup

examples. For the terminology, definitions and the use of XML, refer to REC-xml-20081126 W3C Recommendation: XML 1.0 (Fifth Edition).

The chapter is further broken down to give definitions and guidance on using the XML to create data modules.

Chap 3.9.5.1 gives the definitions and guidance for the identification and status section of all types of data modules.

The definitions and guidance for the common constructs and information types are given in Chap 3.9.5.2.

Chap 3.9.5.3 gives the rules for applicability.

Throughout these chapters, attributes are marked as mandatory or optional. The definitions for these are:

- mandatory (M) if the attribute must be included in the context concerned, as enforced by the Schema structure or otherwise
- optional (O) if the attribute is not enforced by the Schema structure, (ie, can be omitted in the context concerned)

XML **elements** are written in `Courier New 12` in blue within brackets preceded by the word "element", (eg, element <`applic`>).

Attributes are written in `Courier New 12` in black without quotation marks and brackets preceded by the word "attribute", (eg, attribute `internalRefId`).

Values given in the text are written in `Courier New 12` in blue within quotation marks preceded by the word "value", (eg, value "`Value_1`").

XML **examples** are written in `Courier New 11` in black.

Example:

```
<language languageIsoCode="sx" countryIsoCode="US"/>
<language languageIsoCode="de" countryIsoCode="AT"/>
<reasonForUpdate id="rfu-001" updateHighlight="1"
updateReasonType="urt02"><simpleRefPara>The tool set is
changed.</simpleRefPara></reasonForUpdate>
```

2 XML terminology and definitions

2.1 Element

An element is a component of an XML instance, defined by the Schema and is identified in the document by descriptive markup, usually a start-tag and end-tag.

For example: `<para>...</para>`. There is also a type of element called an empty element which does not comprise an end-tag.

Example:

```
<security securityClassification="01"/>.
```

2.2 Generic identifier

A generic identifier is a name of an element or "tag-name".

Example: The generic identifier of the element <`para`> is para.

2.3 Attribute

An attribute is a value that can be applied to an element.

Example: The values for day, month and year are numeric attributes of the <issueDate> element <issueDate day="30" month="07" year="2000"/>.

Attributes are either mandatory (they must be given a value) or optional. Some attributes require a typed value, while other attribute values are selectable from a list. Certain attributes have a default value which is applied automatically if a value for the attribute is not specified.

In most cases attributes can have only one allowable value at a time. However, there are a few attributes that can have one or more allowable values at the same time. When more than one value is given, the values must be separated by space characters

Example: Attribute itemCharacteristic can have one value defining the parent element as related to electrostatic discharge:

```
<proceduralStep itemCharacteristic="ic02">… text
…</proceduralStep>
```

Example: Attribute itemCharacteristic can also have two values defining the parent element as related to electrostatic discharge and with a quality assurance effect:

```
<proceduralStep itemCharacteristic="ic02 ic03">… text
…</proceduralStep>
```

2.4 Tag

The start of an element is marked by a start-tag and the end by an end-tag (unless the element is an empty element). An element start-tag is comprised of a less-than sign [<], then the generic identifier, then, if required, a set of attributes followed by a greater-than sign [>].

Example: The start-tag of a paragraph is <para>.

An element end-tag is comprised of a less-than sign [<] followed by a slash [/], then the generic identifier and finally a greater-than sign [>].

Example: The end-tag of a paragraph is </para>.

In XML markup empty tags are represented like this <security securityClassification="01"/> or like this <unverified></unverified>.

2.5 XML Schemas

The XML Schema controls which elements can appear in an XML instance and in which order. The Schema also defines the rules for attributes and entities and provides data type constraints which describe valid units of data.

2.6 Data type string

String data is any character(s) entered between the start-tag and end-tag of an element (plain text) and characters between quotes that make up the value of an attribute.

Example: <para>This is plain text data.</para>.

2.7 Entity

An entity is a character string which, in the final data module output, will be replaced by a character, symbol or an external file.

2.7.1 Character entities

Some characters required for data modules are not available on a computer keyboard, for example, degrees, fractions and Greek letters. These characters are made available on XML

systems by substituting a character entity for the required character. Most XML systems allow an inserted character entity to be displayed on the screen as it will appear to the reader. When entering a character entity, it must be preceded by [&] and followed by [;], for example, in XML, the characters inserted for degrees [º] will be °.

It is important to remember that, in XML, character entities are case sensitive, so using an initial uppercase letter will affect the final character shown in the data module.

Example: Σ (uppercase S) = Σ, and σ (lowercase letter s) = σ.

Table 2 details some of the more common character entities currently in use. For a complete list, refer to the S1000D data module Schemas.

Table 2 Commonly used character entities - Example

Entity	Character	XML	Ent file	Entity	Character	XML	Ent file
alpha	α	α	ISOgrk3	micro	µ	µ	ISOnum
amp	&	&	ISOnum	mu	µ	μ	ISOgrk3
beta	β	β	ISOgrk3	ndash	–	–	ISOpub
bull	•	•	ISOpub	ne	≠	≠	ISOtech
deg	°	°	ISOnum	ohm	Ω	Ω	ISOnum
Delta	Δ	Δ	ISOgrk3	Omega	Ω	Ω	ISOgrk3
delta	δ	δ	ISOgrk3	percnt	%	%	ISOnum
divide	÷	÷	ISOnum	Phi	Φ	Φ	ISOgrk3
epsis	ε	∊	ISOgrk3	phis	φ	φ	ISOgrk3
eta	η	η	ISOgrk3	pi	π	π	ISOgrk3
equiv	≡	≡	ISOtech	plusmn	±	±	ISOnum
gamma	γ	γ	ISOgrk3	prop	∝	∝	ISOtech
ge	≥	≥	ISOtech	psi	ψ	ψ	ISOgrk3
gt	>	>	ISOnum	quot	"	"	ISOnum
infin	∞	∞	ISOtech	radic	√	√	ISOtech
Lambda	Λ	Λ	ISOgrk3	rho	ρ	ρ	ISOgrk3
lambda	λ	λ	ISOgrk3	Sigma	Σ	Σ	ISOgrk3
le	≤	≤	ISOtech	sigma	σ	σ	ISOgrk3
lt	<	<	ISOnum	Theta	Θ	Θ	ISOgrk3
mdash	—	—	ISOpub	theta	θ	θ	ISOgrk3

2.7.2 External system entities

For illustrations and symbols, a system entity is inserted into the XML instance normally carried out by the system.

2.8 Use of some special characters

The following rules apply:

- Hyphen [-] is used in the data module code, ICN, publication module code, CSN and as a separator in normal text, (eg, between the element <techName> and the element <infoName> on data module titles).
- Vertical bar [|] is used in the markup to separate values and intervals in, for example, the attribute applicPropertyValues
- Tilde [~] is used in the markup to separate values within a range in, for example, the attribute applicPropertyValues
- Space [ ] is used as a single space character (using spacebar on the keyboard) to substitute numbers in, for example, the CSN (Space = ASCII 32 (hexadecimal code 20)).

Note

These special characters are normally inserted by the formatting application and must not to be entered by the author.

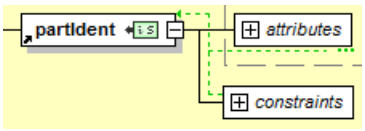
Note

For the entry of XML elements and attributes which can be used as hyperlinks in the IETP (eg, CSN, part numbers, NSN), any spaces must be entered from the keyboard using the spacebar. Do not use XML character entities for these elements and attributes.

2.9 Constraints

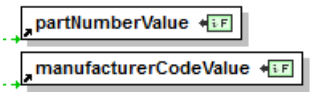
There are elements in the Schemas that are used under constraints that are described by the content of their attributes.

Constrained element



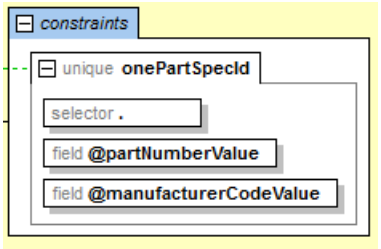
A constrained element has an attribute, or attributes, that has a value, or combination of values, which must be unique within the data module. The constraint indicates which attribute, or combination of attributes, contain the unique value.

Constrained attribute



An attribute, or attributes, that have a value, or combination of values, which must be unique within the data module.

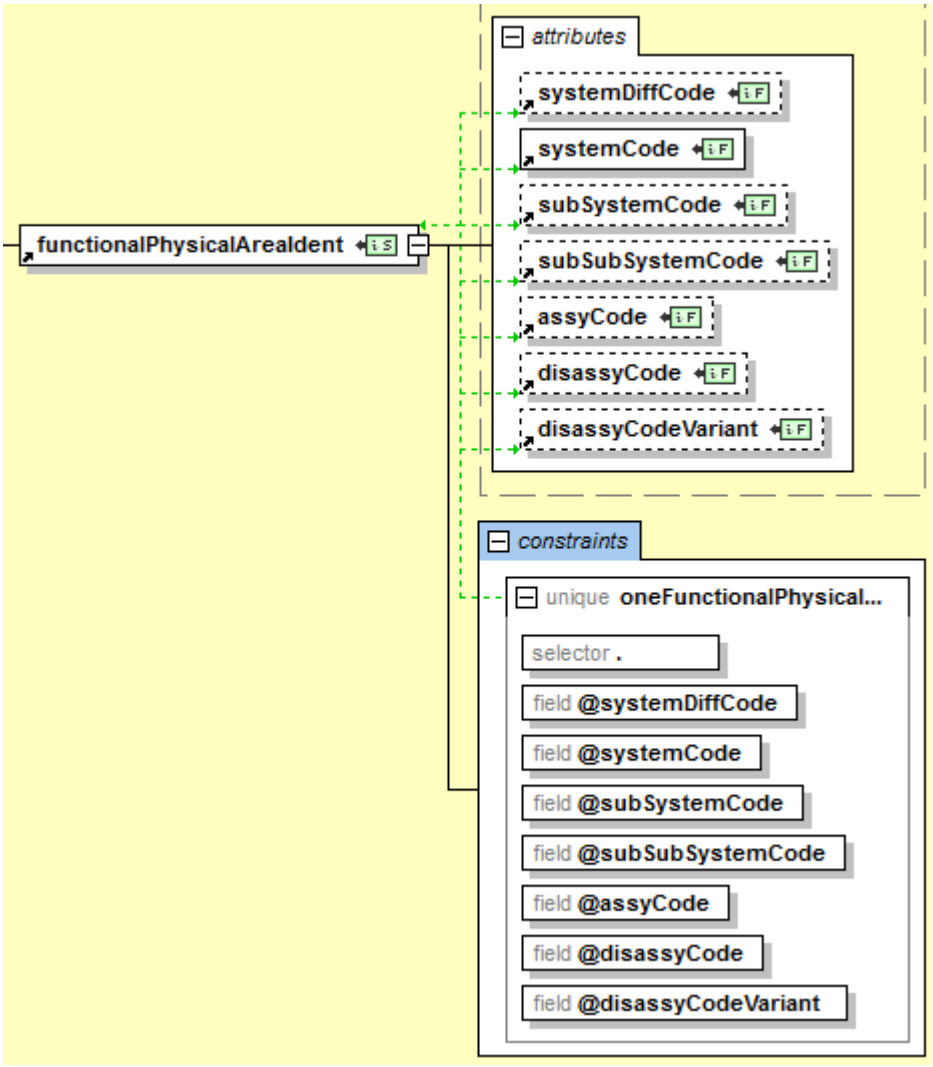
Constraint



The constraints indicate which attribute, or combination of attributes, must contain the unique value.

Example of a constrained element:

The element <functionalPhysicalAreIdent> has attributes systemDiffCode, systemCode, subSystemCode, subSubSystemCode, assyCode, disassyCode and disassyCodeVariant, the combination of which must be unique within the data module. Refer to Fig 1.



ICN-83007-S1000D0001-001-01

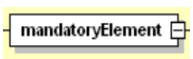
Fig 1 Constrained element - Example

2.10 XML Schema representation

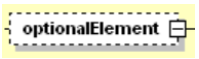
In S1000D some chapters include graphical representations of the XML Schemas fragments. This method allows the author to learn the schema structure of S1000D progressively.

When reading the graphical representations it is important that the reader understands that an element can be mandatory when its optional parent element is used.

Element structure

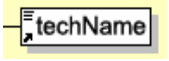


An element that must be included in the markup

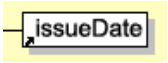


An element that the Schema allows but does not mandate

Element content



Element with textual content (the "paragraph" symbol in the upper left of the element box indicates that it is either a pure textual element or a mixed content element).



Empty element

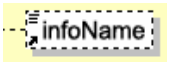
Element occurrence indicators



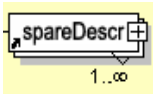
Element with subelements indicated by the "+" symbol. Subelements can be presented in another figure.



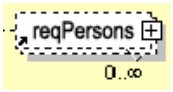
Required (M) and non-repeatable, (once and only once)



Optional (O) and non-repeatable, (zero or one time)

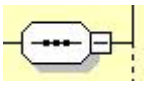


Required and repeatable (one or more times)

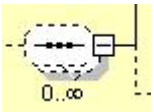


Optional and repeatable (zero or more times)

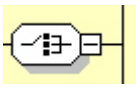
Connectors



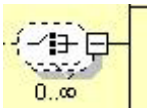
Sequence of branches, mandatory. The contained elements (if present) must be in the order listed in the branches of the connector.



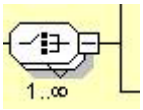
Sequence of branches, optional and repeatable. The contained branches (if present) must be in the order listed in the branches of the connector.



Choice of branches, mandatory. One and only branch is allowed from the defined branches of the choice.

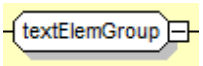


Choice of branches, optional and repeatable. Zero to many branches in any order is allowed from the defined branches of the choice.



Choice of branches, mandatory and repeatable. One to many branches in any order is allowed from the defined branches of the choice.

Groups (do not appear in an XML instance)



Group of elements. Used in maintaining the Schemas.

Chapter 3.9.5.1

Data modules - Identification and status section

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Chap 4.3.9	Data module code - Learn code
Chap 4.3.10	Data module code - Learn event code
Chap 4.4	Information management - Information control number
Chap 4.7	Information management - Version control of data modules, publication modules and SCORM content package modules
Chap 4.10	Information management - Business rules exchange
Chap 4.12	Information management - Multiple instances of CSDB objects
Chap 4.14	Information management - Applicability
Chap 7.8	Information processing - Applicability
Chap 8.5	SNS, information codes and learn codes - Learn codes
ASD-STE100	ASD Simplified Technical English®
ISO 639-1	Codes for the representation of names of languages - Part 1: Alpha-2 code
ISO 3166-1	Codes for the representation of names of countries and their subdivisions - Part 1: Country codes.
ISO 8601	Data elements and interchange formats - Information interchange - Representation of dates and times

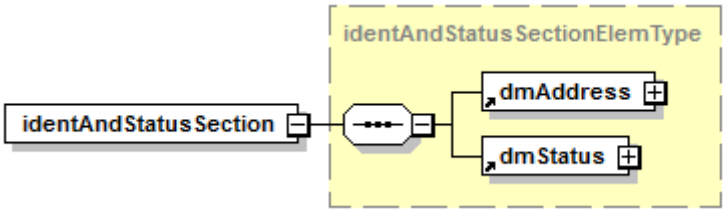
1 General

The identification and status section gives all the identification elements required to address and control the data module. It also provides the status elements for information on the security, quality and technical status together with the applicability of the overall data module content.

2 Identification and status section

Description: The element <identAndStatusSection> contains the identification and status of a data module, which are captured in the two parts, identification and status.

Markup element: <identAndStatusSection>



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Fig 1 Element <identAndStatusSection>

Attributes:

– None

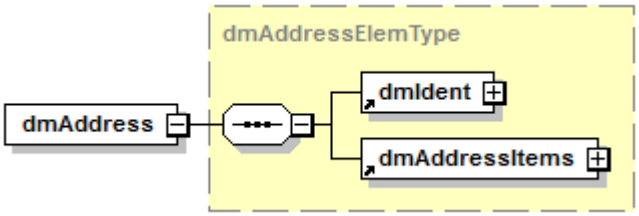
Child elements:

– <dmAddress>. Refer to Para 2.1.
– <dmStatus>. Refer to Para 2.2.

2.1 Identification part

Description: The element <dmAddress> contains the unique identification and additional information supporting the data module.

Markup element: <dmAddress>



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Fig 2 Element <dmAddress>

Attributes:

– None

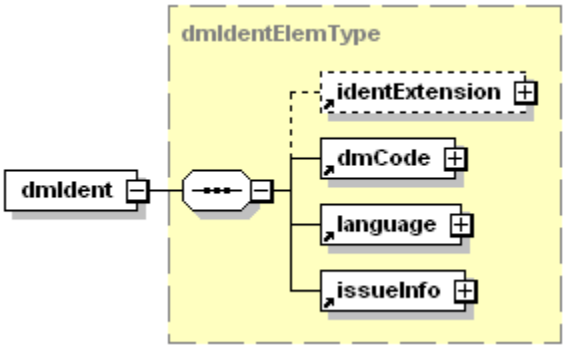
Child elements:

– <dmIdent>. Refer to Para 2.1.1.
– <dmAddressItems>. Refer to Para 2.1.2.

2.1.1 Data module identification

Description: The element <dmIdent> contains the unique identification of the data module.

Markup element: <dmIdent>



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Fig 3 Element <dmIdent>

Attributes:

– None

Child elements:

– <identExtension>, the additional parameters establish a unique identification of a data module in those cases when data module code, issue and inwork numbers together with the language and country are insufficient to form a universally unique identity. The element establishes a producer unique subdomain for identification. Refer to Chap 4.12.
– <dmCode>. Refer to Para 2.1.1.1.
– <language>. Refer to Para 2.1.1.2.
– <issueInfo>. Refer to Para 2.1.1.3.

2.1.1.1 Data module code

Description: The element <dmCode> contains the data module code and forms part of the unique identifier of a data module. All data modules are allocated a data module code.

The data module code provides four top level pieces of information:

– The identification of the Product, or part of the Product, about which the data module has been written, using the model identifier, the system difference code, the standard numbering system, the disassembly code and the disassembly code variant
– The identification of the information type, using the information code and the information code variant
– The identification of the location at which the information in the data module is appropriate, using the item location code
– The identification of the type of learning content in learning data modules. Refer to Chap 4.3.

Establishing the data module code requires a data module coding strategy. Refer to Chap 4.3.

Markup element: <dmCode>

Attributes:

– modelIdentCode (M), the model identifier or project name. Refer to Chap 4.3.1.
– systemDiffCode (M), the system difference code. Refer to Chap 4.3.2.
– systemCode (M), the system code (part of the SNS). Refer to Chap 4.3.3.
– subSystemCode (M), the subsystem code (part of the SNS). Refer to Chap 4.3.3.
– subSubSystemCode (M), the sub-subsystem code (part of the SNS). Refer to Chap 4.3.3.
– assyCode (M), the assembly code (part of the SNS). Refer to Chap 4.3.3.
– disassyCode (M), the disassembly code. Refer to Chap 3.8 and Chap 4.3.4.
– disassyCodeVariant (M), the disassembly code variant. Refer to Chap 4.3.5.
– infoCode (M), the information code. Refer to Chap 4.3.6.
– infoCodeVariant (M), the information code variant. Refer to Chap 4.3.7.
– itemLocationCode (M), the item location code. Refer to Chap 4.3.8.
– learnCode (O), the learn code. Refer to Chap 4.3.9 and Chap 8.5.
– learnEventCode (O), the learn event code. Refer to Chap 3.9.5.2.13 and Chap 4.3.10.

Child elements:

– None

Markup example:

Markup example for maintenance data modules:

```
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA2" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="041" infoCodeVariant="A" itemLocationCode="A"/>
```

Markup example for training data modules:

```
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA2" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="041" infoCodeVariant="A" itemLocationCode="A"
learnCode="T12" learnEventCode="C"/>
```

2.1.1.2 Language

Description: The element <language> is used to describe the language in which the data module is written.

Markup element: <language>

Attributes:

– languageIsoCode (M), the two alpha characters from International Standards Organization (ISO) 639. Simplified languages are coded by using additional codes similar to, and not in conflict with, ISO 639 codes. For example, languageIsoCode="sx" means a Simplified Technical English® (ASD-STE100) data module and languageIsoCode="ra" means a rationalized French data module.
– countryIsoCode (M), the two alpha characters from ISO 3166 to denote the country where the language is spoken

Child elements:

– None

Markup examples:

The following example is for a data module written in the default language:

```
<language languageIsoCode="sx" countryIsoCode="US"/>
```

The following example is for a data module written in Simplified Technical English with Oxford English spelling:

```
<language languageIsoCode="sx" countryIsoCode="GB"/>
```

The following example is for a data module written in French:

```
<language languageIsoCode="fr" countryIsoCode="FR"/>
```

The following example is for a data module written in German:

```
<language languageIsoCode="de" countryIsoCode="DE"/>
```

The following example is for a data module written in German for an Austrian end user:

```
<language languageIsoCode="de" countryIsoCode="AT"/>
```

2.1.1.3 Issue information

Description: The element <issueInfo> contains the issue number of the data module. Refer to Chap 4.7.

Markup element: <issueInfo>

Attributes:

- issueNumber (M), the issue number of the data module. Every approved issue of a data module must be allocated an incremented issue number which, with the data module code, uniquely identifies that instance of the data module. The initial issue must be numbered with the value "001", which must be incremented with every approved release of a data module.
- inWork (M), the "inwork" number of the unreleased data module. It can be used for monitoring and control of intermediate drafts within a project. The initial inwork number is set to the value "01" and is incremented with every change to the unreleased data module.

Child elements:

- None

Markup examples:

These examples show the use of the attribute inWork.

Note

For each of these, set the value of the attribute issueType of the element <dmStatus> accordingly.

A data module that is in work, where this is the second draft.

```
<issueInfo issueNumber="000" inWork="02"/>
```

A data module that is released for the first time

```
<issueInfo issueNumber="001" inWork="00"/>
```

A data module that is the subject of a first change to the content section and is in work

```
<issueInfo issueNumber="001" inWork="01"/>
```

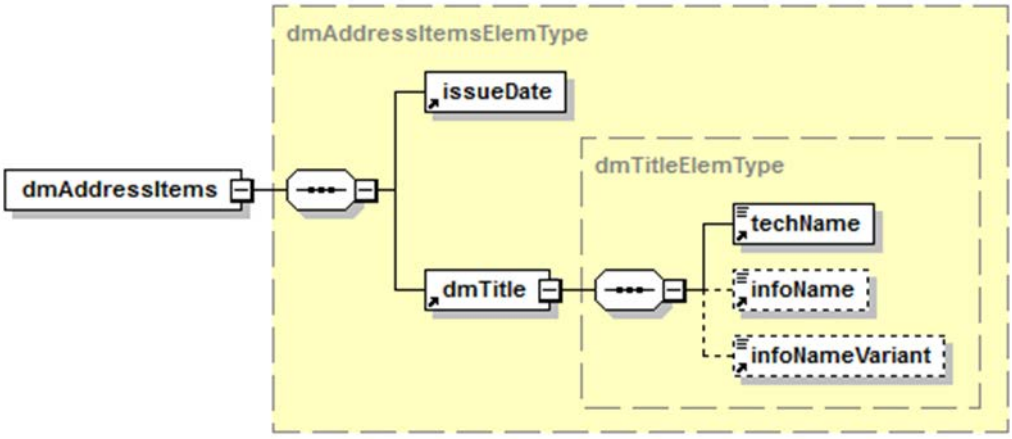
A data module that has been changed and released for the second time

```
<issueInfo issueNumber="002" inWork="00"/>
```

2.1.2 Data module address items

Description: The element <dmAddressItems> contains information that is supplementary to the data module identification but not part of the unique identifier.

Markup element: <dmAddressItems>



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Fig 4 Element <dmAddressItems>

Attributes:

– None

Child elements:

– <issueDate>. Refer to Para 2.1.2.1.
– <dmTitle>. Refer to Para 2.1.2.2.

2.1.2.1 Issue date

Description: The element <issueDate> contains the data module's date of issue, which must be defined. This can be, for example, the input date (ie, the release to CSDB date), or the cut-off date for the delivery, etc. Every issue of a data module whether initially written, completely revised or updated by changes, must be allocated an ISO 8601 calendar date in the form YYYY-MM-DD.

Markup element: <issueDate>

Attributes:

– year (M), the year of issue given as a four-digit number
– month (M), the month of issue given as a two-digit number
– day (M), the day of issue given as a two-digit number

Child elements:

– None

Business rule decision point BRDP-S1-00049 - Definition of the issue date:

– Decide on the definition of the issue date.

2.1.2.2 Data module title

Description: The element <dmTitle> contains the title of the data module. The data module title must give meaning to the Product identification and action elements of the data module code. Refer to Chap 3.9.5.2.1.5.

Markup element: <dmTitle>

Attributes:

– None

Child elements:

– <techName>. Refer to Para 2.1.2.2.1.
– <infoName>. Refer to Para 2.1.2.2.2.
– <infoNameVariant>. Refer to Para 2.1.2.2.3.

2.1.2.2.1 Technical name

Description: The element <techName> content must reflect the name of the hardware or function. That is, it must reflect the system, subsystem or sub-subsystem concerned based on the Product breakdown.

Examples:

– Aircraft
– Landing gear system
– Hydraulic accumulator No. 2
– Three axes trim actuator
– Servicing

Markup element: <techName>

Attributes:

– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

Markup example:

```
<techName securityClassification="01">Steering</techName>
```

2.1.2.2.2 Information name

Description: The element <infoName> contains the information name describing the type of information related to the Product about which the data module has been written. It is recommended that the element is populated with the information code short definition (corresponding to the attribute infoCode in the element <dmCode>, refer to Para 2.1.1.1). Refer to Chap 8.4.1.

Projects can decide to modify (or extend) the information name to one that is more suitable, provided the sense of the information code is maintained. If there is a variation indicated by the information code variant (the attribute infoCodeVariant in the element <dmCode>, refer to Para 2.1.1.1), the information name can be extended to describe this variation. Such an extension can be given by using the element <infoNameVariant>. Refer to Para 2.1.2.2.3.

Example:

The short definition of IC 258 is “Other procedure to clean”. A project can have a data module that tells the reader how to clean with water. Another data module could tell the reader how to

clean with air. In both cases, the information name can be extended from “Other procedure to clean” (normally IC 258A) to “Other procedure to clean, Clean with water” (can be IC 258B) and “Other procedure to clean, Clean with air” (can be IC 258C).

Note

The information name must not contain the characters “&”, “<”, or “>”. These characters will cause issues with BREX checking and XML validation.

Note

Not all information codes within S1000D will apply to a project. Further, there can be some that are defined by the project and some that can be modified. Where this is the case, it is recommended that the project compiles a list containing the list of information codes and variants that can be used, together with their information names.

Examples:

- Description of how it is made (IC 041)
- Functional test (IC 340)
- Remove procedure, Vertical (IC 520 variant B)
- Remove procedure, Horizontal (IC 520 variant C)

The information code is set to "000" when the SNS gives the function.

Examples:

- Product, General maintenance
- Safety and protective devices
- Fatigue index calculations
- Time limits
- Principal dimensions
- Recovering
- Static stability
- Mass and balance data
- Weigh
- Level
- Handling
- Scheduled servicing
- Product safety

Markup element: <`infoName`>

Attributes:

- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Business rule decision point BRDP-S1-00052 - Allocation of the information codes and the information names:

- Decide which information codes and associated information names will be used.

Markup example:

```
<infoName securityClassification="01">Description of how it is
made</infoName>
```

2.1.2.2.3 Information name variant

Description: The element <infoNameVariant> contains the information name extension describing the variation of the information related to the Product about which the data module has been written.

Markup element: <infoNameVariant>

Attributes:

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

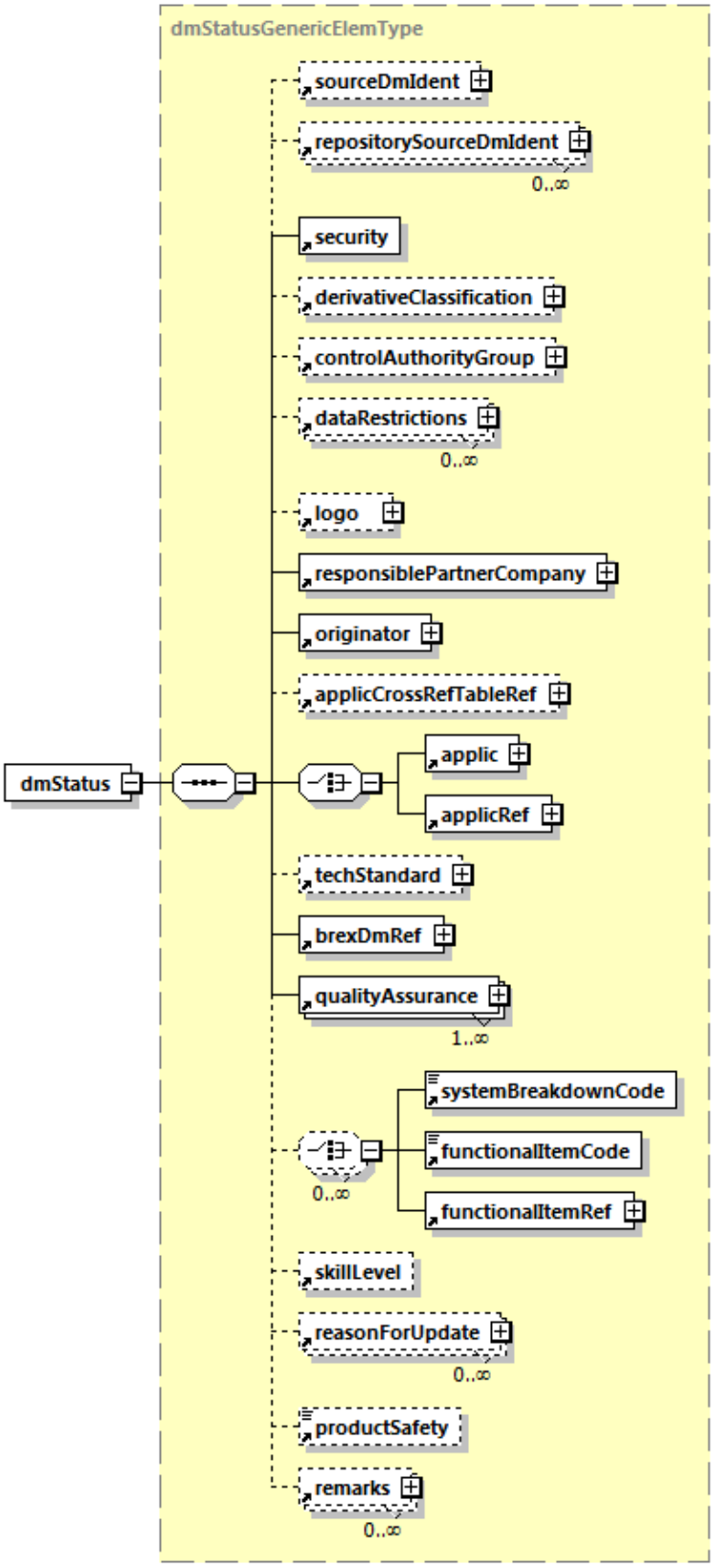
This is an example where the value of attribute infoCode is "258" and the value of attribute infoCodeVariant is "B".

```
<infoName>Other procedure to clean</infoName>
<infoNameVariant>Clean with water</infoNameVariant>
```

2.2 Status part

Description: The element <dmStatus> contains information about the status of the data module.

Markup element: <dmStatus>



ICN-83007-0000000029-004-01

Fig 5 Element <dmStatus>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `issueType` (O), the issue status of the data module. There are eight values that can be used:
  - "`new`" - data modules up to and including the initial issue of the approved release must have the attribute `issueNumber` set to the value "`000`" for inwork versions or value "`001`" for the initial issue and have the attribute `issueType` set to the value "`new`". Refer to default BREX rule BREX-S1-00030.
  - "`changed`" - data modules that have been changed and have the changes indicated within the data module using change elements and/or attributes, must have the attribute `issueType` set to the value "`changed`". Refer to default BREX rule BREX-S1-00032.
  - "`deleted`" - deletion of a data modules is treated as a special case of update. The data module itself is not physically deleted from the CSDB but marked as deleted by setting the attribute `issueType` to the value "`deleted`". Refer to default BREX rule BREX-S1-00031.
  - "`revised`" - data modules that have been revised and that contain no change elements or attributes must have the attribute `issueType` set to the value "`revised`". Refer to default BREX rule BREX-S1-00033.
  - "`status`" - data modules that have had their identification and status information updated must have the attribute `issueType` set to the value "`status`". Refer to default BREX rule BREX-S1-00034.
  - "`rinstate-status`" - data modules that have been reinstated from a previously deleted data module and have only the status information changed must have the attribute `issueType` set to the value "`rinstate-status`". In the simplest case, this status change must require setting the attribute `issueType` to the value "`rinstate-status`". Refer to default BREX rule BREX-S1-00034.
  - "`rinstate-changed`" - data modules that have been reinstated from a previously deleted data module and have the changes indicated by change elements or attributes, must have the attribute `issueType` set to the value "`rinstate-changed`". Refer to default BREX rule BREX-S1-00032.
  - "`rinstate-revised`" - data modules that have been reinstated from a previously deleted data module and have the changes not indicated by change elements and attributes, must have the attribute `issueType` set to the value "`rinstate-revised`". Refer to default BREX rule BREX-S1-00033.

Table 2 shows the permitted values of the attribute `issueType`, where "X" shows that the value is permitted.

Table 2 Values of the issue type attribute

Current issue	**Next issue of data module**					
	new	changed	deleted	revised	status	rinstate-x
New		X	X	X	X	
changed		X	X	X	X	
deleted						X
revised		X	X	X	X	

Current issue	Next issue of data module					
	new	changed	deleted	revised	status	rinstate-x
status		X	X	X	X	
rinstate-x		X	X	X	X	

When work first starts on a data module, the attribute `issueType` is set to the value "`new`", while the issue number is set to the value "`000`" and inwork number to "`01`", using the attribute `issueNumber` and attribute `inWork` of element <`issueInfo`>. Then, when the data module is released, the attribute `inWork` is reset to the value "`00`", and the issue number incremented to indicate approved release of that instance of the data module. From issue "`002`" onwards the attribute `issueType` must not be set to the value "`new`" but is to reflect the release status of the instance of the data module. Examples are shown in Table 3.

Table 3 Rules for the attributes `issueNumber`, `inWork`, and `issueType`

Numbering	Rule	Attribute value
000-01	new data module, first `inwork` version, status attribute `issueType`="`new`"	`inWork`="`01`" `issueNumber`="`000`" `issueType`="`new`"
000-02	new data module, second `inwork` version, status attribute `issueType`="`new`"	`inWork`="`02`" `issueNumber`="`000`" `issueType`="`new`"
000-NN	new data module, `inwork` version "NN", status attribute `issueType`="`new`"	`inWork`="`NN`" `issueNumber`="`000`" `issueType`="`new`"
001-00	first issue of data module, status attribute `issueType`="`new`"	`inWork`="`00`" `issueNumber`="`001`" `issueType`="`new`"
001-01	first issue of data module, first `inwork` version, status attribute `issueType`="`new`"	`inWork`="`01`" `issueNumber`="`001`" `issueType`="`new`"
001-02	first issue of data module, second `inwork` version, status attribute `issueType`="`new`"	`inWork`="`02`" `issueNumber`="`001`" `issueType`="`new`"
001-NN	first issue of data module, `inwork` version "NN", status attribute `issueType`="`new`"	`inWork`="`NN`" `issueNumber`="`001`" `issueType`="`new`"
002-00	second issue of data module, status attribute (for example) `issueType`="`changed`"	`inWork`="`00`" `issueNumber`="`002`" `issueType`="`changed`"

Numbering	Rule	Attribute value
NNN.00	issue "NNN" of data module, status attribute (for example) issueType="revised"	inWork="00" issueNumber="NNN" issueType="revised"

Child elements:

- <sourceDmIdent>. Refer to Para 2.2.1.
- <repositorySourceDmIdent>. Refer to Para 2.2.2.
- <security>. Refer to Para 2.2.3.
- <derivativeClassification> Refer to Para 2.2.4.
- <dataRestrictions>. Refer to Para 2.2.5.
- <controlAuthorityGroup>. Refer to Para 2.2.6.
- <logo>. Refer to Para 2.2.7.
- <responsiblePartnerCompany>. Refer to Para 2.2.8.
- <originator>. Refer to Para 2.2.9.
- <applicCrossRefTableRef>. Refer to Para 2.2.10.
- <applic>. Refer to Chap 3.9.5.3.
- <applicRef>. Refer to Chap 3.9.5.2.1.13.
- <techStandard>. Refer to Para 2.2.11.
- <brexDmRef>. Refer to Para 2.2.12.
- <qualityAssurance>. Refer to Para 2.2.13.
- <systemBreakdownCode>. Refer to Para 2.2.14.
- <functionalItemCode>. Refer to Para 2.2.15.
- <functionalItemRef>. Refer to Para 2.2.16.
- <skillLevel>. Refer to Para 2.2.17.
- <reasonForUpdate>. Refer to Chap 3.9.5.2.1.1.
- <productSafety>. Refer to Para 2.2.18.
- <remarks>. Refer to Para 2.2.19.

Business rule decision point BRDP-S1-00053 - Data module change/revised ratio:

- Decide on the threshold that a data module is considered revised rather than changed.

2.2.1 Source data module identification

Description: The element <sourceDmIdent> contains the identification of the source data module on which the current data module instance is based.

Markup element: <sourceDmIdent>

Attributes:

- None

Child elements:

- <identExtension>. Refer to Chap 4.12.
- <dmCode>. Refer to Para 2.1.1.1.
- <language>. Refer to Para 2.1.1.2.
- <issueInfo>. Refer to Para 2.1.1.3.

Markup example:

```
<sourceDmIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="131" infoCodeVariant="A" itemLocationCode="A"/>
<language languageIsoCode="en" countryIsoCode="US"/>
<issueInfo issueNumber="004" inWork="00"/>
</sourceDmIdent>
```

2.2.2 Repository source data module identification

Description: The element <repositorySourceDmIdent> contains the identifiers for additional Common Information Repository (CIR) data modules. It must be used when retrieving a self-contained data module from a CIR dependent data module and the associated CIR data module. Refer to Chap 4.13.2.

Markup element: <repositorySourceDmIdent>

Attributes:

- None

Child elements:

- <identExtension>. Refer to Chap 4.12.
- <dmCode>. Refer to Para 2.1.1.1.
- <language>. Refer to Para 2.1.1.2.
- <issueInfo>. Refer to Para 2.1.1.3.

Markup example:

```
<repositorySourceDmIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00E" infoCodeVariant="A" itemLocationCode="A"/>
<language languageIsoCode="sx" countryIsoCode="US"/>
<issueInfo inWork="00" issueNumber="004"/>
</repositorySourceDmIdent>
```

2.2.3 Security classification

Description: The element <security> contains the security classification and restrictive marking of the complete data module and its contained or associated illustrations. For the permissible values for the attributes of the element <security>, refer to Chap 3.9.6.1.

Markup element: <security>

Attributes:

- securityClassification (M), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

Business rule decision point BRDP-S1-00054 - Use and definitions of the attributes `commercialClassification` and `caveat`:

– Decide on the use and definitions of the attributes `commercialClassification` and `caveat`.

Business rule decision point BRDP-S1-00055 - Priorities and relationships of the security attributes `securityClassification`, `commercialClassification` and `caveat`:

– Decide on the priorities and relationships between the attributes `securityClassification`, `commercialClassification` and `caveat` if they are used.

Markup example:

The following is an example of a data module that has the value of the attribute `securityClassification` set to "`04`", which has been defined as secret, with a commercial classification of Commercial in Confidence and a caveat of United Kingdom (UK) Eyes Only.

```
<security securityClassification="04"
commercialClassification="cc51" caveat="cv51"/>
```

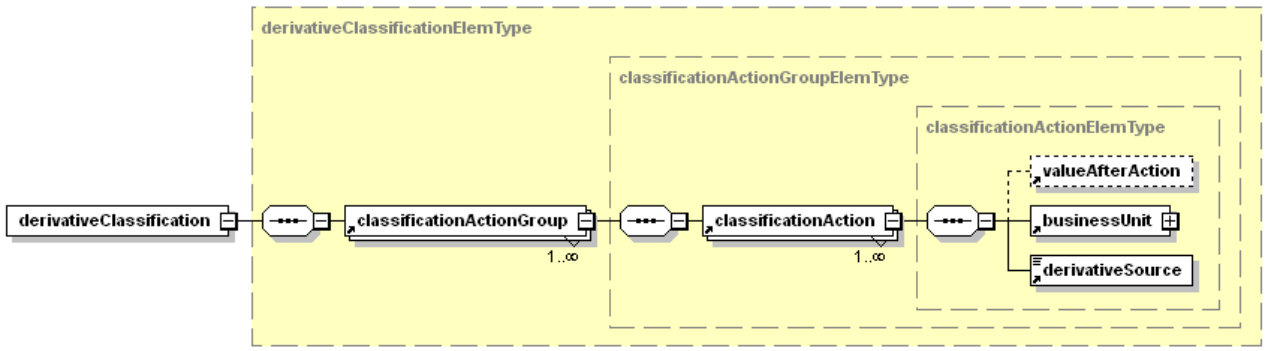
The following shows a data module that has the lowest possible security classification.

```
<security securityClassification="01"/>
```

2.2.4 Derivative classification

Description: The element <`derivativeClassification`> contains all derivative classification actions taken (eg, source material, date of action, action type) to the information in the complete publication.

Markup element: <`derivativeClassification`>



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Fig 6 Element <`derivativeClassification`>

Attributes:

– None

Child elements:

– <classificationActionGroup>. Refer to Para 2.2.4.1.

Business rule decision point BRDP-S1-00558 – Use of the element <derivativeClassification> within data modules:

– Decide whether and how to use the element <derivativeClassification>.

Markup example:

```
<derivativeClassification>
<classificationActionGroup id="dcg-001">
<classificationAction year="2012" month="03" day="15"
actionIdentType="ai01">
<businessUnit>
<businessUnitName>ASD Couriers</businessUnitName>
<contactPerson><lastName>Clifford</lastName></contactPerson>
</businessUnit>
<derivativeSource>Bike security guidance book
1</derivativeSource>
</classificationAction>
<classificationAction year="2012" month="11" day="02"
actionIdentType="ai09">
<valueAfterAction year="2013" month="03" day="15"
actionIdentType="ai02"/>   <businessUnit>
<businessUnitName>ASD Couriers</businessUnitName>
<contactPerson><lastName>Wink</lastName></contactPerson>
</businessUnit>
<derivativeSource>Bike security guidance book 2
</derivativeSource>
</classificationAction>
</classificationActionGroup>
</derivativeClassification>
```

The associated markup in the content section of the same data module is:

```
<para securityClassification="03" caveat="cv55"
derivativeClassificationRefId="dcg-001">The lighting system is
faulty and will be replaced by 2013-03-15.</para>
```

Setting the value of the attribute derivativeClassificationRefId to "dcg-001" provides the linking mechanism to the derivative classification information in the element <classificationActionGroup>, with the value of its attribute id also being set to "dcg-001".

The markup above results in setting up the derivative classifications and shows that the contents of the element <para> in the content section of the data module was:

– Classified by Clifford (ASD Couriers) on 2012-03-15 per Bike security guidance book 1.
– Upgrade to Security classification 04 per Wink (ASD Couriers) on 2012-11-02 per Bike security guidance book 1.
– Declassify per Wink (ASD Couriers) on 2013-03-15 per Bike security guidance book 2.

2.2.4.1 Classification action group

Description: The element <classificationActionGroup> contains the set of classification actions that can be referred to using the attribute derivativeClassificationRefId within the element <businessUnit>.

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child element:

– <classificationAction>. Refer to Para 2.2.4.2.

2.2.4.2 Classification action

Description: The element <classificationAction> contains the classification action.

Attributes:

– actionIdentType (M), the classification action. Refer to Chap 3.9.6.1.
– year (M), the year of issue given as a four-digit number
– month (M), the month of issue given as a two-digit number
– day (M), the day of issue given as a two-digit number

Child elements:

– <valueAfterAction>. Refer to Para 2.2.4.2.1.
– <businessUnit>. Refer to Chap 3.9.5.2.11.6.
– <derivativeSource>. Refer to Para 2.2.4.2.2.

2.2.4.2.1 Value after action

Description: The element <valueAfterAction> contains a secondary classification action to occur on secondary date.

Attributes:

– actionIdentType (M), the classification action. Refer to Chap 3.9.6.1.
– year (M), the year of issue given as a four-digit number
– month (M), the month of issue given as a two-digit number
– day (M), the day of issue given as a two-digit number

Child elements:

– None

2.2.4.2.2 Derivative source

Description: The element <derivativeSource> contains a string that identifies the material from which the classification is derived.

Attributes:

– None

Child elements:

– None

2.2.5 Data restrictions

Description: The element <dataRestrictions> contains the instructions and information, applicable to the data module, that relate to the use, storage and handling. This element can contain applicability information. Projects must ensure the all data restriction information and information is in line with the project requirements.

Markup element: <dataRestrictions>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

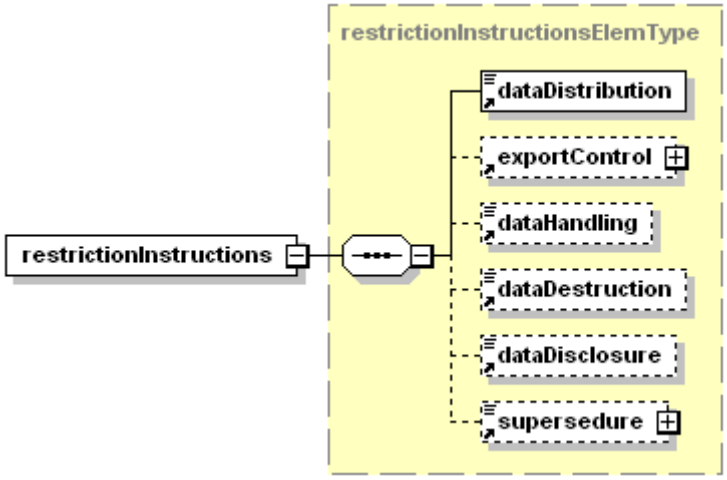
Child elements:

- <restrictionInstructions>. Refer to Para 2.2.5.1.
- <restrictionInfo>. Refer to Para 2.2.5.2.

2.2.5.1 Restriction instructions

Description: The element <restrictionInstructions> contains the instructions that must be followed when data restrictions apply.

Markup element: <restrictionInstructions>



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Fig 7 Element <restrictionInstructions>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <dataDistribution>. Refer to Para 2.2.5.1.1.
- <exportControl>. Refer to Para 2.2.5.1.2.
- <dataHandling>. Refer to Para 2.2.5.1.3.
- <dataDestruction>. Refer to Para 2.2.5.1.4.
- <dataDisclosure>. Refer to Para 2.2.5.1.5.
- <supersedure>. Refer to Para 2.2.5.1.6.

2.2.5.1.1 Data distribution

Description: The element <dataDistribution> contains the instructions for distribution of a data module.

Markup element: <dataDistribution>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.2.5.1.2 Export control

Description: The element <exportControl> contains the information regarding export control of the data module. Refer to Chap 3.9.5.1.1.

2.2.5.1.3 Data handling

Description: The element <dataHandling> contains any handling instructions, including storage, that are specific to the data module.

Markup element: <dataHandling>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.2.5.1.4 Data destruction

Description: The element <dataDestruction> contains any destruction instructions that are specific to the data module and that must be applied.

Markup element: <dataDestruction>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.2.5.1.5 Data disclosure

Description: The element <dataDisclosure> contains any special instructions with regard to the dissemination and disclose of the data module.

Markup element: <dataDisclosure>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.2.5.1.6 Supersedure

Description: The element <supersedure> contains a notice that the data module supersedes other data modules. For example, the requirements that must be applied to a data module with regard to supersedure notices.

Markup element: <supersedure>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

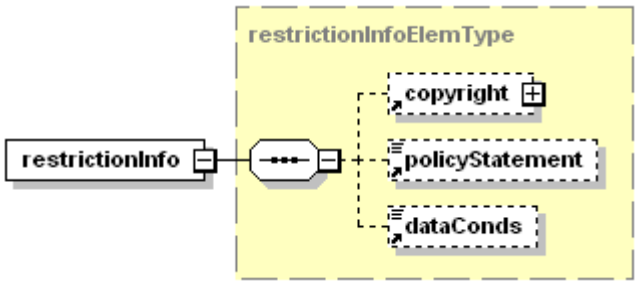
Child elements:

- textual characters. Refer to Chap 3.9.1.
- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.

2.2.5.2 Restriction information

Description: The element <restrictionInfo> contains any other information that is related to data restrictions, such as copyright information, policy references and other conditions, for example, the content and extent of restriction information to include in a data module.

Markup element: <restrictionInfo>



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Fig 8 Element <restrictionInfo>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <copyright>. Refer to Para 2.2.5.2.1.
- <policyStatement>. Refer to Para 2.2.5.2.3.
- <dataConds>. Refer to Para 2.2.5.2.4.

2.2.5.2.1 Copyright

Description: The element <copyright> contains the copyright information.

There are two methods for populating copyright information for a particular data module. These are:

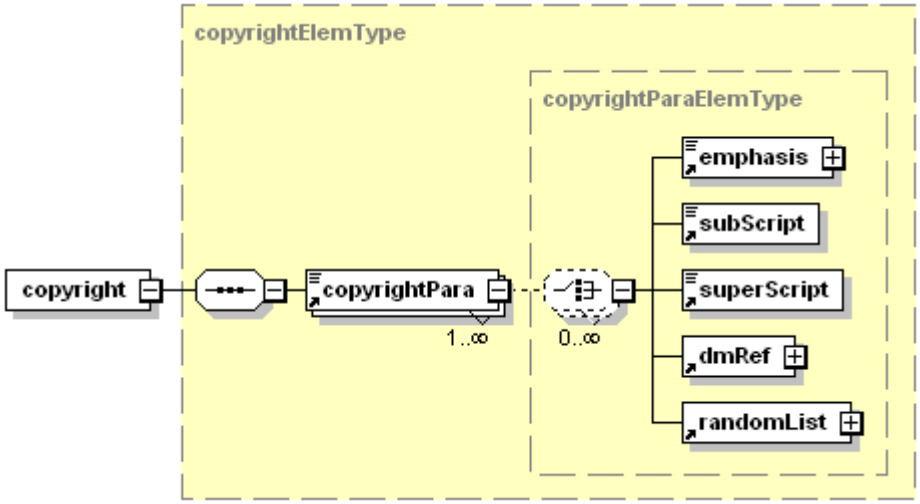
- by including the copyright information directly in data modules
- by reference to a specific data module that contains the copyright information

Both methods are permitted.

Note

When deciding on which method to use when there are likely to be changes to copyright information, using a single copyright data module means any changes would be made in one place.

Markup element: <copyright>



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Fig 9 Element <copyright>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <copyrightPara>. Refer to Para 2.2.5.2.2.

Business rule decision point BRDP-S1-00065 - Use of the element <copyright> and source of copyright information:

– Decide whether and how to use the element <copyright>. Any copyright information must be obtained from the relevant authority.

Business rule decision point BRDP-S1-00066 - Method of populating copyright information (in each data module or in a consolidated data module):

– Decide whether to populate copyright information in each data module or whether to cross-reference to a copyright data module.

Note

While choosing the population method, assess the impact of changes to copyright information on updating of data modules.

Markup example:

Method 1: Recording copyright information directly in a data module. Note the use of the copyright character entity © to get the required symbol "©".

```
<copyrightPara>
<emphasis>Copyright (C) 2016</emphasis> by each of the following
organizations:
<randomList>
<listItem>
<para>AeroSpace and Defence Industries Associations of Europe -
ASD.</para>
</listItem>
<listItem>
<para>Ministries of Defence of the member countries of
ASD.</para>
</listItem>
</randomList>
</copyrightPara>
```

Method 2: Reference to a specific copyright data module(s):

```
<copyright>
<copyrightPara>For Copyright information, refer to
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="A"
systemCode="00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="A"
infoCode="021" infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent>
</dmRef> and
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000D" systemDiffCode="A"
systemCode="00" subSystemCode="0" subSubSystemCode="0"
```

```
assyCode="00" disassyCode="01" disassyCodeVariant="A"
infoCode="021" infoCodeVariant="A" itemLocationCode="D" />
</dmRefIdent>
</dmRef>
</copyrightPara>
</copyright>
```

2.2.5.2.2 Copyright paragraph

Description: The element <copyrightPara> contains the copyright statement itself or provides a cross-reference to another data module that contains the statement.

Markup element: <copyrightPara>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.

Child elements:

- textual characters. Refer to Chap 3.9.1.
- <emphasis>. Refer to Chap 3.9.5.2.1.10.
- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.
- <dmRef>. Refer to Chap 3.9.5.2.1.2.
- <randomList>. Refer to Chap 3.9.5.2.1.3.

2.2.5.2.3 Policy reference

Description: The element <policyStatement> contains the reference to the security policy information.

Markup element: <policyStatement>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.2.5.2.4 Data conditions

Description: The element <dataConds> contains any information on any special conditions that can apply to the data module. For example, the security classification of a data module can be required to be changed when aggregated with other data modules with similar conditions.

Markup element: <dataConds>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

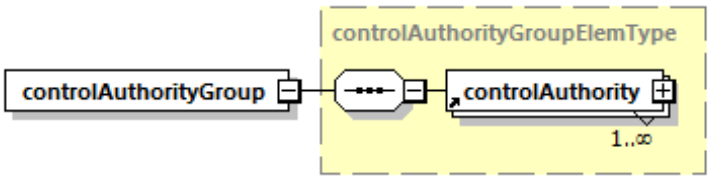
- None

2.2.6 Control authority group

Description: The element <controlAuthorityGroup> is a container element for the control authority information.

Regulatory agencies and manufacturers agree on certain information and exact wording in technical manuals. This wording must not be changed or deleted by the owner or operator. This wording must be visible to the mechanic as part of the procedure.

Markup element: <controlAuthorityGroup>



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Fig 10 Element <controlAuthorityGroup>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <controlAuthority>. Refer to Para 2.2.6.1.

Markup example:

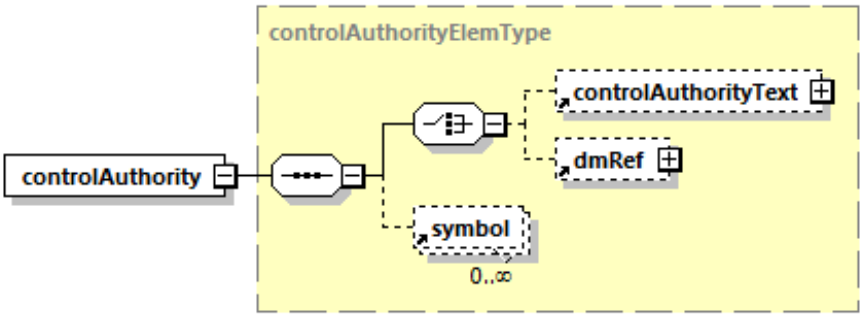
```
<controlAuthorityGroup>
<controlAuthority id="controlAuthority-001"
controlAuthorityType="cat01" controlAuthoritySource="FAA"
controlAuthorityValue="2005-23-17">
<controlAuthorityText>
<para>Text related to an AD - Airworthiness Directive
(cat01)</para>
</controlAuthorityText>
<symbol infoEntityIdent="FLAGNOTEINDICATOR"/>
</controlAuthority>
<controlAuthority id="controlAuthority-002"
controlAuthorityType="cat06" controlAuthoritySource="FAA"
controlAuthorityValue="22-CMR-99">
<controlAuthorityText>
<para>Text related to a CMR - Certification Maintenance
Requirement (cat06)</para>
</controlAuthorityText>
<symbol infoEntityIdent="FLAGNOTEINDICATOR"/>
</controlAuthority>
<controlAuthority id="controlAuthority-003"
controlAuthorityType="cat10" controlAuthoritySource="ZAP"
controlAuthorityValue="RII"/>
<controlAuthority id="controlAuthority-004"
controlAuthorityType="cat05" controlAuthoritySource="FAA"
controlAuthorityValue="28-AWL-03: CDCC
L"/>
<controlAuthority id="controlAuthority-005"
controlAuthorityType="cat13" controlAuthoritySource="ZAP"
controlAuthorityValue="POL-9999"/>
</controlAuthorityGroup>
```

2.2.6.1 Control authority

Description: The element <controlAuthority> is used to identify the authority or organization that is responsible for the content.

Within the content section, when an element is affected by a controlling authority, the attribute controlAuthorityRefs is used to provide a link to the <controlAuthority> structure.

Markup element: <controlAuthority>



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Fig 11 Element <controlAuthority>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.
- controlAuthorityType (M), Control authority type identifies the classification of the data. The attribute controlAuthorityType can have one of the following values:
  - "cat01" thru "cat99". Refer to Chap 3.9.6.1.
- controlAuthoritySource (O), Control authority source identifies the regulatory agency that controls the content.
- controlAuthorityValue (O), Control authority value identifies the full citation of the applicable regulation.

Child elements:

- <controlAuthorityText>. Refer to Para 2.2.6.1.1.
- <dmRef>. Refer to Chap 3.9.5.2.1.2.
- <symbol>. Refer to Chap 3.9.5.2.1.10.

2.2.6.1.1 Control Authority Text

Description: The element <controlAuthorityText> contains the text that is related to the type of the controlling authority.

Markup element: <controlAuthorityText>

Attributes:

- None

Child elements:

- <para>. Refer to Chap 3.9.5.2.1.10.

2.2.7 Logo

Description: The element <logo> contains the reference to the manufacturer's, project's or sponsor's logotype.

Markup element: <logo>

Attributes:

– None

Child elements:

– <symbol>. Refer to Chap 3.9.5.2.1.10.

2.2.8 Responsible partner company

Description: The element <responsiblePartnerCompany> contains the company, organization or authority responsible for the data module. Only one entry is permitted.

The responsible partner company must indicate the company or organization responsible for the data module. In many projects there can be two or more partner companies and, in these cases, the organization must designate which company is the responsible for which data modules. Only the responsible partner company is indicated within the data module.

Note

A responsible partner company can be defined as one of the companies or organization making up a consortium pursuing a common project. Each of these partner companies is responsible for a certain share of the total project effort, however, only one is designated as responsible for the population of the CSDB.

This company or organization must be indicated by either the name of the company and/or the company's CAGE code, which is the preferred method. For information control numbers that are not CAGE code based, and the SNS for non-chapterized parts data modules, a project specific single alphanumeric character code as defined in Chap 4.4. However, if a responsible partner company has an enterprise code, then that code must be used. Refer to default BREX rule BREX-S1-00035.

Markup element: <responsiblePartnerCompany>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– enterpriseCode (O), containing the CAGE code of the enterprise.

Child elements:

– <enterpriseName>, string with the enterprise name. Refer to Para 2.2.8.1.

Business rule decision point BRDP-S1-00070 - Use of the element <enterpriseName> and/or the attribute enterpriseCode for the responsible partner company:

– Decide whether to use the element <enterpriseName> and/or the attribute enterpriseCode to capture the name and CAGE code, respectively, of the responsible partner company. If the name is used it must be done consistently and be mandatory for the project.

2.2.8.1 Enterprise/manufacturer/supplier name

Description: The element <enterpriseName> contains the name of the enterprise/manufacturer/supplier, which is responsible for the data.

Markup element: <enterpriseName>

Attributes:

– None

Child elements:

– None

Markup example:

```
<enterpriseName>Amphenol Ltd</enterpriseName>
```

2.2.9 Originator

Description: The element <originator> contains the identifier of the originating company or organization responsible for the production of the data module. The originator's code is indicated with the company name, the CAGE code, which is the preferred method, or both. Normally, the originator is defined as the designated design authority of the Product. However, projects must nominate the originators. If a responsible partner company has an enterprise code, then that code must be used.

Markup element: <originator>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– enterpriseCode (O), containing the CAGE code of the enterprise. Refer to Para 2.2.8.

Child elements:

– <enterpriseName>, string with the enterprise name. Refer to Para 2.2.8.1.

Business rule decision point BRDP-S1-00071 - Use of the element <enterpriseName> and/or the attribute enterpriseCode for the originator:

– Decide whether to use the element <enterpriseName> and/or the attribute enterpriseCode to capture the name and CAGE code respectively, of the originator. If the name is used it must be done consistently and be mandatory for the project.

2.2.10 Applicability cross-reference table reference

Description: The element <applicCrossRefTableRef> contains a pointer to the Applicability Cross-reference Table (ACT) data module that applies to the data module. Refer to Chap 3.9.5.3.1, Chap 4.14, and Chap 7.8.

Markup element: <applicCrossRefTableRef>

Attributes:

– None

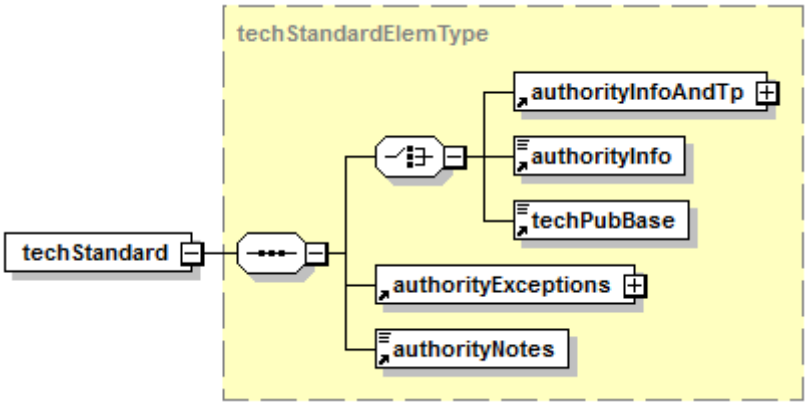
Child elements:

– <dmRef>. Refer to Chap 3.9.5.2.1.2.

2.2.11 Technical standard

Description: The element <techStandard> contains the authorized technical standard and associated data to be entered, describing the information basis used to write the data module. The information basis can be described by giving, for example, the modification or drawing standard including amendments, alterations, etc, or a publication baseline. Technical standard, in this context, is defined as the technical design and development level of the technical information of the Product, on which the data module has been based. This element contains authority block or technical publications baseline number or both.

Markup element: <techStandard>



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Fig 12 Element <techStandard>

Attributes:

– None

Child elements:

– <authorityInfoAndTp>. Refer to Para 2.2.11.1.
– <authorityInfo>. Refer to Para 2.2.11.2.
– <techPubBase>. Refer to Para 2.2.11.3.
– <authorityExceptions>. Refer to Para 2.2.11.4.
– <authorityNotes>. Refer to Para 2.2.11.5.

2.2.11.1 Authority block and technical publications information

Description: The element <authorityInfoAndTp> contains both the authority block information and the technical publications baseline when it is appropriate to use both.

Markup element: <authorityInfoAndTp>

Attributes:

– None

Child elements:

– <authorityInfo>. Refer to Para 2.2.11.2.
– <techPubBase>. Refer to Para 2.2.11.3.

2.2.11.2 Authority information

Description: The element <authorityInfo> contains the authority that owns the source data from which the data module is written. If codes are used, they are determined by the project.

Markup element: <authorityInfo>

Attributes:

– None

Child elements:

– None

2.2.11.3 Publication baseline number

Description: The element <techPubBase> contains the technical publication baseline to which the data module is written. The publication baseline number represents the technical build standard of the Product, which defines the technical standard by reference to a certain point in time. This is achieved by declaring a "Cut-off date" or milestone and listing the drawing set standard, relevant modification documents, etc, issued prior to the Cut-off or milestone date and used as source material for producing data modules. The technical standard so defined, ensures that all data modules are to the same standard. Projects can also decide to use this element to record the delivery number of the Logistics Support Analysis Record (LSAR) to which the data module is written.

Markup element: <techPubBase>

Attributes:

– None

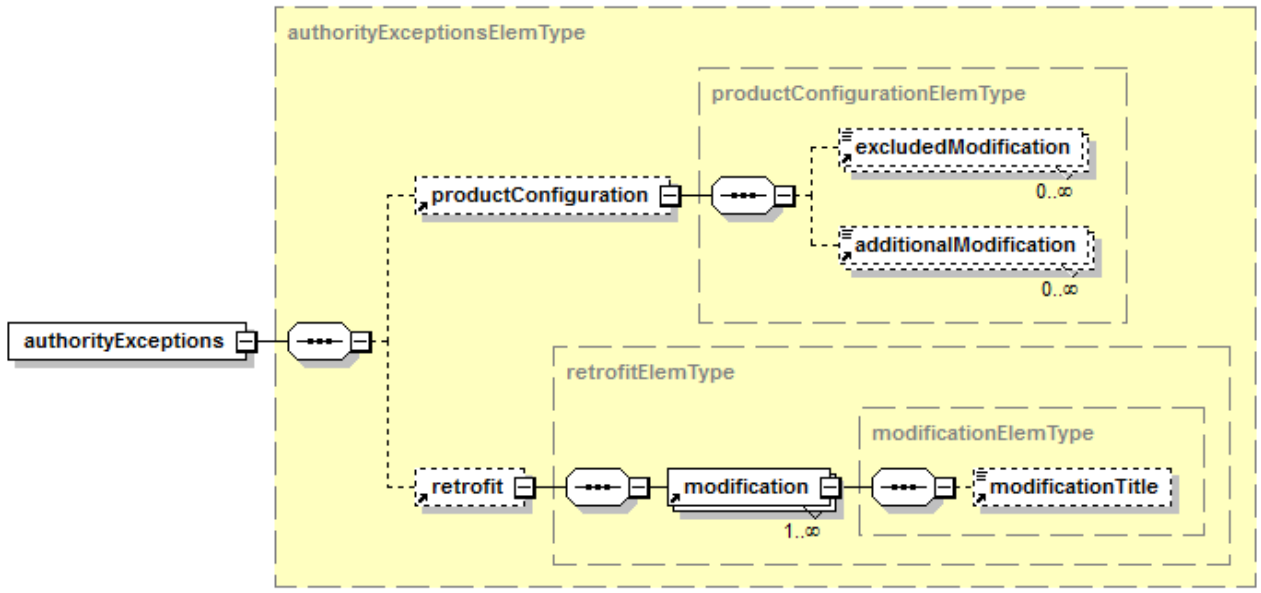
Child elements:

– None

2.2.11.4 Authority exceptions

Description: The element <authorityExceptions> contains deviations of the data module content from the standard given in the authority block for configurations.

Markup element: <authorityExceptions>



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Fig 13 Element <authorityExceptions>

Attributes:

– None

Child elements:

– <productConfiguration>. Refer to Para 2.2.11.4.1.
– <retrofit>. Refer to Para 2.2.11.4.4.

2.2.11.4.1 Product configuration

Description: The element <productConfiguration> contains a reference to the Product configuration as defined for production in the authority block. Any deviation from that configuration or standard is shown by inserting the modification number.

Markup element: <productConfiguration>

Attributes:

– None

Child elements:

– <excludedModification>. Refer to Para 2.2.11.4.2.
– <additionalModification>. Refer to Para 2.2.11.4.3.

2.2.11.4.2 Excluded modification

Description: The element <excludedModification> contains an indication that the modification is not covered even though it was actually required.

Markup element: <excludedModification>

Attributes:

– None

Child elements:

– None

2.2.11.4.3 Additional modification

Description: The element <additionalModification> contains an indication that a modification is additionally covered.

Markup element: <additionalModification>

Attributes:

– None

Child elements:

– None

2.2.11.4.4 Retrofit

Description: The element <retrofit> contains a reference to post-delivery changes that are usually performed in accordance with a retrofit order, (eg, pre- or post-modification).

Markup element: <retrofit>

Attributes:

– None

Child elements:

– <modification>. Refer to Para 2.2.11.4.5.

2.2.11.4.5 Modification

Description: The element <modification> contains the identification of the retrofit order.

Markup element: <modification>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– modificationType (M), the type of modification in terms of pre, post and pre and post. The attribute can have one of the following values:
  - "post" (D) - indicates that the data is to a standard that is after the modification given
  - "pre" - indicates that the data is the initial standard, or to a previous modification standard than the one given
  - "prandpo" - indicates that the data is to a standard that satisfies both a standard before and after the modification given
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <modificationTitle>. Refer to Para 2.2.11.4.6.

2.2.11.4.6 Modification title

Description: The element <modificationTitle> contains the title of the modification.

Markup element: <modificationTitle>

Attributes:

– None

Child elements:

– None

2.2.11.5 Authority notes

Description: The element <authorityNotes> contains additional information that can be necessary to explain preceding entries. Whenever a data module is only applicable to one or a range of serial numbers, this is stated here. It is recommended that, where applicable, the titles of documents be given under authority exceptions. The notes are also used for recording deficiency reports, special technical orders, service bulletins, explanations of excluded and additional modifications, and similar documents.

Markup element: <authorityNotes>

Attributes:

– None

Child elements:

– None

2.2.12 Business rules reference

Description: The element <brexDmRef> contains a pointer to the business rules data module (BREX data module) that applies to the data module. For a detailed description of the BREX module and related aspects, refer to Chap 4.10.

Markup element: <brexDmRef>

Attributes:

– None

Child elements:

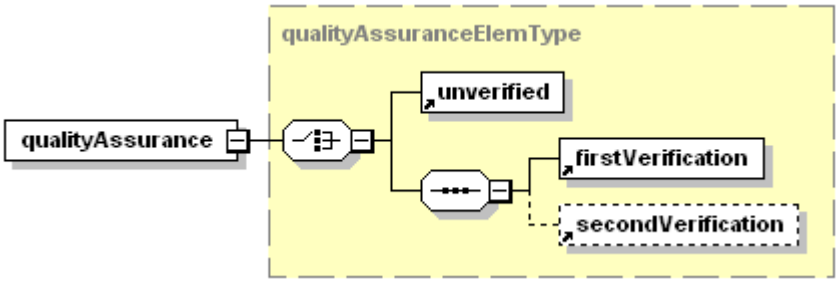
– <dmRef>. Refer to Chap 3.9.5.2.1.2.

2.2.13 Quality assurance

Description: The element <qualityAssurance> contains details of the status of the QA process as required by the project. The data module must be identified as either being unverified or verified. This element can contain applicability information to indicate the applicability of the QA information. This applicability information must be a subset of the mandatory applicability settings for the complete data module. This applies equally to the element <qualityAssurance> and all its subelements.

The element <qualityAssurance> enables applicability filtering of the data upon publication. When there is more than one occurrence of the element <qualityAssurance>, each must have different applicability statements to enable applicability filtering of the data upon publication.

Markup element: <qualityAssurance>



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Fig 14 Element <qualityAssurance>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.

Child elements:

- <unverified>. Refer to Para 2.2.13.1.
- <firstVerification>. Refer to Para 2.2.13.2.
- <secondVerification>. Refer to Para 2.2.13.3.

2.2.13.1 Unverified

Description: The element <unverified> identifies that the data module has not yet been first verified.

Markup element: <unverified>

Attributes:

- None

Child elements:

- None

Business rule decision point BRDP-S1-00077 - Exchange of draft data modules:

- Decide whether the project will allow the exchange of draft data modules.

Markup example:

```
<qualityAssurance>
<unverified/>
</qualityAssurance>
```

2.2.13.2 First verification

Description: The element <firstVerification> identifies a data module which has been first verified. Refer to Chap 3.7.

Markup element: <firstVerification>

Attributes:

– verificationType (M). The attribute can have one of the following values:

- "tabtop" - used to indicate that the first verification was carried out on a desktop
- "onobject" - used to indicate that the first verification was carried out at the Product
- "ttandoo" - used to indicate that the first verification was carried out at the Product and on a desktop

Child elements:

– None

2.2.13.3 Second verification

Description: The element <secondVerification> identifies a data module which has been second verified. Data modules cannot be only second verified. They must also be first verified. Refer to Chap 3.7.

Markup element: <secondVerification>

Attributes:

– verificationType (M). The attribute can have one of the following values:

- "tabtop" - used to indicate that the second verification was carried out on a desktop
- "onobject" - used to indicate that the second verification was carried out at the Product
- "ttandoo" - used to indicate that the second verification was carried out at the Product and on a desktop

Child elements:

– None

Markup example:

```
<qualityAssurance>
<firstVerification verificationType="onobject"/>
<secondVerification verificationType="ttandoo"/>
</qualityAssurance>
```

2.2.14 System breakdown code

Description: The element <systemBreakdownCode> contains a code that captures the physical breakdown for those projects that are producing data modules that are in line with some logistic databases.

Markup element: <systemBreakdownCode>

Attributes:

– `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

– None

2.2.15 Functional item code

Description: The element <`functionalItemCode`> contains a code that represents the functional breakdown.

Markup element: <`functionalItemCode`>

Attributes:

– None

Child elements:

– None

2.2.16 Functional item reference

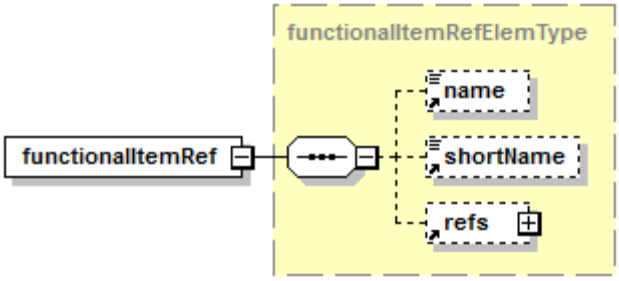
Description: The element <`functionalItemRef`> contains a reference to the functional item's CIR data module.

A functional item can be used to uniquely identify an item that performs a function, in a system that is part of a Product.

For example, a functional item can be the third pump in a hydraulic system of a Product. Depending on the Product instance, this functional item can be mechanical or electrical, and so, can perform the function of a hydraulic pump.

The functional item is also known as the reference designator.

Markup element: <`functionalItemRef`>



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Fig 15 Element <`functionalItemRef`>

Attributes:

– `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
– `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- functionalItemNumber (M), the functional item number identifier. Refer to Chap 3.9.5.2.7.
- functionalItemType (O), the functional item type. The attribute can have one of the following values:
  - "fit01" thru "fit99". Refer to Chap 3.9.6.1.
- installationIdent (O), the installation identifier.
- contextIdent (O), the context identification (eg, the vendor's part number allocated to a next higher assembly). This identifier is used in combination with the attribute manufacturerCodeValue to ensure the uniqueness of the manufacturer's equipment data.
- manufacturerCodeValue (O), the CAGE code of the functional item designer. Since there is no standardized method for assigning functional item numbers, the CAGE code of the functional item designer ensures the uniqueness of a functional item number.
- itemOriginator (O), the originator of the functional item. This is used to indicate the origin of the equipment (eg, if the equipment is an aircraft manufacturer equipment).
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Para 2.2.6.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name> (O), gives the name of the functional item. Refer to Chap 3.9.5.2.1.10.
- <shortName> (O). Refer to Chap 3.9.5.2.1.10.
- <refs> (O), references providing a link to the functional item. Refer to Chap 3.9.5.2.1.2.

2.2.17 Skill level

Description: The element <skillLevel> contains the skill level to which the data module has been written.

Markup element: <skillLevel>

Attributes:

- skillLevelCode (M), the actual code. The attribute can have one of the following values:
  - "sk01" thru "sk99". Refer to Chap 3.9.6.1.

Child elements:

- None

2.2.18 Product safety

Description: The element <productSafety> contains an indication when a data module is transmitting information that affects the safety of the Product's users. The element <productSafety> can be empty or can contain textual information describing the urgency for processing the information in the data module and handling of the data module when third parties now operate the Product.

Markup element: <productSafety>

Attributes:

– `safetyLabel` (M), contains a short description of the type of safety issue or a category selected from industry standard safety labels.

Child elements:

– None

2.2.19 Remarks

Description: The element <`remarks`> can contain general remarks.

Markup element: <`remarks`>

Attributes:

– `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
– `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Para 2.2.6.1.

Child elements:

– <`simplePara`> (O). Refer to Chap 3.9.5.2.1.10.

3 Example

```
<identAndStatusSection>
<dmAddress>
<dmIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA2" subSystemCode="3" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="720" infoCodeVariant="A" itemLocationCode="A">
</dmCode>
<language countryIsoCode="US" languageIsoCode="sx">
</language>
<issueInfo issueNumber="005" inWork="00"/>
</dmIdent><dmAddressItems>
<issueDate year="2012" month="07" day="31"/><dmTitle>
<techName securityClassification="01">Headset</techName>
<infoName securityClassification="01">Install
procedure</infoName>
</dmTitle>
</dmAddressItems></dmAddress>
<dmStatus>
<security securityClassification="01"
commercialClassification="cc51" caveat="cv51"
derivativeClassificationRefId="dcg-001"/>
<dataRestrictions>
<restrictionInstructions>
<dataDistribution>To be made available to all S1000D
users.</dataDistribution>
<exportControl><exportRegistrationStmt>
```

```
<simplePara>Export of this data module to all countries that are
the residence of organizations that are users of S1000D is
permitted. Storage of this data module is to be at the
discretion of the organization.</simplePara>
</exportRegistrationStmt></exportControl>
<dataHandling>There are no specific handling instructions for
this data module.</dataHandling>
<dataDestruction>Users may destroy this data module in
accordance with their own local procedures.</dataDestruction>
<dataDisclosure>There are no dissemination limitations that
apply to this data module.</dataDisclosure>
</restrictionInstructions>
<restrictionInfo>
<copyright>
<copyrightPara>
<emphasis>Copyright (C) 2016</emphasis> by each of the following
organizations:
<randomList>
<listItem>
<para>AeroSpace and Defence Industries Associations of Europe -
ASD.</para>
</listItem>
<listItem>
<para>Ministries of Defence of the member countries of
ASD.</para>
</listItem>
</randomList>
</copyrightPara>
<copyrightPara>
<emphasis>Limitations of liability:</emphasis>
</copyrightPara>
<copyrightPara>
<randomList>
<listItem>
<para>This material is provided "As is" and neither ASD nor any
person who has contributed to the creation, revision or
maintenance of the material makes any representations or
warranties, express or implied, including but not limited to,
warranties of merchantability or fitness for any particular
purpose.</para>
</listItem>
<listItem>
<para>Neither ASD nor any person who has contributed to the
creation, revision or maintenance of this material shall be
liable for any direct, indirect, special or consequential
damages or any other liability arising from any use of this
material.</para>
</listItem>
<listItem>
<para>Revisions to this document may occur after its issuance.
The user is responsible for determining if revisions to the
material contained in this document have occurred and are
```

```
applicable.</para>
</listItem>
</randomList>
</copyrightPara>
</copyright>
<policyStatement>S1000D-SC-2016-017-002-00 Steering Committee
TOR</policyStatement>
<dataConds>There are no known conditions that would change the
data restrictions for, or security classification of, this data
module.</dataConds>
</restrictionInfo>
</dataRestrictions>
<controlAuthorityGroup>
<controlAuthority id="controlAuthority-001"
controlAuthorityType="cat01" controlAuthoritySource="FAA"
controlAuthorityValue="2005-23-17">
<controlAuthorityText>
<para>Text related to an AD - Airworthiness Directive
(cat01)</para>
</controlAuthorityText>
<symbol infoEntityIdent="FLAGNOTEINDICATOR"/>
</controlAuthority>
<controlAuthority id="controlAuthority-002"
controlAuthorityType="cat06" controlAuthoritySource="FAA"
controlAuthorityValue="22-CMR-99">
<controlAuthorityText>
<para>Text related to a CMR - Certification Maintenance
Requirement (cat06)</para>
</controlAuthorityText>
<symbol infoEntityIdent="FLAGNOTEINDICATOR"/>
</controlAuthority>
<controlAuthority id="controlAuthority-003"
controlAuthorityType="cat10" controlAuthoritySource="ZAP"
controlAuthorityValue="RII"/>
<controlAuthority id="controlAuthority-004"
controlAuthorityType="cat05" controlAuthoritySource="FAA"
controlAuthorityValue="28-AWL-03: CDCC
L"/>
<controlAuthority id="controlAuthority-005"
controlAuthorityType="cat13" controlAuthoritySource="ZAP"
controlAuthorityValue="POL-9999"/>
</controlAuthorityGroup>
<logo>
<symbol infoEntityIdent="ICN-S3627-S1000D094-001-01"/>
</logo>
<responsiblePartnerCompany enterpriseCode="B6865">
<enterpriseName>AEROSPACE AND DEFENCE INDUSTRIES ASSOCIATION OF
EUROPE</enterpriseName></responsiblePartnerCompany>
<originator enterpriseCode="B6865">
<enterpriseName>AEROSPACE AND DEFENCE INDUSTRIES ASSOCIATION OF
EUROPE</enterpriseName></originator>
<applicCrossRefTableRef>
```

```
<dmRef><dmRefIdent><dmCode modelIdentCode="S1000DBIKE"
systemDiffCode="AAA" systemCode="D00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" disassyCode="00"
disassyCodeVariant="AA" infoCode="00W" infoCodeVariant="A"
itemLocationCode="D"></dmCode>
</dmRefIdent></dmRef></applicCrossRefTableRef>
<applic>
<displayText><simplePara>Mountain bicycle and (Mountain storm
Mk1 or Brook trekker Mk9)</simplePara></displayText>
<evaluate andOr="and">
<assert applicPropertyIdent="type" applicPropertyType="prodattr"
applicPropertyValues="Mountain bicycle"/>
<evaluate andOr="or">
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Mountain
storm"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk1"/>
</evaluate>
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk9"/>
</evaluate>
</evaluate>
</evaluate>
</applic>
<techStandard>
<authorityInfoAndTp>
<authorityInfo>20010131</authorityInfo>
<techPubBase>Bike book</techPubBase>
</authorityInfoAndTp>
<authorityExceptions/>
<authorityNotes/>
</techStandard>
<brexDmRef>
<dmRef><dmRefIdent><dmCode modelIdentCode="S1000DBIKE"
systemDiffCode="AAA" systemCode="D00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" disassyCode="00"
disassyCodeVariant="AA" infoCode="022" infoCodeVariant="A"
itemLocationCode="D"/>
<issueInfo issueNumber="005" inWork="00"/>
</dmRefIdent></dmRef></brexDmRef>
<qualityAssurance>
<firstVerification verificationType="tabtop"/>
</qualityAssurance>
<systemBreakdownCode>BY143</systemBreakdownCode>
<functionalItemCode>AAI2392</functionalItemCode>
<functionalItemRef functionalItemNumber="101HG1"
```

```
manufacturerCodeValue="2D671"/>
<skillLevel skillLevelCode="sk02"/>
<reasonForUpdate updateReasonType="urt02">
<simpleRefPara>Revised to cover the requirements of
<externalPubRef>
<externalPubRefIdent>
<externalPubCode>ModXYZ</externalPubCode>
<externalPubTitle>Headset bolt torque values.</externalPubTitle>
</externalPubRefIdent>
</externalPubRef>
</simpleRefPara>
</reasonForUpdate>
<productSafety safetyLabel="Alert">THIS SERVICE BULLETIN DATASET
HAS BEEN DELIVERED TO THE OPERATORS OF RECORD OF THE AFFECTED
AIRPLANES. IF AN AFFECTED AIRPLANE HAS BEEN LEASED OR SOLD, SEND
THE SERVICE BULLETIN TO THE NEW OPERATOR.</productSafety>
<remarks><simplePara>This is a complete markup example of an
identification and status section</simplePara></remarks>
</dmStatus>
</identAndStatusSection>
```

Chapter 3.9.5.1.1

Identification and status section - Export control

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Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.6	Information generation - Security and data restrictions

1 General

This chapter contains information and guidance on the use of export controls. These controls are required to contain a statement regarding the regulations that apply to the data contained within a data module. The controls also contain an indicator that shows which government gives authority to the regulations defined. This information can be required by companies, government departments and their delivery systems to control the release of data to authorized users. In addition, it can be required by authorized users so they can further control transmittal and use of the data, as required by many export control regulations.

When using export controls, projects must consider the requirements of their statutory government and the end data users and their data management requirements. Other items to consider are the display of this data within the user interface. Projects are responsible to ensure that the export controls applied are correct for the data content and that they comply with the relevant regulations pertaining to export controls.

2 Export control

Description: The element <exportControl> is used to define any government regulations concerning access to the data module.

Markup element: <exportControl>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- exportRegulationType (O), the identification of the regulation type that governs the use of the data contained in the data module
- governmentAuthority (O), the identification of the government that controls the use of the data contained in the data module. It is recommended to use the two character country code as defined in International Standards Organisation (ISO) 3166-1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <exportRegistrationStmt>. Refer to Para 2.1.
- <exportRegistrationCode>. Refer to Para 2.2.

2.1 Export registration statement

Description: The element <exportRegistrationStmt> is used to specify either a full or a partial export registration statement describing the export status of the data module content.

Markup element: <exportRegistrationStmt>

Attributes:

- exportRole (O), the description of whether this statement is a full statement or a partial statement. Valid values are:
  - "full"
  - "partial"

Child elements:

- <simplePara>. Refer to Chap 3.9.5.2.1.10.
- <dmRef>. Refer to Chap 3.9.5.2.1.2.

Note

The element <dmRef> in this context is used to refer to export policy statements that have been externalized into a separate data module that uses IC 025.

Note

The content of the statement is made up of a choice of a combination of multiple instances of the child elements.

2.2 Export registration code

Description: The element <exportRegistrationCode> is used to indicate a coded value representing an export control property that applies to the content of the data module.

Markup element: <exportRegistrationCode>

Attributes:

- exportRegulationCodeType (O), the type of the regulation code. In the case of Export Administration Regulations (EAR), the value of the attribute can be "ECCN". In the case of International Traffic in Arms Regulations (ITAR), the value can be a program code related to the Project.

Child elements:

- None

3 Example

The following example shows an export control statement:

```
<exportControl exportRegulationType="EAR">
<exportRegistrationStmt exportRole="partial"><simplePara>This
information contains technology controlled under EAR. Transfer
of this data to a foreign person without export approval is
expressly prohibited.</simplePara></exportRegistrationStmt>
<exportRegistrationStmt exportRole="full"><simplePara>Export of
this technology is controlled under the United States Export
Administration Regulations (EAR) (15 CFR 730-774). An export
license may be required before it is used for development,
production or use by foreign persons from specific countries.
The controller of this data has the individual responsibility to
abide by all export laws.</simplePara></exportRegistrationStmt>
<exportRegistrationCode
exportRegulationCodeType="ECCN">1E001</exportRegistrationCode>
<exportRegistrationCode
exportRegulationCodeType="ECCN">5A101</exportRegistrationCode>
<exportRegistrationCode
exportRegulationCodeType="ECCN">9A991</exportRegistrationCode>
</exportControl>
```

Chapter 3.9.5.2

Data modules - Content section

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Chap 3.9.5.2.13	Content section - Learning data module
Chap 3.9.5.2.14	Content section - Maintenance checklists and inspections
Chap 3.9.5.2.15	Content section - Service bulletin data module
Chap 3.9.5.2.16	Content section - Front matter
Chap 3.9.5.2.17	Content section - SCO content data module

1 General

The S1000D Schemas provide the capability to capture operator, maintenance and training content.

2 Content section

The content section of a data module must be structured in accordance with one of the following information types:

- Descriptive information, refer to Chap 3.9.5.2.2
- Procedural information, refer to Chap 3.9.5.2.3
- Fault isolation information, refer to Chap 3.9.5.2.4
- Maintenance planning information, refer to Chap 3.9.5.2.5
- Crew/Operator information, refer to Chap 3.9.5.2.6
- IPD information, refer to Chap 3.9.5.2.7
- Battle damage assessment and repair information (to be included in a future change), refer to Chap 3.9.5.2.8
- Wiring data, refer to Chap 3.9.5.2.9
- Process data module, refer to Chap 3.9.5.2.10
- Common information repository data module, refer to Chap 3.9.5.2.11
- Container data module, refer to Chap 3.9.5.2.12
- Learning data module, refer to Chap 3.9.5.2.13
- Maintenance checklists and inspections, refer to Chap 3.9.5.2.14
- Service bulletins, refer to Chap 3.9.5.2.15
- Front matter, refer to Chap 3.9.5.2.16
- Shareable content objects (SCO), refer to Chap 3.9.5.2.17

Among these information types there are many common constructs. These are described in Chap 3.9.5.2.1.

Chapter 3.9.5.2.1

Content section - Common constructs

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Chap 3.9.6	Authoring - Attributes
Chap 3.9.7	Authoring - Human performance technology and training
Chap 6.2	Information presentation and use - Page-oriented publications
Chap 6.3	Information presentation and use - IETP

1 General

The content of a data module must be structured in accordance with the appropriate Schema and must be authored in line with the requirements given in the following:

- warnings cautions and notes (refer to Chap 3.9.3)
- security classification (refer to Chap 3.9.5.1)
- change marking (refer to Chap 3.9.5.2.1.1)
- referencing (refer to Chap 3.9.5.2.1.2)
- lists (refer to Chap 3.9.5.2.1.3)
- captions (refer to Chap 3.9.5.2.1.4)
- titles (refer to Chap 3.9.5.2.1.5)
- tables (refer to Chap 3.9.5.2.1.6)
- figures, multimedia and foldouts (refer to Chap 3.9.5.2.1.7)
- hotspots (refer to Chap 3.9.5.2.1.8)
- preliminary requirements (refer to Chap 3.9.5.2.1.9)
- paragraphs (refer to Chap 3.9.5.2.1.10)
- simple paragraphs (refer to Chap 3.9.5.2.1.10)
- controlled content (refer to Chap 3.9.5.2.1.11)
- common information (refer to Chap 3.9.5.2.1.12)
- externalization (refer to Chap 3.9.5.2.1.13)
- descriptive information (refer to Chap 3.9.5.2.2)
- procedural information (refer to Chap 3.9.5.2.3)
- fault information (refer to Chap 3.9.5.2.4)
- maintenance planning information (refer to Chap 3.9.5.2.5)
- crew/operator information (refer to Chap 3.9.5.2.6)
- parts information (refer to Chap 3.9.5.2.7)

- battle damage assessment and repair information (refer to Chap 3.9.5.2.8)
- wiring information (refer to Chap 3.9.5.2.9)
- process data module (refer to Chap 3.9.5.2.10)
- common information repository data module (refer to Chap 3.9.5.2.11)
- container data module (refer to Chap 3.9.5.2.12)
- learning data module (refer to Chap 3.9.5.2.13)
- maintenance checklists and inspections (refer to Chap 3.9.5.2.14)
- service bulletin data module (refer to Chap 3.9.5.2.15)
- front matter (refer to Chap 3.9.5.2.16)
- SCO content data module (refer to Chap 3.9.5.2.17)
- applicability (refer to Chap 3.9.5.3)
- attributes (refer to Chap 3.9.6)
- training information (refer to Chap 3.9.7)

The rules for the presentation of the content are given in Chap 6.2 and Chap 6.3.

Chapter 3.9.5.2.1.1

Common constructs - Change marking

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Chap 6.2.2	Page-oriented publications - Typography and layout elements

1 General

Indicating changes to CSDB objects is achieved by using the change markup provided by the Schemas. The types of changes are insertions, deletions and modifications for elements and/or text.

Tables, figures and warnings and cautions have special rules. Refer to Para 2.5, Para 2.6 and Para 2.7, respectively.

Note

The Data Dispatch Note (DDN) and Comment (COM) Schemas include the change markup only within the identification and status section.

With the exception of the DDN and COM, each CSDB object records the reasons for the changes in their identification and status section. Since reasons for changes are included in all the explanations of change in this chapter, the subject is explained first. Refer to Para 2.2.

2 Using change markup

2.1 General rules

2.1.1 Use limitations

The use of the change markup is limited to indicate technical changes only. Change markup must only be used to indicate changes since the previous issue of a data module and not between increments of the attribute `inwork`. Any changes indicated in the previous issue must be deleted for the upissue.

Note

The previous issue of the data module remains stored in the CSDB with the change markup at that issue.

Editorial changes must not use change markup. Refer to default BREX rule BREX-S1-00044.

Data modules that have the value of the attribute `issueNumber` of the element <`issueInfo`> set to "`001`" and the value of the attribute `issueType` of the element <`dmStatus`> set to "`new`" must not use change markup. Refer to default BREX rule BREX-S1-00013 and BREX-S1-00036.

Generated TOC, LOT, LOF and references must not have changes applied or indicated.

2.1.2 Recording reasons for change

All elements that contain the change markup use a reason for update. Refer to Para 2.2 and default BREX rules BREX-S1-00037 and BREX-S1-00038. However, graphics and multimedia can also use a reason for amendment. Refer to Para 2.3.

2.1.3 Linking reasons for update

The details of the changes made within the content section of a data module are recorded in the identification and status section. Linking the change to the reason for change is achieved by using the attribute `reasonForUpdateRefIds` of the element that is changed and the attribute `id` of the element <`reasonForUpdate`>.

When the content of an element is changed, the value of its attribute `reasonForUpdateRefIds` is set to the same value as the attribute `id` of the element <`reasonForUpdate`>.

When the content of more than one element are affected by the same change, the value for each of the elements' attribute `reasonForUpdateRefIds` are set to the same value as the attribute `id` of the element <`reasonForUpdate`>.

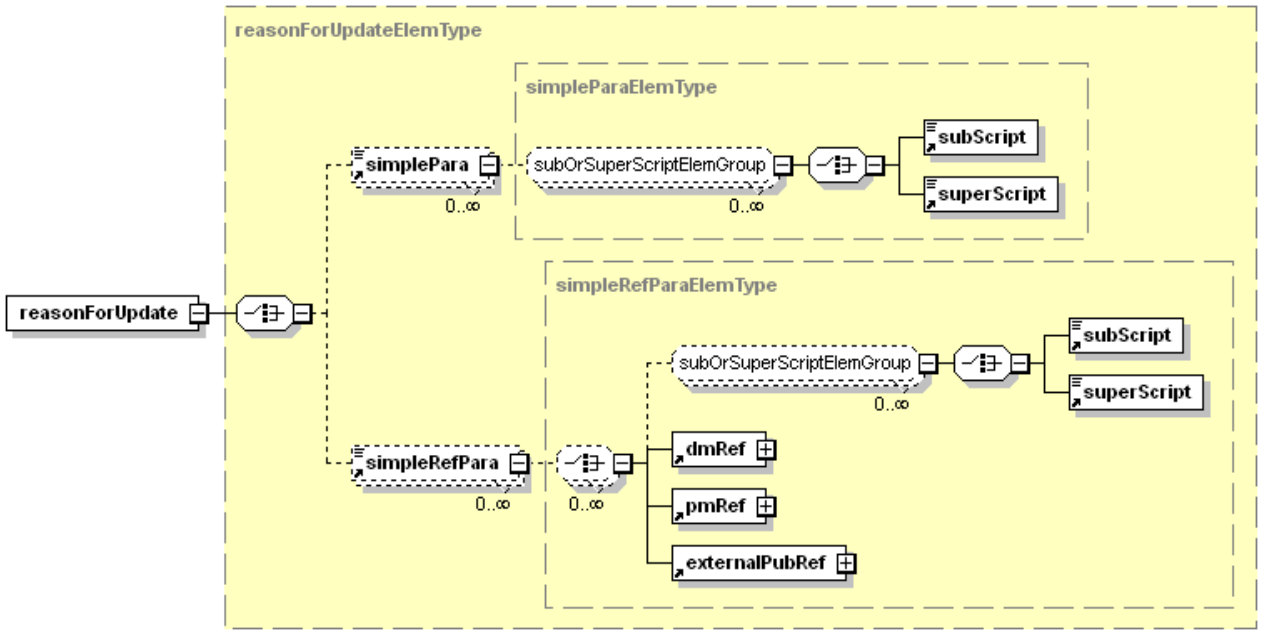
When the content of more than one element is affected by different changes, the elements affected by one change have the value for each of those elements' attribute `reasonForUpdateRefIds` set to the same value as the attribute `id` of one occurrence of the element <`reasonForUpdate`>. The elements affected by a different change have the value for each of those elements' attribute `reasonForUpdateRefIds` set to the same value as the attribute `id` of a separate occurrence of the element <`reasonForUpdate`>.

2.2 Reason for update

Description: The element `<reasonForUpdate>`, within the identification and status section, records the reasons for developing and issuing the data module (issue number 001) or the changes made to the data module since previous issue (ie, issue number 002 and upwards). The element `<reasonForUpdate>` in data modules can be used to generate the highlights data module. Examples of highlight statements are:

- New. Developed to support situation X
- Revised to incorporate modification XYZ
- Deleted. Data module no longer required

Markup element: <`reasonForUpdate`>



ICN-83007-0000000072-002-01

Fig 1 Element <reasonForUpdate>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `updateReasonType` (O), indicates the type of the reason for update that it applies to, and is configurable. Refer to Chap 3.9.6.1. If this attribute is not used, a technical change is implied. The attribute can have one of the following values:
  - "`urt01`" - the changes are editorial (and therefore there must be no change markers in the data module that relate to this reason for update). There must be no technical changes in an element that relate to this reason for update.
  - "`urt02`" - the changes are technical. Provided that the data module is not revised, there must be change markers that relate to this reason for update.
  - "`urt03`" - the changes are related to markup only. If these changes affect the technical content of the data module, and the data module is of issue type changed, the changes that relate to this reason for update must be marked.
  - "`urt04`" - the changes are to applicability markings only. If these changes do not affect the technical content (or the issue type is other than changed), there must be no change markings in the data module that relate to this reason for update.
  - "`urt05`" - the changes are to referencing markings only. If these changes do not affect the technical content (or the issue type is other than changed), there must be no change markings in the data module that relate to this reason for update.
- `updateHighlight` (O), indicates whether the reason for update must appear in the highlights data module. The attribute can have one of the following values:
  - "`1`"- Yes, the reason for update must appear in the highlights data module
  - "`0`" - No, the reason for update must not appear in the highlights data module

  Refer to default BREX rule BREX-S1-00039.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <simplePara>. Refer to Chap 3.9.5.2.1.10.
- <simpleRefPara>. Refer to Chap 3.9.5.2.1.10.

Note

Both these elements are used to record the details of the change. Multiple occurrences of this element in a single occurrence of <reasonForUpdate> are not used to record individual changes made within the data module.

Business rule decision point BRDP-S1-00089 - Standard sentences for reasons for update:

- Decide whether standard sentences for reasons for update are to be used.

Business rule decision point BRDP-S1-00090 - Use of reason for update in conjunction with the production process:

- Decide whether the element <reasonForUpdate> is used during the production process.

Business rule decision point BRDP-S1-00091 - Use of applicability information:

- Decide whether it is permissible to differentiate reasons for update based on Product configuration.

2.3 Reason for amendment

Description: When the element <reasonForAmendment> is used, it records the reason for the amendment to either a complete figure, or of individual illustration sheets of a multi-sheet figure. The element can contain free text and/or its child elements to record the reason.

If the change markup is used on the element <figure> then the change attributes on the element <graphic> of multi-sheet figures must not be used. Refer to default BREX rule BREX-S1-00043. This does not prevent the use of the element <reasonForAmendment> on a single illustration sheet of multi-sheet figures to indicate changes in the illustration itself.

If change marking indication is required on individual illustration sheets of a multi-sheet figure, then the appropriate change markup must be applied to the element <graphic>, and the change markup on the element <figure> must not be used.

A single occurrence of the element <reasonForAmendment> is used for each individual change.

The element <reasonForUpdate> that is referenced by the element <figure> or the element <graphic> is used as described in Para 2.2, and contains general reasons why the figure (or illustration sheet) has been added, modified or deleted.

Markup element: <reasonForAmendment>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <functionalItemRef>. Refer to Chap 3.9.5.1.
- <circuitBreakerRef>. Refer to Chap 3.9.5.2.1.10.
- <controlIndicatorRef>. Refer to Chap 3.9.5.2.1.10.
- <inlineSignificantData>. Refer to Chap 3.9.5.2.1.10.
- <quantity>. Refer to Chap 3.9.5.2.1.10.
- <zoneRef>*. Refer to Chap 3.9.5.2.1.10.
- <accessPointRef>*. Refer to Chap 3.9.5.2.1.10.
- <identNumber>*. Refer to Chap 3.9.5.2.1.9.
- <internalRef>. Refer to Chap 3.9.5.2.1.2.
- <indexFlag>*. Refer to Chap 3.9.5.2.1.10.
- <changeInline>.Refer to Para 2.4.2.
- <emphasis>. Refer to Chap 3.9.5.2.1.10.
- <symbol>. Refer to Chap 3.9.5.2.1.10.
- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.
- <dmRef>. Refer to Chap 3.9.5.2.1.2.
- <pmRef>*. Refer to Chap 3.9.5.2.1.2.
- <externalPubRef>. Refer to Chap 3.9.5.2.1.2.
- <footnote>. Refer to Chap 3.9.5.2.1.10.
- <footnoteRef>*. Refer to Chap 3.9.5.2.1.10.
- <acronym>. Refer to Chap 3.9.5.2.1.10.
- <acronymTerm>. Refer to Chap 3.9.5.2.1.10.
- <caption>*. Refer to Chap 3.9.5.2.1.4.
- <captionGroup>*. Refer to Chap 3.9.5.2.1.4.
- <verbatimText>. Refer to Chap 3.9.5.2.1.10.
- <sequentialList>. Refer to Chap 3.9.5.2.1.3.
- <randomList>. Refer to Chap 3.9.5.2.1.3.
- <definitionList>. Refer to Chap 3.9.5.2.1.3.

Note

The elements marked with an asterisk (*) are not available in all data modules. Refer to Chap 3.9.5.2.1.10.

2.4 Making changes to text

Text can be changed by changing a complete element or by changing the text within the element, which is known as inline change. In both cases, the attribute issueType of the element <dmStatus> is set to the value "changed".

2.4.1 Changing a complete element

When an element is added, modified or deleted, its change marking attribute values are set to indicate the display requirements and the type of change.

All elements that contain the following attributes:

Attributes:

– changeMark (O), indicates whether the display of a change bar, mark or other visual indication next to the entire content of an element being added, deleted or modified is intended. The attribute can have one of the following values:

- "1" - Yes, the display of a change bar, mark or other visual indication is intended
- "0" - No, the display of a change bar, mark or other visual indication is not intended

Note

If the attribute changeMark is not used, then there is no display of a change bar, mark or other visual indication intended.

– changeType (O), the type of the change. The attribute can have one of the following values:

- "add" - the element is added
- "modify" - the element is changed
- "delete" - the element is deleted

Note

The attribute changeType can apply to any element and not especially to the element where the change occurs. Depending on the type of the change, propagation rules defining the change marking inheritance from the upper element to the lower can differ:

  – Elements marked with the value "modify" are allowed to contain elements marked with values "add", "modify" or "delete"
  – Elements marked with the value "delete": There is no need to set the change attributes on the element's children because this is implied. Any change markings on child elements are ignored by the presentation system.
  – Elements marked with value "add": There is no need to set the change attributes on the element's children because this is implied. Any change markings on child elements are ignored by the presentation system.

Note

If this attribute is not used, and the attribute changeMark is used, the change is assumed to be an addition.

– reasonForUpdateRefIds (O), this attribute is used to link to the appropriate occurrence of the element <reasonForUpdate>. Refer to Para 2.1.3.

Note

When deleting an element, authors must ensure that any references to that element are not adversely affected by the deletion. Refer to default BREX rules BREX-S1-00041 and BREX-S1-00042.

Markup example:

```
<proceduralStep changeType="add" changeMark="1"
reasonForUpdateRefIds="rfu-0005">
<para>Remove the four bolts
(<internalRef internalRefId="spa-0023"
internalRefTargetType="irtt06"/>).</para>
</proceduralStep>
```

The change markup shows that the element is added and a change bar, mark or other visual indication is intended to be displayed. The corresponding reason for update would be:

```
<reasonForUpdate id="rfu-0005" updateReasonType="urt02"
updateHighlight="1">
<simplePara>Updated to include the requirements of Brook Trekker
Modification PO-RT1/ON (extended length bottom-bracket shaft
bolts).</simplePara>
</reasonForUpdate>
```

The example shows that the reason for update indicates a technical change, because the attribute `updateReasonType` is set to the value "`urt02`". It is also intended that the reason for update appears in the highlights data module, because the attribute `updateHighlight` is set to the value "`1`".

Note

There is no need to set the change attributes on the element's child because this is implied. Any change markings on child elements are ignored by the presentation system.

2.4.2 Changing text inline

Description: The element <`changeInline`> must be used for changed data modules when changing parts of text within elements. The element <`changeInline`> must not be used to indicate that a complete element has been added, modified or deleted. Refer to default BREX rule BREX-S1-00040.

Markup element: <`changeInline`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Para 2.4.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`functionalItemRef`>. Refer to Chap 3.9.5.1.
- <`circuitBreakerRef`>. Refer to Chap 3.9.5.2.1.10.
- <`controlIndicatorRef`>. Refer to Chap 3.9.5.2.1.10.
- <`inlineSignificantData`>. Refer to Chap 3.9.5.2.1.10.
- <`quantity`>. Refer to Chap 3.9.5.2.1.10.
- <`zoneRef`>*. Refer to Chap 3.9.5.2.1.10.
- <`accessPointRef`>*. Refer to Chap 3.9.5.2.1.10.
- <`identNumber`>*. Refer to Chap 3.9.5.2.1.9.
- <`internalRef`>. Refer to Chap 3.9.5.2.1.2.
- <`indexFlag`>*. Refer to Chap 3.9.5.2.1.10.
- <`changeInline`>. Refer to Para 2.4.2.
- <`emphasis`>. Refer to Chap 3.9.5.2.1.10.
- <`symbol`>. Refer to Chap 3.9.5.2.1.10.
- <`subScript`>. Refer to Chap 3.9.5.2.1.10.

- <superScript>. Refer to Chap 3.9.5.2.1.10.
- <dmRef>. Refer to Chap 3.9.5.2.1.2.
- <pmRef>*. Refer to Chap 3.9.5.2.1.2.
- <externalPubRef>. Refer to Chap 3.9.5.2.1.2.
- <footnote>. Refer to Chap 3.9.5.2.1.10.
- <footnoteRef>*. Refer to Chap 3.9.5.2.1.10.
- <acronym>. Refer to Chap 3.9.5.2.1.10.
- <acronymTerm>. Refer to Chap 3.9.5.2.1.10.
- <caption>*. Refer to Chap 3.9.5.2.1.4.
- <captionGroup>*. Refer to Chap 3.9.5.2.1.4.
- <verbatimText>. Refer to Chap 3.9.5.2.1.10.
- <sequentialList>. Refer to Chap 3.9.5.2.1.3.
- <randomList>. Refer to Chap 3.9.5.2.1.3.
- <definitionList>. Refer to Chap 3.9.5.2.1.3.

Note

The elements marked with an asterisk (*) are not available in all data modules. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<proceduralStep>
<para>Use the
<internalRef internalRefId="seq-0001"
internalRefTargetType="irtt05">wrench</internalRef>
to tighten the bolts to
<changeInline changeType="add" reasonForUpdateRefIds="rfu-0007"
changeMark="1">16 lb/in<superScript>2</superScript>
</changeInline>.</para>
</proceduralStep>
```

The change markup shows that the text "16 lb/in^2" has been added. It is also intended that the change is indicated by displaying a change bar, mark or other visual indication. The corresponding reason for update would be:

```
<reasonForUpdate id="rfu-0007" updateReasonType="urt02"
updateHighlight="1">
<simplePara>The torque value is added</simplePara>
</reasonForUpdate>
```

The change markup shows that the reason for update indicates a technical change, because the attribute updateReasonType is set to the value "urt02". It is also intended that the reason for update appears in the highlights data module, because the attribute updateHighlight is set to the value "1".

2.5 Special rules for marking changes in tables

There are five ways to change mark a table. By marking the individual elements, the project gets flexibility at presentation. For the presentation of changes to tables, refer to Chap 6.2.2. Tables can be change marked on:

- the complete table only and not the table title. Refer to Para 2.5.1.
- the title of a table only. Refer to Para 2.5.2.
- the complete table and the table title. Refer to Para 2.5.3.
- individual rows only within a table. Refer to Para 2.5.4.

– individual rows and the table title. Refer to Para 2.5.5.

Business rule decision point BRDP-S1-00092 - Use of change marks for tables:

– Decide whether and how to use change marks for tables.

2.5.1 Marking only the complete table

Marking the complete table supports the standard page-oriented presentation. An alternative is to mark the table title line only. Refer to Para 2.5.2.

2.5.1.1 Adding

When a complete table is added, set appropriate values to the attributes of the element <table>.

Markup example:

```
<table id="tab-0003" changeType="add" changeMark="1"
reasonForUpdateRefIds="rfu-0001">
<title>Title</title>
...
</table>
```

2.5.1.2 Modifying

When a complete table is modified, set appropriate values to the attributes of the element <table>.

Markup example:

```
<table id="tab-0003" changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0002">
<title>Title</title>
...
</table>
```

2.5.1.3 Deleting

When a complete table is deleted, set appropriate values to the attributes of the element <table>.

Markup example:

```
<table id="tab-0003" changeType="delete" changeMark="1"
reasonForUpdateRefIds="rfu-0003">
<title>Title</title>
...
</table>
```

2.5.2 Marking only the table title

Marking only the table title line supports the standard page-oriented presentation. An alternative is to mark the complete table. Refer to Para 2.5.1.

2.5.2.1 Adding

When only a table title is added, set appropriate values to the attributes of the element <title> within the element <table>.

Markup example:

```
<table id="tab-0004">
<title changeType="add" changeMark="1"
reasonForUpdateRefIds="rfu-0004">Title added</title>
...
</table>
```

2.5.2.2 Modifying

When only a table title is modified, set appropriate values to the attributes of the element <title> within the element <table>.

Markup example:

```
<table id="tab-0004">
<title changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0005">Title modified</title>
...
</table>
```

2.5.2.3 Deleting

When only a table title is deleted, set appropriate values to the attributes of the element <title> within the element <table>.

Markup example:

```
<table id="tab-0004">
<title changeType="delete" changeMark="1"
reasonForUpdateRefIds="rfu-0006">Title</title>
...
</table>
```

2.5.3 Marking a complete table and the table title

2.5.3.1 Adding

When a whole table and its title are added, set appropriate values to the attributes of the element <table>.

Markup example:

```
<table id="tab-0005" changeType="add" changeMark="1"
reasonForUpdateRefIds="rfu-0007">
<title>Title added</title>
...
</table>
```

2.5.3.2 Modifying

Tables and their titles can be modified for the same reason or for different reasons.

2.5.3.2.1 Same reason

When a table and its title are modified for the same reason, set appropriate values to the attributes of the element <table>.

Markup example:

```
<table id="tab-0005" changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0008">
<title>Title modified</title>
```

```
...
</table>
```

2.5.3.2.2 Different reasons

When a table and its title are modified for different reasons, set appropriate values to the attributes of the element <table> and the element <title>.

Markup example:

```
<table id="tab-0005" changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0009">
<title changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0010">Title modified</title>
...
</table>
```

2.5.3.3 Deleting

When a whole table and its title are deleted, set appropriate values to the attributes of the element <table>. Refer to Para 2.5.1.3.

2.5.4 Marking only individual rows within a table

2.5.4.1 Adding

When a row is added, set appropriate values to the attributes of the element <row>.

Markup example:

```
<table id="tab-0006">
<title>Title</title>
<tgroup cols="3">
<tbody>
<row changeType="add" changeMark="1"
reasonForUpdateRefIds="rfu-0011">
<entry><para>This paragraph has been added.</para></entry>
...
</row>
...
</tbody>
</tgroup>
</table>
```

2.5.4.2 Modifying

When a row is modified, set appropriate values to the attributes of the element <row>.

Markup example:

```
<table id="tab-0006">
<title>Title</title>
<tgroup cols="3">
<tbody>
<row changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0012">
<entry><para>This paragraph has been modified.</para></entry>
...
</row>
...
</tbody>
```

```
</tgroup>
</table>
```

2.5.4.3 Deleting

When a row is deleted, set appropriate values to the attributes of the element <row>.

Markup example:

```
<table id="tab-0006">
<title>Title</title>
<tgroup cols="3">
<tbody>
<row changeType="delete" changeMark="1"
reasonForUpdateRefIds="rfu-0013">
<entry><para>This paragraph has been deleted.</para></entry>
...
</row>
...
</tbody>
</tgroup>
</table>
```

2.5.5 Marking individual rows within a table and the table title

2.5.5.1 Adding

When an individual row and the table title are added, set appropriate values to the attributes of the element <title> and the element<row>.

Markup example:

```
<table id="tab-0007">
<title changeType="add" changeMark="1"
reasonForUpdateRefIds="rfu-0014">Title added</title>
<tgroup cols="4">
<tbody>
<row changeType="add" changeMark="1"
reasonForUpdateRefIds="rfu-0015">
<entry><para>This paragraph has been added.</para></entry>
...
</row>
...
</tbody>
</tgroup>
</table>
```

2.5.5.2 Modifying

When a row and the table title are modified, set appropriate values to the attributes of the element <title> and the element<row>.

Markup example:

```
<table id="tab-0007">
<title changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0016">Title modified</title>
<tgroup cols="4">
<tbody>
```

```
<row changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0017">
<entry><para>This paragraph has been modified.</para></entry>
...
</row>
...
</tbody>
</tgroup>
</table>
```

2.5.5.3 Deleting

When a row and the table title are deleted, set appropriate values to the attributes of the element <title> and the element<row>.

Markup example:

```
<table id="tab-0007">
<title changeType="delete" changeMark="1"
reasonForUpdateRefIds="rfu-0018">Title deleted</title>
<tgroup cols="4">
<tbody>
<row changeType="delete" changeMark="1"
reasonForUpdateRefIds="rfu-0019">
<entry><para>This paragraph has been deleted.</para></entry>
...
</row>
...
</tbody>
</tgroup>
</table>
```

2.6 Special rules for marking change in figures

There are three ways to change mark a figure. By marking the individual elements, the project gets flexibility at presentation. For the presentation of changes to figures, refer to Chap 6.2.2. Figures can be change marked on:

- the figure only. Refer to Para 2.6.1.
- the title of a figure only. Refer to Para 2.6.2.
- the figure and the figure title. Refer to Para 2.6.3.

Business rule decision point BRDP-S1-00093 - Use of change marks for figures:

- Decide whether and how to use change marks for figures.

2.6.1 Marking the complete figure only

2.6.1.1 Adding

When a figure is added, its title is also added, because the element <title> is mandatory within the element <figure>. Set appropriate values to the attributes of the element <figure>.

Markup example:

```
<figure id="fig-0003" changeType="add" changeMark="1"
reasonForUpdateRefIds="rfu-0001">
<title>Title</title>
```

```
<graphic infoEntityIdent="ICN-S3627-S1000D0800-001-01"/>
</figure>
```

2.6.1.2 Modifying

When a figure only is modified, set appropriate values to the attributes of the element <figure>.

Markup example:

```
<figure id="fig-0003">
<title>Title</title>
<graphic infoEntityIdent="ICN-S3627-S1000D0800-002-01"
changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0002"/>
</figure>
```

2.6.1.3 Deleting

When a whole figure is deleted, set appropriate values to the attributes of the element <figure>.

Markup example:

```
<figure id="fig-0003" changeType="delete" changeMark="1"
reasonForUpdateRefIds="rfu-0003">
<title>Title</title>
<graphic infoEntityIdent="ICN-S3627-S1000D0800-003-01"/>
</figure>
```

Note

The graphic is still upissued.

2.6.2 Marking only the figure title

Marking only the figure title will support the standard page-oriented presentation.

2.6.2.1 Adding

Figure titles are mandatory within the element <figure> and can only be added with the figure. Refer to Para 2.6.1.1.

2.6.2.2 Modifying

When a figure title is modified, set appropriate values to the attributes of the element <title> within the element <figure>.

Markup example:

```
<figure id="fig-0003">
<title changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0004">Title modified</title>
<graphic infoEntityIdent="ICN-S3627-S1000D0800-003-01"/>
</figure>
```

2.6.2.3 Deleting

Figure titles cannot be deleted without deleting the complete figure. Refer to Para 2.6.1.3.

2.6.3 Marking complete figures

2.6.3.1 Adding

When the figure is added, its title is also added, because the element <title> is mandatory within the element <figure>. Refer to Para 2.6.1.1.

2.6.3.2 Modifying

Figures and their titles can be modified for the same reason or for different reasons.

2.6.3.2.1 Same reason

When a figure and its title are modified for the same reason, set appropriate values to the attributes of the element <figure>.

Markup example:

```
<figure id="fig-0007" changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0005">
<title>Title modified</title>
<graphic infoEntityIdent="ICN-S3627-S1000D0800-003-01">
</figure>
```

2.6.3.2.2 Different reasons

When a figure and its title are modified for different reasons, set appropriate values to the attributes of the element <figure> and the element <title>.

Markup example:

```
<figure id="fig-0007" changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0006">
<title changeType="modify" changeMark="1"
reasonForUpdateRefIds="rfu-0007">Title modified</title>
<graphic infoEntityIdent="ICN-S3627-S1000D0800-003-01"/>
</figure>
```

2.6.3.3 Deleting

When a figure and its title are deleted, set appropriate values to the attributes of the element <figure>.

Markup example:

```
<figure id="fig-0007" changeType="delete" changeMark="1"
reasonForUpdateRefIds="rfu-0008">
<title>Title</title>
<graphic infoEntityIdent="ICN-S3627-S1000D0800-004-01"/>
</figure>
```

Note

The graphic is still upissued.

2.6.4 Marking sheets in a multisheet figure

When a sheet (or sheets) of a figure are changed, values for the attributes of the element <graphic> that contain the sheet are set in the same way as the element <figure>.

2.7 Special rules for indicating changes in warnings and cautions

It is essential that the user reads a complete warning and caution when performing the maintenance task. Therefore, change marks must be applied to the complete warning or caution and not to individual words or paragraphs that they contain.

Markup example:

The following example shows how to markup a warning that has changed.

```
<warning changeMark="1" changeType="modify"
reasonForUpdateRefIds="rfu-0022">
<warningAndCautionPara>Do not drink the oil or allow it to spill
on your skin. It can kill you.</warningAndCautionPara>
</warning>
```

The change markup shows that the element has been modified and a change bar, mark or other visual indication is intended to be displayed. The corresponding reason for update would be:

```
<reasonForUpdate id="rfu-0022" updateHighlight="1"
updateReasonType="urt02">
<simplePara>Warning changed in accordance with the new
requirements of HAZMAT001.</simplePara>
</reasonForUpdate>
```

The change markup shows that the reason for update indicates a technical change because the attribute `updateReasonType` is set to the value "`urt02`". It is also intended that the reason for update appears in the highlights data module, because the attribute `updateHighlight` is set to the value "`1`".

Chapter 3.9.5.2.1.2

Common constructs - Referencing

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1 General

The rules, definitions and handling of references and cross-references from an author's point of view are given below. Details about the available elements and attributes and how to use and populate them are also given.

The rules for the presentation of references and cross-references in page-oriented publications and IETP are given in Chap 6.2 and in Chap 6.3, respectively.

References are used to direct the reader to another document or to a certain place within the document. Thus, there are two types of references used in S1000D:

- Cross-references - Internal references (eg, to other places within the same data module). Refer to Para 2.1.
- References - External references:
  - Refer to Para 2.2 for a general description of the references to other data modules.
  - Refer to Para 2.3 for a general description of the references from SCO content data modules to portions of a destination data module.
  - Refer to Para 2.5 for a general description of references to publication modules.
  - Refer to Para 2.6 for a general description of references to other external documents.
  - Refer to Para 2.7 for rules regarding the presentation of references in the reference table of the data module.
  - Refer to Para 2.8 for rules regarding the use of "inline" references to other documents.

In IETP, references and cross-references are usually realized as links. To support establishment of such links, the reference elements are provided with five XLink attributes. These attributes are not aimed to be manually populated by an author. For guidance and examples, refer to Chap 7.7.4.

References given in the SCO content data modules (using the SCO content Schema) include an XPath linking mechanism. For guidance and examples, refer to Chap 7.7.5.

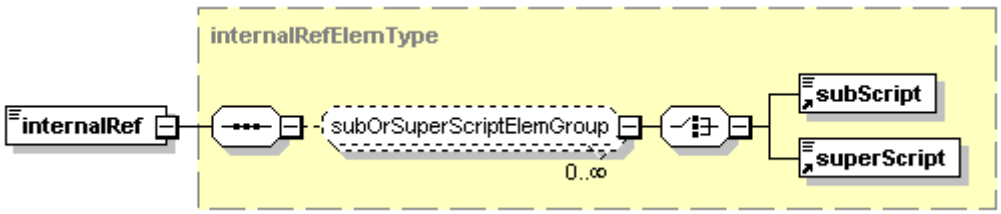
2 Use of references

2.1 Cross-references within a data module

Description: The element <`internalRef`> is used to markup a cross-reference from one point in a data module to another point in the same data module. This is achieved by linking the attribute `internalRefId` to the target attribute `id`, refer to Para 2.1.1.

The identification of cross-references is described in Para 2.1.1, and the linking mechanism is described in Chap 7.7.4.

Markup element: <`internalRef`>



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Fig 1 Element <`internalRef`>

Hotspot areas within graphics can also be cross-referenced from within a data module and back by using the element <`internalRef`>. A graphical hotspot can also point at another graphical hotspot within the same graphic. Refer to Chap 3.9.5.2.1.8 for details.

Cross-references can be made to any element that has its attribute `id` populated.

When cross-referring to an alternate element (<`figureAlts`>, <`levelledParaAlts`>, etc), use the attribute `id` of this element rather than its child element (<`figure`>, <`levelledPara`>, etc).

This chapter gives the rules for coding cross-references to:

- figures
- tables
- multimedia
- supplies
- support equipment
- spares
- material set lists
- paragraphs
- steps in procedures, fault isolation, etc
- graphics (sheets)
- multimedia objects
- hotspots
- parameters
- work locations
- single material or material sets
- access points
- zones

Cross-references to paragraphs, steps, figures, sheets, hotspots, multimedia, multimedia objects and tables must be preceded with the prefixes "Para", "Step", "Fig", "Fig, Sheet", "Fig [ ]", "Fig, Object" and "Table", respectively, when presented. The prefix must include the number of the target, for example, the paragraph, step or figure number. These cross-references can be followed by a title by project decision.

Note

The prefixes are normally not entered in the data modules when data modules are written, since many tools automatically generate the prefixes, either by analyzing the reference or by using the attribute `internalRefTargetType`. Also refer to the business rule decision points below.

There are several methods that can be used to include and present the title or other supporting information for the cross-reference:

- Include the information as textual content in the element <`internalRef`>.

  Note

  The element <`internalRef`> can have textual content including subscripts and superscripts.

- Include the information in the attribute `targetTitle`.

The title of the target, if given, in the element <`title`> in <`levelledPara`>, <`proceduralStep`>, <`figure`>, <`multimedia`> or <`table`>, or in the attribute `hotspotTitle` can also be used for presentation.

Note

Presentation of the titles (by project decision) depends on the presentation system and its settings.

For all the methods listed above, the following rules apply:

- Any textual content of the element <internalRef> must be presented. Any information given in the attribute targetTitle is disregarded in a page-oriented presentation but can be used as a tooltip in a viewer application.
- Cross-references to supplies, support equipment, spares, material sets and zones must be presented by the textual content of the target child element <shortName> or, if there is no element <shortName>, by the textual content of the element <name>. For an alternative presentation of zones, refer to Chap 6.2.2.

  If the project has decided to use and present any of the "identifiers" given in the elements <reqSupplies>, <reqSupportEquips> and <reqSpares>, respectively, (eg, the NATO stock number, the functional item number, or the CSN), the identifier must be included in the textual content of the element <internalRef> in the delivered data modules. The "identifiers" can be derived from the content of these three elements.

  When the element <internalRef> is populated, **only** the textual content of this element is presented, not the content of the element <shortName> or the element <name>.

  Note

  Any information given in the attribute targetTitle can be used as a tooltip in a viewer application.

- Cross-references to parameters, work locations and access points must be presented by the textual content of the child elements <parameterName>, <workArea> and <name>, respectively. For an alternative presentation of access points, refer to Chap 6.2.2.

  If the project has decided to use and present any of the "identifiers" given in the element <workLocation> (eg, the installation location, the coordinates on the Product, or an item on the Product), the identifier must be included in the textual content of the element <internalRef> in the delivered data modules. The "identifiers" can be derived from the content of the element <workLocation>.

  When the element <internalRef> is populated, **only** the textual content of this element is presented. Refer to Chap 6.2.2 for details.

  Note

  Make sure that either the element <workArea> or the element <internalRef> is populated.

  Note

  Any information given in the attribute targetTitle can be used as a tooltip in a viewer application.

- Cross-references to hotspots must be presented by the value of the attribute referredFragment of the element <internalRef>, or by the value of the target attribute applicationStructureName if there is no attribute referredFragment.

  When the element <internalRef> is populated, **only** the textual content of this element is presented. Refer to Chap 6.2.2 for details.

  Note

  Any information given in the target hotspot attribute hotspotTitle can be used as a tooltip in a viewer application.

For details on presentation of cross-references using target types "irtt01" thru "irtt17", refer to Chap 6.2.2.

The author must in all cases enter all "separators" like comma [,], spaces [ ], parenthesis [(], [)], "and" and "or".

Table 2 Cross-references - Examples

Cross-reference to	Method of presentation	Note
Para <levelledPara>	Para 3.2.1 (for <levelledPara> at third level)	This method is the usual method in documents using side heads.
A number of paragraphs	Para 2.1 and Para 3.4	
Table	Table 3	
Figure as a whole	Fig 1	
A number of figures as a whole	Fig 1, Fig 3 and Fig 5	
Illustration sheet of a multi-sheet figure	Fig 2, Sheet 3	An alternative method of presenting the cross-reference is Fig 2.3.
Cross-reference to a callout in a figure (hotspot)	Fig 1 [2]	Callout (Item) 2 in Fig 1
Cross-reference to several callouts in the same figure	Fig 6 [1], Fig 6 [3], Fig 6 [5]	

Attributes:

- internalRefId (O), the target id. Refer to Para 2.1.1.
- internalRefTargetType (O), the type of destination of the reference. The attribute internalRefTargetType can have one of the following values:
  - "irtt01" thru "irtt99". Refer to Chap 3.9.6.1. Refer to default BREX rules BREX-S1-00045 thru BREX-S1-00060.
- referredFragment (O), the cross-reference to an item number of a hotspot in an illustration within the data module. Refer to Chap 3.9.5.2.1.8.
- targetTitle (O), a human-readable tooltip to be displayed when for instance the cursor is hovering over the target identifier in a viewer application. For details, refer to the rules given above.
- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Note

The element <internalRef> also includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

- <subScript>. Refer to Chap 3.9.5.2.1.
- <superScript>. Refer to Chap 3.9.5.2.1.

Business rule decision point BRDP-S1-00094 - Extent of cross-referencing:

- Decide on the extent of cross-referencing within data modules and the methods used for populating the various attributes.

Business rule decision point BRDP-S1-00095 - Use of the element <internalRef> in titles:

- Use of the element <internalRef> in titles is strongly discouraged. However, decide whether to use cross-references in titles.

Business rule decision point BRDP-S1-00096 - Use of the attribute targetTitle:

- Decide whether to use the attribute targetTitle. When used (populated), it is a tooltip in a viewer application.

Business rule decision point BRDP-S1-00098 - Use of the textual content of the element <internalRef> in cross-references:

- Decide whether to use the textual content of the element <internalRef>. When used (populated), it must be presented.

Business rule decision point BRDP-S1-00099 - Use of the "identifiers" given in the elements <reqSupportEquips>, <reqSupplies>, <reqSpares> or <workLocation>:

- Decide whether to use any of the "identifiers" given in the elements <reqSupportEquips>, <reqSupplies>, <reqSpares> or <workLocation> as the presented link (textual content of the element <internalRef>), or as a tooltip in a viewer application (value of the attribute targetTitle).

  Note

  The "identifiers" can be derived from the content of the child elements or the attributes of the four elements.

Business rule decision point BRDP-S1-00100 - Use of the attribute internalRefTargetType:

- Decide whether to use the attribute internalRefTargetType, which values to use and allocate suitable definitions to the values. Refer to Chap 3.9.6.1.

Markup examples:

Example 1: Cross-reference to a levelled paragraph in a descriptive data module. The element <internalRef> is empty, and the value of the attribute internalRefTargetType is "irtt07". The project has decided **not** to present any titles for paragraph cross-references.

```
<para>For more information, refer to <internalRef
internalRefId="par-0074"
internalRefTargetType="irtt07"/>.</para>
```

- Presentation - Page-oriented:

  "For more information, refer to Para 3."

- Comment: The building of the link, the generation of the prefix "Para", together with the relevant paragraph number "3", is defined by the stylesheet". The attribute `targetTitle` is not populated.

Example 2: Cross-reference to a levelled paragraph in a descriptive data module. The element <`internalRef`> is empty, and the value of the attribute `internalRefTargetType` is "`irtt07`". The project has decided to present titles for paragraph cross-references.

```
<para>For more information, refer to <internalRef
internalRefId="par-0074"
internalRefTargetType="irtt07"/>.</para>
```

- Presentation - Page-oriented:

  "For more information, refer to Para 3 - All you need to know about cross-references."

- Comment: The building of the link, the generation of the prefix "Para", together with the relevant paragraph number "3", is defined by the stylesheet. The title of the target element ("All you need to know about cross-references") is derived from the target element and presented after the prefix (preceded by a space). The attribute `targetTitle` is not populated.

  Note

  Presentation of the title is dependent on the presentation system.

Example 3: Cross-reference to a table. The element <`internalRef`> is empty, and the attribute value is "`irtt02`". The project has decided not to present any titles for table cross-references.

```
<para>To get the latest time table for the express trains to
Linkoeping, refer to <internalRef internalRefId="tab-4711"
internalRefTargetType="irtt02"/>.</para>
```

- Presentation - Page-oriented:

  "To get the latest time table for the express trains to Linkoeping, refer to Table 7."

- Comment: The building of the link, the generation of the prefix "Table ", together with the relevant table number "7", is defined by the stylesheet. The attribute `targetTitle` is not populated.

Example 4: Cross-reference to a table in a descriptive data module. The element <`internalRef`> has content and the attribute `internalRefTargetType` is not given.

```
<para>To identify power supply leads, refer to <internalRef
internalRefId="tab-0081">Power supply lead
identification</internalRef>.</para>
```

- Presentation - Page-oriented:

  "To identify power supply leads, refer to Table 6 Power supply lead identification."

- Comment: The building of the link, the generation of the prefix "Table ", together with the relevant table number "6" is defined by the stylesheet. There is textual content ("Power supply lead identification") in the element <`internalRef`> which must be presented (after the prefix). The attribute `internalRefTargetType` is not populated, but the presentation system must recognize the target type based on the target element.

Example 5: Cross-reference to a levelled paragraph in a descriptive data module. The attribute `targetTitle` has content, and the value of the attribute `internalRefTargetType` is "`irtt07`".

```
<para>All necessary information related to the weight variants,
their maximum weights and the modifications associated with the
aircraft type is given in <internalRef internalRefId="par-0123"
internalRefTargetType="irtt07" targetTitle="Weight variant
information list"/>.</para>
```

– Presentation - Page-oriented:

  "All necessary information related to the weight variants, their maximum weights and the modifications associated with the aircraft type is given in Para 4."

– Comment: The building of the link, the generation of the prefix "Para ", together with the relevant paragraph number "4", is defined by the stylesheet. The attribute `targetTitle` is populated but is not shown in a page-oriented presentation. The value of the attribute `targetTitle` can be used as a tooltip in a viewer application.

Example 6: Cross-reference to a figure. The attribute `targetTitle` has content, and the value of the attribute `internalRefTargetType` is "`irtt01`".

```
<para>Refer to <internalRef internalRefId="fig-0084"
internalRefTargetType="irtt01" targetTitle="Wing rib
stations"/>.</para>
```

– Presentation - Page-oriented:

  "Refer to Fig 5."

– Comment: The building of the link, the generation of the prefix "Fig", together with the figure number "5", is defined by the stylesheet. The attribute `targetTitle` is populated but is not shown in a page-oriented presentation. The value of the attribute `targetTitle` can be used as a tooltip in a viewer application.

Example 7: Cross-reference to a hotspot. The element <`internalRef`> is empty, and the value of the attribute `internalRefTargetType` is "`irtt11`". The attribute `referredFragment` is not populated.

```
<para>Tighten the nut <internalRef internalRefId="fig-1234-hot-
0935" internalRefTargetType="irtt11"/>.</para>
```

– Presentation - Page-oriented:

  "Tighten the nut, Fig 6 [25]".

– Comment: The building of the link, the generation of the prefix "Fig", together with the figure number "6", and the value of the target attribute `applicationStructureName` within square brackets "[25]" is defined by the stylesheet.

  The attribute `targetTitle` is not populated. The markup of the destination for the internal reference contains:

```
<hotspot id="fig-1234-hot-0935"
applicationStructureIdent="hot0935"
applicationStructureName="25" hotspotType="CALLOUT"
hotspotTitle="25 - Under cover lock"></hotspot>
```

For more markup examples of hotspot linking, refer to Chap 3.9.5.2.1.8.

Example 8: Cross-reference to a single sheet of a multi-sheet figure. The element <internalRef> is empty, and the value of the attribute internalRefTargetType is "irtt09". The project has decided to present titles for figure cross-references.

```
<para>Refer to <internalRef internalRefId="gra-1245"
internalRefTargetType="irtt09"/>.</para>
```

– Presentation - Page-oriented:

  "Refer to Fig 7, Sheet 2 The eminent Publishing WG in action."

– Comment: The building of the link, the generation of the prefix "Fig", together with the figure number "7", the word "Sheet" and the relevant target sheet number is defined by the stylesheet.

  The project has decided to present the titles for figure cross-references. The attribute targetTitle is not populated. The figure title "The eminent Publishing WG in action" is derived from the child element <title> of the element <figure>, and is presented after the prefix (preceded by a space) as decided by the project.

Example 9: Cross-reference to support equipment. The short name "Voltmeter" is given in the preliminary requirements. The author has included a tooltip.

```
<para>Connect a <internalRef internalRefId="seq-2435"
internalRefTargetType="irtt05" targetTitle="Voltmeter (range 0-
100V)"/> to pin 34 and pin 38.</para>
```

– Presentation - Page-oriented:

  "Connect a Voltmeter to pin 34 and pin 38."

– Comment: The <shortName> ("Voltmeter") given in the table Support equipment (in the element <reqSupportEquips>) is presented. The information given in the element <targetTitle> ("Voltmeter (range 0-100V)") can be used as a tooltip in a viewer application.

Example 10: Cross-reference to special support equipment. The element <shortName> is not given.

```
<para>In the cockpit, on the center pedestal, install the
<internalRef internalRefId="seq-1867"
internalRefTargetType="irtt05"/> on the slat/flap control
lever.</para>
```

– Presentation - Page-oriented:

  "In the cockpit, on the center pedestal, install the Locking tool-flap slat control lever (98L27801001000) on the slat/flap control lever."

– Comment: The project follows the default rules and presents the name as given in the element <name> ("Locking tool-flap slat control lever (98L27801001000)") within the table Support equipment (in the element <reqSupportEquips>) of the preliminary requirements.

Example 11: Cross-reference to a supply. The element <shortName> is populated.

```
<para>Lightly lubricate with <internalRef internalRefId="sup-
3010" internalRefTargetType="irtt04"/>.</para>
```

- Presentation - Page-oriented:

  "Lightly lubricate with Common grease Type 1."

- Comment: The project follows the default rules and presents the name ("Common grease Type 1") given in the element <shortName> within the table Consumables, materials and expendables (in the element <reqSupplies>).

Example 12: Cross-reference to an access point. The project has decided to present the content of the attributes accessPointNumber and accessPointTypeValue. The element <name> is not populated.

```
<para>Open <internalRef internalRefId="acp-0122"
internalRefTargetType="irtt16"/>.</para>
```

- Presentation - Page-oriented:

  "Open Access Panel 521 AT."

- Comment: As there is no value given in the element <name>, the alternate rules are used, and the content of the attribute accessPointTypeValue (value "accpnl02" = Panel) followed by the content of the attribute accessPointNumber (value "521 AT") is presented after the prefix "Access ".

2.1.1 Identification of internal references (cross-references)

Usually, in an IETP a cross-reference will appear as a link, as described in Para 2.1. However, there is also a number of possible implicit links in a data module which are not explicitly authored as cross-references. Examples are references from some content location to an applicability annotation located in the status section, or a reference from some content location to a change note in the element <reasonForUpdate>, also located in the status section.

To enable these references/links within the data module, the targets of the links must be uniquely identified which is achieved by providing the possible target elements with dedicated identification attributes. These are always named id. To establish a link, the element from where the link starts (source element) is provided with a corresponding attribute which is populated with the identity given by the attribute id of the target element. Link source attributes have names like xxxRefId.

In most implementations of S1000D, population of the element identities (ie, the id attributes) is cared for automatically.

Business rule decision point BRDP-S1-00101 - Define the format of the cross-reference attributes id and internalRefId:

- Decide whether the values of the cross-reference attributes id and internalRefId must be prefixed by alpha characters that identify the type of the target element. Example:
  - Structure: Prefix followed by a hyphen and a four-digit number to make it unique within the data module (eg, "par-0001")
  - Prefixes:
    - "fig" for figures and alternates
    - "tab" for tables
    - "mma" for multimedia and alternates
    - "sup" for supplies
    - "seq" for support equipment
    - "spa" for spares

- "par" for levelled paragraphs and alternates
- "stp" for steps of procedure, fault isolation, etc, and alternates
- "gra" for graphics (multiple sheets)
- "mmo" for multimedia objects
- "hot" for hotspots (eg, "fig-0001-hot-0002")
- "pme" for parameters
- "zon" for zones
- "wla" for work locations
- "mat" for single material or material sets
- "msl" for material set lists
- "acp" for access points

Note

The four-digit number has no connection to, for example, the figure or table number which is generated for data module presentation. For example, the value of the attribute id can be "fig-0345" for "Fig 1". Refer to Para 2.1.

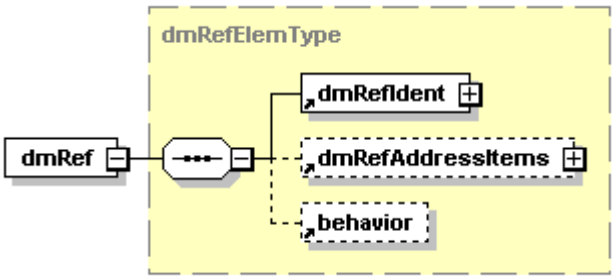
Note

Refer to Chap 3.9.5.2.1.10 for the equivalent business rule decision point regarding footnotes. Example: "ftn-0001".

2.2 References to data modules

Description: The element <dmRef> contains the necessary information items to build a link to a destination data module. It contains the identification of the destination data module as well as information to control presentation and behavior of the reference/link to the data module or a fragment of the data module.

Markup element: <dmRef>



ICN-S3627-S1000D0571-001-01

Fig 2 Element <dmRef>

Attributes:

- referredFragment (O), the identification of an exact target within a data module when a reference addresses a specific location within another data module rather than the whole data module. The target must be an element in the destination data module, and the target identification is the value of the attribute id of the target element.
- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Para 2.1.1.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Note

The element <dmRef> also includes five attributes, normally populated by the authoring application to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

- <dmRefIdent>, the items forming a unique identification of a destination data module. Refer to Para 2.2.1.
- <dmRefAddressItems>, the additional information about the destination data module. Refer to Para 2.2.2.
- <behavior>, the appearance/behavior of the destination data module or a fragment of the destination data module. Refer to Para 2.2.3.

Markup example:

The following example shows a reference to another data module including its title and issue number (child elements are described below):

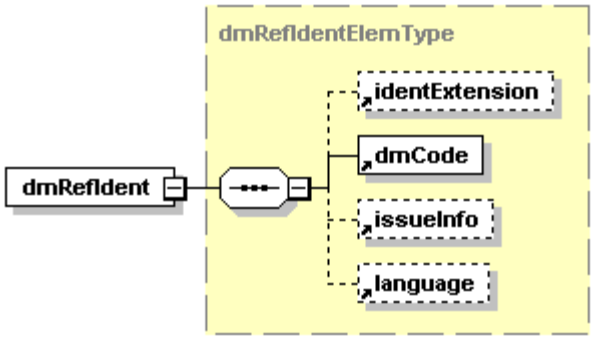
```
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA2" subSystemCode="2" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="520" infoCodeVariant="A" itemLocationCode="A"/>
<issueInfo issueNumber="002" inWork="00"/>
</dmRefIdent>
<dmRefAddressItems>
<dmTitle>
<techName>Handlebar</techName>
<infoName>Remove procedures</infoName>
</dmTitle>
</dmRefAddressItems>
</dmRef>
```

2.2.1 Identification of a referred data module

Description: The element <dmRefIdent> contains the items forming a unique identification of the destination data module.

The project or the organization must be aware of the implications of using issue and inwork numbers as well as language and country codes of the destination data module when referenced data modules are updated.

Markup element: <dmRefIdent>



ICN-S3627-S1000D0572-001-01

Fig 3 Element <dmRefIdent>

Attributes:

– None

Child elements:

– <identExtension>, the additional parameters needed to establish a unique identification of a data module in those cases when data module code, issue and inwork numbers together with the language and country codes are insufficient to form a universally unique identity. The element <identExtension> establishes a producer unique subdomain for identification. Refer to Chap 4.12.
– <dmCode>, the data module code of the destination data module. Refer to Chap 3.9.5.1 and Chap 4.3.
– <issueInfo>, the issue information needed to address a particular issue of the destination data module. Refer to Chap 3.9.5.1.
– <language>, the language of the destination data module. Refer to Chap 3.9.5.1.

Markup examples:

Reference to a data module with DMC:

```
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA2" subSystemCode="2" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="520" infoCodeVariant="A" itemLocationCode="A"/>
<issueInfo issueNumber="002" inWork="00"/>
</dmRefIdent>
```

Reference to a data module instance with DME:

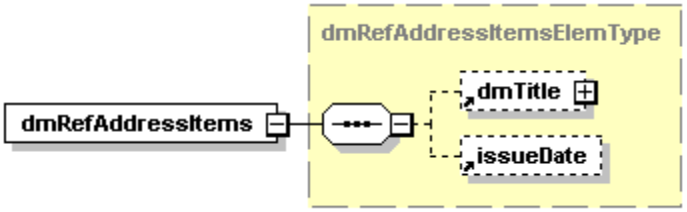
```
<dmRefIdent>
<identExtension extensionProducer="SF518"
extensionCode="ABC00231"/>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA2" subSystemCode="2" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="520" infoCodeVariant="A" itemLocationCode="A"/>
<issueInfo issueNumber="002" inWork="00"/>
</dmRefIdent>
```

2.2.2 Complementary identifying information for a data module

Description: The element <dmRefAddressItems> contains additional identifying information about the destination data module.

The project or the organization must be aware of the implications of using the title and the issue date of the destination data module when referenced data modules are updated.

Markup element: <dmRefAddressItems>



ICN-S3627-S1000D0573-001-01

Fig 4 Element <dmRefAddressItems>

Attributes:

– None

Child elements:

– <dmTitle>, the data module title of the destination data module. Refer to Chap 3.9.5.1.
– <issueDate>, the issue date of the destination data module. Refer to Chap 3.9.5.1.

Markup example:

```
<dmRefAddressItems>
<dmTitle>
<techName>Handlebar</techName>
<infoName>Remove procedures</infoName>
</dmTitle>
</dmRefAddressItems>
```

2.2.3 Link behavior information

Description: The element <behavior> contains the appearance (behavior) of the destination data module or a fragment of the destination data module.

Markup element: <behavior>

Attributes:

– linkShow (O), the link appearance, if an XLink link is established. Refer to Chap 7.7.4. The attribute linkShow can have one of the following values:

- "newPane" - show the referred context in a new pane
- "embedInContext" - embed the referred context in the current context
- "replaceAndReturnToSource" - show the referred context instead of the current context, and return automatically to the current context when the referred context has been viewed
- "replaceAndNoReturn" - show the referred context instead of the current context, but do not automatically return to the current context when the referred context has been viewed.

– linkActuate (O), the link behavior, if an XLink link is established. Refer to Chap 7.7.4. The attribute linkActuate can have one of the following values:
  - "onLoad" - present the referred context automatically when the link is loaded (ie, when the link appears in the currently viewed context)
  - "onRequest" - present the referred context on user request only

Child elements:

– None

Markup example:

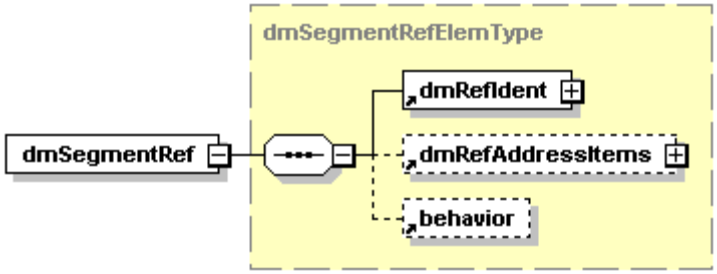
The following example illustrates how to markup a reference/link that will cause the reference target to show in a separate pane on the screen as soon as the link appears in the viewing context.

```
<behavior linkShow="newPane" linkActuate="onLoad"/>
```

2.3 References to portions of a data module from a SCO content data module

Description: The element <dmSegmentRef> contains all necessary details to constitute a reference from some context, such as a data module or a publication module, to portions of a destination data module by the use of an XPath expression.

Markup element: <dmSegmentRef>



ICN-S3627-S1000D0574-001-01

Fig 5 Element <dmSegmentRef>

Attributes:

– targetPath (M), the identification of the portion of a destination data module addressed by the reference. The portion is identified using an XPath expression. For guidance and examples, refer to Chap 7.7.5.
– applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
– id (O), the identifier of the markup element. Refer to Para 2.1.1.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Note

The element <dmSegmentRef> also includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

- <dmRefIdent>, the items forming the unique identification of a destination data module. Refer to Para 2.1.1.
- <dmRefAddressItems>, additional information about the destination data module. Refer to Para 2.2.1.
- <behavior>, the appearance/behavior of the destination data module or a fragment of the destination data module. Refer to Para 2.2.3.

Markup example:

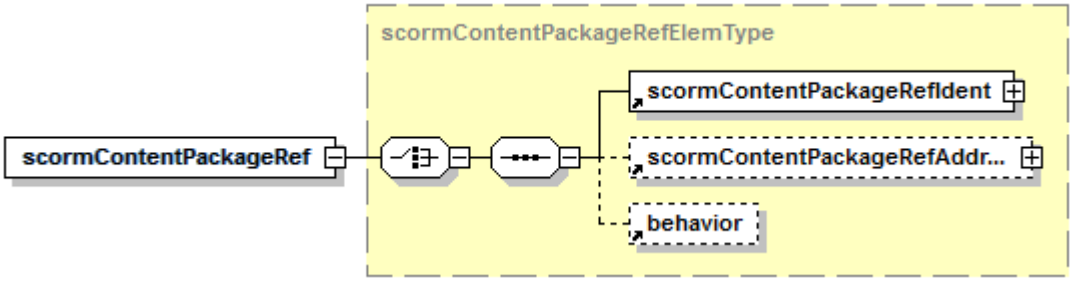
The following example shows a reference to another data module including its title and issue number:

```
<dmSegmentRef targetPath="//mainProcedure">
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA2" subSystemCode="2" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="520" infoCodeVariant="A" itemLocationCode="A"/>
<issueInfo issueNumber="007" inWork="00"/>
</dmRefIdent>
<dmRefAddressItems>
<dmTitle>
<techName>Handlebar</techName>
<infoName>Remove procedures</infoName>
</dmTitle>
</dmRefAddressItems>
</dmSegmentRef>
```

2.4 References to SCORM content packages

Description: The element <scormContentPackageRef> contains details of the destination SCORM content package that is referred from another SCORM content package.

Markup element: <scormContentPackageRef>



ICN-83007-0000000135-001-01

Fig 6 Element <scormContentPackageRef>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Para 2.1.1.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Note

The element <`scormContentPackageRef`> also includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

- <`scormContentPackageRefIdent`>, the items forming a unique identification of a destination SCORM content package. Refer to Para 2.4.1.
- <`scormContentPackageRefAddressItems`>, additional information about the destination SCORM content package. Refer to Para 2.4.2.
- <`behavior`>, the appearance/behavior of the destination SCORM content package. Refer to Para 2.2.3.

Markup example:

The following example shows a reference to a SCORM content package by using the elements <`scormContentPackageRefIdent`> and <`scormContentPackageRefAddressItems`> (child elements are described below):

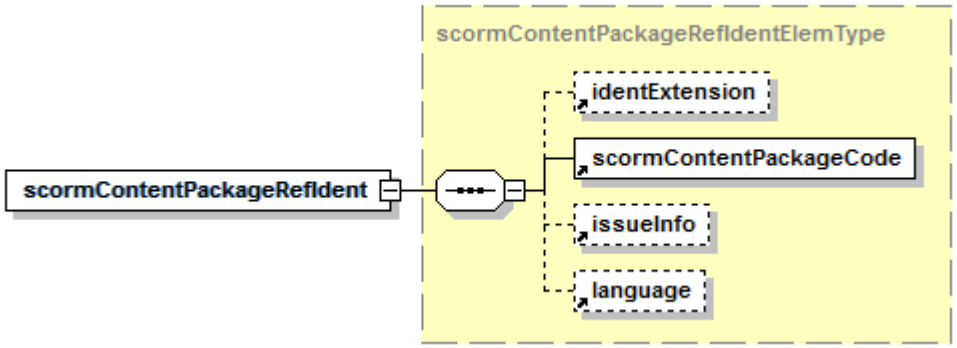
```
<scoEntry>
<scoEntryItem>
<scormContentPackageRef>
<scormContentPackageRefIdent>
<scormContentPackageCode modelIdentCode="S1000DBIKE"
scormContentPackageIssuer="AH019"
scormContentPackageNumber="00001"
scormContentPackageVolume="00"/>
<language countryIsoCode="US" languageIsoCode="en"/>
<issueInfo inWork="00" issueNumber="001"/>
</scormContentPackageRefIdent>
<scormContentPackageRefAddressItems>
<issueDate day="12" month="01" year="2010"/>
<scormContentPackageTitle>S1000D BIKE learning
sample</scormContentPackageTitle>
</scormContentPackageRefAddressItems>
</scormContentPackageRef>
</scoEntryItem>
</scoEntry>
```

2.4.1 Identification of a referred SCORM content package

Description: The element <scormContentPackageRefIdent> contains the items forming a unique identification of the destination SCORM content package.

The project or the organization must be aware of the implications of using issue and inwork numbers as well as language and country codes of the destination SCORM content package when referenced SCORM content packages are updated.

Markup element: <scormContentPackageRefIdent>



ICN-83007-0000000136-001-01

Fig 7 Element <scormContentPackageRefIdent>

Attributes:

– None

Child elements:

– <identExtension>, the additional parameters needed to establish a unique identification of a SCORM content package in those cases where the SCORM content package, the issue and inwork numbers together with the language and country are insufficient to form a universally unique identity. The element <identExtension> establishes a producer unique subdomain for identification. Refer to Chap 4.12.
– <scormContentPackageCode>, the SCORM content package code of the destination SCORM content package. Refer to Chap 4.15.2.
– <issueInfo>, the issue information needed to address a particular destination SCORM content package issue. Refer to Chap 3.9.5.1.
– <language>, the language of the destination SCORM content package. Refer to Chap 3.9.5.1.

Markup examples:

```
<scormContentPackageRef>
<scormContentPackageRefIdent>
<scormContentPackageCode modelIdentCode="S1000DBIKE"
scormContentPackageIssuer="AH019"
scormContentPackageNumber="00001"
scormContentPackageVolume="00"/>
<language countryIsoCode="US" languageIsoCode="en"/>
<issueInfo inWork="00" issueNumber="001"/>
</scormContentPackageRefIdent>
</scormContentPackageRef>
```

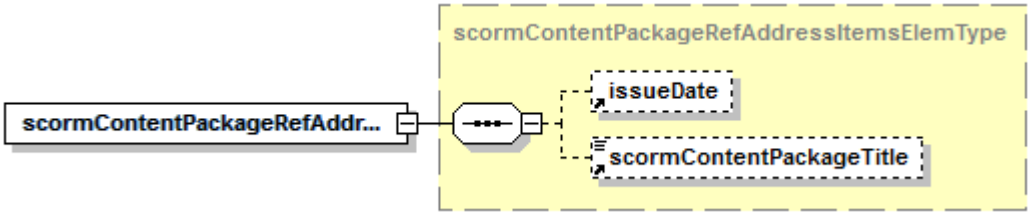
2.4.2 Complementary identifying information for a SCORM content package

Description: The element <scormContentPackageRefAddressItems> contains additional identifying information about the destination SCORM content package.

Note

Only the SCORM content package code, the SCORM content package title, and the issue number will be presented in page-oriented publications. Refer to Chap 6.2.2.

Markup element: <scormContentPackageRefAddressItems>



ICN-83007-0000000137-001-01

Fig 8 Element <scormContentPackageRefAddressItems>

Attributes:

– None

Note

The element <scormContentPackageRefAddressItems> also includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

– <scormContentPackageTitle>, the SCORM content package title of the destination SCORM content package. Refer to Chap 4.15.1.
– <issueDate>, the issue date of the destination SCORM content package. Refer to Chap 3.9.5.1.

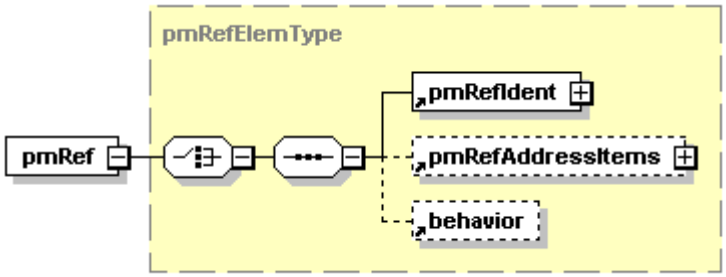
Markup example:

```
<scormContentPackageRefAddressItems>
<issueDate day="12" month="01" year="2010"/>
<scormContentPackageTitle>S1000D BIKE learning
sample</scormContentPackageTitle>
</scormContentPackageRefAddressItems>
```

2.5 References to publications

Description: The element <pmRef> contains details of the destination publication module that is referred from some other S1000D context, such as a data module or another publication module.

Markup element: <pmRef>



ICN-S3627-S1000D0575-001-01

Fig 9 Element <pmRef>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Para 2.1.1.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Note

The element <`pmRef`> also includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

- <`pmRefIdent`>, the items forming a unique identification of a destination publication module. Refer to Para 2.5.1.
- <`pmRefAddressItems`>, additional information about the destination publication module. Refer to Para 2.5.2.
- <`behavior`>, the appearance/behavior of the destination publication module. Refer to Para 2.2.3.

Markup example:

The following example shows a reference to an S1000D publication by using the elements <`pmRefIdent`> and <`pmRefAddressItems`> (child elements are described below):

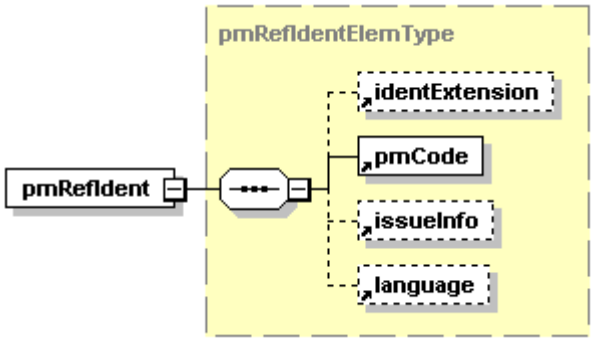
```
<pmRef>
<pmRefIdent>
<pmCode modelIdentCode="S1000DBIKE" pmIssuer="SF518"
pmNumber="00003" pmVolume="00"/>
</pmRefIdent>
<pmRefAddressItems>
<pmTitle>Bike manuals</pmTitle>
<issueDate year="2007" month="02" day="28"/>
</pmRefAddressItems>
</pmRef>
```

2.5.1 Identification of a referred publication module

Description: The element <pmRefIdent> contains the items forming a unique identification of the destination publication module.

The project or the organization must be aware of the implications of using issue and inwork numbers as well as language and country codes of the destination publication module when referenced publication modules are updated.

Markup element: <pmRefIdent>



ICN-S3627-S1000D0576-001-01

Fig 10 Element <pmRefIdent>

Attributes:

– None

Child elements:

– <identExtension>, the additional parameters needed to establish a unique identification of a publication module in those cases where the publication module code, the issue and inwork numbers together with the language and country are insufficient to form a universally unique identity. The element <identExtension> establishes a producer unique subdomain for identification. Refer to Chap 4.12.
– <pmCode>, the publication module code of the destination publication module. Refer to Chap 4.9.2.
– <issueInfo>, the issue information needed to address a particular destination publication module issue. Refer to Chap 3.9.5.1.
– <language>, the language of the destination publication module. Refer to Chap 3.9.5.1.

Markup examples:

Reference to a publication module with PMC:

```
<pmRefIdent>
<pmCode modelIdentCode="S1000DBIKE" pmIssuer="SF518"
pmNumber="00003" pmVolume="00"/>
</pmRefIdent>
```

Reference to a publication module instance with PME:

```
<pmRefIdent>
<identExtension extensionProducer="SF518"
extensionCode="ABC00231"/>
<pmCode modelIdentCode="S1000DBIKE" pmIssuer="SF518"
```

```
pmNumber="00003" pmVolume="00"/>
</pmRefIdent>
```

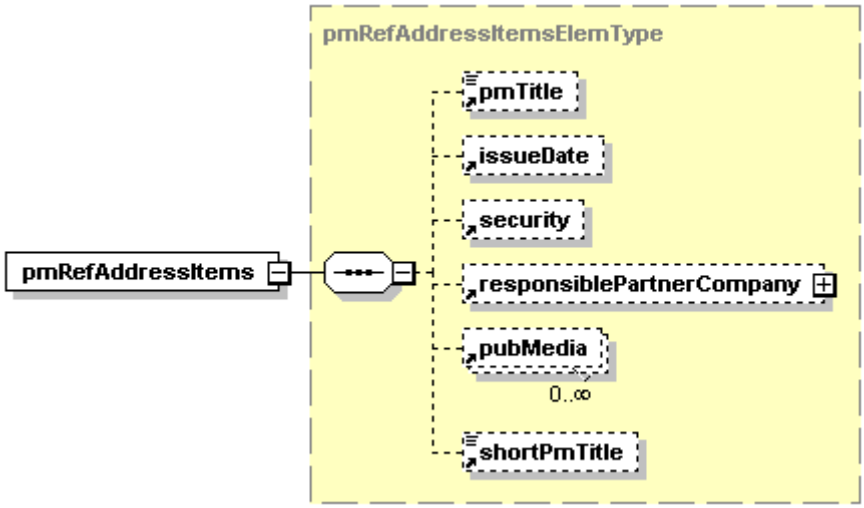
2.5.2 Complementary identifying information for a publication module

Description: The element <pmRefAddressItems> contains additional identifying information about the destination publication module.

Note

Only the publication module code, the publication module title, and the issue number will be presented in page-oriented publications. Refer to Chap 6.2.2.

Markup element: <pmRefAddressItems>



ICN-S3627-S1000D0577-001-01

Fig 11 Element <pmRefAddressItems>

Attributes:

– None

Note

The element <pmRefAddressItems> also includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

– <pmTitle>, the publication module title of the destination publication module. Refer to Chap 4.9.1.
– <issueDate>, the issue date of the destination publication module. Refer to Chap 3.9.5.1.
– <security>, the publication module security classification as described in Chap 3.9.5.1.
– <responsiblePartnerCompany>, the responsible partner company of the publication module as described in Chap 3.9.5.1.
– <pubMedia>, the media of the publication module as described in Chap 4.9.1.
– <shortPmTitle>, the abbreviated alternate publication module title corresponding to the element <pmTitle>. This short form for the publication module title is meant to be presented in the narrative of the publication module to make the reading easier. Refer to Chap 6.2.2 for presentation.

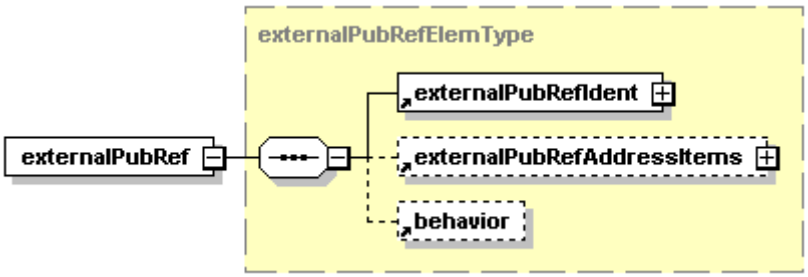
Markup example:

```
<pmRefAddressItems>
<pmTitle>Bike manuals</pmTitle>
<issueDate year="2007" month="02" day="28"/>
</pmRefAddressItems>
```

2.6 References to external documents

Description: The element <externalPubRef> contains the identification of a referenced non-S10000D publication or document.

Markup element: <externalPubRef>



ICN-S3627-S1000D0569-001-01

Fig 12 Element <externalPubRef>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Para 2.1.1.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Note

The element <externalPubRef> also includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

- <externalPubRefIdent>, the identification of the non-S1000D publication or document. Refer to Para 2.6.1.
- <externalPubRefAddressItems>, additional information about the non-S1000D destination publication or document. Refer to Para 2.6.2.
- <behavior>, the appearance/behavior of the non-S1000D destination publication or document. Refer to Para 2.2.3.

Markup example:

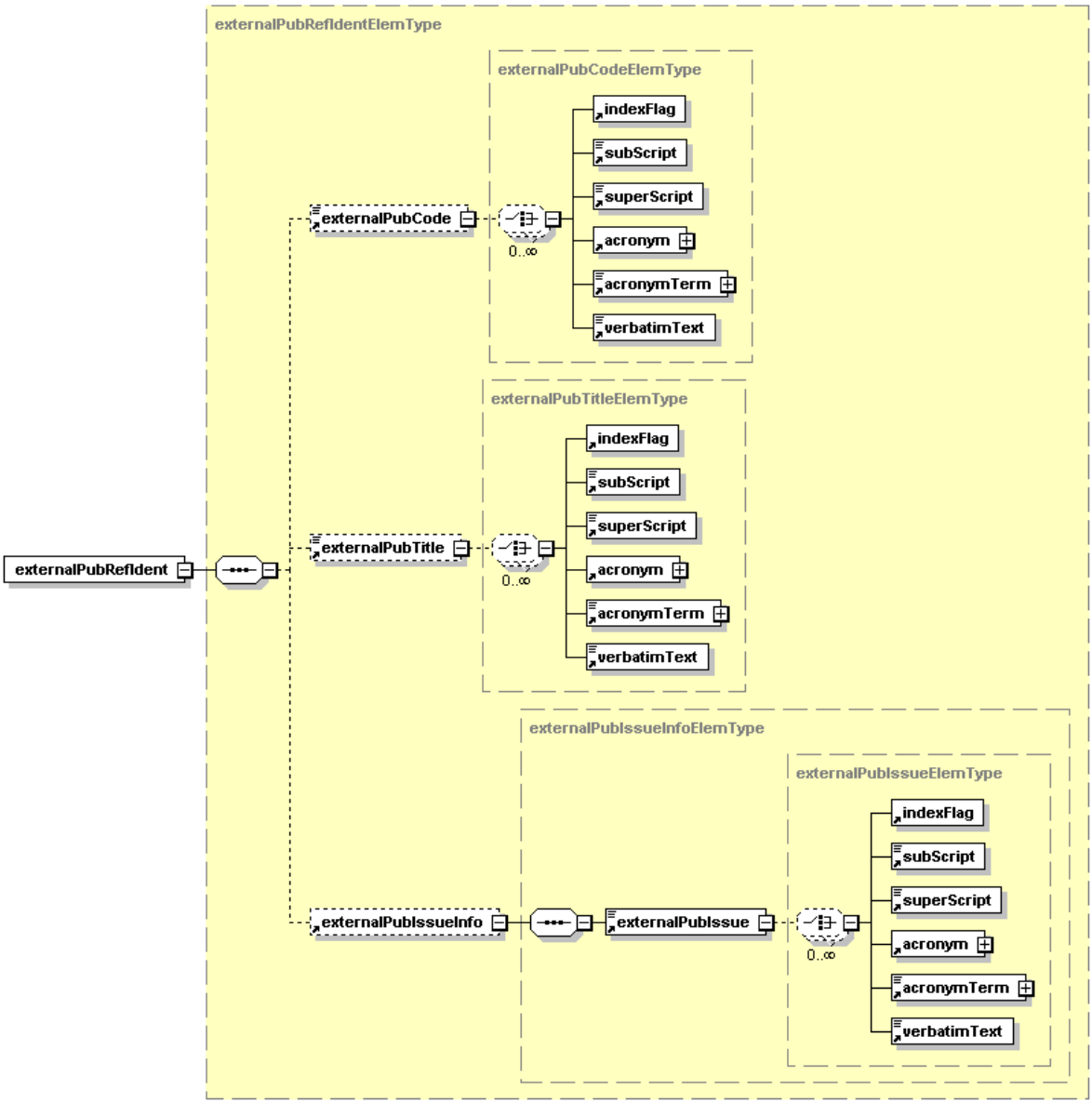
The following example shows a reference to another technical publication by using the element <externalPubCode> as free text:

```
<externalPubRef>
<externalPubRefIdent>
<externalPubCode pubCodingScheme="ISBN">9999999999
</externalPubCode>
<externalPubTitle>Effective Cycling</externalPubTitle>
</externalPubRefIdent>
</externalPubRef>
```

2.6.1 Identification of an external document

Description: The element <externalPubRefIdent> contains the identification of a non-S1000D publication or document.

Markup element: <externalPubRefIdent>



ICN-S3627-S1000D0578-001-01

Fig 13 Element <externalPubRefIdent>

Attributes:

– None

Child elements:

– <externalPubCode>. Refer to Para 2.6.1.1.
– <externalPubTitle>. Refer to Para 2.6.1.2.
– <externalPubIssueInfo>. Refer to Para 2.6.1.3.

Markup example:

```
<externalPubRefIdent>
<externalPubCode pubCodingScheme="ISBN">9999999999
</externalPubCode>
<externalPubTitle>Effective Cycling</externalPubTitle>
</externalPubRefIdent>
```

2.6.1.1 Identifying code of an external document

Description: The element <externalPubCode> contains, as textual content, a code that identifies a publication or document by a non-S1000D identity, such as an ISBN code or similar.

Markup element: <externalPubCode>

Attributes:

– pubCodingScheme (O). Provides a reference to specification of the syntax of the identity given, such as "ISBN".

Child elements:

– <indexFlag>. Refer to Chap 3.9.5.2.1.10.
– <subScript>. Refer to Chap 3.9.5.2.1.10.
– <superScript>. Refer to Chap 3.9.5.2.1.10.
– <acronym>. Refer to Chap 3.9.5.2.1.10.
– <acronymTerm>. Refer to Chap 3.9.5.2.1.10.
– <verbatimText>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<externalPubCode pubCodingScheme="ISBN">9999999999
</externalPubCode>
```

2.6.1.2 Title of an external document

Description: The element <externalPubTitle> contains, as textual content, the title of a non-S1000D publication or document.

Markup element: <externalPubTitle>

Attributes:

– None

Child elements:

– <indexFlag>. Refer to Chap 3.9.5.2.1.10.
– <subScript>. Refer to Chap 3.9.5.2.1.10.
– <superScript>. Refer to Chap 3.9.5.2.1.10.
– <acronym>. Refer to Chap 3.9.5.2.1.10.

- <acronymTerm>. Refer to Chap 3.9.5.2.1.10.
- <verbatimText>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<externalPubTitle>Effective Cycling</externalPubTitle>
```

2.6.1.3 Issue information of an external document

Description: The element <externalPubIssueInfo> contains issue information concerning the referred non-S1000D publication or document.

Markup element: <externalPubIssueInfo>

Attributes:

- None

Child elements:

- <externalPubIssue>. Refer to Para 2.6.1.3.1.

Markup example:

```
<externalPubIssueInfo>
<externalPubIssue>Issue B</externalPubIssue>
</externalPubIssueInfo>
```

2.6.1.3.1 Issue information of an external document

Description: The element <externalPubIssue> contains, as text content, issue identification of a non-S1000D publication or document.

Markup element: <externalPubIssue>

Attributes:

- None

Child elements:

- <indexFlag>. Refer to Chap 3.9.5.2.1.10.
- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.
- <acronym>. Refer to Chap 3.9.5.2.1.10.
- <acronymTerm>. Refer to Chap 3.9.5.2.1.10.
- <verbatimText>. Refer to Chap 3.9.5.2.1.10.

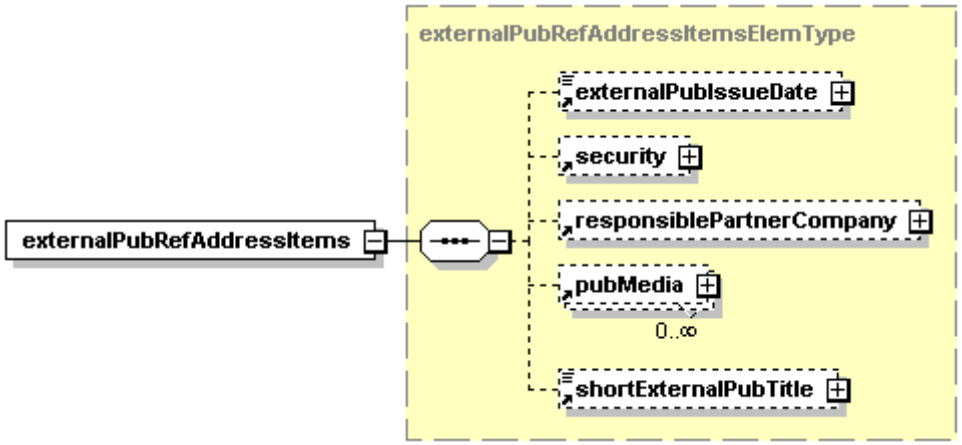
2.6.2 Complementary identifying information for an external document

Description: The element <externalPubRefAddressItems> contains, as textual content, additional information potentially useful to identify the non-S1000D destination publication or document.

Note

Only the publication code, title and date will be presented in page-oriented publications. Refer to Chap 6.2.2.

Markup element: <externalPubRefAddressItems>



ICN-S3627-S1000D0579-001-01

Fig 14 Element <externalPubRefAddressItems>

Attributes:

– None

Child elements:

– <externalPubIssueDate>, the date given to the non-S1000D publication or document. Refer to Para 2.6.2.1.
– <security>, the security of the non-S1000D publication or document. Refer to Chap 3.9.5.1.
– <responsiblePartnerCompany>, the responsible partner company of the non-S1000D publication or document. Refer to Chap 3.9.5.1.
– <pubMedia>, the media of the non-S1000D publication or document. Refer to Chap 4.9.1.
– <shortExternalPubTitle>, an abbreviated alternate title (of the non-S1000D publication or document) corresponding to the element <externalPubTitle>. This short form for the publication title is meant to be presented in the narrative of the data module to make the reading easier. Refer to Chap 6.2.2 for presentation.

2.6.2.1 Issue date of an external publication

Description: The element <externalPubIssueDate> contains date information about the referenced publication.

If the <externalPubIssueDate> contains a date in textual form, then that text will be displayed to the user. If only the attributes are provided, then it must be displayed in the ISO 8601 calendar date format YYYY-MM or YYYY-MM-DD. If the attribute month of <externalPubIssueDate> is populated, then the attribute year must also be populated. If the attribute day is populated, then the attribute month must also be populated. Refer to default BREX rule BREX-S1-00061.

Attributes:

– year (O), the year of issue given as a four-digit number
– month (O), the month of issue given as a two-digit number
– day (O), the day of issue given as a two-digit number.

Markup example:

```
<externalPubRefAddressItems>
<externalPubIssueDate month="01" year="2010">January
2010</externalPubIssueDate>
</externalPubRefAddressItems>
```

2.7 References presented in the reference table of a data module

Description: The element <refs> contains all references to data modules, publication modules and to non-S1000D publications or documents given in the data module. It is used to populate the standardized tabular list "Table 1 References". This paragraph gives the rules and recommendations for inclusion of the standardized tabular list "Table 1 References" at the beginning of the data module content section.

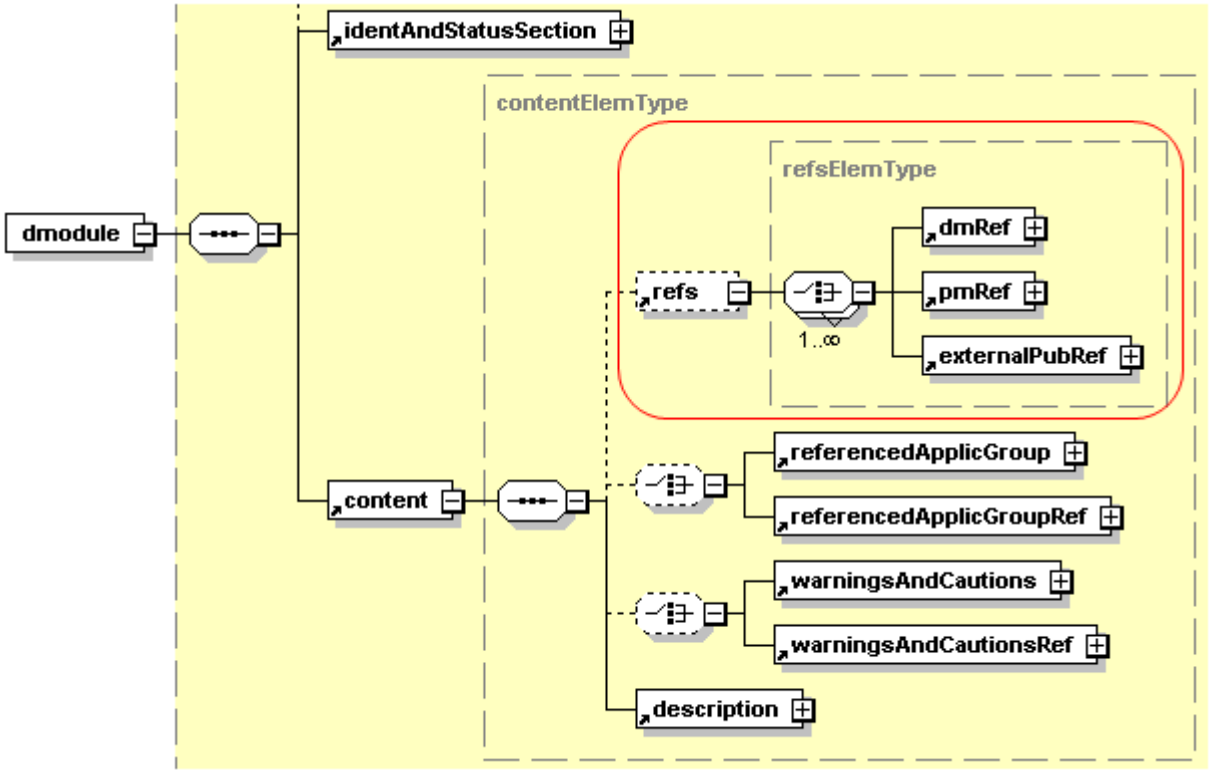
Note

The element <refs> is also used to group the three child elements on a "lower level" within several types of Schema. Refer to Para 2.8.

Note

The element <refs>, to be presented in "Table 1 References", is either "authored" (in a "manual" authoring environment) or automatically populated before delivery of the self-contained data module by analyzing the inline references (refer to Para 2.8) in the data module.

Markup element: <refs>



ICN-S3627-S1000D0580-001-01

Fig 15 Element <refs>

Absence of the element <refs> indicates that there are no references to other data modules or technical publications.

Note

The absence of the element <refs> will be presented in the standardized table References with "None" in the left-hand column. Refer to Chap 6.2.2 for presentation rules and examples.

When the element <refs> is used, the referenced data modules, publication modules and non-S1000D publications or documents, must be listed in lexical order, with data modules first, publication modules second and non-S1000D publications or documents last.

Each referenced data module, document or other publication, must be listed only once in the element <refs>.

References must only be given to complete documents or to complete publications.

When referring to documents or publications without a data module code or without a publication module code, the reference must give an appropriate identification of the referred document or publication.

Attributes:

– None

Child elements:

– <dmRef>. Refer to Para 2.2.
– <pmRef>. Refer to Para 2.5.
– <externalPubRef>. Refer to Para 2.6.

Business rule decision point BRDP-S1-00106 - Population of the element <refs>:

– Decide if and how the element <refs> is populated. If populated, the order of items in the list must be specified.

Markup example:

The following example shows a reference table including a reference to a data module, a publication module and to two non-S1000D documents of which one is identified by an ISBN code:

```
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA2" subSystemCode="2" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="520" infoCodeVariant="A" itemLocationCode="A" />
<issueInfo issueNumber="002" inWork="00"/>
</dmRefIdent>
<dmRefAddressItems>
<dmTitle><techName>Handlebar</techName>
<infoName>Remove procedures</infoName>
</dmTitle>
</dmRefAddressItems>
</dmRef>
<pmRef>
```

```
<pmRefIdent>
<pmCode modelIdentCode="S1000DBIKE" pmIssuer="SF518"
pmNumber="00003" pmVolume="00"/>
</pmRefIdent>
<pmRefAddressItems>
<pmTitle>Bike manuals</pmTitle>
<issueDate year="2007" month="02" day="28"/>
</pmRefAddressItems>
</pmRef>
<externalPubRef>
<externalPubRefIdent>
<externalPubTitle>Local Disposal Procedures</externalPubTitle>
</externalPubRefIdent>
</externalPubRef>
<externalPubRef>
<externalPubRefIdent>
<externalPubCode pubCodingScheme="ISBN">9999999999
</externalPubCode>
<externalPubTitle>Effective Cycling</externalPubTitle>
</externalPubRefIdent>
</externalPubRef>
</refs>
```

2.8 Inline use of references to other documents

Description: This paragraph gives the rules and recommendations for use of the elements <dmRef>, <pmRef> and <externalPubRef> when they are used inline.

Referring to information not contained in the current context is achieved by using the element <dmRef> for data modules, the element <pmRef> for publication modules, or the element <externalPubRef> for non-S1000D publications or documents. The elements <dmRef>, <pmRef> and <externalPubRef> must be populated as described in Para 2.2, Para 2.5 and Para 2.6, respectively.

References can be made to a part of a data module using the attribute referredFragment of the element <dmRef>. However, references to a part of a data module are only allowed into the following data modules:

- descriptive
- IPD
- schedules
- Service bulletins - only from procedures to material data sets in a Service bulletin
- common information repositories as described in Chap 4.13.1. Refer to default BREX rules BREX-S1-00062 and BREX-S1-00063.
- procedural data modules from training data modules - only when the safety case is taken into account. Refer to Chap 3.9.7 and Chap 5.2.1.19.

Refer to the markup example below.

Note

Only the data module code and the issue number will be presented in page-oriented publications. Refer to Chap 6.2.2.

Note

Only the publication module code (element <pmCode>) will be presented in page-oriented publications. Refer to Chap 6.2.2.

Excessive linking, by references to data modules without real content apart from just another element <dmRef>, must be avoided.

The system must not generate the pre and post text (ie, the words before and after the referenced item), as this can interfere with authored text, prevents presentation in a different presentation system, and hinders information sharing between projects.

Business rule decision point BRDP-S1-00107 - Define the words before and after the reference elements:

– Define the words before and after the elements <dmRef>, <pmRef> and <externalPubRef>. This is important as it has implications on the stylesheets used. Example: For one implementation, the stylesheet can automatically generate the words "Refer to data module: "when it recognizes the element <dmRef>. This will cause problems if the author has written "Refer to" within the paragraph before the element <dmRef>.

Markup example:

The following example shows a reference to another data module without including the issue number and title.

```
... Refer to
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="041" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
 for a functional ...
```

The following example shows a reference to a data module including the issue number and title.

```
... as described in
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA3" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="041" infoCodeVariant="A" itemLocationCode="A"/>
<issueInfo issueNumber="007" inWork="00"/>
</dmRefIdent>
<dmRefAddressItems>
<dmTitle>
<techName>Frame</techName>
<infoName>Description of how it is made</infoName>
</dmTitle>
</dmRefAddressItems>
</dmRef>
...
```

The following example shows a reference to a paragraph in another data module, without including the issue number and title.

```
<proceduralStep>
<para>Use the
<internalRef internalRefId="seq-0002"
internalRefTargetType="irtt05"/>
from the
<internalRef internalRefId="seq-0001"
internalRefTargetType="irtt05"/>
and attach the new
<internalRef internalRefId="spa-0001"
internalRefTargetType="irtt06"/>
to the wheel. Refer to
<dmRef referredFragment="par-0003">
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="041" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>.</para>
</proceduralStep>
```

Chapter 3.9.5.2.1.3

Common constructs - Lists

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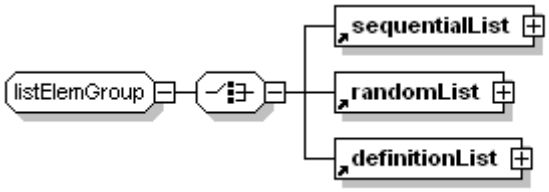
Chap No./Document No.	Title
Chap 3.6	Information generation - Security and data restrictions
Chap 3.9.3	Authoring - Warnings, cautions and notes
Chap 3.9.5.1	Data modules - Identification and status section
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Chap No./Document No.	Title
Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
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Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.6.1	Attributes - Project configurable values
Chap 6.2.2	Page-oriented publications - Typography and layout elements

1 General

This chapter contains the definition and handling of lists from an author's point of view. It gives details about the available elements and attributes for:

- sequential lists
- random lists
- definition lists



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Fig 1 The `listElementGroup`

Lists consist of two main parts, a title and the list items. The title is optional.

There must be no full stops after any list items if the items are not full sentences.

2 Lists

2.1 Sequential lists

Description: The element <`sequentialList`> contains sequential lists, which are also known as ordered lists. It can contain applicability information, a title and the list items themselves.

In a sequential list, a list item can consist of one or more paragraphs. A sequential list, when formatted, is numbered with Arabic numerals. Refer to Chap 6.2.2.

Sequential lists must not be used to provide procedural step information. Refer to default BREX rule BREX-S1-00065.

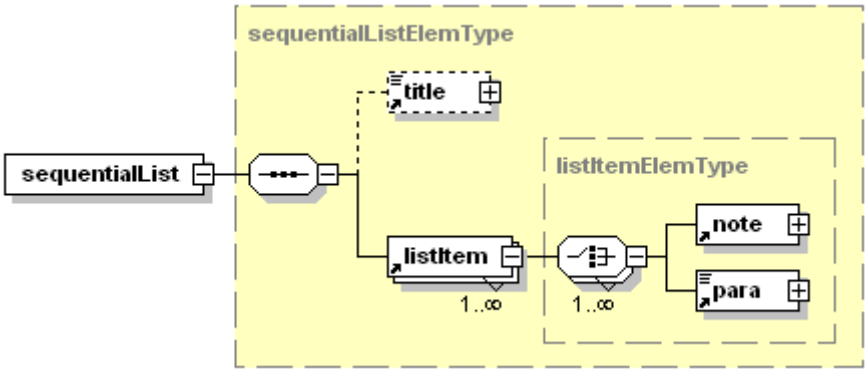
Only one sequential (ordered) list must be placed under a numbered title or paragraph (subheading). Refer to default BREX rule BREX-S1-00066.

Sequential lists are limited to a maximum of two levels. Refer to default BREX rule BREX-S1-00064.

Note

Sequential lists are not available in warnings and cautions. Refer to Chap 3.9.3.

Markup element: <sequentialList>



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Fig 2 Element <sequentialList>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <listItem>. Refer to Para 2.1.1.

2.1.1 List items

Description: The element <listItem> contains a list item which can contain notes and paragraphs.

Markup element: <listItem>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <note>. Refer to Chap 3.9.3.
- <para>. Refer to Chap 3.9.5.2.1.10.

2.1.2 Sequential lists in warnings and cautions

Refer to Chap 3.9.3 for details concerning the element <attentionSequentialList>.

2.2 Random list

Description: The element <randomList> contains random lists. It can contain applicability information, a title and the list items themselves.

There are two types of random lists:

- simple - recognized by the value "pf01" of the attribute listItemPrefix
- unordered - recognized by the default value "pf02" of the attribute listItemPrefix giving the following default sequence of prefix: [-][●][-]

The difference between a simple random list and an unordered random list becomes visible when presented. Refer to Chap 6.2.2.

Each list item, on any level, can consist of one or more paragraphs.

The use of the element <randomList> within the element <action> (in the fault Schema) is limited to one level. Refer to default BREX rule BREX-S1-00067.

Markup element: <randomList>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- listItemPrefix (O), the indicator whether the list is a simple list or an unordered list. The attribute can have one of the following values:
  - "pf01" thru "pf99". The default value is "pf02". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <listItem>. Refer to Para 2.1.1.

2.2.1 Random list in warnings and cautions

Refer to Chap 3.9.3 for details of the element <attentionRandomList>.

2.2.2 Random lists in notes

Refer to Chap 3.9.3 for details of the element <attentionRandomList>.

2.3 Definition list

Description: The element <definitionList> contains a list of terms and definitions. It can contain applicability information, a title and a definition list header. The body of the definition list comprises one or more definition list items, each containing a term and its definition.

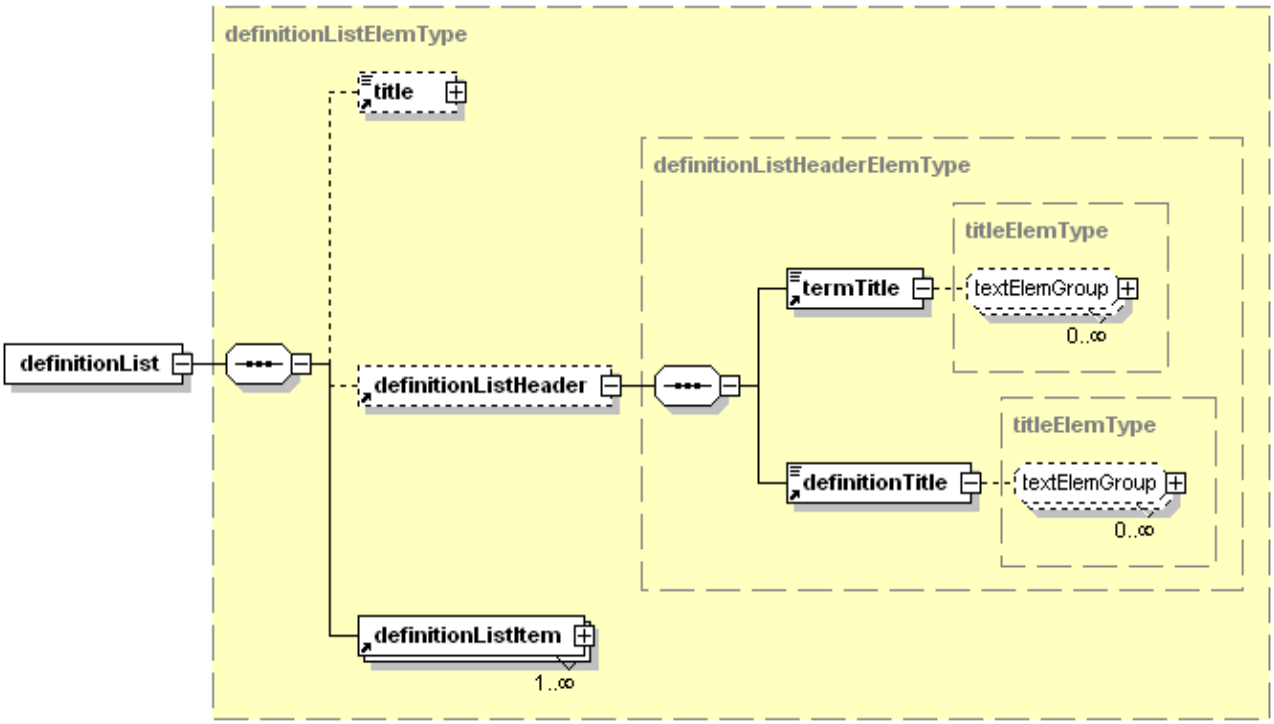
It is possible to have more than one paragraph in a definition.

The definition list is presented as a two-column table that contains terms and definitions. Examples for use are the definition of terms and legends. Refer to Chap 6.2.2.

Note

Definition lists are not available in warnings, cautions and notes. Refer to Chap 3.9.3.

Markup element: <definitionList>



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Fig 3 Element <definitionList>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <definitionListHeader>. Refer to Para 2.3.1.
- <definitionListItem>. Refer to Para 2.3.2.

2.3.1 Definition list headers

Description: The element <definitionListHeader> contains the column headers of the definition list. It can contain the term title and the definition title.

Markup element: <definitionListHeader>

Attributes:

- None

Child elements:

- <termTitle>. The column title for the terms. Refer to Para 2.3.1.1.
- <definitionTitle>. The column title for the definitions. Refer to Para 2.3.1.2.

2.3.1.1 Term title

Description: The element <termTitle> contains the column title for the terms.

Markup element: <termTitle>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), and caveat (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- Includes the same set of child elements as the textElementGroup applicable to the actual data module type. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<termTitle>Attribute</termTitle>
```

2.3.1.2 Definition title

Description: The element <definitionTitle> contains the column title for the definitions.

Markup element: <definitionTitle>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- Includes the same set of child elements as the textElementGroup applicable to the actual data module type. Refer to Chap 3.9.5.2.1.10.

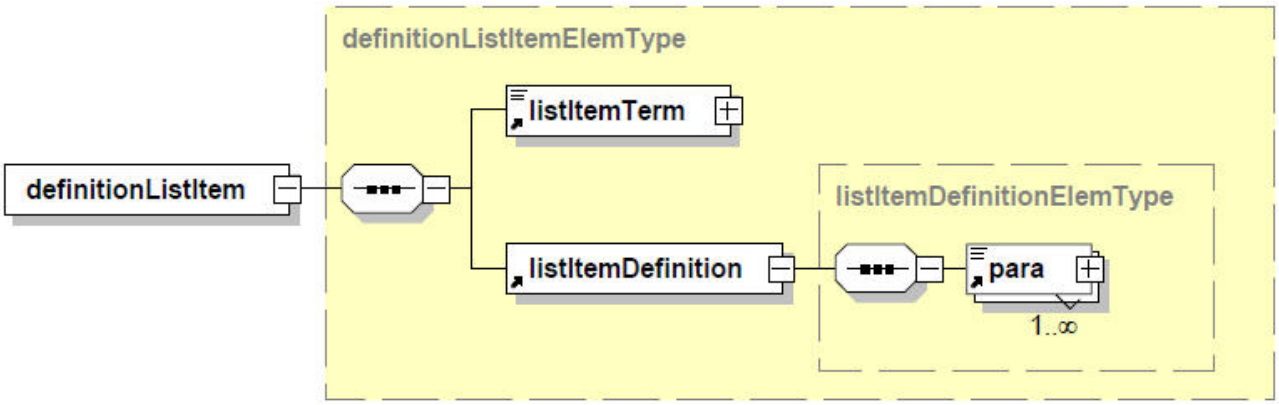
Markup example:

```
<definitionTitle>Value</definitionTitle>
```

2.3.2 Definition list item

Description: The element <definitionListItem> contains a definition list item.

Markup element: <definitionListItem>



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Fig 4 Element <definitionListItem>

Attributes:

- Includes the same set of attributes as the element <sequentialList>. Refer to Para 2.1.

Child elements:

- <listItemTerm>. Refer to Para 2.3.2.1.
- <listItemDefinition>. Refer to Para 2.3.2.2.

2.3.2.1 List item term

Description: The element <listItemTerm> contains the term to be defined.

Markup element: <listItemTerm>

Attributes:

- Includes the same set of attributes as the element <sequentialList>. Refer to Para 2.1.

Child elements:

– Includes the same set of child elements as the `textElementGroup` applicable to the actual data module type. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<listItemTerm>em01</listItemTerm>
```

2.3.2.2 List item definition

Description: The element <`listItemDefinition`> contains the definition of the term. It can contain one or more paragraphs.

Markup element: <`listItemDefinition`>

Attributes:

– `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
– `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
– `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <`para`>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<listItemDefinition><para>Bold</para></listItemDefinition>
```

3 Examples

3.1 Sequential lists

The following example shows a sequential list.

```
<para>This is an example of a sequential list with two items:
<sequentialList>
<listItem><para>This is the first list item.</para></listItem>
<listItem><para>This is the second list item.</para></listItem>
</sequentialList>
</para>
```

3.2 Random list

3.2.1 Unordered

The following example shows an unordered random list.

```
<para>This is an example of an unordered random list with two
items:
<randomList listItemPrefix="pf02">
<listItem><para>This is the first list item.</para></listItem>
<listItem><para>This is the second list item.</para></listItem>
```

```
</randomList>
</para>
```

3.2.2 Simple

The following shows a simple random list.

```
<randomList listItemPrefix="pf01">
<listItem><para>This is the first item.</para></listItem>
<listItem>
<para>This is the second item with two paras.</para>
<para>This is the second para of the second item.</para>
</listItem>
</randomList>
```

3.3 Definition list

The following is an example of a definition list.

```
<definitionList>
<definitionListItem>
<listItemTerm>Frame</listItemTerm>
<listItemDefinition><para>The frame is the skeleton of the
bicycle.</para></listItemDefinition></definitionListItem>
<definitionListItem>
<listItemTerm>Wheel</listItemTerm>
<listItemDefinition><para>The wheel is the point of contact
between the bicycle and the road for the bicycle to have
movement.</para></listItemDefinition></definitionListItem>
<definitionListItem>
<listItemTerm>Spokes</listItemTerm>
<listItemDefinition><para>The spokes are thick wires with
tension applied that connect the hub to the rim. You can adjust
the tension with the nipple on the rim
side.</para></listItemDefinition></definitionListItem>
<definitionListItem>
<listItemTerm>Hub</listItemTerm>
<listItemDefinition><para>The hub attaches to the center of the
wheel where the axle and the bearings
are.</para></listItemDefinition></definitionListItem>
<definitionListItem>
<listItemTerm>Metal rim</listItemTerm>
<listItemDefinition><para>The metal rim is a metal ring that has
a U-shaped cross section to hold the spokes on the inner side
and the tire on the outer
side.</para></listItemDefinition></definitionListItem>
<definitionListItem>
<listItemTerm>Seat</listItemTerm>
<listItemDefinition><para>The Seat, which is also known as the
'saddle', is used as the support platform for the person to sit
on the bicycle.</para></listItemDefinition></definitionListItem>
<definitionListItem>
<listItemTerm>Seat post</listItemTerm>
<listItemDefinition><para>The Seat post is used as a support
post for the seat and to change the height of the seat for the
```

```
rider.</para></listItemDefinition></definitionListItem>
<definitionListItem>
<listItemTerm>...</listItemTerm>
<listItemDefinition><para>...</para></listItemDefinition>
</definitionListItem>
</definitionList>
```

Chapter 3.9.5.2.1.4

Common constructs - Caption groups

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Chap 3.9.2.3	Illustration rules and multimedia - Use of color and photographs
Chap 3.9.5.1	Data modules – Identification and status section
Chap 3.9.5.2.1.1	Common constructs - Change marking
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Chap 3.9.5.2.1.6	Common constructs - Tables
Chap 3.9.5.2.1.7	Common constructs - Figures, multimedia and foldouts

Chap No./Document No.	Title
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.6.1	Attributes - Project configurable attributes

1 General

In some situations it is convenient for the reader of the data module to find a warning light, push button, annunciator or a block of warning lights, etc, within the text flow instead of referring to an illustration. This can be achieved by using captions and caption groups which are created by the author using XML markup as defined below.

Caption is a stylized representation of a single illuminated warning light, push button or annunciator to be presented inline within the text flow.

Caption group is a block of captions to be presented within the text flow.

There is no standardized style guide for presenting captions and caption groups. Each project has to agree and set up a style guide including, for example, basic font, font size, font style, font color, line style and line weight. The only control mechanism to deviate from the basic style guide values is by using the configurable attribute `color` which can be used to restyle, for example, the caption fill, font, font size, font style, font color, line style and line weight. Refer to Para 2.2.1.

Business rule decision point BRDP-S1-00559 - Caption style guide:

– Decide on a project style guide to be used for captions.

2 Caption groups and captions

2.1 Caption groups

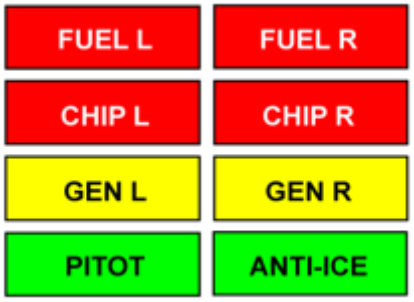
2.1.1 Caption group

Description: The element <captionGroup> represents a block of illuminated warning lights, push buttons, annunciators, or display captions. The <captionGroup> structure has been designed to provide some basic control of formatting. By using the element it is possible to create caption groups that are visually similar to the real object.

Note

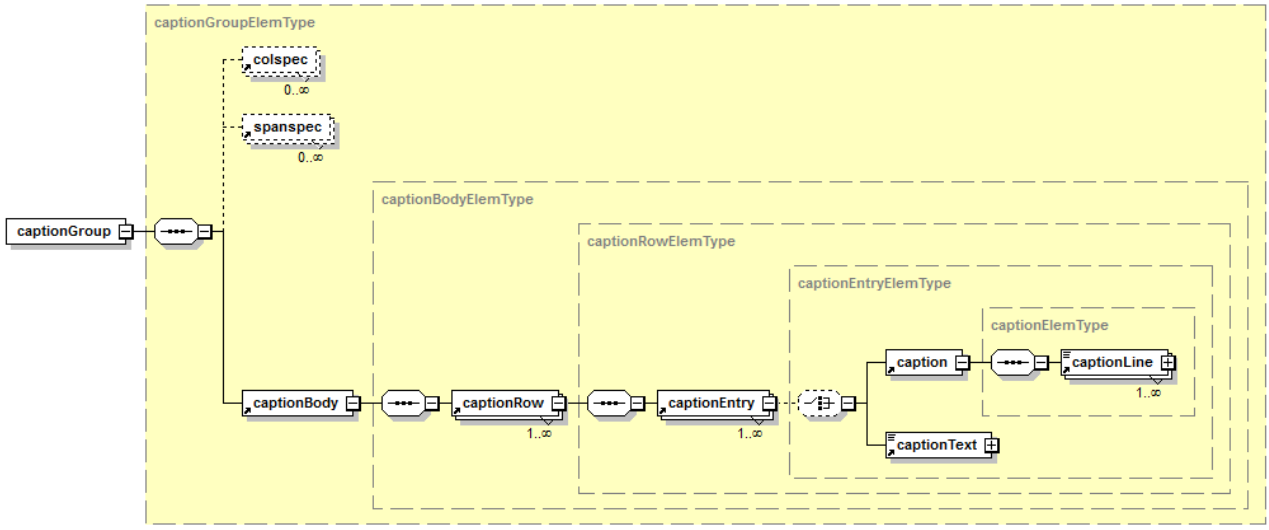
The element <captionGroup> structure is based on the Continuous Acquisition and Life-cycle Support (CALS) table model with similar element names and attributes. Refer to Chap 3.9.5.2.1.6.

A caption group is best used as the only content of an element <para> which makes it appear as paragraph of its own and not inline within the text flow in a paragraph.



The block of illuminated warning lights above is an example of a caption group.

Markup element: <captionGroup>



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Fig 1 Element <captionGroup>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- cols (M), the number of columns in the element <captionGroup> table. The attribute must have a numeric value, greater than "0".
- alignCaption (O), the horizontal alignment of the text content of each element <captionEntry> unless overridden by the attribute align of the elements <colspec>, <spanspec>, <caption> or <captionText>. The attribute can have one of the following values:
  - "left" (D) - the text is left justified (quad flush left)
  - "right" - the text is right justified (quad flush right)
  - "center" - the text is center justified (text is centered around the middle of the column)
- tableOfContentType (O), a classification of captions to be used in the publishing process to group captions in specific tables or indexes. The attribute can have one of the following values:
  - "none" (D) - do not include in any caption table
  - "redtoc" - to be included in the red caption table
  - "comdtoc" - to be included in a combined caption table
  - "ambertoc" - to be included in the amber caption table
  - "greentoc" - to be included in the green caption table
  - "yelowtoc" - to be included in the yellow caption table

  Refer to Fig 2.

- `colsep` (O), defines the column separator settings. A non-zero value for this attribute will draw a rule to the right of each element <`captionEntry`> to which it applies. If the <`captionEntry`> is in the first column a rule will also be drawn on the left side. If the attribute is zero, then no column ruling will appear on either side of the <`captionEntry`> to which it applies. If the attribute `colsep` is not used, this implies that a column ruling will not be drawn for the applicable column. To set the column rulings for the complete column, set the attribute `colsep` on the element <`colspec`> that represents the column. Any values that are given in the <`captionEntry`> within a column will override the values given in element <`colspec`> or the element <`captionGroup`>.
- `rowsep` (O), defines the row separator settings. A non-zero value for this attribute will draw a rule below each element <`captionEntry`> to which it applies. If the <`captionEntry`> is in the first <`captionRow`> a rule will also be drawn above. If the attribute is zero, then no row ruling will appear below the entries to which it applies. If the attribute `rowsep` is not used, this implies that a row rule will not be drawn for the applicable row. To set the row rulings for the complete row, set the attribute `rowsep` on the element <`captionRow`> that represents the row. Any values that are given in the entries of the row will override the values given in the element <`captionRow`> or <`captionGroup`>.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Table 4 Red caption index

Caption	Location	Action
FIRE 1 ENG	Para 2.1	...
FIRE 2 ENG	Para 2.1	...
LOW PRESSURE CABIN	Para 3.2	...
LOW PRESSURE STORE 1	Para 4.2	...

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Fig 2 Table/Index of captions - Example

Child elements:

- <`colspec`> Refer to Chap 3.9.5.2.1.6.
- <`spanspec`> Refer to Chap 3.9.5.2.1.6.
- <`captionBody`> Refer to Para 2.1.2.

2.1.2 Caption body

Description: The element <`captionBody`> is equivalent to the table element <`tbody`>. Refer to Chap 3.9.5.2.1.6.

Markup element: <`captionBody`>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- valign (O), the vertical alignment of the contents of each occurrence of the element <captionEntry>, unless overridden by the attribute valign of the element <captionEntry>. The value of the attribute valign defines the vertical position of a caption within its <captionEntry>, it does not affect the alignment of the text within a caption. The attribute can have one of the following values:
  - "top" (D)
  - "bottom"
  - "middle"
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <captionRow> Refer to Para 2.1.3.

2.1.3 Caption row

Description: The element <captionRow> represents a caption table row and is equivalent to the table element <row>. Refer to Chap 3.9.5.2.1.6.

Markup element: <captionRow>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- rowsep (O), defines the row separator settings. A non-zero value for this attribute will draw a rule. If the attribute rowsep is not used, it implies that a row rule will be drawn. Refer to Para 2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <captionEntry> Refer to Para 2.1.4.

2.1.4 Caption entry

Description: The element <captionEntry> represents a table cell that contain the captions or caption text and is equivalent to the table element <entry>. Refer to Chap 3.9.5.2.1.6.

Markup element: <captionEntry>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `colname` (O), relates the element <`captionEntry`> to its column definition in the element <`colspec`>. The width of each element <`captionEntry`> can only be defined in the element <`colspec`>. If this attribute is missing, the column width must be wide enough to contain the contents of any child caption element. The value is the name of a column defined in element <`colspec`> in the current element <`captionGroup`>.
- `namest` (O), locally defines the start column of a horizontal span of merged occurrences of the element <`captionEntry`>. The value must be the name of a column defined in the element <`colspec`> in the current element <`captionGroup`>.
- `nameend` (O), locally defines the end column of a horizontal span of merged occurrences of the element <`captionEntry`>. The value must be the name of a column defined in the element <`colspec`> in the current element <`captionGroup`>.
- `spanname` (O), a named, reusable span specification for merged occurrences of the element <`captionEntry`>. The value must be the name of a span defined in the element <`spanspec`> in the current element <`captionGroup`>.
- `morerows` (O), locally defines the number of additional rows in a vertical span of merged occurrences of the element <`captionEntry`>. The value must be the number of spanned rows minus 1.
- `colsep` (O, defines the column separator settings. It is used to display rules to the right of the column to which it applies. An attribute `colsep` that is set on an element <`captionEntry`> will determine if a rule is drawn for the height of the entry only. A non-zero value for this attribute will draw a rule. If the attribute `colsep` is not used, it implies that a row rule will not be drawn. Refer to Para 2.1.1.
- `rowsep` (O) , defines the row separator settings. It is used to display rules below the row to which it applies. An attribute `rowsep` that is set on the element <`captionEntry`> determines if a rule is drawn for the width of the entry only. A non-zero value for this attribute will draw a rule. If the attribute `rowsep` is not used, it implies that a column rule will not be drawn. Refer to Para 2.1.1.
- `valign` (O), the vertical alignment of the contents of each occurrence of the element <`captionEntry`> in the row, unless overridden by the attribute `valign` of the element <`captionEntry`>. The value of the attribute `valign` defines the vertical position of a caption within its element <`captionEntry`>, it does not affect the alignment of the text within a caption. The attribute can have one of the following values:
  - "`top`"
  - "`bottom`"
  - "`middle`"
- `alignCaptionEntry` (O), the horizontal alignment of each element <`caption`>. The attribute's value defines the horizontal position of a caption within its element <`captionEntry`>, it does not affect the alignment of the text within a caption. The attribute can have one of the following values:
  - "`left`"
  - "`right`"
  - "`center`".
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <caption> Refer to Para 2.2.1.
- <captionText> Refer to Para 2.1.5.

2.1.5 Caption text

Description: The element <captionText> contains the text to be added to a <captionGroup>.

Markup element: <captionText>

Attributes:

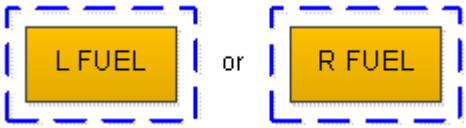
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

The element can contain text mixed with the following elements:

- <internalRef>. Refer to Chap 3.9.5.2.1.2.
- <indexFlag>. Refer to Chap 3.9.5.2.1.10.
- <changeInline>. Refer to Chap 3.9.5.2.1.1.
- <emphasis>. Refer to Chap 3.9.5.2.1.10.
- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.
- <dmRef>. Refer to Chap 3.9.5.2.1.1.
- <pmRef>. Refer to Chap 3.9.5.2.1.1.
- <externalPubRef>. Refer to Chap 3.9.5.2.1.1.
- <acronym>. Refer to Chap 3.9.5.2.1.10.
- <acronymTerm>. Refer to Chap 3.9.5.2.1.10.

Markup example:



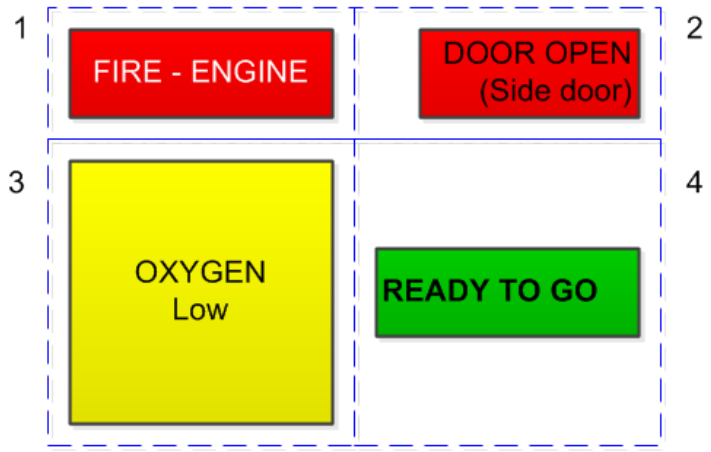
The markup of the caption group above is as follows:

```
<para><captionGroup cols="3" colsep="1" rowsep="1">
<colspec colnum="1" colname="col1" colwidth="25mm"/>
<colspec colnum="2" colname="col2" colwidth="10mm" colsep="0"
rowsep="0"/>
<colspec colnum="3" colname="col3" colwidth="25mm"/>
<captionBody>
<captionRow>
<captionEntry colname="col1" alignCaptionEntry="center"
valign="middle">
<caption color="co02" captionWidth="20mm" captionHeight="10mm">
<captionLine>L FUEL</captionLine>
</caption>
</captionEntry>
<captionEntry colname="col2" alignCaptionEntry="center"
```

```
valign="middle">
<captionText>or</captionText>
</captionEntry>
<captionEntry colname="col3" alignCaptionEntry="center"
valign="middle">
<caption color="co02" captionWidth="20mm" captionHeight="10mm">
<captionLine>R FUEL</captionLine>
</caption>
</captionEntry>
</captionRow>
</captionBody>
</captionGroup>
</para>
```

2.1.6 Formatting options

The effect of the formatting attributes is shown in Fig 3, with the markup for each occurrence of the element <captionEntry> given in Table 2.



ICN-S3627-S1000D0796-001-01

Fig 3 <captionGroup> formatting

The four element <captionEntry> table cells in Fig 3 are formatted as shown in Table 2 . The blue dashed cell borders simply show the outline of each occurrence of the element <captionEntry>, but would not be visible in the output.

Table 2 <captionGroup> formatting example

<captionEntry>		Formatting attribute settings
1	Width 30 mm Height 10 mm Align center Vertical align middle Color red[1] Text[1] - white - center	`<captionEntry colname="col1" alignCaptionEntry="center" valign="middle"><caption color="co51" captionWidth="30mm" captionHeight="10mm"><captionLine>FIRE - ENGINE</captionLine></caption></captionEntry>`

<captionEntry>		Formatting attribute settings
2	Width 25 mm Height 10 mm Align right Vertical align middle Color red Text - black - right	<captionEntry colname="col2" alignCaptionEntry="right" valign="middle"> <caption color="co04" captionWidth="25mm" captionHeight="10mm" alignCaption="right"> <captionLine>DOOR OPEN </captionLine> <captionLine>(Side door) </captionLine> </caption> </captionEntry>
3	Width 30 mm Height 30 mm Align center Vertical align middle Color yellow Text - black - center	<captionEntry colname="col1" alignCaptionEntry="center" valign="middle"> <caption color="co03" captionWidth="30mm" captionHeight="30mm" <captionLine>OXYGEN</captionLine> <captionLine>Low</captionLine> </caption> </captionEntry>
4	Width 30 mm Height 10 mm Align center Vertical align middle Color Green2 Text2 - black - bold - left	<captionEntry colname="col2" alignCaptionEntry="center" valign="middle"> <caption color="co52" captionWidth="30mm" captionHeight="10mm" alignCaption="left"> <captionLine>REDAY TO GO </captionLine> </caption> </captionEntry>

2.2 Captions

2.2.1 Caption

Description: The element <caption> contains a caption representing a single illuminated warning light, push button, annunciator, or display caption. It can be used inline within text content elements such as the element <para>, or grouped within the element <captionGroup> structure as given in Para 2.1.

Each caption can contain lines of text in individual occurrences of the element <captionLine>.

Markup element: <caption>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- color (O), the colors of the caption. A project can decide to use project specific values that represent not only caption fill color, but also, for example, font, font size, font style, font color, line style and line weight. The attribute can have one of the following values:

  - "co00" thru "co99". The default value is "co09". Refer to Chap 3.9.6.1.

  Note
  The project must for each attribute value define the style guide settings/values, like fill color, font, font size, font style, font color, line style and line weight.

  Recommendation: It is recommended to the use color value definitions from the S1000D standard color palette given in Chap 3.9.2.3 when defining the style guide settings/values.

- captionWidth (O), the width of the caption. The value must be a positive number, plus a unit of measure. Column width can be specified as a proportional measure, a fixed measure, or a mixed measure. Refer to Chap 3.9.5.2.1.6 (attribute colwidth).
- captionHeight (O), the height of the caption. The value must be a positive number, plus a unit of measure. Column height can be specified as a proportional measure, a fixed measure, or a mixed measure. Refer to Chap 3.9.5.2.1.6 (attribute colhight).
- systemIdentCode (O), the system identification code as defined by the project
- alignCaption (O), the horizontal alignment of the text content of the child elements <captionLine>. The attribute can have one of the following values:

  - "left" (D) - the text is left aligned
  - "right" - the text is right aligned
  - "center" - the text is centered around the middle of the caption

- tableOfContentType (O), a classification of captions to be used in the publishing process to group captions in specific caption tables or indexes. Refer to Para 2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <captionLine> Refer to Para 2.2.2.

Business rule decision point BRDP-S1-00117 - Inline use of captions:

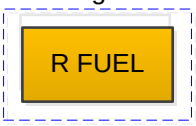
- Decide whether inline captions affect the text line spacing and how this is defined.

Markup example:

The following markup example shows the coding behind a caption presented in inline within the text flow:

The following markup example shows the coding behind the two captions below, to be presented in inline within the text flow:

"The fuel system control panel includes a set of warning and control lamps. The most important control lamps shows the 

or 

fuel levels in the left and right tanks, respectively. If they turn to red, the situation becomes critical. Try to find a gas station."

```
<para>"The fuel system control panel includes a set of warning and
control lamps. The most important control lamps shows the fuel levels
in the
<caption color="co02" captionWidth="20mm"
captionHeight="10mm"><captionLine>L FUEL</captionLine></caption> or
<caption color="co02" captionWidth="20mm"
captionHeight="10mm"><captionLine>R FUEL</captionLine></caption> left
and right tanks, respectively. If they turn to red, the situation
becomes critical. Try to find a gas station."
</para>
```

2.2.2 Caption line

Description: The element <captionLine> represents a single line of text, so its text content should not wrap to second or subsequent lines.

Markup element: <captionLine>

Attributes:

– None

Child elements:

The element can contain text mixed with the element

– <acronymTerm> Refer to Chap 3.9.5.2.1.10.

3 Example

The following markup example shows the coding behind the caption group presented in Fig 3:

```
<para>
<captionGroup cols="2" colsep="1" rowsep="1">
<colspec colnum="1" colname="col1" colwidth="40mm"/>
<colspec colnum="2" colname="col2" colwidth="40mm"/>
<captionBody>
<captionRow>
<captionEntry colname="col1" alignCaptionEntry="center"
valign="middle">
<caption color="co51" captionWidth="30mm" captionHeight="10mm">
<captionLine>FIRE - ENGINE</captionLine>
</caption>
</captionEntry>
<captionEntry colname="col2" alignCaptionEntry="right"
valign="middle">
<caption color="co04" captionWidth="25mm" captionHeight="10mm"
alignCaption="right">
<captionLine>DOOR OPEN</captionLine>
<captionLine>(Side door)</captionLine>
</caption>
</captionEntry>
</captionRow>
```

```
<captionRow>
<captionEntry colname="col1" alignCaptionEntry="center"
valign="middle">
<caption color="co03" captionWidth="30mm" captionHeight="30mm">
<captionLine>OXYGEN</captionLine>
<captionLine>Low</captionLine>
</caption>
</captionEntry>
<captionEntry colname="col2" alignCaptionEntry="center"
valign="middle">
<caption color="co52" captionWidth="30mm" captionHeight="10mm"
alignCaption="left">
<captionLine>READY TO GO</captionLine>
</caption>
</captionEntry>
</captionRow>
</captionBody>
</captionGroup>
</para>
```

Chapter 3.9.5.2.1.5

Common constructs - Titles

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 6.2.2	Page-oriented publications - Typography and layout elements

1 General

This chapter contains the definition and use of titles from an author's point of view.

2 Titles

Description: The element <title> contains the title for a paragraph, step, table or figure, etc. Titles can also be used in the preparation of Table of Contents (TOC). Doing this enables the level of indenture in the TOC to be controlled.

In descriptive data modules, titles can be included for the element <levelledPara> from sublevel one thru five, but must be included for element <figure> and element <table> for formal tables. Refer to Chap 6.2.2.

In procedural, process, crew and fault data modules, titles must be included for <figure> and <table> for formal tables. Refer to default BREX rule BREX-S1-00068. Titles can also be

included for the element <proceduralStep> from sublevel one thru five and for the element <dmNode>. Refer to Chap 6.2.2.

All titles must be presented in sentence case. Refer to Chap 3.9.1.

Markup element: <title>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- Includes the same set of child elements as the textElementGroup, which can be different depending on the Schema type. Refer to Chap 3.9.5.2.1.10.

Business rule decision point BRDP-S1-00118 - Use of the element <title>:

- Decide how to use the element <title> and on which elements.

Business rule decision point BRDP-S1-00119 - Use of cross-references from titles:

- Decide whether to allow cross-referencing from titles.

Business rule decision point BRDP-S1-00120 - Use of titles for the elements <levelledPara> and <proceduralStep> from sublevel six thru eight for legacy data:

- Decide whether titles can be included for the elements <levelledPara> and <proceduralStep> from sublevel six thru eight when converting legacy data to S1000D.

3 Example

```
<levelledPara>
<title>Brake system</title>
<para>The most important part of the bicycle is the brake
system. Only a minimum maintenance of the brake system is
necessary. But, when a problem does occur, make sure you
do the necessary maintenance as quickly as possible.
If you do not do this the bicycle will be dangerous to
use.</para>
<para>There are nine different types of brake systems. The
one found on most bicycles is the cantilever brake (refer to
<internalRef internalRefId="par-0001"
internalRefTargetType="irtt07"></internalRef>).</para>
<levelledPara id="par-0001">
<title>Cantilever brake</title>
<para>The brake system (refer to
<internalRef internalRefId="fig-0001"
internalRefTargetType="irtt01"></internalRef>) has
```

```
these primary components:
<randomList listItemPrefix="pf01" changeMark="1">
<listItem>
<para>the brake lever (refer to
<internalRef internalRefId="par-0003"
internalRefTargetType="irtt07"></internalRef>)</para>
</listItem>
<listItem>
<para>the brake cable</para>
</listItem>
<listItem>
<para>the brake arm</para>
</listItem>
<listItem>
<para>the brake clamp (also known as callipers)</para>
</listItem>
<listItem>
<para>the brake pads (refer to
<internalRef internalRefId="par-0002"
internalRefTargetType="irtt07"></internalRef>)</para>
</listItem>
</randomList>
</para>
<figure id="fig-0001">
<title>Cantilever brake with straddle cable</title>
<graphic
infoEntityIdent="ICN-S1000DBIKE-AAA-DA10000-0-U8025-00512-A-03-
1">
</graphic>
</figure>
<para>A cable that goes from the brake levers on the
handlebars pulls the two levers on the brakes together.
This presses the brake pads against the outer rim of the
wheel, which decreases the speed of the bicycle.</para>
</levelledPara>
<levelledPara id="par-0002">
<title>Brake pads</title>
<para>There are four brake pads (refer to <internalRef
internalRefId="fig-0002" internalRefTargetType="irtt01"/>) on
the bicycle. Two are found on the front wheel and two on the
rear wheel. The brake pads are made out of hard wearing rubber.
The pads press against the rim of the wheel to cause friction
when the you operate the brake levers.</para>
<figure id="fig-0002">
<title>Exploded diagram of a brake</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA10000-0-C0419-
00014-A-01-1">
</graphic>
</figure>
</levelledPara>
<levelledPara id="par-0003">
<title>Brake lever</title>
```

```
<para>The brake levers (refer to <internalRef
internalRefId="fig-0003" internalRefTargetType="irtt01"/>) are
easily damaged. The lever is installed in the mount. A clamp
bolt holds the mount. This bolt is not visible because it is
found in the mount. The lever turns on a lever pivot bolt. The
adjuster lock nut holds the brake cable. This lock nut adjusts
the tension of the cable.</para>
<figure id="fig-0003">
<title>Typical components of a mountain bicycle lever</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA10000-0-C0419-
00015-A-01-1">
</graphic>
</figure>
<para>The left brake lever holds the brake pads on the front
wheel and the right brake pads hold the brakes on the rear
wheel.</para>
</levelledPara>
</levelledPara>
```

Chapter 3.9.5.2.1.6

Common constructs - Tables

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Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing

Chap No./Document No.	Title
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Chap 3.9.5.2.1.5	Common constructs - Titles
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OASIS CALS Table model	OASIS Technical Memorandum TM 9502:1995 (CALS Table Model Document Type Definition)

1 General

This chapter contains the definition, rules and guidelines for handling tables from an author's point of view. It gives details about the available elements and attributes and how to use them to create tables in a data module. It also serves as a guide to stylesheet designers who will have to create the templates for presenting the tables in a page-oriented output or an IETP where a table must be presented by using the formatting information contained in the table's presentation attributes that have been set by the author.

The rules for the presentation of tables in page-oriented publications and IETP are given in Chap 6.2.2 and Chap 6.3.1, respectively.

Parts of this chapter have been derived from the OASIS information about the Continuous Acquisition and Life-cycle Support table model. Refer to OASIS CALS table model.

2 Tables

2.1 Definition

There are two types of tables:

- Formal
- Informal

A formal table consists of four parts: the table title, the table head, the optional table footer and the table body. Each of these parts contains the rows and entries that comprise the table.

An informal table is a short, simple table, which does not need a table title, table head and table footer. These tables are typically small and contain only a few columns and rows.

Table titles must be written in sentence case and have no period [.] at the end.

When formatted, table titles must not exceed two lines.

A formal table can be column-width or image-width. A column width table is one which starts at the left type limit (ie, taking into account any indents) and covers the remaining space available to the right type limit. An image width table starts at the left margin and covers the space up to the right margin. To define a column-width or image-width table, use the attribute `pgwide`. Refer to Para 2.6. Tables must be located in the context where it is most convenient to the

reader. If it is cross-referenced only once, the location is immediately after the paragraph, or major element, in which the reference occurred.

Note

For page-oriented publications, if it is not possible to fit a table into the full image width (170 mm), the table can be presented on a fold-out page (ie, by wrapping the element <table> in the element <foldout>. Refer to Chap 3.9.5.2.1.7).

2.2 Specific tables

Chap 6.2.2 details the required presentation for seven specific tables and each of these has its own markup element. The rest of this chapter discusses tables that are marked up using the element <table>. The seven specific tables are:

- References. Used in all data modules (element <refs>). Refer to Chap 3.9.5.2.1.2.
- Required conditions. Used in procedural, schedule and fault isolation procedure data modules (element <reqCondGroup>). Refer to Chap 3.9.5.2.1.9.
- Required persons. Used in procedural, schedule and fault isolation procedure data modules (element <reqPersons>). Refer to Chap 3.9.5.2.1.9.
- Required technical information. Used in procedural, schedule and fault isolation procedure data modules (element <reqTechInfoGroup>). Refer to Chap 3.9.5.2.1.9.
- Support equipment. Used in procedural, schedule and fault isolation data modules (element <reqSupportEquips>). Refer to Chap Chap 3.9.5.2.1.9.
- Consumables, materials and expendables. Used in procedural, schedule and fault isolation data modules (element <reqSupplies>). Refer to Chap Chap 3.9.5.2.1.9.
- Spares. Used in procedural, schedule and fault isolation data modules (element <reqSpares>). Refer to Chap Chap 3.9.5.2.1.9.
- Caption group. Used in all data modules. Refer to Chap 3.9.5.2.1.4.

2.3 Project table types

A project can define a number of standard table types, and these can be any type of commonly used tables (for example, inspection and examination tables, tables of modification and repairs). Within the project it is good practice that these standard table types are be marked up in a consistent manner and contain consistent numbers of columns, widths and textual values for the table title and its header rows, etc, and these standard types and their properties can be documented in the project business rules.

When set to one of the project defined standard table values, the table attribute tabstyle can be used by an author to indicate that the table that follows is of a specific type, and therefore should comply to the table's presentation rules which will be defined in the table's presentation attributes, and other business rules that govern the textual values the table can contain. The setting of this attribute will then allow the table settings to be checked for compliance to the business rules.

Complex tables can have areas where the format of the rows and columns is different and the element <tgroup> can be used to mark up such table areas. Refer to Para 2.6.1. There is an attribute tgstyle that can be used to define and check business rules that apply to these areas of the complex tables.

To illustrate how this is used, for example, when the value of attribute tabstyle is set to a project defined value of "examination", this could mean that the business rules are defined as follows:

- the table must always have a title of the form "component – examination"
- the table must always have one attribute thead row that contains the values "Component", "Maximum serviceable limits", "Maximum repairable limits", and "Description"

- the table must have four columns of widths 50mm, 25mm, 25mm and 70mm when the display width is 170mm
- it must use proportional spacing
- it must have attribute `frame` set to the value "`topbot`"
- it must have no column separators
- it must have a row separator after the attribute `thead` row, but nowhere else

The use of the attributes `tabstyle` and `tgstyle` must **not** mean that the author can omit the table's display attributes (eg, `frame`, `rowsep`, etc) on the assumption that they are inherited by the meaning of `tabstyle` and `tgstyle` for the given table type within the project. The reason for this is that the end user's application will have no knowledge of what those display properties should be, and the table will not display properly.

Note that the project specified standard tables must comply with the rules for formal and informal tables.

When a table is not a project standard table the fact that it is an informal or formal table can be recorded in the attribute `tabstyle` with the values "formal" and "informal", and this will allow the S1000D rules for these table types to be checked.

Business rule decision point BRDP-S1-00121 - Use of standard table types:

- Decide if a list of standard table types applies to the project (eg, inspection, examination) and define what the business rules are for these types in terms of their presentation requirements and certain textual values (eg, titles and heading row values). Each of these standard types must have a defined value that can be applied to the table's attribute `tabstyle`.

For complex standard tables that have more than one table group, decide how to use the element <`tgroup`> and define a list of project values for attribute `tgstyle`.

2.4 Tables as graphics

Tables normally are marked up using the elements and attributes which define the table heading, the footer and the body which contain rows and entries. It is also possible to present a table using the graphic element (although this is discouraged).

Business rule decision point BRDP-S1-00122 - Use of tables as graphics:

- Decide if tables represented as graphics are allowed, and if they are, in what situations they can be used.

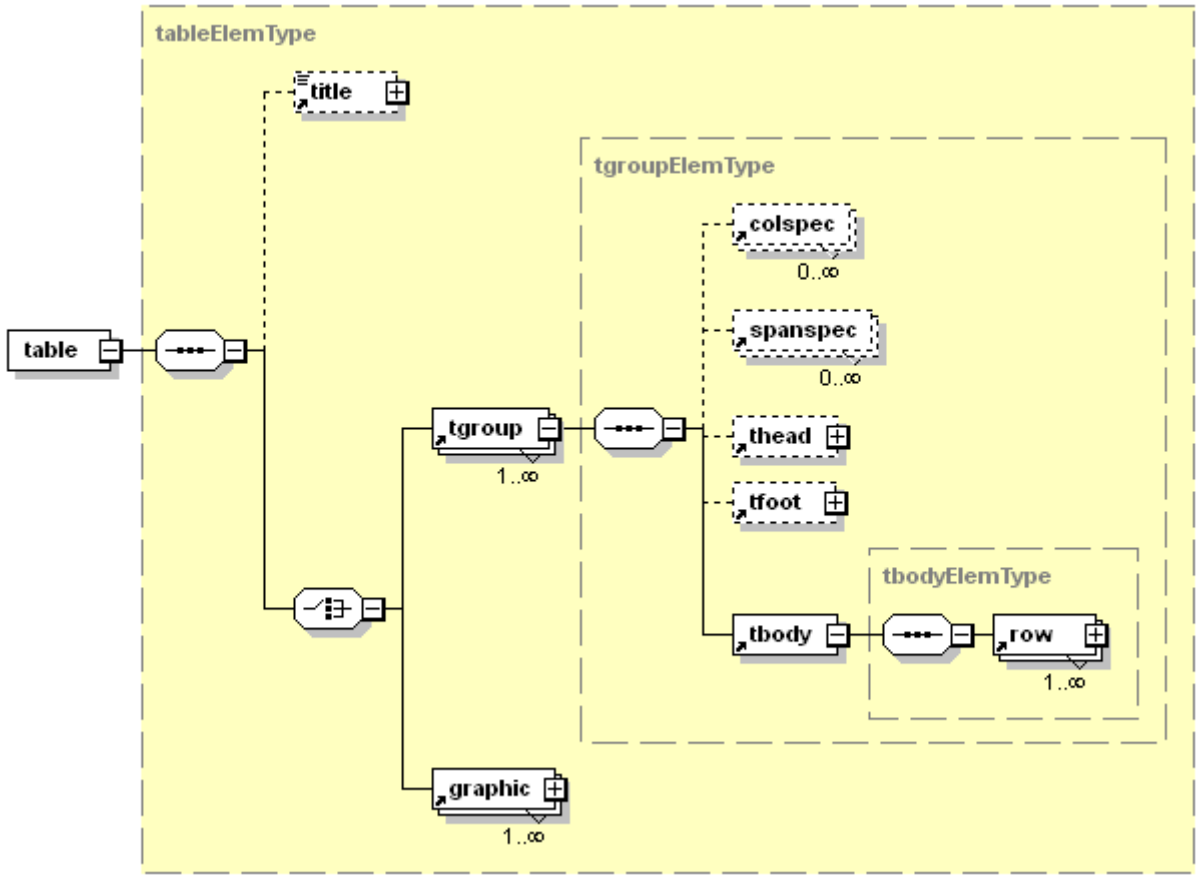
2.5 Attribute inheritance

In order to understand the CALS table model, the concept of attribute inheritance needs to be explained. This applies to the table presentation attributes such as `rowsep` and `colsep` (which determine if table rulings are required) and alignments etc. Attributes on higher level elements set formatting defaults that can be overridden by the same attributes set on lower level elements. For example, a default row separation can be specified for the complete table on the <`table`> element, and this applies to the complete table, unless values are expressed on contained table groups, column specifications, rows, entries etc. A presentation attribute value expressed at a level applies to that level and to its children (unless any child element's attributes override it). As an example, a `rowsep` value of "`1`" applies to all entries in the row, except any <`entry`> with a `rowsep` value specified.

2.6 Table markup

Description: The element <`table`> is used to contain information which is to be presented in a tabular form. The element is used for both formal and informal tables.

Markup element: <table>



ICN-83007-0000000087-001-01

Fig 1 Element <table>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the table element. Refer to Chap 3.9.5.2.1.2. It must only be used for tables that have a title (and hence have an enumerated table number).
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `tabstyle` (O), defines a style for the table. Although the CALS table model allows the value of this attribute to determine the presentation style of the table (in terms of the table rulings, the frame, the orientation, etc), S1000D mandates that the presentation attributes are populated with the correct values to make the table display correctly in any application. This attribute must not be used for tables that only contain a graphic. Refer to Para 2.4. The attribute `tabstyle` can be used by a project or organization to allow the definition and subsequent checking of business rules that apply standard project table. Refer to Para 2.3.
- `tocentry` (O), determines whether the table will appear in the list of tables. If the value of this attribute is "`0`," the table's title will not appear in the automatically generated list of tables at the front of the data module. If the value is not "`0`," or the attribute is not used, and the table has a title, it will appear in the list of tables. If the table has a title and you do not wish it to appear in the list of tables, you must specify a `tocentry` value of "`0`".

- `frame` (O), defines the style of the outside rulings of the table. The attribute can have one of the following values:
  - "`all`" (D) - draws a rule above and below the table, and to the left and right
  - "`sides`" - draws a rule on the left and right of the table, but not on the top and bottom
  - "`top`" - draws a rule above the table, but not below, or to the left or right of the table
  - "`topbot`" - draws a rule above and below the table (this is the setting to be used for S1000D formal tables)
  - "`bottom`" - draws a rule below the table
  - "`none`" - indicates no rules will be drawn for the frame of the table

  Note

  If the attribute `frame` is not used, then this implies that all frame rulings will be drawn (ie, equivalent to the value "`all`"). It is important to set `frame`="`topbot`" for S1000D formal tables. This attribute must not be used for tables that only contain a graphic. Refer to Para 2.4.
- `colsep` (O), defines the column separator setting. A non-zero value for this attribute will draw a rule to the right of the table entries to which it applies. If the attribute is zero, then no column ruling will appear to the right of the entries to which it applies. The value of `colsep` is ignored for the rightmost column because the rulings for this column are given by the setting of the frame attribute. If the attribute `colsep` is not used, this implies that a column rule will be drawn for the applicable columns. To set the column rulings for the complete column, set the attribute `colsep` on the element <`colspec`> that represents the column. Any values that are given in the entries of the column will override the values given in a <`colspec`> element. This attribute must not be used for tables that only contain a graphic. Refer to Para 2.4.
- `rowsep` (O), defines the row separator setting. A non-zero value for this attribute will draw a rule below the table entries to which it applies. If the attribute is zero, then no row ruling will appear below the entries to which it applies. The value of `rowsep` is ignored for the last row because the rulings for this row are given by the setting of the frame attribute. If the `rowsep` attribute is not used, this implies that a row rule will be drawn for the applicable rows. To set the row rulings for the complete row, set the attribute `rowsep` on element the <`row`> that represents the row. Any values that are given in the entries of the row will override the values given in the element <`row`>. This attribute must not be used for tables that only contain a graphic. Refer to Para 2.4.
- `orient` (O), defines the orientation of the table. The default setting (when the attribute is not used) is portrait. The attribute can contain the values "`port`" (representing a portrait orientation) or "`land`" (representing a landscape orientation). A landscape orientation is one that is 90 degrees counter-clockwise to the normal writing direction. This attribute must not be used for tables that only contain a graphic. Refer to Para 2.4.
- `pgwide` (O), defines the width of the table relative to the page. A value other than zero for this attribute defines that the table is to span the width of the page (or the display area) and will ignore any indentation settings that can be in place where the table element appears. A value of 0 (or if the attribute is not used) means that the table will span the page but be within the current indentation settings. The correct setting of this attribute for S1000D tables that are image-wide is a non-zero value. For column-wide tables, this attribute must not be used or set. This attribute must not be used for tables that only contain a graphic. Refer to Para 2.4. The value of attribute `pgwide` is ignored if the orientation of the table is landscape (because landscape tables have an implied to be image-width).
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O) caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. This element is mandatory for formal tables and optional for informal tables. Refer to Chap 3.9.5.2.1.5.
- <tgroup>. Refer to Para 2.6.1.
- <graphic>. Refer to Chap 3.9.5.2.1.7.

Business rule decision point BRDP-S1-00123 - Use of applicability information of various table child elements - attribute applicRefId of the element <table>:

- Decide whether and how to use the attribute applicRefId of various <table> child elements. The child elements can be differentiated based on Product configuration.

Markup example:

The markup example shows a table that contains a graphic. Refer to Para 2.4.

```
<table id="tab-0002">
<title>Widget - inspection limits</title>
<graphic infoEntityIdent="ICN-E2-A-723200-R-K0378-01234-A-01-1">
...
</graphic>
</table>
```

2.6.1 Table group

Description: A table can contain one or more table group <tgroup> elements. Normally, there will be one table group. Multiple table groups are used to define portions of the table that have different presentation requirements (eg, column and row specifications).

Markup element: <tgroup>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- cols (M), defines the number of columns in the table.
- tgstyle (O), the table group style. This defines that a specified style (eg, column and row specifications) is to be applied to the table group. Although the CALS table model allows the value of this attribute to determine the presentation style of the table (in terms of the table rulings, the frame, the orientation etc), S1000D mandates that the presentation attributes are populated with the correct values to make the table display correctly in any application. The attribute tgstyle can be used by a project or organization to allow the definition and subsequent checking of business rules that apply standard project table. Refer to Para 2.3.
- colsep (O), the column separator default setting. Refer to Para 2.6 for the description of colsep on <table>. In the context of <tgroup>, this is the default setting for column rulings for the table group and takes precedence over defaults set using colsep on <table>. A non-zero value means that column rulings will appear to the right of all columns of the table group unless there is a "0" value given in the child <entry> elements (which will override the settings for that entry only). A value of "0" means that there are to be no column rulings for the table group. If the attribute colsep is not

specified for the table group, this implies that column rulings are required (unless colsep values on individual <entry> elements state otherwise).

- rowsep (O), the row separator default setting. Refer to Para 2.6 for the description of rowsep on <table>. In the context of <tgroup>, this is the default setting for row rulings for the table group and takes precedence over defaults set using rowsep on <table>. A non-zero value means that row rulings will be appear beneath each row of the table group unless there are values given in the child <entry>. A value of "0" means that there will be no row rulings. If the attribute rowsep is not specified for the table group, this implies that row rulings are required (unless rowsep values on individual <row> elements state otherwise).
- align (O), alignment. This attribute provides the default alignment setting for the table group (which is the horizontal position of the text within the column) and applies to all entries in the table group that do not have an alignment specified by their own align attribute, or in their parent table element <row>. The attribute can have one of the following values:

  - "left" - the text is left justified (quad flush left)
  - "right" - the text is right justified (quad flush right)
  - "center" - the text is center justified (text is centered around the middle of the column)
  - "justify" - the text is justified (both quad left and right)
  - "char" - text is aligned to the leftmost occurrence of the value of the attribute char value. When the attribute align is set to "char", attributes char and charoff must be used. The attribute char is the single character that is used to align the text. The most common use is to align on a decimal separator [.] for decimal alignment of a column of numbers as shown in Fig 2:

```
1002.23
 675.34
   0.002
```

ICN-83007-0000000062-001-01

Fig 2 Example of "char" alignment

This causes the text to range left or right around the fixed location of the decimal point.

The attribute charoff is used to position the alignment character within the width of the cell. This is given as a percentage of the cell width and must only be used when the value of attribute align is set to "char."

- charoff (O), the value is used when the value of the align attribute is "char". It is a number that represents the percentage of the column width to the left of the alignment character specified in the attribute char and must only be used when the attribute align is set to "char".
- char (O), the value is used when the value of the align attribute is "char". The value is the single alignment character source for any implied "char" values and must only be used when the align attribute is set to "char".
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <colspec>. Refer to Para 2.6.5.
- <spanspec>. Refer to Para 2.6.6.
- <thead>, defines the header of the table in terms of its rows and entries. Refer to Para 2.6.2. For page-oriented output, the header will be replicated on each page when the table spans multiple pages. S1000D formal tables must always have a table header.
- <tfoot>, contains the rows and entries that define the footer of the table when one is needed. Refer to Para 2.6.3.
- <tbody>, contains the rows and entries that define the body of the table. Refer to Para 2.6.4.

Markup example:

```
<tgroup cols="2">
<colspec colname="col1" colwidth="1*"/>
<colspec colname="col2" colwidth="1*"/>
<tbody>
<row>
<entry><para>row 1, column 1</para></entry>
<entry><para>row 1, column 2</para></entry>
</row>
<row>
<entry><para>row 2, column 1</para></entry>
<entry><para>row 2, column 2</para></entry>
</row>
</tbody>
</tgroup>
```

2.6.2 Table header

Description: The element <thead> (table header) contains the rows of the table that provide the column headings and is mandatory for S1000D formal tables. The table header is displayed in bold type face and, for page-oriented output, will be displayed at the top of each page on which the table appears. The table header must contain at least one table row. There is no need to use emphasis to make a table header bold.

Markup element: <thead>

Attributes:

- valign (O), specifies how the text is to be presented in each element <entry> that does not have its own attribute valign set. If the attribute is not used, the default setting is top. The value of attribute valign on the element <thead> supplies the default alignment for the entire table header. These values are overridden by values that are contained in the table header's entries (if they are present). The attribute can have one of the following values:
  - "top" (D) - for the text to be presented at the top of the element <entry>
  - "middle" - for the text to presented in the middle of the element <entry>
  - "bottom" - for the text to be presented at the bottom of the element <entry>

Child elements:

- <colspec>. Refer to Para 2.6.5.This specifies the presentation information of each column in the table header and, if present, overrides any column specifications found in the table group. Refer to Para 2.6.1.

– <row>. Refer to Para 2.6.7. The table header must contain at least one row. For S1000D formal tables, the last row of the table header must have its attribute rowsep set to a non-zero value.

Markup example:

```
<thead>
<row rowsep="1">
<entry><para>Area</para></entry>
<entry><para>Maximum blend depth</para></entry>
<entry><para>Maximum blend length</para></entry>
<entry><para>Maximum blend width</para></entry>
<entry><para>Maximum number of blends</para></entry>
</row>
</thead>
```

2.6.3 Table footer

Description: The element <tfoot> (table footer) contains the rows and entries that represent the table footer. The table footer is to appear at the end of the table (ie, after the last table body row). For page-oriented publications, the table footer is to appear after the last row of each page on which the table appears.

Markup element: <tfoot>

Attributes:

– valign (O), specifies how the text is to be presented in each entry that does not have its own valign attribute set. The attribute can have one of the following values:

- "top" (D) - the text is presented at the top of the element <entry>
- "middle" - the text is presented in the middle of the element <entry>
- "bottom" - the text is presented at the bottom of the element <entry>

Child elements:

– <colspec>. Refer to Para 2.6.5.This specifies the presentation information of each column in the table footer and, if present, overrides any column specifications found in the table group. Refer to Para 2.6.1.
– <row>. Refer to Para 2.6.7. The table footer must contain at least one row.

Markup example:

```
<tfoot>
<row>
<entry spanname="all5"><para>Example footnote</para></entry>
</row>
</tfoot>
```

2.6.4 Table body

Description: The element <tbody> (table body) contains the rows of the table that provide the primary content and is mandatory for all tables. The table body must contain at least one table row.

Markup element: <tbody>

Attributes:

– `valign` (O), specifies the default within the body of the table for how the text is to be presented in each element <`entry`> that does not have its own `valign` attribute set. If the attribute is not used, the default setting is top. The value of `valign` on the <`tbody`> element supplies the default alignment for the entire table body. These values are overridden by values that are contained in the table header's entries (if they are present). The attribute can have one of the following values:

- "`top`" (D) - for the text to be presented at the top of the element <`entry`>
- "`middle`" - for the text to presented in the middle of the element <`entry`>
- "`bottom`" - for the text to be presented at the bottom of the element <`entry`>

Child elements:

– <`row`>. Refer to Para 2.6.7. The table header must contain at least one row. For S1000D formal tables, the last row of the table header must have its attribute `rowsep` set to a non-zero value.

Markup example:

```
<tbody>
<row>
<entry><para>row 1, column 1</para></entry>
<entry><para>row 1, column 2</para></entry>
</row>
<row>
<entry><para>row 2, column 1</para></entry>
<entry><para>row 2, column 2</para></entry>
</row>
</tbody>
```

2.6.5 Column specification

Description: The element <`colspec`> (column specification) is used in the table group (<`tgroup`>, refer to Para 2.6.1) and can be overridden by the element <`colspec`> in the table header (<`thead`>, refer to Para 2.6.2), the table footer (<`tfoot`>, refer to Para 2.6.3) and the table body (<`tbody`>, refer to Para 2.6.4). When used in the table header, table footer and table body, the values specified override those that can be present on the table group and these values are in turn overridden by the settings of the same attributes on individual rows and entries.

Markup element: <`colspec`>

Attributes:

– `colnum` (O), represents the number of the column starting at 1 which represents the leftmost row. The column number is not used in any span specification (refer to Para 2.6.6) and simply serves as a consistency check for the authoring and / or software.
– `colname` (O), is the name of the column that is used to specify the position or horizontal span of columns in a row. It can also be used in the <`entry`> element (refer to Para 2.6.8) using the `colname`, or the `namest` with `nameend` attributes. It can also be used by the <`spanspec`> element in its attributes `namest` and `nameend`. Refer to Para 2.6.6.
– `align` (O), is the default alignment for entries in the table body. Refer to Para 2.6.1.

- charoff (O), is the default character offset for alignment of entries in the table body. Refer to Para 2.6.1:
- char (O), is the character on which to align. Refer to Para 2.6.1.
- colwidth (O), is the column width setting. Column width can be specified as a proportional measure, a fixed measure, or a mixed measure.
  - A proportional measure is of the form "number*" (eg, "10*"), and means that the column width is the number times the proportion.
  - A fixed measure is of the form number and unit (eg, "25pt", "25mm", "16.2in"). The units are case insensitive and can be "pt" (points), "cm" (centimeters), "mm" (millimeters), "pi" (picas), and "in" (inches). The default fixed unit must be "pt" if neither a proportion nor a fixed unit is specified. An example of a mixed measure is "10*"+"3pt".
  - If no column width is specified for a column specification, this implies that the column has the proportional width "1*", and hence, if no column widths are specified for any column, the column widths will be the same for each column and will be an equal proportion of the available width.
- colsep (O), is the column separator setting. Refer to Para 2.6.
- rowsep (O), is the row separator setting. Refer to Para 2.6.

Child elements:

- None

Markup example:

```
<colspec colname="col1" colwidth="1*"/>
<colspec colname="col2" colwidth="1*"/>
<colspec colname="col3" colwidth="1*"/>
<colspec colname="col4" colwidth="1*"/>
<colspec colname="col5"/>
```

2.6.6 Span specification

Description: The element <spanspec> (span specification) identifies a horizontal span of columns and associated attributes that can subsequently be referenced by its attribute spanname for repeated use in a table's <entry> elements. A <spanspec> uses column names from <colspec> elements defined in that context. It gets default values from the <colspec> that provides the namest. namest and nameend identify the first and last columns in increasing left-to-right order that identify the span. The reason colname is used rather than colnum in identifying <spanspec> is that the names are independent of revisions that can change the number of inserted/deleted columns, as long as namest remains to the left of (has a smaller column than) nameend. In a <thead> or <tfoot>, if any <colspec> are redefined, the <tgroup> <spanspec> elements are ignored in references to spanname from <entry> elements within this <thead> or <tfoot>. When such redefinition occurs, any spanning should be by the attributes namest and nameend.

Markup element: <spanspec>

Attributes:

- namest (M), contains the name of leftmost column of span (as defined in the column's colname attribute of its <colspec> element).

- nameend (M), contains the name of rightmost column of span (as defined in the column's colname attribute of its <colspec> element).
- spanname (M), uniquely identifies the span, and is the name that is applied in an <entry> element's spanname attribute (refer to Para 2.6.8).
- align (O), the alignment. Refer to Para 2.6.1.
- charoff (O), the character offset. Refer to Para 2.6.1.
- char (O), the character on which to align. Refer to Para 2.6.1.
- colsep (O), determines if the columns covered by the span are to have column rulings This value is overridden by the colsep attribute on the <entry> elements if they are present. Refer to Para 2.6.5.
- rowsep (O), determines if the rows covered by the span are to have row rulings This value is overridden by the attribute rowsep on the <entry> and on the <row> elements if they are present. Refer to Para 2.6.7.

Child elements:

- None

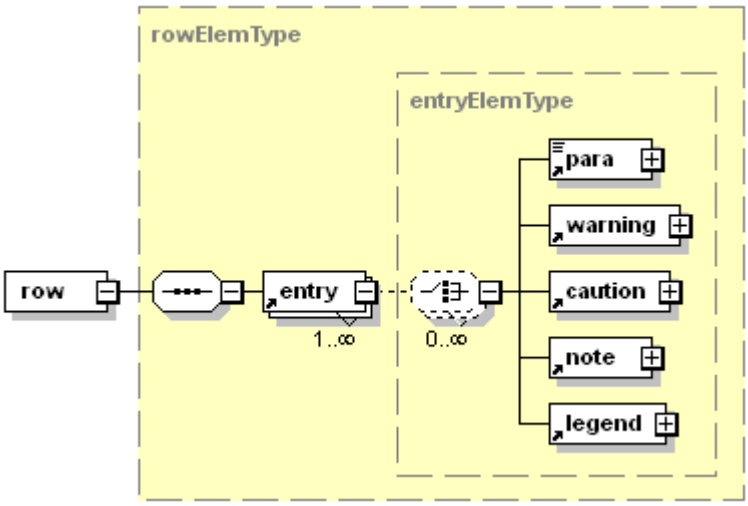
Markup example:

```
<spanspec namest="col1" nameend="col2" spanname="col1-2"/>
<spanspec namest="col1" nameend="col5" spanname="all5"/>
```

2.6.7 Table row

Description: The element <row> (table row) represents a row in a table header (refer to Para 2.6.2), a table footer (refer to Para 2.6.3), or a table body (refer to Para 2.6.4). The table row contains at least one <entry>. Refer to Para 2.6.8. The values specified for the attributes rowsep and valign override any values for these attributes given in a parent element. These values are also overridden by any settings applied to <entry> elements. Refer to Fig 3.

Markup element: <row>



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Fig 3 Element <row>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the table element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `rowsep` (O), the default row separator setting for the row. Refer to Para 2.6.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O) `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`entry`>. Refer to Para 2.6.8.

Markup example:

```
<row>
<entry><para>row 1, column 1</para></entry>
<entry><para>row 1, column 2</para></entry>
</row>
```

2.6.8 Table entry

Description: The element <`entry`> (table entry) represents a table cell.

Markup element: <`entry`>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the table element. Refer to Chap 3.9.5.2.1.2.
- `warningRefs` (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `cautionRefs` (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `colname` (O), is used to specify the column name for the <`entry`>. If this attribute is used, and there is also a `spanname` or `namest` value used, then the attribute is ignored. It is an error if a column name is specified that does not have a corresponding definition in a <`colspec`> element.
- `namest` (O), is used to define the start column of the entry for entries that are spanned across multiple columns (the `nameend` attribute defines the column in which the entry ends). The value entered in `namest` must have a corresponding column definition (<`colspec`>). If `namest` is specified with no `nameend`, then the entry will span a single column. Standard spans can also be defined by using the <`spanspec`> element and referencing it using the attribute `spanname`. Refer to Para 2.6.6.
- `nameend` (O), is used to define the end column for spanned entries.
- `spanname` (O), is used to apply a standard span to the entry that is defined in the corresponding element <`spanspec`>. Refer to Para 2.6.6.

- morerows (O), defines the vertical straddling of the entry (ie, the number of rows that the entry spans). For example, a morerows value of "1" means that the entry will straddle the current and the next row. There must be at least as many rows in the <tbody>, <thead> or <tfoot> to cover the number of rows straddled by the entry. If there is a rowsep attribute specified, it applies to the first row that is straddled by the entry.
- colsep (O), is the column separator setting for the entry. Refer to Para 2.6.
- rowsep (O), is the row separator setting for the entry. Refer to Para 2.6.
- rotate (O), can be zero or non-zero and is used to specify that the contents of the entry are to be rotated. If the value is "0", or the attribute is not used, then the text in the entry is presented in the orientation of the table (as set by the attribute orient. Refer to Para 2.6). If the orientation is landscape, and the value of the rotate attribute is "1", the resulting text is displayed upside-down to the page's headers and footers.
- valign (O), the vertical alignment of the entry. Refer to Para 2.6.8.
- align (O), the horizontal alignment of the entry. Refer to Para 2.6.1.
- charoff (O), the character offset. Refer to Para 2.6.1.
- char (O), the character on which to align. Refer to Para 2.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <para>. Refer to Chap 3.9.5.2.1.10.
- <warning>. Refer to Chap 3.9.3.
- <caution>. Refer to Chap 3.9.3.
- <note>. Refer to Chap 3.9.3.
- <legend>. Refer to Chap 3.9.5.2.1.7.

Markup example:

```
<entry colsep="0"><para>25,00 mm</para></entry>
```

3 Examples

The following example shows the markup of an S1000D formal table that has five columns and rules as defined in Chap 6.2.2 and Chap 6.3.1. Note that the attributes colsep and rowsep on the element <table> set the default rulings for the entire table (ie, no rulings). The attribute frame value of "topbot" draws a rule above and below the table, and the rowsep value of "1" on the <row> of the table header draws a rule before after the header (if the table header contains more than one row, for S1000D formal tables, the rowsep must be on the last row of the table header only. This table will be numbered (because it has a title), and it will appear in the data module's list of tables (because the attribute tocentry is set to a non-zero value).

```
<table frame="topbot" id="tab-0001" colsep="0" rowsep="0"
tocentry="1">
<title>Ring, Bearing Inner (No. 1) - Repair Data</title>
<tgroup cols="5">
<colspec colname="col1" colwidth="1*"/>
<colspec colname="col2" colwidth="1*"/>
<colspec colname="col3" colwidth="1*"/>
<colspec colname="col4" colwidth="1*"/>
<colspec colname="col5"/>
<thead>
```

```
<row rowsep="1">
<entry><para>Area</para></entry>
<entry><para>Maximum blend depth</para></entry>
<entry><para>Maximum blend length</para></entry>
<entry><para>Maximum blend width</para></entry>
<entry><para>Maximum number of blends</para></entry>
</row>
</thead>
<tbody>
<row>
<entry><para>All areas (unless specified differently)
</para></entry>
<entry><para>None</para></entry>
<entry><para>None</para></entry>
<entry><para>None</para></entry>
<entry colsep="0"><para>Blends are not permitted</para></entry>
</row>
<row rowsep="0">
<entry><para>A1</para></entry>
<entry><para>0,60 mm</para></entry>
<entry><para>10,00 mm</para></entry>
<entry><para>10,00 mm</para></entry>
<entry><para>Four</para></entry>
</row>
<row rowsep="0">
<entry><para>A2</para></entry>
<entry><para>1,00 mm</para></entry>
<entry colsep="0"><para>25,00 mm</para></entry>
<entry><para>17,00 mm</para></entry>
<entry><para>Six</para></entry>
</row>
</tbody>
</tgroup>
</table>
```

The example below shows the markup of a formal, image width table.

```
<table frame="topbot" pgwide="1" id="tab-0002">
<title>Ring, Bearing Inner (No. 1) - Repair Data</title>
<tgroup cols="5">
<colspec colname="col1"/>
<colspec colname="col2"/>
<colspec colname="col3"/>
<colspec colname="col4"/>
<colspec colname="col5"/>
<thead>
<row rowsep="1">
<entry colname="col1" colsep="0"><para>Area</para></entry>
<entry colname="col2" colsep="0"><para>Maximum blend
depth</para></entry>
<entry colname="col3" colsep="0"><para>Maximum blend
length</para></entry>
<entry colname="col4" colsep="0"><para>Maximum blend
```

```
width</para></entry>
<entry colname="col5" colsep="0"><para>Maximum number of
blends</para></entry>
</row>
</thead>
<tbody>
<row rowsep="0">
<entry colsep="0"><para>A3</para></entry>
<entry colsep="0"><para>0,60 mm</para></entry>
<entry colsep="0"><para>10,00 mm</para></entry>
<entry colsep="0"><para>10,00 mm</para></entry>
<entry colsep="0"><para>Four</para></entry>
</row>
<row rowsep="0">
<entry colsep="0"><para>A4</para></entry>
<entry colsep="0"><para>0,10 mm</para></entry>
<entry colsep="0"><para>Not applicable</para></entry>
<entry colsep="0"><para>Not applicable</para></entry>
<entry colsep="0"><para>No limit to the quantity. Remove the
high metal only.</para></entry>
</row>
</tbody>
</tgroup>
</table>
```

The example below shows the markup of a column width, informal table.

```
<table id="tab-0003">
<tgroup cols="2">
<colspec colname="col1"/>
<colspec colname="col2"/>
<tbody>
<row rowsep="0">
<entry colsep="0"><para>A3460</para></entry>
<entry colsep="0"><para>Avio</para></entry>
</row>
<row rowsep="0">
<entry colsep="0"><para>D3309</para></entry>
<entry colsep="0"><para>MTU</para></entry>
</row>
<row rowsep="0">
<entry colsep="0"><para>8338B</para></entry>
<entry colsep="0"><para>ITP</para></entry>
</row>
</tbody>
</tgroup>
</table>
```

Chapter 3.9.5.2.1.7

Common constructs - Figures, multimedia and foldouts

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References

Table 1 References

Chap No./Document No.	Title
Chap 3.6	Information generation - Security and data restrictions
Chap 3.9.2	Authoring - Illustration rules and multimedia
Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2.1.1	Common constructs - Change marking

Chap No./Document No.	Title
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.3	Common constructs - Lists
Chap 3.9.5.2.1.5	Common constructs - Titles
Chap 3.9.5.2.1.6	Common constructs - Tables
Chap 3.9.5.2.1.8	Common constructs - Hotspots
Chap 3.9.5.3	Data modules - Applicability
Chap 4.4	Information management - Information control number
Chap 4.13.3	Optimizing and reuse - Alternates concept
Chap 7.7.4	Guidance and examples - XLink

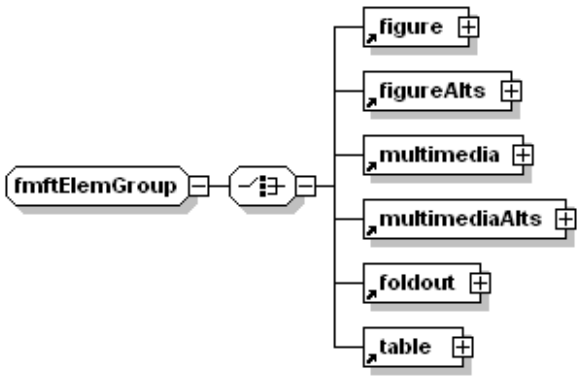
1 General

This chapter contains the definition and use of figures and foldouts from an author's point of view. It gives details about the available elements and attributes and how to use them to establish a connection between data module text and figures. Figures must be located in the context where it is most convenient to the reader. If it is cross-referenced only once, the location is immediately after the paragraph, or major element, in which the reference occurred.

2 Figures, multimedia and foldouts

2.1 General

The element group for figures, multimedia and foldouts also contains the alternates for figures and multimedia.



ICN-83007-0000000067-001-01

Fig 1 Element group `fmftElemGroup`

Child elements:

- <`figure`>. Refer to Para 2.2.1.
- <`figureAlts`>. Refer to Para 2.2.2.
- <`multimedia`>. Refer to Para 2.3.1.
- <`multimediaAlts`>. Refer to Para 2.3.2.
- <`foldout`>. Refer to Para 2.4.
- <`table`>. Refer to Chap 3.9.5.2.1.6.

2.2 Figure and figure alternates

2.2.1 Figure

Description: This element contains the figure. The figure consists of a title and one or more illustrations sheets, using the element <graphic>, and a figure title. It can also contain a legend.

For specific rules and guidance for the preparation of illustrations, refer to Chap 3.9.2.

In all cases, figures must be placed as near as possible to, and preferably immediately following, the related text.

Figure titles must be written in sentence case and must not have a period [.] at the end.

Figure titles must not exceed two lines.

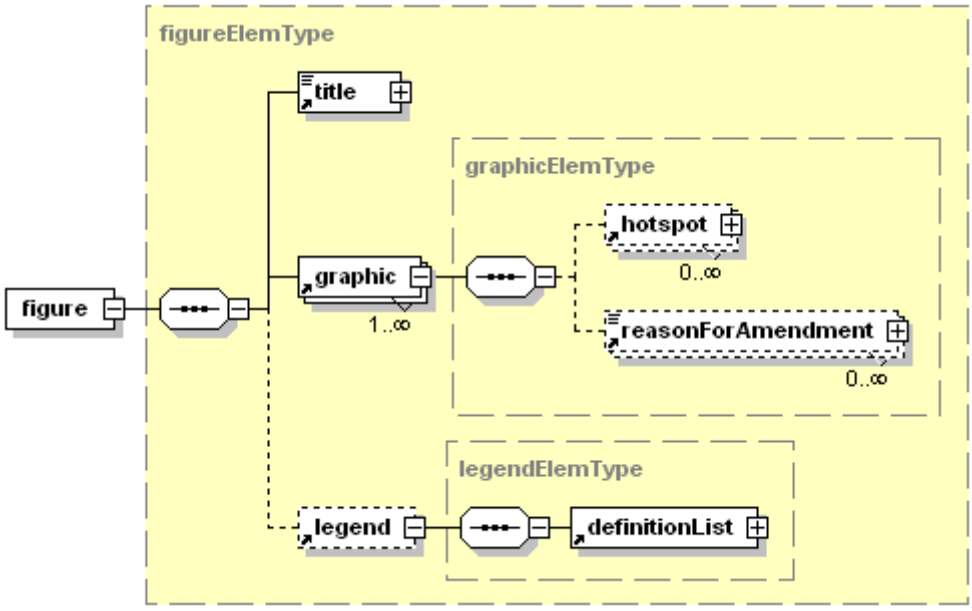
Note

For paper based publications and documents, which are produced from data modules, the placement of the figure is given in the data module. There must be no manual attempt to move the figure to another page due to an automatic page break.

An ICN is used to control the production and management of the illustration. This ICN is used within the data module to identify the associated graphic as described below. Refer to Chap 4.4.

Where appropriate, figures can be divided over a number of illustration sheets. This is achieved using multiple occurrences of the element <graphic> within the element <figure>.

Markup element: <figure>



ICN-83007-0000000068-001-01

Fig 2 Element <figure>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Note

When cross referring to an illustration or graphic in a data module, use this attribute `id` of the element <`figure`>, and not the attribute `id` of the element <`graphic`>.

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>. Refer to Chap 3.9.5.2.1.5.
- <`graphic`>. Refer to Para 2.2.1.1.
- <`legend`>, used to contain the legend information related to the figure. Refer to Para 2.2.1.2.

2.2.1.1 Graphic

Description: The element contains the external entity reference to the illustration file.

Markup element: <`graphic`>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

  Note

  An example value for the attribute `id`, when using the element <`graphic`> specifically for multiple sheets, is given in Chap 3.9.5.2.1.2 ("`fig-NNNN-gra-NNNN`", where NNNN gives a unique figure and sheet number within the data module).

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `infoEntityIdent` (M), the link to the external entity declaration, which points to the illustration file. The population of this attribute must include the complete ICN with the prefix "`ICN-`".
- `reproductionWidth` (O), used to indicate the presentation width to the presentation system. The width measurement is of the form number and unit (eg, 25pt, 25mm, 16.2in). The units are case sensitive and can be "pt" (points 1/72”), "cm" (centimeters), "mm" (millimeters), "pi" (picas), and "in" (inches).
- `reproductionHeight` (O), used to indicate the presentation height to the presentation system. The height measurement is of the form number and unit (eg, 25pt, 25mm, 16.2in). The units are case sensitive and can be "pt" (points 1/72”), "cm" (centimeters), "mm" (millimeters), "pi" (picas), and "in" (inches).
- `reproductionScale` (O), used to indicate the presentation scale to the presentation system. The scale measurement is of the form "integer number" (eg, 70), and means that the scaled height and width is the percentage of the full size graphic (100 is full size).
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Note

The element also includes five attributes normally populated by applications to make the use of W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

- <hotspot>, used for hot spotting. Refer to Chap 3.9.5.2.1.8.
- <reasonForAmendment>, used to contain the reason for amendment information. Refer to Chap 3.9.5.2.1.1.

2.2.1.2 Legend

Description: The element <legend> contains the legend or explanatory list. The entries in the legend must be exactly as the items are presented in the text (eg, if the legend says "Bolt" any text paragraph referencing this item should be "Bolt" or "bolt" if it is in a middle of a sentence).

Note

In the case of multi-sheet illustrations, only one legend is permitted.

Markup element: <legend>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <definitionList>. Refer to Chap 3.9.5.2.1.3.

Business rule decision point BRDP-S1-00128 - Types of legends:

- Decide on the strategy for legends, if used. Legends can appear as part of the illustration or as text using the element <legend>. The advantage of making the legend part of the text is that:
  - the same illustration can have different legends wherever it appears (eg, in multi-language projects)
  - the text of the element <legend> can be searched (this might not be the case if the legend is part of the illustration)
  - items in the illustration can be linked to the legend by the use of hotspots
  - the legend in the text can save space on the illustration (particularly when the legends are long)

2.2.2 Figure alternates

Description: The element <figureAlts> is an alternate group that provides the capability to group several alternatives to a figure. Refer to Chap 4.13.3.for information related to the use of alternates group in data module content.

Markup element: <figureAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

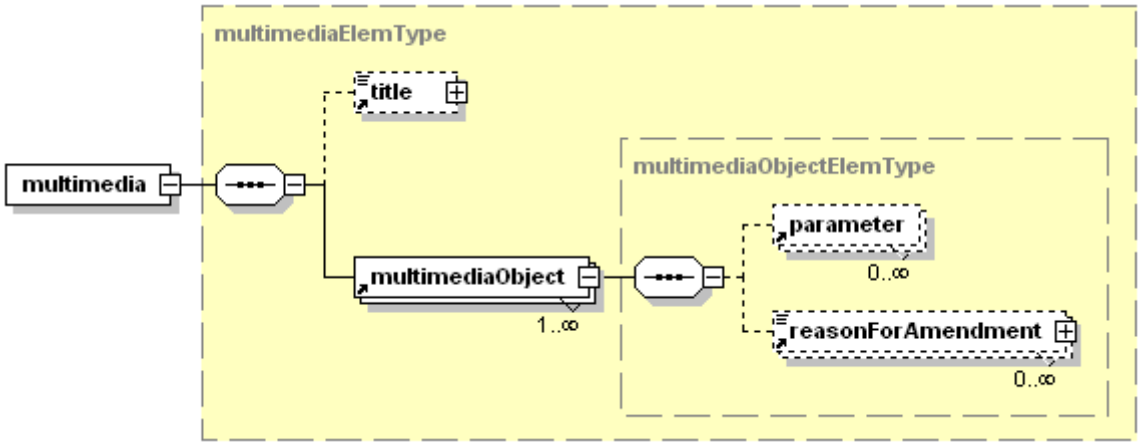
- <figure>. Refer to Para 2.2.1.

2.3 Multimedia and multimedia alternates

2.3.1 Multimedia

Description: The element <multimedia> contains the multimedia content, which is used for marking up all multimedia content.

Markup element: <multimedia>



ICN-83007-0000000070-001-01

Fig 3 Element <multimedia>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <multimediaObject>. Refer to Para 2.3.2.1.

Business rule decision point BRDP-S1-00129 - Suitability of multimedia use:

- Decide whether using multimedia is suitable for the environment in which the project will operate.

2.3.2 Multimedia alternates

The element <multimediaAlts> contains the element <multimedia>. Refer to Para 2.3.1.

2.3.2.1 Multimedia object

Description: The element <multimediaObject>, which contains parameter details of the multimedia objects.

Markup element: <multimediaObject>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- autoPlay (O), defines whether the object is automatically played on load or not (ie, wait for user interaction). The attribute can have one of the following values:
  - "0" - No, the object will not automatically play on load
  - "1" - Yes, the object will automatically play on load
- fullScreen (O), used to determine if the object will be viewed/played in full screen mode. This attribute can have one of the following values:
  - "0" - No, the object will not be viewed/played in full screen mode
  - "1" - Yes, the object will be viewed/played in full screen mode
- infoEntityIdent (M), a unique control number used to declare the entity name.
- multimediaObjectHeight (O), defines the display height of the object at run time if not full screen.
- multimediaObjectWidth (O), defines the display width of the object at run time if not full screen.
- multimediaType (M), used to denote the type of multimedia (eg, video, audio). The attribute can have one of the following values:
  - "3D" - to declare the multimedia object type as 3D
  - "audio" - to declare the multimedia object type as audio
  - "video" - to declare the multimedia object type as video
  - "other" - to declare the multimedia object type other than those defined above
- runTimeDuration (O), defines the objects run time (this can be necessary for text to sound synchronization, common in e-learning).
- showPluginControls (O), used to hide or show the third-party software plug-in controls. The attribute can have one of the following values:

- "hide" - to hide the plug-in controls
- "show" - to show the plug-in controls

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Note

The element also includes five attributes normally populated by applications to make the use of W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

– <parameter>. Refer to Chap 3.9.5.2.1.8.
– <reasonForAmendment>. Refer to Chap 3.9.5.2.1.1.

Business rule decision point BRDP-S1-00130 - Permitted types of multimedia:

– Decide what types of multimedia objects are permitted.

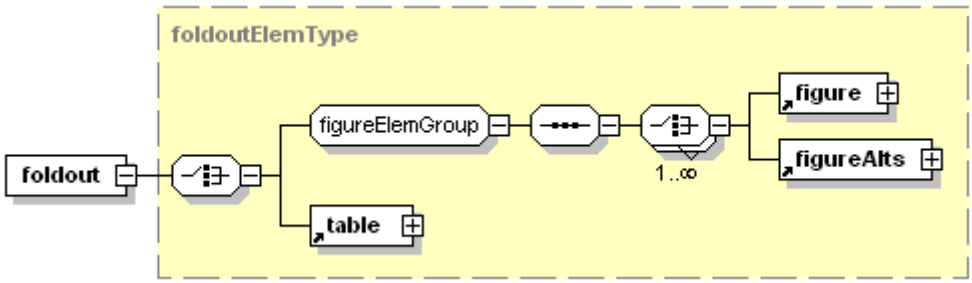
2.4 Foldouts

Description: The element <foldout> is used to contain a figure, or table which is larger than the default size.

Note

Use of foldouts for tables is to be avoided.

Markup element: <foldout>



ICN-83007-0000000069-001-01

Fig 4 Element <foldout>

Attributes:

– None

Child elements:

– <figure>. Refer to Para 2.1.
– <figureAlts>. Refer to Para 2.2.2.
– <table>. Refer to Chap 3.9.5.2.1.6.

Business rule decision point BRDP-S1-00131 - Use of foldouts:

– Decide whether to use the element <foldout> and, if used, where its use is allowed (eg, within specific information sets).

Note

It is only used for page-oriented publications, as it will not have an effect in the screen view of an IETP.

3 Examples

3.1 Single illustration

The following example shows the markup for a data module that contains a single CGM illustration using the complete ICN in the attribute `infoEntityIdent`.

```
<!DOCTYPE dmodule [
<!ENTITY ICN-S1000DBIKE-AAA-D000000-0-U8025-00536-A-04-1 SYSTEM
"../../../illustrations/ICN-S1000DBIKE-AAA-D000000-0-U8025-
00536-A-04-1.CGM" NDATA cgm>
]>
...
<figure id="fig-0001">
<title>Complete bicycle</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-D000000-0-U8025-
00536-A-04-1">
</graphic>
</figure>
```

3.2 Multiple illustrations

The following example shows the markup for a multiple illustration sheet figure:

```
<figure id="fig-0001">
<title>LP compressor - Removal</title>
<graphic id="fig-0001-gra-0001" infoEntityIdent="ICN-E2-A-
723200-R-K0378-00232-A-01-1">
</graphic>
<graphic id="fig-0001-gra-0002" infoEntityIdent="ICN-E2-A-
723200-R-K0378-00233-A-01-1">
</graphic>
</figure>
```

3.3 Alternate illustration

The following example shows the markup for an alternate illustration:

```
<figureAlts id="fig-0001">
<figure id="fig-0002">
<title>LP compressor - Removal</title>
<graphic id="fig-0001-gra-0001" infoEntityIdent="ICN-E2-A-
723200-R-K0378-00232-A-01-1">
</graphic>
<graphic id="fig-0001-gra-0002" infoEntityIdent="ICN-E2-A-
723200-R-K0378-00233-A-01-1">
</graphic>
</figure>
</figureAlts>
```

3.4 Legend

The following example shows the markup for a legend:

```
<figure id="fig-0001">
<title>LP compressor - Removal</title>
<graphic id="fig-0001-gra-0001" infoEntityIdent="ICN-E2-A-
723200-R-K0378-00232-A-01-1">
</graphic>
<graphic id="fig-0001-gra-0002" infoEntityIdent="ICN-E2-A-
723200-R-K0378-00233-A-01-1">
</graphic>
<legend>
<definitionList>
<title>Legend for <internalRef internalRefId="fig-0001">
</internalRef>
</title>
<definitionListItem>
<listItemTerm>1</listItemTerm>
<listItemDefinition><para>Display</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm>2</listItemTerm>
<listItemDefinition><para>Button</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm>3</listItemTerm>
<listItemDefinition><para>Widget</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm>4</listItemTerm>
<listItemDefinition><para>Adaptor</para></listItemDefinition>
</definitionListItem>
...
<definitionListItem>
<listItemTerm>102</listItemTerm>
<listItemDefinition><para>Retainer</para></listItemDefinition>
</definitionListItem>
</definitionList>
</legend>
</figure>
```

3.5 Multimedia

The multimedia element can be inserted into the data module at the same locations as a figure, foldout or table. An example of the inserted markup is as follows:

```
<multimedia id="mul-0001">
<multimediaObject autoPlay="0" infoEntityIdent="ICN-S1000DBIKE-
AAA-D000000-0-SF518-00538-A-001-01" multimediaType="3D"
showPluginControls="hide" fullScreen="0"
multimediaObjectHeight="300" multimediaObjectWidth="300">
</multimediaObject>
</multimedia>
```

To refer to an object inside the multimedia object the author must use the standard cross-reference element <internalRef>. To enable this cross-referencing, additional values

"multimedia", "multimediaObject" and "param" have been added to the attribute type within the element <internalRef>.

An example of the markup for the cross-reference is as follows:

```
<internalRef internalRefTargetType="irtt12" internalRefId="prm-
0001"></internalRef>
```

The cross reference is linked by the element <multimediaObject> which lists the accessible objects in the multimedia object. An example of this markup is as follows:

```
<multimedia>
<multimediaObject autoPlay="0" infoEntityIdent="ICN-S1000DBIKE-
AAA-D000000-0-SF518-00538-A-001-01" multimediaType="3D"
showPluginControls="hide" fullScreen="0"
multimediaObjectHeight="300" multimediaObjectWidth="300">
<parameter id="prm-0001" parameterIdent="param001"
parameterName="cable"/>
</multimediaObject>
<multimediaObject autoPlay="0" infoEntityIdent="ICN-S1000DBIKE-
AAA-D000000-0-SF518-00538-A-001-01" multimediaType="3D"
showPluginControls="hide" fullScreen="0"
multimediaObjectHeight="300" multimediaObjectWidth="300">
<parameter id="prm-0002" parameterIdent="param002"
parameterName="lever"/>
</multimediaObject>
<multimediaObject autoPlay="0" infoEntityIdent="ICN-S1000DBIKE-
AAA-D000000-0-SF518-00538-A-001-01" multimediaType="3D"
showPluginControls="hide" fullScreen="0"
multimediaObjectHeight="300" multimediaObjectWidth="300">
<parameter id="prm-0003" parameterIdent="param003"
parameterName="guide"/>
</multimediaObject>
</multimedia>
```

In the example above, referencing the element <parameter> by its attribute id will highlight the object in the multimedia object that is identified through the value "param001" of the attribute parameterIdent and the value "cable" of the attribute parameterName of the element <parameter>. For details on the element <parameter>, refer to Chap 3.9.5.2.1.8.

3.6 Foldout

The following example shows the markup for a foldout illustration:

```
<foldout>
<figure id="fig-0001">
<title>LP compressor - Removal</title>
<graphic infoEntityIdent="ICN-E2-A-723200-R-K0378-00232-A-01-1">
</graphic>
<graphic infoEntityIdent="ICN-E2-A-723200-R-K0378-00233-A-01-1">
</graphic>
</figure>
</foldout>
```

Chapter 3.9.5.2.1.8

Common constructs - Hotspots

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Chap 3.6	Information generation - Security and data restrictions

Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.7	Common constructs - Figures, multimedia and foldouts
Chap 3.9.5.2.7	Content section - Parts information
Chap 3.9.5.2.13.5	Content section - Learning assessment information
Chap 3.9.5.3	Data modules - Applicability
Chap 7.3.2	CSDB objects - Graphics
Chap 7.3.3	CSDB objects - Multimedia

1 General

The definition and the use of graphical hotspots including the use of multimedia parameters from an author's point of view is given here. The available elements and attributes, and how to use them to establish a connection between the data module text and objects within multimedia content is given in detail. S1000D does not mandate specific multimedia formats. It is up to the project or organization to specify which formats are to be used.

Information and guidance on how to prepare graphics for hyperlinking and navigation, is given in Chap 7.3.2.

2 Content

2.1 Relationship to CGM V4

The content model of an S1000D CGM version 4 Application Structure (APS) can be described as a recursive definition of a CGM APS parameter type with value <grobject>.

Note

All attributes of the CGM APS type value <grobject> correspond to CGM APS attributes, except the CGM APS parameter apsid, which corresponds to the application structure identifier of the CGM APS itself. Refer to Chap 7.3.2.

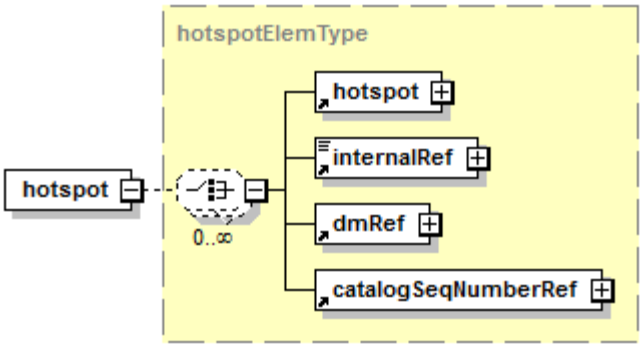
2.2 Relationship to multimedia content

The content model of an S1000D multimedia object or scene is dependent on the format of that object or scene. It is therefore not possible to describe the internal id mechanism of each multimedia type. Projects and organizations must ensure that the internal id mechanism for the specified format is clearly defined in the business rules.

2.3 Hotspot

Description: The element <hotspot> contains the definition of graphical regions in an illustration. It also contains information needed to navigate between graphical objects or between graphical objects and text. For the use of the element <hotspot> in the context of a learning assessment, refer to Chap 3.9.5.2.13.5.

Markup element: <hotspot>



ICN-S3627-S1000D0628-001-01

Fig 1 Element <hotspot>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- applicationStructureIdent (O), the relationship between the hotspot and the graphical object in the illustration, associated with the CGM APS parameter apsid
- applicationStructureName (O), the alternate relationship between the hotspot and the graphical object in the illustration, associated with the CGM APS attribute name
- hotspotType (O), the classification of a graphical object. Example values are "callout" or "detail".
- hotspotTitle (O), the context dependent human-readable label, such as a tool tip, that is displayed when the cursor passes over a graphical object
- objectDescr (O), the more detailed description of a graphical object
- objectCoordinates (O), the coordinates of the overlay region as a closed polygon, separated by commas in the form "x1, y1,...,xn, yn", where each (x,y)-pair defines a vertex point of the closed region in absolute pixel coordinates. The coordinate system has its origin (0,0) at the top/left corner of the raster image with the x-axis pointing to the right and the y-axis pointing down.

  Note

  The word "closed" means that the last vertex point equals to the first one. Thus, a rectangular region is defined by five coordinate pairs. The attribute objectCoordinates is only needed for defining externally sensible regions applicable to raster graphics that are not embedded in CGM graphics.

- visibility (O), controls how the graphical region is presented. It is set to the value "hidden" to turn off any graphical region that is not to be displayed for the current use of a graphic. Otherwise the value "visible" is assumed, which means that the graphical region will be displayed.

  Note

  The attribute visibility of the element <grobject> in the graphics companion file has three allowable values:

- "on" - the graphical region can be selected to be visible
- "off" - the graphical region cannot be selected to be visible
- "inherit" - the values "on" and "off" are inherited from the attribute pictureVisibility of the element <webcgm> in the graphics companion file, ie, "on" or "off"

The combination of the values for the attribute visibility of the element <hotspot> and the values for the attribute visibility of the element <grobject> provides the function of whether a graphical region can be selected for display or not. This combination has three allowable definitions:

- **visible, not selectable**, meaning one of the following:

  Do not define in a hotspot (do nothing).

  Define a hotspot without any internal references, data module references, or CSN references.

  Define a hotspot without any internal references, data module references, or CSN references and set the value of the attribute visibility to "visible".

- **visible, selectable**, meaning one of the following:

  Define a hotspot with at least one internal reference, data module reference, or CSN reference.

  Define a hotspot with at least one internal reference, data module reference, or CSN reference and set the value of the attribute visibility to "visible".

- **not visible, not selectable**, meaning:

  Define a hotspot with no internal reference, data module reference, or CSN reference and set the value of the attribute visibility to "hidden".

Note

The use of the definition, **not visible, selectable**, is disallowed.

- securityClassification (O), commercialClassification (O), and caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <hotspot>. Refer to Para 2.2.
- <internalRef>. Internal references must be populated in accordance with Chap 3.9.5.2.1.2. Refer to default BREX rule BREX-S1-00060.
- <dmRef>. Data module references must be populated in accordance with Chap 3.9.5.2.1.2.
- <catalogSeqNumberRef>. CSN references must be populated in accordance with Chap 3.9.5.2.7.

Business rule decision point BRDP-S1-00132 - Use of hotspots:

- Decide whether and how to use hotspots as follows:

- If hotspots are to be used, decide whether hotspots can be used to link to graphical objects from local text.
- If hotspots are to be used, decide whether hotspots can be used to link from graphical objects to other graphical objects or local text.
- If hotspots are to be used, decide whether hotspots can be used to link from graphical objects to other data modules.

2.4 Links to/from graphical objects

Graphical objects can be linked with text, other graphics or graphical objects, other data modules, and parts data in several ways. Links can originate from other objects referring to a graphical object. Links can also originate from graphical objects referring to other objects within the same data module (local), other data modules, or parts data.

If several links exist from the same object then the possible link destinations must be presented as a choice menu to the user when activating the object, for example, by clicking on it.

2.4.1 Links to graphical objects originating from local text

Graphical objects are addressed from within data module text by the use of the element <internalRef>. The content model of the element <internalRef> is described in Chap 3.9.5.2.1.2.

Note

In order to allow more flexibility for the element <internalRef> in data module text, it can have textual content including subscripts and superscripts to highlight link anchors to the end user in viewer applications. This expansion is not required when using the element <internalRef> within the context of the element <hotspot>.

The attribute internalRefId is used in cases where the link can be expressed as a simple inherited XML link to a target identified by an id attribute in accordance with the W3C XLink mechanism. This applies to all "outbound" links from data module text to graphical objects, all "inbound" links from a graphical object back to data module text (into the same data module where the graphical object is defined), and all "third-party" links from one graphical object to another.

In cases where the attribute internalRefId cannot be used, the attribute referredFragment contains a Universal Resource Name (URN) reference (including a fragment identifier in the general case) which points to the destination of the link. An example of using the attribute referredFragment would be to point into an audio/video data stream at a specific location. In this case, the attribute internalRefId is not used.

The attribute referredFragment of the element <internalRef> also covers the possibility of simultaneously addressing all graphical objects within a (multi-sheet) figure with the same value of the attribute applicationStructureName. The attribute applicationStructureName, which is replicated in the attribute referredFragment of the element <internalRef>, can be used as a shorthand address for all graphical objects defined in a (multi-sheet) figure with that name. In this case, the attribute internalRefId contains the value of the attribute id of the corresponding element <figure>. This feature is especially useful in parts data modules by providing a link from the textual description of a part to each occurrence of that part in the figure.

The attribute targetTitle of the element <internalRef> can be used to provide a human-readable label for the link destination, which will be displayed when, for instance, the graphical object is activated (eg, by a mouse-down event). If the element <internalRef> is attached to a graphical object more than once, then the possible link destinations (ie, the values of the attribute internalRefId and/or the attribute referredFragment and/or the

corresponding values of the attribute targetTitle) are presented as a choice menu to the user when activating the graphical object, for example, by clicking on it.

The value "irtt11" of the attribute internalRefTargetType is necessary to distinguish traditional references to a figure from references into it. Refer to default BREX rule BREX-S1-00060.

In case of multi-sheet figures, when cross-referencing to/into a single illustration sheet, the attribute internalRefId contains the value of the attribute id of the referenced element <graphic>.

Note

The attribute internalRefTargetType is not mandatory. If the application is able to retrieve the name of the link destination element, then it can perform proper actions based on this looked-up name instead of using the value of the attribute internalRefTargetType. In this case, the attribute internalRefTargetType does not need to be given.

2.4.2 Links originating from graphical objects to local text or graphics

Links from graphical objects to objects within the same data module are expressed by using the element <internalRef>. The links can be to data module text and/or to other graphic locations of a figure. The element <internalRef> is not used for references to another data module.

The use of the element <internalRef> follows the rules as described in Para 2.4.1 with the exception that the attribute internalRefTargetType is not limited to the value "irtt11". The value used accurately represents the type of the destination object.

In cases where the attribute internalRefId cannot be used, the attribute referredFragment will contain a URN reference (including a fragment identifier in the general case) pointing to the destination of the link. An example of using the attribute referredFragment is to point into an audio/video data stream at a specific location. In this case, the attribute internalRefId is not used.

2.4.3 Links from graphical objects to other data modules

Links from graphical objects to other data modules are expressed by using the element <dmRef>.

The use of the element <dmRef> follows the rules as described in Chap 3.9.5.2.1.2.

The use of the attribute referredFragment of the element <dmRef> covers the possibility of referencing into a figure within a different data module. This can be used, for example, to provide a graphical navigation capability. Referencing into the middle of procedural data is strongly discouraged as critical warnings, cautions, and setup information can be skipped creating a hazardous condition for personnel and equipment. Refer to Chap 3.9.5.2.1.2.

2.4.4 Links from graphical objects to parts data

Links from graphical objects to parts data are expressed by using the element <catalogSeqNumberRef>.

The element <catalogSeqNumberRef> is used to contain a reference to a parts catalog entry. Refer to Chap 3.9.5.2.7.

2.5 XML "authoring"

The manual effort involved in authoring the definition of and the access to graphical objects within data modules and their associated illustrations can be minimized by the use of sufficiently powerful tools, both in the CGM graphics and the textual XML environment. An example would be an existing tool which automatically reads and transforms callout/item numbers/items in the graphic to addressable objects with names and unique identifiers. WebCGM 2.1 supports this approach through the Document Object Model (DOM) interface. Refer to Chap 7.3.2.

2.6 Hotspot definition

In general, the major manual effort required to define hotspots must be spent in the graphics environment. Leaving out the simple example above of only defining callout/item numbers/items as graphical objects, the illustrator has to group graphic primitives, or has to define a geometric outline embracing them, and must associate address information (a unique identifier and possibly a name) to those potential hotspots.

Depending on the functionality of the CGM export facility in the graphics tool, this address information can be exposed to the textual XML environment for automated insertion of the element <hotspot> in data module text.

Some further information to be associated with hotspots can be automatically retrievable from within the data module text, such as the value of the attribute hotspotTitle of the element <hotspot> (eg, from the structural content of the element <legend>) or predetermined context-dependent link ends originating from that graphical object (eg, links back to part numbers in parts information data module text).

In the case of separate raster graphics (not embedded in CGM), the attribute applicationStructureIdent and the attribute applicationStructureName have no predefined meaning in the graphics environment. As described above, the attribute objectCoordinates of the element <hotspot> is used to hold the coordinates of a sensible overlay region associated with the raster image and serves as the "address" for linking into the graphics environment.

Note

In the light of the possible multiple use of a graphic in different data modules, it has to be clearly stated that not every object (APS in case of CGM) defined in the graphical environment needs to be inserted as the element <hotspot> in a specific data module (ie, only those graphical objects which are addressed by the element <internalRef> in that specific data module must be defined therein). The graphic itself must not be copied and/or re-identified.

2.7 Cross-referencing

As opposed to the definition of hotspots, the insertion of cross-references cannot be automated to the same degree. Nevertheless, some support can be given to "link authors" by the XML editor or by a separate link tool.

Note

If the identifiers are semantically meaningful within the data module content (eg, the attribute id of the element <catalogSeqNumber> in parts information data modules), then an automated cross-referencing process can be achieved.

2.8 Parameter

Description: The element <parameter> and its attributes are used for passing parameters to objects within the multimedia scene. These parameters can be used to control the behavior to or from objects and to capture click events.

The element <parameter> is a child of the element <multimediaObject>. Refer to Chap 3.9.5.2.1.7.

Note

Refer to Chap 7.3.3 for guidance on the use of multimedia objects.

Parameters are id values and names that can be passed to and from multimedia objects, and can be used to link or pass values to create behaviors within a multimedia scene.

Some examples of their use are:

- text in a data module to one area of an object
- text in a data module to several areas of an object
- one area of an object to data module text
- one area of an object to another area of the same object
- one area or object of a multimedia scene to another object of a multimedia scene, data module, or any valid reference in a data module
- one area or object to another object in the same multimedia scene
- from an object in a multimedia resource to another multimedia type, data module, or any valid reference in a data module

Markup element: <parameter>

Attributes:

- id (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- parameterIdent (O), the unique identifier in the multimedia object used to call a single element/object of the multimedia object, for example "Item 1" or "Step 1"
- parameterValue (O), an assigned value used as a method of passing a value to the object
- parameterName (O), the non-unique name used as a method of identifying an object or group of objects to pass a value to or from objects with the same name within the multimedia scene

Child elements:

- None

Business rule decision point BRDP-S1-00133 - Use of the element <parameter>:

- Decide whether to use the element <parameter> and how to use it. If used, specify the attributes to be used within the project or organization.

2.9 Defining sensitive areas

The author has to define a region, an object or objects, be that manual or automated, and must associate address information, a unique identifier and an optional name to those sensitive areas. The method of definition will be dependent on the content creation tools used and the specified formats.

Highlighting the sensitive area by interaction of the user is a viewer or application function. This can be handled within the multimedia environment as specified by the project or organization in the business rules.

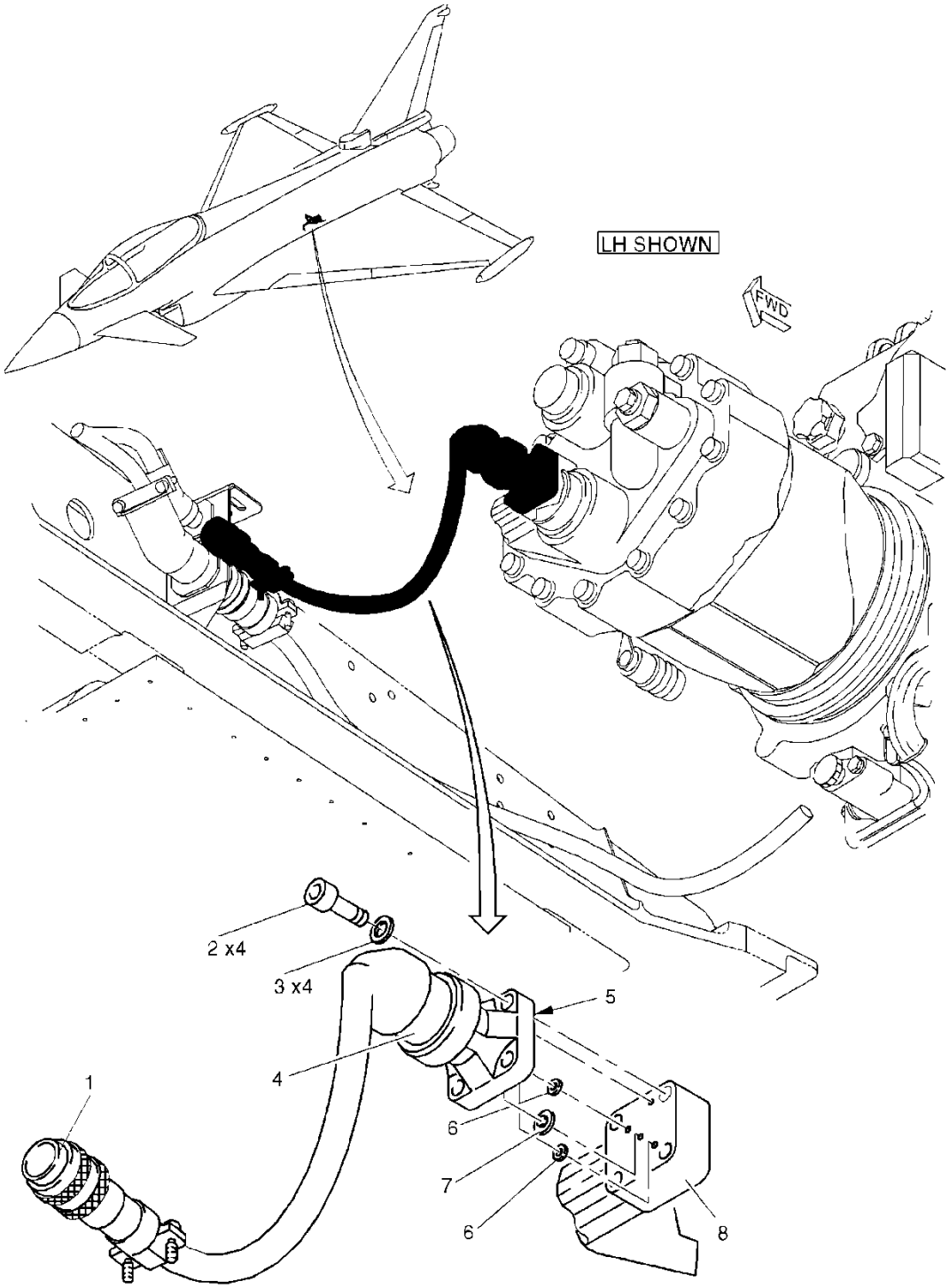
To set up links between data module text and multimedia presentations or between multimedia objects, cross-reference identifiers are necessary. This also applies to defined regions and viewcontext attributes. The required target address of points and values are handled within the multimedia environment as specified by the project or organization. The sensitive area can be represented by:

- objects or their surfaces
- buttons with or without text objects
- navigation symbols or callout numbers, can include the leader line
- visible region (or invisible before a user interaction)

3 Examples

The examples given below demonstrate the use of graphical hotspots in the data module text and the CGM illustration. The illustrations shown are not to scale.

3.1 Illustration example



ICN-1B-B-291101-M-C0419-00571-A-01-1

Fig 2 Graphical hotspots - Example

3.2 CGM version 4 file

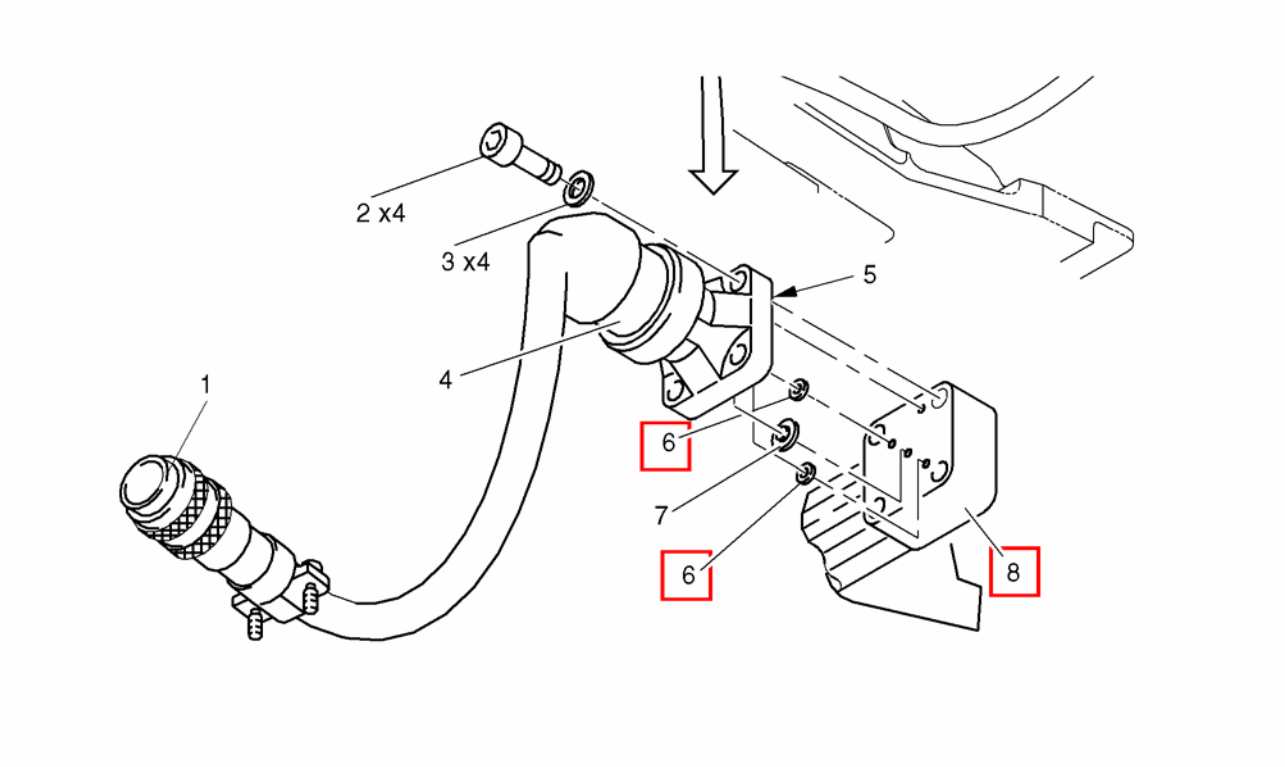
The following simple example is an extract from the CGM version 4 file of the illustration which shows the APS used to define the two occurrences of callout number "6" and the single occurrence of callout number "8" as graphical objects. The APS parameter id values are

"hot001", "hot002" and "hot003". The optional object names are "6" for both occurrences of callout number "6", whereas "hot003" is not named, and there are optional picking/highlighting regions (a continuous polybezier and two rectangles) defined for the three graphical objects.

```
BEGMF 'ICN-1B-B-291101-M-C0419-00571-A-001-01';
MFVERSION 4;
MFDESC '"ProfileId:S1000D",
"ProfileEd:2.3", "ColourClass:colour"';
MFELEMLIST 'VERSION4';
FONTLIST 'HELVETICA' 'HELVETICA_BOLD' 'HELVETICA_OBLIQUE'
'HELVETICA_BOLD_OBLIQUE';
CHARSETLIST STD94 'B' STD96 'A';
VDCTYPE REAL;
COLRPREC 255;
COLRINDEXPREC 255;
COLRVALUEEXT 0 0 0 255 255 255;
MAXCOLRINDEX 255;
INTEGERPREC -32767 32767;
REALPREC -2147483647 2147483647 4;
CHARCODING BASIC8BIT;
MAXVDCEXT 13.0581,41.3273 173.8012,259.1455;
BEGPIC 'Picture 1';
SCALEMODE METRIC 1;
VDCEXT 13.0581,41.3273 173.8012,259.1455;
COLRMODE INDEXED;
LINEWIDTHMODE ABS;
EDGEWIDTHMODE ABS;
LINEEDGETYPEDEF -22 5.75 10000 1333 111 1333;
BEGPICBODY;
LINECLIPMODE SHAPE;
% %
% All other primitives/elements deleted here %
% %
RESTRTEXTTYPE 2;
CHARSETINDEX 1;
ALTCHARSETINDEX 2;
TEXTALIGN CTR BASE 0 0;
CHARORI 0 1 1 0;
CHARHEIGHT 3.2844;
TEXTCOLR 1;
BEGAPS 'hot001' 'grobject' STLIST;
APSATTR 'name' "14 1 '6'";
APSATTR 'region' "11 1 4, 16 26 88.757 66.1349 88.757 66.1349
91.2264 66.1349 91.2264 66.1349 91.2264 66.1349 91.2264 70.0155
91.2264 70.0155 91.2264 70.0155 88.757 70.0155 88.757 70.0155
88.757 70.0155 88.757 66.1349 88.757 66.1349";
BEGAPSBODY;
RESTRTEXT 1.9476 3.2844 89.991,67.1933 final '6';
ENDAPS;
BEGAPS 'hot002' 'grobject' STLIST;
APSATTR 'name' "14 1 '6'";
APSATTR 'region' "11 1 1, 16 4 91 48 94 53";
```

```
BEGAPSBODY;
RESTRTEXT 1.9477 2.533 92.8528,49.9939 final '6';
ENDAPS;
BEGAPS 'hot003' 'grobject' STLIST;
APSATTR 'region' "11 1 1, 16 4 134 48 136 52";
BEGAPSBODY;
RESTRTEXT 1.9476 3.2844 135.3942,49.4756 final '8';
ENDAPS;
ENDPIC;
ENDMF;
```

The effect when highlighting these graphical objects and bringing them into view (possibly by defining an APS attribute `viewcontext` in addition) by a CGM viewer application can be as shown in the following illustration extract:



ICN-1B-B-291101-M-C0419-00571-B-01-1

Fig 3 Highlighting graphical objects - Example

3.3 XML companion metadata

3.3.1 Hotspot definition

The original XML data module fragment, which defines the figure that corresponds to the illustration example above, looks as follows:

```
<figure id="fig-0001">
<title>Removal of solenoid valve, pump no. 1
(no. 2)</title>
<graphic infoEntityIdent="ICN-1B-B-291101-M-C0419-00571-A-001-
01"></graphic>
<legend>
<definitionList>
<definitionListItem>
```

```
<listItemTerm>1</listItemTerm>
<listItemDefinition>
<para>Electrical plug 3MRa (5MRa)</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm>2</listItemTerm>
<listItemDefinition><para>Screw</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm>3</listItemTerm>
<listItemDefinition><para>Washer</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm>4</listItemTerm>
<listItemDefinition><para>Solenoid valve</para>
</listItemDefinition></definitionListItem>
<definitionListItem>
<listItemTerm>5</listItemTerm>
<listItemDefinition>
<para>Locating pin</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm id="fig-0001-trm-0001">6</listItemTerm>
<listItemDefinition><para>O-Ring</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm>7</listItemTerm>
<listItemDefinition><para>O-Ring</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm id="fig-0001-trm-0002">8</listItemTerm>
<listItemDefinition><para>Hydraulic pump</para>
</listItemDefinition></definitionListItem>
</definitionList></legend></figure>
```

After automated insertion of the potential hotspots, the XML data module fragment for the element <graphic> looks as follows, where the value "fig001" is the content of the attribute id of the parent single-sheet element <figure>:

```
<graphic id="fig-001-gra-0000" infoEntityIdent="ICN-1B-B-291101-
M-C0419-00571-A-001-01">
<hotspot id="fig-0001-gra-0000-hot-0001"
applicationStructureIdent="hot001" applicationStructureName="6"
hotspotTitle="O-Ring">
<internalRef internalRefId="fig-0001-trm-0001"
targetTitle="Explanation"
internalRefTargetType="irtt13"></internalRef></hotspot>
<hotspot id="fig-0001-gra-0000-hot-0002"
applicationStructureIdent="hot002" applicationStructureName="6"
hotspotTitle="O-Ring">
<internalRef internalRefId="fig-0001-trm-0001"
targetTitle="Explanation"
internalRefTargetType="irtt13"></internalRef></hotspot>
```

```
<hotspot id="fig-0001-gra-0000-hot-0003"
applicationStructureIdent="hot003" hotspotTitle="Hydraulic
pump">
<internalRef internalRefId="fig-0001-trm-0002"
targetTitle="Explanation" internalRefTargetType="irtt13">
</internalRef></hotspot></graphic>
```

This initial definition step can be performed, to a certain degree, without manual intervention by extracting the values of the attribute `applicationStructureIdent` and the attribute `applicationStructureName` from the CGM environment and inserting them in the XML instance.

In this example, the individual value of the attribute `hotspotTitle` of the element <`hotspot`> is retrieved from the element <`legend`>.

Note

The individual value of the attribute `internalRefId` is an XML identifier that points (back) from the graphical object to the proper location within the element <`legend`>.

3.3.2 Cross-referencing

For cross-referencing from within data module text to a single graphical object, the element <`internalRef`> can be used as follows:

```
<para>Refer to
<internalRef internalRefId="fig-0001-gra-0000-hot-0003"
internalRefTargetType="irtt11">item 8</internalRef></para>
```

In order to address both graphical objects named "6" at once, the attribute `target` of the element <`internalRef`> is used (in addition to the attribute `internalRefId` which points to the element <`figure`>) in the context of the element <`legend`> as follows:

```
<legend>
<definitionList>
<definitionListItem>
<listItemTerm>1</listItemTerm>
<listItemDefinition>
<para>Electrical plug 3MRa (5MRa)</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm>2</listItemTerm>
<listItemDefinition><para>Screw</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm>3</listItemTerm>
<listItemDefinition><para>Washer</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm>4</listItemTerm>
<listItemDefinition><para>Solenoid valve</para>
</listItemDefinition></definitionListItem>
<definitionListItem>
<listItemTerm>5</listItemTerm>
<listItemDefinition><para>Locating pin</para>
</listItemDefinition></definitionListItem>
```

```
<definitionListItem>
<listItemTerm id="fig-0001-trm-0001">6</listItemTerm>
<listItemDefinition>
<para><internalRef internalRefId="fig-0001" referredFragment="6"
internalRefTargetType="irtt11">O-Ring</internalRef></para>
</listItemDefinition></definitionListItem>
<definitionListItem>
<listItemTerm>7</listItemTerm>
<listItemDefinition><para>O-Ring</para></listItemDefinition>
</definitionListItem>
<definitionListItem>
<listItemTerm id="fig-0001-trm-0002">8</listItemTerm>
<listItemDefinition><para>Hydraulic pump</para>
</listItemDefinition></definitionListItem></definitionList>
</legend>
```

3.4 Separate raster graphics

In order to demonstrate the use of the attributes of the element <hotspot> in case of separate raster graphics (not embedded in CGM), it is assumed that the above illustration is only available as a TIF, CG4, GIF, PNG or JPG image file.

The XML data module fragment for the definition of the third element <hotspot> within the element <graphic> looks then as follows:

```
<hotspot id="fig-0001-gra-0000-hot-0003" hotspotTitle="Hydraulic
pump" objectCoordinates="134,48,134,52,136,52,136,48,134,48">
<internalRef internalRefId="fig-0001-trm-0002"
targetTitle="Explanation"
internalRefTargetType="irtt13"></internalRef></hotspot>
```

Note

The attribute `applicationStructureIdent` and the attribute `applicationStructureName` are not used in this example.

3.5 References between graphical objects

For cross-referencing from one graphical object to another, the element <internalRef> is used within the element <hotspot> as follows (building up on the example above):

```
<hotspot id="fig-0001-gra-0000-hot-0001"
applicationStructureIdent="hot001" applicationStructureName="6"
hotspotTitle="O-Ring">
<internalRef internalRefId="fig-0001-trm-0001"
targetTitle="Explanation"
internalRefTargetType="irtt13"></internalRef>
<internalRef internalRefId="fig-0001-gra-0000-hot-0002"
internalRefTargetType="irtt11" targetTitle="Second occurrence of
catalogItemNumber 6"></internalRef></hotspot>
```

In this example, the link from the first to the second occurrence of item number "6" is expressed by another child element <internalRef> of the element <hotspot>.

3.6 References from within illustration sheets to other data modules

For cross-referencing from one graphical object to the figure and the XML text of another data module and to parts data, the element <internalRef>, the element <dmRef> and the element <catalogSeqNumberRef> are used within the element <hotspot> as follows (building up on the example above):

```
<hotspot id="fig-0001-gra-0000-hot-0003"
applicationStructureIdent="hot003" hotspotTitle="Hydraulic
pump">
<internalRef internalRefId="fig-0001-trm-0002"
targetTitle="Explanation" internalRefTargetType="irtt13">
</internalRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="1B" systemDiffCode="B"
systemCode="24" subSystemCode="4" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="A"
infoCode="510" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
<dmRefAddressItems>
<dmTitle>
<techName>External power</techName>
<infoName>Disconnect procedure</infoName>
</dmTitle></dmRefAddressItems></dmRef>
<dmRef referredFragment="ICN-1B-B-244000-M-C0419-00123-A-001-
01">
<dmRefIdent>
<dmCode modelIdentCode="1B" systemDiffCode="B"
systemCode="24" subSystemCode="4" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="A"
infoCode="510" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent></dmRef>
<catalogSeqNumberRef modelIdentCode="E2" systemDiffCode="A"
systemCode="53" subSystemCode="2" subSubSystemCode="5"
assyCode="10" figureNumber="01" item="001" itemLocationCode="D"
itemSeqNumberValue="00A"/></hotspot>
```

In this example, the second child element <dmRef> of the element <hotspot> demonstrates the possibility for link definitions from a graphical hotspot to another data module.

The third child element <dmRef> of the element <hotspot> demonstrates the possibility for link definitions from a graphical hotspot to other resources (ie, to another figure), external to the context of a specific data module. This is accomplished by using the attribute `referredFragment`.

The fourth child element <catalogSeqNumberRef> of the element <hotspot> demonstrates the possibility for link definitions from a graphical hotspot to a part within an IPD data module.

In this example, when the graphical hotspot is selected in an IETP, a list of four possible link destinations is presented:

– Explanation - Other

- Disconnection of power supply - Normal operation
- Disconnection of power supply - Figure
- Hydraulic pump XYZ - Parts data

Chapter 3.9.5.2.1.9

Common constructs - Preliminary requirements and requirements after job completion

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Chap 3.9.5	Authoring - Data modules
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Chap 3.9.6.1	Attributes - Project configurable values
Chap 4.13.1	Optimizing and reuse - Common information repository concept
Chap 6.2.3.3	Layout rules and examples - Procedural data modules
Chap 6.3.1	IETP - Output specification

1 General

This chapter contains the definition and handling of the sections "Preliminary requirements" and "Requirements after job completion" from an author's point of view. It gives details about the available elements and attributes and how to use them to populate Preliminary requirements and Requirements after job completion.

The rules for the presentation of Preliminary requirements and Requirements after job completion in page-oriented publications and IETP are given in Chap 6.2.3.3 and Chap 6.3.1, respectively.

Preliminary requirements, element <preliminaryRqmts> used in procedural, fault isolation, process and maintenance checklists and inspections data modules:

- lists (Required conditions) the tasks to be done or conditions that must be satisfied before the Main procedure, element <mainProcedure>, for procedural data modules, elements <faultReporting> and <faultIsolation> for fault isolation data modules, <checkList> in the maintenance checklists and inspection data modules is started
- lists any personnel, required technical information, support equipment, supplies and spares that are needed to perform the Required conditions, Main procedure and Requirements after job completion. Resources given in referenced procedures (data modules, publication modules or non-S1000D publications or documents) must not be included.
- contains the safety conditions that apply to the Main procedure and the Requirements after job completion

Basic production maintenance data can be specified by using in the element <productionMaintData>.

Requirements after job completion, element <closeRqmts>, captures any actions that are required after the Main procedure is complete, to return the Product to a serviceable condition or the conditions that must be satisfied to have the Product in a serviceable condition.

Fig 1 shows the overall construct of the elements <preliminaryRqmts> and <closeRqmts> in procedural, fault isolation and process data modules. The maintenance

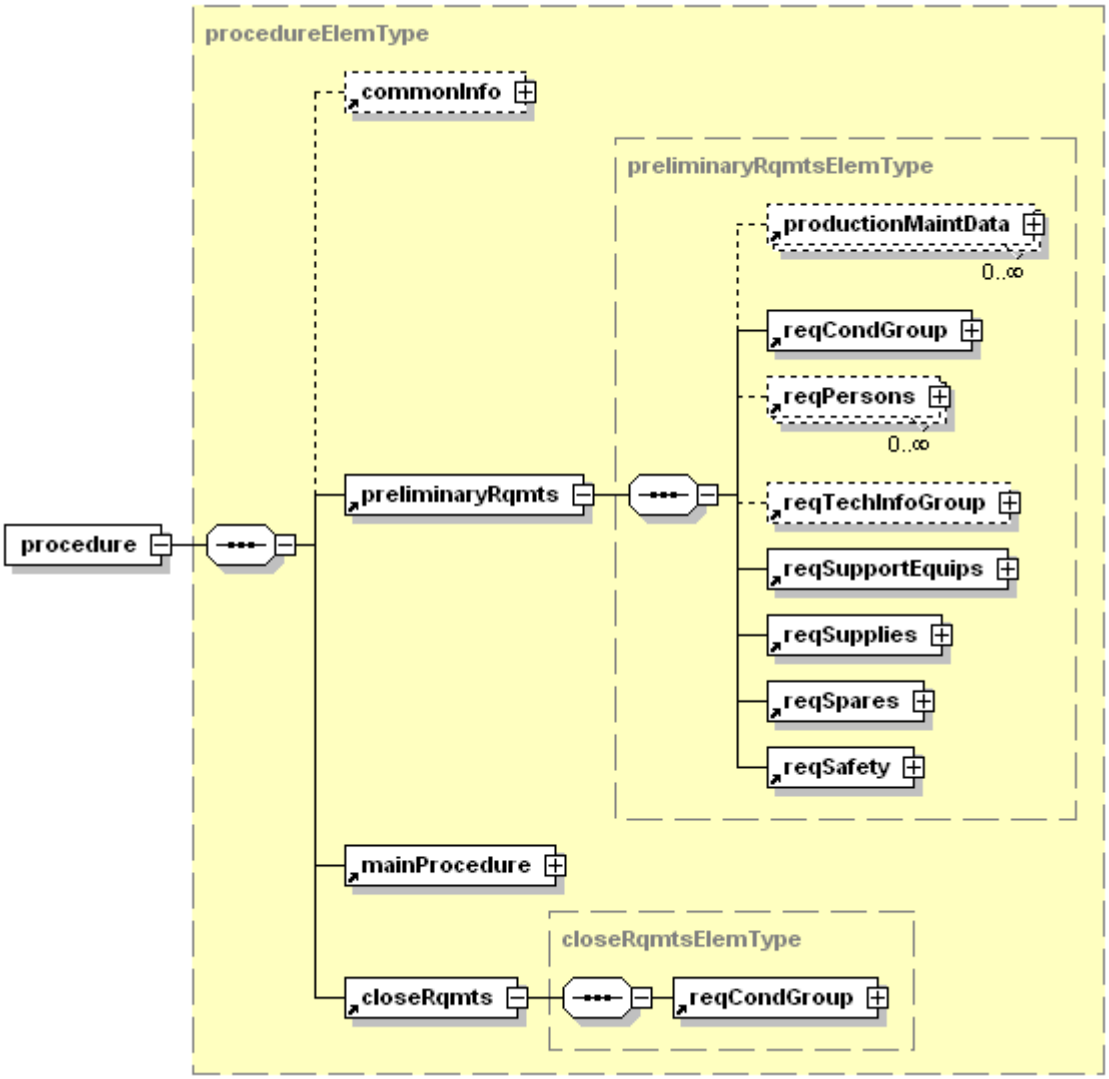
planning and maintenance checklist data modules use only the element <preliminaryRqmts>.

It is recommended to give references to complete data modules only, in Required conditions, element <reqCondGroup>, and in Requirements after job completion, element <closeRqmts>. This enables an automatically preparation of situation adopted maintenance procedures, by compiling all the Preliminary requirements data and actions, and the Requirements after job completion data and actions, together with all Main procedures, consolidated into one complete sequence.

To prescribe a condition by giving an action in the elements <preliminaryRqmts> or <closeRqmts>, without a reference to a data module, can reduce the possibility for further automated preparation of situation adopted maintenance procedures. The same limitation appears where an action just refers to one or more steps in the referred data module or publication.

The markup examples given in this chapter are presented in Chap 6.2.3.3 in the S1000D standard layout for page-oriented presentation.

The graphical representation of the XML schema fragments use specific symbols which are explained in Chap 3.9.5.



ICN-S3627-S1000D0442-001-01

Fig 1 Element <preliminaryRqmts> and element <closeRqmts> in a procedural data module

2 Preliminary requirements

Description: The element <preliminaryRqmts> contains all preliminary requirements for a procedure as described at Para 2.2 through Para 2.8.

Markup element: <preliminaryRqmts>

The element is mandatory in procedural and fault isolation data modules and optional in process and maintenance planning data modules.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <productionMaintData>, production management data. Refer to Para 2.1.
- <reqCondGroup>, required conditions. Refer to Para 2.2.
- <reqPersons>, required persons. Refer to Para 2.3.
- <reqTechInfoGroup>, required technical information. Refer to Para 2.4.
- <reqSupportEquips>, support equipment. Refer to Para 2.5.
- <reqSupplies>, consumables, materials and expendables. Refer to Para 2.6.
- <reqSpares>, spares. Refer to Para 2.7.
- <reqSafety>, safety conditions. Refer to Para 2.8.

Business rule decision point BRDP-S1-00134 - Use of the element <preliminaryRqmts>:

- Decide whether to use the element <preliminaryRqmts> in maintenance planning, fault isolation, maintenance checklist and/or process data modules.

Markup example:

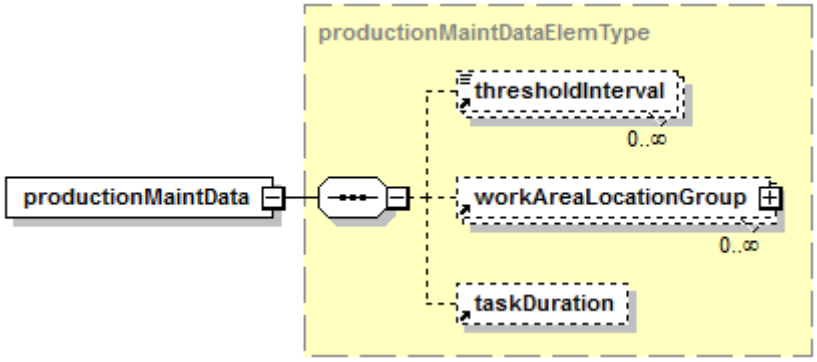
```
<preliminaryRqmts>
<reqCondGroup>
<noConds/>
</reqCondGroup>
<reqPersons>
<person man="A">
<personCategory personCategoryCode="Basic user"/>
<trade>Operator</trade>
<estimatedTime unitOfMeasure="h">0,3</estimatedTime></person>
</reqPersons>
<reqSupportEquips>
<supportEquipDescrGroup>
<supportEquipDescr id="seq-0001">
<name>Tire pressure gauge</name>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001-01</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
<supportEquipDescr id="seq-0002">
<name>Specialist toolset</name>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
</supportEquipDescrGroup>
</reqSupportEquips>
<reqSupplies>
```

```
<supplyDescrGroup>
<supplyDescr id="sup-0001">
<name>General lubricant</name>
<identNumber>
<manufacturerCode>KZ222</manufacturerCode>
<partAndSerialNumber>
<partNumber>LL-001</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity>As required</reqQuantity>
</supplyDescr>
</supplyDescrGroup>
</reqSupplies>
<reqSpares>
<noSpares/>
</reqSpares>
<reqSafety>
<noSafety/>
</reqSafety>
</preliminaryRqmts>
```

2.1 Production maintenance data

Description: The element <productionMaintData> contains the basic information required for the planning and preparation of the task.

Markup element: <productionMaintData>



ICN-S3627-S1000D0443-002-01

Fig 2 Element <productionMaintData>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <thresholdInterval>, the threshold intervals. Refer to Para 2.1.1.

- <workAreaLocationGroup>, the group of work area locations. Refer to Para 2.1.2.
- <taskDuration>, the maintenance task duration. Refer to Para 2.1.3.

2.1.1 Threshold interval

Description: The element <thresholdInterval> contains any (one or more) threshold interval information that is relevant to the task. It is populated in the format of threshold or threshold interval value. For example 25 followed by the value of the attribute thresholdUnitOfMeasure (eg, FH).

Recommendation: The use of the element <thresholdInterval> can conflict with the same data given in the maintenance planning information data modules. A close coordination must be taken if the same data is given in both the procedure and the maintenance planning information. It is recommended to use the maintenance planning information in preference of the element <thresholdInterval> in each procedural data module.

Markup element: <thresholdInterval>

Attributes:

- thresholdUnitOfMeasure (M), the unit of measure for the threshold interval. The attribute can have one of the following values:
  - "th01" thru "th99". Refer to Chap 3.9.6.1.

Child elements:

- None

Markup example:

The following example is a threshold interval indicating 25 flight hours. The attribute thresholdUnitOfMeasure set to "th01" indicates flight hours as specified in Chap 3.9.6.1.

```
<thresholdInterval
thresholdUnitOfMeasure="th01">25</thresholdInterval>
```

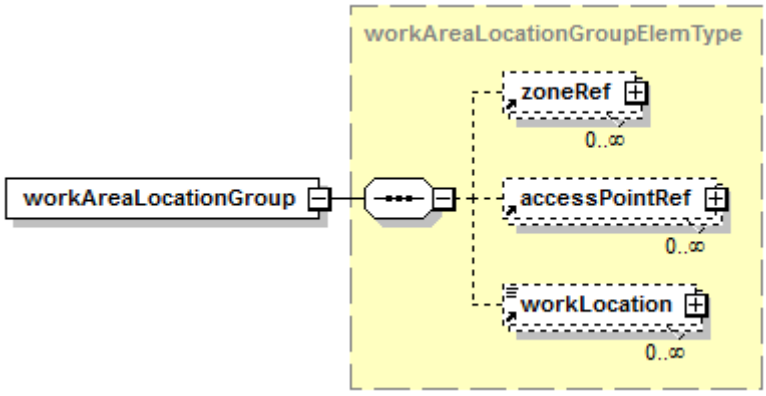
The following example is a threshold interval indicating 55 to 60 days. The attribute thresholdUnitOfMeasure set to "th06" indicates days as specified in Chap 3.9.6.1.

```
<thresholdInterval thresholdUnitOfMeasure="th06">55 to
60</thresholdInterval>
```

2.1.2 Work area location group

Description: The element <workAreaLocationGroup> contains the area where work must be done. This area is sorted by zone, access point and work location.

Markup element: <workAreaLocationGroup>



ICN-S3627-S1000D0626-001-01

Fig 3 Element <workAreaLocationGroup>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <zoneRef>, the references to the zones. Refer to Chap 3.9.5.2.1.10.
- <accessPointRef>, the references to the access points. Refer to Chap 3.9.5.2.1.10.
- <workLocation>, the description of the area where work is accomplished. Refer to Para 2.1.2.1.

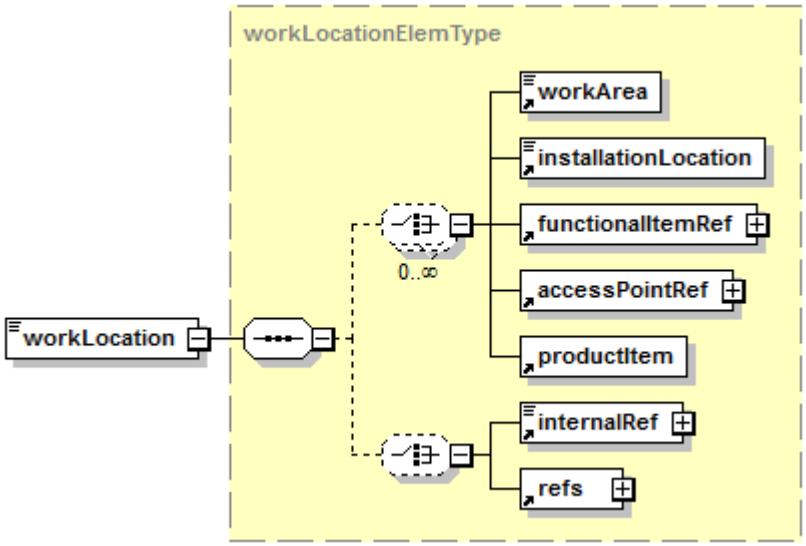
Business rule decision point BRDP-S1-00135 - Use of the element <workAreaLocationGroup> in the element <preliminaryRqmts>:

- Decide whether and how to use the element <workAreaLocationGroup>. The possibility of duplication and mismatch of data given in the maintenance planning information must be taken into account.

2.1.2.1 Work location

Description: The element <workLocation> contains the precise location where work must be done.

Markup element: <workLocation>



ICN-S3627-S1000D0627-001-01

Fig 4 Element <workLocation>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

One or more of the following:

- <workArea>, the descriptive identifier of the area where work is accomplished that cannot be deduced from the names of the collection of zones. Refer to Para 2.1.2.1.1.
- <installationLocation>, the installation location. Refer to Para 2.1.2.1.2.
- <functionalItemRef>. Refer to Chap 3.9.5.1.
- <accessPointRef>, the references to the access points. Refer to Chap 3.9.5.2.1.10.
- <productItem>, the identifiers of structural parts. Refer to Para 2.1.2.1.3.

and/or one or more of the following elements:

- <internalRef>. Refer to Chap 3.9.5.2.1.2.
- <refs>. Refer to Chap 3.9.5.2.1.2.

Business rule decision point BRDP-S1-00136 - Use of the element <workLocation> in the element <preliminaryRqmts>:

- Decide whether and how to use the element <workLocation>. If used, decide the data module types with which it will be used.

2.1.2.1.1 Work area

Description: The element <workArea> contains a descriptive identifier of the area where work is accomplished that cannot be deduced from the names of the collection of zones.

Markup element: <workArea>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Business rule decision point BRDP-S1-00137 - Use of the element <workArea> in the element <preliminaryRqmts>:

- Decide whether and how to use the element <workArea>. If used, decide which data module types to use it.

Markup example:

```
<workArea>Nose cowl</workArea>
```

2.1.2.1.2 Installation location

Description: The element <installationLocation> contains the installation location information of the equipment instances.

Markup element: <installationLocation>

Attributes:

- unitOfMeasure (O), the unit of measure for the installation location if applicable for the installation location type
- installationLocationType (O), the type of the installation location information (eg, Section, Station). The attribute can have one of the following values:
  - "instloctyp02" thru "instloctyp99". Refer to Chap 3.9.6.1.

  Note

  When the installation location refers to a zone, the element <zoneRef> must be used. Refer to Chap 3.9.5.2.1.10.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Business rule decision point BRDP-S1-00138 - Use of the element <installationLocation> in the element <preliminaryRqmts>:

- Decide whether and how to use the element <installationLocation>. If used, decide which data module types to use it.

Markup examples:

Example 1 - Installation location in coded form:

The following markup example shows an installation location in coded form, when the type is "Section":

```
<installationLocation installationLocationType="instloctyp02">
245</installationLocation>
```

Example 2 - Installation location in clear text:

The following markup example shows an installation location in clear text:

```
<installationLocation>Side console and rear pressure bulkhead
plug break RH (rear cockpit)</installationLocation>
```

Example 3 - Installation location with dimensions:

The following example shows the installation location of equipment by populating the element <installationLocation> with station, water line and buttock line information. The unit of measure is centimeter.

```
<installationLocation installationLocationType="instloctyp03"
unitOfMeasure="cm">199</installationLocation>
<installationLocation installationLocationType="instloctyp04"
unitOfMeasure="cm">170</installationLocation>
<installationLocation installationLocationType="instloctyp05"
unitOfMeasure="cm">57</installationLocation>
```

2.1.2.1.3 Product item

Description: The element <productItem> is an identifier of structural part of a Product (eg, Frame, Rib, Stringer). It helps workers determining the exact position where a work must be done.

Markup element: <productItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- productItemName (O), contains the product item name.
- productItemType (O), contains the product item type (eg, Frame, Rib, Stringer). The attribute can have one of the following values:
  - "pi01" thru "pi99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Business rule decision point BRDP-S1-00139 - Use of the element <productItem> in the element <preliminaryRqmts>:

- Decide whether and how to use the element <productItem>. If used, decide which data module types to use it.

Business rule decision point BRDP-S1-00140 - Use of the attribute `productItemName` in the element <`preliminaryRqmts`>:

– Decide whether and how to use the attribute `productItemName`.

Business rule decision point BRDP-S1-00141 - Use of the attribute `productItemType` in the element <`preliminaryRqmts`>:

– Decide whether and how to use the attribute `productItemType`.

Markup example:

```
<workAreaLocationGroup>
<zoneRef zoneNumber="250"/>
<zoneRef zoneNumber="260"/>
<workLocation>
from <productItem productItemType="pi01" productItemName="62"/>
to <productItem productItemType="pi01"
productItemName="63"/></workLocation>
</workAreaLocationGroup>
```

Note

"`pi01`" corresponds to a "frame" product item.

2.1.3 Maintenance task duration

Description: The element <`taskDuration`> contains the elapsed times for performing the actions specified in Preliminary requirements, the Main procedure and the Requirements after job completion which are necessary to achieve the complete maintenance action.

Note

All referenced actions must be included.

Markup element: <`taskDuration`>

Attributes:

– `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– `unitOfMeasure` (M), the unit of measure to be used are:

  - "`d`" - day
  - "`h`" - hour

  Refer to default BREX rule BREX-S1-00070.

– `startupDuration` (M), the duration for performing the actions specified in the Preliminary requirements
– `procedureDuration` (M), the duration for performing the actions specified in the procedure
– `closeupDuration` (M), the duration for performing the actions specified in the Requirements after job completion
– `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

The task duration must be given in hours or days with maximum two decimals (eg, 12,55 h, 1,5 d). The three values of time duration, and the unit of measure must be entered.

The total elapsed time for the maintenance task is built up by populating all three attributes `startupDuration`, `procedureDuration` and `closeupDuration`.

Recommendation: The use of the element <`taskDuration`> can interfere with the same data given in the maintenance planning information data modules. A close coordination must be taken if the same data is given in both the procedure and the maintenance planning information. It is recommended to use the maintenance planning information in preference of the element <`taskDuration`> in each procedural data module.

Child elements:

– None

Business rule decision point BRDP-S1-00142 - Use of the element <`taskDuration`> in the element <`preliminaryRqmts`>

– Decide whether and how to use the element <`taskDuration`>. The possibility of duplication and mismatch of data given in the maintenance planning information must be taken into account.

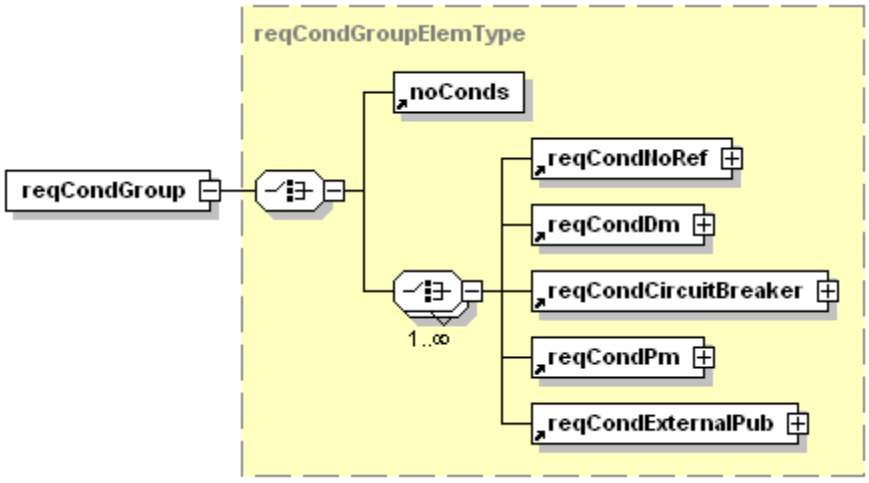
Markup example:

```
<taskDuration closeupDuration="0,5" procedureDuration="3,0"
startupDuration="1,5" unitOfMeasure="h"/>
```

2.2 Required conditions

Description: This element <`reqCondGroup`> contains any required conditions information. Required conditions are **actions to be done** and/or **conditions that must be satisfied** before the procedure which is the subject of the data module is started.

Markup element: <`reqCondGroup`>



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Fig 5 Element <`reqCondGroup`>

Attributes:

– `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <noConds>. Refer to Para 2.2.1.

  or one or more of the following:

- <reqCondNoRef>, any simple action/condition with no referenced data module or technical publication. Refer to Para 2.2.2.
- <reqCondDm>, any actions/conditions referenced to a data module. Refer to Para 2.2.3.
- <reqCondCircuitBreaker>, the circuit breaker actions/conditions. Refer to Para 2.2.4.
- <reqCondPm>, any actions/conditions referenced to a publication module. Refer to Para 2.2.5.
- <reqCondExternalPub>, any actions/conditions referenced to a non-S1000D publication. Refer to Para 2.2.6.

In process data modules, each element can also include the element <variablePostSet> used to update the state information about the state of the Product. For example, if there were a required condition that "Door 12 is open", at some point an assertion can be made to the state information that "Door 12 is open", which can then impact maintenance instructions to follow. Refer to Chap 3.9.5.2.10.

The required actions/conditions, including any circuit breaker actions/conditions, must be listed in the order that they must be carried out to accomplish the procedure.

Markup example:

```
<reqCondGroup>
<reqCondNoRef>
<reqCond>The bicycle is outdoors.</reqCond>
</reqCondNoRef>
</reqCondGroup>
```

2.2.1 No conditions

Description: The element <noConds> contains the "marker" for no required actions/conditions. If there are no required actions/conditions for the procedure then the element <noConds> must be used.

Note

When a data module is formatted, the element <noConds> generates the word "None" at presentation. For page-oriented presentation "None" is given in the title/condition column of the Required conditions table.

Markup element: <noConds>

Attributes:

- None

Child elements:

- None

Markup example:

```
<reqCondGroup>
<noConds/>
</reqCondGroup>
```

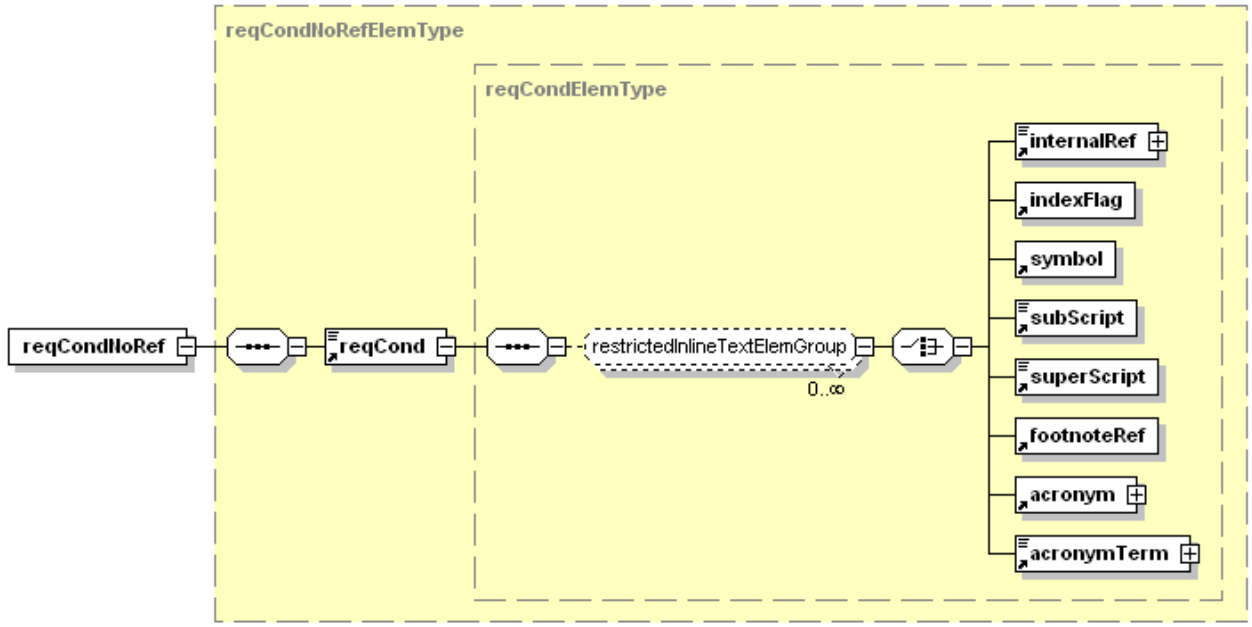
2.2.2 Required condition - simple action/condition

Description: The element <reqCondNoRef> contains the action/condition on its own with no referenced data module or technical publication to represent a simple one step action/condition that does not require further explanation.

The text of a **required action** must be written as an instruction that can be carried out, by a trained mechanic, without any additional information. For example, write "Remove the blanks from all orifices".

The text of a **required condition** must be written as a statement that can be evaluated true or false. For example, write "The blanks are removed from all orifices".

Markup element: <reqCondNoRef>



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Fig 6 Element <reqCondNoRef>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <reqCond>. Refer to Para 2.2.3.1.

Markup example:

```
<reqCondNoRef>
<reqCond>The bicycle is outdoors</reqCond>
</reqCondNoRef>
```

2.2.3 Required conditions - referenced data module

Description: The element <reqCondDm> contains the required action/condition when satisfied by completing a procedure that is described in a separate data module.

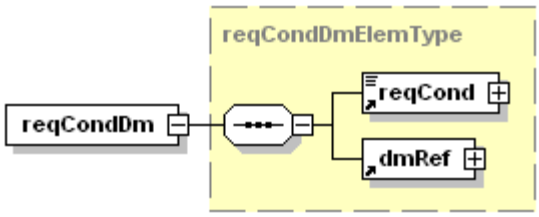
The element <reqCondDm> is used to describe the required action/condition and the element <dmRef> to contain the reference to the data module that contains the procedure to fulfill the condition.

The required action/condition must be equivalent to the full procedure in the referenced data module.

The text of a **required action** must be written as a statement that can be carried out, by a trained mechanic, with support of the referenced data module if needed. For example, write "Make the engine safe for maintenance".

The text of a **required condition** must be written as a statement that can be evaluated true or false with support of the referenced data module if needed. For example, write "The engine is safe for maintenance".

Markup element: <reqCondDm>



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Fig 7 Element <reqCondDm>

Attributes:

– Includes the same set of attributes as the element <reqCondNoRef>. Refer to Para 2.2.2.

Child elements:

– <reqCond>. Refer to Para 2.2.3.1.
– <dmRef>. Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<reqCondDm>
<reqCond>The tire is removed.</reqCond>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE"  systemDiffCode="AAA"
systemCode="DA0"  subSystemCode="1"  subSubSystemCode="0"
```

```
assyCode="20"  disassyCode="00"  disassyCodeVariant="AA"
infoCode="215"  infoCodeVariant="A"  itemLocationCode="A">
</dmCode>
</dmRefIdent>
</dmRef>
</reqCondDm>
```

2.2.3.1 Required condition

Description: The element <reqCond> contains the required action/condition statement, such as "The tire is removed", "The engine is safe for maintenance", "Make the engine safe for maintenance", "Open the circuit breaker:" or "Make sure the circuit breaker is open, safetied/locked and tagged:" which might require a separate procedure.

Markup element: <reqCond>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- reqCondCategory, the category of the condition (eg, special environmental conditions such as reduced lighting, ventilation, and temperature). The attribute can have one of the following values:
  - "rcc01" thru "rcc99". Refer to Chap 3.9.6.1.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <internalRef> (O). Refer to Chap 3.9.5.2.1.2.
- <indexFlag>(O). Refer to Chap 3.9.5.2.1.10.
- <symbol>(O). Refer to Chap 3.9.5.2.1.10.
- <subScript>(O). Refer to Chap 3.9.5.2.1.10.
- <superScript>(O). Refer to Chap 3.9.5.2.1.10.
- <footnoteRef> (O). Refer to Chap 3.9.5.2.1.10.
- <acronym> (O). Refer to Chap 3.9.5.2.1.10.
- <acronymTerm> (O). Refer to Chap 3.9.5.2.1.10.

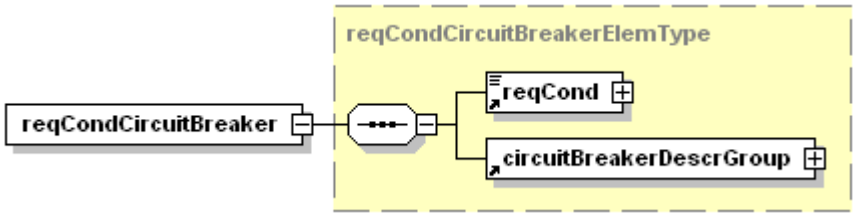
Markup example:

```
<reqCond>The tire is removed</reqCond>
```

2.2.4 Required conditions - circuit breaker list

Description: The element <reqCondCircuitBreaker> contains a set of circuit breaker actions (open, close, open-order, close-order, check open or check closed) to be executed before the performance of the task. The circuit breaker actions must be marked up in the sequence they have to be performed.

Markup element: <reqCondCircuitBreaker>



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Fig 8 Element <reqCondCircuitBreaker>

Attributes:

– Includes the same set of attributes as the element <reqCondNoRef>. Refer to Para 2.2.2.

Child elements:

– <reqCond>. Refer to Para 2.2.3.1.
– <circuitBreakerDescrGroup>. Refer to Para 2.2.4.1.

Business rule decision point BRDP-S1-00143 - Inclusion of a circuit breaker list as part of the required conditions - (element <reqCondCircuitBreaker>):

– Decide if circuit breaker lists are allowed in required conditions and thus the use of the element, or if all the circuit breaker settings must be part of the steps. In this latter case, the element <circuitBreakerDescrGroup> in steps content can be used.

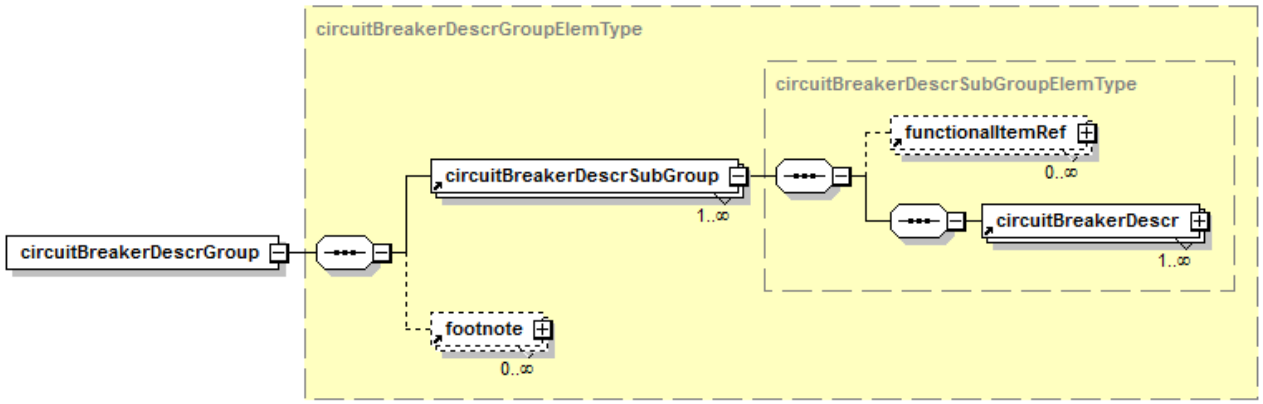
Markup example:

```
<reqCondCircuitBreaker>
<reqCond>Make sure the circuit breaker is open, safetied/locked
and tagged.</reqCond>
...
</reqCondCircuitBreaker>
```

2.2.4.1 Circuit breaker description group

Description: The element <circuitBreakerDescrGroup> contains the circuit breaker lists information.

Markup element: <circuitBreakerDescrGroup>



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Fig 9 Element <circuitBreakerDescrGroup>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- circuitBreakerAction (O), the action to perform on the whole set of circuit breaker described in the table. The attribute can have one of the following values:
  - "open" - the action "to open"
  - "close" - the action "to close"
  - "verif-open" - the check of the condition: "is open"
  - "verif-close" - the check of the condition: "is closed"
  - "open-order" - the action "to open" following the circuit breaker list sequence
  - "close-order" - the action "to close" following the circuit breaker list sequence
- checkSum (O), the entered data which allows potential integrity verification
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <circuitBreakerDescrSubGroup>. Refer to Para 2.2.4.1.1.
- <footnote>. Refer to Chap 3.9.5.2.1.10.

2.2.4.1.1 Circuit breaker description subgroup

Description: The element <circuitBreakerDescrSubGroup> contains one or more sub circuit breaker lists.

Markup element: <circuitBreakerDescrSubGroup>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- circuitBreakerAction (O). Refer to Para 2.2.4.1.
- checkSum (O), the entered data which allows potential integrity verification
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

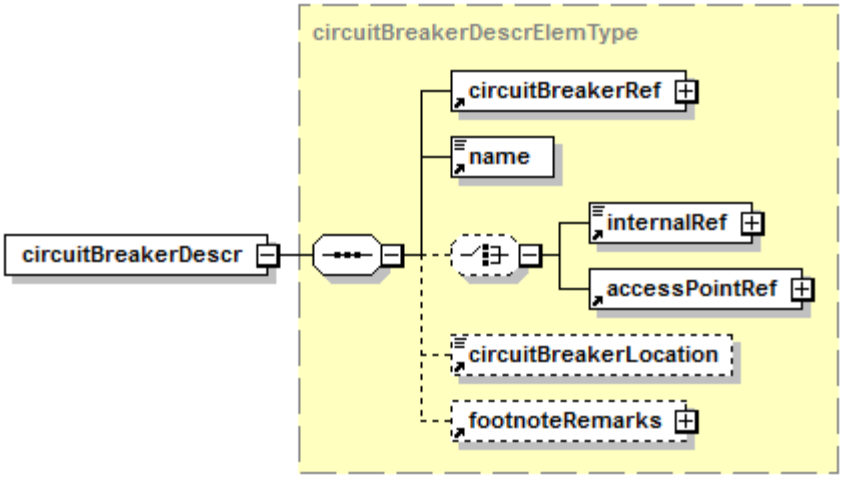
Child elements:

- <functionalItemRef>, contains the particular context for this set of circuit breakers as described in Chap 3.9.5.1.
- <circuitBreakerDescr>, the description of the circuit breaker. Refer to Para 2.2.4.1.2.

2.2.4.1.2 Circuit breaker description

Description: The element <circuitBreakerDescr> contains the information on individual circuit breakers.

Markup element: <circuitBreakerDescr>



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Fig 10 Element <circuitBreakerDescr>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <circuitBreakerRef>, the circuit breaker number, circuit breaker action and circuit breaker type. Refer to Chap 3.9.5.2.1.10.
- <name>, the name of the circuit breaker. Refer to Chap 3.9.5.2.1.10.
- <internalRef>, the cross-reference to the access point introduced in the product management data, element <productionMaintData>
- <accessPointRef>, the identifier of the access point allowing manipulating the circuit breaker. Refer to Chap 3.9.5.2.1.10.
- <circuitBreakerLocation>, the circuit breaker location in the circuit breaker panel by entering text. Refer to Para 2.2.4.1.3.
- <footnoteRemarks>, contains textual remarks or reference to a footnote. Refer to Para 2.5.1.6.

Markup examples:

Markup example 1 - <circuitBreakerRef>:

```
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerNumber="42RT"
circuitBreakerType="cbt02">
</circuitBreakerRef>
<name>MMR-1 (ILS+GPS)</name>
<circuitBreakerLocation>0867</circuitBreakerLocation>
</circuitBreakerDescr>
```

Markup example 2 - <internalRef> - Access point identifier given by element <internalRef> (to element <accessPointRef> within the element <productionMaintData>):

```
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerType="cbt02"
circuitBreakerNumber="44RT"/>
<name>MMR-2 (ILS+GPS)</name>
<internalRef internalRefTargetType="irtt13"
internalRefId="accpnl-0042"/>
<circuitBreakerLocation>0867</circuitBreakerLocation>
</circuitBreakerDescr>
```

Markup example 3 - Access point identifier given by element <accessPointRef>:

```
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerType="cbt02"
circuitBreakerNumber="800RT"/>
<name>GLIDE ANT2 SWGT RELAY</name>
<accessPointRef accessPointNumber="2502VU"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>SSPC</circuitBreakerLocation>
</circuitBreakerDescr>
```

Markup example 4 - <circuitBreakerLocation>:

```
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerNumber="800RT"
circuitBreakerType="cbt02">
</circuitBreakerRef>
<name>GLIDE ANT2 SWGT RELAY</name>
<circuitBreakerLocation>SSPC</circuitBreakerLocation>
<footnoteRemarks><footnoteRef internalRefId ="ftn-
001"/></footnoteRemarks>
</circuitBreakerDescr>
```

2.2.4.1.3 Circuit breaker location

Description: The element <circuitBreakerLocation> contains the textual description of the circuit breaker location in the circuit breaker panel.

Markup element: <circuitBreakerLocation>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.2.5 Required conditions - referenced publication module

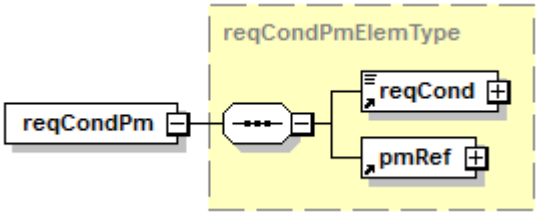
Description: The element <reqCondPm> contains the required action/condition when they are contained in another publication module.

The element <reqCond> is used to describe the required action/condition and the element <pmRef> to contain the publication module identifier.

Note

The use of the element <reqCondPm> needs a clear reference to the procedure needed to do the action or fulfill the condition. A general reference to for example a component maintenance publication can hinder the mechanic to do the job and also the automated generation of situation adopted maintenance procedures.

Markup element: <reqCondPm>



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Fig 11 Element <reqCondPm>

Attributes:

- Includes the same set of attributes as the element <reqCondNoRef>. Refer to Para 2.2.2.

Child elements:

- <reqCond>. Refer to Para 2.2.3.1.
- <pmRef>. Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<reqCondPm>
<reqCond>Gather the following publication.</reqCond>
<pmRef>
<pmRefIdent>
<pmCode modelIdentCode="FRIGATE124ALFA" pmIssuer="01233"
pmNumber="01234"
pmVolume="01"/>
</pmRefIdent>
</pmRef>
</reqCondPm>
```

2.2.6 Required conditions - referenced non-S1000D publication or document

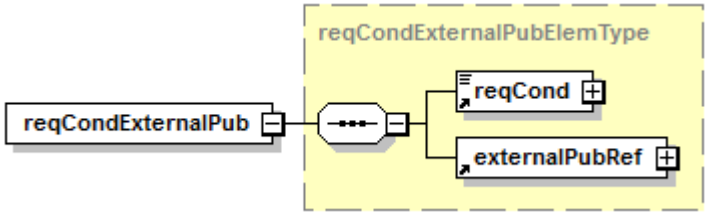
Description: The element <reqCondExternalPub> contains the required action/condition when are contained in a non-S1000D publication or document.

The element <reqCond> is used to describe the required action/condition and the element <externalPubRef> to contain the publication or document identifier.

Note

The use of the element <reqCondExternalPub> needs a clear reference to the procedure needed to do the action or fulfill the condition. A general reference to for example a component maintenance publication can hinder the mechanic to do the job and also the automated generation of situation adopted maintenance procedures.

Markup element: <reqCondExternalPub>



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Fig 12 Element <reqCondExternalPub>

Attributes:

– Includes the same set of attributes as the element <reqCondNoRef>. Refer to Para 2.2.2.

Child elements:

– <reqCond>. Refer to Para 2.2.3.1.
– <externalPubRef>. Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<reqCondExternalPub>
<reqCond>Safely discard the horn that you removed</reqCond>
<externalPubRef><externalPubRefIdent><externalPubTitle>Local
Disposal Procedures</externalPubTitle>
</externalPubRefIdent></externalPubRef>
</reqCondExternalPub>
```

2.2.7 Required conditions - markup example

The presentation of the following example is shown in Chap 6.2.3.3.

```
<preliminaryRqmts>
<reqCondGroup>
<reqCondNoRef>
<reqCond>Remove the blanks from all orifices</reqCond>
</reqCondNoRef>
<reqCondDm>
<reqCond>The engine is safe for maintenance</reqCond>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="ENGINE123" systemDiffCode="AAA"
```

```
systemCode="70" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="23" disassyCodeVariant="AA"
infoCode="200" infoCodeVariant="A"
itemLocationCode="A"></dmCode>
</dmRefIdent>
</dmRef>
</reqCondDm>
<reqCondNoRef>
<reqCond>Open Door 824 to access Electrical panels</reqCond>
</reqCondNoRef>
<reqCondCircuitBreaker>
<reqCond>Make sure the circuit breaker is open, safetied/locked
and tagged:</reqCond>
<circuitBreakerDescrGroup circuitBreakerAction="verif-open">
<circuitBreakerDescrSubGroup>
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerType="cbt02"
circuitBreakerNumber="42RT"/>
<name>MMR-1 (ILS+GPS)</name>
<accessPointRef accessPointNumber="2501VU"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>0867</circuitBreakerLocation>
</circuitBreakerDescr>
</circuitBreakerDescrSubGroup>
</circuitBreakerDescrGroup>
</reqCondCircuitBreaker>
<reqCondCircuitBreaker>
<reqCond>Make sure the circuit breaker is closed,
safetied/locked and tagged:</reqCond>
<circuitBreakerDescrGroup circuitBreakerAction="verif-close">
<circuitBreakerDescrSubGroup>
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerType="cbt02"
circuitBreakerNumber="10CA1"/>
<name>AUTO FLT/FMGC/1</name>
<accessPointRef accessPointNumber="49VU"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>02 B</circuitBreakerLocation>
</circuitBreakerDescr>
</circuitBreakerDescrSubGroup>
<footnote id="ftn-001">
<para>The location of the circuit breaker depends on the
aircraft configuration</para>
</footnote>
</circuitBreakerDescrGroup>
</reqCondCircuitBreaker>
<reqCondCircuitBreaker>
<reqCond>Open the circuit breaker:</reqCond>
<circuitBreakerDescrGroup circuitBreakerAction="open">
<circuitBreakerDescrSubGroup>
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerType="cbt02"
```

```
circuitBreakerNumber="44RT"/>
<name>MMR-2 (ILS+GPS)</name>
<accessPointRef accessPointNumber="2514VU"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>0867</circuitBreakerLocation>
</circuitBreakerDescr>
</circuitBreakerDescrSubGroup>
</circuitBreakerDescrGroup>
</reqCondCircuitBreaker>
<reqCondCircuitBreaker>
<reqCond>Make sure the circuit breaker is open, safetied/locked
and tagged:</reqCond>
<circuitBreakerDescrGroup circuitBreakerAction="verif-open">
<circuitBreakerDescrSubGroup>
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerType="cbt02"
circuitBreakerNumber="800RT"/>
<name>GLIDE ANT2 SWGT RELAY</name>
<accessPointRef accessPointNumber="2502VU"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>SSPC</circuitBreakerLocation>
</circuitBreakerDescr>
</circuitBreakerDescrSubGroup>
<footnote id="ftn-002">
<para>If the circuit breaker is modified by SB-A350-A-25-10-
0001-00A-930A-C</para>
</footnote>
</circuitBreakerDescrGroup>
</reqCondCircuitBreaker>
<reqCondNoRef>
<reqCond>Close Door 824</reqCond>
</reqCondNoRef>
<reqCondNoRef>
<reqCond>Open Door 834 to access Electrical panels 49VU and
121</reqCond>
</reqCondNoRef>
<reqCondCircuitBreaker>
<reqCond>Close the circuit breaker:</reqCond>
<circuitBreakerDescrGroup circuitBreakerAction="close">
<circuitBreakerDescrSubGroup>
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerType="cbt02"
circuitBreakerNumber="11CA1"/>
<name>AUTO FLT/MCDU/1</name>
<accessPointRef accessPointNumber="49VU"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>01 B</circuitBreakerLocation>
</circuitBreakerDescr>
</circuitBreakerDescrSubGroup>
</circuitBreakerDescrGroup>
</reqCondCircuitBreaker>
<reqCondCircuitBreaker>
```

```
<reqCond>Make sure the circuit breaker is closed,
safetied/locked and tagged:</reqCond>
<circuitBreakerDescrGroup circuitBreakerAction="verif-close">
<circuitBreakerDescrSubGroup>
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerType="cbt02"
circuitBreakerNumber="10CA2"/>
<name>AUTO FLT/FMGC/2</name>
<accessPointRef accessPointNumber="121VU"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>17 M</circuitBreakerLocation>
</circuitBreakerDescr>
</circuitBreakerDescrSubGroup>
<circuitBreakerDescrSubGroup>
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerType="cbt02"
circuitBreakerNumber="10CA2"/>
<name>DATA/LOADER/SPLY</name>
<accessPointRef accessPointNumber="121VU"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>20 N</circuitBreakerLocation>
</circuitBreakerDescr>
</circuitBreakerDescrSubGroup>
<circuitBreakerDescrSubGroup>
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerType="cbt02"
circuitBreakerNumber="5TD"/>
<name>DLS&amp;amp;/DLRB/SPLY</name>
<accessPointRef accessPointNumber="121VU"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>16 J</circuitBreakerLocation>
<footnoteRemarks>
<simplePara>If installed</simplePara>
</footnoteRemarks>
</circuitBreakerDescr>
</circuitBreakerDescrSubGroup>
</circuitBreakerDescrGroup>
</reqCondCircuitBreaker>
<reqCondCircuitBreaker>
<reqCond>Open/Close the circuit breaker in the following
order:</reqCond>
<circuitBreakerDescrGroup circuitBreakerAction="open-order">
<circuitBreakerDescrSubGroup>
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerAction="open"
circuitBreakerType="cbt02" circuitBreakerNumber="58GA"/>
<name>LGCIU/BAT SPLY/SYS1</name>
<accessPointRef accessPointNumber="121"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>43Q</circuitBreakerLocation>
<footnoteRemarks>
<footnoteRef internalRefId="ftn-001"/>
```

```
</footnoteRemarks>
</circuitBreakerDescr>
</circuitBreakerDescrSubGroup>
<circuitBreakerDescrSubGroup>
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerAction="open"
circuitBreakerNumber="1WE1"/>
<name>ENGINE/ENG1 AND 2 FIRE EXTIG/BTL1/SQUIB/A</name>
<accessPointRef accessPointNumber="121"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>25 R</circuitBreakerLocation>
</circuitBreakerDescr>
</circuitBreakerDescrSubGroup>
<circuitBreakerDescrSubGroup>
<circuitBreakerDescr>
<circuitBreakerRef circuitBreakerAction="close"
circuitBreakerType="cbt02" circuitBreakerNumber="T4TWO"/>
<name>JUST/AN/OTHER/CB</name>
<accessPointRef accessPointNumber="121"
accessPointTypeValue="accpnl02"/>
<circuitBreakerLocation>26 R</circuitBreakerLocation>
<footnoteRemarks>
<footnoteRef internalRefId="ftn-002"/>
</footnoteRemarks>
</circuitBreakerDescr>
</circuitBreakerDescrSubGroup>
</circuitBreakerDescrGroup>
</reqCondCircuitBreaker>
</reqCondGroup>
<reqSupportEquips>
<noSupportEquips/>
</reqSupportEquips>
<reqSupplies>
<noSupplies/>
</reqSupplies>
<reqSpares>
<noSpares/>
</reqSpares>
<reqSafety>
<noSafety/>
</reqSafety>
</preliminaryRqmts>
```

2.3 Required persons

Description: The element <reqPersons> contains the information on the required personnel for the task.

A program can choose to identify the number of a certain skill (category, skill level, trade) that is required. A program choosing this method must use the element <personnel> in conjunction with the attribute numRequired.

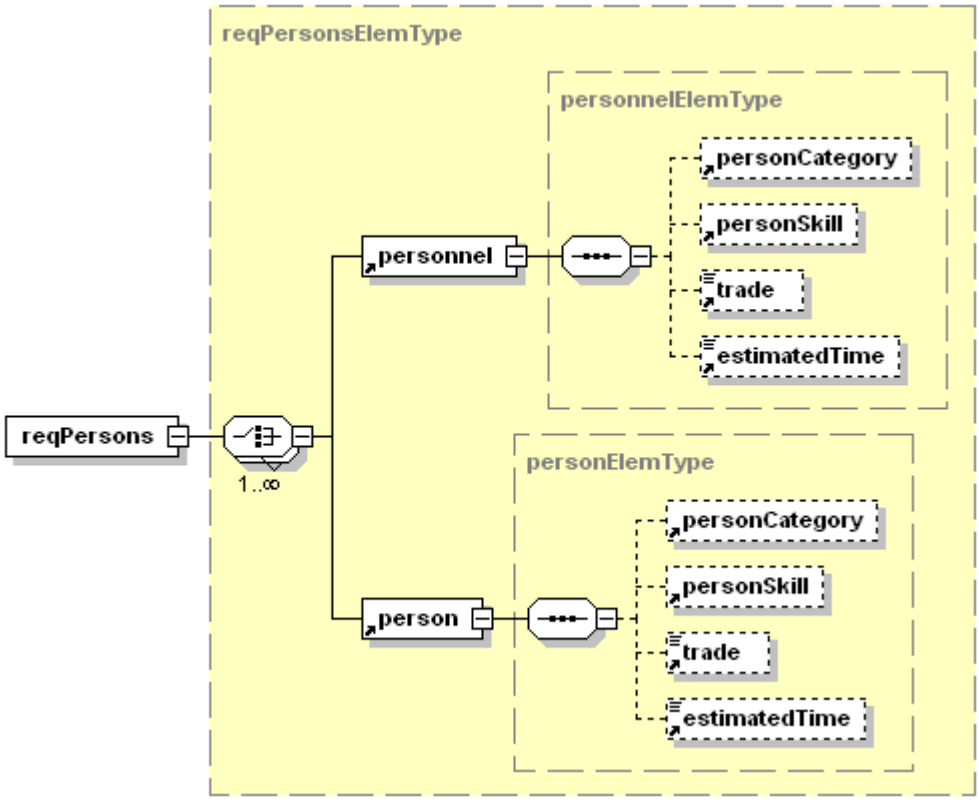
If there are requirements for a specific man, then the element <person> must be used. This element has the attribute man, which must be used to indicate the particular person

(eg, man="B"). This method identifies each person required to do the procedure together with the appropriate information as defined by the project: category, skill level, trade/trade code and estimated time spent per person.

If none of the elements in the element <reqPersons> is used this will be regarded as "As required".

Required persons can be represented by a mix of populated the element <personnel> and the element <person>.

Markup element: <reqPersons>



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Fig 13 Element <reqPersons>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <personnel>, the required personnel when the number of a certain skill is required. Refer to Para 2.3.1.
- <person>, the required personnel when skill per individual is required. Refer to Para 2.3.2.

Business rule decision point BRDP-S1-00144 - Use of the element <reqPersons> in the element <preliminaryRqmts>:

- Decide whether and how to use the element <reqPersons>. For example, use either the element <personnel> or <person> or use both elements.

2.3.1 Personnel

Description: The element <personnel> contains the information on the required personnel for the task by grouping the personnel by category, skill level and trade/trade code together with the number of personnel of a certain skill (category, skill level, trade).

If the number of personnel of a specific category, skill level or trade is not defined in the element <personnel> the absence of a specified quantity indicates as "As required".

Note

At page-oriented presentation "As required" is given in the Person column of the "Required persons" table.

If the attribute numRequired is used, then the number required will be presented with the skill level in parentheses.

Markup element: <personnel>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- numRequired (O), the number of personnel for a certain combination of category, skill level and trade
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <personCategory>. Refer to Para 2.3.1.1.
- <personSkill>. Refer to Para 2.3.1.2.
- <trade>. Refer to Para 2.3.1.3.
- <estimatedTime>. Refer to Para 2.3.1.4.

Markup example:

```
<personnel numRequired="2">
<personCategory personCategoryCode="Electrician"/>
<personSkill skillLevelCode="sk01"/>
<trade>AF901</trade>
```

```
<estimatedTime unitOfMeasure="h">1,5</estimatedTime>
</personnel>
```

2.3.1.1 Category

Description: The element <personCategory> contains the required category of the person.

Markup element: <personCategory>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- personCategoryCode (M), the required skill category/type of the person who will perform the task (eg, Airframe, Electrical, Avionic, Engine). The attribute must have the same values (the S1000D interpretation of the equivalent value of "stNN" as given in Chap 3.9.6.1) as the attribute skillType of the element <taskDefinition> in the schedule Schema if both are used. Refer to Chap 3.9.5.2.5.

  Recommendation: It is recommended to only populate the attribute personCategoryCode of the element <personCategory> when child element <preliminaryRqmts> of the element <taskDefinition> is used in the schedule Schema.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Business rule decision point BRDP-S1-00145 - Values for the attribute personCategoryCode in the element <preliminaryRqmts>:

- Define a list of skill categories/types (eg, Airframe, Electrical, Avionic, Engine).

Markup example:

```
<personCategory personCategoryCode="Electrical"/>
```

2.3.1.2 Skill level

Description: The element <personSkill> contains the required skill level of the person. This represents the skill level that the person must have attained to be able to perform his or her role in the procedure and is (eg, Basic, Intermediate, Advanced).

The element <personSkill> must have the same values (the S1000D interpretation of the equivalent value of "stNN" as given in Chap 3.9.6.1) as the attribute skillLevelCode in the task definition branch of the Schedule Schema, if both are used. Refer to Chap 3.9.5.2.5.

Markup element: <personSkill>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- skillLevelCode (M), the skill level of the person. The attribute can have one of the following values:
  - "sk01" thru "sk99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<personSkill skillLevelCode="sk01"/>
```

2.3.1.3 Trade/trade code

Description: The element <trade> contains the typed in required trade code of the person. Care must be taken when using this element when the product is, for example, multi-national or multi-customer. The trade or trade code or both is typed in.

Markup element: <trade>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Business rule decision point BRDP-S1-00146 - Values for the element <trade> in the context of the element <preliminaryRqmts>:

- If trades are required, define a list of trades/trade codes.

Markup example:

```
<trade>AF901</trade>
```

2.3.1.4 Estimated time

Description: The element <estimatedTime> contains the estimate of aggregation of all the time that the person will be required to complete the task. The estimated time must be given in man-hours with maximum two decimals (eg, 2,45 h). The time and unit of measure must be entered.

Markup element: <estimatedTime>

Attributes:

- `unitOfMeasure` (C), the unit of measure to be used is
  - "`h`" - (man)hour

  Refer to default BREX rule BREX-S1-00072.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<estimatedTime unitOfMeasure="h">1,5</estimatedTime>
```

2.3.2 Person

Description: The element <`person`> contains the skill information on the required personnel for the task when there are requirements to individually specify the personnel.

Each person must be given an identifier in the attribute `man`. For example, A, B and C to represent "Man A", "Man B" and "Man C" respectively.

Note

The use of the element <`person`> generates at presentation the word "Man" before the value of the attribute `man`. At page-oriented presentation "Man A", etc, is given in the Person column of the Required persons table.

Note

The procedure must be written from the point of view of "Man A".

Markup element: <`person`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `man` (M), the alphabetic identifier of the person, starting from A
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- Includes the same set of child elements as the element <`personnel`>. Refer to Para 2.3.1.

Markup example:

```
<person man="A">
<personCategory personCategoryCode="Electrician"/>
<personSkill skillLevelCode="sk02"/>
<trade>AF901</trade>
<estimatedTime unitOfMeasure="h">1,5</estimatedTime>
</person>
```

2.3.3 Markup example - Required persons

Markup using the element <reqPersons> and the element <person>:

- In the following example, Man A is required for 1,5 hours and is an electrician (represented in this project by the category Electrician) of basic skill level (represented by the attribute value "sk01"). Electricians have the trade code AF901.
- Man B is a propulsion engineer (represented in this project by the category code PE) who is required for 2,5 hours. Man B must be of intermediate skill level (represented by the attribute value "sk02"). The trade code for propulsion engineers is AF903.
- Mechanics (as many as required to support Man A and Man B) are required. These can be of basic skill level. The trade code for these mechanics is AF902. They are needed for only 1 hour.
- A supervisor is required. This must be of advanced skill level (represented in this project by attribute value "sk03"). The trade code AF092 represents supervisors.

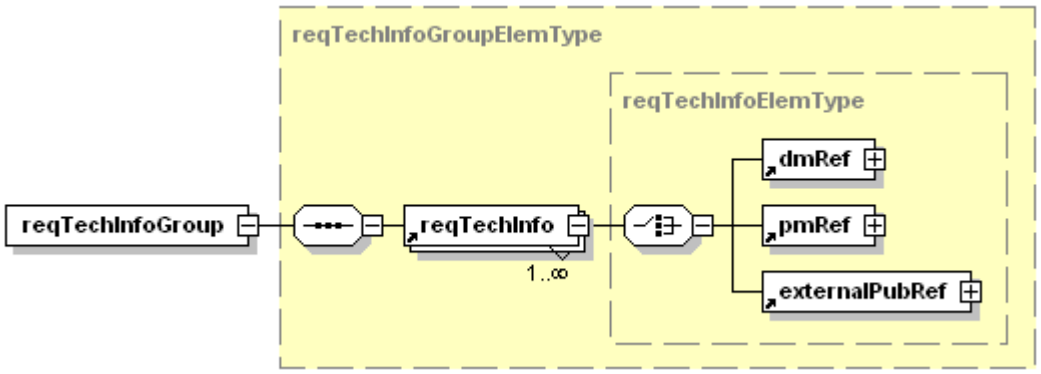
```
<reqPersons>
<person man="A">
<personCategory personCategoryCode="Electrician"/>
<personSkill skillLevelCode="sk01"/>
<trade>AF901</trade>
<estimatedTime unitOfMeasure="h">1,5</estimatedTime>
</person>
<person man="B">
<personCategory personCategoryCode="PE"/>
<personSkill skillLevelCode="sk02"/>
<trade>AF903</trade>
<estimatedTime unitOfMeasure="h">2,5</estimatedTime>
</person>
<personnel>
<personCategory personCategoryCode="Mechanic"/>
<personSkill skillLevelCode="sk01"/>
<trade>AF999</trade>
<estimatedTime unitOfMeasure="h">1</estimatedTime>
</personnel>
<personnel numRequired="1">
<personCategory personCategoryCode="SPRVR"/>
<personSkill skillLevelCode="sk03"/>
<trade>AF092</trade>
</personnel>
</reqPersons>
```

2.4 Required technical information

Description: The element <reqTechInfoGroup> contains references to any technical documents that are required, in addition to the actual data module, for the maintainer to complete the procedure. The list is not a reference list but can be equated to a special tool that

needs to be selected. For example, required technical information can be engineering drawings not included in the data module that the maintainer needs to check out of a drawing library in order to complete the maintenance tasks.

Markup element: <reqTechInfoGroup>



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Fig 14 Element <reqTechInfoGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <reqTechInfo>. Refer to Para 2.4.1.

2.4.1 Required technical information

Description: The element <reqTechInfo> contains the content of <reqTechInfoGroup>.

Markup element: <reqTechInfo>

Attributes:

- reqTechInfoCategory, (O), the type of information. The attribute can have one of the following values:
  - "ti01" thru "ti99". Refer to Chap 3.9.6.1.

Child elements:

- <dmRef>. Refer to Chap 3.9.5.2.1.2.
- <pmRef>. Refer to Chap 3.9.5.2.1.2.
- <externalPubRef>. Refer to Chap 3.9.5.2.1.2.

Business rule decision point BRDP-S1-00147 - Use of the element <reqTechInfoGroup> in the element <preliminaryRqmts>:

- Decide whether and how to use the element <reqTechInfoGroup>.

Markup example:

```
<reqTechInfoGroup>
<reqTechInfo reqTechInfoCategory="ti04">
<externalPubRef>
<externalPubRefIdent>
<externalPubTitle>Power Supply Schematic
(132E470092)</externalPubTitle>
</externalPubRefIdent>
</externalPubRef>
</reqTechInfo>
</reqTechInfoGroup>
```

2.5 Required support equipment

Description: The element <reqSupportEquips> must contain information to list any support equipment including special tools, required to accomplish the procedure contained in the data module. Standard types of test equipment such as voltmeters, signal generators and continuity testers must be listed. Standard tools that are part of a tradesman standard tool kit must not be listed.

Support equipment must be identified by the name of the support equipment, identification and a quantity. As an identification number, the CSN/ISN identifier is recommended in order to provide a direct link to the IPD at the relevant location.

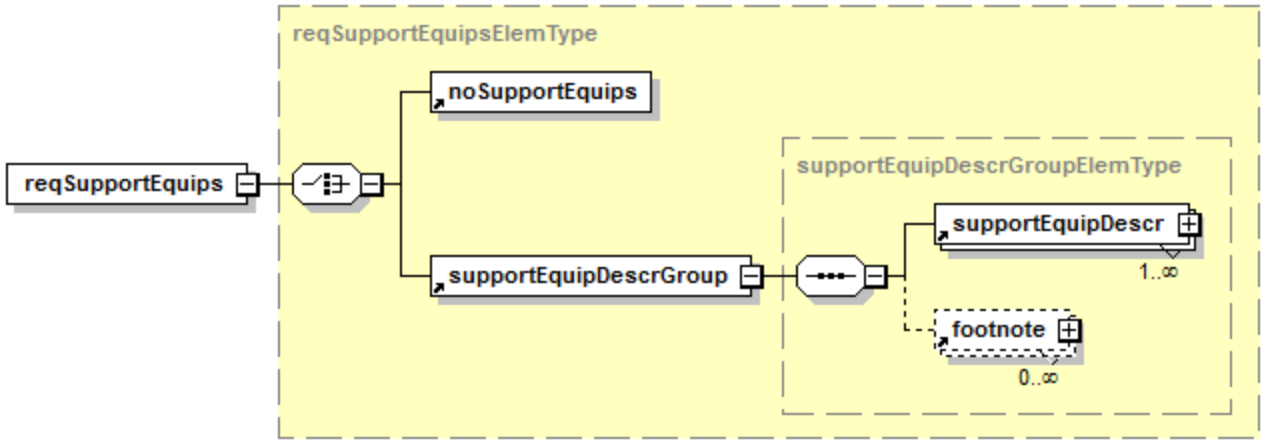
If there is no support equipment required, then the element <noSupportEquips> must be used.

Note

The use of the element <noSupportEquips> generates the word "None" at presentation. At page-oriented presentation "None" is given in the "Name" column of the "Support equipment" table.

If there is support equipment required, then the element <supportEquipDescr>, within the element <supportEquipDescrGroup>, must be used for each item of support equipment.

Markup element: <reqSupportEquips>



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Fig 15 Element <reqSupportEquips>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`noSupportEquips`>, the indicator of no required support equipment as given in the description above
- <`supportEquipDecsrGroup`>, contains:
  - <`supportEquipDescr`>. Refer to Para 2.5.1.
  - <`footnote`>. Refer to Chap 3.9.5.2.1.10.

Business rule decision point BRDP-S1-00149 - Listing of standard tools in Preliminary requirements:

- Decide what types of standard tools or toolkits to be identified and listed in the table "Support equipment".

The Business rule decision points given for the element <`reqSupportEquips`> and its child elements are also applicable to the element <`reqSpares`> (refer to Para 2.7) and to the element <`reqSupplies`> (refer to Para 2.6).

Markup example:

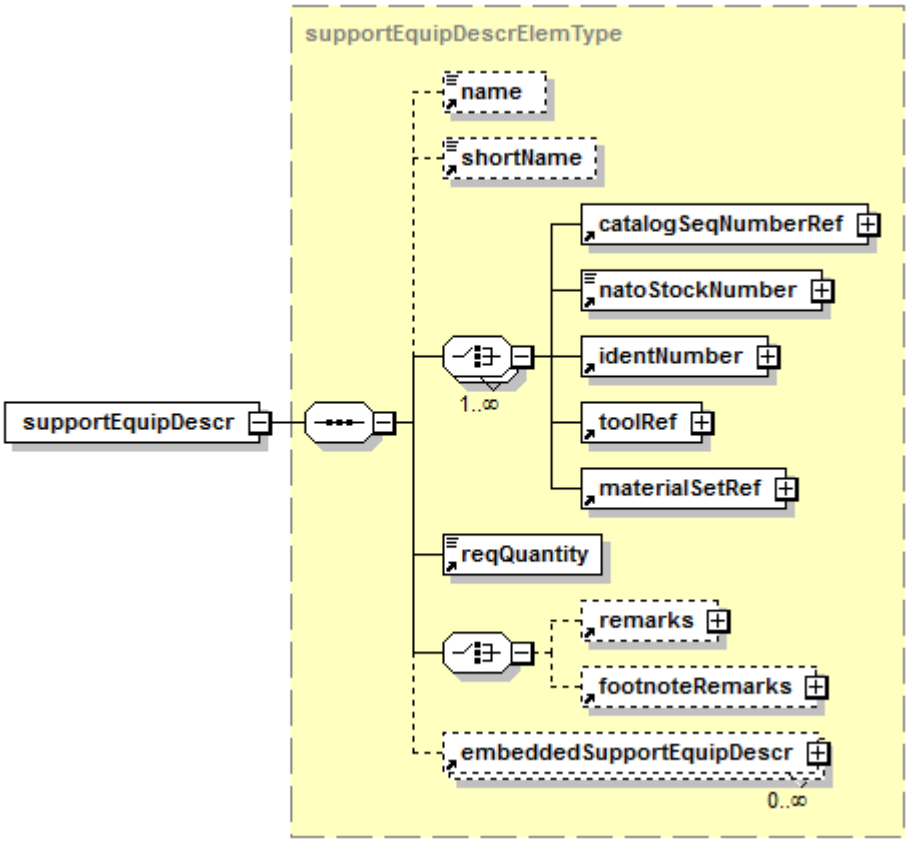
Refer to Para 2.5.2.

2.5.1 Support equipment description

Description: The element <`supportEquipDescr`> contains the information on each item of support equipment.

The attribute `id` in the element <`supportEquipDescr`> can be applied so that the support equipment can be cross-referenced from the procedure.

Markup element: <`supportEquipDescr`>



ICN-S3627-S1000D0532-002-01

Fig 16 Element <supportEquipDescr>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `materialUsage` (O), defines a material set of support equipment. The attribute can have one of the following values:
  - "`mu01`" thru "`mu99`". Refer to Chap 3.9.6.1 and default BREX rule BREX-S1-00073.

  Use of the attribute `materialUsage`

  - For support equipment needed from store and required to do the task, the attribute `materialUsage` is not used. It is used only for support equipment to define a material set (`materialUsage` ="`mu05`"). Refer to Chap 3.9.6.1.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>. Refer to Para 2.5.1.1 and Chap 3.9.5.2.1.10.
- <shortName>. Refer to Para 2.5.1.2 and Chap 3.9.5.2.1.10.
- The identification by one or more of the elements <catalogSeqNumberRef>, <natoStockNumber>, <identNumber>, <toolRef> and <materialSetRef>. Refer to Para 2.5.1.3.
- <reqQuantity>. Refer to Para 2.5.1.4.
- <remarks>. Refer to Para 2.5.1.5.
- <footnoteRemarks>, contains textual remarks or reference to a footnote. Refer to Para 2.5.1.6.
- <embeddedSupportEquipDescr>, defines one or several items if using a support equipment set. Refer to Para 2.5.1.7.

Business rule decision point BRDP-S1-00150 - Use of the attribute id on the element <supportEquipDescr> in the element <preliminaryRqmts>:

- Decide whether to link from the body of the procedure to the support equipment listed in Preliminary requirements.

  Note

  The attribute id on the element <supportEquipDescr> is used to establish the link between the two and will guarantee consistent use of identification throughout the procedure. The use of cross-references is encouraged.

Business rule decision point BRDP-S1-00151 - Use of the attribute materialUsage in the element <supportEquipDescr>, the element <supplyDescr> and the element <spareDescr> context:

- Decide whether to use the attribute materialUsage in the elements <supportEquipDescr>, <supplyDescr> and <spareDescr> context and what values to be used.

Markup examples:

Example 1 - Support equipment from shop:

```
<supportEquipDescr id="seq-0001">
<name>Specialist toolset</name>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
```

Example 2 - Support equipment from tool kit:

```
<supportEquipDescr id="seq-0001" materialUsage="mu05">
<name>Tool kit 578015T01</name>
<materialSetRef materialSetIdent="578015T01"
materialSetIssue="00"></materialSetRef>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
<embeddedSupportEquipDescr id="seq-0002">
```

```
<name>Screwdriver</name>
<toolRef toolNumber="BSK-SCRDV-001" specific="0"/>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</embeddedSupportEquipDescr>
</supportEquipDescr>
```

2.5.1.1 Name of the support equipment element

Description: The element <name> contains the name of the support equipment (or supply or part). If a common information repository is used in the authoring process, the name of the support equipment is optional as it will be populated during the publication process. Refer to Chap 3.9.5.2.1.10.

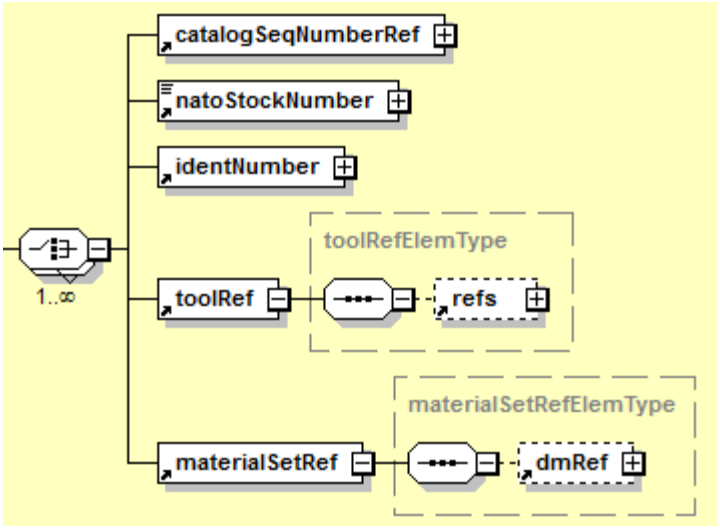
2.5.1.2 Shortname

Description: The element <shortName> contains an abbreviated alternate name of the support equipment (or supply or part) corresponding to the element <name>. This short form for the name of the part is meant to be presented in the narrative text of the data module to make the reading easier. Refer to Chap 3.9.5.2.1.10.

2.5.1.3 Identification

One or more of the following elements can be used to identify the support equipment:

- <catalogSeqNumberRef>, the CSN. Refer to Chap 3.9.5.2.7.
- <natoStockNumber>, the NATO stock number. Refer to Chap 3.9.5.2.7.
- <identNumber>, the identification number. Refer to Para 2.5.1.3.1.
- <toolRef>, the tool reference. Refer to Para 2.5.1.3.6.
- <materialSetRef>, the material set reference. Refer to Para 2.5.1.3.7.



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Fig 17 Identification elements (Support equipment)

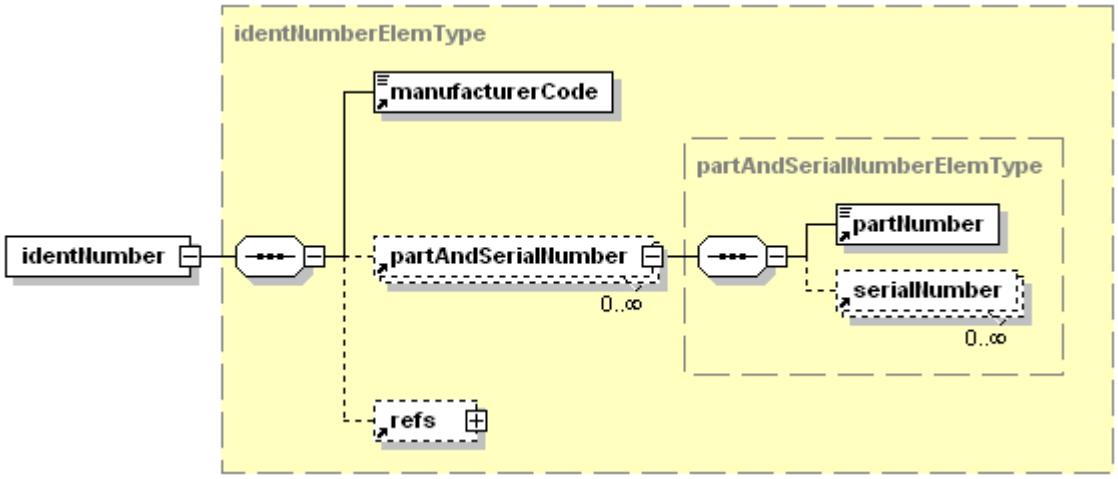
Business rule decision point BRDP-S1-00152 - Use of identification elements in the element <supportEquipDescr>, the element <supplyDescr> and the element <spareDescr> context:

- Decide which of the elements <catalogSeqNumberRef>, <natoStockNumber>, <identNumber>, <toolRef>, <supplyRef>, <supplyRqmtRef>, <partRef>, <functionalItemRef> and <materialSetRef> to use for identification and how to populate these elements.

2.5.1.3.1 Identification number

Description: The element <identNumber> contains the manufacturer's identification information.

Markup element: <identNumber>



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Fig 18 Element <identNumber>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <manufacturerCode>. Refer to Para 2.5.1.3.2.
- <partAndSerialNumber>. Refer to Para 2.5.1.3.3.
- <refs>, the references to a document containing additional parts data related to the equipment concerned (ie, a data module or publication module or some non-S1000D publication). Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
</identNumber>
```

2.5.1.3.2 Manufacturer code

Description: The element <manufacturerCode> contains the manufacturer's code.

Markup element: <manufacturerCode>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<manufacturerCode>KZ666</manufacturerCode>
```

2.5.1.3.3 Part and serial number

Description: The element <partAndSerialNumber> contains parts and serial numbers.

Markup element: <partAndSerialNumber>

Attributes:

- None

Child elements:

- <partNumber>, the part number. Refer to Para 2.5.1.3.4.
- <serialNumber>, the listing of a single serial number or a range. Refer to Para 2.5.1.3.5.

Markup example:

```
<partAndSerialNumber>
<partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
```

2.5.1.3.4 Part number

Description: The element <partNumber> contains the part number.

Markup element: <partNumber>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
</identNumber>
```

2.5.1.3.5 Serial number

Description: The element <serialNumber> contains the listing of a single serial number or a range.

Markup element: <serialNumber>

Attributes:

- serialNumberForm (M), specifies if the serial number is a single value or a range of values. The attribute can have one of the following values:
  - "single" - specifies a single value
  - "range" - specifies a range of values
- serialNumberValue (M), the single value or the range of values. A tilde [~] is used to separate the two values. For example, LKJ123~LKJ777.

Child elements:

- None

Markup example:

```
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001</partNumber>
<serialNumber serialNumberValue="LKJ123~LKJ777"
serialNumberForm="range"/>
</partAndSerialNumber>
</identNumber>
```

2.5.1.3.6 Tool reference

Description: The element <toolRef> contains the reference to support equipment (standard tool, special tool or test equipment), for those projects that use a tool common information repository.

Markup element: <toolRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- toolNumber (M), the tool part number. Used together with the attribute manufacturerCodeValue, as the identifier of the tool, in the tool repository (implicit reference method). Refer to Chap 3.9.5.2.11.9.
- manufacturerCodeValue (O), the CAGE code of the tool part manufacturer used, together with the attribute toolNumber, as the identifier of the tool in the tool repository.

- `specific` (O), the indicator if it is a standard or a special support equipment. The attribute can have one of the following values:
  - "`1`" (D) - a special support equipment including special tools. These support equipment must be presented in the table Support equipment in Preliminary requirements.
  - "`0`" - a standard support equipment including standard tool
- `toolAltFlag` (O) the indicator if the tool is an alternative of the previously described tool. The attribute can have one of the following values:
  - "`0`" (D) - indicates that it is not an alternate support equipment
  - "`1`" - indicates that it is an alternate support equipment
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`refs`>, the explicit link to a tool in the tools common information repository data module (explicit reference method). Refer to Chap 3.9.5.2.11.9.

  Note

  Refer to Chap 4.13.1 for more information on referencing to common information repository data modules.

Markup example:

```
<supportEquipDescr>
<toolRef toolNumber="T123"></toolRef>
<reqQuantity>2</reqQuantity>
</supportEquipDescr>
```

2.5.1.3.7 Material set reference

Description: The element <`materialSetRef`> contains the reference to a material set (kit), and its connection to the relevant service bulletin. Each support equipment, supply or spare included in the set is detailed by use of the element <`embeddedSupportEquipDescr`>, <`embeddedSupplyDescr`> and <`embeddedSpareDescr`>, respectively. These elements must be given together with the element <`materialSetRef`>. Refer to Para 2.5.1.7, Para 2.6.1.3 and Para 2.7.1.3 and BREX-S1-00261, respectively.

The reference (<`dmRef`>) can be made either to:

- a material set in a dedicated data module with IC 934 when material information is externalized from service bulletin core data module

or

- a material set in the service bulletin core data module with IC 930 when material information is included in service bulletin core data module.

Markup element: <`materialSetRef`>

Attributes:

- `applicRefId` (O), the applicability information. Refer to Chap 3.9.5.3.

- id (O), the identifier for the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- materialSetIdent (O), the material set identification. This attribute is used when the attribute materialUsage of the elements <supportEquipDescr>, <supplyDescr> or <spareDescr> is set to "mu05".
- materialSetIssue (O), the material set issue
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <dmRef>. Refer to Chap 3.9.5.2.1.2.

2.5.1.4 Quantity

Description: The element <reqQuantity> contains the quantity of the support equipment item.

For items of indeterminate quantity, "As required" must be entered as text in the element <reqQuantity> and no attribute unitOfMeasure value must be specified.

Markup element: <reqQuantity>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- unitOfMeasure (O), the unit of measure. When the unit of measure is just the number of pieces, EA (= each) must be used.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<reqQuantity>2</reqQuantity>
```

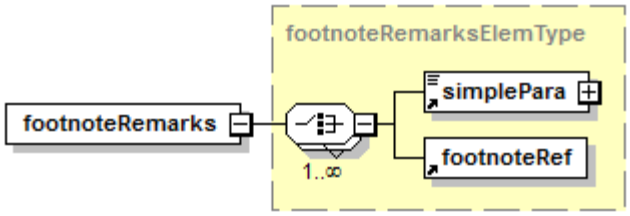
2.5.1.5 Remarks

Description: The element <remarks> contains any additional information to support the identification or use of the support equipment. Refer to Chap 3.9.5.1.

2.5.1.6 Footnote remarks

Description: The element <footnoteRemarks> contains either textual content of remarks using the element <simplePara> or internal reference to footnotes using the element<footnoteRef>. It allows internal references to a target element<footnote>.

Markup element: <footnoteRemarks>



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Fig 19 Element <footnoteRemarks>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <simplePara>. Refer to Chap 3.9.5.2.1.10.
- <footnoteRef>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<footnoteRemarks>
<simplePara>Incorporates repair instruction X15526172-A
</simplePara>
<simplePara>Incorporates repair instruction X15526172-B
</simplePara>
<footnoteRef internalRefId="ftn-0001"/>
</footnoteRemarks>
```

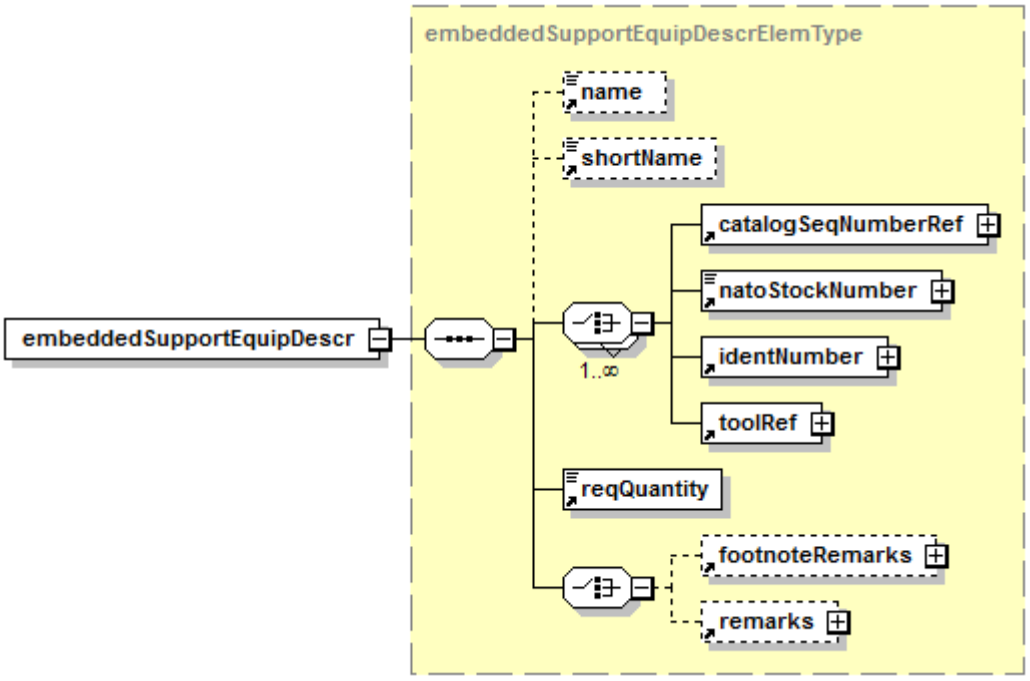
2.5.1.7 Embedded support equipment description

Description: The element <embeddedSupportEquipDescr> contains the information of each item included in a set of support equipment. In this case, the attribute materialUsage is set to "mu05" in the element <supportEquipDescr>.

The hierarchical relation between the element <supportEquipDescr> and the element <embeddedSupportEquipDescr> is the following:

- If the element <supportEquipDescr> is a tool kit, then the attribute materialUsage is set to "mu05" and the embedded support equipment are present in one or several elements <embeddedSupportEquipDescr>.
- Else the support equipment is a single tool and then the attribute materialUsage is not used and there is no element <embeddedSupportEquipDescr>.

Markup element: <embeddedSupportEquipDescr>



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Fig 20 Element <embeddedSupportEquipDescr>

Attributes:

The element <embeddedSupportEquipDescr> contains the same attributes as the element <supportEquipDescr>. Refer to Para 2.5.1.

Child elements:

The element <embeddedSupportEquipDescr> contains the same elements as the element <supportEquipDescr> (refer to Para 2.5.1) with the following exceptions:

- The element <materialSetRef> is suppressed.
- The element <embeddedSupportEquipDescr> is suppressed.

2.5.2 Markup examples - Required support equipment

The presentation of the following examples is shown in Chap 6.2.3.3.

Note

The color codes match the presentation of the example of the standard table "Support equipment".

Example 1 - Identification number reference:

```
<reqSupportEquips>
<supportEquipDescrGroup>
<supportEquipDescr id="seq-0001">
<name>Specialist toolset</name>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
```

```
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
<footnoteRemarks><footnoteRef internalRefId="ftn-
0001"></footnoteRef></footnoteRemarks>
</supportEquipDescr>
<footnote id="ftn-0001"><para>Make sure to use the good
tool.</para></footnote>
</supportEquipDescrGroup>
</reqSupportEquips>
```

Example 2 - CSN reference. Two support equipment items that are required:

```
<reqSupportEquips>
<supportEquipDescrGroup>
<supportEquipDescr id="seq-0002">
<name>Extractor, Puller, Left-hand</name>
<catalogSeqNumberRef modelIdentCode="E2" systemDiffCode="A"
systemCode="11" subSystemCode="2" subSubSystemCode="2"
assyCode="33" figureNumber="01" item="002" itemVariant="A"
itemLocationCode="D"/>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
<supportEquipDescr id="seq-0015">
<name>Extractor, Puller, Right-hand</name>
<catalogSeqNumberRef modelIdentCode="E2" systemDiffCode="A"
systemCode="11" subSystemCode="2" subSubSystemCode="2"
assyCode="33" figureNumber="01" item="001" itemLocationCode="D"
itemSeqNumberValue="00A"/>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
</supportEquipDescrGroup>
</reqSupportEquips>
```

Example 3 - NATO stock number identification broken into its constituent parts, together with a part number:

```
<reqSupportEquips>
<supportEquipDescrGroup>
<supportEquipDescr id="seq-0212">
<name>Extractor, D-Puller, Left-hand</name>
<natoStockNumber natoSupplyClass="4920"
natoCodificationBureau="99" natoItemIdentNumberCore="1234567"/>
<identNumber> <manufacturerCode>K0378</manufacturerCode>
<partAndSerialNumber><partNumber>JJ134252</partNumber>
</partAndSerialNumber></identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
<remarks><simplePara>Serial No. A400 -
A500</simplePara></remarks> </supportEquipDescr>
<supportEquipDescr id="seq-0041">
<name>Extractor, D-Puller, Right-hand</name>
<natoStockNumber natoSupplyClass="4290"
natoCodificationBureau="99" natoItemIdentNumberCore="1234561"/>
<identNumber> <manufacturerCode>K0378</manufacturerCode>
<partAndSerialNumber><partNumber>JJ134259</partNumber>
```

```
</partAndSerialNumber></identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
</supportEquipDescrGroup>
</reqSupportEquips>
```

Example 4 - A tool set:

```
<reqSupportEquips>
<supportEquipDescr id="seq-0006" materialUsage=”mu05”>
<name>The ultimate Chief mechanic daily toolset</name>
<shortName>The toolset</shortName>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>578015T01-00</partNumber>
</partAndSerialNumber>
</identNumber>
<catalogSeqNumberRef modelIdentCode="E2" systemDiffCode="A"
systemCode="FD" subSystemCode="1" subSubSystemCode="0"
assyCode="10" figureNumber="01" item="000"
itemLocationCode="D"/>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
<remarks><simplePara>FBI-A-11-12-00-0014-03-934</simplePara>
</remarks>
<embeddedSupportEquipDescr>
<name>Corkscrew</name>
<catalogSeqNumberRef modelIdentCode="E2" systemDiffCode="A"
systemCode="FD" subSystemCode="1" subSubSystemCode="0"
assyCode="10" figureNumber="12" item="004"
itemLocationCode="D"/>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</embeddedSupportEquipDescr>
<embeddedSupportEquipDescr>
<name>Glass, plastic</name>
<identNumber>
<manufacturerCode>S5194</manufacturerCode>
<partAndSerialNumber>
<partNumber>001.906.89</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">2</reqQuantity>
</embeddedSupportEquipDescr>
</supportEquipDescr>
<embeddedSupportEquipDescr>
<name>Table napkin</name>
<identNumber>
<manufacturerCode>S5194</manufacturerCode>
<partAndSerialNumber>
<partNumber>301.286.05</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">2</reqQuantity>
```

```
</embeddedSupportEquipDescr>
</supportEquipDescr>
```

2.6 Required supplies

Description: The element <reqSupplies> contains information to list any required supplies (consumables (eg, oils, greases, locking wire), materials (eg, gasket sheet, sheet metal) and expendables (eg, O-rings, gaskets, tab washers)) required to accomplish the procedure contained in the data module.

Supplies must be identified by a name of the supply, identification and a quantity as applicable. As an identification number, the CSN/ISN identifier is recommended in order to provide a direct link to the IPD at the relevant location.

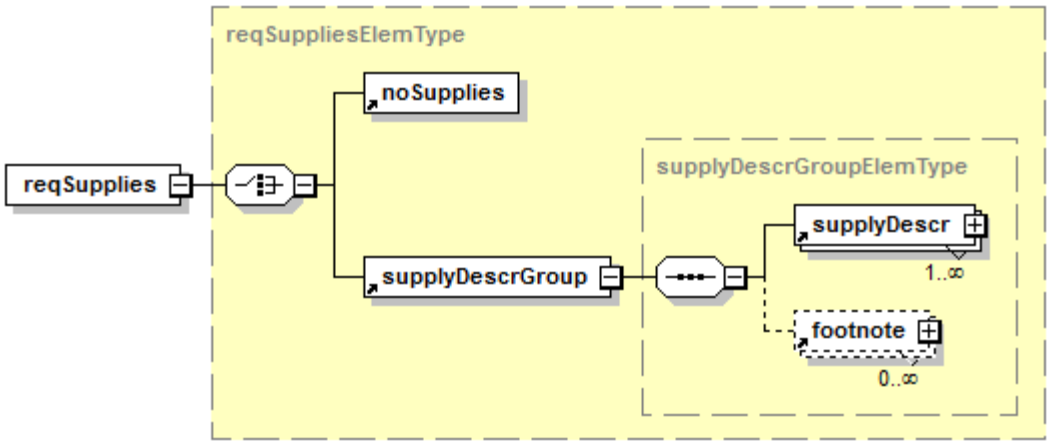
If there are no supplies required, then the element <noSupplies> must be used.

Note

The use of the element <noSupplies> generates the word "None" at presentation. At page-oriented presentation "None" is given in the Name column of the Consumables, materials and expendables table.

If there are supplies required, then the element <supplyDescr>, within the element <supplyDescrGroup>, must be used for each consumable, material and expendable.

Markup element: <reqSupplies>



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Fig 21 Element <reqSupplies>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <noSupplies>, the indicator of no required supplies as given in the description above
- <supplyDescrGroup>, contains:
  - <supplyDescr>. Refer to Para 2.6.1.

- <footnote>. Refer to Chap 3.9.5.2.1.10.

The Business rule decision points given for the element <reqSupportEquips> and its child elements are also applicable to the element <reqSupplies>. Refer to Para 2.5.

Markup example:

The following example shows that two liter of oil and 0,5 liter of grease are required for this procedure. Here a part number and manufacturer identify the supplies to be used:

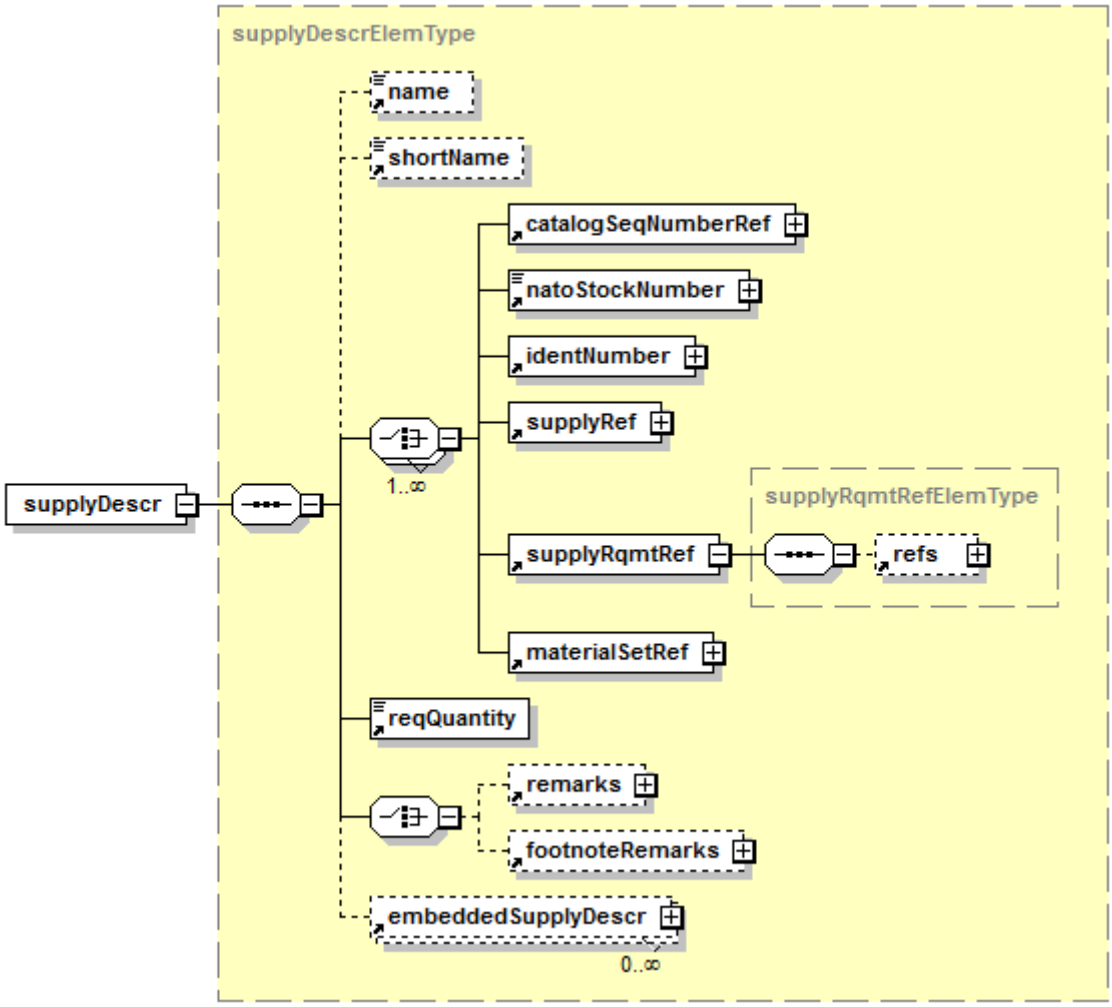
```
<reqSupplies>
<supplyDescrGroup>
<supplyDescr id="sup-0054">
<name>Oil, Engine, Gas turbine</name>
<identNumber><manufacturerCode>K0378</manufacturerCode>
<partAndSerialNumber><partNumber>OIL-HHGA</partNumber>
</partAndSerialNumber></identNumber>
<reqQuantity unitOfMeasure="L">2,0</reqQuantity>
</supplyDescr>
<supplyDescr id="sup-0302">
<name>Grease, Lubricating</name>
<identNumber><manufacturerCode>K0378</manufacturerCode>
<partAndSerialNumber><partNumber>GRL-6726</partNumber>
</partAndSerialNumber></identNumber>
<reqQuantity unitOfMeasure="L">0,5</reqQuantity>
</supplyDescr>
</supplyDescrGroup>
</reqSupplies>
```

2.6.1 Supply description

Description: The element <supplyDescr> contains the information on each item of supply or set of supplies.

The attribute id in the element <supplyDescr> can be applied so that the supply can be cross-referenced from the procedure.

Markup element: <supplyDescr>



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Fig 22 Element <supplyDescr>

Attributes:

The element <supplyDescr> contains the same attributes as the element <supportEquipDescr> (refer to Para 2.5.1) with the different use for attribute:

– materialUsage (O), identifies retained and referenced supplies. It also identifies a material set of supplies. The attribute can have one of the following values:

- "mu01" thru "mu99". Refer to Chap 3.9.6.1 and default BREX rule BREX-S1-00074.

Use of the attribute materialUsage:

- For supplies needed from store and required to do the task, the attribute materialUsage is not used. It is used only for supplies removed from the Product or for supplies when used to define a material set (attribute materialUsage = "mu05"). Refer to Chap 3.9.6.1.
- For supplies, the values "Discarded"(attribute materialUsage = "mu01") and "Modified from" (attribute materialUsage="mu03") must not be used.
- For supplies, the value "Retained" (attribute materialUsage = "mu02") must be used only in the context of a service bulletin.

Child elements:

The element <supplyDescr> contains the same elements as the element <supportEquipDescr> (refer to Para 2.5.1) with the following exception:

- <toolRef> is substituted with the elements <supplyRef> and the element <supplyRqmtRef>. Refer to Para 2.6.1.1 for details on the element <supplyRef>. Refer to Para 2.6.1.2 for details on the element <supplyRqmtRef>.
- <embeddedSupportEquipDescr> is substituted with the element <embeddedSupplyDescr>. Refer to Para 2.6.1.3.

Business rule decision point BRDP-S1-00155 - Use of the attribute id on the element <supplyDescr> in the element <preliminaryRqmts>:

- Decide whether to use the attribute id to create cross-references from the procedure to the supplies listed in Preliminary requirements. The attribute id on the element <supplyDescr> is used to establish the link between the two and will guarantee consistent use of identification throughout the procedure. The use of cross-references is encouraged.

Markup example:

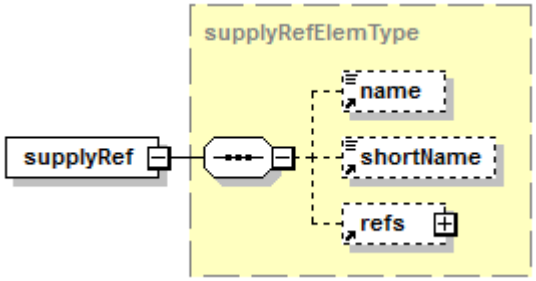
Material set of supplies

```
<reqSupplies>
<supplyDescrGroup>
<supplyDescr materialUsage="mu05" id="sup-0010">
<name>Consumable set</name>
<materialSetRef materialSetIdent="578015CML01"
materialSetIssue="01"/>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
<remarks><simplePara>Issue 1</simplePara></remarks>
<embeddedSupplyDescr id="sup-0054">
<name>Oil, Engine, Gas turbine</name>
<identNumber>
<manufacturerCode>K0378</manufacturerCode>
<partAndSerialNumber><partNumber>OIL-HHGA</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="L">2,0</reqQuantity>
</embeddedSupplyDescr>
<embeddedSupplyDescr id="sup-0302">
<name>Grease, Lubricating</name>
<identNumber>
<manufacturerCode>K0378</manufacturerCode>
<partAndSerialNumber><partNumber>GRL-6726</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="L">0,5</reqQuantity>
</embeddedSupplyDescr>
</supplyDescr>
</supplyDescrGroup>
</reqSupplies>
```

2.6.1.1 Supply reference

Description: The element <supplyRef> contains the references to a supply, for those projects that use a supplies common information repository. Refer to Chap 3.9.5.2.11.8.

Markup element: <supplyRef>



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Fig 23 Element <supplyRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- supplyNumber (M), the supply number. A unique label set by the project (eg, the supply trade name, a specification number).
- supplyNumberType (M), contains the type of supply identification. Refer to Chap 3.9.5.2.11.7.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>. Refer to Para 2.5.1.1 and Chap 3.9.5.2.1.10.
- <shortName>. Refer to Para 2.5.1.2 and Chap 3.9.5.2.1.10.
- <refs>, the explicit link to a supply in the supply common information repository data module (explicit reference method). Refer to Chap 3.9.5.2.11.9.

2.6.1.2 Supply requirement reference

Description: The element <supplyRqmtRef> contains the reference to a consumable, material and expendable for projects which manage a common information repository.

Markup element: <supplyRqmtRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- materialCategory (O), the nature of use of the supply requirement (eg, fuel, cleaning agent, lubricant). Refer to Chap 3.9.5.2.11.8.
- vendorFlag (O), a flag to indicate if the supply requirement is defined by the Product manufacturer or by a supplier. The attribute can have one of the following values:

- "0" - defined by the Product manufacturer
- "1" - defined by a supplier

– supplyRqmtNumber (M), identifies the consumable in the consumable requirement repository. Refer to Chap 3.9.5.2.11.8.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <refs>, the link to the supplies requirement common information repository data module. Refer to Chap 3.9.5.2.11.8.

Note

Refer to Chap 4.13.1 for more information on referencing to common information repository data modules.

Markup example:

```
<supplyRqmtRef supplyRqmtNumber="sup-0002"></supplyRqmtRef>
```

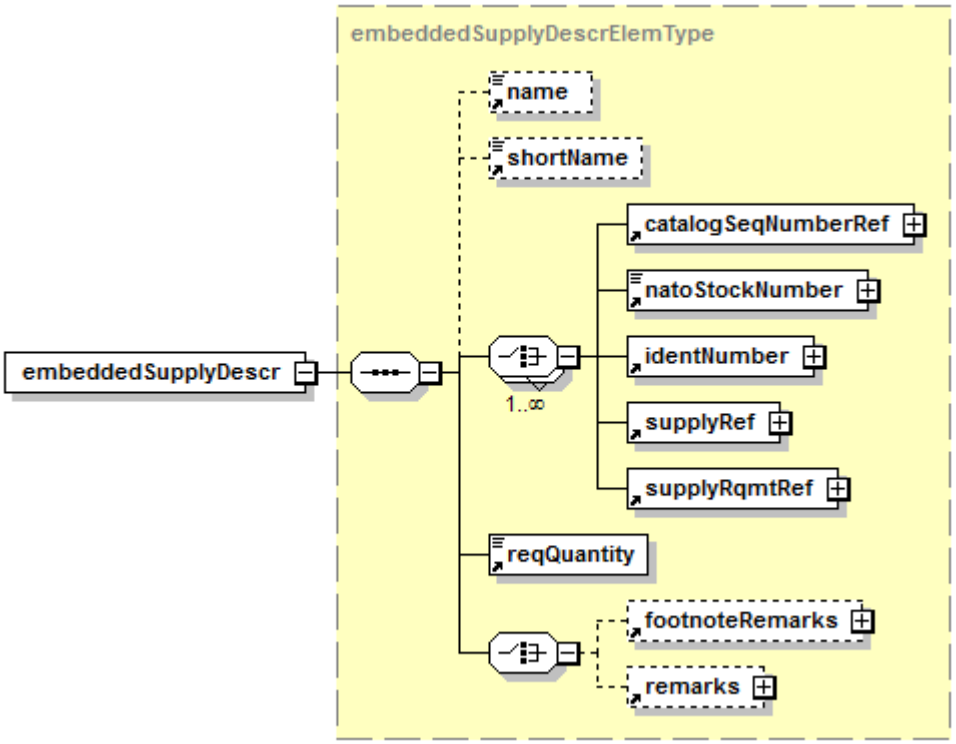
2.6.1.3 Embedded supply description

Description: The element <embeddedSupplyDescr> contains the information of each item included in a supply set.

The hierarchical relation between the element <supplyDescr> and the element <embeddedSupplyDescr> is the following:

– If the element <supplyDescr> is a material set (supply kit), then the attribute materialUsage is set to "mu05" and the embedded supplies are present in one or several elements <embeddedSupplyDescr>.
– If the supply is a simple supply provided from the store or already present on the product then the attribute materialUsage follows the business rules described in Para 2.6.1 and there is no element<embeddedSupplyDescr>.

Markup element: <embeddedSupplyDescr>



ICN-S3627-S1000D0613-001-01

Fig 24 Element <embeddedSupplyDescr>

Attributes:

The element <embeddedSupplyDescr> contains the same attributes as the element <supplyDescr>. Refer to Para 2.6.1.

Child elements:

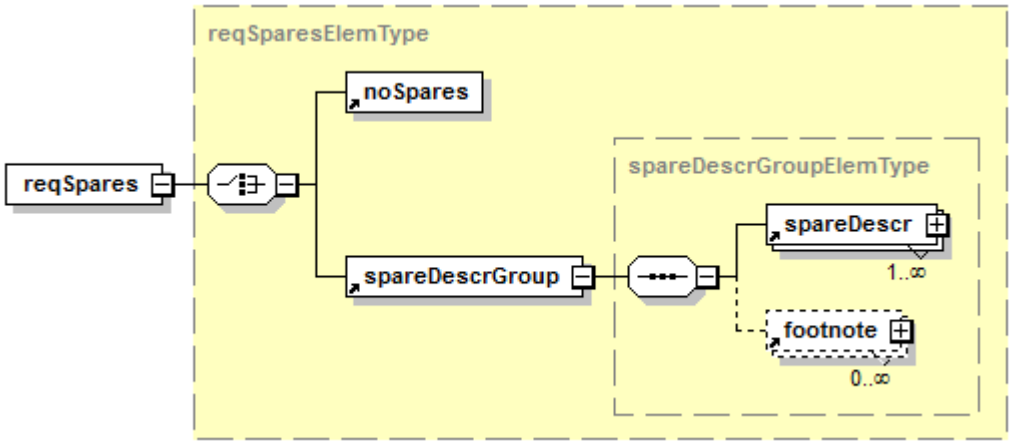
The element <embeddedSupplyDescr> contains the same elements as the element <supplyDescr> (refer to Para 2.6.1) with the following exceptions:

- The element <materialSetRef> is suppressed.
- The element <embeddedSupplyDescr> is suppressed.

2.7 Required spares

Description: The element <reqSpares> must contain information to list any spares required to accomplish the procedure contained in the data module. Parts which are attached to the product and are used during the accomplishment of the procedure can also be listed here. Spares must be identified by a name of the spare, identification and a quantity as applicable. As an identification number, the CSN/ISN identifier is recommended in order to provide a direct link to the IPD at the relevant location.

Markup element: <reqSpares>



ICN-S3627-S1000D0449-002-01

Fig 25 Element <reqSpares>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`noSpares`>, the indicator of no required supplies as given in the description above
- <`spareDescrGroup`>, contains:
  - <`spareDescr`>. Refer to Para 2.7.1.
  - <`footnote`>. Refer to Chap 3.9.5.2.1.10.

If there are no spares requirements, then the element <`noSpares`> must be used.

Note

The use of the element <`noSpares`> generates the word "None" at presentation. At page-oriented presentation "None" is given in the Name column of the Spares table.

If there are spares required, then the element <`spareDescr`>, within the element <`spareDescrGroup`>, must be used for each spare.

The Business rule decision points given for the element <`reqSupportEquips`> and its child elements are also applicable to the element <`reqSpares`>. Refer to Para 2.5.

Markup example:

```
<reqSpares>
<spareDescrGroup>
<spareDescr id="spa-0987">
<name>Blade, LP Compressor</name>
<natoStockNumber natoSupplyClass="2840"
natoCodificationBureau="99" natoItemIdentNumberCore="1234524"/>
<catalogSeqNumberRef modelIdentCode="E2" systemDiffCode="A"
systemCode="72" subSystemCode="3" subSubSystemCode="2"
assyCode="10" figureNumber="01" figureNumberVariant="A"
```

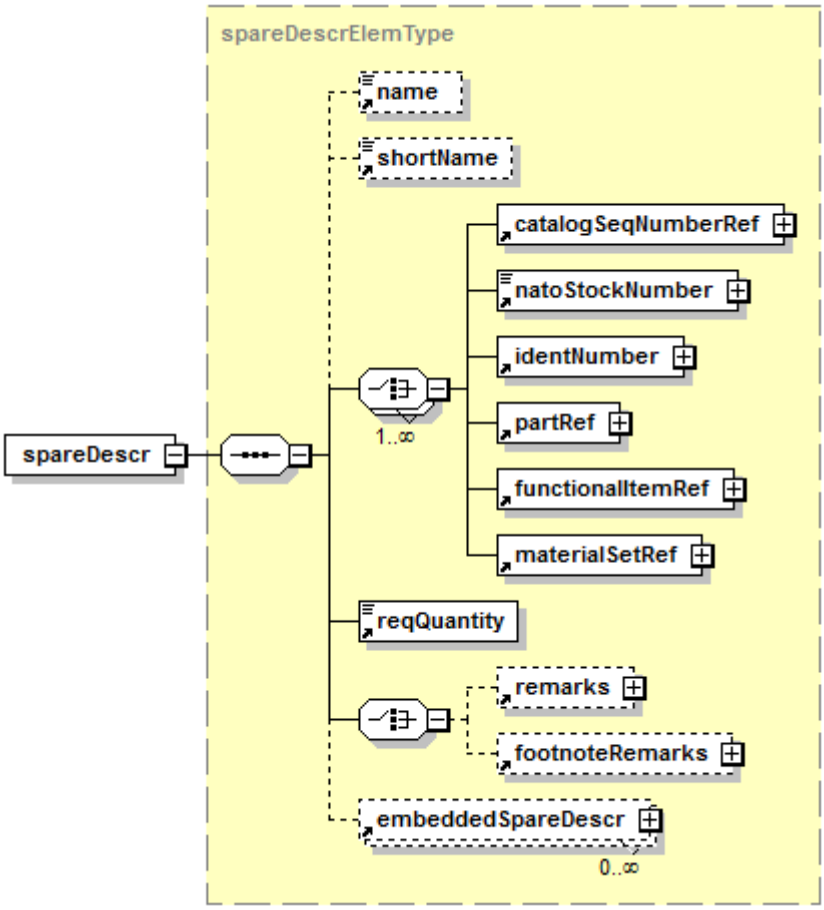
```
item="010" itemVariant="A" itemLocationCode="D"
itemSeqNumberValue="00A"/>
<reqQuantity unitOfMeasure="EA">23</reqQuantity>
<footnoteRemarks><footnoteRef internalRefId="ftn-
0001"></footnoteRef></footnoteRemarks>
</spareDescr>
<spareDescr id="spa-0752">
<name>Retainer, Blade, LP Compressor</name>
<natoStockNumber natoSupplyClass="2840"
natoCodificationBureau="99" natoItemIdentNumberCore="1234584"/>
<catalogSeqNumberRef modelIdentCode="E2" systemDiffCode="A"
systemCode="72" subSystemCode="3" subSubSystemCode="2"
assyCode="10" figureNumber="01" figureNumberVariant="A"
item="040" itemVariant="A" itemLocationCode="D"
itemSeqNumberValue="00A"/>
<reqQuantity unitOfMeasure="EA">23</reqQuantity>
<footnoteRemarks><footnoteRef internalRefId="ftn-
0001"></footnoteRef></footnoteRemarks>
</spareDescr>
<footnote id="ftn-0001"><para>Make sure that the blade is the
good one</para></footnote>
</spareDescrGroup>
</reqSpares>
```

2.7.1 Spare description

Description: The element <spareDescr> contains the information on each item of spare or set of spares.

The attribute id in the element <spareDescr> can be applied so that the spares can be cross-referenced from the procedure.

Markup element: <spareDescr>



ICN-S3627-S1000D0614-001-01

Fig 26 Element <spareDescr>

Attributes:

The element <spareDescr> contains the same attributes as the element <supportEquipDescr> (refer to Para 2.5.1) with the different use for attribute:

– materialUsage (O), identifies discarded, retained, modified and referenced spares. It also identifies a material set of spares. The attribute can have one of the following values:

- "mu01" thru "mu99". Refer to Chap 3.9.6.1.

Use of the attribute materialUsage

- For Spares needed from store and required to do the task, the attribute materialUsage is not used. It is used only for spares removed from the Product or for spares used to define a material set (attribute materialUsage = "mu05"). Refer to Chap 3.9.6.1.
- For Spares, the values of "Discarded" (attribute materialUsage = "mu01") and "Retained" (attribute materialUsage = "mu02") is used only in the context of a service bulletin.
- The element <reqQuantity> must be populated with a hyphen [-] when the element <spareDescr> has the attribute materialUsage set to "mu04" (Referenced).

Child elements:

The element <spareDescr> contains the same elements as the element <supportEquipDescr> (refer to Para 2.5.1) with the following exception:

- The element <toolRef> is substituted with the element <partRef> and the element <functionalItemRef>. Refer to Para 2.7.1.1 for details on the element <partRef>. Refer to Para 2.7.1.2 for details on the element <functionalItemRef>.
- The element <embeddedSupportEquipDescr> is substituted with the element <embeddedSpareDescr>. Refer to in Para 2.7.1.3.

Business rule decision point BRDP-S1-00156 - Use of the attribute id on the element <sparesDescr> in the element <preliminaryRqmts>:

- Decide whether to use the attribute id to create cross-references from the procedure to the spares listed in Preliminary requirements. The attribute id on the element <sparesDescr> is used to establish the link between the two and will guarantee consistent identification throughout the procedure. The use of cross-references is encouraged.

Markup example:

Two spares within a kit

```
<spareDescr id="spa-0002" materialUsage="mu05">
<name>Blanking set</name>
<materialSetRef materialSetIdent="578015B01"
materialSetIssue="01"/><catalogSeqNumberRef modelIdentCode="EP"
systemDiffCode="A" systemCode="72" subSystemCode="6"
subSubSystemCode="1" assyCode="00"   figureNumber="02"
item="000"/>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
<embeddedSpareDescr id="spa-0003">
<name>Bag</name>
<catalogSeqNumberRef modelIdentCode="EP" systemDiffCode="A"
systemCode="72" subSystemCode="6" subSubSystemCode="1"
assyCode="00"   figureNumber="02" item="001"/>
<identNumber>
<manufacturerCode>KZ777</manufacturerCode>
<partAndSerialNumber><partNumber>P0RT-10N-
12F</partNumber></partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</embeddedSpareDescr>
<embeddedSpareDescr id="spa-0004">
<name>Engine assembly protective cover</name>
<catalogSeqNumberRef modelIdentCode="EP" systemDiffCode="A"
systemCode="72" subSystemCode="6" subSubSystemCode="1"
assyCode="00"   figureNumber="02" item="002"/>
<identNumber>
<manufacturerCode>KZ777</manufacturerCode>
<partAndSerialNumber><partNumber>P0RT-10N-B1-
12R</partNumber></partAndSerialNumber>
```

```
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</embeddedSpareDescr>
<embeddedSpareDescr id="spa-0005">
...
</spareDescr>
```

2.7.1.1 Part number reference

Description: The element <partRef> is used for projects using part number references. Refer to Chap 3.9.5.2.1.10.

2.7.1.2 Functional item reference

Description: The element <functionalItemRef> is used for projects using functional item number. Refer to Chap 3.9.5.1 for detail on population of the element <functionalItemRef>.

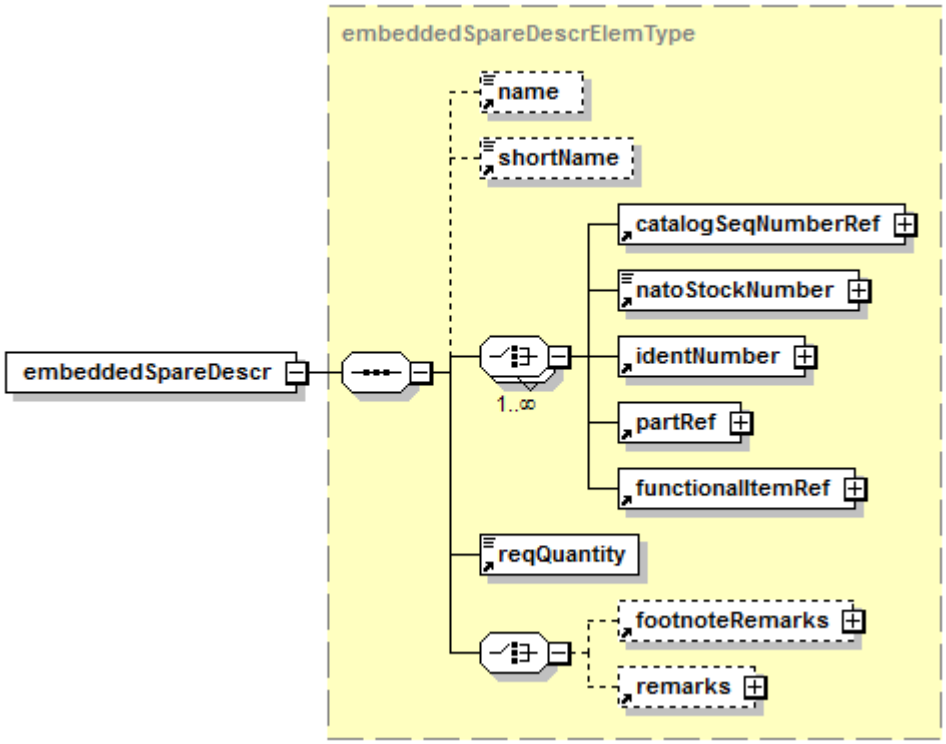
2.7.1.3 Embedded spare description

Description: The element <embeddedSpareDescr> contains the information of each spare item when included in a spare material set or the information of the original spare when included in a modified spare <spareDescr>.

The hierarchical relation between <spareDescr> and <embeddedSpareDescr> is:

- If the element <spareDescr> is a material set, then its attribute materialUsage is set to "mu05" (Material set) and the embedded parts are present in one or several elements <embeddedSpareDescr>
- If the element <spareDescr> is a modified spare from a spare removed from the Product, then its attribute materialUsage is set to "mu03" (Modified from) and the element <spareDescr> contains one or several elements <embeddedSpareDesrc> with the original spares removed from the Product
- If the element <spareDescr> is a simple spare provided from the store or already present on the product, then the attribute materialUsage follows the instantiation rules described in Para 2.7.1 and there is no element <embeddedSpareDescr>

Markup element: <embeddedSpareDescr>



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Fig 27 Element <embeddedSpareDescr>

Attributes:

The element <embeddedSpareDescr> contains the same attributes as the element <spareDescr>. Refer to Para 2.7.1.

Child elements:

The element <embeddedSpareDescr> contains the same elements as the element <spareDescr> (refer to Para 2.7.1) with the following exceptions:

- The element <materialSetRef> is suppressed.
- The element <embeddedSpareDescr> is suppressed.

2.8 Required safety

Description: The element <reqSafety> must contain information to list any safety requirements.

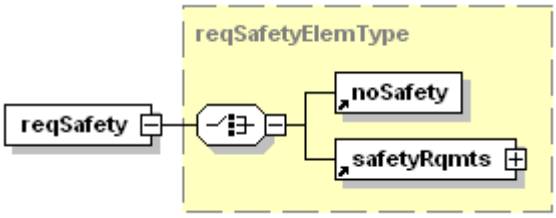
Any warnings, cautions and notes applicable to the procedure and the Requirements after job completion in the data module must be listed here.

If there are no safety requirements, then the element <noSafety> must be used.

Note

The use of the element <noSafety> generates the word "None" at presentation. At page-oriented presentation "None" is given as a text paragraph under the default heading "Safety conditions".

Markup element: <reqSafety>



ICN-S3627-S1000D0482-001-01

Fig 28 Element <reqSafety>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`noSafety`>, indicates that there are no required preliminary safety requirements
- <`safetyRqmts`>. Refer to Para 2.8.1.

Markup example:

The following example shows two warnings in the Safety conditions:

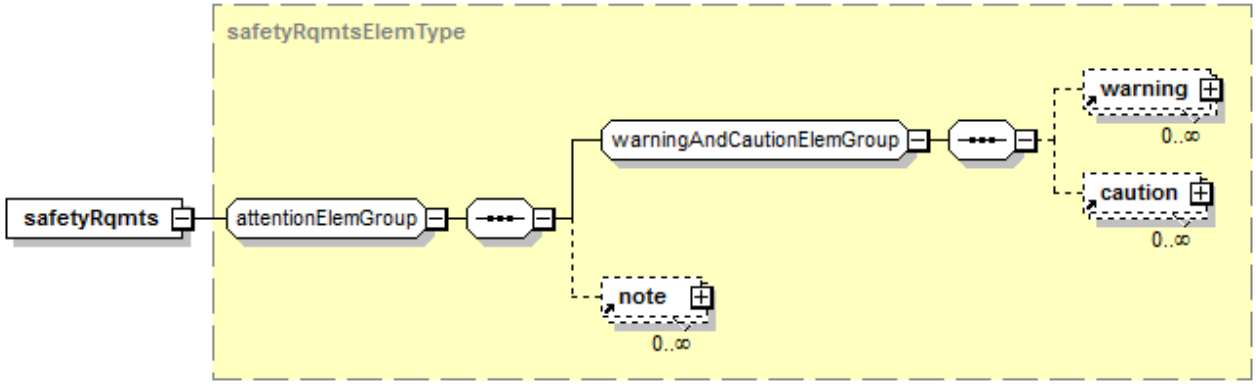
```
<reqSafety>
<safetyRqmts>
<warning>
<warningAndCautionPara>Sellinium-X is corrosive. Do not get it
on your skin.
Do not drink it. Use it in a well ventilated
area.</warningAndCautionPara>
</warning>
<warning>
<warningAndCautionPara>Make sure you read the standard reqSafety
conditions
that are given in <dmRef>
<dmRefIdent>
<dmCode assyCode="00" disassyCode="00" disassyCodeVariant="A"
infoCode="012"
infoCodeVariant="A" itemLocationCode="D" modelIdentCode="AE"
subSubSystemCode="0"
subSystemCode="0" systemCode="00"
systemDiffCode="A"/></dmRefIdent>
</dmRef>.</warningAndCautionPara>
</warning>
</safetyRqmts>
</reqSafety>
```

2.8.1 Safety requirements

Description: If there are any safety requirements, then the element <`safetyRqmts`> must be used. This element can be populated with the attribute `warningRefs` or the attribute

cautionRefs, or the element <warning>, the element <caution>, or the element <note>, as described at Chap 3.9.3.

Markup element: <safetyRqmts>



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Fig 29 Element <safetyRqmts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- warningRefs (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- cautionRefs (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.

Child elements:

- <warning>. Refer to Chap 3.9.3.
- <caution>. Refer to Chap 3.9.3.
- <note>. Refer to Chap 3.9.3.

Markup example:

```
<safetyRqmts>
<warning>
<warningAndCautionPara>Sellinium-X is corrosive. Do not get it
on your skin.
Do not drink it. Use it in a well ventilated
area.</warningAndCautionPara>
</warning>
<warning>
<warningAndCautionPara>Make sure you read the standard reqSafety
conditions
that are given in <dmRef>
<dmRefIdent>
<dmCode assyCode="00" disassyCode="00" disassyCodeVariant="A"
infoCode="012"
infoCodeVariant="A" itemLocationCode="D" modelIdentCode="AE"
subSubSystemCode="0"
subSystemCode="0" systemCode="00"
systemDiffCode="A"/></dmRefIdent>
</dmRef>.</warningAndCautionPara>
```

```
</warning>
</safetyRqmts>
```

2.9 Example - Preliminary requirements

The following markup example gives the Preliminary requirements for S1000DBIKE-AAA-D00-00-00-00AA-258A-A. The presentation of the complete <content> of the data module is given in Chap 6.2.3.3.

```
<preliminaryRqmts>
<reqCondGroup>
<reqCondNoRef>
<reqCond>The bicycle is outdoors</reqCond>
</reqCondNoRef>
</reqCondGroup>
<reqPersons>
<person man="A">
<personCategory personCategoryCode="Chemical technician"/>
<personSkill skillLevelCode="sk02"/>
<trade>Bike cleaner</trade>
<estimatedTime unitOfMeasure="h">1,0</estimatedTime>
</person>
</reqPersons>
<reqPersons applicRefId="app-0002">
<person man="B">
<personCategory personCategoryCode="Operator"/>
<personSkill skillLevelCode="sk02"/>
<trade>Bike rider</trade>
<estimatedTime unitOfMeasure="h">1,0</estimatedTime>
</person>
</reqPersons>
<reqPersons applicRefId="app-0001">
<person man="B">
<personCategory personCategoryCode="Operator"/>
<personSkill skillLevelCode="sk03"/>
<trade>Bike rider</trade>
<estimatedTime unitOfMeasure="h">0,8</estimatedTime>
</person>
</reqPersons>
<reqTechInfoGroup>
<reqTechInfo reqTechInfoCategory="ti01">
<pmRef>
<pmRefIdent>
<pmCode modelIdentCode="S1000DBIKE" pmIssuer="B6865"
pmNumber="SAFE1" pmVolume="00"/>
</pmRefIdent>
<pmRefAddressItems><pmTitle>Safety Handbook - Greasy
Bikes</pmTitle></pmRefAddressItems>
</pmRef>
</reqTechInfo>
<reqTechInfo reqTechInfoCategory="ti06">
<externalPubRef>
<externalPubRefIdent>
<externalPubCode>SafeS-12-156B</externalPubCode>
```

```
<externalPubTitle>Sticky stuff - Safety sheet</externalPubTitle>
<externalPubIssueInfo>
<externalPubIssue>2014</externalPubIssue>
</externalPubIssueInfo>
</externalPubRefIdent>
</externalPubRef>
</reqTechInfo>
</reqTechInfoGroup>
<reqSupportEquips>
<supportEquipDescrGroup>
<supportEquipDescr id="seq-0001">
<name>Water hose</name>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001-09</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
<supportEquipDescr id="seq-0002">
<name>Stiff bristle brush</name>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001-02</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
<supportEquipDescr id="seq-0003">
<name>Sponge</name>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001-11</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
</supportEquipDescrGroup>
</reqSupportEquips>
<reqSupplies>
<supplyDescrGroup>
<supplyDescr id="sup-0001">
<name>ACME super 45 Agent</name>
<shortName>Degreasing agent</shortName>
<identNumber>
<manufacturerCode>KZ222</manufacturerCode>
<partAndSerialNumber>
<partNumber>LL-004</partNumber>
</partAndSerialNumber>
```

```
</identNumber>
<reqQuantity unitOfMeasure="L">1</reqQuantity>
</supplyDescr>
<supplyDescr id="sup-0002">
<name>ACME Middling Detergent 69</name>
<shortName>Detergent A</shortName>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-023-14</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="L">1</reqQuantity>
</supplyDescr>
<supplyDescr id="sup-0003" applicRefId="app-0001"
reasonForUpdateRefIds="rfu-Detergent" changeMark="1"
changeType="modify">
<name>BoeBus DeLux Detergent No.6</name>
<shortName>Detergent C</shortName>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001-15</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="L">1</reqQuantity>
</supplyDescr>
</supplyDescrGroup>
</reqSupplies>
<reqSpares>
<noSpares/>
</reqSpares>
<reqSafety>
<safetyRqmts>
<warning>
<warningAndCautionPara>Do not get <internalRef
internalRefId="sup-0002" internalRefTargetType="irtt04"/> into
your eyes. If it gets into your eyes, wash them immediately in
clean warm water.</warningAndCautionPara>
</warning>
<warning applicRefId="app-0001" changeType="modify"
changeMark="1" reasonForUpdateRefIds="rfu-applic">
<warningAndCautionPara>Do not get <internalRef
internalRefId="sup-0003" internalRefTargetType="irtt04"/> into
your eyes. If it gets into your eyes, wash them immediately in
clean warm water.</warningAndCautionPara>
</warning>
<caution>
<warningAndCautionPara>Do not use a <internalRef
internalRefId="seq-0001" internalRefTargetType="irtt05"/> that
has high pressure. A water hose that has high pressure can cause
some parts to become loose or full of
```

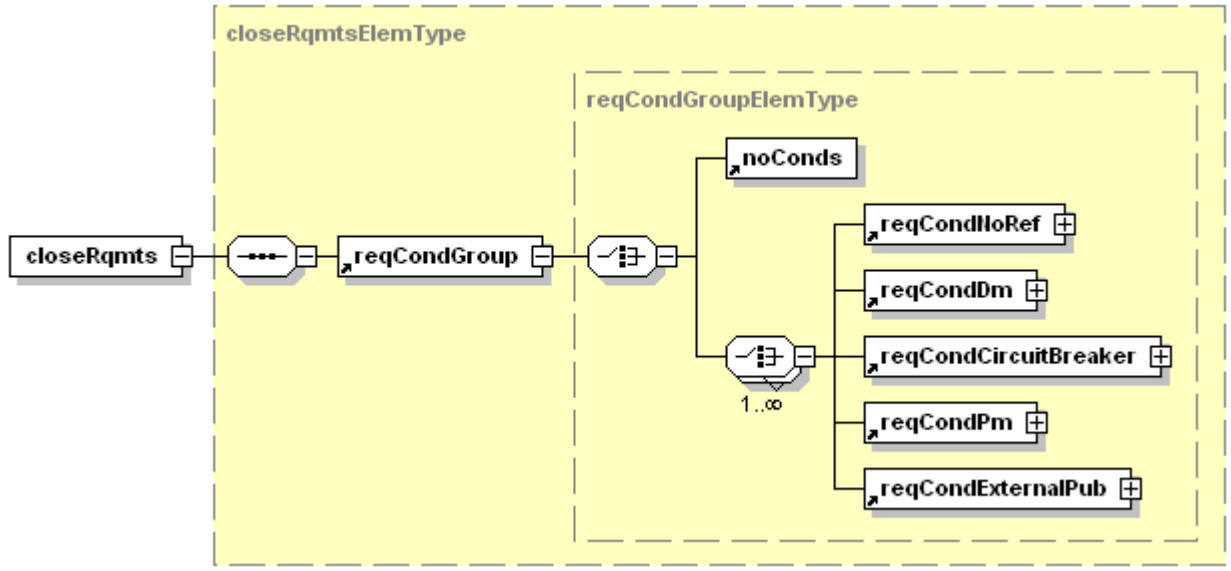
```
water.</warningAndCautionPara>
</caution>
<caution>
<warningAndCautionPara>Do not point the hose directly at the hub
or at the bottom bracket bearings. This can cause damage to the
parts.</warningAndCautionPara>
</caution>
<caution applicRefId="app-0001" changeType="modify"
changeMark="1" reasonForUpdateRefIds="rfu-applic">
<warningAndCautionPara>Apply <internalRef internalRefId="sup-
0003" internalRefTargetType="irtt04"/> in accordance with the
instruction on the container. The substance may cause damage to
the Bike paint if it is not applied
correctly.</warningAndCautionPara>
</caution>
</safetyRqmts>
</reqSafety>
</preliminaryRqmts>
```

3 Requirements after job completion

3.1 General

Description: The element <closeRqmts> contains any actions that are required after the procedure is complete.

Markup element: <closeRqmts>



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Fig 30 Element <closeRqmts>

The element is mandatory in procedural and fault isolation data modules, and optional in process data modules.

If there are no actions, then the child element <noConds> must be used.

If there are actions, then the elements <reqCondNoRef>, <reqCondDm>, <reqCondCircuitBreaker>, <reqCondPm> or <reqCondExternalPub> must be used to give the close up requirement action in accordance with Para 2.2.

The requirements can reference data modules, publication modules, non-S1000D publications or contain no reference at all. It is recommended that details for close up be given by only referring to complete data modules. The use of the element <reqCond> without a reference must be avoided. The requirements after job completion must be in the order that the requirements are satisfied.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <recCondGroup>. Refer to Para 2.2.

Business rule decision point BRDP-S1-00157 - Use of the element <closeRqmts> in the process data modules:

- Decide whether to use the element <closeRqmts> in the process data modules.

3.2 Examples - Requirements after job completion

Example 1 - This example shows markup if no close-up requirements are needed:

```
<closeRqmts>
<reqCondGroup>
<noConds/>
</reqCondGroup>
</closeRqmts>
```

Example 2 - This example shows markup if there are close up requirements needed:

```
<closeRqmts>
<reqCondGroup>
<reqCondDm>
<reqCond>The access panel is closed.</reqCond>
<dmRef>
<dmRefIdent>
<dmCode assyCode="00" disassyCode="00" disassyCodeVariant="A"
infoCode="740" infoCodeVariant="A" itemLocationCode="D"
modelIdentCode="AE" subSubSystemCode="0" subSystemCode="0"
systemCode="10" systemDiffCode="A"/>
</dmRefIdent>
</dmRef>
</reqCondDm>
<!-- A reference to a non-S1000D publication -->
<reqCondExternalPub>
```

```
<reqCond>The access panel is closed.</reqCond>
<externalPubRef>
<externalPubRefIdent>
<externalPubTitle>Component Maintenance
Manual</externalPubTitle>
</externalPubRefIdent>
</externalPubRef>
</reqCondExternalPub>
<!-- A required condition that has no reference -->
<reqCondNoRef>
<reqCond>The caps are installed on all orifices</reqCond>
</reqCondNoRef>
</reqCondGroup>
</closeRqmts>
```

Example 3

```
<closeRqmts>
<reqCondGroup>
<reqCondNoRef>
<reqCond>Replace the tire.</reqCond>
</reqCondNoRef>
<reqCondDm>
<reqCond>Inflate the tire with air.</reqCond>
<dmRef xlink:type="simple" xlink:actuate="onRequest"
xlink:show="replace" xlink:href="URN:S1000D:DMC-S1000DBIKE-AAA-
DA0-10-20-00AA-215A-A">
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="215" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</reqCondDm>
</reqCondGroup>
</closeRqmts>
```

Chapter 3.9.5.2.1.10

Common constructs - Text elements

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.3	Common constructs - Lists
Chap 3.9.5.2.1.4	Common constructs - Caption groups
Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
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Chap 4.13.1	Optimizing and reuse - Common information repository concept

Chap No./Document No.	Title
Chap 4.16	Information management - Content specific data and quantity data
Chap 6	Information presentation and use
Chap 6.2	Information presentation and use - Page-oriented publications
Chap 6.2.3.3	Lay-out rules and examples - Procedural data modules
Chap 6.3	Information presentation/use - Interactive electronic technical publications
Chap 7.7.4	Guidance and examples - XLink
ISO 4217	Codes for the representation of currencies

1 General

The paragraph elements are used to capture text. Several different paragraph models are available depending on which data module type is used and where the paragraph is used. The available elements for each paragraph model are tailored dependent on its use. For example, including a list within a paragraph is desirable in a procedural step (in the element <para>), but is not desirable in an applicability statement (in the element <simplePara>). The different models are detailed within this paragraph. Usage of the individual content elements is detailed in Para 2.

This chapter also describes the three frequently used text elements:

- <name>. Refer to Para 2.5.1.
- <shortName>. Refer to Para 2.5.2.
- <partRef>. Refer to Para 2.5.3.

The rules for presentation of text, including tables and figures are given in Chap 6.

Care must be taken when authoring text and placing spaces around elements embedded within the element <para>. Ensure that spaces are inserted correctly in order to get the desired presentation result.

Example:

```
<para>This is <emphasis emphasisType="em01">bold</emphasis>
text.</para>
```

The display of this markup is:

"This is **bold** text."

1.1 Paragraph models

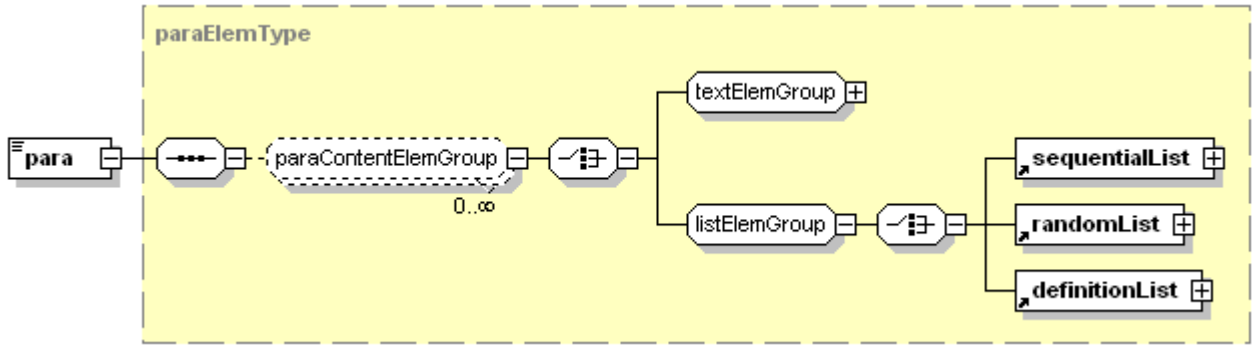
The paragraph model holds seven types of paragraph elements:

- <para>
- <warningAndCautionPara>. Refer to Chap 3.9.3.
- <attentionListItemPara>. Refer to Chap 3.9.3.
- <notePara>. Refer to Chap 3.9.3.

- <simplePara>. Refer to Para 2.2.
- <simpleRefPara>. Refer to Para 2.3.
- <reducedPara>. Refer to Para 2.4.
- <copyrightPara>. Refer to Chap 3.9.5.1.

The element <para> consists of two groups of elements:

- textElemGroup which is detailed in this chapter. Refer to Para 1.1.1 and Para 2.
- listElemGroup. Refer to Para 1.1.2 and Chap 3.9.5.2.1.3.



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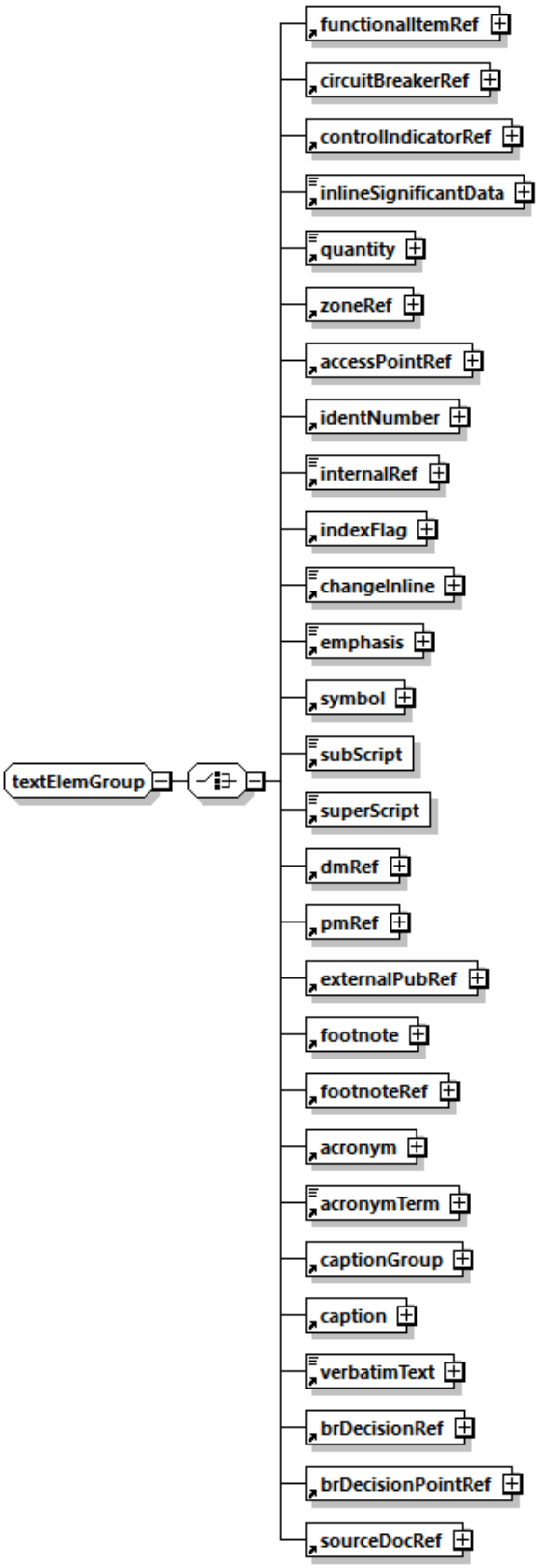
Fig 1 Element <para>

1.1.1 Text element group

The content of the textElemGroup varies depending on data module type but the name of the group is still the same for all data module types. The full (maximum) content of the textElemGroup is shown in Fig 2.

Note

The textElemGroup is used by several other text elements (eg, by the element <action> in the fault isolation schema). The content of the textElemGroup is always the same within the same data module type, wherever it appears.



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Fig 2 The `textElemGroup`

The content of the different paragraph types are detailed in Fig 3. The figure provides the element name, which data module types the element is available in, and which child elements are available in that context.

Note

The para elements <warningAndCautionPara>, <attentionListItemPara> and <notePara>, and the attentionText group are detailed in Chap 3.9.3.

Note

The reducedElemGroup is detailed in Chap 3.9.5.2.16.

Element [group]	Data module type (Schema) in which the element occurs	Available child elements (grey indicates available)																												
		functionalItemRef	circuitBreakerRef	controlIndicatorRef	inlineSignificantData	quantity	zoneRef	accessPointRef	identNumber	internalRef	indexFlag	changeInline	emphasis	symbol	subScript	superScript	dmRef	pmRef	externalPubRef	footnote	footnoteRef	acronym	acronymTerm	captionGroup	caption	verbatimText	brDecisionRef	brDecisionPointRef	sourceDocRef
	container descript learning pm sb scocontent scormcontentpackage																													
<para> [textElemGroup]	crew																													
<para> [textElemGroup]	checklist																													
<para> [textElemGroup]	fault																													
<para> [textElemGroup]	proced process																													
<para> [textElemGroup]	comrep frontmatter ipd schedule update																													
<para> [textElemGroup]	brex applicrossreftable condcrossreftable prdcrossreftable wrngdata																													
<para> [textElemGroup]	wrngflds																													
<para> [textElemGroup]	brdoc																													
<simplePara>	all																													
<simpleRefPara>	all																													
<reducedPara> [reducedElemGroup]	frontmatter																													
<copyrightPara>	all																													

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Fig 3 Paragraph models and available child elements

1.1.2 List element group

The content of the listElemGroup is:

- sequential (ordered) lists
- random lists
- definition lists

For details of authoring lists, refer to Chap 3.9.5.2.1.3.

2 Text elements

2.1 Available elements in the text element group

The complete list of possible elements in the textElemGroup is:

- content specific data, including:
  - elements with a dedicated common information repository:
    - <functionalItemRef>. Refer to Chap 3.9.5.1.
    - <circuitBreakerRef>. Refer to Para 2.1.1.
    - <controlIndicatorRef>. Refer to Para 2.1.2.
    - <zoneRef>. Refer to Para 2.1.5.
    - <accessPointRef>. Refer to Para 2.1.6.

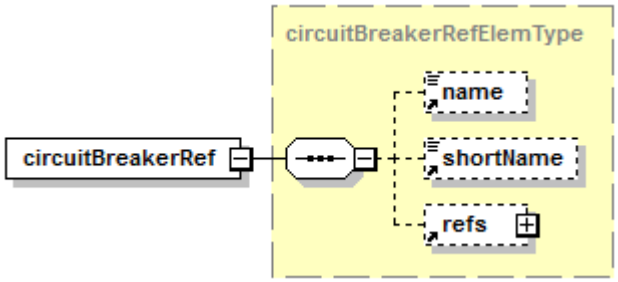
  Note
  There are additional content specific data with a dedicated common information repository (eg, supplies and tools). Refer to Chap 4.16.

  - elements without a dedicated common information repository (paragraph significant data):
    - <inlineSignificantData>. Refer to Para 2.1.3.
    - <quantity>. Refer to Para 2.1.4.
- <identNumber>. Refer to Chap 3.9.5.2.1.9.
- <indexFlag>. Refer to Para 2.1.7.
- <changeInline>. Refer to Chap 3.9.5.2.1.1.
- <emphasis>. Refer to Para 2.1.8.
- <symbol>. Refer to Para 2.1.9.
- <subScript>. Refer to Para 2.1.10.
- <superScript>. Refer to Para 2.1.11.
- <internalRef>. Refer to Chap 3.9.5.2.1.2.
- <dmRef>. Refer to Chap 3.9.5.2.1.2.
- <pmRef>. Refer to Chap 3.9.5.2.1.2.
- <externalPubRef>. Refer to Chap 3.9.5.2.1.2.
- <brDecisionRef>. Refer to Chap 4.10.1.
- <brDecisionPointRef>. Refer to Chap 4.10.1.
- <sourceDocRef>. Refer to Chap 4.10.1.
- <footnote>. Refer to Para 2.1.12.
- <footnoteRef>. Refer to Para 2.1.13.
- <acronym>. Refer to Para 2.1.14.
- <acronymTerm>. Refer to Para 2.1.14.1.
- <captionGroup> and <caption>. Refer to Chap 3.9.5.2.1.4.
- <verbatimText>. Refer to Para 2.1.15.

2.1.1 Circuit breaker

Description: The element <circuitBreakerRef> contains the details about the circuit breaker (eg, number, circuit breaker action and circuit breaker type).

Markup element: <circuitBreakerRef>



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Fig 4 Element <circuitBreakerRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- circuitBreakerNumber (M), the circuit breaker identifier (number).
- circuitBreakerType (O), the circuit breaker type (electronic, electro-mechanic, or another type). The project or the organization is allowed to define its own circuit breaker types. The attribute can have one of the following values:
  - "cbt01" thru "cbt99". Refer to Chap 3.9.6.1.
- circuitBreakerAction (O), contains the action to perform on the circuit breaker. The attribute can have one of the following values:
  - "open" - the action "to open"
  - "close" - the action "to close"
  - "verify-open" - the check of the condition: "is open"
  - "verify-close" - the check of the condition: "is closed"

  Note

  The values "open-order" and "close-order" are not allowed for the attribute circuitBreakerAction in the element<circuitBreakerRef>. Use the values "open" and "close". Refer to default BREX rule BREX-S1-00071.
- checkSum (O), the entered data which allows potential integrity verification
- installationIdent (O), the installation identifier
- contextIdent (O), the context identification which is used in combination with the attribute manufacturerCodeValue to ensure the uniqueness of vendor equipment data. Context identification contains an identifier (eg, the part number of the next higher assembly that has been given to the assembly by the vendor).
- manufacturerCodeValue (O), the manufacturer CAGE code
- itemOriginator (O), the origin of the circuit breaker (eg, whether the circuit breaker has been defined by the Product manufacturer or by a supplier). The attribute can have one of the following values:
  - "orig01" thru "orig99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>, the name of the circuit breaker. Refer to Para 2.5.1.
- <shortName>. Refer to Para 2.5.2.
- <refs>, references providing a link to the circuit breaker. Refer to Chap 3.9.5.2.1.2.

Business rule decision point BRDP-S1-00158 - Use of the attribute `circuitBreakerAction` in text element <`circuitBreakerRef`>:

- Decide whether to use the attribute `circuitBreakerAction`. If used, establish writing rules to ensure that authors will be consistent in the paragraph text and the value of the attribute itself.

Business rule decision point BRDP-S1-00159 - Use of the attribute `checkSum` in text element <`circuitBreakerRef`>:

- Decide whether to use and how to populate the attribute `checkSum`.

Markup examples:

Circuit breaker type

```
<circuitBreakerRef circuitBreakerNumber="42RT"
circuitBreakerType="cbt02">
</circuitBreakerRef>
```

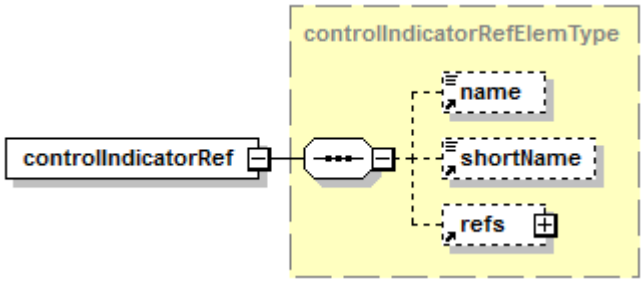
Circuit breaker action

```
<circuitBreakerRef circuitBreakerNumber="809-VM"
circuitBreakerAction="open" checkSum="f9f62226"/>
```

2.1.2 Controls and indicators

Description: The element <controlIndicatorRef> contains the number and name of the controls or indicators and the reference to the control and indicator repository data module.

Markup element: <controlIndicatorRef>



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Fig 5 Element <controlIndicatorRef>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlIndicatorNumber` (O), the control or indicator number identified in the common information repository data module. Refer to Chap 3.9.5.2.11.11 and Chap 4.13.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>, the name of the control or indicator. Refer to Para 2.5.1.
- <shortName>. Refer to Para 2.5.2.
- <refs>, provides a link to the control and indicator repository data module. Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<controlIndicatorRef controlIndicatorNumber="ci-0001">
...
</controlIndicatorRef>
```

2.1.3 Paragraph significant data

Description: The element <inlineSignificantData> contains data with a significant meaning, such as a lubricant or manufacturer code.

Markup element: <inlineSignificantData>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- significantParaDataType (M), the meaning of the data. The attribute can have one of the following values:
  - "psd01" thru "psd99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Business rule decision point BRDP-S1-00160 - Types of inline significant data to markup using the attribute significantParaDataType in the text element <inlineSignificantData>:

- Decide whether to use the attribute significantParaDataType and which types of data to mark up and in what contexts.

  Note

  It must also be considered that data modules can be less portable if the paragraph significant data types are extended in the BREX file past the standard types.

Markup example:

The following markup example illustrates the use of <inlineSignificantData>:

```
<para>Use lubricant
(<inlineSignificantData
significantParaDataType="psd03">1X234</inlineSignificantData>)
```

```
on threads...
</para>
```

The display of this markup can be as follows:

"Use lubricant (1X234) on threads..."

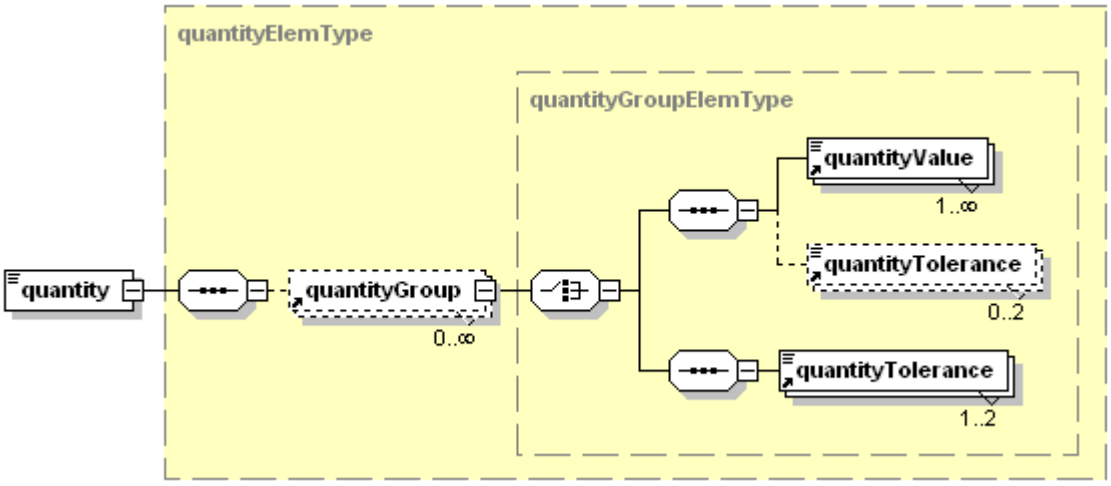
2.1.4 Quantity data

Description: The element <quantity> provides the capability to identify a portion of a paragraph that corresponds to a numeric value with a special meaning, such as a torque value. The exact meaning of the quantity data can be specified using a set of predefined S1000D values, or extended to support specific project or organization needs.

The quantity data provides the ability to define numerical values to a very precise level. Use of the quantity group structure within quantity data provides the following capabilities:

- Specify a decimal value that does not contain display format information (ie, adheres to the W3C XML standard for decimal numbers)
- Specify a unit of measure that applies to the value
- Group a value and a tolerance together
- Specify units of measure to the value/tolerance group or to value and tolerance individually
- Group multiple values and tolerances together, units can be apply to the group or individual values

Markup element: <quantity>



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Fig 6 Element <quantity>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- quantityType (O), the type of quantity (eg, length, time). The attribute can have one of the following values:
  - "qty01" thru "qty99". Refer to Chap 3.9.6.1.
- quantityTypeSpecifics (O), the currency code when the attribute quantityType is set to "qty02" (price). The attribute can have the values of any currency code as defined in ISO 4217. Refer to default BREX rules BREX-S1-00075 and BREX-S1-00076.

Note

Consider that data modules can be less portable if the quantity data types are extended in the BREX file past the standard types.

– `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

– <`quantityGroup`>. Refer to Para 2.1.4.1.

Markup examples:

Example 1: Simple quantity markup using the attribute `quantityType`:

```
<para>Maximum torque not to exceed
<quantity quantityType="qty05">8 Nm</quantity>.
</para>
```

The display of this markup can be as follows:

"Maximum torque not to exceed 8 Nm."

Example 2: Quantity markup using the child element <`quantityGroup`>:

```
<para>Maximum torque not to exceed
<quantity quantityType="qty05">
<quantityGroup quantityGroupType="nominal">
<quantityValue quantityUnitOfMeasure="N.m">8</quantityValue>
</quantityGroup>
</quantity>
.</para>
```

The display of this markup can be as follows:

"Maximum torque not to exceed 8 Nm."

Example 3: Quantity markup using price and currency:

```
<para>The price of the kit is
<quantity quantityType="qty02" quantityTypeSpecifics="USD">1500
</quantity>
.</para>
```

The display of this markup can be as follows:

"The price of the kit is 1500 USD."

2.1.4.1 Quantity group

Description: The element <`quantityGroup`> contains a group of values and tolerances and/or multiple values in the case where multiple units of measure are used (eg, 2 h 30 min).

Markup element: <`quantityGroup`>

Attributes:

– `quantityGroupType` (O). The attribute can have one of the following values:

- "`nominal`" (D) - a single value
- "`minimum`" - a "from" (beginning of a range) or "minimum" value

- "maximum" - a "to" (end of a range) or "maximum" value

– quantityUnitOfMeasure (O), the unit of measure (eg, "m" for meter, "kg" for kilogram). Refer to Chap 3.9.6.2 for an enumerated list of standard quantity units of measure. These can be extended using the standard BREX mechanism. The value within the attribute quantityUnitOfMeasure is a code specifying the exact unit of measure. A quantityUnitOfMeasure at this level indicates that the quantityUnitOfMeasure applies to the entire group, possibly including several values and/or tolerances. The implication is that by default the unit of measure will be displayed once after the value/tolerance (eg, "0,250 + 0,003 - 0,000 in."), but other formats can be applied by stylesheets.

  Refer to Chap 3.9.1 for presentation rules for units of measure and fractions.

About units of measure:

– attribute quantityUnitOfMeasure not used at all indicates that no unit of measure must be displayed
– attribute quantityUnitOfMeasure on the element <quantityValue> and on the element <quantityTolerance> within the same element <quantityGroup> applies to each value or tolerance independent of the others
– attribute quantityUnitOfMeasure on two elements <quantityValue> within the same element <quantityGroup> applies to each value independent of the other or others

Note

In cases where the attribute quantityUnitOfMeasure is specified at both the element <quantityGroup> level and at the element <quantityValue> or element <quantityTolerance> level, the quantityUnitOfMeasure value from the lower level (element <quantityValue> or element <quantityTolerance>) must take precedence over the attribute quantityUnitOfMeasure value from the element <quantityGroup>.

Note

Due to the large number of units of measure, it is expected that a project or an organization will only use a small subset of the available units of measure. It must also be considered that data modules can be less portable if the units of measure types are extended by the BREX mechanism past the standard types.

Child elements:

– <quantityValue>, the value and an optional unit of measure. Refer to Para 2.1.4.1.1.
– <quantityTolerance>, the tolerance value. Refer to Para 2.1.4.1.2.

Business rule decision point BRDP-S1-00163 - Use of the value (element <quantityValue>) and tolerance (element <quantityTolerance>) decomposition in the text element <quantity>:

– Decide whether and how to use to use the element <quantityValue> and the element <quantityTolerance> decomposition.

Business rule decision point BRDP-S1-00164 - Unit of measure to be used:

– If using the value and tolerance decomposition, decide at which level of the markup the attribute quantityUnitOfMeasure must be included. Allowable locations are on the parent element <quantityGroup> which applies to all child elements or on the

individual child elements <quantityValue> and <quantityTolerance>. A consistent usage of the attribute quantityUnitOfMeasure is required to produce a consistent display or printout to the user.

Markup example:

Example 1: Quantity group and is a simple quantity with value and unit of measure:

```
<para>The windshield assembly weighs approximately
<quantity>
<quantityGroup quantityGroupType="nominal">
<quantityValue quantityUnitOfMeasure="kg">40</quantityValue>
</quantityGroup>
</quantity>
and requires two persons ...
</para>
```

The display of this markup can be as follows:

"The windshield assembly weighs approximately 40 kg and requires two persons ..."

Example 2: Quantity where value and tolerance have the same unit of measure:

```
<para>If hole tolerance of
<quantity>
<quantityGroup quantityGroupType="nominal"
quantityUnitOfMeasure="mm">
<quantityValue>0.700</quantityValue>
<quantityTolerance
quantityToleranceType="plus">0.010</quantityTolerance>
<quantityTolerance
quantityToleranceType="minus">0.000</quantityTolerance>
</quantityGroup>
</quantity>
has been exceeded ...
</para>
```

The display of this markup can be as follows:

"If hole tolerance of 0,700 +0,010 -0,000 mm has been exceeded ..."

Example 3: Quantity with minimum/maximum values:

```
<para>Tighten fasteners
<quantity quantityType="qty05">
<quantityGroup quantityGroupType="minimum">
<quantityValue quantityUnitOfMeasure="N.m">18.0</quantityValue>
</quantityGroup>
<quantityGroup quantityGroupType="maximum">
<quantityValue quantityUnitOfMeasure="N.m">22.0</quantityValue>
</quantityGroup>
</quantity>
using torque wrench ...
</para>
```

The display of this markup can be as follows:

"Tighten fasteners from 18,0 Nm to 22,0 Nm using torque wrench ..."

2.1.4.1.1 Value

Description: The element <quantityValue> contains a decimal value and an optional unit of measure. The value must conform to the W3C XML standard for decimal values which requires use a period [.] for the separator between the integral part and the fractional part, and no thousands separator. The display format is not specified in the XML code but, must conform to program or country requirements at presentation. Refer to Chap 3.9.1 for rules on presentation.

Markup element: <quantityValue>

Attributes:

– quantityUnitOfMeasure (O), the unit of measure. Refer to Para 2.1.4.1.

Child elements:

– None

Markup example:

The following markup example illustrates the use of quantity group and is a simple quantity with value and unit of measure:

```
<quantityValue quantityUnitOfMeasure="kg">40</quantityValue>
```

2.1.4.1.2 Tolerance

Description: The element <quantityTolerance> contains a decimal tolerance value, the type of tolerance, and an optional unit of measure. The tolerance value must conform to the W3C XML standard for decimal values which requires to use a period [.] for the separator between the integral part and the fractional part, and no thousands separator. The display format is not specified in the XML code, but must conform to program or country requirements at presentation. Refer to Chap 3.9.1 for presentation rules.

Markup element: <quantityTolerance>

Attributes:

– quantityToleranceType (O), the type of tolerance with allowable values. The attribute can have one of the following values:

- "plus" - the upper tolerance
- "minus" - the lower tolerance
- "plusorminus" - both the upper and the lower tolerance

– quantityUnitOfMeasure (O), the unit of measure. Refer to Para 2.1.4.1.

Child elements:

– None

Markup example:

Example 1: Quantity with type, value, tolerance, and unit of measure:

```
<para>Holding nut, torque bolt to
<quantity quantityType="qty05">
<quantityGroup quantityGroupType="nominal" unitOfMeasure="N.m">
<quantityValue>20</quantityValue>
<quantityTolerance
quantityToleranceType="plusorminus">2</quantityTolerance>
</quantityGroup>
```

```
</quantity>
.</para>
```

The display of this markup can be as follows:

"Holding nut, torque bolt to 20 ± 2 Nm."

Example 2: Quantity with multiple value groups and value and tolerance with different units:

```
<para>Chamfer both sides of rib
<quantity>
<quantityGroup quantityGroupType="nominal">
<quantityValue>0.153</quantityValue>
<quantityTolerance
quantityToleranceType="plusorminus">0.005</quantityTolerance>
</quantityGroup>
x
<quantityGroup quantityGroupType="nominal">
<quantityValue quantityUnitOfMeasure="dega">45</quantityValue>
<quantityTolerance quantityToleranceType="plusorminus"
quantityUnitOfMeasure="mina">30
</quantityTolerance>
</quantityGroup>
</quantity>
.</para>
```

The display of this markup formatted for Système International d'Unites (SI) can be as follows:

"Chamfer both sides of rib 0,153 ± 0,005 × 45° ± 30´."

The display of this markup formatted for imperial can be as follows:

"Chamfer both sides of rib 0.153 ± 0.005 × 45° ± 30´."

Example 3: Quantity with tolerance only:

```
<para>Make sure that spacing is within
<quantity>
<quantityGroup quantityGroupType="nominal">
<quantityTolerance
quantityToleranceType="plusorminus">0.030</quantityTolerance>
</quantityGroup>
</quantity>
on each side ...
</para>
```

The display of this markup formatted for SI can be as follows (comma separator):

"Make sure that spacing is within ± 0,030 on each side ..."

The display of this markup formatted for imperial can be as follows (period separator):

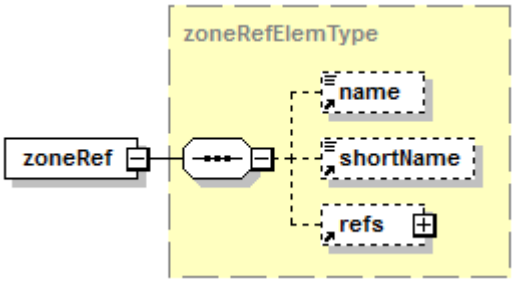
"Make sure that spacing is within ± 0.030 on each side ..."

2.1.5 Zone

Description: The element <zoneRef> contains the zoning information (one or more), as described in Chap 3.4. For the use of the element <zoneRef> in connection with common information repositories, refer to Chap 4.13.1.

This element is available in the product management data within the element <productionMaintData> of preliminary requirements (refer to Chap 3.9.5.2.1.9) and within the element <para> of descriptive data modules.

Markup element: <zoneRef>



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Fig 7 Element <zoneRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- zoneNumber (O), the zone identifier
- lsarData (O), a flag to indicate if the reference is derived from a Logistics Support Analysis Record (LSAR) or not. The attribute can have one of the following values:
  - "0" (D) - No, when not derived from an LSAR
  - "1" - Yes, when derived from an LSAR
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>, the name of the zone. Refer to Para 2.5.1.
- <shortName>. Refer to Para 2.5.2.
- <refs>. Refer to Chap 3.9.5.2.1.2.

Business rule decision point BRDP-S1-00166 - Use of the element <zoneRef>:

- Decide whether and how to use the element <zoneRef>. Consideration for duplication and mismatch of data given in the maintenance planning information has to be taken.

Markup example:

Example 1: A zone with a name, zone number and indicating the use of LSAR data:

```
<zoneRef lsarData="1" zoneNumber="500">
<name>Left wing</name>
</zoneRef>
```

Example 2: A zone with a zone identifier and a zone number:

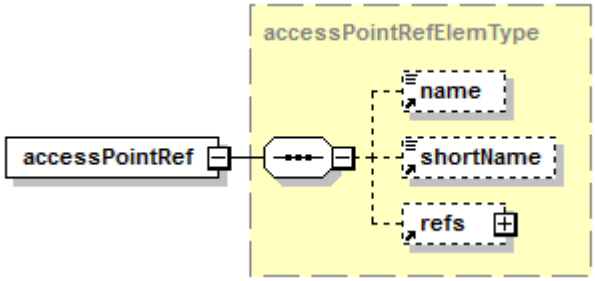
```
<zoneRef id="zoneRef-210" zoneNumber="210"/>
```

2.1.6 Access point

Description: The element <accessPointRef> describes and/or identifies any access points such as panels, doors and hatches. The identifier of the access point can be given either through the attribute accessPointNumber and/or the elements <name> and <refs>. For the use of the element <accessPointRef> in connection with common information repositories, refer to Chap 4.13.1 and Chap 3.9.5.2.11.5.

This element is available in the product management data within the element <productionMaintData> and <reqCondCircuitBreaker> of preliminary requirements (refer to Chap 3.9.5.2.1.9) and within the element <para> of descriptive data modules.

Markup element: <accessPointRef>



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Fig 8 Element <accessPointRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- accessPointNumber (O), the identifier of the access point
- accessPointTypeValue (O), the access point type. The attribute can have one of the following values:
  - "accpnl01" thru "accpnl99". Refer to Chap 3.9.6.1.

  Note

  The use of the attribute supports the presentation, as its value can be presented in front of the value of the attribute value of accessPointNumber. Refer to Chap 6.2.3.3 for examples.
- lsarData (O), a flag to indicate if the reference is derived from an LSAR or not. The attribute can have one of the following values:
  - "0" (D) - No, when not derived from an LSAR
  - "1" - Yes, when derived from an LSAR
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`name`>, the name of the access point. Refer to Para 2.5.1.
- <`shortName`>. Refer to Para 2.5.2.
- <`refs`>. Refer to Chap 3.9.5.2.1.2.

Business rule decision point BRDP-S1-00167 - Use of the element <`accessPointRef`>:

- Decide whether and how to use the element <`accessPointRef`>. Consideration for duplication and mismatch of data given in the maintenance planning information has to be taken.

Markup example:

Example 1: An access point with a name, access point number, and indicating the use of LSAR data:

```
<accessPointRef accessPointNumber="2514VU" lsarData="1">
<name>Panel A</name>
</accessPointRef>
```

Markup example:

Example 2: An access point with an identifier and an access point number:

```
<accessPointRef id="accessRef-210" accessPointNumber="210"/>
```

2.1.7 Index

Description: The element <`indexFlag`> is used to contain the text of an item that is required to be included in an automatically generated index, usually arranged alphabetically, of the specific information in a data module or a publication. Such an index is usually an alphabetical listing of selected items/keywords and their location in a publication.

Example: The index of a book lists words or expressions and the pages of the book upon which they are to be found.

Markup element: <`indexFlag`>

Attributes:

- `indexLevelOne` (O), `indexLevelTwo` (O), `indexLevelThree` (O) and `indexLevelFour` (O), the indications of the four permissible levels of indexing

Child elements:

- None

Business rule decision point BRDP-S1-00169 - Use of the text element <`indexFlag`>:

- Decide whether a publishing index is required and to what index level.

Markup example:

```
<para>The most important part of the bicycle
<indexFlag indexLevelOne="bicycle"/> is the brake system
<indexFlag indexLevelTwo="brake system"/>. Only a minimum
```

```
maintenance of the brake system is necessary. But, when a
problem does occur, make sure you to do the necessary
maintenance as quickly as possible. If you do not do this the
bicycle
<indexFlag indexLevelOne="bicycle"/> will be dangerous to
use.</para>
<para>There are nine different types of brake systems. The one
found on most bicycles is the cantilever
<indexFlag indexLevelFour="cantilever"/> brake
<indexFlag indexLevelThree="brake"/>.</para>
```

This markup example can result in the following listing when published:

bicyle 1, 2
brake system 1
brake 3
cantilever 3

2.1.8 Emphasis

Description: The element <emphasis> contains textual information (eg, a word, an expression or a sentence) to be highlighted.

To highlight a word, an expression or a sentence, bold text is the preferred method. Alternatively, the use of color is permitted. Capital (uppercase) letters, italics or underlining are not permitted to highlight text, except for legacy data. Refer to Chap 3.9.1.

Markup element: <emphasis>

Attributes:

– emphasisType (O), the type of emphasis such as bold. The attribute can have one of the following values:
  - "em01" thru "em99". Refer to Chap 3.9.6.1.

Child elements:

– Includes the same set of child elements as the textElemGroup applicable to the actual data module type. Refer to Para 1.1.1.

Markup example:

Example 1: A paragraph with a highlighted word which is intended by the author to be presented in bold:

```
<para>This is some text which has the word <emphasis
emphasisType="em01">emphasis</emphasis> emphasized in
bold.</para>
```

Example 2: Use of the overline function for the signal name CONTROL:

```
<para>Pin 12 carries the negatively going signal <emphasis
emphasisType="em04">CONTROL</emphasis> which goes more negative
when active.</para>
```

2.1.9 Symbol

Description: The element <symbol> contains illustrations and graphics that are intended to be presented in line within the normal text. Symbols must be controlled using the ICN as described in Chap 4.4. However, the ICN must not be presented.

Markup element: <symbol>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- infoEntityIdent (M), the link to the external entity declaration which points to the illustration file. The population of this attribute must include the complete ICN with the prefix "ICN-".
- reproductionHeight (O), reproductionWidth (O), and reproductionScale (O), the presentation sizes and scaling for the presentation system
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Note

The element <symbol> also includes five attributes normally populated by applications to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

- None

Business rule decision point BRDP-S1-00171 - Use of the symbols:

- Decide whether and how to use symbols using the text element <symbol>.

Markup example:

The following example shows a paragraph with a symbol which is intended to be displayed inline.

```
<para>When this condition occurs, the symbol
<symbol infoEntityIdent="ICN-S1000DBIKE-AAA-DA10000-0-U8025-
09999-A-01-1"></symbol> will show on the display.</para>
```

2.1.10 Subscript

Description: The element <subScript> contains the text that is intended to be presented subscripted.

Markup element: <subScript>

Attributes:

- None

Child elements:

- None

Markup example:

The following example shows a paragraph with text that is subscripted:

```
<para>The chemical symbol for water is H
<subScript>2</subScript>O.</para>
```

2.1.11 Superscript

Description: The element <superScript> contains the text that is intended to be presented superscripted.

Note

Superscript is the default value for inline and table footnotes.

Markup element: <superScript>

Attributes:

– None

Child elements:

– None

Markup example:

The following example shows a paragraph with text that is superscripted:

```
<para>The symbol for a square meter is m
<superScript>2</superScript>.</para>
```

2.1.12 Footnote

Description: The element <footnote> contains bibliographic references or explanations which would take too much space or in any other way would be annoying for the reader in the running text.

The element <footnote> is a wrapper around the contents of a footnote. The element <footnote> typically generates a marker (eg, a superscripted number) at the place in the flow of text where it occurs. The footnote itself is then generally presented at the bottom of the page or at the end of the table.

Footnotes are used in tables (table footnotes) or in regular text and titles (inline footnotes).

Footnotes must not

– be used for references and cross-references
– include footnotes

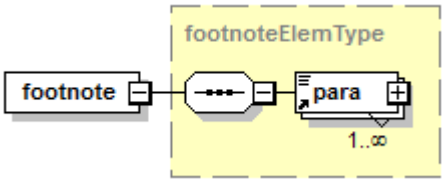
Note

Additional information that is useful for the user in understanding descriptive information (eg, to carry out an action) can be presented in notes. Refer to Chap 3.9.3.

Note

The use of footnotes puts demands on the presentation of the footnote markers and the footnotes themselves. Project or organization decisions on the presentation have to be taken dependent on the publishing as page-oriented or IETP or both. Refer to Chap 6.2 and Chap 6.3.

Markup element: <footnote>



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Fig 9 Element <footnote>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- footnoteMark (O), the type of footnote marker to identify a footnote. Only one type of footnote marker must be used for each of the table footnotes and inline footnotes throughout a data module. The attribute can have one of the following values:
  - "num" (D) - superscripted numbers will be used
  - "sym" - symbols such as asterisk (*) and dagger (†) will be used
  - "alpha" - alpha characters will be used
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <para>, the footnote text. Refer to Para 1.1.

Business rule decision point BRDP-S1-00172 - Use of footnotes:

- Decide whether and how to use the text element <footnote> and when used, decide whether the use of footnotes is limited to regular text and titles (inline) and/or to tables (table footnotes).

Business rule decision point BRDP-S1-00173 - Types of footnote markers:

- Decide on the types of footnote markers (attribute footnoteMark) to use. It is recommended to use:
  - only one type of footnote marker for each of the table footnotes and the inline footnotes throughout a project
  - superscripted numbers for both

Markup example:

Example 1: An inline page footnote:

```
<para>This paragraph includes a footnote. I would like to
further define a footnote<footnote id="ftn-1234"
footnoteMark="num"><para>A footnote is used to further define
information and it is printed at the bottom of the
page</para></footnote> and where the footnote is printed.
</para>
```

Example 2: Table footnotes:

```
<table frame="topbot">
<title>Example table with footnotes</title>
<tgroup cols="3">
<colspec colnum="1" colname="col1"/>
<colspec colnum="2" colname="col2"/>
<colspec colnum="3" colname="col3"/>
<thead>
<row rowsep="1">
<entry><para>Col 1 Heading</para></entry>
<entry><para>Col 2 Heading</para></entry>
<entry><para>Col 3 Heading</para></entry>
</row>
</thead>
<tfoot>
<row>
<entry namest="col1" nameend="col3"><para>This is footer
information and spans the bottom of the table. The footer can
give information about the table content such as "All units are
measured in inches".
</para></entry>
</row>
</tfoot>
<tbody>
<row>
<entry><para>Row 1 entry 1 has a footnote
<footnote id="ftn-0001">
<para>This is a footnote for entry 1</para></footnote></para>
</entry>
<entry><para>Row 1 entry 2</para></entry>
<entry><para>Row 1 entry 3</para></entry>
</row>
<row>
<entry><para>Row 2 entry 1 continues on a second line</para>
</entry>
<entry><para>Row 2 entry 2</para></entry>
<entry><para>Row 2 entry 3 uses the first footnote for the
second time<footnoteRef internalRefId="ftn-0001"/>
</para></entry>
</row>
<row rowsep="1">
<entry><para>Row 3 entry 1 also has a footnote
<footnote id="ftn-0002">
<para>Second footnote</para></footnote>
</para></entry>
<entry><para>Row 3 entry 2</para></entry>
<entry><para>Row 3 entry 3</para></entry>
</row>
</tbody>
</tgroup>
</table>
```

2.1.13 Footnote reference

Description: The element <footnoteRef> contains the link information to a previously defined footnote. This link information is used each time when referring to the same footnote.

Markup element: <footnoteRef>

Attributes:

- internalRefId (O), the target id of the footnote. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

The following markup example illustrates a footnote reference:

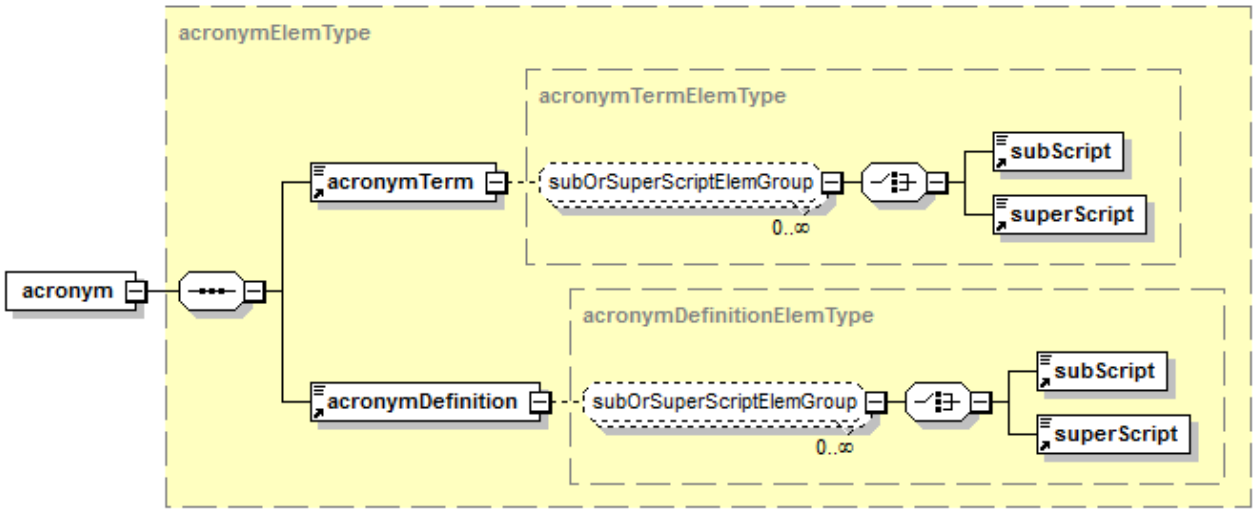
```
<para>This paragraph includes the same footnote<footnoteRef
internalRefId="ftn-1234"/>given in the previous paragraph</para>
```

2.1.14 Acronym

Description: The element <acronym> contains an acronym and its definition when the acronym is first introduced.

Once an acronym has been defined in text using the element <acronym>, it can be reused, and its definition be referred to, multiple times. Refer to Para 2.1.14.1.

Markup element: <acronym>



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Fig 10 Element <acronym>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- acronymType (O), the type of acronym. The attribute can have one of the following values:
  - "at01" thru "at99". The default value is "at01". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <acronymTerm>, the term of the acronym. Refer to Para 2.1.14.1.
- <acronymDefinition>, the definition of the acronym when that acronym is first used. Refer to Para 2.1.14.2.

Markup example:

```
<acronym>
<acronymTerm>ASD</acronymTerm>
<acronymDefinition id="acr-0001">AeroSpace and Defence
Industries Association of Europe</acronymDefinition>
</acronym>
```

2.1.14.1 Acronym term

Description: The element <acronymTerm> contains the acronym itself and a reference to its definition.

Markup element: <acronymTerm>

Attributes:

- internalRefId (O), the target id of the acronym definition. Refer to Chap 3.9.5.2.1.2.

Child elements:

- <subScript>, the items to be subscripted. Refer to Para 2.1.10.
- <superScript>, the items to be superscripted. Refer to Para 2.1.11.

Markup example:

The following example shows the markup of an acronym term with a reference to its definition (refer to the markup example in Para 2.1.14):

```
<acronymTerm internalRefId="acr-0001">ASD</acronymTerm>
```

2.1.14.2 Acronym definition

Description: The element <acronymDefinition> contains the definition of the acronym when that acronym is first used. The use of this element without its parent element <acronym> and its sibling element <acronymTerm> is not sensible.

Markup element: <acronymDefinition>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <subScript>, the items to be subscripted. Refer to Para 2.1.10.
- <superScript>, the items to be superscripted. Refer to Para 2.1.11.

2.1.15 Verbatim text

Description: The element <verbatimText> contains text that must be presented as is, without distorting the content. Typically, using the element <verbatimText>, the included text represents information such as computer program text or non-proportional display text. Whitespaces and line breaks within the included text must be preserved.

When the element contains markup, the information must be entered in such a way that the marked up information does not interfere with the data module markup itself. One way to achieve this is to use a CDATA marked section for that information.

Markup element: <verbatimText>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- verbatimStyle (O), the style of verbatim text in cases where there are more than one type of verbatim information, and the types must be recognized and/or presented differently. The attribute can have one of the following values:
  - "vs01" thru "vs99". Refer to Chap 3.9.6.1.
- xml:space, specifies the handling of whitespace characters. The attribute is fixed with a value of:
  - "preserve"
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup examples:

Example 1: A paragraph containing a command line sequence. Whitespace and line breaks must be preserved.

```
<para>
<verbatimText>
```

```
C:\&gt;cd C:\BikeDS\the_text_xml

C:\BikeDS\the_text_xml&gt;dir data module code-S1000DBIKE-AAA-
DA0-20*.* /b
data module code-S1000DBIKE-AAA-DA0-20-00-0000-412A-A_000-02.XML
data module code-S1000DBIKE-AAA-DA0-20-00-0000-520A-A_000-02.XML

C:\BikeDS\the_text_xml&gt;
</verbatimText>
</para>
```

Example 2: The markup of the same paragraph as in Example 1 containing a command line sequence using a CDATA marked section. Whitespace and line breaks must be preserved.

```
<para>
<verbatimText>
<![CDATA[
C:\>cd C:\BikeDS\the_text_xml

C:\BikeDS\the_text_xml>dir DMC-S1000DBIKE-AAA-DA0-20*.* /b
DMC-S1000DBIKE-AAA-DA0-20-00-0000-412A-A_000-02.XML
DMC-S1000DBIKE-AAA-DA0-20-00-0000-520A-A_000-02.XML

C:\BikeDS\the_text_xml>
]]>
</verbatimText>
</para>
```

Example 3: A paragraph of marked up text (such as XML) using a CDATA marked section. Whitespace and line breaks must be preserved.

```
<para>
<verbatimText>
<![CDATA[
<para>For a full description of the headset,
refer to <dmRef>
<dmRefIdent><dmCode modelIdentCode="S1000DBIKE"
systemDiffCode="AAA" systemCode="DA2" subSystemCode="3"
subSubSystemCode="0" assyCode="00" disassyCode="00"
disassyCodeVariant="AA" infoCode="041" infoCodeVariant="A"
itemLocationCode="A"/></dmRefIdent>
</dmRef>.</para>
]]>
</verbatimText>
</para>
```

Example 4: A paragraph of marked up text (such as XML) using character entities to avoid markup character conflicts. Whitespace and line breaks must be preserved.

```
<para>
<verbatimText>
&lt;para&gt;For a full description of the headset,
refer to &lt;dmRef&gt;&lt;dmRefIdent&gt;&lt;dmCode
modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA2" subSystemCode="3" subSubSystemCode="0"
```

```
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="041" infoCodeVariant="A"
itemLocationCode="A"/&gt;&lt;/dmRefIdent&gt;&lt;/dmRef&gt;.&lt;/
para&gt;
</verbatimText>
</para>
```

Example 5: A paragraph of text containing an example of inline XML markup that has to be recognized in its context:

```
<para>This is a running text demonstrating how the attribute
<verbatimText verbatimStyle="vs01">verbatimStyle</verbatimText>
itself could be marked up in some context.</para>
```

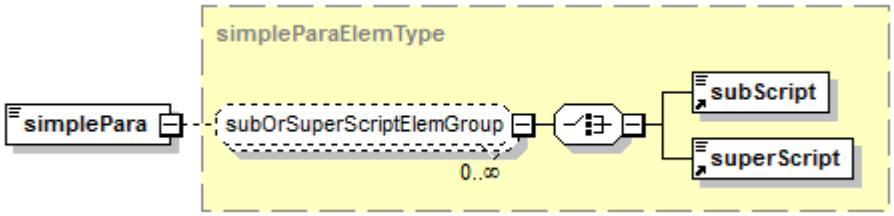
This text would typically be presented as:

"This is a running text demonstrating how the attribute `verbatimStyle` itself could be marked up in some context."

2.2 Simple paragraph

Description: The element <simplePara> contains a minimum set of text elements. It is used where the full set of elements that are available in a full paragraph (in the element <para>) is not required. Simple paragraphs are used for example in the elements <displayText> and <remarks>.

Markup element: <simplePara>



ICN-S3627-S1000D0769-001-01

Fig 11 Element <simplePara>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <subScript>, the items to be subscripted. Refer to Para 2.1.10.
- <superScript>, the items to be superscripted. Refer to Para 2.1.11.

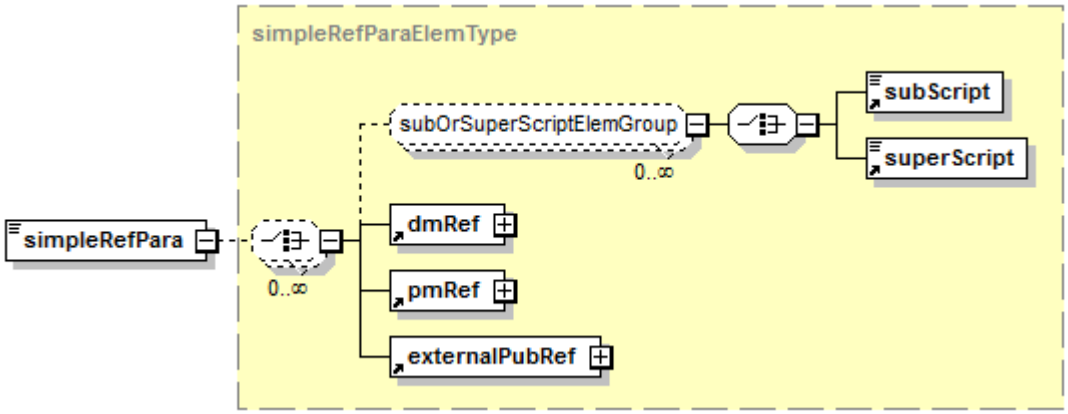
Markup example:

```
<remarks>
<simplePara>This data module was authored in line with Repair
scheme ME-BAB1EE.</simplePara>
</remarks>
```

2.3 Simple paragraph with reference

Description: The element <simpleRefPara> contains a minimum set of text elements. It is used where the full set of elements that are available in a full paragraph (in the element <para>) is not required, but a reference to a data module, a publication module or a non-S1000D publication required. Simple paragraphs with reference are used for example in the elements <reasonForUpdate>.

Markup element: <simpleRefPara>



ICN-S3627-S1000D0770-001-01

Fig 12 Element <simpleRefPara>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <subScript>, the items to be subscripted. Refer to Para 2.1.10.
- <superScript>, the items to be superscripted. Refer to Para 2.1.11.
- <dmRef>, a reference to a data module from the reason for update. Refer to Chap 3.9.5.2.1.2.
- <pmRef>, a reference to a publication module from the reason for update. Refer to Chap 3.9.5.2.1.2.
- <externalPubRef>, a reference to an external publication from the reason for update. Refer to Chap 3.9.5.2.1.2.

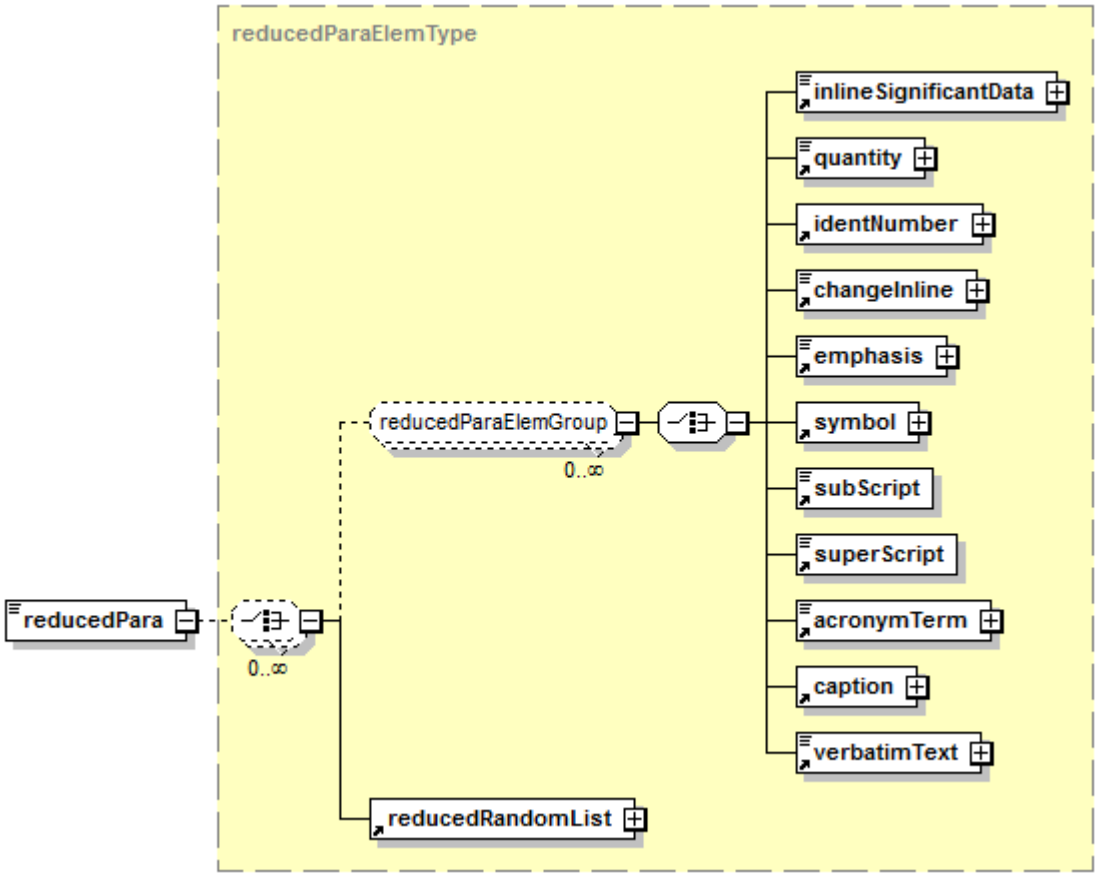
Markup example:

```
<reasonForUpdate>
<simpleRefPara id="rfu-001">Updated to include requirements of
<externalPubRef><externalPubRefIdent><externalPubCode>JSP-ORT-
1ON</externalPubCode><externalPubTitle>Modification of handlebar
mountings to give extra strength in downhill
racing.</externalPubTitle></externalPubRefIdent>
</externalPubRef>.
</simpleRefPara>
<simpleRefPara id="rfu-002">Updated to incorporate the scope of
data module <dmRef><dmRefIdent><dmCode modelIdentCode="ME"
systemDiffCode="B" systemCode="34" subSystemCode="1"
subSubSystemCode="1" assyCode="00" disassyCode="00"
disassyCodeVariant="A" infoCode="251" infoCodeVariant="A"
itemLocationCode="C"/></dmRefIdent></dmRef>.
</simpleRefPara>
</reasonForUpdate>
```

2.4 Reduced paragraph

Description: The element <reducedPara> contains a reduced set of text elements. It is used where the full set of elements that are available in a full paragraph (in the element <para>) is not required. Reduced paragraphs are used for example in the elements <frontMatterInfo>.

Markup element: <reducedPara>



ICN-S3627-S1000D0562-001-01

Fig 13 Element <reducedPara>

Attributes:

– None

Child elements:

– <reducedRandomList>. Refer to Para 2.4.2.
– The elements of the reducedParaElemGroup. Refer to Para 2.4.1.

2.4.1 Reduced para element group

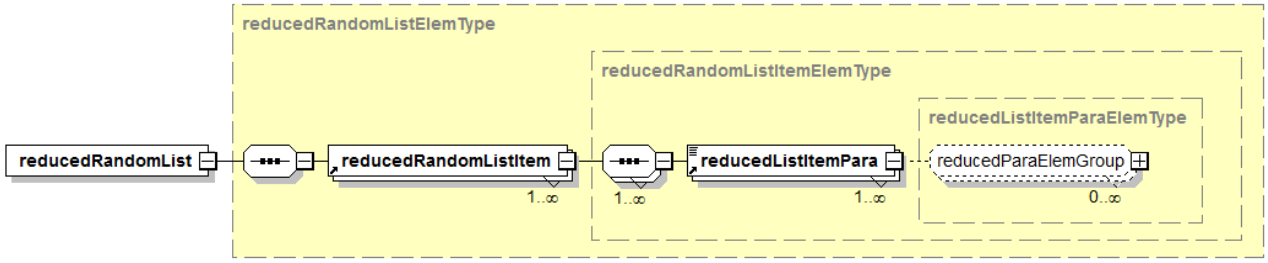
The reducedParaElemGroup contains the elements given in Fig 13.

Description of these elements are given in Para 2.1.

2.4.2 Reduced random list

Description: The element <reducedRandomList> contains any listing of information. The listing is limited to one level of random list.

Markup element: <reducedRandomList>



ICN-S3627-S1000D0563-001-01

Fig 14 Element <reducedRandomList>

Attributes:

– None of the attributes must be used except for the attribute `listItemPrefix` which is set to the value "`pf03`". Refer to default BREX rule BREX-S1-00117.

Child elements:

– <`reducedRandomListItem`>. Refer to Para 2.4.3.

2.4.3 Reduced random list item

Description: The element <`reducedRandomListItem`> contains a random list item.

Markup element: <`reducedRandomListItem`>

Attributes:

– `applicRefId`, `id`, and `controlAuthorityRefs` must not be used. Refer to default BREX rule BREX-S1-00118.
– `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <`reducedListItemPara`>. Refer to Para 2.4.4.

2.4.4 Reduced list item para

Description: The element <`reducedListItemPara`> contains the random list items.

Markup element: <`reducedListItemPara`>

Attributes:

– `applicRefId` and `id` must not be used. Refer to default BREX rule BREX-S1-00119.
– `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
– `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– Includes the elements of the reducedParaElemGroup. Refer to Para 2.4.1.

2.5 Frequently used text elements

2.5.1 Name

Description: The element <name> contains, for example, the name of an enterprise, a function, a circuit breaker, a control and indicator, a zone or an access point. If common information repositories are used in the authoring process, the name is optional as it will be populated during the publication process.

Markup element: <name>

Attributes:

– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

Mark-up examples:

```
<name>Fueltank sealant polysulfide</name>
```

```
<name>Fixative for placard installation</name>
```

2.5.2 Short name

Description: The element <shortName> contains an abbreviated alternate name of the corresponding element <name>. This short form of the name is meant to be presented in the narrative of the data module to make the reading easier.

The project or organization must make sure that any used short name is unique to avoid mistakes which could result in death or injuries to personnel, or damage to the Product.

Markup element: <shortName>

Attributes:

– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

Mark-up examples:

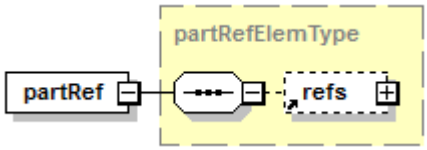
```
<shortName>Sealant4EVER</shortName>
```

```
<shortName>FixativeFIXIT</shortName>
```

2.5.3 Part reference

Description: The element <partRef> is used to markup a part and allows reference to its position in the part common information repository.

Markup element: <partRef>



ICN-S3627-S1000D0761-001-01

Fig 15 Element <partRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- partNumberValue (M), the part number of an item which is allocated by the design authority of the equipment, or which is renamed by the OEM for use in technical publications.
- manufacturerCodeValue (M), the CAGE code of the manufacturer.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Note

As there is no standardized rule to assign a part number, the CAGE code of the part manufacturer ensures the uniqueness of a part number.

Child elements:

- <refs>, the explicit reference (link) to a part in the part common information repository data module (explicit reference method, refer to Chap 4.13.1). For implicit references, the part semantic identifiers (part number and manufacturer code) are sufficient. Refer to Chap 3.9.5.2.1.2.

Business rule decision point BRDP-S1-00560 - Identification of parts:

- Decide whether the project can use OEM renamed part numbers instead of part numbers allocated by the part design authority in the attribute partNumberValue.

Markup example:

```
<partRef partNumberValue="0-0204504-1"
manufacturerCodeValue="F0286"/>
```

Chapter 3.9.5.2.1.11

Common constructs - Controlled content

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1 General

Rules and guidance for marking controlled content within the content section of data modules is given in Chap 3.9.5.1.

Chapter 3.9.5.2.1.12

Common constructs - Common information

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Chap 3.9.5.2.1.5	Common constructs - Titles
Chap 3.9.5.2.1.6	Common constructs - Tables
Chap 3.9.5.2.1.7	Common constructs - Figures and foldouts
Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.3	Data modules - Applicability
Chap 4.13.3	Optimizing and reuse - Alternates concept

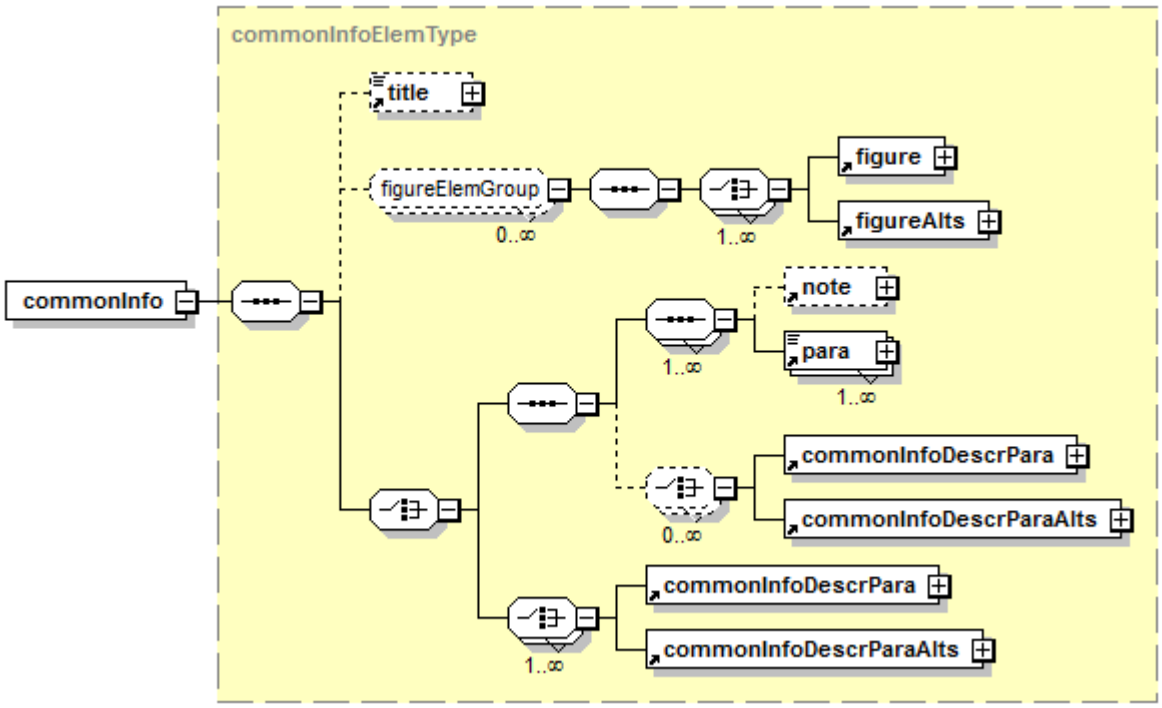
1 General

This chapter contains the definition and handling of the element <commonInfo> from an author's point of view. It gives details about the available elements and attributes and how to use them to populate <commonInfo>.

Common information provides data to the user that applies to the entire data module. The information can contain a general description or introduction of the task or subtask contained in the data module. The element <commonInfo> must not contain procedural steps.

The element <commonInfo> is contained in the business rules exchange, procedural, process, fault, maintenance checklist, common repository, service bulletin and maintenance planning data modules.

2 Common information



ICN-07GB6-00020-002-01

Fig 1 Element <commonInfo>

2.1 Definition

Description: The element <commonInfo> contains descriptive information that applies to an entire data module.

Markup element: <commonInfo>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <note>. Refer to Chap 3.9.3.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <commonInfoDescrPara>. Refer to Para 2.1.1.2.
- <commonInfoDescrParaAlts>. Refer to Para 2.1.1.3.

Business rule decision point BRDP-S1-00177 – Use of common information:

- Decide whether to use the element <commonInfo> in business rules exchange, common repositories, fault, maintenance checklist, maintenance planning, procedural, process, and service bulletin data modules. If decided to be used, then determine the circumstances for its use for each related data module type, and give guidance and rules that will make sure it is consistently used.

2.1.1 Paragraph text

2.1.1.1 Definition

The common information text can be marked up using one of two methods. One method makes use of an optional element <note>, one or more element <para>, and optional and repeatable element <commonInfoDescrPara> (or optional and repeatable element <commonInfoDescrParaAlts>). The other method makes use of one or more element <commonInfoDescrPara> and/or one or more element <commonInfoDescrParaAlts>.

2.1.1.2 Descriptive paragraph definition

Description: The element <commonInfoDescrPara> is used to contain text information.

Markup element: <commonInfoDescrPara>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- warningRefs (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- cautionRefs (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O) caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <warning>. Refer to Chap 3.9.3.
- <caution>. Refer to Chap 3.9.3.
- <note>. Refer to Chap 3.9.3.

- <circuitBreakerDescrGroup>. Refer to Chap 3.9.5.2.1.9.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7.
- <table>. Refer to Chap 3.9.5.2.1.6.
- <commonInfoDescrPara>.
- <commonInfoDescrParaAlts>. Refer to Para 2.1.1.3.

Business rule decision point BRDP-S1-00178 - Markup method for common information text:

- Decide which markup method to use for common information text:
  - the method containing <note>, <para> and <commonInfoDescrPara>

  or
  - the method containing only <commonInfoDescrPara>

2.1.1.3 Descriptive paragraph alternates group definition

Description: The element <commonInfoDescrParaAlts> is an alternates group that provides the capability to group several alternate solutions of a descriptive text <commonInfoDescrPara>. Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <commonInfoDescrParaAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <commonInfoDescrPara>. Refer to Para 2.1.1.2.

3 Examples

The following markup examples show the use of the <commonInfo> element.

Example 1: The use of multiple <commonInfoDescrPara> elements:

```
<commonInfo>
<title>General Information</title>
<commonInfoDescrPara>
<title>Components Involved in an Accident</title>
<para>Any component removed for reason of accident shall be preserved
```

```
and shall be shipped in the same condition it was in after the
accident</para>
</commonInfoDescrPara>
</commonInfo>

<commonInfo>
<title>Special Instructions</title>
<commonInfoDescrPara>
<para>The columns headed I and P are used to indicate the requirements
for Intermediate and Periodic inspections respectively. When item is
required with a frequency other than that indicated by these column
headings, the proper frequency is indicated in the appropriate
column.</para>
</commonInfoDescrPara>
<commonInfoDescrPara>
<para>Work time requirements for individual items are stated in the
W/T column.</para>
</commonInfoDescrPara>
</commonInfo>
```

Example 2: The use of a single <para> element:

```
<commonInfo>
<title>Condition Inspection</title>
<para>Operators have periodically experienced frame vibration and have
had difficulty identifying the cause of vibration. Troubleshooting
frame vibration can consume a number of man-hours and cause
considerable amount of concern. This procedure provides a compliation
of known causes of frame vibration and the required corrective
action.</para>
</commonInfo>
```

Example 3: The use of <commonInfoDescrParaAlts>:

```
<commonInfo>
<title>Special Instructions</title>
<commonInfoDescrParaAlts>
<commonInfoDescrPara applicRefId="app-0001">
<para>The columns headed I and P are used to indicate the requirements
for Intermediate and Periodic inspections respectively. When item is
required with a frequency other than that indicated by these column
headings, the proper frequency is indicated in the appropriate
column.</para>
<para>Work time requirements for individual items are stated in the
W/T column.</para>
</commonInfoDescrPara>
<commonInfoDescrPara applicRefId="app-0002">
<para>The columns headed A and B are used to indicate the requirements
for Intermediate and Periodic inspections respectively. When item is
required with a frequency other than that indicated by these column
headings, the proper frequency is indicated in the appropriate
column.</para>
<para>Work time requirements for individual items are stated in the
W/T column.</para>
</commonInfoDescrPara>
</commonInfoDescrParaAlts>
</commonInfo>
```

Chapter 3.9.5.2.1.13

Common constructs - Externalization

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Chap 3.9.5.2.11.12	Common information repository - Applicability annotations
Chap 3.9.5.2.11.13	Common information repository - Warnings
Chap 3.9.5.2.11.14	Common information repository - Cautions
Chap 4.13.1	Optimizing and reuse - Common information repository concept

1 General

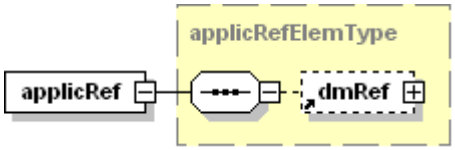
Specific information can be externalized into a dedicated Common Information Repository (CIR) data module in order to avoid duplication of data. This concerns applicability annotations, warnings and cautions. Refer to Chap 4.13.1.

2 Reference to externalized data elements

2.1 References to externalized applicability annotations

Description: The element <applicRef> contains the reference to an applicability annotation in an applicability annotations CIR data module. It is used for externalizing applicability annotations. Refer to Chap 3.9.5.2.11.12.

Markup element: <applicRef>



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Fig 1 Element <applicRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- applicIdentValue (M), the unique identification of the externalized applicability annotation
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <dmRef>, the data module reference. Refer to Chap 3.9.5.2.1.2 and default BREX rule BREX-S1-00133.

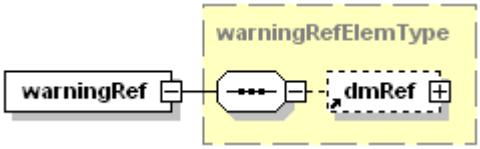
Markup example:

```
<applicRef applicIdentValue="app-00000000AA056A-0000"/>
```

2.2 References to externalized warnings

Description: The element <warningRef> contains the reference to a warning in a warnings CIR data module. It is used for externalizing warnings. Refer to Chap 3.9.5.2.11.13.

Markup element: <warningRef>



ICN-S1000D-A-03090502-A-FAPE3-00002-A-001-01

Fig 2 Element <warningRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- warningIdentNumber (M), the unique identification of the externalized warning
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <dmRef>, the data module reference. Refer to Chap 3.9.5.2.1.2.

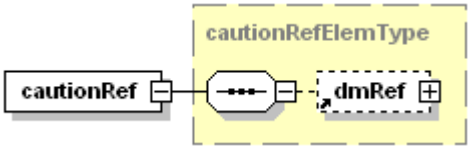
Markup example:

```
<warningRef warningIdentNumber="warn-00000000AA056A-0001"/>
```

2.3 References to externalized cautions

Description: The element <cautionRef> contains the reference to a caution in a cautions CIR data module. It is used for externalizing cautions. Refer to Chap 3.9.5.2.11.14.

Markup element: <cautionRef>



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Fig 3 Element <cautionRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- cautionIdentNumber (M), the unique identification of the externalized caution
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <dmRef>, the data module reference. Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<cautionRef cautionIdentNumber="caut-00000000AA056A-0003"/>
```

Chapter 3.9.5.2.2

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Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.2.1.11	Common constructs - Controlled content
Chap 3.9.5.3	Data modules - Applicability
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1 General

The descriptive Schema is used to capture and represent descriptive information.

2 Descriptive information

2.1 Schema basic rules

The granularity of descriptive data modules must follow the breakdown reflected by the SNS providing descriptions at:

- system
- subsystem
- sub-subsystem levels

as required by the:

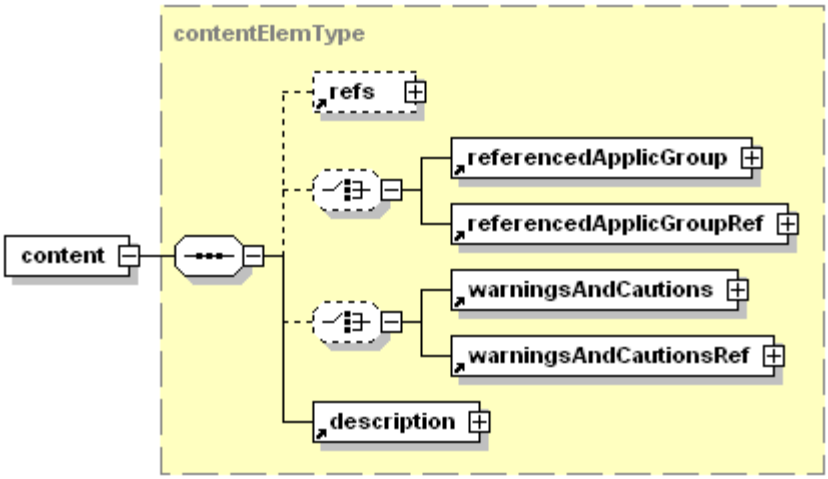
- maintenance philosophy
- scope of information required

For details on the scope of information, refer to Chap 5.2.1.2.

2.2 Content

Description: This element contains all descriptive types of information.

Markup element: <content>



ICN-83007-0000000063-001-01

Fig 1 Major elements in description content

Attributes:

- `id` (O), the identifier of the <`content`> element. Refer to Chap 3.9.5.2.1.2.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`refs`>. Refer to Chap 3.9.5.2.1.2.
- <`referencedApplicGroup`>). Refer to Chap 3.9.5.3.
- <`referencedApplicGroupRef`>. Refer to Chap 3.9.5.3.
- <`warningsAndCautions`>. Refer to Chap 3.9.3.
- <`warningsAndCautionsRef`>. Refer to Chap 3.9.3.
- <`description`>. Refer to Para 2.3.

2.3 Description

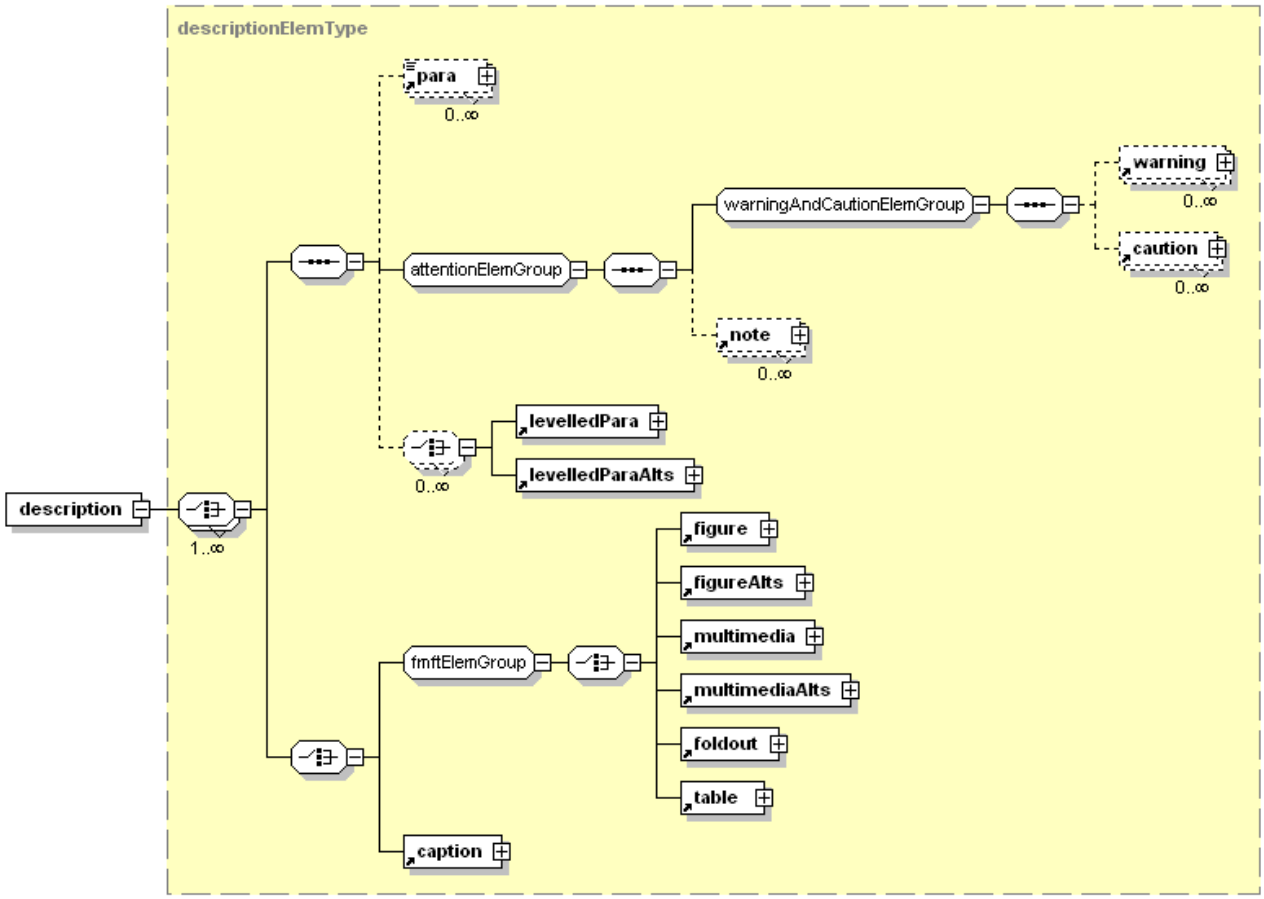
Description: The element <`description`> contains the descriptive information. Descriptive paragraphs can be broken down into subparagraphs, which can be broken down further into sub-subparagraphs and so on. Refer to Para 2.4.

This element also contains the elements <`figure`>, <`figureAlts`>, <`multimedia`> and <`multimediaAlts`>.

Note

The descriptive data module uses common constructs. For the detailed explanations and rules for common constructs, refer to Chap 3.9.5.2.1.

Markup element: <`description`>



ICN-83007-0000000054-002-01

Fig 2 Element <description>

Attributes:

- `warningRefs` (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `cautionRefs` (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.

Child elements:

- <para>. Used for introductory unnumbered paragraphs before the description starts. Refer to Chap 3.9.5.2.1.10.
- <warning>. The use of warnings in descriptive information is a project or an organization decision. Refer to Chap 3.9.3.
- <caution>. The use of cautions in descriptive information is a project or an organization decision. Refer to Chap 3.9.3.
- <note>. Refer to Chap 3.9.3.
- <levelledPara>. Used for breaking down the descriptive content into numbered paragraphs. Refer to Para 2.4 and Chap 3.9.5.2.1.10.
- <levelledParaAlts>. Refer to Para 2.5.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.

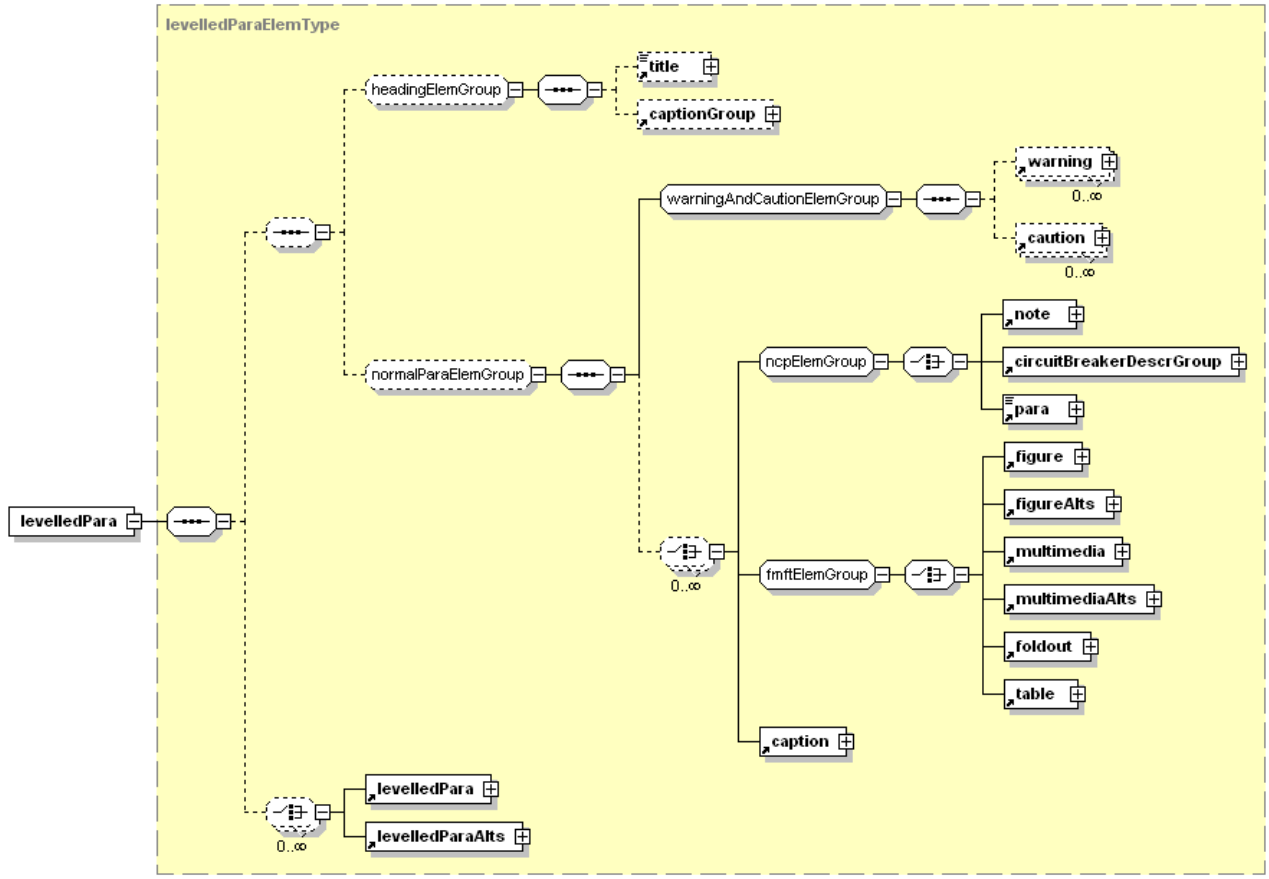
- <foldout>. Refer to Chap 3.9.5.2.1.7 and Chap 3.9.5.2.1.6.
- <table>. Refer to Chap 3.9.5.2.1.6.
- <caption>. Refer to Chap 3.9.5.2.1.4.

2.4 Levelled paragraphs

Description: The element <levelledPara> is the equivalent of a headed paragraph and subparagraphs. It can have one or more <levelledPara> elements nested within it and/or one or more <levelledParaAlts> elements. The depth of this structure is unlimited, however, it is recommended to not exceed five levels of depth. Refer to default BREX rule BREX-S1-00077.

When a <levelledPara> or <levelledParaAlts> contain nested <levelledPara> or <levelledParaAlts> children, it is recommended that the occurrence of these children be two or more. It is further recommended that additional levels only be used in a conversion effort, where existing data is authored to such a depth and restructuring of data is not feasible. In these cases, the structure must never exceed eight levels of depth. Refer to default BREX rule BREX-S1-00078.

Markup element: <levelledPara>



ICN-83007-0000000061-002-01

Fig 3 Element <levelledPara>

Attributes:

- applicRefId (O), the applicability information referencing the element <applic>. Refer to Chap 3.9.5.3.

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- warningRefs (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- cautionRefs (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O), and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <captionGroup>. Refer to Chap 3.9.5.2.1.4.
- <warning>. The use of warnings in descriptive information is a project or an organization decision. Refer to Chap 3.9.3.
- <caution>. The use of cautions in descriptive information is a project or an organization decision. Refer to Chap 3.9.3.
- <note>. Refer to Chap 3.9.3.
- <circuitBreakerDescrGroup>. Refer to Chap 3.9.5.2.1.9.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7 and Chap 3.9.5.2.1.6.
- <table>. Refer to Chap 3.9.5.2.1.6.
- <caption>. Refer to Chap 3.9.5.2.1.4.
- <levelledPara>.
- <levelledParaAlts>. Refer to Para 2.5.

Business rule decision point BRDP-S1-00180 - Maximum number of subordinate levelled paragraphs in a descriptive data module:

- Decide on the maximum number of levelled paragraphs allowed in a descriptive data module. Exceeding five levels of depth is strongly discouraged in development of new data. It is recommended that additional levels are only used in a conversion effort where the existing data is authored to this depth (maximum eight levels) and restructuring of data is not feasible.

Business rule decision point BRDP-S1-00181 - Minimum levelled para occurrences:

- Decide whether to impose a minimum of two occurrences of child elements <levelledPara> and/or <levelledParaAlts>.

2.5 Levelled paragraphs alternates group

Description: The element <levelledParaAlts> is an alternates group that provides the capability to group several alternates to levelled paragraphs. The element <levelledParaAlts> can be used in conjunction with the element

<levelledPara>. Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <levelledParaAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O) the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <levelledPara>. Refer to Para 2.4.

3 Example

```
<levelledPara>
<title>The bicycle wheel</title>
<para>The wheel (refer to <internalRef internalRefId="fig-0001"
internalRefTargetType="irtt01"></internalRef>) of a bicycle is a
complex structure. The wheel assembly has these parts:
<randomList listItemPrefix="pf01">
<listItem><para>the tire</para></listItem>
<listItem><para>the tube</para></listItem>
<listItem><para>the spokes</para></listItem>
<listItem><para>the spoke nipples</para></listItem>
<listItem><para>the valve</para></listItem>
<listItem><para>the hub</para></listItem>
</randomList>
On their own, the individual components are not very strong.
But, when they are installed together, the components make the
complete wheel (refer to <internalRef internalRefId="fig-0001"
internalRefTargetType="irtt01"></internalRef>). The complete
wheel is resistant to almost any type of heavy loads and
operation.</para>
<figure id="fig-0001">
<title>Parts of the wheel</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA00000-0-U8025-
00504-A-03-1" reproductionWidth="510mm"></graphic>
</figure>
<levelledPara id="par-0001">
<title>Spokes</title>
<para>The spokes go out from the hub and go across and below
each other. The spoke nipples attach the spokes to the rim
with the threads on the end of the spokes. You can use the
spoke nipples to adjust the tension of the spokes.
The tension on each of the spokes must be equal.</para>
</levelledPara>
```

```
<levelledPara id="par-0002">
<title>Wheel rim</title>
<para>The rim (refer to <internalRef internalRefId="fig-0002"
internalRefTargetType="irtt01"></internalRef>) of the wheel has
a lining of rim tape. This tape protects the tube from damage
that the rough edges on the spoke nipples can cause.</para>
<figure id="fig-0002">
<title>The tire and rim</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA00000-0-U8025-
00504-B-03-1" reproductionWidth="510mm"></graphic>
</figure>
</levelledPara>
<levelledPara id="par-0003">
<title>Tube and tire</title>
<para>The tube and the tire install on the rim. The sidewalls of
the tire have markings on them. These which are used to indicate
the correct direction of rotation. The markings also make sure
the tire installs on the rim and that the directional arrows
points in the correct direction. You install the tube into the
tire before you inflate it. The tube has a valve (refer to
<internalRef internalRefId="fig-0003"
internalRefTargetType="irtt01"></internalRef>) which you put
through the hole in the rim. This valve (refer to <internalRef
internalRefId="fig-0003"
internalRefTargetType="irtt01"></internalRef>) is used to
inflate the tube and the tire to the correct pressure. A dust
cap installs on the valve (refer to <internalRef
internalRefId="fig-0003"
internalRefTargetType="irtt01"></internalRef>) to prevent damage
that dust and debris can cause.</para>
<figure id="fig-0003">
<title>Valve</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA00000-0-U8025-
00505-A-03-1" reproductionWidth="510mm"></graphic>
</figure>
</levelledPara>
</levelledPara>
```

Chapter 3.9.5.2.3

Content section - Procedural information

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.5.2.1	Content section - Common constructs
Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing

Chap No./Document No.	Title
Chap 3.9.5.2.1.4	Common constructs - Caption groups
Chap 3.9.5.2.1.5	Common constructs - Titles
Chap 3.9.5.2.1.6	Common constructs - Tables
Chap 3.9.5.2.1.7	Common constructs - Figures, multimedia and foldouts
Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.2.1.12	Common constructs - Common information
Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.6.1	Attributes - Project configurable values
Chap 4.13.3	Optimizing and reuse - Alternates concept
Chap 5.2.1.3.1	Maintenance information - Maintenance procedures

1 General

The procedural Schema is used to capture and represent procedural information. The granularity of maintenance procedural data modules must follow the breakdown reflected by the SNS and the information codes, and must reflect the tasks identified in the maintenance plan. The granularity of crew/operator procedural data modules must follow the breakdown reflected by the SNS and the information codes, and must reflect the operations identified. Common entities, elements and attributes must be used as detailed in Chap 3.9.5.2.1.

2 Procedural information

2.1 Schema basic rules

The procedural Schema has structural elements that are used to provide a hierarchy of steps and substeps. Note that if a condition (eg, warning, caution and/or security) applies to a step or substep, then that condition also applies to all its substeps.

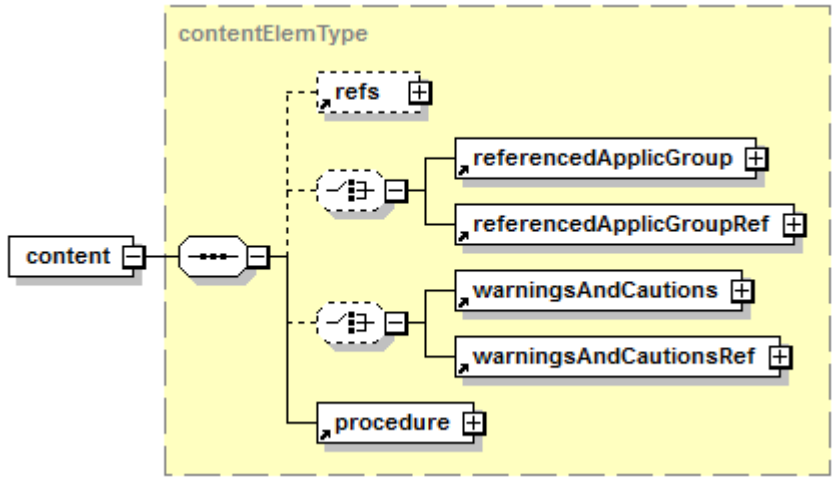
This Schema can be used for all types of information of procedural or instructional type (eg, for the technical content in maintenance procedures, refer to Chap 5.2.1.3.1).

This Schema contains alternates for various elements. For related business rule decisions, refer to Chap 4.13.3.

2.2 Content

Description: The element <content> contains the content section of the procedural data module.

Markup element: <content>



ICN-S3627-S1000D0498-002-01

Fig 1 Major elements in procedural content

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

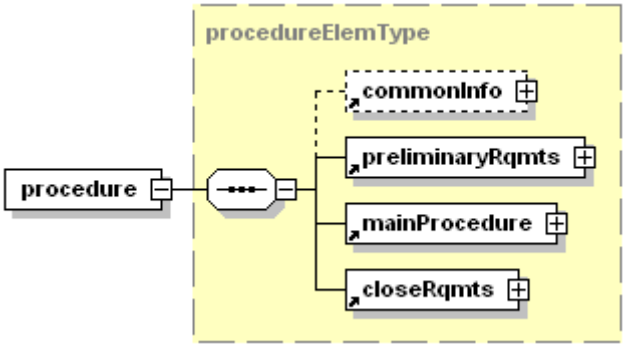
Child elements:

- <`refs`>. Refer to Chap 3.9.5.2.1.2.
- <`referencedApplicGroup`>. Refer to Chap 3.9.5.3.
- <`referencedApplicGroupRef`>. Refer to Chap 3.9.5.3.
- <`warningsAndCautions`>. Refer to Chap 3.9.3.
- <`warningsAndCautionsRef`>. Refer to Chap 3.9.3.
- <`procedure`>. Refer to Para 2.3.

2.3 Procedure

Description: The element <`procedure`> contains all information necessary to carry out the task or the main objective of the procedural information.

Markup element: <`procedure`>



ICN-S3627-S1000D0499-001-01

Fig 2 Element <`procedure`>

Attributes:

– None

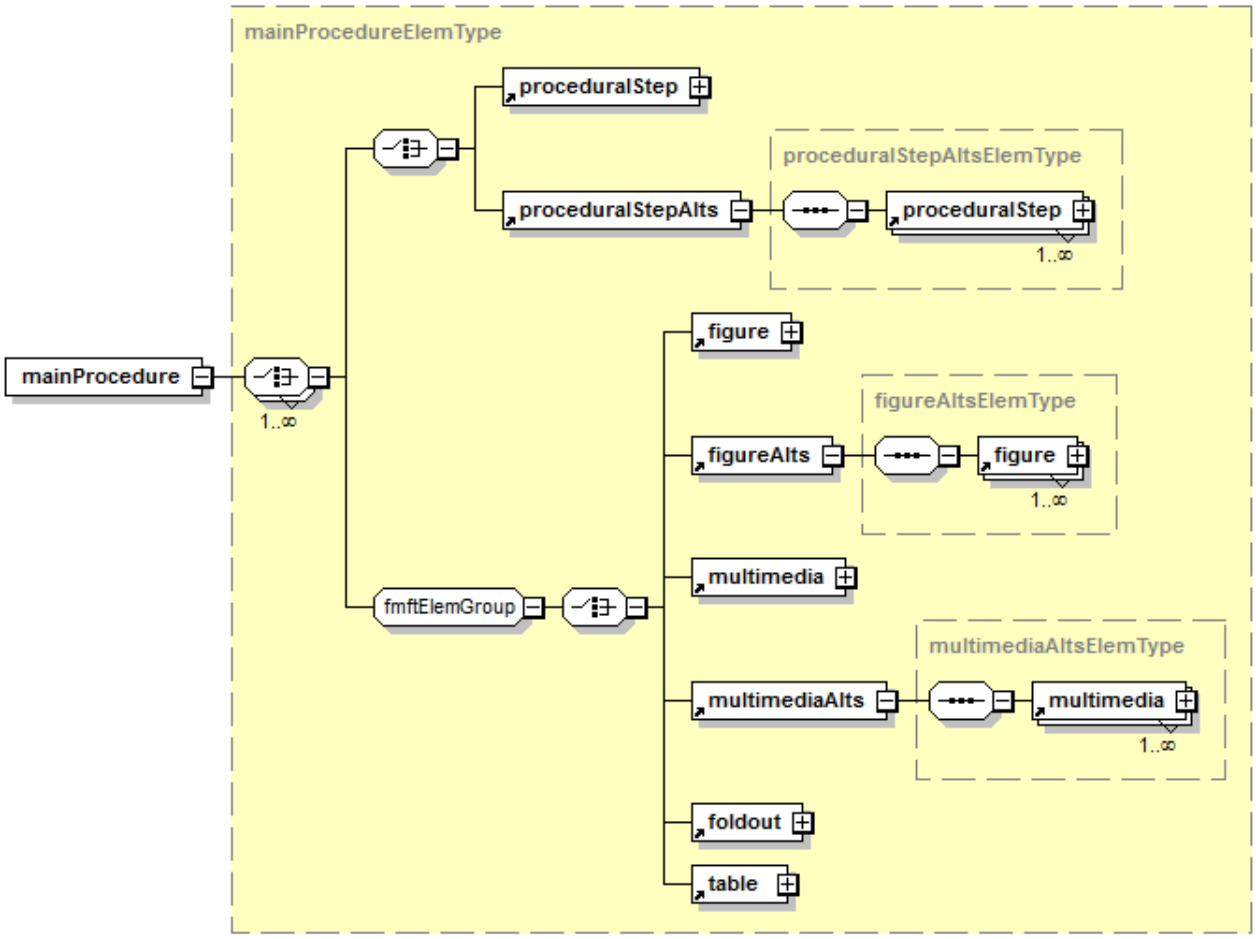
Child elements:

– <commonInfo> . Refer to Chap 3.9.5.2.1.12.
– <preliminaryRqmts>. Refer to Chap 3.9.5.2.1.9.
– <mainProcedure>. Refer to Para 2.4.
– <closeRqmts>. Refer to Chap 3.9.5.2.1.9.

2.4 Main procedure

Description: The element <mainProcedure> contains the detailed procedural steps to be done, properly supported by figures, multimedia, foldouts and tables.

Markup element: <mainProcedure>



ICN-S3627-S1000D0500-002-01

Fig 3 Element <mainProcedure>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- skillLevelCode (O), the skill level required for the complete procedure. Refer to Chap 3.9.5.1. The attribute skillLevelCode can have one of the following values:
  - "sk01" thru "sk99". Refer to Chap 3.9.6.1.
- independentCheck (O), the complete procedure must be checked by a supervisor with a given qualification
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <proceduralStep>. Refer to Para 2.4.1.
- <proceduralStepAlts>. Refer to Para 2.4.2.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7.
- <table>. Refer to Chap 3.9.5.2.1.6.

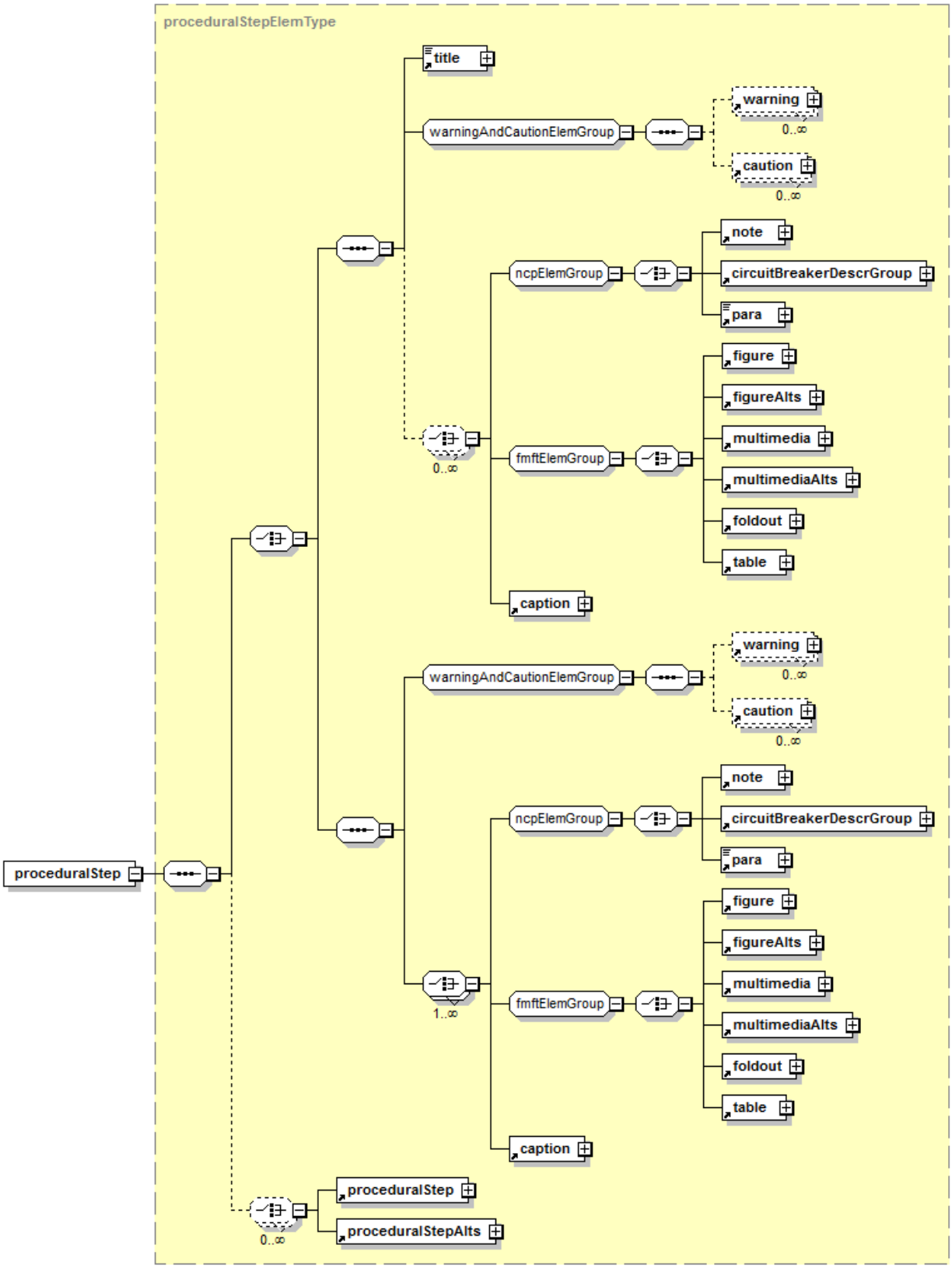
Business rule decision point BRDP-S1-00185 - Use of the alternates concept within the element <mainProcedure>:

- Decide whether to use the alternates concept for steps, figures and multimedia within the element <mainProcedure>. This concerns the child elements <proceduralStepAlts> (refer to Para 2.4.2), <figureAlts> (refer to Chap 3.9.5.2.1.7) and <multimediaAlts> (refer to Chap 3.9.5.2.1.7).

2.4.1 Procedural step

Description: The element <proceduralStep> contains a step in the procedure. A step can be broken down into substeps by including another element <proceduralStep> (or <proceduralStepAlts>), which can itself be broken down further into substeps by including another element <proceduralStep> (or <proceduralStepAlts>), and so on. In this way, any depth of substep breakdown can be achieved. However, exceeding five levels of depth is strongly discouraged. Refer to default BREX rule BREX-S1-00079. The substep breakdown must never exceed eight levels of depth. Refer to default BREX rule BREX-S1-00080.

Markup element: <proceduralStep>



ICN-S3627-S1000D0501-002-01

Fig 4 Element <`proceduralStep`>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- warningRefs (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- cautionRefs (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- independentCheck (O), the step must be checked (eg, by a supervisor with a given qualification).
- skillLevelCode (O), the skill level required for this procedural step. Refer to Chap 3.9.5.1. The attribute skillLevelCode can have one of the following values:
  - "sk01" thru "sk99". Refer to Chap 3.9.6.1.
- keepWithNext (O), the indication whether a step is presented together with the next step, if possible. The attribute keepWithNext is intended for use only when absolutely necessary in a given situation (eg, where scrolling is not practical for the user or the viewing device does not allow scrolling). The attribute keepWithNext can have one of the following values:
  - "0" (D) - No, the step is not kept with the next sibling step
  - "1" - Yes, the step is kept with the next sibling step (if one exists) and therefore, all children of the element for which the attribute keepWithNext is set, must be kept together as well (if possible). The attribute keepWithNext has no meaning when placed on a final step.
- itemCharacteristic (O), used to indicate the characteristics of the item that is the subject of a given procedural step. If used, the attribute itemCharacteristic can have one or more of the following values:
  - "ic01" thru "ic99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Para 2.4.3 for the use of titles. Refer to Chap 3.9.5.2.1.5 for general rules on titles.
- <warning>. Refer to Para 2.4.4 for the validity of warnings. Refer to Chap 3.9.3 for general rules on warnings.
- <caution>. Refer to Para 2.4.4 for the validity of cautions. Refer to Chap 3.9.3 for general rules on cautions.
- <note>. Refer to Chap 3.9.3.
- <circuitBreakerDescrGroup>. Refer to Chap 3.9.5.2.1.9.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.

- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7.
- <table>. Refer to Chap 3.9.5.2.1.6.
- <caption>. Refer to Chap 3.9.5.2.1.4.
- <proceduralStep>.
- <proceduralStepAlts>. Refer to Para 2.4.2.

Business rule decision point BRDP-S1-00186 - Maximum number of step levels in a procedure:

- Decide on the maximum number of step levels allowed in a procedure. Exceeding five levels of depth is strongly discouraged in development of new data. It is recommended that additional levels are only used in a conversion effort where the existing data is authored to this depth (maximum eight levels) and restructuring of data is not feasible.

Business rule decision point BRDP-S1-00187 - Minimum number of substeps in a step:

- Decide whether to allow for a single substep, or to insist on a minimum of two substeps in a step.

  Note

  The Schema allows for a single substep.

2.4.2 Procedural step alternates group

Description: The element <proceduralStepAlts> is an alternate group that provides the capability to group several alternatives of a step. Refer to Chap 4.13.3 for information related to the use of alternate groups in data module content.

Markup element: <proceduralStepAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- altsName (O), the name of the alternate group
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

2.4.3 Title

Description: The element <title> contains the title of a step or gives the title for a sequence of substeps. The element <title> must be used consistently in a procedure (refer to default BREX rule BREX-S1-00264). The following rules apply:

1 A step must have a title if any of its sibling steps have a title

2 A substep can have a title only if its parent step has a title

2.4.4 Warnings, cautions and notes

A warning, caution or note, or a warning or caution reference that is placed in a step (element <proceduralStep>) applies to all substeps (element <proceduralStep>).

3 Examples

3.1 Not using the alternates concept

The following is a markup example of a procedure not using the alternates concept:

```
<procedure>
<preliminaryRqmts>
<reqCondGroup>
<reqCondNoRef>
<reqCond>The bicycle is outdoors</reqCond>
</reqCondNoRef></reqCondGroup>
<reqPersons applicRefId="apMK9">
<person man="A">
<personCategory personCategoryCode="Chemical technician"/>
<personSkill skillLevelCode="sk02"/>
<trade>Bike cleaner</trade>
<estimatedTime unitOfMeasure="h">1,0</estimatedTime>
</person></reqPersons>
<reqPersons applicRefId="apMK1">
<person man="B">
<personCategory personCategoryCode="Operator"/>
<personSkill skillLevelCode="sk02"/>
<trade>Bike rider</trade>
<estimatedTime unitOfMeasure="h">1,0</estimatedTime>
</person></reqPersons>
<reqSupportEquips><supportEquipDescrGroup>
<supportEquipDescr id="seq-0001"><name>Water hose</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber><partNumber>BSK-TLST-001-09</partNumber>
</partAndSerialNumber></identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
<supportEquipDescr id="seq-0002">
<name>Stiff bristle brush</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber><partNumber>BSK-TLST-001-02</partNumber>
</partAndSerialNumber></identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
<supportEquipDescr id="seq-0003"><name>Sponge</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber><partNumber>BSK-TLST-001-11</partNumber>
</partAndSerialNumber></identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr></supportEquipDescrGroup></reqSupportEquips>
<reqSupplies><supplyDescrGroup>
<supplyDescr id="sup-0001"><name>Degreasing agent</name>
<identNumber><manufacturerCode>KZ222</manufacturerCode>
<partAndSerialNumber><partNumber>LL-004</partNumber>
</partAndSerialNumber></identNumber>
<reqQuantity unitOfMeasure="L">1</reqQuantity></supplyDescr>
<supplyDescr id="sup-0002"><name>Detergent A</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
```

```
<partAndSerialNumber><partNumber>BSK-TLST-023-14</partNumber>
</partAndSerialNumber></identNumber>
<reqQuantity unitOfMeasure="L">1</reqQuantity></supplyDescr>
<supplyDescr id="sup-0003" applicRefId="apMK9">
<name>Detergent B</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber><partNumber>BSK-TLST-001-15</partNumber>
</partAndSerialNumber></identNumber>
<reqQuantity unitOfMeasure="L">1</reqQuantity></supplyDescr>
</supplyDescrGroup></reqSupplies>
<reqSpares><noSpares/></reqSpares>
<reqSafety><safetyRqmts>
<warning><warningAndCautionPara>Do not get <internalRef
internalRefId="sup-0002" internalRefTargetType="irtt04"/>
into your eyes. If it gets into your eyes, wash them immediately
in clean warm water.</warningAndCautionPara></warning>
<warning><warningAndCautionPara>Do not get <internalRef
internalRefId="sup-0003" internalRefTargetType="irtt04"/>
into your eyes. If it gets into your eyes, wash them immediately
in clean warm water.</warningAndCautionPara></warning>
<caution><warningAndCautionPara>Do not use a <internalRef
internalRefId="seq-0001" internalRefTargetType="irtt05"/>
that has high pressure. A water hose that has high pressure can
cause some parts to become loose or full of
water.</warningAndCautionPara></caution>
<caution><warningAndCautionPara>Do not point the hose directly
at the hub or at the bottom bracket bearings. This can cause
damage to the parts.</warningAndCautionPara></caution>
<caution><warningAndCautionPara>Apply <internalRef
internalRefId="sup-0003" internalRefTargetType="irtt04"/>
in accordance with the instruction on the container. The
substance may cause damage to the Bike paint if it is not
applied correctly.</warningAndCautionPara></caution>
</safetyRqmts></reqSafety></preliminaryRqmts>
<mainProcedure>
<proceduralStep><para>Clean the bicycle with water to remove all
dirt. Refer to <internalRef internalRefId="fig-0001"
internalRefTargetType="irtt01"/>.</para>
<figure id="fig-0001"><title>Cleaning the bike</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-D000000-0-U8025-
00502-A-04-1"/></figure></proceduralStep>
<proceduralStep><para>Use a <internalRef internalRefId="seq-
0002" internalRefTargetType="irtt05"/> to get access to areas
that are not easy to clean. These are the shift levers, the
knobbly tires, and the brakes.</para></proceduralStep>
<proceduralStep><para>Clean the caked grime from the chain and
the sprockets with a screwdriver that has a small
blade.</para></proceduralStep>
<proceduralStep><para>Remove the grease from the freewheel
assembly with the <internalRef internalRefId="sup-0001"
internalRefTargetType="irtt04"/> as shown in <internalRef
internalRefId="fig-0002" internalRefTargetType="irtt01"/> . Use
```

```
a brush to remove the grease from these parts:
<randomList listItemPrefix="pf02">
<listItem><para>sprockets</para></listItem>
<listItem><para>guide and tension wheels of the
derailleur</para></listItem>
<listItem><para>chain ring teeth</para></listItem>
</randomList></para>
<figure id="fig-0002"><title>Degreasing the freehub</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA52000-0-U8025-
00523-A-04-1"/></figure>
</proceduralStep>
<proceduralStep><para>Flush the sprockets, the derailleurs, the
chain rings and the chain with water.</para>
<note><notePara>If necessary, do the flush procedure
again.</notePara></note></proceduralStep>
<proceduralStep applicRefId="apMK1"><title>Wash the Bike</title>
<proceduralStep><para>Soak the <internalRef internalRefId="seq-
0003" internalRefTargetType="irtt05"/> into <internalRef
internalRefId="sup-0002"
internalRefTargetType="irtt04"/> and
water.</para></proceduralStep>
<proceduralStep><para>Clean the bicycle with the soaked
sponge.</para></proceduralStep>
<proceduralStep><para>Flush the bicycle and make sure that all
<internalRef internalRefId="sup-0002"
internalRefTargetType="irtt04"/> is
removed.</para></proceduralStep>
<proceduralStep><para>Move the bicycle up and down on its tires
to remove all water.</para></proceduralStep></proceduralStep>
<proceduralStep applicRefId="apMK9"><title>Wash the
Bike</title><proceduralStep><para>Soak the <internalRef
internalRefId="seq-0003" internalRefTargetType="irtt05"/> into
<internalRef internalRefId="sup-0003"
internalRefTargetType="irtt04"/> and
water.</para></proceduralStep>
<proceduralStep><para>Clean the bicycle with the soaked
sponge.</para></proceduralStep>
<proceduralStep><para>Soak the <internalRef internalRefId="seq-
0003" internalRefTargetType="irtt05"/> into <internalRef
internalRefId="sup-0002" internalRefTargetType="irtt04"/> and
water.</para></proceduralStep>
<proceduralStep><para>Fully clean the bicycle with the soaked
sponge.</para></proceduralStep>
<proceduralStep><para>Flush the bicycle to make sure that all
detergents are removed.</para></proceduralStep>
<proceduralStep><para>Move the bicycle up and down on its tires
to remove all water.</para></proceduralStep></proceduralStep>
<proceduralStep><para>Lubricate the bicycle (refer to
<dmRef ><dmRefIdent><dmCode modelIdentCode="S1000DBIKE"
systemDiffCode="AAA" systemCode="DA4" subSystemCode="1"
subSubSystemCode="0" assyCode="00" disassyCode="00"
disassyCodeVariant="AA" infoCode="241" infoCodeVariant="A"
```

```
itemLocationCode="A"/></dmRefIdent></dmRef>).</para></procedural
Step></mainProcedure>
<closeRqmts><reqCondGroup>
<reqCondNoRef><reqCond>Make sure the bicycle is dry</reqCond>
</reqCondNoRef></reqCondGroup></closeRqmts>
</procedure>
```

3.2 Using the alternates concept

The following is a markup example of a procedure using the alternates concept:

```
<mainProcedure>
<proceduralStep><para>Clean the bicycle with water to remove all
dirt. Refer to <internalRef internalRefId="fig-0001"
internalRefTargetType="irtt01"/>.</para>
<figure id="fig-0001"><title>Cleaning the bike</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-D000000-0-U8025-
00502-A-04-1"/></figure></proceduralStep>
<proceduralStep><para>Use a <internalRef internalRefId="seq-
0002" internalRefTargetType="irtt05"/> to get access to areas
that are not easy to clean. These are the shift levers, the
knobbly tires, and the brakes.</para></proceduralStep>
<proceduralStep><para>Clean the caked grime from the chain and
the sprockets with a screwdriver that has a small
blade.</para></proceduralStep>
<proceduralStep><para>Remove the grease from the freewheel
assembly with the <internalRef internalRefId="sup-0001"
internalRefTargetType="irtt04"/> as shown in <internalRef
internalRefId="fig-0002" internalRefTargetType="irtt01"/> . Use
a brush to remove the grease from these parts:
<randomList listItemPrefix="pf02">
<listItem><para>sprockets</para></listItem>
<listItem><para>guide and tension wheels of the
derailleur</para></listItem>
<listItem><para>chain ring teeth</para></listItem>
</randomList></para>
<figure id="fig-0002"><title>Degreasing the freehub</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA52000-0-U8025-
00523-A-04-1"/></figure></proceduralStep>
<proceduralStep><para>Flush the sprockets, the derailleurs, the
chain rings and the chain with water.</para>
<note><notePara>If necessary, do the flush procedure
again.</notePara></note></proceduralStep>
<proceduralStepAlts>
<proceduralStep applicRefId="apMK1"><para>Wash the Bike</para>
<proceduralStep><para>Soak the <internalRef internalRefId="seq-
0003" internalRefTargetType="irtt05"/> into <internalRef
internalRefId="sup-0002" internalRefTargetType="irtt04"/> and
water.</para></proceduralStep>
<proceduralStep><para>Clean the bicycle with the soaked
sponge.</para></proceduralStep>
<proceduralStep><para>Flush the bicycle and make sure that all
<internalRef internalRefId="sup-0002"
internalRefTargetType="irtt04"/> is
```

```
removed.</para></proceduralStep>
<proceduralStep><para>Move the bicycle up and down on its tires
to remove all water.</para></proceduralStep>
</proceduralStep>
<proceduralStep applicRefId="apMK9"><para>Wash the Bike</para>
<proceduralStep><para>Soak the <internalRef internalRefId="seq-
0003" internalRefTargetType="irtt05"/> into <internalRef
internalRefId="sup-0003" internalRefTargetType="irtt04"/> and
water.</para></proceduralStep>
<proceduralStep><para>Clean the bicycle with the soaked
sponge.</para></proceduralStep>
<proceduralStep><para>Soak the <internalRef internalRefId="seq-
0003" internalRefTargetType="irtt05"/> into <internalRef
internalRefId="sup-0002" internalRefTargetType="irtt04"/> and
water.</para></proceduralStep>
<proceduralStep><para>Fully clean the bicycle with the soaked
sponge.</para></proceduralStep>
<proceduralStep><para>Flush the bicycle to make sure that all
detergents are removed.</para></proceduralStep>
<proceduralStep><para>Move the bicycle up and down on its tires
to remove all water.</para></proceduralStep></proceduralStep>
</proceduralStepAlts>
<proceduralStep><para>Lubricate the bicycle (refer to <dmRef
><dmRefIdent><dmCode modelIdentCode="S1000DBIKE"
systemDiffCode="AAA" systemCode="DA4" subSystemCode="1"
subSubSystemCode="0" assyCode="00" disassyCode="00"
disassyCodeVariant="AA" infoCode="241" infoCodeVariant="A"
itemLocationCode="A"/></dmRefIdent></dmRef>).</para>
</proceduralStep>
</mainProcedure>
```

Chapter 3.9.5.2.4

Content section - Fault information

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Chap 3.9.5.2.1.1	Common constructs - Change marking
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Chap 3.9.5.2.1.6	Common constructs - Tables
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Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.1.10	Common constructs - Text elements
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Chap 3.9.5.2.7	Content section - Parts information
Chap 3.9.5.3	Data modules - Applicability
Chap 4.13.3	Optimizing and reuse - Alternates concept
Chap 5.2.1.3.2	Maintenance information - Fault isolation

1 General

The fault Schema is used to capture and represent fault reporting, fault isolation and fault correlation information. The granularity of these data modules must follow the breakdown reflected by the SNS.

For details on the scope of the information, refer to Chap 5.2.1.3.2.

The use of the common entities, elements and attributes is detailed in Chap 3.9.5.2.1.

2 Fault information

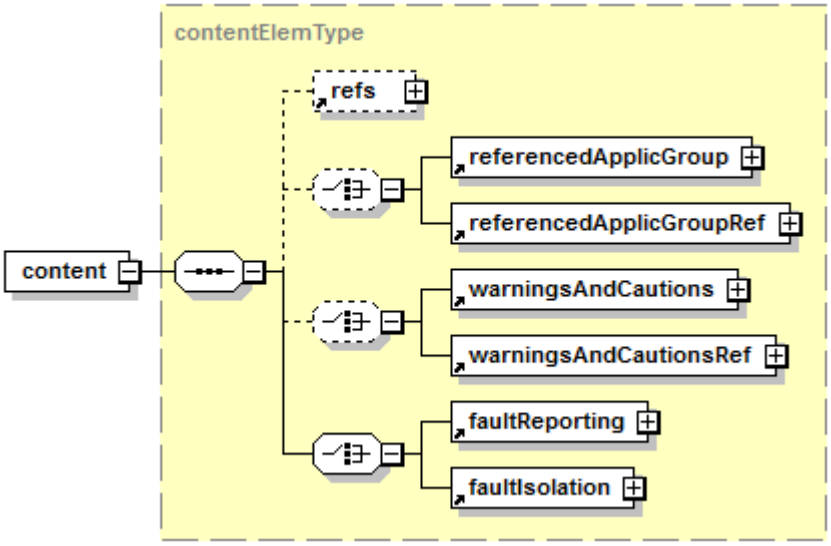
2.1 Schema basic rules

The fault Schema has structural elements that are used to support the build-up of the required fault information in the project. The fault Schema is used to structure fault reporting and fault isolation. The fault Schema is used to structure fault reporting and fault isolation where fault reporting includes isolated fault, detected fault, observed fault and correlated fault. Fault reporting includes fault isolation procedure.

2.2 Content

Description: The fault Schema allows for five types of fault information to be produced as individual data modules. These are fault reporting (in terms of isolated, detected, observed or correlated faults) or fault isolation. Refer to Chap 5.2.1.3.2.

Markup element: <content>



ICN-S3627-S1000D0502-002-01

Fig 1 Major elements in fault content

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
- <warningsAndCautions>. Refer to Para 2.4.
- <warningsAndCautionsRef>. Refer to Para 2.4.

and one of

- <faultReporting>. Refer to Para 2.5.
- <faultIsolation>. Refer to Para 2.6.

Markup example:

```
<content>
<faultReporting>
<isolatedFault id=flt-0003" faultCode="NYCJD03">
<faultDescr>
</faultDescr>
<locateAndRepair>
<locateAndRepairLruItem>
<lru>
</lru>
</locateAndRepairLruItem>
</locateAndRepair>
</isolatedFault>
</faultReporting>
</content>
```

2.3 References

References (element <refs>) must be populated in accordance with Chap 3.9.5.2.1.2.

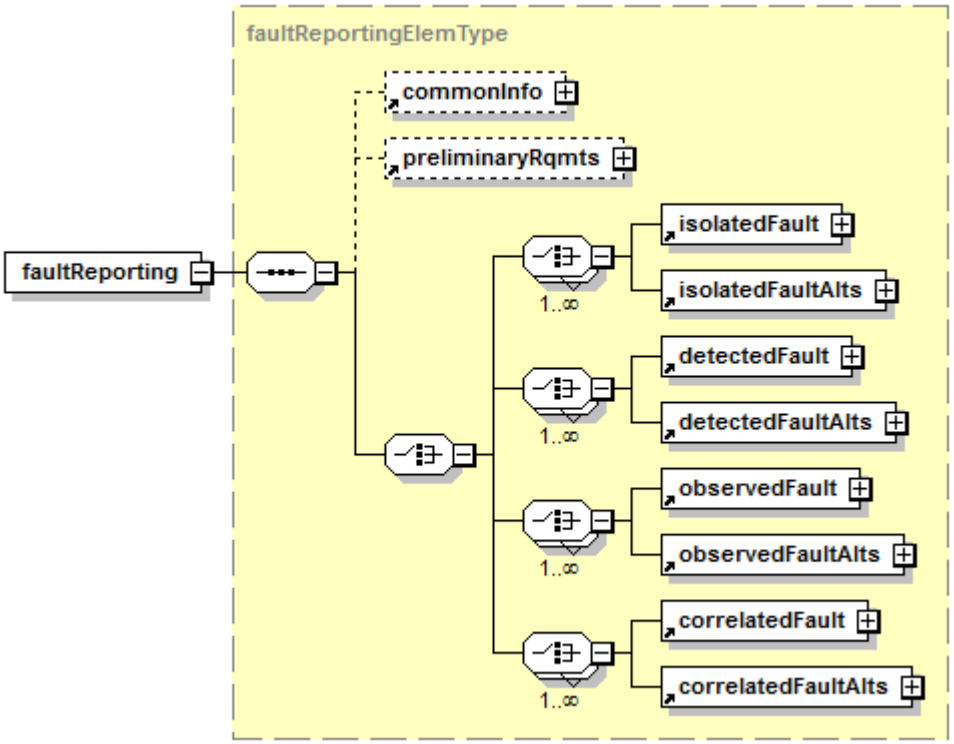
2.4 Warnings and cautions

There are two possibilities to collect warnings and cautions, either within the data module where they are used (element <warningsAndCautions>) or within a warning and caution common information repository (element <warningsAndCautionsRef>). Refer to Chap 3.9.3.

2.5 Fault reporting

Description: The element <faultReporting> contains information to enable technician or computerized maintenance systems to indicate faults through data modules.

Markup element: <faultReporting>



ICN-S3627-S1000D0622-001-01

Fig 2 Element <faultReporting>

Attributes:

– None

Child elements:

– <commonInfo>. Refer to Chap 3.9.5.2.1.12.
– <preliminaryRqmts>. Refer to Chap 3.9.5.2.1.9.
– <isolatedFault>. Refer to Para 2.5.1.
– <isolatedFaultAlts>. Refer to Para 2.5.2.
– <detectedFault>. Refer to Para 2.5.3.
– <detectedFaultAlts>. Refer to Para 2.5.4.
– <observedFault>. Refer to Para 2.5.5.
– <observedFaultAlts>. Refer to Para 2.5.6.
– <correlatedFault>. Refer to Para 2.5.7.
– <correlatedFaultAlts>. Refer to Para 2.5.8.

Markup example:

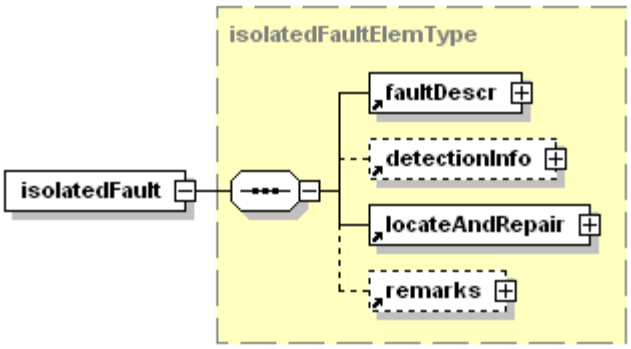
```
<faultReporting>
<isolatedFault id="flt-0003" faultCode="NYCJD03">
<faultDescr>
<detailedFaultDescr>
<systemName>Engine</systemName>
<faultMessageBody>Engine will not start.</faultMessageBody>
</detailedFaultDescr>
```

```
</faultDescr>
<locateAndRepair>
<locateAndRepairLruItem>
<lru>
</lru>
</locateAndRepairLruItem>
</locateAndRepair>
</isolatedFault>
</faultReporting>
```

2.5.1 Isolated faults

Description: The element <isolatedFault> is used to capture isolated faults information.

Markup element: <isolatedFault>



ICN-S3627-S1000D0503-001-01

Fig 3 Element <isolatedFault>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- faultCode (M), the fault code that is allocated as part of a logistic analysis process
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <faultDescr>. Refer to Para 2.5.1.1.
- <detectionInfo>. Refer to Para 2.5.1.3.
- <locateAndRepair>. Refer to Para 2.5.1.4.
- <remarks>. Refer to Chap 3.9.5.1.

Markup example:

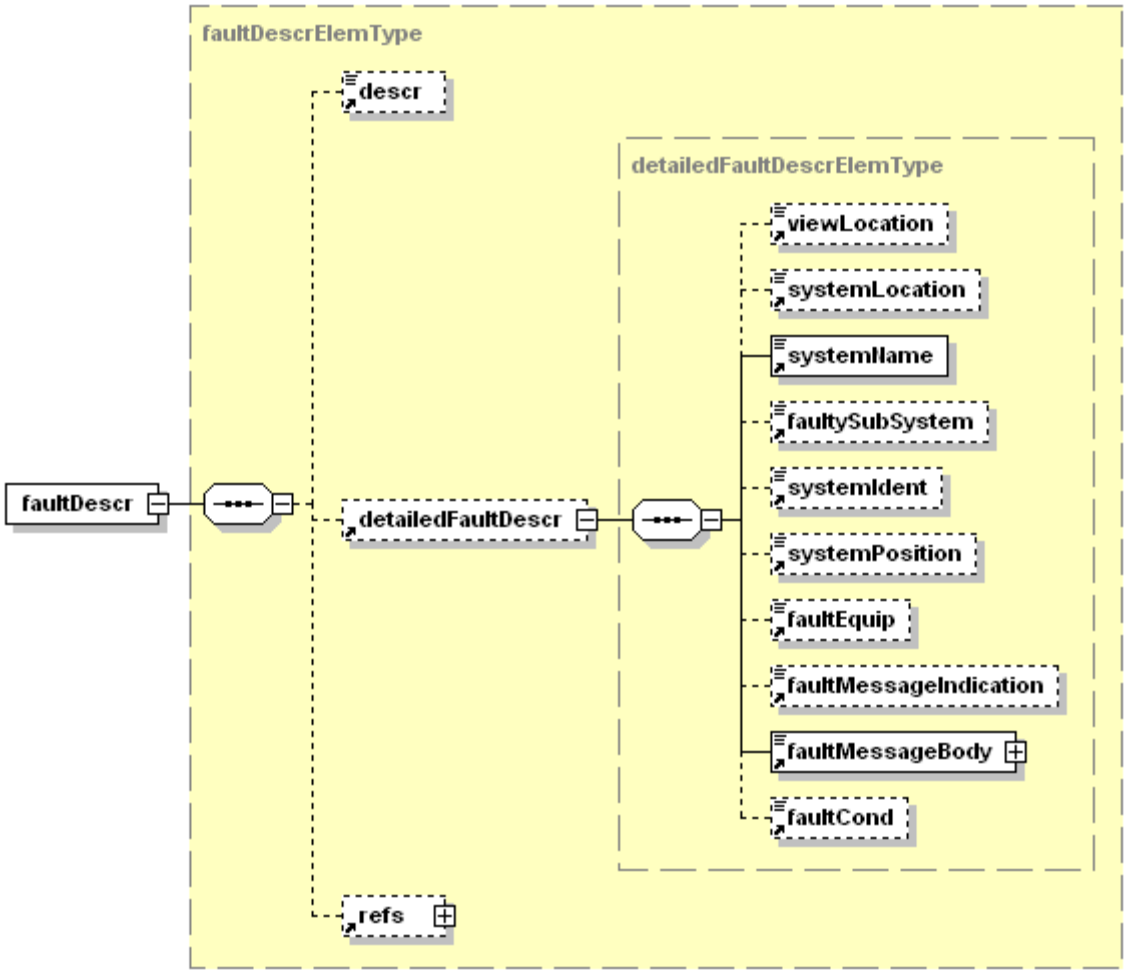
```
<isolatedFault id="flt-0003" faultCode="NYCJD03">
<faultDescr>
<detailedFaultDescr>
<systemName>Engine</systemName>
<faultMessageBody>Engine will not start.</faultMessageBody>
</detailedFaultDescr>
</faultDescr>
```

```
<locateAndRepair>
<locateAndRepairLruItem>
<lru>
</lru>
</locateAndRepairLruItem>
</locateAndRepair>
</isolatedFault>
```

2.5.1.1 Description of the isolated fault

Description: The element <faultDescr> contains the description of the isolated fault.

Markup element: <faultDescr>



ICN-S3627-S1000D0504-001-01

Fig 4 Element <faultDescr>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <descr>, the textual fault description by the message identification as it is displayed to the maintenance crew
- <detailedFaultDescr>. Refer to Para 2.5.1.2.
- <refs>, the references to, if required, other data modules, publication modules or non S1000D publications to complete the description. Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<faultDescr>
<descr>Horn failed</descr>
</faultDescr>
```

2.5.1.2 Detailed description of the isolated fault

Description: The element <detailedFaultDescr> contains the detailed description of the isolated fault.

Markup element: <detailedFaultDescr>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

All child elements can have a textual content and all have the same set of attributes as the element <faultDescr>.

- <viewLocation>, the location where the description of the fault is displayed
- <systemLocation>, the location or panel where the malfunction is shown
- <systemName>, the faulty system
- <faultySubSystem>, the faulty subsystem
- <systemIdent>, the discriminating identification information to identify the faulty system (eg, "yellow" for a hydraulic flag system)
- <systemPosition>, the discriminating identification information, position-oriented (eg, "left")
- <faultEquip>, the equipment involved in the malfunction
- <faultMessageIndication>, the indication part of the fault message (eg, "temperature")
- <faultMessageBody>, the main part of the fault message
- <faultCond>, the potential fault condition

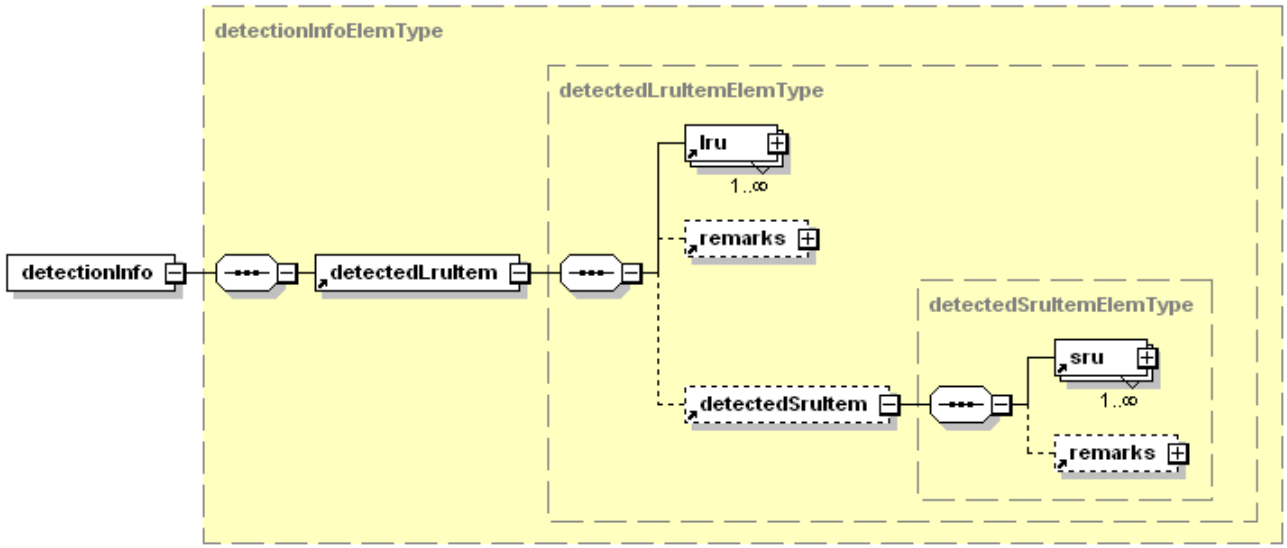
Markup example:

```
<detailedFaultDescr>
<systemName>Engine</systemName>
<faultMessageBody>Engine will not start.</faultMessageBody>
</detailedFaultDescr>
```

2.5.1.3 Fault detecting information

Description: The element <detectionInfo> contains the information for detecting the fault.

Markup element: <detectionInfo>



ICN-S3627-S1000D0505-002-01

Fig 5 Element <detectionInfo>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- detectionType (O), the type of fault
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <detectedLruItem>. Refer to Para 2.5.1.3.1.

Markup example:

```
<detectionInfo detectionType="Major">
<detectedLruItem>
<lru>
<name>Tire</name>
<identNumber>
<manufacturerCode>KT666</manufacturerCode>
<partAndSerialNumber>
<partNumber>TIRES-010101</partNumber>
</partAndSerialNumber>
```

```
</identNumber>
</lru>
</detectedLruItem>
</detectionInfo>
```

2.5.1.3.1 Detected Line Replaceable Unit (LRU) item

Description: The element <detectedLruItem> contains the identification, name and abbreviation of the detected LRU.

Markup element: <detectedLruItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- faultProbability (O), the probability factor to indicate the likelihood that this particular LRU is faulty
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lru>. Multiple <lru> elements must only contain LRU alternates. Refer to Para 2.5.1.3.2.
- <remarks>. Refer to Chap 3.9.5.1.
- <detectedSruItem>. Refer to Para 2.5.1.3.3.

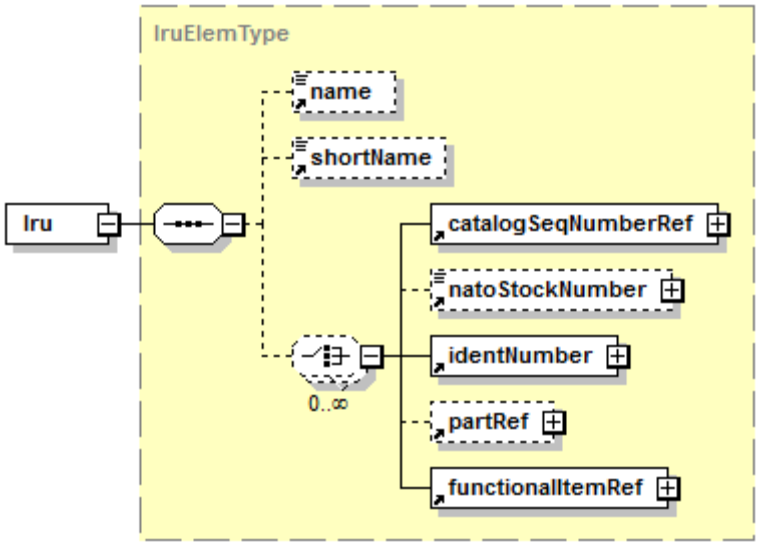
Markup example:

```
<detectedLruItem>
<lru>
<name>Tire</name>
<identNumber>
<manufacturerCode>KT666</manufacturerCode>
<partAndSerialNumber>
<partNumber>TIRES-010101</partNumber>
</partAndSerialNumber>
</identNumber>
</lru>
</detectedLruItem>
```

2.5.1.3.2 LRU identification

Description: The element <lru> contains a name, a short name and an identification of the LRU.

Markup element: <lru>



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Fig 6 Element <lru>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>, the name of the LRU. Refer to Chap 3.9.5.2.1.10.
- <shortName>. Refer to Chap 3.9.5.2.1.10.
- The identification by one or more of the elements <catalogSeqNumberRef> (refer to Chap 3.9.5.2.7), <natoStockNumber> (refer to Chap 3.9.5.2.1.9), <identNumber> (refer to Chap 3.9.5.2.1.9), <partRef> (refer to Chap 3.9.5.2.1.10) and <functionalItemRef> (refer to Chap 3.9.5.1).

Markup example:

```
<lru>
<name>Tire</name>
<identNumber>
<manufacturerCode>KT666</manufacturerCode>
<partAndSerialNumber>
<partNumber>TIRES-010101</partNumber>
</partAndSerialNumber>
</identNumber>
</lru>
```

2.5.1.3.3 Detected Shop Replaceable Unit (SRU) item

Description: The element <detectedSruItem> contains the identification, name, abbreviation and any remark information of the detected SRU.

Markup element: <detectedSruItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- faultProbability (O), the probability factor to indicate the likelihood that this particular SRU is faulty
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <sru>. Multiple <sru> elements must only contain SRU alternates. Refer to Para 2.5.1.3.4.
- <remarks>. Refer to Chap 3.9.5.1.

Markup example:

```
<detectedSruItem>
<sru>
<identNumber>
<manufacturerCode>KT666</manufacturerCode>
<partAndSerialNumber>
<partNumber>TIRES-010101</partNumber>
</partAndSerialNumber>
</identNumber>
</sru>
</detectedSruItem>
```

2.5.1.3.4 SRU identification

Description: The element <sru> contains a name, a short name and an identification of the SRU.

Markup element: <sru>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>, the name of the SRU. Refer to Chap 3.9.5.2.1.10.
- <shortName>. Refer to Chap 3.9.5.2.1.10.
- The identification by one or more of the elements <catalogSeqNumberRef> (refer to Chap 3.9.5.2.7), <natoStockNumber> (refer to Chap 3.9.5.2.1.9), <identNumber> (refer to Chap 3.9.5.2.1.9), <partRef> (refer to Chap 3.9.5.2.1.10) and <functionalItemRef> (refer to Chap 3.9.5.1).

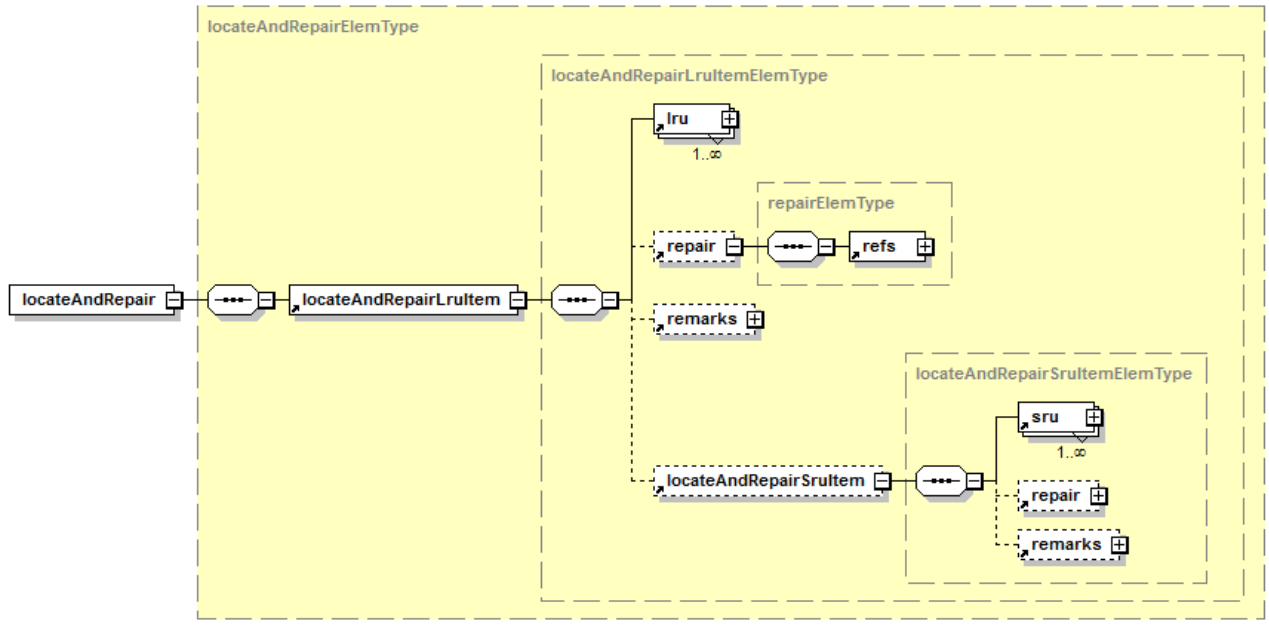
Markup example:

```
<sru>
<identNumber>
<manufacturerCode>KT666</manufacturerCode>
<partAndSerialNumber>
<partNumber>TIRES-010101</partNumber>
</partAndSerialNumber>
</identNumber>
</sru>
```

2.5.1.4 Locate and repair/Locate and repair LRU

Description: The child element <locateAndRepairLruItem> of the element <locateAndRepair> contains any locating and repairing tasks and information on the faulty LRU.

Markup element: <locateAndRepairLruItem>



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Fig 7 Element <locateAndRepair>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- faultProbability (O), the probability factor to indicate the likelihood that this particular LRU is faulty
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lru>. Multiple <lru> elements must only contain LRU alternates. Refer to Para 2.5.1.3.2.
- <repair>. Refer to Para 2.5.1.4.1.
- <remarks>. Refer to Chap 3.9.5.1.
- <locateAndRepairSruItem>. Refer to Para 2.5.1.4.2.

2.5.1.4.1 Repair

Description: The element <repair> contains references to one or more repair procedures.

Markup element: <repair>

Attributes:

- None

Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<repair>
<refs>
<externalPubRef>
<externalPubRefIdent>
<externalPubTitle>External repair publication</externalPubTitle>
</externalPubRefIdent>
</externalPubRef>
</refs>
</repair>
```

2.5.1.4.2 Locate and repair SRU

Description: The element <locateAndRepairSruItem> contains any locating and repairing tasks and information on the faulty SRU.

Markup element: <locateAndRepairSruItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- faultProbability (O), the probability factor to indicate the likelihood that this particular LRU is faulty
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <sru>. Multiple <sru> elements must only contain SRU alternates. Refer to Para 2.5.1.3.4.
- <repair>. Refer to Para 2.5.1.4.1.
- <remarks>. Refer to Chap 3.9.5.1.

Markup example:

```
<faultReporting>
<isolatedFault id="flt-0003" faultCode="NYCJD03">
<faultDescr>
<descr>Horn failed</descr>
</faultDescr>
<locateAndRepair>
<locateAndRepairLruItem>
<lru>
<name>Horn</name>
<identNumber>
<manufacturerCode>KZ444</manufacturerCode>
<partAndSerialNumber>
<partNumber>Horn-001</partNumber>
</partAndSerialNumber>
</identNumber>
</lru>
<repair>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA3" subSystemCode="1" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="921" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
</repair>
</locateAndRepairLruItem>
</locateAndRepair>
</isolatedFault>
</faultReporting>
```

2.5.2 Isolated faults alternates group

Description: The element <isolatedFaultAlts> is an alternates group that provides the capability to group several alternate solutions of the isolated faults. Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <isolatedFaultAlts>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`isolatedFault`>. Refer to Para 2.5.1.

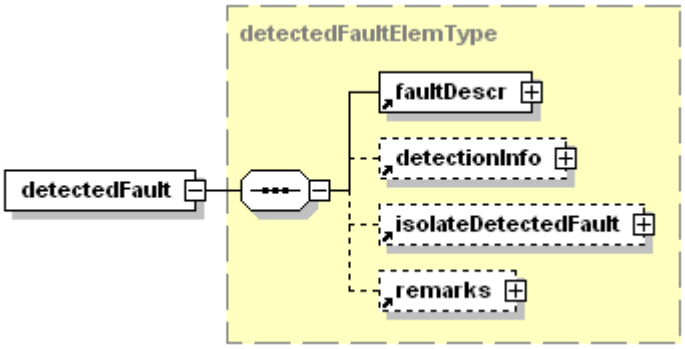
Markup example:

```
<isolatedFaultAlts id="fltc-001">
<isolatedFault id="flt-0001" faultCode="NYCJD01">
<faultDescr>
<detailedFaultDescr>
<systemName>Engine</systemName>
<faultMessageBody>Engine 1 will not start.</faultMessageBody>
</detailedFaultDescr>
</faultDescr>
<locateAndRepair>
<locateAndRepairLruItem>
<lru>
</lru>
</locateAndRepairLruItem>
</locateAndRepair>
</isolatedFault>
<isolatedFault id="flt-0002" faultCode="NYCJD02">
<faultDescr>
<detailedFaultDescr>
<systemName>Engine</systemName>
<faultMessageBody>Engine 2 will not start.</faultMessageBody>
</detailedFaultDescr>
</faultDescr>
<locateAndRepair>
<locateAndRepairLruItem>
<lru>
</lru>
</locateAndRepairLruItem>
</locateAndRepair>
</isolatedFault>
</isolatedFaultAlts>
```

2.5.3 Detected faults

Description: The element <`detectedFault`> contains information on detected faults.

Markup element: <detectedFault>



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Fig 8 Element <detectedFault>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- faultCode (M), the fault code that is allocated as part of a logistic analysis process
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <faultDescr>. Refer to Para 2.5.1.1.
- <detectionInfo>. Refer to Para 2.5.1.3.
- <isolateDetectedFault>. Refer to Para 2.5.3.1.
- <remarks>. Refer to Chap 3.9.5.1.

Markup example:

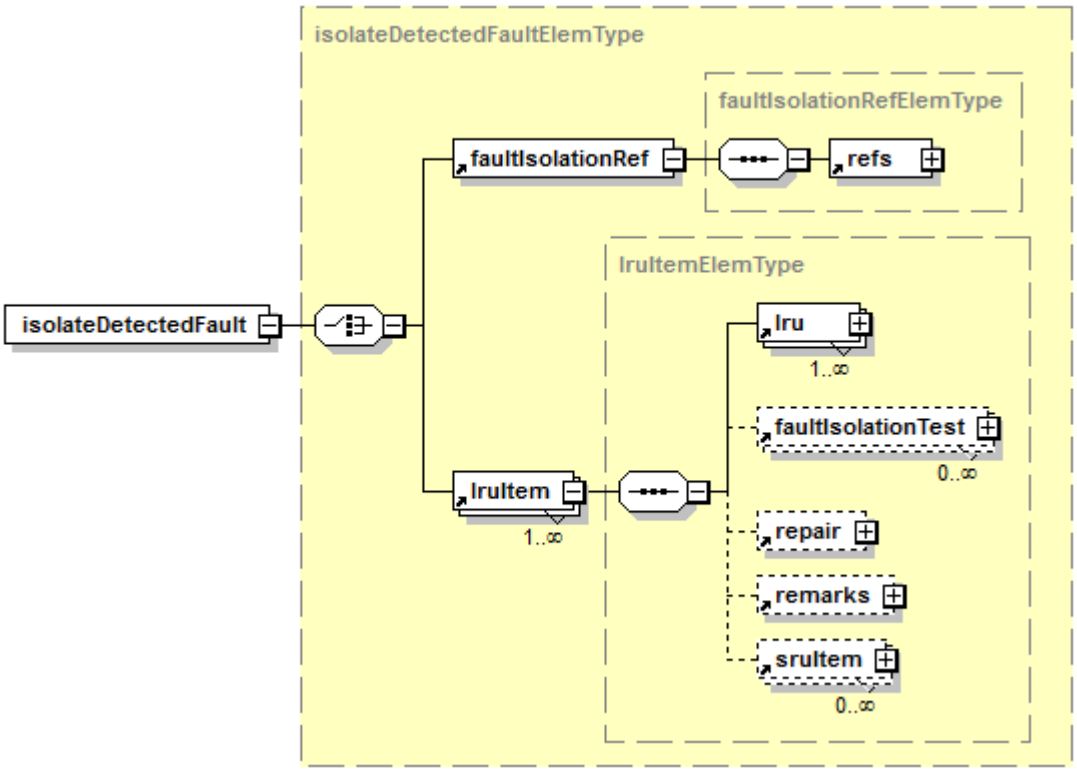
```
<detectedFault id="flt-0002" faultCode="NYCJD00">
<faultDescr>
<descr>The rear wheel does not operate correctly</descr>
</faultDescr>
<detectionInfo detectionType="Major">
<detectedLruItem>
<lru>
<name>Tire</name>
<identNumber>
<manufacturerCode>KT666</manufacturerCode>
<partAndSerialNumber>
<partNumber>TIRES-010101</partNumber>
</partAndSerialNumber>
</identNumber>
</lru>
</detectedLruItem>
</detectionInfo>
<isolateDetectedFault>
<lruItem>
```

```
<lru>
<name>Rear wheel</name>
<identNumber>
<manufacturerCode>KZ333</manufacturerCode>
<partAndSerialNumber>
<partNumber>WH-001</partNumber>
</partAndSerialNumber>
</identNumber>
</lru>
</lruItem>
</isolateDetectedFault>
<remarks><simplePara>Prepare the rear wheel for the removal of
the tire</simplePara></remarks>
</detectedFault>
```

2.5.3.1 Isolate detected faults

Description: The element <isolateDetectedFault> contains the information needed to isolate the detected fault to an LRU from amongst a list of suspected LRU. This is done by referring out to another data module through the element <faultIsolationRef> or by describing a test on these LRU using the element <lruItem>.

Markup element: <isolateDetectedFault>



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Fig 9 Element <isolateDetectedFault>

Attributes:

– None

Child elements:

- <faultIsolationRef>, the reference to information needed to isolate the detected fault
- <lruItem>. Refer to Para 2.5.3.1.1.

Markup example:

```
<isolateDetectedFault>
<lruItem>
<lru>
<name>Rear wheel</name>
<identNumber>
<manufacturerCode>KZ333</manufacturerCode>
<partAndSerialNumber>
<partNumber>WH-001</partNumber>
</partAndSerialNumber>
</identNumber>
</lru>
</lruItem>
</isolateDetectedFault>
```

2.5.3.1.1 Fault isolation test - LRU

Description: The element <lruItem> contains the information needed to perform the test on the faulty LRU.

Markup element: <lruItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- faultProbability (O), the probability factor to indicate the likelihood that this particular LRU is faulty
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lru>. Multiple <lru> elements must only contain LRU alternates. Refer to Para 2.5.1.3.2.
- <faultIsolationTest>. Refer to Para 2.5.3.1.2.
- <repair>. Refer to Para 2.5.1.4.1.
- <remarks>. Refer to Chap 3.9.5.1.
- <sruItem>. Refer to Para 2.5.3.1.4.

Markup example:

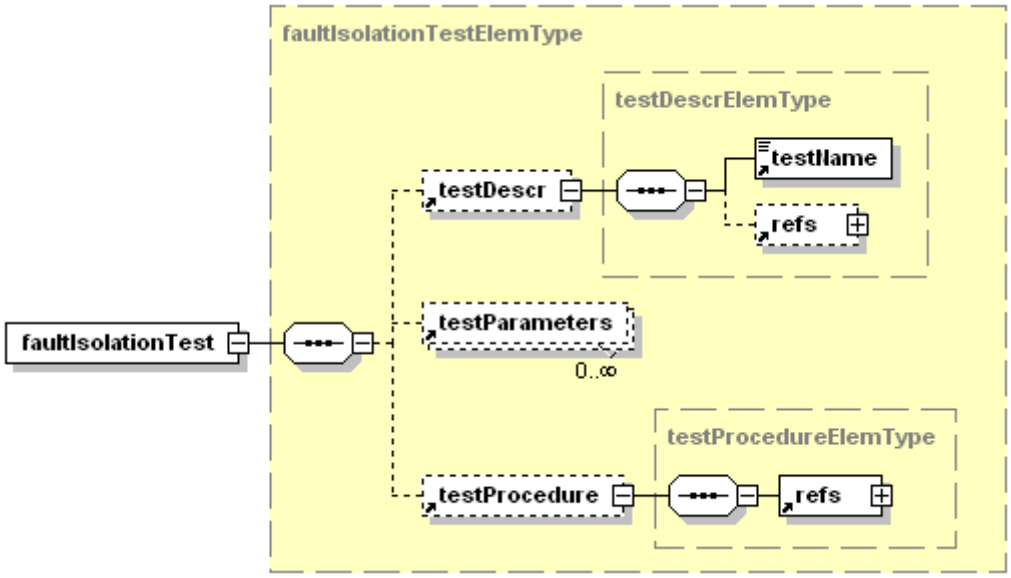
```
<lruItem>
<lru>
<name>Rear wheel</name>
<identNumber>
```

```
<manufacturerCode>KZ333</manufacturerCode>
<partAndSerialNumber>
<partNumber>WH-001</partNumber>
</partAndSerialNumber>
</identNumber>
</lru>
</lruItem>
```

2.5.3.1.2 Fault isolation test performance

Description: The element <faultIsolationTest> contains the test description, test parameters and the test procedure.

Markup element: <faultIsolationTest>



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Fig 10 Element <faultIsolationTest>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- testType (M), the type of test
- testCode (M), the identifier of the test
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <testDescr>, the name of the test and any reference to a test description
- <testParameters>. Refer to Para 2.5.3.1.3.
- <testProcedure>, the reference to test procedures or any relevant information

Markup example:

```
<faultIsolationTest testCode="O-001" testType="Operation">
<testDescr>
<testName>Test the bulbs</testName>
</testDescr>
<testParameters from="1" to="1" unitOfMeasure="Days"/>
<testProcedure>
<refs>
<dmRef>
<dmRefIdent>
<dmCode assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="341" infoCodeVariant="A" itemLocationCode="A"
modelIdentCode="S1000DLIGHTING" subSubSystemCode="0"
subSystemCode="0" systemCode="D00" systemDiffCode="AAA"/>
</dmRefIdent>
</dmRef>
</refs>
</testProcedure>
</faultIsolationTest>
```

2.5.3.1.3 Test parameters

Description: The element <testParameters> contains a set of attributes to capture parameters for the test.

Markup element: <testParameters>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- from (O), the start value for a range of values
- to (O), the end value for a range of values
- unitOfMeasure (O), the unit of measure for the values
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

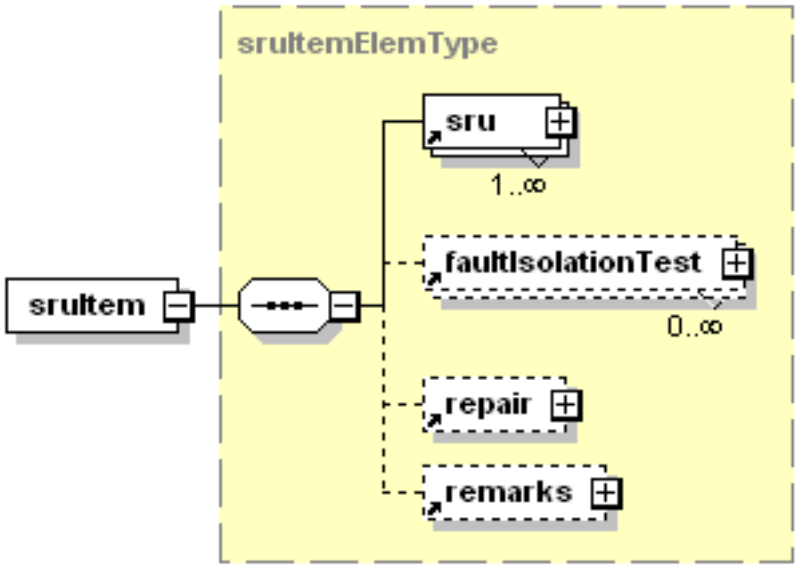
Markup example:

```
<testParameters from="1" to="1" unitOfMeasure="Days"/>
```

2.5.3.1.4 Fault isolation test - SRU

Description: The element <sruItem> contains the information needed to perform the test on the faulty SRU.

Markup element: <sruItem>



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Fig 11 Element <sruItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- faultProbability (O), the probability factor to indicate the likelihood that this particular LRU is faulty
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <sru>. Multiple <sru> elements must only contain SRU alternates. Refer to Para 2.5.1.3.4.
- <faultIsolationTest>. Refer to Para 2.5.3.1.2.
- <repair>. Refer to Para 2.5.1.4.1.
- <remarks>. Refer to Chap 3.9.5.1.

Markup example:

```
<sruItem>
<sru><name>Shop unit</name></sru>
</sruItem>
```

2.5.4 Detected faults alternates group

Description: The element <detectedFaultAlts> is an alternates group that provides the capability to group several alternate solutions of a detected faults. Refer to Chap 4.13.3.for information related to the use of alternates group in data module content.

Markup element: <detectedFaultAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <detectedFault>. Refer to Para 2.5.3.

Markup example:

```
<detectedFaultAlts id="fltc-001">
<detectedFault id="flt-0001" faultCode="NYCJD00">
<faultDescr>
<descr>The rear wheel does not operate correctly</descr>
</faultDescr>
<detectionInfo detectionType="Major">
<detectedLruItem>
<lru>
<name>Tire</name>
<identNumber>
<manufacturerCode>KT666</manufacturerCode>
<partAndSerialNumber>
<partNumber>TIRES-010101</partNumber>
</partAndSerialNumber>
</identNumber>
</lru>
</detectedLruItem>
</detectionInfo>
<!-- ... -->
</detectedFault>
<detectedFault id="flt-0002" faultCode="NYCJD01">
<faultDescr>
<descr>The front wheel does not operate correctly</descr>
</faultDescr>
<detectionInfo detectionType="Major">
<detectedLruItem>
<lru>
<name>Tire</name>
<identNumber>
<manufacturerCode>KT666</manufacturerCode>
<partAndSerialNumber>
<partNumber>TIRES-010101</partNumber>
</partAndSerialNumber>
</identNumber>
</lru>
</detectedLruItem>
</detectionInfo>
<!-- ... -->
```

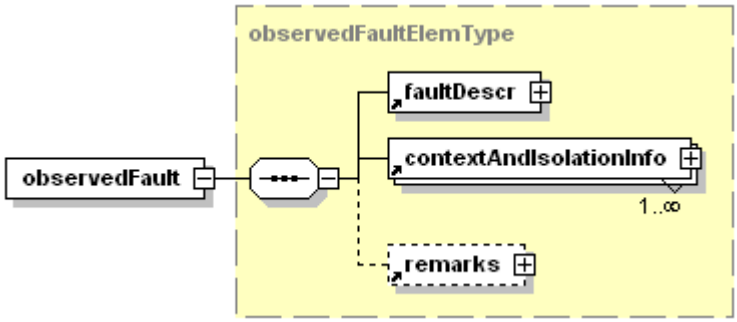
```
</detectedFault>
</detectedFaultAlts>
```

2.5.5 Observed faults

Description: The element <observedFault> contains information on observed faults but not detected by the computerized maintenance system.

The element has an attribute faultCode, which can be used to contain the fault code that is allocated as part of a logistic analysis process and an attribute faultType which can capture the type of fault.

Markup element: <observedFault>



ICN-S3627-S1000D0512-001-01

Fig 12 Element <observedFault>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- faultCode (O), the fault code that is allocated as part of a logistic analysis process
- faultType (O), the fault type that is allocated as part of a logistic analysis process
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <faultDescr>, the description of the isolated fault. Refer to Para 2.5.1.1.
- <contextAndIsolationInfo>. Refer to Para 2.5.5.1.
- <remarks>. Refer to Chap 3.9.5.1.

Markup example:

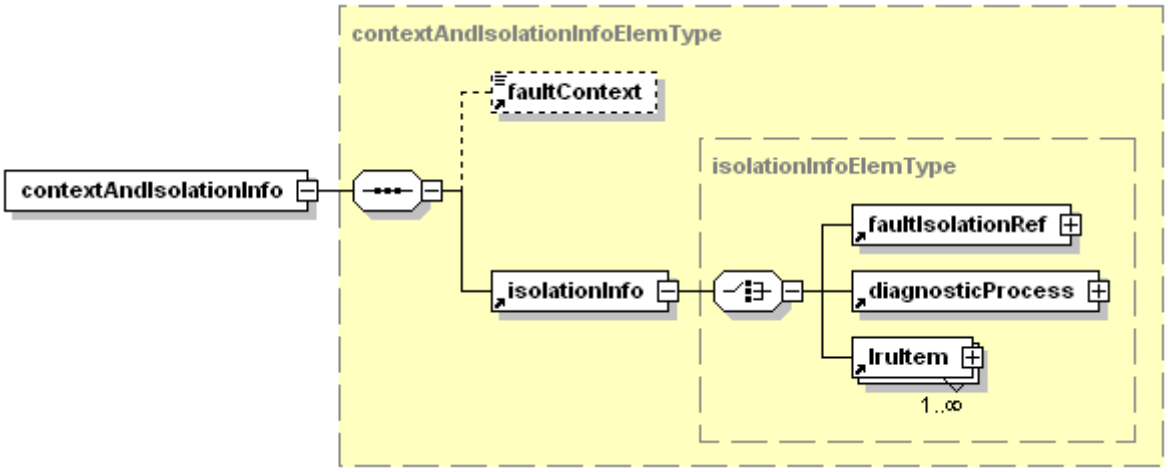
```
<observedFault faultCode="NYCJD02" id="flt-0001">
<faultDescr>
<descr>The lights are set to the dim position.</descr>
</faultDescr>
<contextAndIsolationInfo>
<isolationInfo>
<lruItem>
<lru></lru>
</lruItem>
```

```
</isolationInfo>
</contextAndIsolationInfo>
</observedFault>
```

2.5.5.1 Context and isolation information

Description: The element <contextAndIsolationInfo> contains the description of the context in which the fault is observed and information needed to isolate the faulty item.

Markup element: <contextAndIsolationInfo>



ICN-S3627-S1000D0513-001-01

Fig 13 Element <contextAndIsolationInfo>

Attributes:

– None

Child elements:

– <faultContext>, the textual description of the context in which the fault is observed
– <isolationInfo>. Refer to Para 2.5.5.2.

Markup example:

```
<observedFault faultCode="NYCJD02" id="flt-0001">
<faultDescr>
<descr>The lights are set to the dim position.</descr>
</faultDescr>
<contextAndIsolationInfo>
<isolationInfo>
<lruItem>
<lru></lru>
</lruItem>
</isolationInfo>
</contextAndIsolationInfo>
</observedFault>
```

2.5.5.2 Fault isolation information

Description: The element <isolationInfo> contains the diagnostic information for the observed fault. This is done by referring out using the element <faultIsolationRef> or

by describing a diagnostic process using the element <diagnosticProcess> or simply testing the LRU using the element <lruItem>.

Markup element: <isolationInfo>

Attributes:

– None

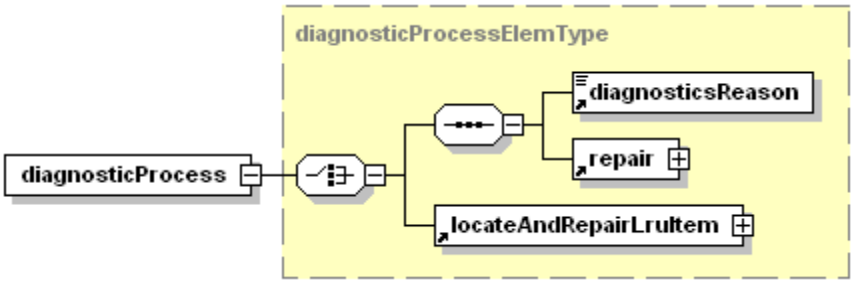
Child elements:

– <faultIsolationRef>, the references to diagnostic information for the observed fault by using the element <refs>. Refer to Chap 3.9.5.2.1.2.
– <diagnosticProcess>. Refer to Para 2.5.5.3.
– <lruItem>. Refer to Para 2.5.3.1.1.

2.5.5.3 Diagnostics

Description: The element <diagnosticProcess> contains a textual description of the reason and a reference to a repair procedure or any locating and repairing tasks and information on the faulty LRU.

Markup element: <diagnosticProcess>



ICN-S3627-S1000D0514-001-01

Fig 14 Element <diagnosticProcess>

Attributes:

– None

Child elements:

– <diagnosticsReason>, the textual description of the of the cause of the failure
– <repair>. Refer to Para 2.5.1.4.1.
– <locateAndRepairLruItem>. Refer to Para 2.5.1.4.

2.5.6 Observed faults alternates group

Description: The element <observedFaultAlts> is an alternates group that provides the capability to group alternates of the observed fault. Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <observedFaultAlts>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <observedFault>. Refer to Para 2.5.5.

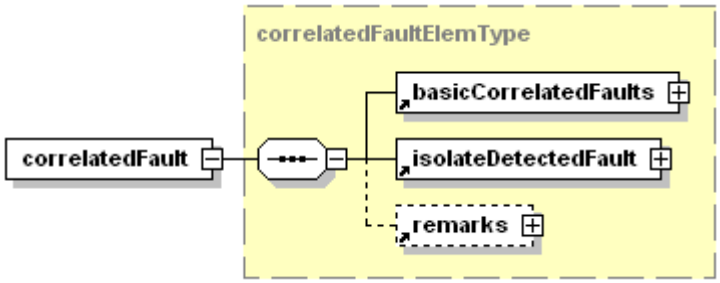
Markup example:

```
<observedFaultAlts id="ofc-001">
<observedFault faultCode="NYCJD01" id="flt-0001">
<faultDescr>
<descr>The lights are set to the dim position.</descr>
</faultDescr>
<contextAndIsolationInfo>
<isolationInfo>
<lruItem>
<lru></lru>
</lruItem>
</isolationInfo>
</contextAndIsolationInfo>
</observedFault>
<observedFault faultCode="NYCJD02" id="flt-0002">
<faultDescr>
<descr>The lights are set to the high position.</descr>
</faultDescr>
<contextAndIsolationInfo>
<isolationInfo>
<lruItem>
<lru></lru>
</lruItem>
</isolationInfo>
</contextAndIsolationInfo>
</observedFault>
</observedFaultAlts>
```

2.5.7 Correlated faults

Description: The element <correlatedFault> contains the information on correlated faults.

Markup element: <correlatedFault>



ICN-S3627-S1000D0515-001-01

Fig 15 Element <correlatedFault>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <basicCorrelatedFaults>, the descriptions of correlated messages and warnings/malfunctions. Refer to Para 2.5.7.1.
- <isolateDetectedFault>, the information for the correlated fault isolation. Refer to Para 2.5.3.1.
- <remarks>. Refer to Chap 3.9.5.1.

Markup example:

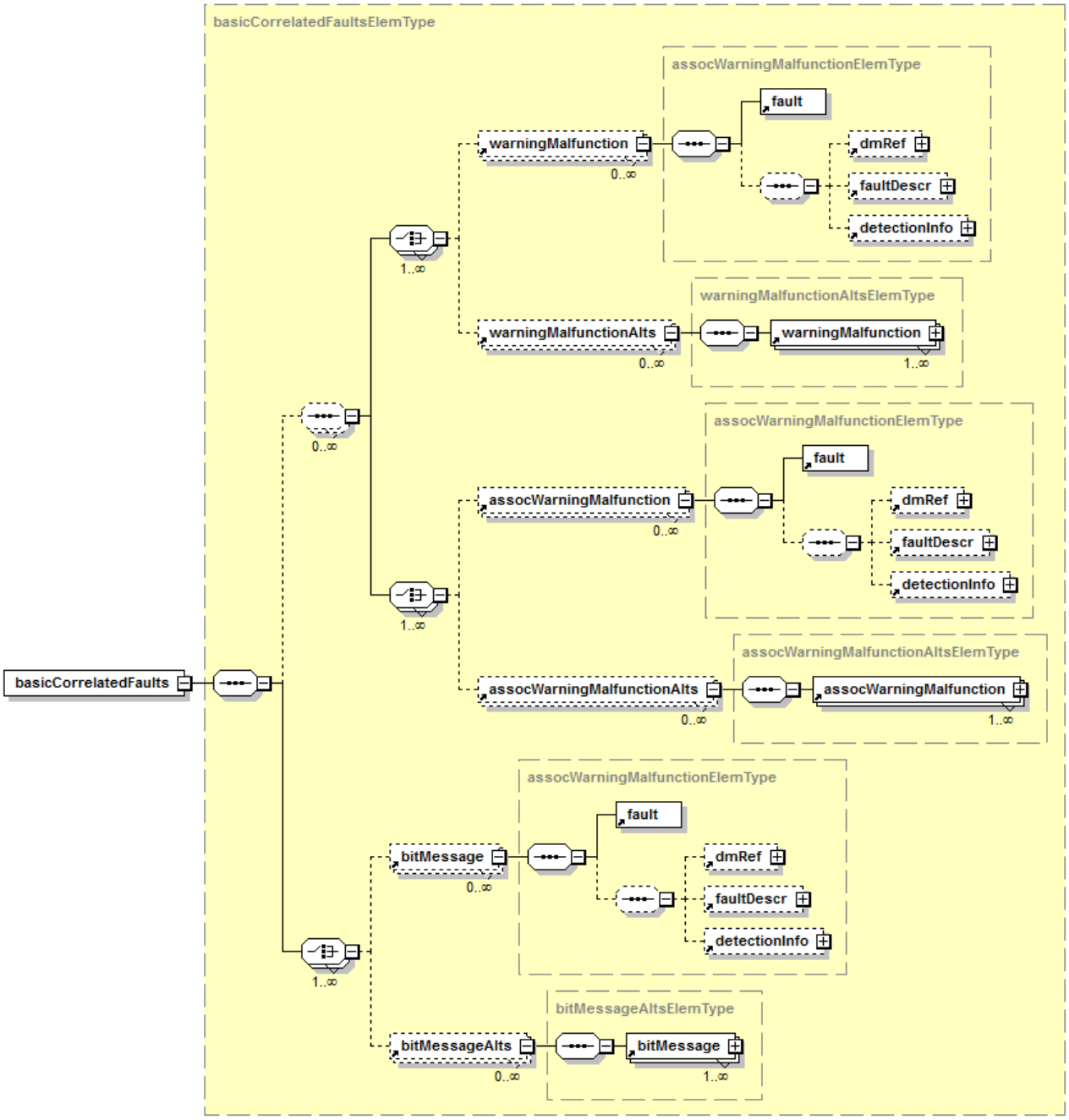
```
<correlatedFault id="CFS0001">
<basicCorrelatedFaults>
<bitMessage><fault faultCode="100FC01"/>
<faultDescr>
<descr>The pedal mechanism is jammed</descr>
</faultDescr>
</bitMessage>
<bitMessage><fault faultCode="200FC01"/>
<faultDescr>
<descr>The derailleur is jammed</descr>
</faultDescr>
</bitMessage>
</basicCorrelatedFaults>
<isolateDetectedFault>
<lruItem>
<lru>
<name>Bicycle chain</name>
<identNumber>
```

```
<manufacturerCode>KZ120</manufacturerCode>
<partAndSerialNumber>
<partNumber>Tchain-120</partNumber>
</partAndSerialNumber>
</identNumber>
</lru>
</lruItem>
</isolateDetectedFault>
<remarks><simplePara>Prepare the derailleur to put transmission
chain back on pedal mechanism.</simplePara></remarks>
</correlatedFault>
```

2.5.7.1 Messages and warnings

Description: The element <basicCorrelatedFaults> contains the list of basic faults (messages and/or warnings) that have been correlated.

Markup element: <basicCorrelatedFaults>



ICN-S3627-S1000D0516-002-01

Fig 16 Element <basicCorrelatedFaults>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <warningMalfunction>. Refer to Para 2.5.7.1.1.
- <warningMalfunctionAlts>. Refer to Para 2.5.7.1.2.
- <assocWarningMalfunction>. Refer to Para 2.5.7.1.3.
- <assocWarningMalfunctionAlts>. Refer to Para 2.5.7.1.4.
- <bitMessage>. Refer to Para 2.5.7.1.5.
- <bitMessageAlts>. Refer to Para 2.5.7.1.6.

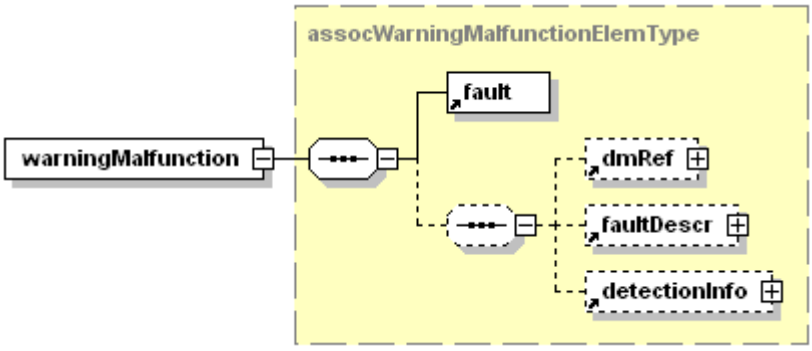
Markup example:

```
<basicCorrelatedFaults>
<bitMessage><fault faultCode="100FC01"/>
<faultDescr>
<descr>The pedal mechanism is jammed</descr>
</faultDescr>
</bitMessage>
<bitMessage><fault faultCode="200FC01"/>
<faultDescr>
<descr>The derailleur is jammed</descr>
</faultDescr>
</bitMessage>
</basicCorrelatedFaults>
```

2.5.7.1.1 Warning or malfunction

Description: The basic fault (warning or malfunction) which is part of the current correlated fault.

Markup element: <warningMalfunction>



ICN-S3627-S1000D0517-001-01

Fig 17 Element <warningMalfunction>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- faultPartCategory (O), the category of the fault part of the correlation

- subCategory (O), the subcategory of the fault part of the correlation
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <fault>, the basic fault presented through the attribute faultCode
- <dmRef>, an optional reference to the data module where the unitary fault has been introduced (eg, a reference to a "detected fault list" data module). Refer to Chap 3.9.5.2.1.2.
- <faultDescr>. Refer to Para 2.5.1.1.
- <detectionInfo>. Refer to Para 2.5.1.3.

Markup example:

```
<warningMalfunction>
<fault faultCode="100FC01"/>
</warningMalfunction>
```

2.5.7.1.2 *Warning or malfunction alternates group*

Description: The element <warningMalfunctionAlts> is an alternates group that provides the capability to group several alternate solutions of a basic fault (element <warningMalfunction>). Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <warningMalfunctionAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <warningMalfunction>. Refer to Para 2.5.7.1.1.

Markup example:

```
<warningMalfunctionAlts>
<warningMalfunction id="warn1">
<fault faultCode="100FC01"/>
</warningMalfunction>
<warningMalfunction id="warn2">
<fault faultCode="100FC02"/>
</warningMalfunction>
</warningMalfunctionAlts>
```

2.5.7.1.3 Associated warning or malfunction

Description: The associated fault (warning or malfunction) which is part of the current correlated fault.

Markup element: <assocWarningMalfunction>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- faultPartCategory (O), the category of the fault part of the correlation
- subCategory (O), the subcategory of the fault part of the correlation
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <fault>, the basic fault presented through the attribute faultCode
- <dmRef>, an optional reference to the data module where the unitary fault has been introduced (eg, a reference to a "detected fault list" data module). Refer to Chap 3.9.5.2.1.2.
- <faultDescr>. Refer to Para 2.5.1.1.
- <detectionInfo>. Refer to Para 2.5.1.3.

Markup example:

```
<assocWarningMalfunction>
<fault faultCode="100FC01"/>
</assocWarningMalfunction>
```

2.5.7.1.4 Associated warning or malfunction alternates group

Description: The element <assocWarningMalfunctionAlts> is an alternates group that provides the capability to group several alternate solutions of element <assocWarningMalfunction>. Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <assocWarningMalfunctionAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <assocWarningMalfunction>. Refer to Para 2.5.7.1.3.

Markup example:

```
<assocWarningMalfunctionAlts>
<assocWarningMalfunction id="assocWarn1">
<fault faultCode="100FC01"/>
</assocWarningMalfunction>
<assocWarningMalfunction id="assocWarn2">
<fault faultCode="100FC02"/>
</assocWarningMalfunction>
</assocWarningMalfunctionAlts>
```

2.5.7.1.5 Computerized message from built-in test equipment

Description: The basic fault (computerized message or warning/malfunction) which is part of the current correlated fault.

Markup element: <bitMessage>

Attributes:

– applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– faultPartCategory (O), the category of the fault part of the correlation
– subCategory (O), the subcategory of the fault part of the correlation
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <fault>, the basic fault presented through the attribute faultCode
– <dmRef>, an optional reference to the data module where the unitary fault has been introduced (eg, a reference to a "detected fault list" data module). Refer to Chap 3.9.5.2.1.2.
– <faultDescr>. Refer to Para 2.5.1.1.
– <detectionInfo>. Refer to Para 2.5.1.3.

Business rule decision point BRDP-S1-00192 - Use of correlation fault concept:

– Decide whether to use the correlated fault concept.

Business rule decision point BRDP-S1-00193 - Use of correlated fault messages and warnings:

– Decide how to populate the elements <warningMalfunction>, <assocWarningMalfunction> and <bitMessage> when using the correlated fault concept.

Business rule decision point BRDP-S1-00194 - Use of detection and description information elements:

– Decide whether the repetition of the detection and description information for the basic fault which has been correlated (elements <faultDescr> and <detectionInfo>) is used. Projects can consider that the detection and description information can for example be populated during IETP generation by picking up the information in the detected fault list data module describing the basic faults.

Markup example:

```
<bitMessage>
<fault faultCode="100FC01"/>
<faultDescr>
<descr>The pedal mechanism is jammed</descr>
</faultDescr>
</bitMessage>
```

2.5.7.1.6 Computerized message from built-in test equipment alternates group

Description: The element <bitMessageAlts> is an alternates group that provides the capability to group several alternate solutions of element <bitMessage>. Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <bitMessageAlts>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <bitMessage>. Refer to Para 2.5.7.1.5.

Markup example:

```
<bitMessageAlts>
<bitMessage><fault faultCode="100FC01"/>
<faultDescr>
<descr>The pedal mechanism is jammed</descr>
</faultDescr>
</bitMessage>
<bitMessage><fault faultCode="200FC01"/>
<faultDescr>
<descr>The derailleur is jammed</descr>
</faultDescr>
</bitMessage>
</bitMessageAlts>
```

2.5.8 Correlated faults alternates group

Description: The element <correlatedFaultAlts> is an alternates group that provides the capability to group several alternate solutions of a correlated fault. Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <correlatedFaultAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <correlatedFault>. Refer to Para 2.5.7.

Markup example:

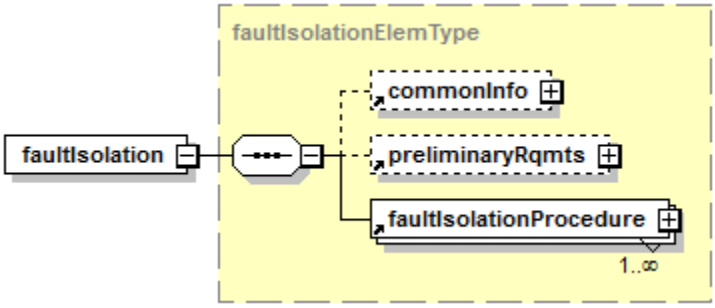
```
<correlatedFaultAlts id="fltc-001">
<correlatedFault id="CFS0001">
<basicCorrelatedFaults>
<bitMessage><fault faultCode="100FC01"/>
<faultDescr>
<descr>The pedal mechanism is jammed</descr>
</faultDescr>
</bitMessage>
<bitMessage><fault faultCode="200FC01"/>
<faultDescr>
<descr>The derailleur is jammed</descr>
</faultDescr>
</bitMessage>
</basicCorrelatedFaults>
<isolateDetectedFault>
<lruItem>
<lru></lru>
</lruItem>
</isolateDetectedFault></correlatedFault>
<correlatedFault id="CFS0002">
<basicCorrelatedFaults>
<bitMessage><fault faultCode="100FC02"/>
<faultDescr>
<descr>The joystick mechanism is jammed</descr>
</faultDescr>
</bitMessage>
<bitMessage><fault faultCode="200FC02"/>
<faultDescr>
<descr>The derailleur is jammed</descr>
</faultDescr>
</bitMessage>
```

```
</basicCorrelatedFaults>
<isolateDetectedFault>
<lruItem>
<lru></lru>
</lruItem>
</isolateDetectedFault></correlatedFault>
</correlatedFaultAlts>
```

2.6 Fault isolation

Description: The fault isolation branch of the Schema identifies and describes the fault and gives the diagnostic path to isolate a faulty item.

Markup element: <faultIsolation>



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Fig 18 Element <faultIsolation>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <commonInfo>. Refer to Chap 3.9.5.2.1.12.
- <preliminaryRqmts>. Refer to Chap 3.9.5.2.1.9.
- <faultIsolationProcedure>. Refer to Para 2.6.1.

Markup example:

```
<faultIsolation>
<faultIsolationProcedure>
<fault faultCode="NYCJD04"/>
<faultDescr><descr>Tire does not function correctly</descr>
</faultDescr>
<isolationProcedure>
<preliminaryRqmts><reqCondGroup><noConds/></reqCondGroup>
<reqSupportEquips><supportEquipDescrGroup>
<supportEquipDescr id="seq-0001"><name>Tire pressure
```

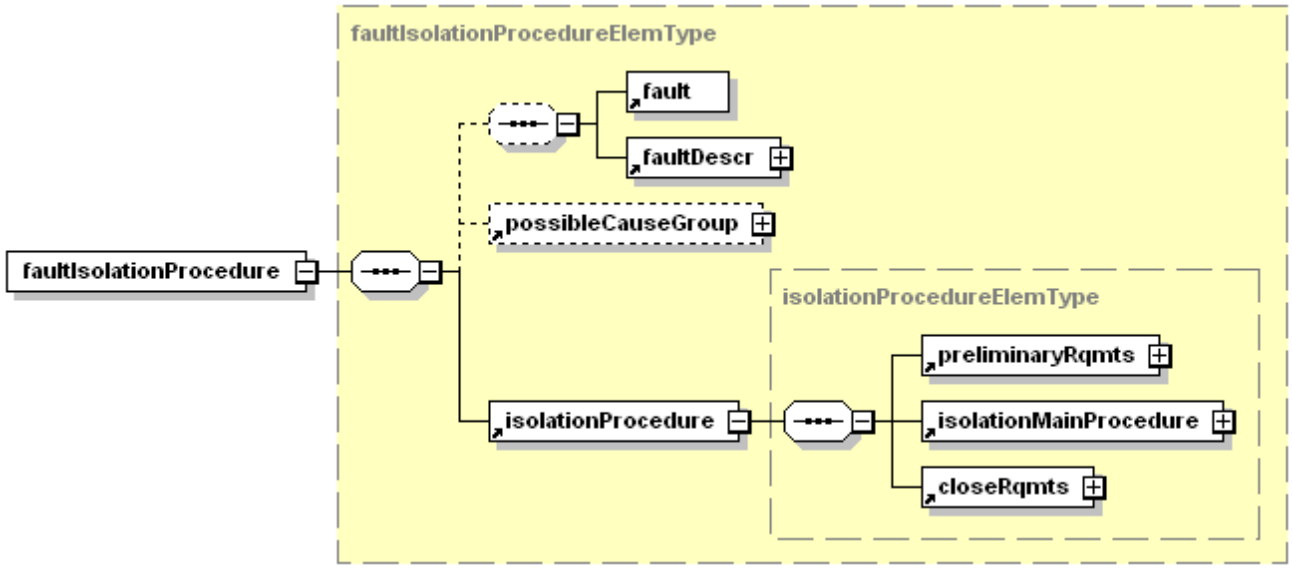
```
gauge</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001-01</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity
unitOfMeasure="EA">1</reqQuantity></supportEquipDescr>
<supportEquipDescr><name>Specialist toolset</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity
unitOfMeasure="EA">1</reqQuantity></supportEquipDescr>
</supportEquipDescrGroup></reqSupportEquips>
<reqSupplies><noSupplies/></reqSupplies>
<reqSpares><noSpares/></reqSpares>
<reqSafety><noSafety/></reqSafety></preliminaryRqmts>
<isolationMainProcedure>
<isolationStep id="stp-0001">
<action>Use the tire pressure gauge (<internalRef
internalRefId="seq-0001"
internalRefTargetType="irtt05"></internalRef>) to do a check of
the pressure</action>
<isolationStepQuestion>What is the tire pressure
reading?</isolationStepQuestion>
<isolationStepAnswer>
<listOfChoices>
<choice nextActionRefId="stp-0002">More than 2700 hPa</choice>
<choice nextActionRefId="stp-0003">Between 100 hPa and 2700
hPa</choice>
<choice nextActionRefId="stp-0004">Less than 100 hPa</choice>
</listOfChoices>
</isolationStepAnswer>
</isolationStep>
<isolationProcedureEnd id="stp-0002">
<action>Deflate the tire until the pressure is 2700 hPa</action>
</isolationProcedureEnd>
<isolationProcedureEnd id="stp-0003">
<action>Inflate the tire as given in
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="215" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef></action>
</isolationProcedureEnd>
<isolationStep id="stp-0004"><action>To do a check of the tire
```

```
for damage</action>
<isolationStepQuestion>Is there damage to the
tire?</isolationStepQuestion>
<isolationStepAnswer>
<yesNoAnswer>
<yesAnswer nextActionRefId="stp-0005"/>
<noAnswer nextActionRefId="stp-0006"/>
</yesNoAnswer>
</isolationStepAnswer>
</isolationStep>
<isolationProcedureEnd id="stp-0005">
<action>Replace the tire (refer to
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="921" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>).</action>
</isolationProcedureEnd>
<isolationProcedureEnd id="stp-0006">
<action>Replace the inner-tube (refer to
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="10" disassyCode="00" disassyCodeVariant="AA"
infoCode="921" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>).</action>
</isolationProcedureEnd>
</isolationMainProcedure>
<closeRqmts>
<reqCondGroup><noConds/></reqCondGroup>
</closeRqmts>
</isolationProcedure>
</faultIsolationProcedure>
</faultIsolation>
```

2.6.1 Fault isolation procedure

Description: The element <faultIsolationProcedure> contains the detailed fault isolation procedure including fault code, fault description, and the possible causes of the malfunction that can be isolated through the fault isolation procedure.

Markup element: <faultIsolationProcedure>



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Fig 19 Element <faultIsolationProcedure>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <fault>, the basic fault presented through the attribute faultCode
- <faultDescr>. Refer to Para 2.5.1.1.
- <possibleCauseGroup>. Refer to Para 2.6.1.1.
- <isolationProcedure>. Refer to Para 2.6.1.2.

Markup example:

```
<faultIsolationProcedure>
<fault faultCode="NYCJD04"/>
<faultDescr><descr>Tire does not function correctly</descr>
</faultDescr>
<isolationProcedure>
<preliminaryRqmts><reqCondGroup><noConds/></reqCondGroup>
<reqSupportEquips><supportEquipDescrGroup>
<supportEquipDescr id="seq-0001"><name>Tire pressure
gauge</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
```

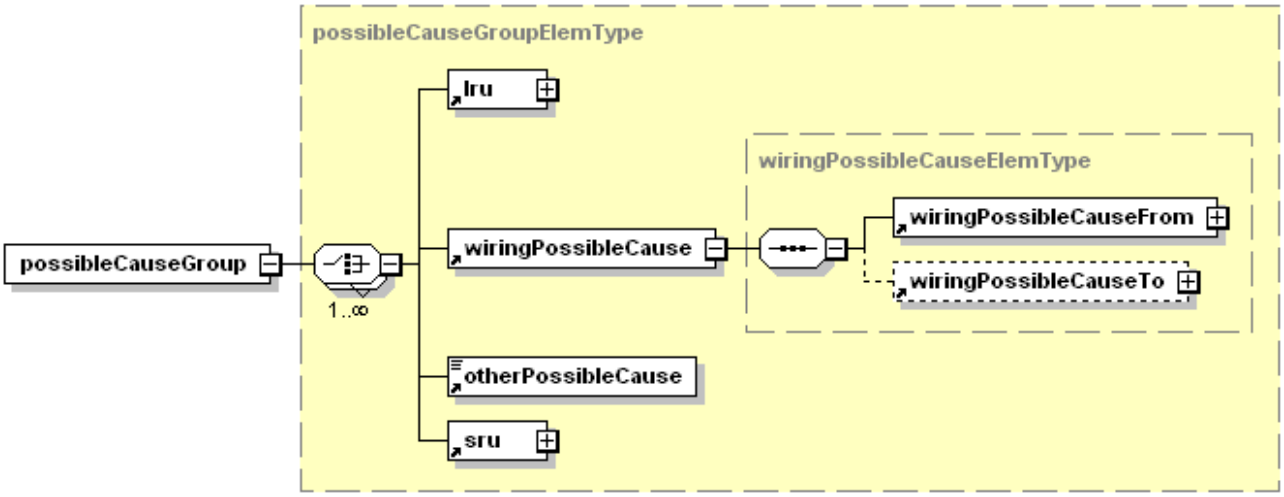
```
<partNumber>BSK-TLST-001-01</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
<supportEquipDescr><name>Specialist toolset</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
</supportEquipDescrGroup>
</reqSupportEquips>
<reqSupplies><noSupplies/></reqSupplies>
<reqSpares><noSpares/></reqSpares>
<reqSafety><noSafety/></reqSafety></preliminaryRqmts>
<isolationMainProcedure>
<isolationStep id="stp-0001">
<action>Use the tire pressure gauge (<internalRef
internalRefId="seq-0001"
internalRefTargetType="irtt05"></internalRef>) to do a check of
the pressure</action>
<isolationStepQuestion>What is the tire pressure
reading?</isolationStepQuestion>
<isolationStepAnswer>
<listOfChoices>
<choice nextActionRefId="stp-0002">More than 2700 hPa</choice>
<choice nextActionRefId="stp-0003">Between 100 hPa and 2700
hPa</choice>
<choice nextActionRefId="stp-0004">Less than 100 hPa</choice>
</listOfChoices>
</isolationStepAnswer>
</isolationStep>
<isolationProcedureEnd id="stp-0002">
<action>Deflate the tire until the pressure is 2700 hPa</action>
</isolationProcedureEnd>
<isolationProcedureEnd id="stp-0003">
<action>Inflate the tire as given in
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="215" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef></action>
</isolationProcedureEnd>
<isolationStep id="stp-0004"><action>To do a check of the tire
for damage</action>
<isolationStepQuestion>Is there damage to the
```

```
tire?</isolationStepQuestion>
<isolationStepAnswer>
<yesNoAnswer>
<yesAnswer nextActionRefId="stp-0005"/>
<noAnswer nextActionRefId="stp-0006"/>
</yesNoAnswer>
</isolationStepAnswer>
</isolationStep>
<isolationProcedureEnd id="stp-0005">
<action>Replace the tire (refer to <dmRef><dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="921" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>).</action>
</isolationProcedureEnd>
<isolationProcedureEnd id="stp-0006">
<action>Replace the inner-tube (refer to <dmRef><dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="10" disassyCode="00" disassyCodeVariant="AA"
infoCode="921" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>).</action>
</isolationProcedureEnd>
</isolationMainProcedure>
<closeRqmts>
<reqCondGroup><noConds/></reqCondGroup>
</closeRqmts>
</isolationProcedure>
</faultIsolationProcedure>
```

2.6.1.1 List of possible causes

Description: The element <possibleCauseGroup> provides the list of all possible causes of the fault that can be isolated through a fault isolation procedure.

Markup element: <possibleCauseGroup>



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Fig 20 Element <possibleCauseGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <lru>. LRU possible cause. Refer to Para 2.5.1.3.2.
- <wiringPossibleCause>. Wiring path possible cause. Refer to Para 2.6.1.1.1.
- <otherPossibleCause>. Other possible cause. Refer to Para 2.6.1.1.4.
- <sru>. SRU possible cause. Refer to Para 2.5.1.3.4.

Markup example:

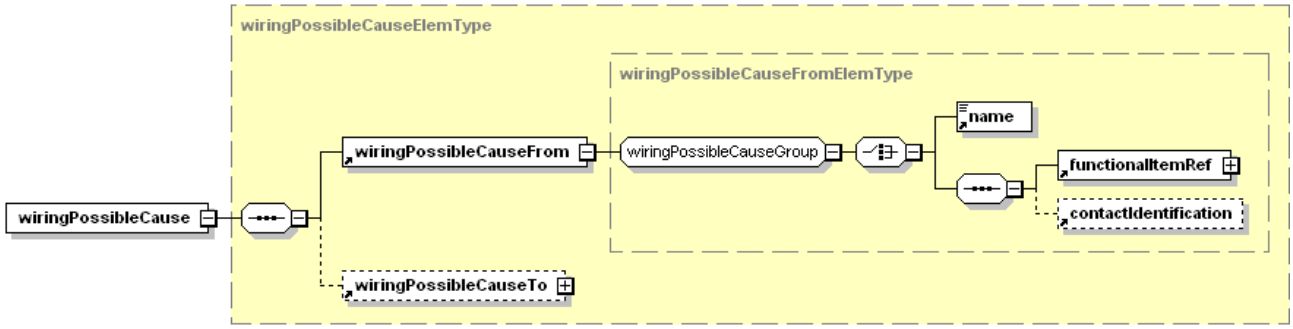
```
<possibleCauseGroup>
<lru id="pc1">
<name>ACTUATOR-AIR INTAKE FLAP</name>
<functionalItemRef functionalItemNumber="516KB"/>
</lru>
<wiringPossibleCause id="pc2">
<wiringPossibleCauseFrom>
<functionalItemRef functionalItemNumber="4926VC"/>
<contactIdentification contactIdent="3"/>
</wiringPossibleCauseFrom>
<wiringPossibleCauseTo>
<name>ground point</name>
</wiringPossibleCauseTo>
</wiringPossibleCause>
<otherPossibleCause id="pc3">Lubrication of the
NLG</otherPossibleCause>
<sru id="pc4">
```

```
<identNumber>
<manufacturerCode>KT666</manufacturerCode>
<partAndSerialNumber>
<partNumber>TIRES-010101</partNumber>
</partAndSerialNumber>
</identNumber>
</sru>
</possibleCauseGroup>
```

2.6.1.1.1 Wiring path possible cause

Description: The element <wiringPossibleCause> describes a wiring path that is a possible cause of a fault. It can also be used to identify a single electrical connection point. The element <wiringPossibleCause> contains the two ends of the wiring path.

Markup element: <wiringPossibleCause>



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Fig 21 Element <wiringPossibleCause>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <wiringPossibleCauseFrom>, the "from" wiring path extremity. Refer to Para 2.6.1.1.2.
- <wiringPossibleCauseTo>, the "to" wiring path extremity (not applicable if the possible cause is a single electrical connection point). Refer to Para 2.6.1.1.2.

Markup example:

```
<wiringPossibleCause id="pc2">
<wiringPossibleCauseFrom>
<functionalItemRef functionalItemNumber="59KD">
<name>ECB-APU ELECTRONIC CONTROL BOX</name>
</functionalItemRef>
<contactIdentification contactIdent="AC/3"/>
</wiringPossibleCauseFrom>
<wiringPossibleCauseTo>
```

```
<functionalItemRef functionalItemNumber="4926VC"/>
<contactIdentification contactIdent="1"/>
</wiringPossibleCauseTo>
</wiringPossibleCause>
```

2.6.1.1.2 Wiring path extremities (from/to)

Description: The wiring path extremity elements <wiringPossibleCauseFrom> and <wiringPossibleCauseTo> contain the wiring path connection information.

Markup elements: <wiringPossibleCauseFrom> and <wiringPossibleCauseTo>

Attributes:

– None

Child elements:

– <name>, the wire extremity name (eg, "ground point", "next terminal block"). Refer to Chap 3.9.5.2.1.10.
– <functionalItemRef>, the equipment functional item reference. Refer to Chap 3.9.5.1.
– <contactIdentification>, the contact identification. Refer to Para 2.6.1.1.3.

Markup example:

```
<wiringPossibleCause id="pc3">
<wiringPossibleCauseFrom>
<functionalItemRef functionalItemNumber="4926VC"/>
<contactIdentification contactIdent="3"/>
</wiringPossibleCauseFrom>
<wiringPossibleCauseTo>
<name>ground point</name>
</wiringPossibleCauseTo>
</wiringPossibleCause>
```

2.6.1.1.3 Contact identification

Description: The element <contactIdentification> contains the contact identification of a functional item.

Attributes:

– contactIdent (M), contains the identification of the contact, (eg, "A", "1")

Child elements:

– None

Markup example:

```
<contactIdentification contactIdent="1"/>
```

2.6.1.1.4 Other possible causes

Description: The element <otherPossibleCause> contains the textual description of any possible cause that is not a lru or a wiring path, such as an immaterial possible cause (eg, "MLG wheel balance", "Oil level of the MLG shock absorber").

Markup element: <otherPossibleCause>

Attributes:

- `applicRefId` (O), the applicability information. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<otherPossibleCause id="pc3">Lubrication of the NLG
</otherPossibleCause>
```

2.6.1.2 Isolation procedure

Description: The element <`isolationProcedure`> contains the isolation procedure including preliminary and close-up requirements.

Markup element: <`isolationProcedure`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `independentCheck` (O), the complete core procedure must be checked by a supervisor with a given qualification
- `skillLevelCode` (O), the skill level to which the procedure has been written. Refer to Chap 3.9.5.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`preliminaryRqmts`>. Refer to Chap 3.9.5.2.1.9.
- <`isolationMainProcedure`>. Refer to Para 2.6.1.3.
- <`closeRqmts`>. Refer to Para 2.6.1.8 and Chap 3.9.5.2.1.9.

Business rule decision point BRDP-S1-00195 - Use of the attribute `independentCheck` on the elements <`isolationProcedure`>, <`isolationStep`> and <`isolationProcedureEnd`>:

- Decide whether to use the attribute `independentCheck`, which values to use and allocate suitable definitions.

Markup example:

```
<isolationProcedure>
<preliminaryRqmts><reqCondGroup><noConds/></reqCondGroup>
<reqSupportEquips><supportEquipDescrGroup>
```

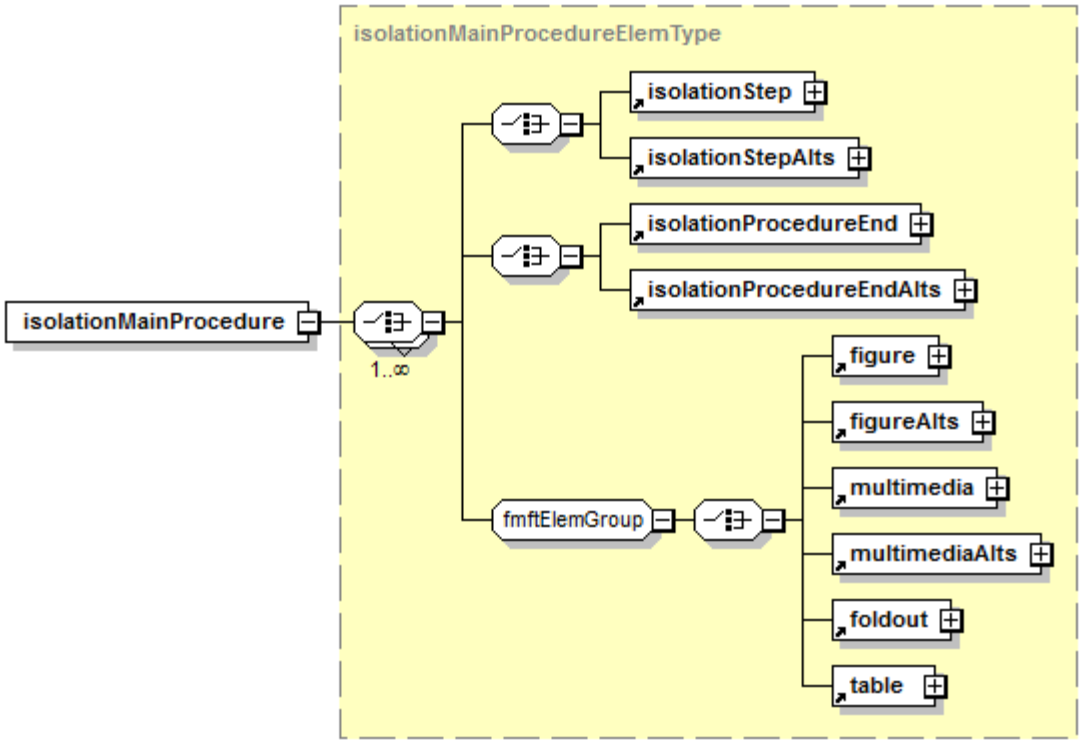
```
<supportEquipDescr id="seq-0001"><name>Tire pressure
gauge</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001-01</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
<supportEquipDescr><name>Specialist toolset</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
</supportEquipDescrGroup></reqSupportEquips>
<reqSupplies><noSupplies/></reqSupplies>
<reqSpares><noSpares/></reqSpares>
<reqSafety><noSafety/></reqSafety></preliminaryRqmts>
<isolationMainProcedure>
<isolationStep id="stp-0001">
<action>Use the tire pressure gauge (<internalRef
internalRefId="seq-0001"
internalRefTargetType="irtt05"></internalRef>) to do a check of
the pressure</action>
<isolationStepQuestion>What is the tire pressure
reading?</isolationStepQuestion>
<isolationStepAnswer>
<listOfChoices>
<choice nextActionRefId="stp-0002">More than 2700 hPa</choice>
<choice nextActionRefId="stp-0003">Between 100 hPa and 2700
hPa</choice>
<choice nextActionRefId="stp-0004">Less than 100 hPa</choice>
</listOfChoices>
</isolationStepAnswer>
</isolationStep>
<isolationProcedureEnd id="stp-0002">
<action>Deflate the tire until the pressure is 2700 hPa</action>
</isolationProcedureEnd>
<isolationProcedureEnd id="stp-0003">
<action>Inflate the tire as given in <dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="215" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef></action>
</isolationProcedureEnd>
<isolationStep id="stp-0004"><action>To do a check of the tire
```

```
for damage</action>
<isolationStepQuestion>Is there damage to the
tire?</isolationStepQuestion>
<isolationStepAnswer>
<yesNoAnswer>
<yesAnswer nextActionRefId="stp-0005"/>
<noAnswer nextActionRefId="stp-0006"/>
</yesNoAnswer>
</isolationStepAnswer>
</isolationStep>
<isolationProcedureEnd id="stp-0005">
<action>Replace the tire (refer to <dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="921" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>).</action>
</isolationProcedureEnd>
<isolationProcedureEnd id="stp-0006">
<action>Replace the inner-tube (refer to <dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="10" disassyCode="00" disassyCodeVariant="AA"
infoCode="921" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>).</action>
</isolationProcedureEnd>
</isolationMainProcedure>
<closeRqmts>
<reqCondGroup><noConds/></reqCondGroup>
</closeRqmts>
</isolationProcedure>
```

2.6.1.3 Fault isolation main procedure

Description: The element <isolationMainProcedure> contains the individual isolation steps.

Markup element: <isolationMainProcedure>



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Fig 22 Element <isolationMainProcedure>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <isolationStep>. Refer to Para 2.6.1.4.
- <isolationStepAlts>. Refer to Para 2.6.1.5.
- <isolationProcedureEnd>. Refer to Para 2.6.1.6.
- <isolationProcedureEndAlts>. Refer to Para 2.6.1.7.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7.
- <table>. Refer to Chap 3.9.5.2.1.6.

Markup example:

```
<isolationMainProcedure>
<isolationStep id="stp-0001">
<action>Use the tire pressure gauge to do a check of the
```

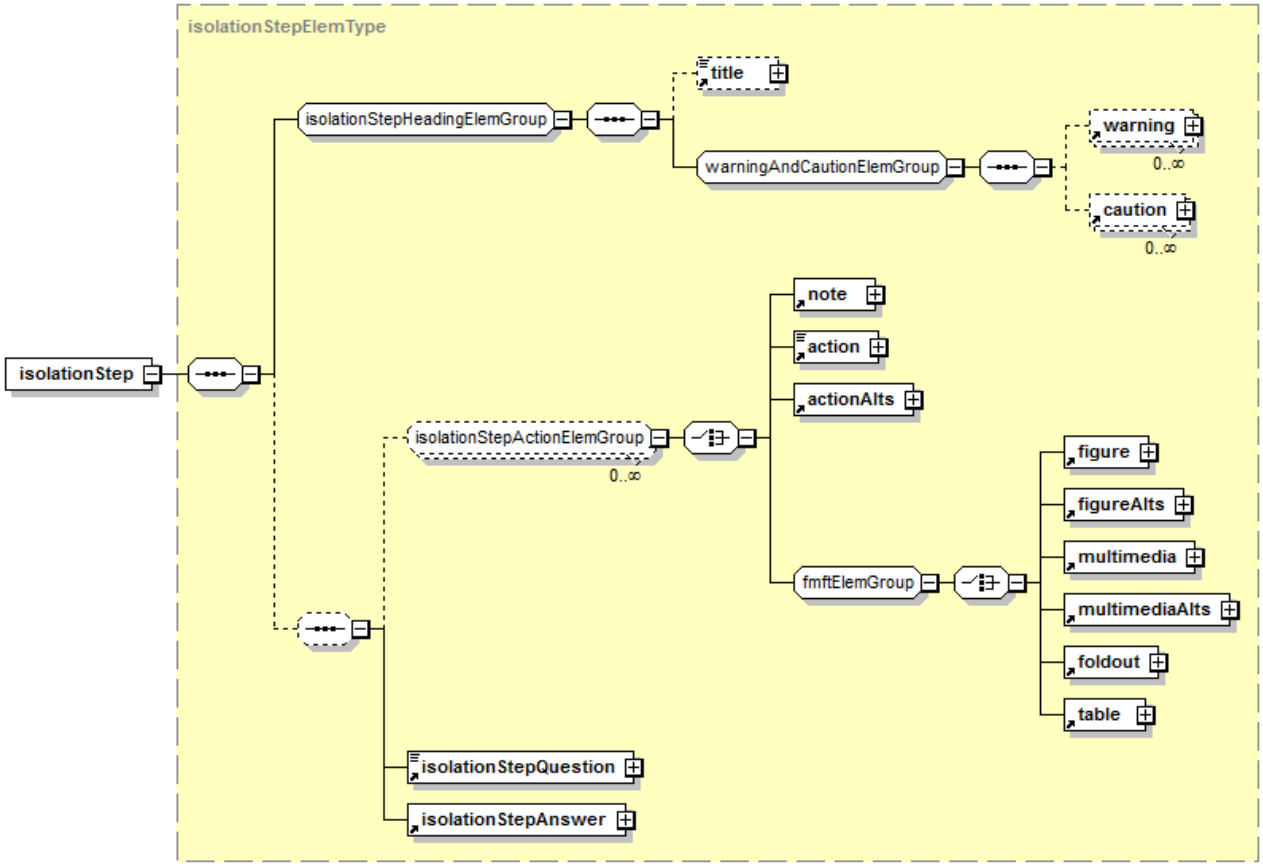
```
pressure</action>
<isolationStepQuestion>What is the tire pressure
reading?</isolationStepQuestion>
<isolationStepAnswer>
<listOfChoices>
<choice nextActionRefId="stp-0002">More than 2700 hPa</choice>
<choice nextActionRefId="stp-0003">Between 100 hPa and 2700
hPa</choice>
<choice nextActionRefId="stp-0004">Less than 100 hPa</choice>
</listOfChoices>
</isolationStepAnswer>
</isolationStep>
<isolationProcedureEnd id="stp-0002">
<action>Deflate the tire until the pressure is 2700 hPa</action>
</isolationProcedureEnd>
<isolationProcedureEnd id="stp-0003">
<action>Inflate the tire as given in <dmRef><dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="215" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent></dmRef></action></isolationProcedureEnd>
<isolationStep id="stp-0004"><action>To do a check of the tire
for damage</action>
<isolationStepQuestion>Is there damage to the
tire?</isolationStepQuestion>
<isolationStepAnswer>
<yesNoAnswer>
<yesAnswer nextActionRefId="stp-0005"/>
<noAnswer nextActionRefId="stp-0006"/>
</yesNoAnswer>
</isolationStepAnswer>
</isolationStep>
<isolationProcedureEnd id="stp-0005">
<action>Replace the tire (refer to <dmRef><dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="921" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>).</action>
</isolationProcedureEnd>
<isolationProcedureEnd id="stp-0006">
<action>Replace the inner-tube (refer to <dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="10" disassyCode="00" disassyCodeVariant="AA"
infoCode="921" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>).</action>
```

```
</isolationProcedureEnd>
</isolationMainProcedure>
```

2.6.1.4 Fault isolation step

Description: The element <isolationStep> contains the textual description of the action, the question and answer alternatives. It can also include a title, warnings, cautions and notes.

Markup element: <isolationStep>



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Fig 23 Element <isolationStep>

Attributes:

- `applicRefId` (O), the applicability information. Refer to Chap 3.9.5.3.
- `id` (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `keepWithNext` (O), the indication whether a step must be presented together with the next step, if possible. The attribute `keepWithNext` is intended for use only when absolutely necessary in a situation where for instance scrolling is not practical for the user, or the viewing device does not allow scrolling.The attribute `keepWithNext` can have one of the following values:

- "0" (D) - No, the step must not be kept with the next sibling step.
- "1" - Yes, the step must be kept with the next sibling step (if one exists) and all children of the element for which the attribute is set should be kept together as well (if possible). The attribute keepWithNext has no meaning on a final step.

– warningRefs (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
– cautionRefs (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
– independentCheck (O), the isolation step must be checked by a supervisor with a given qualification
– skillLevelCode (O), the skill level to which the procedure has been written. Refer to Chap 3.9.5.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– <title>. Refer to Para 2.6.1.4.1 for the use of titles. Refer to Chap 3.9.5.2.1.5 for general rules.
– <warning>. Refer to Chap 3.9.3.
– <caution>. Refer to Chap 3.9.3.
– <note>. Refer to Chap 3.9.3.
– <action>. Refer to Para 2.6.1.4.2.
– <actionAlts>. Refer to Para 2.6.1.4.3.
– <figure>. Refer to Chap 3.9.5.2.1.7.
– <figureAlts>. Refer to Chap 3.9.5.2.1.7.
– <multimedia>. Refer to Chap 3.9.5.2.1.7.
– <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
– <foldout>. Refer to Chap 3.9.5.2.1.7.
– <table>. Refer to Chap 3.9.5.2.1.6.
– <isolationStepQuestion>, the textual question based on the corresponding action. Refer to Para 2.6.1.4.4.
– <isolationStepAnswer>, the answers to the question. Refer to Para 2.6.1.4.5.

2.6.1.4.1 Title

Description: The element <title> contains the title of the step.

Markup element: <title>

Attributes:

– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– All child text elements of the element <action> can be used. Refer to Para 2.6.1.4.2 and Chap 3.9.5.2.1.10.

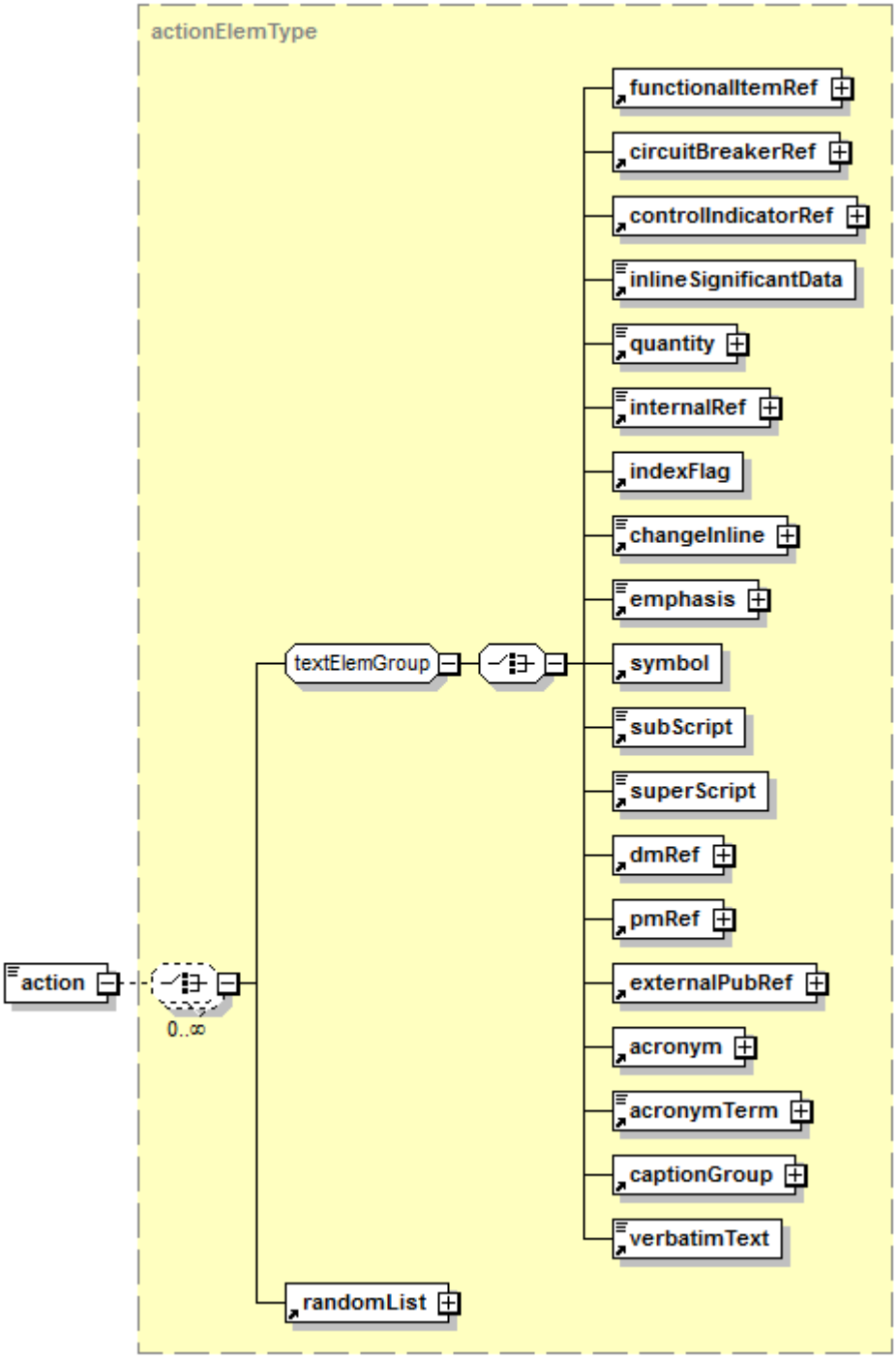
Markup example:

```
<title>Tire Pressure</title>
```

2.6.1.4.2 Action

Description: The element <action> contains an action in the isolation procedure.

Markup element: <action>



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Fig 24 Element <action>

Attributes:

- `applicRefId` (O), the applicability information. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- All text elements given in Fig 24 can be used. Refer to Chap 3.9.5.2.1.10.
- <`randomList`>. Refer to Chap 3.9.5.2.1.3.

Markup example:

```
<action>Use the tire pressure gauge (<internalRef
internalRefId="seq-0001" internalRefTargetType="irtt05"/> to do
a check of the pressure</action>
```

2.6.1.4.3 Action alternates group

Description: The element <`actionAlts`> is an alternates group that provides the capability to group several alternate solutions of the action. Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <`actionAlts`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

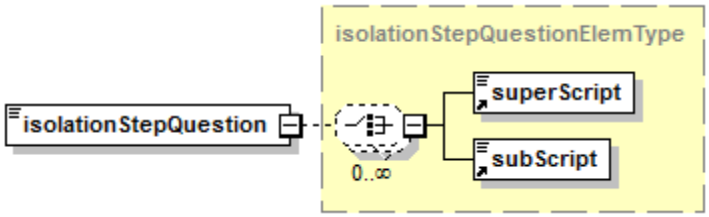
Child elements:

- <`action`>. Refer to Para 2.6.1.4.2.

2.6.1.4.4 Question

Description: The element <`isolationStepQuestion`> contains the question that is prompted by the action contained in the element <`action`>.

Markup element: <isolationStepQuestion>



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Fig 25 Element <isolationStepQuestion>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <subScript>. The items to be subscripted. Refer to Chap 3.9.5.2.1.10.
- <superScript>. The items to be superscripted. Refer to Chap 3.9.5.2.1.10.

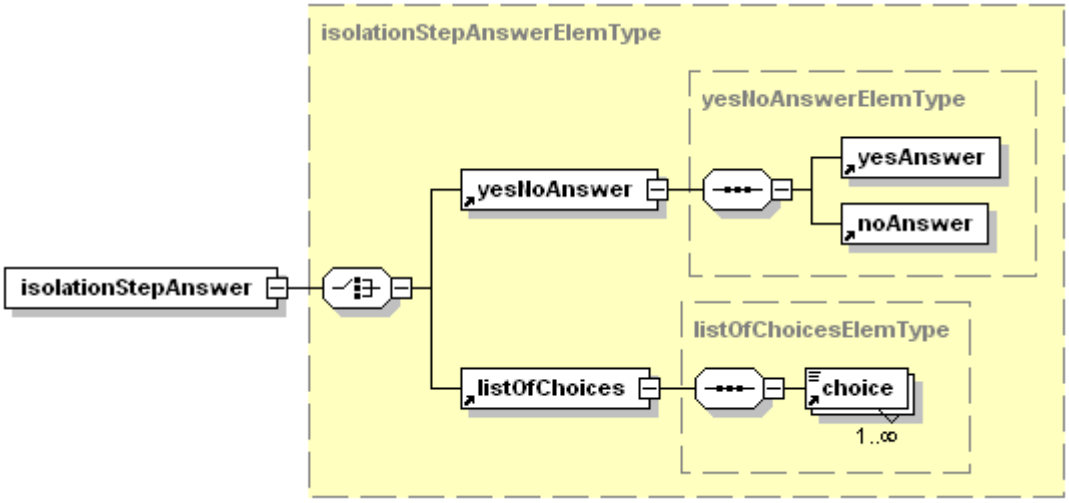
Markup example:

```
<isolationStepQuestion>What is the tire pressure reading?
</isolationStepQuestion>
```

2.6.1.4.5 Answer

Description: The element <isolationStepAnswer> contains the answers to the corresponding question (element <isolationStepQuestion>). The answers are given in the form of a reference to another action, to one or more final actions (element <isolationProcedureEnd>) or to close-up requirements (element <closeRqmts>).

Markup element: <isolationStepAnswer>



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Fig 26 Element <isolationStepAnswer>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <yesNoAnswer>. Refer to Para 2.6.1.4.6.
- <listOfChoices>. Refer to Para 2.6.1.4.9.

2.6.1.4.6 Answers - Yes or No

Description: The element <yesNoAnswer> contains the selection of the two answers Yes (element <yesAnswer>) or No (element <noAnswer>).

Markup element: <yesNoAnswer>

Attributes:

- None

Child elements:

- <yesAnswer>, contains the action for a positive answer. Refer to Para 2.6.1.4.7.
- <noAnswer>, contains the action for a negative answer. Refer to Para 2.6.1.4.8.

2.6.1.4.7 Yes answer

Description: The element <yesAnswer> provides the internal link to the next action related to a positive answer.

Markup element: <yesAnswer>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- nextActionRefId (M), the identifier for the next action
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

2.6.1.4.8 No answer

Description: The element <noAnswer> provides the internal link to the next action related to a negative answer.

Markup element: <noAnswer>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- nextActionRefId (M), the identifier for the next action
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

2.6.1.4.9 Answers - Selection of choices

Description: The element <listOfChoices> contains a selection of multiple (one or more) choices.

Markup element: <listOfChoices>

Attributes:

- None

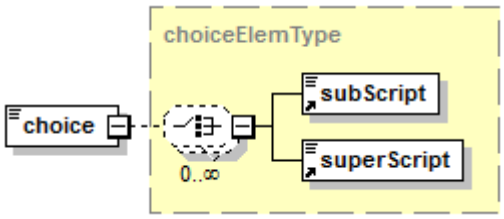
Child elements:

- <choice>, a possible choice. Refer to Para 2.6.1.4.10.

2.6.1.4.10 Choice

Description: The element <choice> provides the internal link to the next action related to a selection from a choice of answers.

Markup element: <choice>



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Fig 27 Element <choice>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- nextActionRefId (M), the identifier for the next action
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.

2.6.1.5 Isolation step alternates group

Description: The element <isolationStepAlts> is an alternates group that provides the capability to group several alternate solutions of the fault isolation step. Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <isolationStepAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <isolationStep>. Refer to Para 2.6.1.4.

Markup example:

```
<isolationStepAlts id="stpc-0001">
<isolationStep id="stp-0001">
<action>To do a check of the tire for damage</action>
<isolationStepQuestion>Is there damage to the
tire?</isolationStepQuestion>
<isolationStepAnswer>
<yesNoAnswer>
<yesAnswer nextActionRefId="stp-0003"/>
<noAnswer nextActionRefId="stp-0004"/>
</yesNoAnswer>
</isolationStepAnswer>
</isolationStep>
<isolationStep id="stp-0002">
<action>To do a check of the wheel for damage</action>
<isolationStepQuestion>Is there damage to the
wheel?</isolationStepQuestion>
<isolationStepAnswer>
<yesNoAnswer>
<yesAnswer nextActionRefId="stp-0005"/>
<noAnswer nextActionRefId="stp-0006"/>
</yesNoAnswer>
</isolationStepAnswer>
</isolationStep>
</isolationStepAlts>
```

2.6.1.6 Isolation procedure end

Description: The element <isolationProcedureEnd> contains further isolation actions (these are either within the data module or referenced out to another data module) or to the element <closeRqmts> containing a closeup procedure.

Markup element: <isolationProcedureEnd>

Attributes:

- `applicRefId` (O), the applicability information. Refer to Chap 3.9.5.3.
- `id` (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `warningRefs` (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `cautionRefs` (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `independentCheck` (O), the isolation step must be checked by a supervisor with a given qualification
- `skillLevelCode` (O), the skill level to which the procedure has been written. Refer to Chap 3.9.5.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`title`>. Refer to Para 2.6.1.4.1 for the use of titles. Refer to Chap 3.9.5.2.1.5 for general rules.
- <`warning`>. Refer to Chap 3.9.3.
- <`caution`>. Refer to Chap 3.9.3.
- <`note`>. Refer to Chap 3.9.3.
- <`action`>. Refer to Para 2.6.1.4.2.
- <`figure`>. Refer to Chap 3.9.5.2.1.7.
- <`figureAlts`>. Refer to Chap 3.9.5.2.1.7.
- <`multimedia`>. Refer to Chap 3.9.5.2.1.7.
- <`multimediaAlts`>. Refer to Chap 3.9.5.2.1.7.
- <`foldout`>. Refer to Chap 3.9.5.2.1.7.
- <`table`>. Refer to Chap 3.9.5.2.1.6.

Markup example:

```
<isolationProcedureEnd id="stp-0002">
<action>Deflate the tire until the pressure is 2700 hPa</action>
</isolationProcedureEnd>
```

2.6.1.7 Isolation procedure end alternates group

Description: The element <`isolationProcedureEndAlts`> is an alternates group that provides the capability to group several alternate solutions of the isolation procedure end. Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <`isolationProcedureEndAlts`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <isolationProcedureEnd>. Refer to Para 2.6.1.6.

Markup example:

```
<isolationProcedureEndAlts id="ipec-0002">
<isolationProcedureEnd id="ipe-0002">
<action>Deflate the tire until the pressure is 2700 hPa</action>
</isolationProcedureEnd>
<isolationProcedureEnd id="ipe-0003">
<action>Inflate the tire as given in <dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="215" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</action>
</isolationProcedureEnd>
</isolationProcedureEndAlts>
```

2.6.1.8 Close-up requirements

Description: The element <closeRqmts> contains any actions/conditions that must be in place before the equipment, which was the object of the procedure, is returned to operation. Refer to Chap 3.9.5.2.1.9.

Markup element: <closeRqmts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <reqCondGroup>. Refer to Chap 3.9.5.2.1.9.

Markup example:

```
<faultIsolation>
<faultIsolationProcedure>
<fault faultCode="NYCJD04"/>
<faultDescr><descr>Tire does not function correctly</descr>
</faultDescr>
```

```
<isolationProcedure>
<preliminaryRqmts><reqCondGroup><noConds/></reqCondGroup>
<reqSupportEquips><supportEquipDescrGroup>
<supportEquipDescr id="seq-0001"><name>Tire pressure
gauge</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001-01</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
<supportEquipDescr><name>Specialist toolset</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
</supportEquipDescrGroup></reqSupportEquips>
<reqSupplies><noSupplies/></reqSupplies>
<reqSpares><noSpares/></reqSpares>
<reqSafety><noSafety/></reqSafety></preliminaryRqmts>
<isolationMainProcedure>
<isolationStep id="stp-0001">
<action>Use the tire pressure gauge (<internalRef
internalRefId="seq-0001"
internalRefTargetType="irtt05"></internalRef>) to do a check of
the pressure</action>
<isolationStepQuestion>What is the tire pressure
reading?</isolationStepQuestion>
<isolationStepAnswer>
<listOfChoices>
<choice nextActionRefId="stp-0002">More than 2700 hPa</choice>
<choice nextActionRefId="stp-0003">Between 100 hPa and 2700
hPa</choice>
<choice nextActionRefId="stp-0004">Less than 100 hPa</choice>
</listOfChoices>
</isolationStepAnswer>
</isolationStep>
<isolationProcedureEnd id="stp-0002">
<action>Deflate the tire until the pressure is 2700 hPa</action>
</isolationProcedureEnd>
<isolationProcedureEnd id="stp-0003">
<action>Inflate the tire as given in <dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="215" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
```

```
</dmRef>
</action>
</isolationProcedureEnd>
<isolationStep id="stp-0004"><action>To do a check of the tire
for damage</action>
<isolationStepQuestion>Is there damage to the
tire?</isolationStepQuestion>
<isolationStepAnswer>
<yesNoAnswer>
<yesAnswer nextActionRefId="stp-0005"/>
<noAnswer nextActionRefId="stp-0006"/>
</yesNoAnswer>
</isolationStepAnswer>
</isolationStep>
<isolationProcedureEnd id="stp-0005">
<action>Replace the tire (refer to <dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="20" disassyCode="00" disassyCodeVariant="AA"
infoCode="921" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>).</action>
</isolationProcedureEnd>
<isolationProcedureEnd id="stp-0006">
<action>Replace the inner-tube (refer to <dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0"
assyCode="10" disassyCode="00" disassyCodeVariant="AA"
infoCode="921" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>).</action>
</isolationProcedureEnd>
</isolationMainProcedure>
<closeRqmts>
<reqCondGroup><noConds/></reqCondGroup>
</closeRqmts>
</isolationProcedure>
</faultIsolationProcedure>
</faultIsolation>
```

Chapter 3.9.5.2.5

Content section - Maintenance planning information

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Chap 3.9.3	Authoring - Warnings, cautions and notes
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Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.5	Common constructs - Titles
Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.2.1.12	Common constructs - Common information
Chap 3.9.5.2.7	Content section - Parts information
Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.6.1	Attributes - Project configurable values
Chap 4.13.3	Optimizing and reuse - Alternates concept
Chap 5.2.1.6	Common information sets - Maintenance planning information
Chap 8.2.1	Maintained SNS - Generic

Chap No./Document No.	Title
MSG-3	Operator/Manufacturer Scheduled Maintenance Development
S3000L	International procedure specification for Logistics Support Analysis (LSA)
S4000P	International specification for developing and continuously improving preventive maintenance

1 General

The maintenance planning ("schedule") Schema is used to capture and represent maintenance planning information in data modules.

2 Maintenance planning information

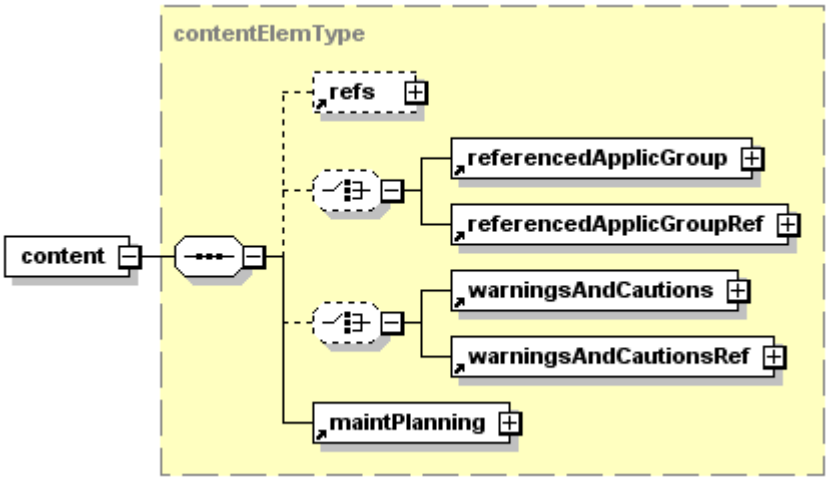
2.1 Schema basic rules

The granularity of these data modules is determined by the application of the SNS in accordance with Chap 8.2.1 and the data module coding guidance given in Chap 5.2.1.6.

2.2 Content

Description: The element <content> contains the content section of the maintenance planning data modules. The maintenance planning ("schedule") Schema can be used for several types of maintenance planning information.

Markup element: <content>



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Fig 1 Major elements in maintenance planning content

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.

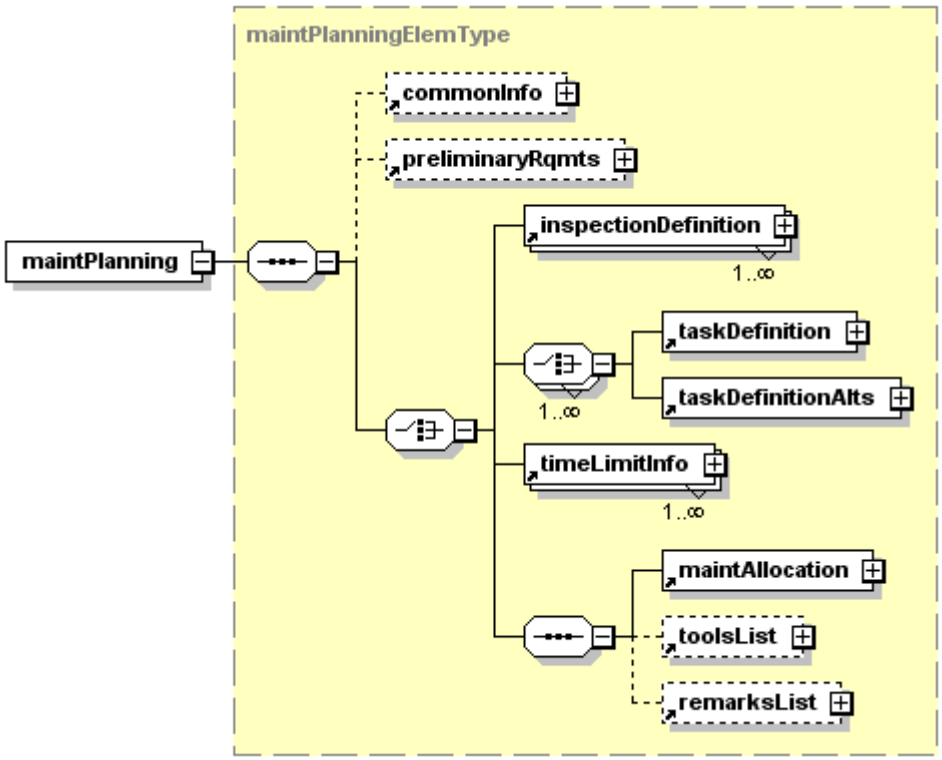
- <warningsAndCautions>. Refer to Chap 3.9.3.
- <warningsAndCautionsRef>. Refer to Chap 3.9.3.
- <maintPlanning>, the collection of maintenance planning information. Refer to Para 2.3.

2.3 Maintenance planning

Description: The element <maintPlanning> contains maintenance planning information of four types:

- Time limits - Information about periodicities and life details for a system
- Task definitions - Information about individual tasks to be carried out on a system
- Inspection definitions - Groups of maintenance tasks or inspections
- Maintenance allocation - Collection of maintenance functions along with maintenance levels and time associated for each task

Markup element: <maintPlanning>



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Fig 2 Element <maintPlanning>

Attributes:

- maintPlanningType (O), the textual information used to classify the maintenance planning data

Child elements:

- <commonInfo>. Refer to Chap 3.9.5.2.1.12.
- <preliminaryRequirements>. Refer to Para 2.4 and Chap 3.9.5.2.1.9.
- <inspectionDefinition>. Refer to Para 2.5.
- <taskDefinition>. Refer to Para 2.6.

- <taskDefinitionAlts>. Refer to Para 2.7.
- <timeLimitInfo>. Refer to Para 2.8.
- <maintAllocation>. Refer to Para 2.9.
- <toolsList>. Refer to Para 2.10.
- <remarksList>. Refer to Para 2.11.

2.4 Rolling-up preliminary requirements

The concept of roll-up is an important part of efficiency in preventive maintenance planning. It ensures that the right number of personnel, with the required skills and trade, are available to carry out the tasks at their allotted periodicity. In support of these tasks, it also ensures that the right numbers and types of technical information, support equipment and supplies are available.

The actual activity of rolling-up resources for the preliminary requirements of an inspection definition is carried out during the Logistics Support Analysis (LSA) process and is typically carried out by the analyst and not the author. This preliminary requirement construct is for the author to record the results of that analysis for each inspection, should they become available.

Depending on the project or organization requirements and the availability of the data, the top-level preliminary requirements are used when individual tasks belonging to the same inspection (eg, pre-flight) have, for example, the same tool quality requirements that result in a collection of tool requirements which differs from each individual task's preliminary requirements.

If required by the project or the organization, the rolled up preliminary requirements data are the Maintenance Task Analysis (MTA) results from, for example, S3000L. These are based on the results from preventive maintenance analysis from, for example, MSG-3, S4000P.

Business rule decision point BRDP-S1-00562 - Use of the top-level preliminary requirements construct for maintenance inspections:

- Decide whether to use the top-level preliminary requirements for maintenance inspections.

2.4.1 Example

In this example, preventive maintenance analysis has shown that the engine (SNS = 72-00-00) must have three preventive maintenance tasks, one in Zone X and two in Zone Y of the Product.

2.4.1.1 Task definition data module

Table 2 shows the frequency and the day for each task are different and that the tool requirement for each task includes one 13mm wrench. This information is recorded in the preliminary requirements construct in the task definition data module of each task.

Table 2 Task Definition data module (SNS = 05-20-72) for the engine

Task	Frequency	Day	Tool requirements	Qty	Where performed
Task A	Weekly	Friday	13 mm wrench	1	Zone Y
Task B	Monthly	1st Monday	13 mm wrench	1	Zone Y
Task C	3 Monthly	1st Tuesday of 3rd month	13 mm wrench	1	Zone X

The preventive maintenance analysis has also shown that two tasks are required for the hydraulic system, one in Zone X and one in Zone Y of the Product. Table 3 shows the frequency and the day for each task to be performed are different. They are also different from

the tasks in Table 2. However, the preliminary requirements for each task listed in the task definition data module include one 13 mm wrench.

Table 3 Task definition data module (SNS = 05-20-29) for the hydraulics

Task	Frequency	Day	Tool requirements	Qty	Where performed
Task 1	Weekly	Friday	13 mm wrench	1	Zone Y
Task 2	3 Monthly	1st Wednesday of 3rd month	13 mm wrench	1	Zone X

The LSA has grouped tasks for the engine and the hydraulics system by zone, one for each of Zone X and Zone Y.

2.4.1.2 Inspection data module

Table 4 shows the two tasks for Zone X. Although the two tasks are 3 Monthly tasks, they are performed on different days. The preliminary requirements for each task include one 13 mm wrench but because the tasks are performed on different days, a single 13 mm wrench is enough for both tasks. Therefore, the top-level preliminary requirements in this inspection data module list one 13 mm wrench.

Table 4 Inspection definition data module (SNS = 05-40-01) for Zone X

Task	Frequency	Day	Tool requirements	Qty	Top level preliminary requirements of the maintenance inspection data module
Task C	3 Monthly	1st Tuesday of 3rd month	13 mm wrench	1	1
Task 2	3 Monthly	1st Wednesday of 3rd month	13 mm wrench	1	

Table 5 shows the three tasks for Zone Y. Here there are two tasks performed every Friday and one task performed on the first Monday of each month. The preliminary requirements for each task include one 13 mm wrench but because two of the tasks are performed on the same day, they will both require a 13 mm wrench at the same time. Therefore, the top-level preliminary requirements in this inspection definition data module lists two 13 mm wrenches, one for use on Task B and two for use on each of Task A and Task 1 because they are both performed on the same day.

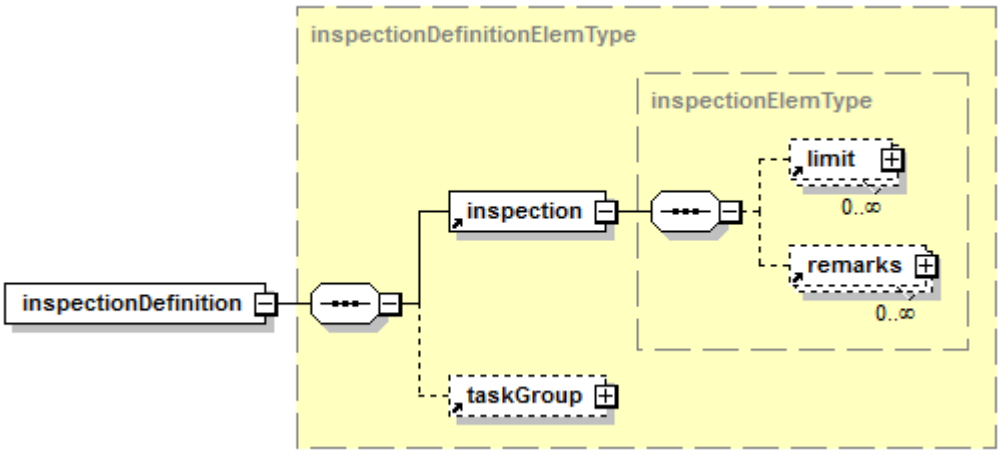
Table 5 Inspection definition data module (SNS = 05-40-02) for Zone Y

Task	Frequency	Day	Tool requirements	Qty	Top level preliminary requirements of the maintenance inspection data module
Task A	Weekly	Friday	13 mm wrench	1	
Task B	Monthly	1st Monday	13 mm wrench	1	2
Task 1	Weekly	Friday	13 mm wrench	1	

2.5 Inspection definition

Description: The element <inspectionDefinition> contains information about inspections. Inspections are a way to group tasks that are related to the topic or intent of the inspection. The element <inspectionDefinition> groups a set of tasks with the limit information associated, to perform the set of tasks.

Markup element: <inspectionDefinition>



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Fig 3 Element <inspectionDefinition>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <inspection>, the inspection information. Refer to Para 2.5.1.
- <taskGroup>, the list of tasks associated with the inspection. Refer to Para 2.5.2.

2.5.1 Inspection information

Description: The element <inspection> groups the inspection limit information with the associated remark information.

Markup element: <inspection>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeMark` (O), `changeType` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

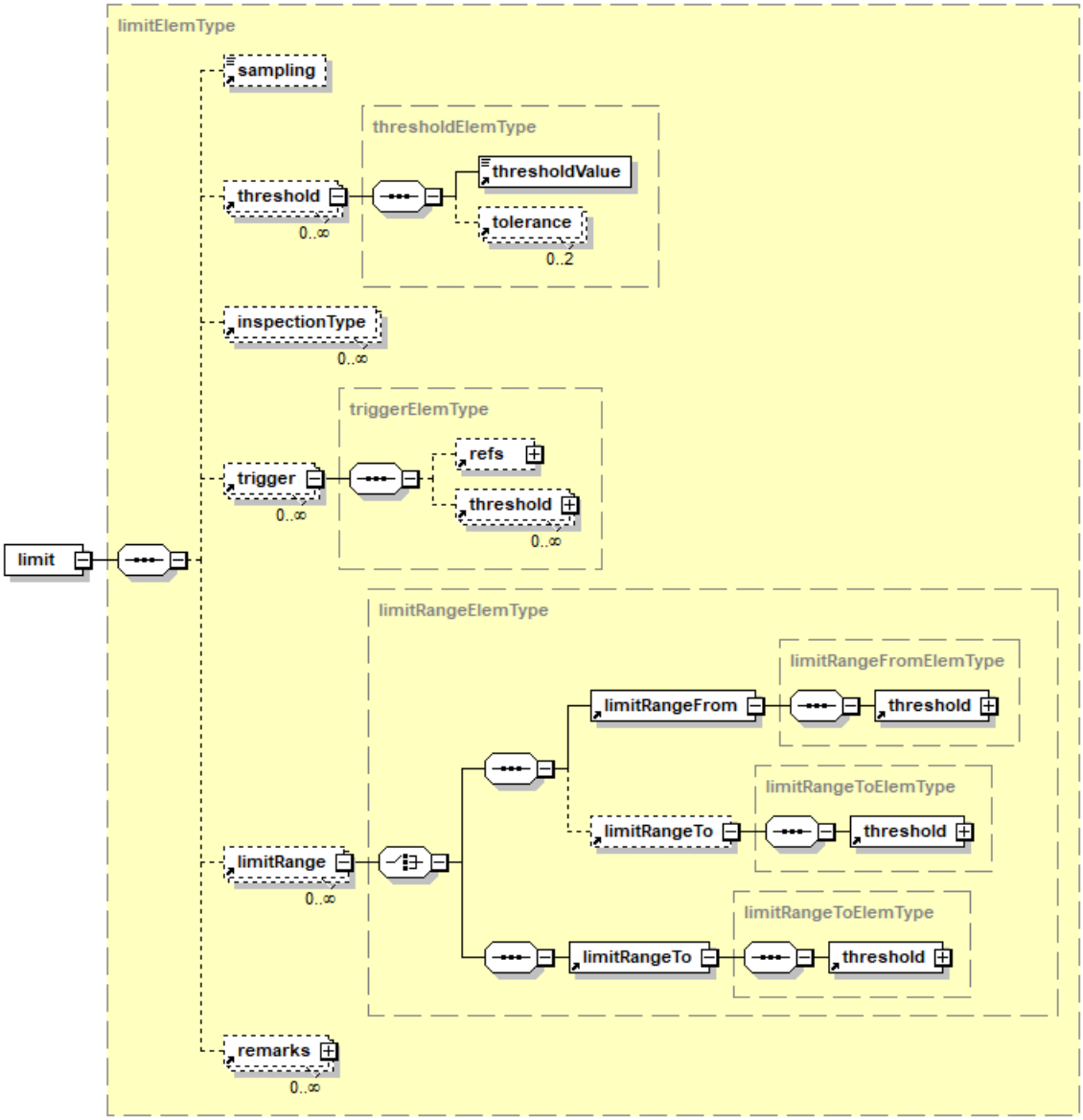
Child elements:

- <limit>, the interval between inspections, or the threshold before which an inspection must be performed. The limits can be associated with units of calendar time, number of events or with the occurrence of specific events. Refer to Para 2.5.1.1.
- <remarks>, the textual comment giving further information about the inspection. Refer to Chap 3.9.5.1.

2.5.1.1 Limit information

Description: The element <limit> contains the information required to determine when a task must be performed.

Markup element: <limit>



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Fig 4 Element <limit>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeMark` (O), `changeType` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `limitTypeValue` (O), the limit classification. If no value is specified, the default value "`pe`" is implied. The attribute `limitTypeValue` can have one of the following values:
  - "`pe`" (D) - perform periodically
  - "`po`" - perform once
  - "`oc`" - on condition
- `limitCond` (O), the condition type of the limit (eg, maritime flight, dirty conditions) used when the attribute `limitTypeValue` contains the value "`oc`"
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`sampling`>. Refer to Para 2.5.1.1.1.
- <`threshold`>. Refer to Para 2.5.1.1.2.
- <`inspectionType`>. Refer to Para 2.5.1.1.4.
- <`trigger`>. Refer to Para 2.5.1.1.5.
- <`limitRange`>. Refer to Para 2.5.1.1.6.
- <`remarks`>. Refer to Para 2.5.1.2.

2.5.1.1.1 Sampling

Description: The element <`sampling`> contains a description of the sampling being used as expressed in its attributes. It is a subset of the total number of product instances on which the inspection must be performed. The sampling can be given as a percentage, a fraction or as a textual description. The element <`sampling`> has only textual content and must be omitted if the inspection is performed on the full set of products.

Markup element: <`sampling`>

Attributes:

- `samplingValue` (O), the number of product instances
- `samplingUnit` (O), the product instance name
- `samplingRatio` (O), the percentage of product instances to be sampled

Child elements:

- None

2.5.1.1.2 Threshold information

Description: The element <`threshold`> contains the limit information in terms of a value before which the inspection must be performed. The value can be given in calendar time or in other terms such as the number of hours a Product has been operating.

Markup element: <`threshold`>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- thresholdUnitOfMeasure (M), the unit of measure for the threshold. The attribute thresholdUnitOfMeasure can have one of the following values:
  - "th01" thru "th99". Refer to Chap 3.9.6.1.
- thresholdType (O), the starting point of the threshold. The starting point can be "from the beginning of the maintenance program" or "from the last time the inspection was performed". The attribute thresholdType can have one of the following values:
  - "threshold" - the starting point is "from the beginning of the maintenance program"
  - "interval" - the starting point is "from the last time the inspection was performed"
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <thresholdValue>, the value before which the inspection must be performed. The element <thresholdValue> has only textual content.
- <tolerance>, the values that can be used to expand the threshold value into a range of acceptable values. Refer to Para 2.5.1.1.3.

Markup example:

```
<threshold thresholdUnitOfMeasure="th01">
<thresholdValue>10</thresholdValue>
</threshold>
```

2.5.1.1.3 Tolerance information

Description: The element <tolerance> contains the threshold minimum and maximum values between which the inspection must be performed.

Markup element: <tolerance>

Attributes:

- toleranceValue (M), the value of the tolerance.
- toleranceType (O), the tolerance type that determines whether the value is related to the minimum value, the maximum value or both values. The attribute can have one of the following values:
  - "plus" - maximum value
  - "minus" - minimum value
  - "plusorminus" - plusminus value
- thresholdUnitOfMeasure (O), the unit of measure for the tolerance value. The attribute can have one of the following values:
  - "th01" thru "th99". Refer to Chap 3.9.6.1.

Child elements:

- None

Markup example:

```
<threshold thresholdUnitOfMeasure="th06">
<thresholdValue>5</thresholdValue>
<tolerance toleranceType="plus" toleranceValue="3"
thresholdUnitOfMeasure="th06"/>
<tolerance toleranceType="minus" toleranceValue="2"
thresholdUnitOfMeasure="th06"/>
</threshold>
```

2.5.1.1.4 Inspection type

Description: The element <inspectionType> contains the classification of maintenance into various types such as "systems", "structural" and "zonal".

Markup element: <inspectionType>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- inspectionTypeCategory (M), the textual classification of the inspection. When limit is used at the task level, the attribute inspectionTypeCategory allows the author to refer to the inspection id.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (M), commercialClassification (O) and caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Business rule decision point BRDP-S1-00197 - Values for the attribute inspectionTypeCategory:

- Decide which values to use for the attribute inspectionTypeCategory and allocate suitable definitions.

Markup example:

```
<inspectionType inspectionTypeCategory="Preflight"/>
```

2.5.1.1.5 Trigger

Description: The element <trigger> contains the means to establish that the inspection must be performed after a task(s) or event(s).

Markup element: <trigger>

Attributes:

- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- occurrenceTrigger (O), the description and number of tasks or events that cause the trigger

- releaseEvent (O), the trigger event that determines whether an inspection must be done before, after, or with the trigger event. The attribute can have one of the following values:
  - "before"
  - "with"
  - "after"
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <threshold>, the threshold value, when reached, after which the inspection must be performed. Refer to Para 2.5.1.1.2.

Markup example:

```
<trigger releaseEvent="after">
<threshold thresholdUnitOfMeasure="th01">
...
</threshold>
</trigger>
```

2.5.1.1.6 Limit range

Description: The element <limitRange> contains the two values between which the inspection must be performed.

Markup element: <limitRange>

Attributes:

- None

Child elements:

- <limitRangeFrom>. Refer to Para 2.5.1.1.7.
- <limitRangeTo>. Refer to Para 2.5.1.1.8.

2.5.1.1.7 Limit range start

Description: The element <limitRangeFrom> contains the starting limit for a limit range between which the inspection must be performed.

Markup element: <limitRangeFrom>

Attributes:

- None

Child elements:

- <threshold>, the threshold value after which the inspection must be performed. Refer to Para 2.5.1.1.2.

Markup example:

If there is a task that must be repeated every 8000 flight cycles after the 8000th flight cycle until the 48000th flight cycle, then the element <limitRangeFrom> need not be used. The value

"8000" would be held in the element <thresholdValue>. The markup would look like this:

```
<limit>
<threshold thresholdUnitOfMeasure="th02"
thresholdType="threshold">
<thresholdValue>8000</thresholdValue>
</threshold>
<limitRange>
<limitRangeTo>
<threshold thresholdUnitOfMeasure="th01"
thresholdType="interval">
<thresholdValue>48000</thresholdValue>
</threshold>
</limitRangeTo>
</limitRange>
</limit>
```

If there is a task that must be repeated after an earlier event, then the element <limitRangeFrom> would be used. For example carry out the task 8000 flight cycles after the first 400 flight hours and repeat this task every 8000 flight cycles until 48000 flight cycles. The markup for this would look like:

```
<limit>
<threshold thresholdUnitOfMeasure="th02"
thresholdType="threshold">
<thresholdValue>8000</thresholdValue>
</threshold>
<limitRange>
<limitRangeFrom>
<threshold thresholdUnitOfMeasure="th01"
thresholdType="interval">
<thresholdValue>400</thresholdValue>
</threshold>
</limitRangeFrom>
<limitRangeTo>
<threshold thresholdUnitOfMeasure="th01"
thresholdType="threshold">
<thresholdValue>48000</thresholdValue>
</threshold>
</limitRangeTo>
</limitRange>
</limit>
```

2.5.1.1.8 Limit range end

Description: The element <limitRangeTo> contains the ending limit for a limit range between which the inspection must be performed.

Markup element: <limitRangeTo>

Attributes:

– None

Child elements:

– <threshold>, the threshold value before which the inspection must be performed. Refer to Para 2.5.1.1.2.

2.5.1.2 Remarks

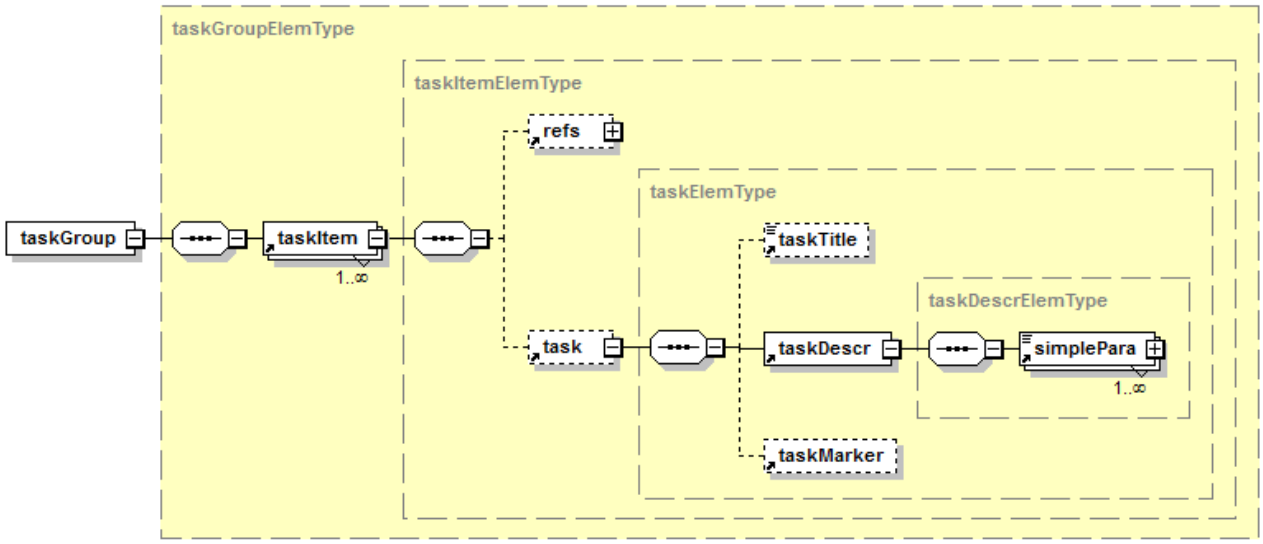
Description: The element <remarks> contains further information about the limit. The element <remarks> provides the means to convey comments on the limit information or descriptions of limits that cannot be represented with the available elements.

Markup element: <remarks>. Refer to Chap 3.9.5.1.

2.5.2 Task group

Description: The element <taskGroup> contains a list of tasks that belong to the inspection. The element <taskGroup> facilitates production of a table of tasks in an inspection.

Markup element: <taskGroup>



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Fig 5 Element <taskGroup>

Attributes:

– None

Child elements:

– <taskItem>, the individual task in an inspection. Refer to Para 2.5.2.1.

Business rule decision point BRDP-S1-00198 - Methodology of assigning tasks into the element <taskGroup>:

– Decide on a methodology of assigning tasks to groups.

2.5.2.1 Task item

Description: The element <taskItem> contains an individual task that belongs to an inspection.

Markup element: <taskItem>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `taskSeqNumber` (M), the sequential position of the task within the inspection tasks group
- `taskName` (M), the textual identifier of the task
- `skillLevelCode` (O), the skill level required of the person who will perform the task. Refer to Chap 3.9.6.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`refs`>. Refer to Chap 3.9.5.2.1.2.
- <`task`>, the information that describes the task. Refer to Para 2.5.2.1.1.

2.5.2.1.1 Task

Description: The element <`task`> contains general data for a task that belongs to an inspection.

Markup element: <`task`>

Attributes:

- None

Child elements:

- <`taskTitle`>, the task title.
- <`taskDescr`>. Refer to Para 2.5.2.1.2.
- <`taskMarker`>. Refer to Para 2.5.2.1.3.

Markup example:

```
<taskItem taskSeqNumber="001" taskName="Nose landing gear
inspection">
<task>
<taskTitle>
General visual inspection of the landing gear
</taskTitle>
<taskDescr><simplePara>
This inspection of the landing gear covers all aspects including
wiring... </simplePara>
</taskDescr>
<taskMarker markerType="location"/>
</task>
</taskItem>
```

2.5.2.1.2 Task description

Description: The element <`taskDescr`> contains the task description.

Markup element: <`taskDescr`>

Attributes:

- None

Child elements:

– <simplePara>. Contains the textual information of the task description. Refer to Chap 3.9.5.2.1.10.

2.5.2.1.3 Task marker

Description: The element <taskMarker> contains the marker to separate an aggregation of text that came from regulatory sources into discretely classified textual items.

Markup element: <taskMarker>

Attributes:

– markerType (M), the nature of the data in the element <taskDescr>. The value of the attribute markerType can be used to indicate whether the task is performed internal or external to the Product.

Child elements:

– None

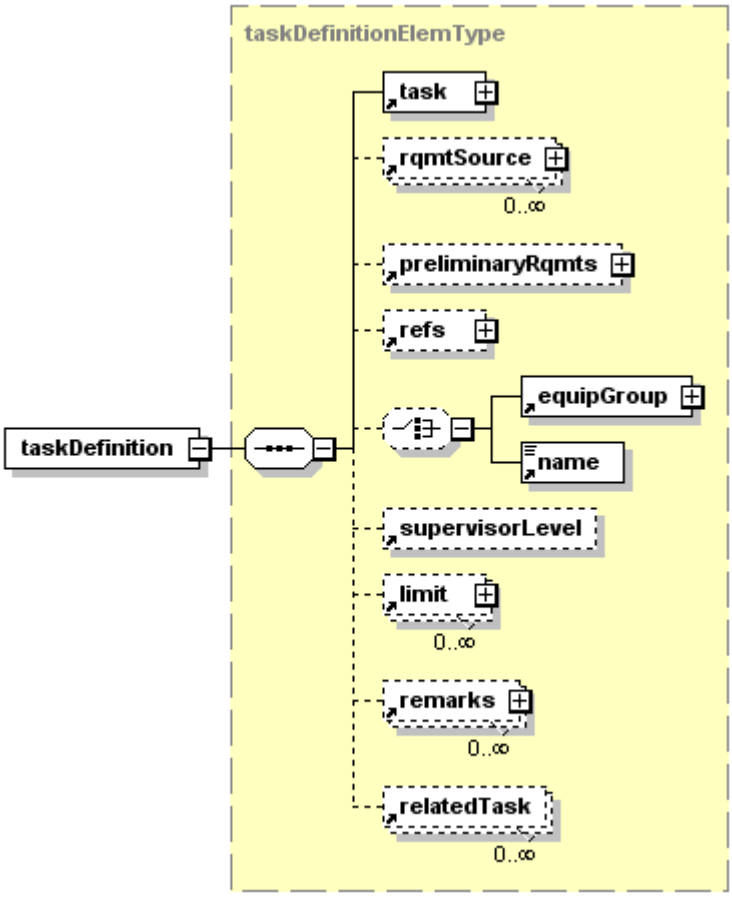
Business rule decision point BRDP-S1-00199 - Values for the attribute markerType:

– Decide which values to use for the attribute markerType and allocate suitable definitions.

2.6 Task definition

Description: The element <taskDefinition> contains the necessary information to define a planned maintenance task.

Markup element: <taskDefinition>



ICN-S1000D-A-030905-D-F6117-25003-A-001-01

Fig 6 Element <taskDefinition>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- taskIdent (M), the unique identifier for the list of tasks
- taskCode (O), the task category code. For example, a general visual inspection is a common category. The attribute taskCode can have one of the following values:
  - "taskcd01" thru "taskcdk99". Refer to Chap 3.9.6.1.
- worthinessLimit (O), the indicator whether the performance of the tasks is mandatory or recommended which signifies whether the task is subject to worthiness limitations
- reducedMaint (O), used to indicate whether a task or step(s) that are not required to return the Product to a minimum mission capable operational condition can be omitted, deferred or reduced under certain circumstances (eg, when in deployed or extended operations). The attribute must give the reason, or the condition or the situation circumstances under which the maintenance task can be deviated from.

- skillLevelCode (O), the skill level required of the person who will perform the task. Refer to Chap 3.9.6.1.

  The attribute skillLevelCode of the element <taskDefinition> must have the same value as the attribute skillLevelCode of the element <personSkill> of the element <preliminaryRqmts> in the <taskDefinition> branch of the maintenance planning ("schedule") Schema, if both attributes are used.

  It is recommended to only populate the element <personSkill> when the element <preliminaryRqmts> is used.

- skillType (O), the required skill category of the person who will perform the task (eg, Airframe, Electrical, Avionic, Engine). The attribute skillType can have one of the following values:

  - "st01" thru "st99". Refer to Chap 3.9.6.1.

  The attribute skillType must have the same value as the attribute personCategoryCode of the element <preliminaryRqmts> in the <taskDefinition> branch of the maintenance planning ("schedule") Schema, if both attributes are used.

  It is recommended to only populate the attribute personCategoryCode of the element <personCategory> when the child element <preliminaryRqmts> of the element <taskDefinition> is used.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (M), commercialClassification (O) and caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <task>, the information used to describe the task. Refer to Para 2.5.2.1.1.
- <rqmtSource>, the authority that established the requirement to do the task. Refer to Para 2.6.1.
- <preliminaryRqmts>. Refer to Para 2.6.2 and Chap 3.9.5.2.1.9.
- <refs>. Refer to Chap 3.9.5.2.1.2.
- <equipGroup>. Refer to Para 2.6.3.
- <name>, the identifier that can be used instead of the element <equipGroup> for structural and other items that do not have a part number. Refer to Chap 3.9.5.2.1.10.
- <supervisorLevel>, the level of supervision that is appropriate for the task. Refer to Para 2.6.4.
- <limit>, the information required to determine when a task must be performed. Refer to Para 2.5.1.1.
- <remarks>, the textual comment giving further information about the inspection. Refer to Para 2.5.1.2.
- <relatedTask>. Refer to Para 2.6.5.

Markup example:

The following example shows that by a business rule decision, a project has identified tasks by using the first four characters of the SNS (56-40, Windows and canopies - Inspection and observation) and the information code (250, Clean and apply surface protection). The attribute

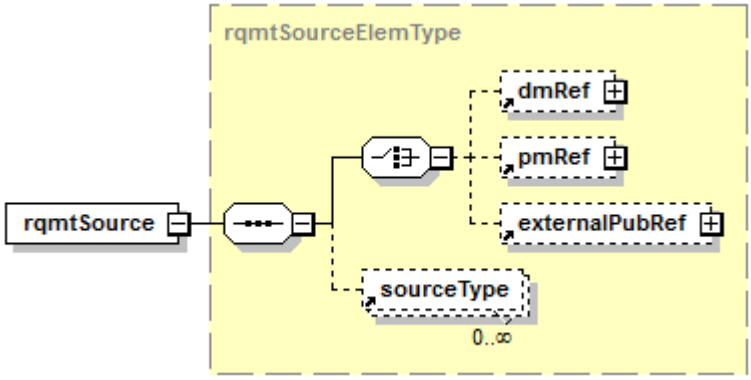
taskCode value "08" indicates that the task is a servicing task. The attribute reducedMaint indicates that the application of surface protection steps in the task is not required under crisis/war conditions.

```
<taskDefinition taskIdent="56-40-250" taskCode="taskcd08"
reducedMaint="Application of surface protection is not required
under crisis/war conditions">
<task>
...
</task>
<relatedTask taskIdent="23-050-02" relatedTaskDescr="after"/>
</taskDefinition>
```

2.6.1 Requirement source

Description: The element <rqmtSource> contains the information to enable identification of the authority that is the source of the maintenance requirement.

Markup element: <rqmtSource>



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Fig 7 Element <rqmtSource>

Attributes:

- sourceOfRqmt (M), the code that indicates the origination of the requirement (eg, "MRB", "MPD" and "AD")
- approval (O), the level of approval of the source

Child elements:

- <dmRef>, the reference to the data module which is the source of the requirements. Refer to Chap 3.9.5.2.1.2.
- <pmRef>, the reference to the publication module which is the source of the requirements. Refer to Chap 3.9.5.2.1.2.
- <externalPubRef>, the reference to the non-S1000D document which is the source of the requirements. Refer to Chap 3.9.5.2.1.2.
- <sourceType>. Refer to Para 2.6.1.1.

Business rule decision point BRDP-S1-00202 - Values for the attribute sourceOfRqmt:

- Decide which values to use for the attribute sourceOfRqmt and allocate suitable definitions.

2.6.1.1 Source type

Description: The element <sourceType> contains information of the source of the requirement. This gives the ability to include requirements such as failure effect category, failure effect code, Enhanced Zonal Analysis Program (EZAP), Lightning or High Intensity Radiated Field (L/HIRF), CMR 1 star, CMR 2 star, and future regulatory sources.

Note

Maintenance requirements can have been developed as a result of the safety analysis for certification of civil aviation products. These tasks are called "Certification Maintenance Requirements" (CMR). The "star" categories identify whether the maintenance is to limit exposure to catastrophic versus hazardous failures.

Markup element: <sourceType>

Attributes:

– sourceCriticality (O), the impact of not complying with the requirement. The attribute sourceCriticality can have one of the following values:

- "sc01" thru "sc99". Refer to Chap 3.9.6.1.

  Example of usage:

  – "sc51" - no source criticality
  – "sc52" - 1-star
  – "sc55" - evident, safety

– sourceTypeCode (O), the type of source. The attribute sourceTypeCode can have one of the following values:

- "stc01" thru "stc99". Refer to Chap 3.9.6.1.

  Example of usage:

  – "stc51" - MSG-3 failure effect category
  – "stc52" - enhanced zonal analysis program
  – "stc53" - certification maintenance requirement

Child elements:

– None

2.6.2 Preliminary requirements

Description: The element <preliminaryRqmts> contains all information about resources that are required before the accomplishment of the task. Refer to Chap 3.9.5.2.1.9.

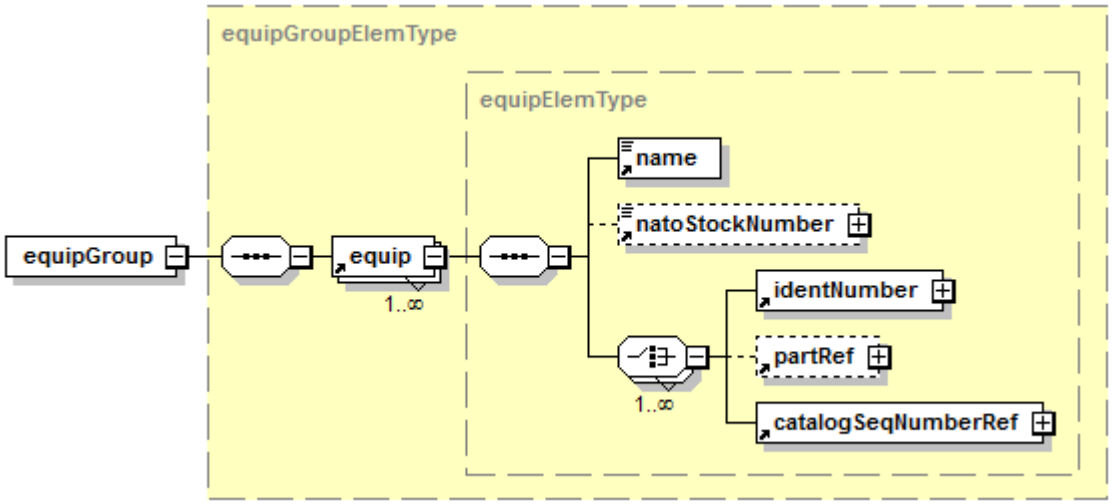
Business rule decision point BRDP-S1-00204 - Use of the element <preliminaryRqmts> in the element <taskDefinition>:

– Decide whether to use the element <preliminaryRqmts> in the context of task definition.

2.6.3 Equipment group

Description: The element <equipGroup> contains the grouping of the equipment that used in or associated with the task.

Markup element: <equipGroup>



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Fig 8 Element <equipGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (M), commercialClassification (O) and caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <equip>. Refer to Para 2.6.3.1.

2.6.3.1 Equipment

Description: The element <equip> contains the identification of an individual piece of equipment associated with the task.

Markup element: <equip>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (M), commercialClassification (O) and caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>, the name of the equipment. Refer to Chap 3.9.5.2.1.10.
- <natoStockNumber>. Refer to Chap 3.9.5.2.7.
- <identNumber>. Refer to Chap 3.9.5.2.1.9.
- <partRef>. Refer to Chap 3.9.5.2.1.10.
- <catalogSeqNumberRef>, the reference to the IPD CSN that corresponds to the equipment. Refer to Chap 3.9.5.2.7.

2.6.4 Supervisor level

Description: The element <supervisorLevel> contains the hierarchical level in the supervisory structure that explains if the supervisor must observe the task or inspect the results of the task.

Markup element: <supervisorLevel>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- supervisorLevelCode (O), the level of the supervisor who must observe the task or inspect the results of the task. The attribute supervisorLevelCode can have one of the following values:
  - "sl01" thru "sl99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (M), commercialClassification (O) and caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.6.5 Related task

Description: The element <relatedTask> contains the relationship between two tasks.

Markup element: <relatedTask>

Attributes:

- taskIdent (M), the task identifier that has an association to the current task (via the attribute taskIdent of the related task)
- relatedTaskDescr (M), the nature of the association. The attribute relatedTaskDescr can have one of the following values:
  - "after" - perform maintenance requirement **after** the related requirement is started
  - "before" - perform maintenance requirement **before** the related requirement
  - "complied" - the maintenance requirement is **complied** with by the related requirement
  - "finished" - cannot finish maintenance requirement until the related requirement is **finished**
  - "precludes" - the maintenance requirement **precludes** the related requirement

- "started" - cannot finish the maintenance requirement until the related requirement is **started**
- "with" - perform maintenance requirement **with** the related requirement

Child elements:

– None

2.7 Task definition alternates group

Description: The element <taskDefinitionAlts> provides the capability to group several alternate solutions of the task information necessary to plan maintenance. Refer to Chap 4.13.3 for information related to the use of alternates group in data module content.

Markup element: <taskDefinitionAlts>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <taskDefinition>. Refer to Para 2.6.

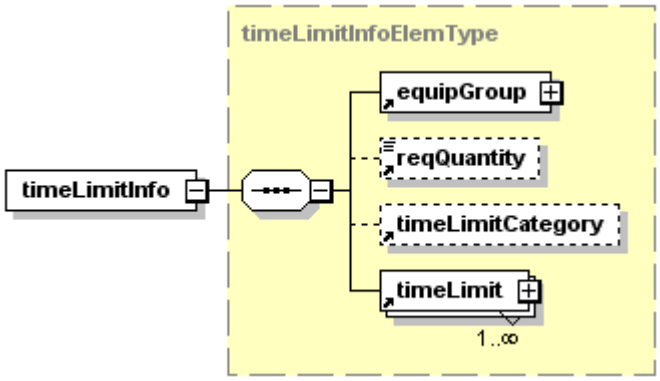
Markup example:

```
<taskDefinitionAlts>
<taskDefinition taskIdent="31-010-01" taskCode="taskcd01">
<task>
...
</task>
<relatedTask taskIdent="23-050-02" relatedTaskDescr="after"/>
</taskDefinition>
<taskDefinition taskIdent="31-010-02" taskCode="taskcd02">
<task>
...
</task>
<relatedTask taskIdent="23-060-02" relatedTaskDescr="before"/>
</taskDefinition>
</taskDefinitionAlts>
```

2.8 Time limit information

Description: The element <timeLimitInfo> contains time limits, periodicities and life details information relating to equipment or systems.

Markup element: <timeLimitInfo>



ICN-S1000D-A-030905-D-F6117-25004-A-001-01

Fig 9 Element <timeLimitInfo>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- timeLimitIdent (M), the identifier of the element <timeLimit>.
- skillLevelCode (O), the skill level required of the person who will perform the task. Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <equipGroup>, the grouping of the equipment that is the subject to the time limit. Refer to Para 2.6.3.
- <reqQuantity>, the quantity of items of equipment subject to the time limit. Refer to Para 2.8.1.
- <timeLimitCategory>, the classification of the time limit. Refer to Para 2.8.2.
- <timeLimit>, the threshold when a piece of equipment must be removed from service or storage. Refer to Para 2.8.3.

2.8.1 Required quantity

Description: The element <reqQuantity> contains the number of equipment items that are subject to the time limit in the scope of the Product.

Markup element: <reqQuantity>

Attributes:

- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- unitOfMeasure (O), the unit of measure. Can be a text string giving the fundamental subdivision along the dimension to which the quantity applies. It can also give a name for a container of items (eg, "cases" as in "5 cases").
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

Markup example:

```
<reqQuantity unitOfMeasure="boxes">6</reqQuantity>
```

2.8.2 Time limit category

Description: The element <timeLimitCategory> is used to classify the time limit.

Markup element: <timeLimitCategory>

Attributes:

– changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– timeLimitCategoryValue (M), an enumeration representing the categories of time limits. The attribute timeLimitCategoryValue can have one of the following values:

- "1" - safety related
- "2" - non-safety related

The interpretation of these values can be defined by a project or organization business rule. However, the default interpretation of the values is as given above.

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

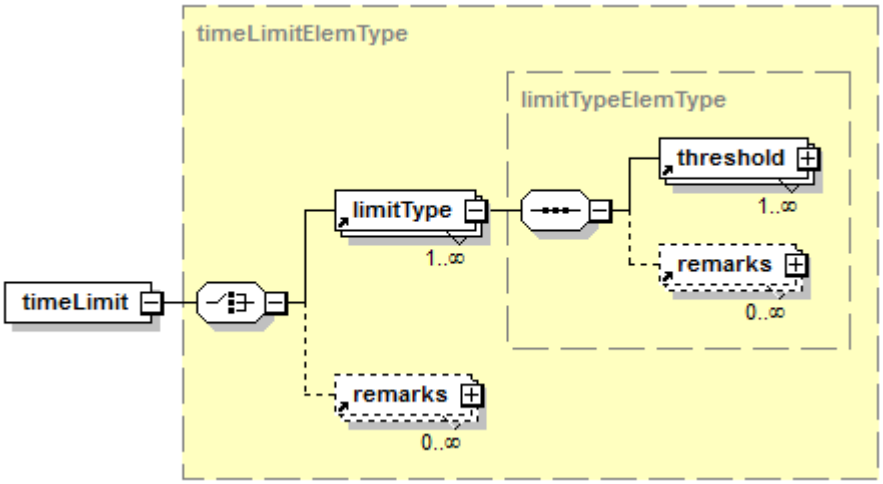
Business rule decision point BRDP-S1-00563 - Use of the attribute timeLimitCategoryValue:

– In case standard descriptions are not applicable, describe how the values "1" and "2", respectively, will be used for the attribute timeLimitCategoryValue.

2.8.3 Time limit

Description: The element <timeLimit> contains a time limit.

Markup element: <timeLimit>



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Fig 10 Element <timeLimit>

Attributes:

– None

Child elements:

– <limitType>. Refer to Para 2.8.4.
– <remarks>, the textual comments to supplement the structured limit information. Refer to Para 2.5.1.2.

2.8.4 Limit type

Description: The element <limitType> contains the threshold values and units of the time limit.

Markup element: <limitType>

Attributes:

– applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– limitUnitType (O), the enumeration representing the dimensional unit for the given time limit values. The attribute limitUnitType can have one of the following values:
  - "lt01" thru "lt99". Refer to Chap 3.9.6.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

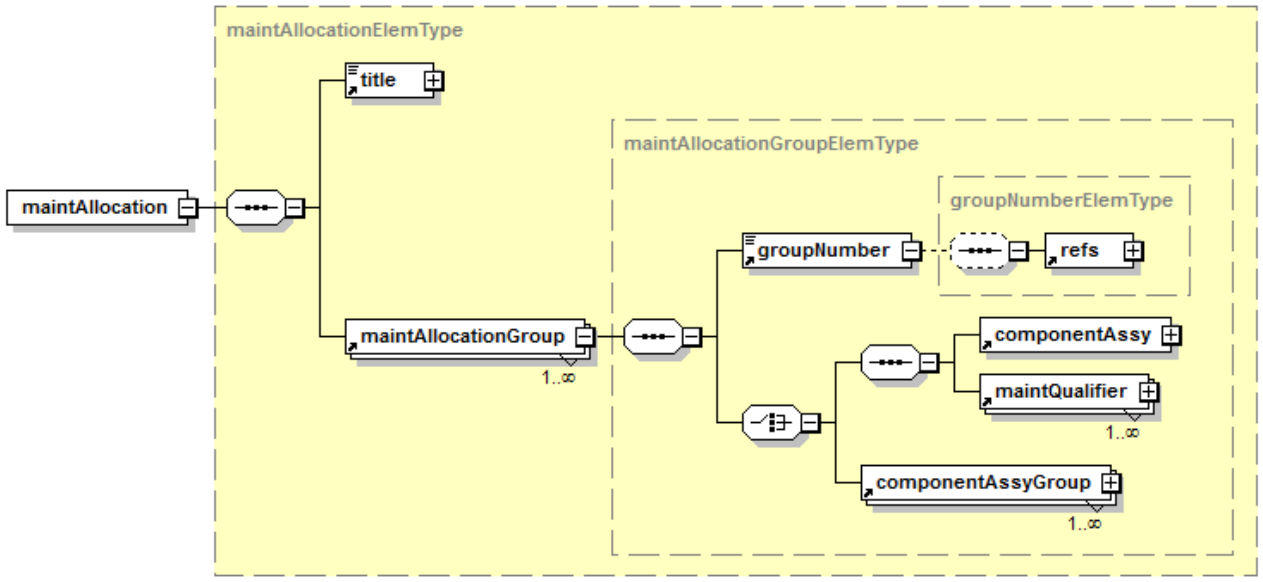
- <threshold>, the threshold value for the inspection. Refer to Para 2.5.1.1.2.
- <remarks>, the textual comments to supplement the structured limit type information. Refer to Para 2.5.1.2.

2.9 Maintenance allocation

Description: The element <maintAllocation> contains information about maintenance allocations. Maintenance allocations capture maintenance functions along with maintenance levels and time associated for each task. It is contained in the element <maintPlanning>. Refer to Para 2.3.

The maintenance allocation designates the overall authority and the responsibility for the performance of maintenance functions on the identified end item or component. The data lists maintenance functions along with maintenance levels, and the time associated for each task. These maintenance functions can also be grouped together. All the information required to build the maintenance allocation is included in the Logistics Support Analysis Record (LSAR). The element <toolsList> and the element <remarksList> are used to provide a list of support equipment (standard tools, special tools and test equipment) and remarks for referencing purposes.

Markup element: <maintAllocation>



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Fig 11 Element <maintAllocation>

Attributes:

- None

Child elements:

- <title>, the title which describes the maintenance allocation. Refer to Chap 3.9.5.2.1.5.
- <maintAllocationGroup>. Refer to Para 2.9.1.

2.9.1 Maintenance allocation group

Description: The element <maintAllocationGroup> contains groups of maintenance functional items.

Markup element: <maintAllocationGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- skillLevelCode (O), the skill level required of the person who will perform the task. Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <groupNumber>. Refer to Para 2.9.1.1.
- <componentAssy>. Refer to Para 2.9.1.2.
- <maintQualifier>. Refer to Para 2.9.1.3.
- <componentAssyGroup>. Refer to Para 2.9.1.4.

2.9.1.1 Maintenance allocation group number

Description: The element <groupNumber> contains a number or other identifier associated with major components, assemblies, and subassemblies that form functional groups. Subordinate, sub-functional groups or sub-subassemblies relate to the base group number (top position) in a sequential, next higher assembly (NHA) relationship (ie, top-down breakdown structure). The functional group applies to repairable assemblies and subassemblies, for example, spares (any repairable component required for the maintenance or repair of an end item), but not to repair parts (any consumable, non-repairable component required for the maintenance or repair of an end item).

Markup element: <groupNumber>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- skillLevelCode (O), the skill level required of the person who will perform the task. Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

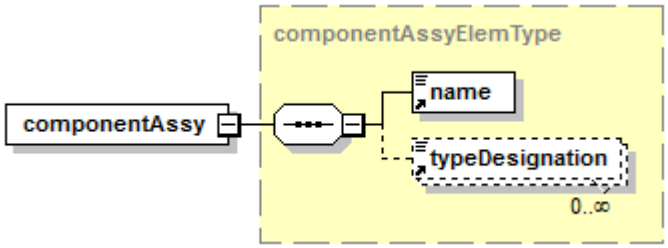
Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.

2.9.1.2 Component assembly

Description: The element <componentAssy> contains the identification of the item (component assembly) by name (a basic name and a noun word or phrase modifier, for example, transformer). Parts that are not subject to maintenance must not be listed.

Markup element: <componentAssy>



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Fig 12 Element <componentAssy>

Attributes:

– None

Child elements:

– <name>, the name of the item. Refer to Chap 3.9.5.2.1.10.
– <typeDesignation>, the textual information for additional information about the item.

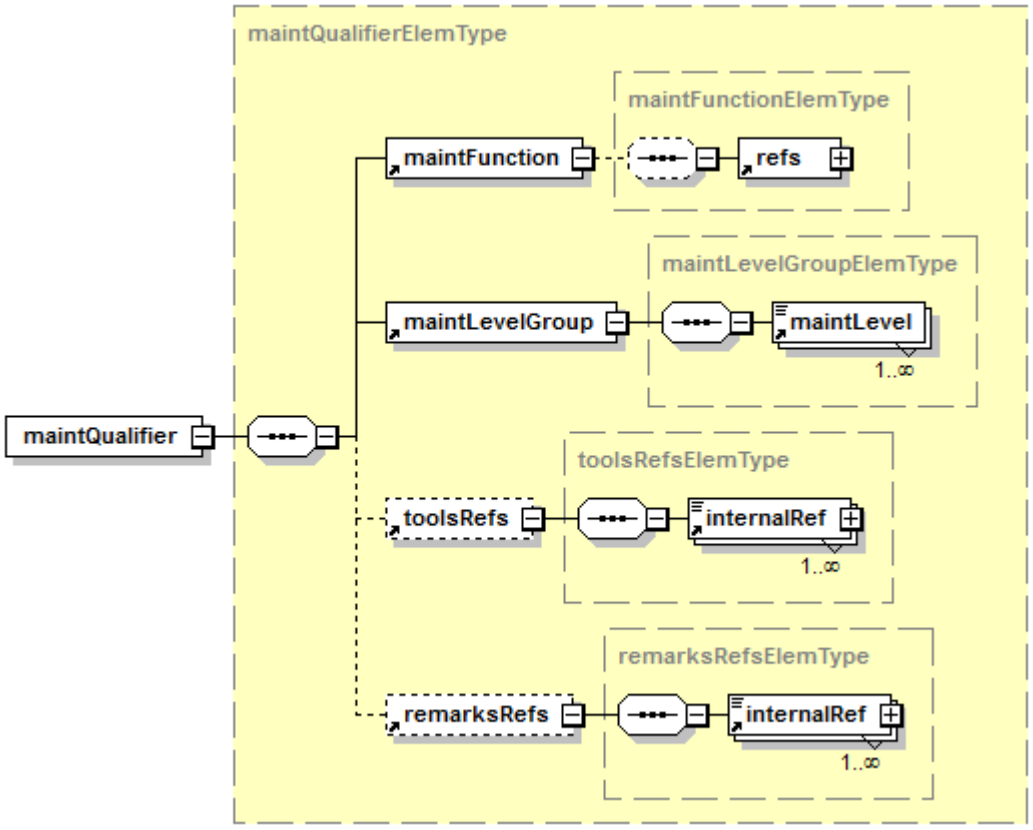
Markup example:

```
<componentAssy>
<name>Flight Data Recorder</name>
<typeDesignation>
Here is some text.
</typeDesignation>
</componentAssy>
```

2.9.1.3 Maintenance qualifier

Description: The element <maintQualifier> contains maintenance action qualification such as maintenance function, maintenance level, estimated work time, any support equipment and any remarks.

Markup element: <maintQualifier>



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Fig 13 Element <maintQualifier>

Attributes:

– None

Child elements:

– <maintFunction>. Refer to Para 2.9.1.3.1.
– <maintLevelGroup>. Refer to Para 2.9.1.3.2.
– <toolsRefs>. Refer to Para 2.9.1.3.4.
– <remarksRefs>. Refer to Para 2.9.1.3.5.

Markup example:

```
<maintQualifier>
<maintFunction function="ft00"/>
<maintLevelGroup>
...
</maintLevelGroup>
</maintQualifier>
```

2.9.1.3.1 Maintenance function

Description: The element <maintFunction> contains the maintenance function to be performed on the item listed.

Markup element: <maintFunction>

Attributes:

– `function` (M), the maintenance action (eg, Inspect, Test, Service). The attribute `function` can have one of the following values:

- "`ft01`" thru "`ft99`". Refer to Chap 3.9.6.1.

Child elements:

– <`refs`>. Refer to Chap 3.9.5.2.1.2.

2.9.1.3.2 Maintenance level group

Description: The element <`maintLevelGroup`> contains the information about the lowest authorized maintenance level and the associated estimated work time to perform the maintenance.

Markup element: <`maintLevelGroup`>

Attributes:

– None

Child elements:

– <`maintLevel`>. Refer to Para 2.9.1.3.3.

2.9.1.3.3 Maintenance level

Description: The element <`maintLevel`> contains the maintenance level by selecting an enumerated value for the attribute `maintLevelCode`. The estimated work time can be entered as textual information within the element.

Markup element: <`maintLevel`>

Attributes:

– `maintLevelCode` (M), the values for the maintenance levels such as crew, operator, organization, direct, general support, or depot. The attribute `maintLevelCode` can have one of the following values:

- "`ml01`" thru "`ml99`". Refer to Chap 3.9.6.1.

Child elements:

– None

2.9.1.3.4 Tools references

Description: The element <`toolsRefs`> contains references to required support equipment (standard tools, special tools and test equipment) that is contained in the tools list. Refer to Para 2.10.

Markup element: <`toolsRefs`>

Attributes:

– None

Child elements:

– <`internalRef`>, the reference to a support equipment contained in the tools list (refer to Para 2.10). Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<toolsRefs>
<internalRef internalRefId="tool-001"
internalRefTargetType="irtt05">
...
</internalRef>
</toolsRefs>
```

2.9.1.3.5 Remarks references

Description: The element <remarksRefs> contains a reference to remarks contained in the remarks list. Refer to Para 2.11.

Markup element: <remarksRefs>

Attributes:

– None

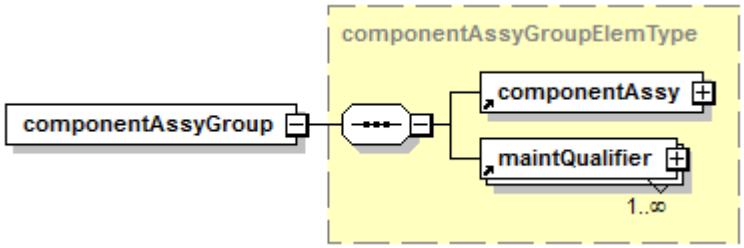
Child elements:

– <internalRef>. Refer to Chap 3.9.5.2.1.2.

2.9.1.4 Component assembly group

Description: The element <componentAssyGroup> contains a group of subassemblies when there is a need to divide the item (component assembly).

Markup element: <componentAssyGroup>



ICN-S3627-S1000D0652-001-01

Fig 14 Element <componentAssyGroup>

Attributes:

– None

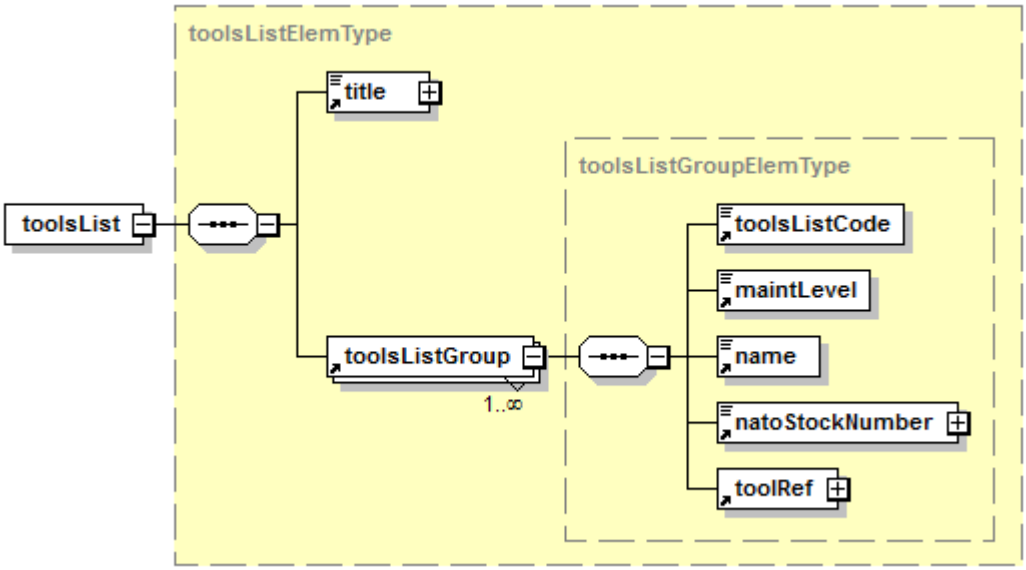
Child elements:

– <componentAssy>. Refer to Para 2.9.1.2.
– <maintQualifier>. Refer to Para 2.9.1.3.

2.10 Tools list

Description: The element <toolsList> contains a list of support equipment (special tools, standard tools and test equipment) required to maintain the equipment as indicated in the maintenance allocation. When support equipment is indicated in the maintenance allocation, the tools list must be included.

Markup element: <toolsList>



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Fig 15 Element <toolsList>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- skillLevelCode (O), the skill level required of the person who will perform the task. Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>, the support equipment list title. Refer to Chap 3.9.5.2.1.5.
- <toolsListGroup>. Refer to Para 2.10.1.

2.10.1 Tools list group

Description: The element <toolsListGroup> contains the data about the support equipment. It includes the maintenance level, name of the support equipment, NATO stock number, and support equipment number.

Markup element: <toolsListGroup>

Attributes:

- None

Child elements:

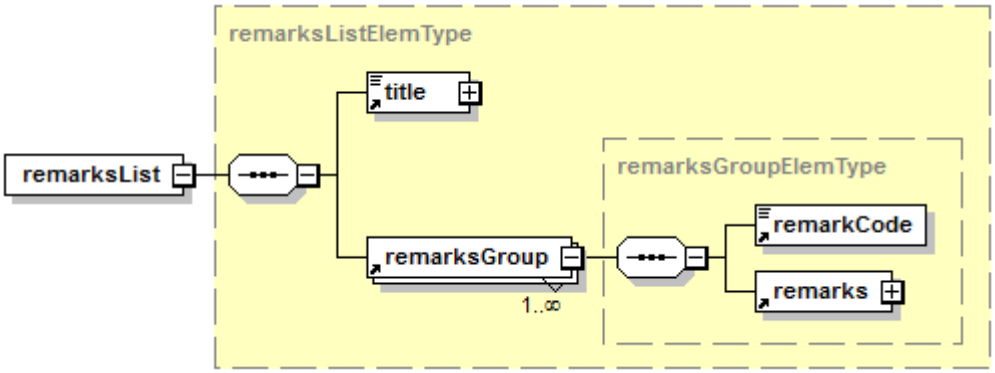
- <toolsListCode>, the identification for the purposes of cross-referencing. The element <toolsListCode> also allows textual data in the event that a particular code

such as "A", "B", or "C" is used to identify the support equipment in the maintenance allocation data.
- <maintLevel>, the lowest authorized maintenance level. Refer to Para 2.9.1.3.3.
- <name>, the name of the support equipment. A basic name or noun must be used. Refer to Chap 3.9.5.2.1.10.
- <natoStockNumber>. Refer Chap 3.9.5.2.7.
- <toolRef>. Refer to Chap 3.9.5.2.1.9.

2.11 Remarks list

Description: The element <remarksList> contains a list of remarks pertinent to the maintenance functions listed in maintenance allocation data. The purpose is to provide a list for referencing from maintenance allocation. When a "remark" is indicated in the maintenance allocation, the remarks list must be included.

Markup element: <remarksList>



ICN-S3627-S1000D0654-001-01

Fig 16 Element <remarksList>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- skillLevelCode (O) the skill level required of the person who will perform the task. Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>, the remarks list title. Refer to Chap 3.9.5.2.1.5.
- <remarksGroup>. Refer to Para 2.11.1.

2.11.1 Remarks group

Description: The element <remarksGroup> contains the remark with an identifier.

Markup element: <remarksGroup>

Attributes:

– None

Child elements:

– <remarkCode>, the identification for the purposes of cross referencing. The element also allows for textual content in the event that a particular code such as "A", "B", or "C" is used to identify the remark in the maintenance allocation data.
– <remarks>, the textual comment about the data. Refer to Chap 3.9.5.1.

3 Examples

3.1 Time limit example

```
<content>
<referencedApplicGroup>
<applic id="appl-001">
<displayText><simplePara>Mountain storm Mk1 or Brook trekker Mk9
</simplePara></displayText>
<evaluate andOr="or">
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Mountain
storm"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk1"/>
</evaluate>
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk9"/>
</evaluate>
</evaluate>
</applic>
</referencedApplicGroup>
<maintPlanning>
<timeLimitInfo applicRefId="appl-001" timeLimitIdent="001">
<equipGroup>
<equip><name>Bicycle</name>
<identNumber><manufacturerCode>KZ555</manufacturerCode>
<partAndSerialNumber><partNumber>Bicycle-001</partNumber>
</partAndSerialNumber>
</identNumber></equip>
</equipGroup>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
<timeLimitCategory timeLimitCategoryValue="1"/>
<timeLimit>
<limitType limitUnitType="lt07">
<threshold thresholdUnitOfMeasure="th06">
<thresholdValue>1</thresholdValue>
<tolerance toleranceType="plusorminus" toleranceValue="1"
thresholdUnitOfMeasure="th06"/>
```

```
</threshold>
</limitType>
</timeLimit>
<timeLimit>
<limitType limitUnitType="lt05">
<threshold thresholdUnitOfMeasure="th06">
<thresholdValue>1</thresholdValue>
</threshold>
</limitType>
</timeLimit>
</timeLimitInfo>
<timeLimitInfo applicRefId="appl-001" timeLimitIdent="002">
<equipGroup>
<equip><name>Brake pads</name>
<identNumber><manufacturerCode>KT444</manufacturerCode>
<partAndSerialNumber><partNumber>BR-PADS-001</partNumber>
</partAndSerialNumber>
</identNumber></equip>
</equipGroup>
<reqQuantity unitOfMeasure="EA">4</reqQuantity>
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<timeLimitInfo applicRefId="appl-001" timeLimitIdent="003">
<equipGroup>
<equip><name>Chain</name>
<identNumber>
<manufacturerCode>KZ555</manufacturerCode>
<partAndSerialNumber><partNumber>Ch-001</partNumber>
</partAndSerialNumber>
</identNumber></equip>
</equipGroup>
<timeLimit>
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</threshold>
</limitType>
</timeLimit>
</timeLimitInfo>
<timeLimitInfo applicRefId="appl-001" timeLimitIdent="004">
<equipGroup>
<equip><name>Hub bearings</name>
<identNumber>
<manufacturerCode>KZ555</manufacturerCode>
<partAndSerialNumber><partNumber>HB-001</partNumber>
```

```
</partAndSerialNumber>
</identNumber></equip>
</equipGroup>
<reqQuantity unitOfMeasure="EA">2</reqQuantity>
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<timeLimit>
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thresholdUnitOfMeasure="th04"/>
</threshold>
</limitType>
</timeLimit>
</timeLimitInfo>
</maintPlanning>
</content>
```

3.2 Task definition example

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<content>
<referencedApplicGroup>
<applic id="appl-001">
<displayText><simplePara>Mountain storm Mk1 or Brook trekker
Mk9</simplePara>
</displayText>
<evaluate andOr="or">
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Mountain
storm"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk1"/>
</evaluate>
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk9"/>
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</evaluate>
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</referencedApplicGroup>
<maintPlanning>
<taskDefinition applicRefId="appl-001" taskIdent="001"
taskCode="taskcd04" worthinessLimit="recommended"
reducedMaint="No" skillType="st01">
<task> <taskDescr>
<simplePara>To do the pre-ride checks </simplePara>
</taskDescr></task>
<rqmtSource sourceOfRqmt="MRB" approval="ap01"><externalPubRef>
<externalPubRefIdent>
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<externalPubCode>XY774W001-MRB</externalPubCode>
<externalPubTitle>Maintenance Review BoardReport
</externalPubTitle>
</externalPubRefIdent>
<externalPubRefAddressItems>
<externalPubIssueDate year="2010" month="12" day="14"/>
</externalPubRefAddressItems></externalPubRef>
<sourceType sourceTypeCode="stc05"/>
</rqmtSource>
<preliminaryRqmts><reqCondGroup><noConds/></reqCondGroup>
<reqPersons>
<person man="A">
<personCategory personCategoryCode="Basic user"/>
<trade>Operator</trade>
<estimatedTime unitOfMeasure="h">0,25</estimatedTime>
</person>
</reqPersons>
<reqSupportEquips>
<supportEquipDescrGroup>
<supportEquipDescr><name>Tire pressure gauge</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber><partNumber>BSK-TLST-001-01</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
<supportEquipDescr><name>Specialist toolset</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber><partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</supportEquipDescr>
</supportEquipDescrGroup>
</reqSupportEquips>
<reqSupplies>
<supplyDescrGroup>
<supplyDescr><name>General lubricant</name>
<identNumber><manufacturerCode>KZ222</manufacturerCode>
<partAndSerialNumber><partNumber>LL-001</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity>As required</reqQuantity>
</supplyDescr>
</supplyDescrGroup>
</reqSupplies>
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<reqSafety><noSafety/></reqSafety>
</preliminaryRqmts>
<refs><dmRef>
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```
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="121" infoCodeVariant="A" itemLocationCode="A"/>
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</dmRef></refs>
<equipGroup>
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<identNumber><manufacturerCode>KZ555</manufacturerCode>
<partAndSerialNumber><partNumber>Bicycle-001</partNumber>
</partAndSerialNumber>
</identNumber>
</equip>
</equipGroup>
<limit limitTypeValue="po">
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thresholdType="interval">
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thresholdUnitOfMeasure="th06"/>
</threshold>
<inspectionType inspectionTypeCategory="Daily"/>
</limit>
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worthinessLimit="recommended" reducedMaint="No">
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maintenance</simplePara>
</taskDescr></task>
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</reqPersons>
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<supportEquipDescrGroup>
<supportEquipDescr><name>Specialist toolset</name>
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</identNumber>
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```

```
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</reqSupplies>
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<reqSafety><noSafety/></reqSafety>
</preliminaryRqmts>
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infoCode="151" infoCodeVariant="A" itemLocationCode="A"/>
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</dmRef></refs>
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<equip><name>Bicycle</name>
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<partAndSerialNumber><partNumber>Bicycle-001</partNumber>
</partAndSerialNumber>
</identNumber>
</equip>
</equipGroup>
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thresholdUnitOfMeasure="th06"/>
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<inspectionType inspectionTypeCategory="Daily"/>
</limit>
</taskDefinition>
<taskDefinition applicRefId="appl-001" taskIdent="003"
worthinessLimit="recommended" reducedMaint="Yes">
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</taskDescr></task>
<preliminaryRqmts><reqCondGroup><noConds/></reqCondGroup>
<reqPersons>
<person man="A">
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<trade>Operator</trade>
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</person>
</reqPersons>
<reqSupportEquips><noSupportEquips/></reqSupportEquips>
<reqSupplies>
<supplyDescrGroup>
<supplyDescr><name>Rubbing alcohol</name>
<identNumber><manufacturerCode>KZ222</manufacturerCode>
<partAndSerialNumber><partNumber>LL-002</partNumber>
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</partAndSerialNumber>
</identNumber>
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</supplyDescr>
</supplyDescrGroup>
</reqSupplies>
<reqSpares><noSpares/></reqSpares>
<reqSafety><noSafety/></reqSafety>
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assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="251" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef></refs><equipGroup><equip><name>Brake pads</name>
<identNumber><manufacturerCode>KT444</manufacturerCode>
<partAndSerialNumber><partNumber>BR-PADS-001</partNumber>
</partAndSerialNumber>
</identNumber>
</equip>
</equipGroup>
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</threshold>
</limitRangeFrom>
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</limitRange>
</limit>
</taskDefinition>
<taskDefinition applicRefId="appl-001" taskIdent="004"
worthinessLimit="recommended" reducedMaint="Yes">
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</taskDescr></task>
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<supportEquipDescrGroup>
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<supportEquipDescr><name>Stiff bristle brush</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
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</identNumber>
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</supportEquipDescr>
<supportEquipDescr><name>Chain cleaning fluid</name>
<identNumber><manufacturerCode>KZ222</manufacturerCode>
<partAndSerialNumber><partNumber>LL-003</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity>As required</reqQuantity>
</supportEquipDescr>
<supportEquipDescr><name>Chain cleaning tool</name>
<identNumber><manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber><partNumber>BSK-TLST-001-03</partNumber>
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</identNumber>
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</supportEquipDescr>
</supportEquipDescrGroup>
</reqSupportEquips>
<reqSupplies>
<supplyDescrGroup>
<supplyDescr><name>Floor covering</name>
<identNumber><manufacturerCode></manufacturerCode>
<partAndSerialNumber><partNumber></partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity>As required</reqQuantity>
</supplyDescr>
<supplyDescr><name>General lubricant</name>
<identNumber><manufacturerCode>KZ222</manufacturerCode>
<partAndSerialNumber><partNumber>LL-001</partNumber>
</partAndSerialNumber>
</identNumber>
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</supplyDescr>
</supplyDescrGroup>
</reqSupplies>
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<reqSafety><noSafety/></reqSafety>
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infoCode="251" infoCodeVariant="B" itemLocationCode="A"/>
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assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="121" infoCodeVariant="A" itemLocationCode="A"/>
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<dmRefAddressItems>
<dmTitle><techName>Bicycle</techName>
<infoName>Pre-operation procedures (crew)</infoName>
</dmTitle>
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</dmRef></refs>
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<identNumber><manufacturerCode>KZ555</manufacturerCode>
<partAndSerialNumber><partNumber>Ch-001</partNumber>
</partAndSerialNumber>
</identNumber>
</equip>
</equipGroup>
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</threshold>
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systemCode="D00" subSystemCode="0" subSubSystemCode="0"
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infoCode="121" infoCodeVariant="A" itemLocationCode="A"/>
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</trigger>
</limit>
</taskDefinition>
<taskDefinition applicRefId="appl-001" taskIdent="005"
worthinessLimit="recommended"
reducedMaint="No">
<task><taskDescr><simplePara>Clean the hub bearings</simplePara>
</taskDescr></task>
<preliminaryRqmts>
<reqCondGroup>
<reqCondDm>
<reqCond>Rear wheel removed</reqCond>
<dmRef>
<dmRefIdent>
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systemCode="DA0" subSystemCode="2" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="520" infoCodeVariant="A" itemLocationCode="A"/>
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```
</dmRef>
</reqCondDm>
</reqCondGroup>
<reqPersons>
<person man="B">
<personCategory personCategoryCode="Supervisor"/>
<personSkill skillLevelCode="sk03"/>
<trade>Bicycle mechanic</trade>
<estimatedTime unitOfMeasure="h">0,75</estimatedTime>
</person>
<person man="A">
<personCategory personCategoryCode="Basic user"/>
<trade>Operator</trade>
<estimatedTime unitOfMeasure="h">0,25</estimatedTime>
</person>
</reqPersons>
<reqSupportEquips>
<supportEquipDescrGroup>
<supportEquipDescr><name>Specialist toolset</name>
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<partAndSerialNumber><partNumber>BSK-TLST-001</partNumber>
</partAndSerialNumber>
</identNumber>
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</supportEquipDescr>
</supportEquipDescrGroup>
</reqSupportEquips>
<reqSupplies>
<supplyDescrGroup>
<supplyDescr><name>Degreasing agent</name>
<identNumber><manufacturerCode>KZ222</manufacturerCode>
<partAndSerialNumber><partNumber>LL-004</partNumber>
</partAndSerialNumber>
</identNumber>
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</supplyDescr>
<supplyDescr id="sup-0002">
<name>General grease</name>
<identNumber><manufacturerCode>KZ222</manufacturerCode>
<partAndSerialNumber><partNumber>LL-005</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity>As required</reqQuantity>
</supplyDescr>
</supplyDescrGroup>
</reqSupplies>
<reqSpares><noSpares/></reqSpares>
<reqSafety><noSafety/></reqSafety>
</preliminaryRqmts>
<equipGroup>
<equip><name>Hubs</name>
<identNumber><manufacturerCode>KZ555</manufacturerCode>
```

```
<partAndSerialNumber><partNumber>HB-002</partNumber>
</partAndSerialNumber>
</identNumber>
</equip>
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<supervisorLevel supervisorLevelCode="sl01"/>
<limit><threshold thresholdUnitOfMeasure="th03">
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<inspectionType inspectionTypeCategory="6 Monthly"/>
<limitRange>
<limitRangeFrom>
<threshold thresholdUnitOfMeasure="th03">
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<tolerance toleranceType="plusorminus" toleranceValue="4"
thresholdUnitOfMeasure="th04"/>
</threshold>
</limitRangeFrom>
</limitRange>
</limit>
</taskDefinition>
</maintPlanning>
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```

3.3 Inspection definition example

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<inspectionDefinition>
<inspection>
<limit limitCond="Pre-ride">
<sampling samplingValue="4" samplingUnit="brakes"
samplingRatio="0.5">50 % of the 4 brakes</sampling>
<threshold thresholdUnitOfMeasure="th51">
<thresholdValue>1</thresholdValue>
<tolerance toleranceType="plusorminus" toleranceValue="1"
thresholdUnitOfMeasure="th04"/>
</threshold>
<inspectionType inspectionTypeCategory="Pre"/>
<limitRange>
<limitRangeFrom>
<threshold thresholdUnitOfMeasure="th51">
<thresholdValue>1</thresholdValue>
<tolerance toleranceType="plusorminus" toleranceValue="1"
thresholdUnitOfMeasure="th04"/>
</threshold>
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</limitRange>
</limit>
</inspection>
<taskGroup>
<taskItem taskSeqNumber="001" taskName="Inspect brakes">
<refs>
<dmRef>
<dmRefIdent>
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```
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systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="121" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
<task><taskDescr>
<simplePara>To do an inspection of the brakes</simplePara>
</taskDescr></task>
</taskItem>
<taskItem taskSeqNumber="002"
taskName="Inspect brakes installation">
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="121" infoCodeVariant="A" itemLocationCode="A"/>
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</refs>
<task><taskDescr><simplePara>To do an inspection of the brakes
installation</simplePara></taskDescr></task>
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<taskItem taskSeqNumber="003" taskName="Check tire pressure">
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<dmRefIdent>
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systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="121" infoCodeVariant="A" itemLocationCode="A"/>
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</dmRef>
</refs>
<task><taskDescr><simplePara>To do a check of the tire
pressure</simplePara></taskDescr></task>
</taskItem>
<taskItem taskSeqNumber="004" taskName="Inspect wheel
condition">
<refs>
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assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="121" infoCodeVariant="A" itemLocationCode="A"/>
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</dmRef>
</refs>
<task><taskDescr><simplePara>To do an inspection of the wheel
```

```
condition</simplePara></taskDescr></task>
</taskItem>
<taskItem taskSeqNumber="005" taskName="Check headset bearings">
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systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="121" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
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bearings</simplePara></taskDescr></task>
</taskItem>
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<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="121" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
<task><taskDescr><simplePara>To do a check of the
chain</simplePara></taskDescr></task>
</taskItem>
</taskGroup>
</inspectionDefinition>
</maintPlanning>
```

3.4 Maintenance allocation example

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<title>MAC for the Roller</title>
<maintAllocationGroup>
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<componentAssy><name>ENGINE</name></componentAssy>
<maintQualifier>
<maintFunction function="ft00"/>
<maintLevelGroup>
<maintLevel maintLevelCode="ml01"/>
</maintLevelGroup>
</maintQualifier>
</maintAllocationGroup>
<maintAllocationGroup>
<groupNumber>0100</groupNumber>
<componentAssyGroup>
<componentAssy><name>Engine Assembly</name></componentAssy>
```

```
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<maintFunction function="ft00"/>
<maintLevelGroup>
<maintLevel maintLevelCode="ml01"/>
</maintLevelGroup>
</maintQualifier>
</componentAssyGroup>
<componentAssyGroup>
<componentAssy><name>Engine, Turbo Diesel</name></componentAssy>
<maintQualifier>
<maintFunction function="ft01"/>
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<maintLevel maintLevelCode="ml01">1.0</maintLevel>
</maintLevelGroup>
<remarksRefs>
<internalRef internalRefId="RemarkA"></internalRef>
</remarksRefs>
</maintQualifier>
<maintQualifier>
<maintFunction function="ft02"/>
<maintLevelGroup>
<maintLevel maintLevelCode="ml02">0.5</maintLevel>
<maintLevel maintLevelCode="ml03">1.0</maintLevel>
</maintLevelGroup>
<toolsRefs>
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<internalRef internalRefId="Tool03">3</internalRef>
<internalRef internalRefId="Tool04">4</internalRef>
</toolsRefs>
</maintQualifier>
<maintQualifier>
<maintFunction function="ft03"/>
<maintLevelGroup>
<maintLevel maintLevelCode="ml02">1.5</maintLevel>
</maintLevelGroup>
<toolsRefs>
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<internalRef internalRefId="Tool04">4</internalRef>
</toolsRefs>
</maintQualifier>
<maintQualifier>
<maintFunction function="ft08"/>
<maintLevelGroup>
<maintLevel maintLevelCode="ml03">8.0</maintLevel>
</maintLevelGroup>
<toolsRefs>
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<internalRef internalRefId="Tool04">4</internalRef>
</toolsRefs>
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<maintQualifier>
<maintFunction function="ft09"/>
```

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<internalRef internalRefId="Tool04">4</internalRef>
</toolsRefs>
</maintQualifier>
</componentAssyGroup>
<componentAssyGroup>
<componentAssy><name>Engine Lifting Plate</name></componentAssy>
<maintQualifier>
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<maintLevelGroup>
<maintLevel maintLevelCode="ml02">0.2</maintLevel>
</maintLevelGroup>
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</remarksRefs>
</maintQualifier>
<maintQualifier>
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<maintLevelGroup>
<maintLevel maintLevelCode="ml02">0.5</maintLevel>
</maintLevelGroup>
</maintQualifier>
</componentAssyGroup>
<componentAssyGroup>
<componentAssy>
<name>Engine Mounts</name>
</componentAssy>
<maintQualifier>
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</maintLevelGroup>
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</maintQualifier>
<maintQualifier>
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</maintLevelGroup>
<toolsRefs>
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<internalRef internalRefId="Tool04">4</internalRef>
</toolsRefs>
</maintQualifier>
</componentAssyGroup>
</maintAllocationGroup>
```

```
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<toolsList>
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<toolsListGroup>
<toolsListCode id="Tool01">1</toolsListCode>
<maintLevel maintLevelCode="ml02">O</maintLevel>
<name>Shop Equipment, Automotive Maintenance and Repair: OM
Common No. 1, Less Power (SC4910-95-A74)</name>
<natoStockNumber natoSupplyClass="4910"
natoCodificationBureau="00" natoItemIdentNumberCore="75406548"/>
<toolRef toolNumber="W32593"/>
</toolsListGroup>
<toolsListGroup>
<toolsListCode id="Tool02">2</toolsListCode>
<maintLevel maintLevelCode="ml03">F</maintLevel>
<name>Shop Equipment, General Purpose Repair, Semitrailer
Mounted (SC4940-95-CL-B02)</name>
<natoStockNumber natoSupplyClass="4940"
natoCodificationBureau="00" natoItemIdentNumberCore="2874894"/>
<toolRef toolNumber="T10549"/>
</toolsListGroup>
<toolsListGroup>
<toolsListCode id="Tool03">3</toolsListCode>
<maintLevel maintLevelCode="ml02">O</maintLevel>
<name>Simplified Test Equipment for Internal Combustion Engines
Reprogrammed (STE/ICE-R)</name>
<natoStockNumber natoSupplyClass="4910"
natoCodificationBureau="01" natoItemIdentNumberCore="2226589"/>
<toolRef toolNumber="A56243"/>
</toolsListGroup>
<toolsListGroup>
<toolsListCode id="Tool04">4</toolsListCode>
<maintLevel maintLevelCode="ml02">O</maintLevel>
<name>Tool Kit, General Mechanics: Automotive (SC5180-90-
N26)</name>
<natoStockNumber natoSupplyClass="5180"
natoCodificationBureau="00" natoItemIdentNumberCore="1777033"/>
<toolRef toolNumber="W33004"/>
</toolsListGroup>
</toolsList>
<remarksList>
<title>Remarks</title>
<remarksGroup>
<remarkCode id="RemarkA">A</remarkCode>
<remarks><simplePara>Preventive Maintenance Checks and Services
(PMCS).</simplePara></remarks>
</remarksGroup>
</remarksList>
</maintPlanning>
```

Chapter 3.9.5.2.6

Content section - Crew/Operator information

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Chap 3.9.5.2.1	Content section - Common constructs
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Chap 3.9.5.2.1.6	Common constructs - Tables
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Chap 3.9.6.1	Attributes - Project configurable values
Chap 5.2.2.7	Air specific information sets - Aircrew information
Chap 5.2.3	Information sets - Land/Sea specific information sets

1 General

The crew Schema is provided for the production of Crew/Operator information such as description and operation of the Product and sequential information.

For aircrew information, refer to Chap 5.2.2.7. For crew/operator information for land/sea products, refer to Chap 5.2.3.

2 Crew Information

2.1 Schema basic rules

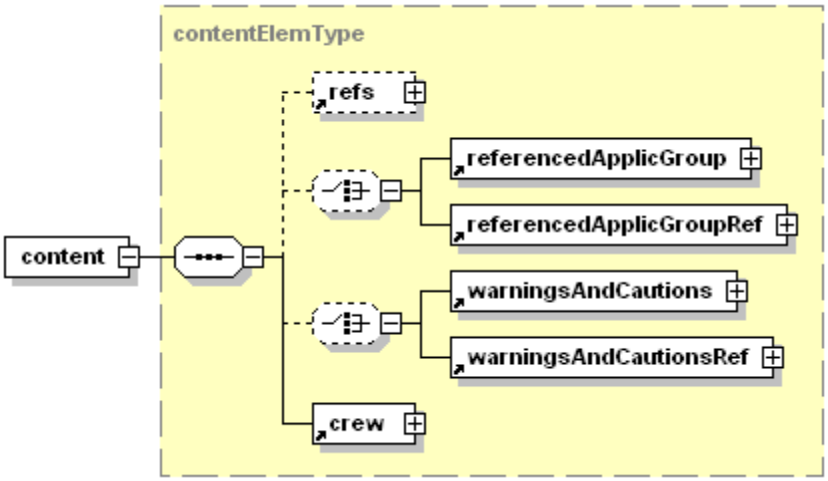
This Schema is used to capture and represent information to be used by crew/operators. The granularity of crew data modules follows the breakdown reflected by the SNS.

The use of the common entities, elements and attributes is as detailed in Chap 3.9.5.2.1.

2.2 Content

Description: The element <content> is the top-level element in the content section of this Schema.

Markup element: <content>



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Fig 1 Major elements in crew content

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`refs`>. Refer to Chap 3.9.5.2.1.2.
- <`referencedApplicGroup`>. Refer to Chap 3.9.5.3.
- <`referencedApplicGroupRef`>. Refer to Chap 3.9.5.3.
- <`warningsAndCautions`>. Refer to Chap 3.9.3.
- <`warningsAndCautionsRef`>. Refer to Chap 3.9.3.
- <`crew`>. Refer to Para 2.3.

2.3 Crew

Description: The element <`crew`> is the container for all crew/operator content (excluding references).

Markup element: <`crew`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

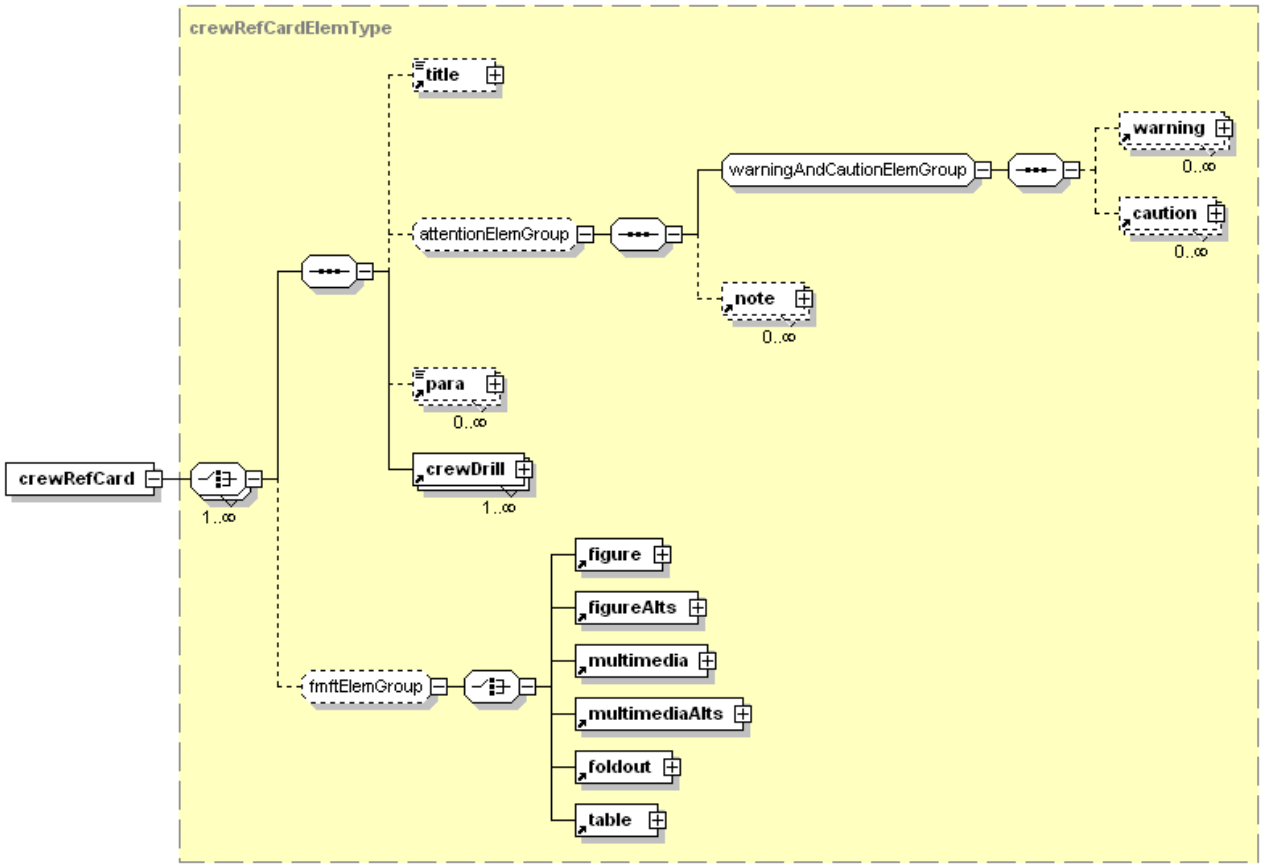
Child elements:

- <`crewRefCard`>. Refer to Para 2.3.1.
- <`descrCrew`>. Refer to Para 2.3.2.

2.3.1 Reference card

Description: The element <`crewRefCard`> contains a crew/operator reference card information for drills.

Markup element: <crewRefCard>



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Fig 2 Element <crewRefCard>

Attributes:

- `warningRefs` (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `cautionRefs` (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

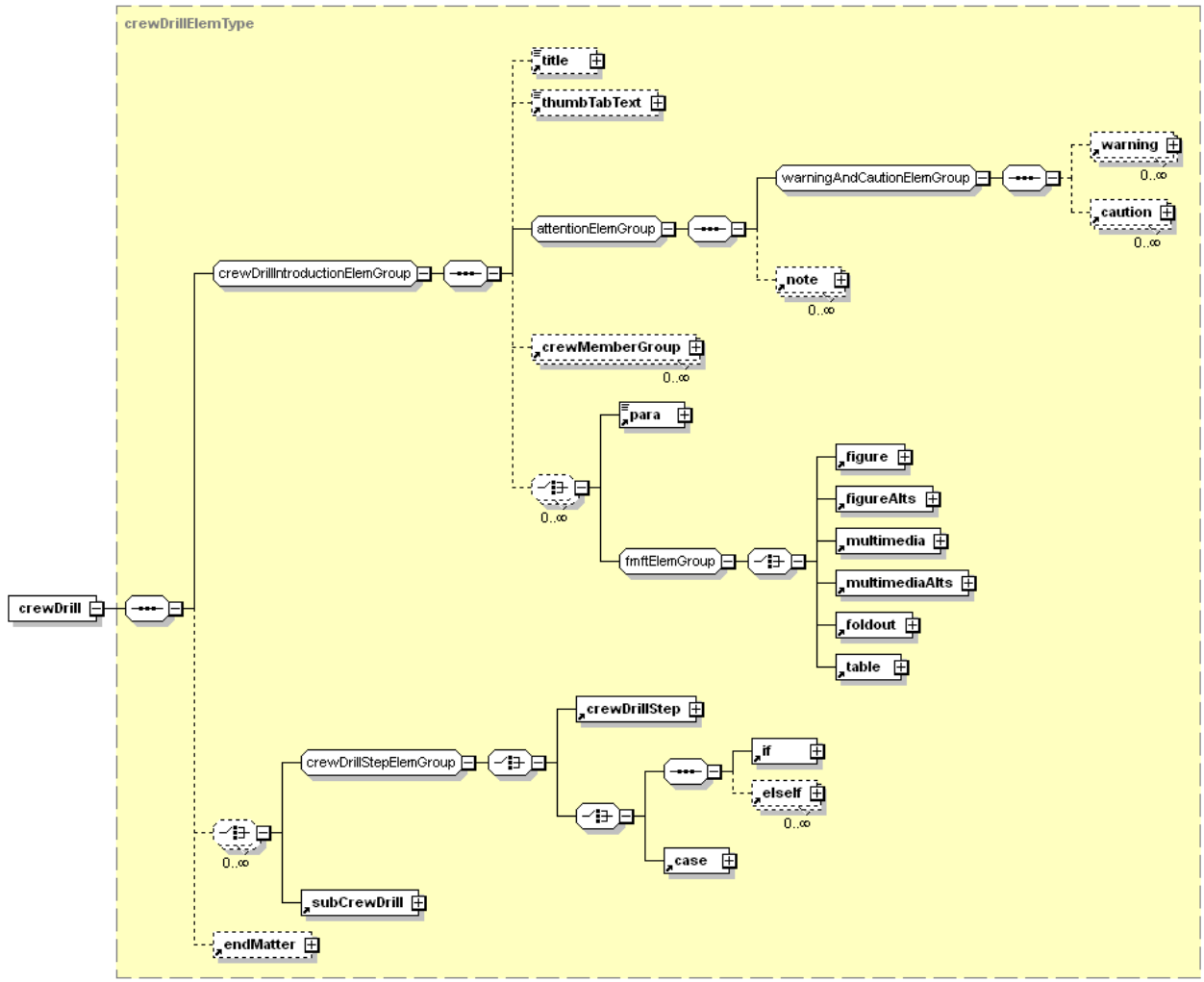
- <title>. Refer to Chap 3.9.5.2.1.5.
- <warning>. Refer to Chap 3.9.3.
- <caution>. Refer to Chap 3.9.3.
- <note>. Refer to Chap 3.9.3.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <crewDrill>. Refer to Para 2.3.1.1.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.

- <foldout>. Refer to Chap 3.9.5.2.1.7.
- <table>. Refer to Chap 3.9.5.2.1.6.

2.3.1.1 Drill

Description: The element <crewDrill> contains a crew/operator drill.

Markup element: <crewDrill>



ICN-83007-0000000089-001-01

Fig 3 Element <crewDrill>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- warningRefs (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- cautionRefs (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.

- drillType (O), the type of drill. The attribute drillType can have one of the following values:
  - "dt00" (D) thru "dt99". Refer to Chap 3.9.6.1.
- orderedStepsFlag (O), indicates whether the drill steps are a chronologically ordered list. The attribute orderedStepsFlag can have one of the following values:
  - "1" (D) - Yes, the list is chronologically ordered
  - "0" - No, the list is not chronologically ordered
- crewStepCondition (O), the special conditions associated with a drill. The attribute crewStepCondition can have one or more of the following values:
  - "csc01" thru "csc99". Refer to Chap 3.9.6.1.
- independentCheck (O), the drill must be checked by a supervisor with a given qualification
- skillLevelCode (O), the skill level required for the drill. The attribute skillLevelCode can have one of the following values:
  - "sk01" thru "sk99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

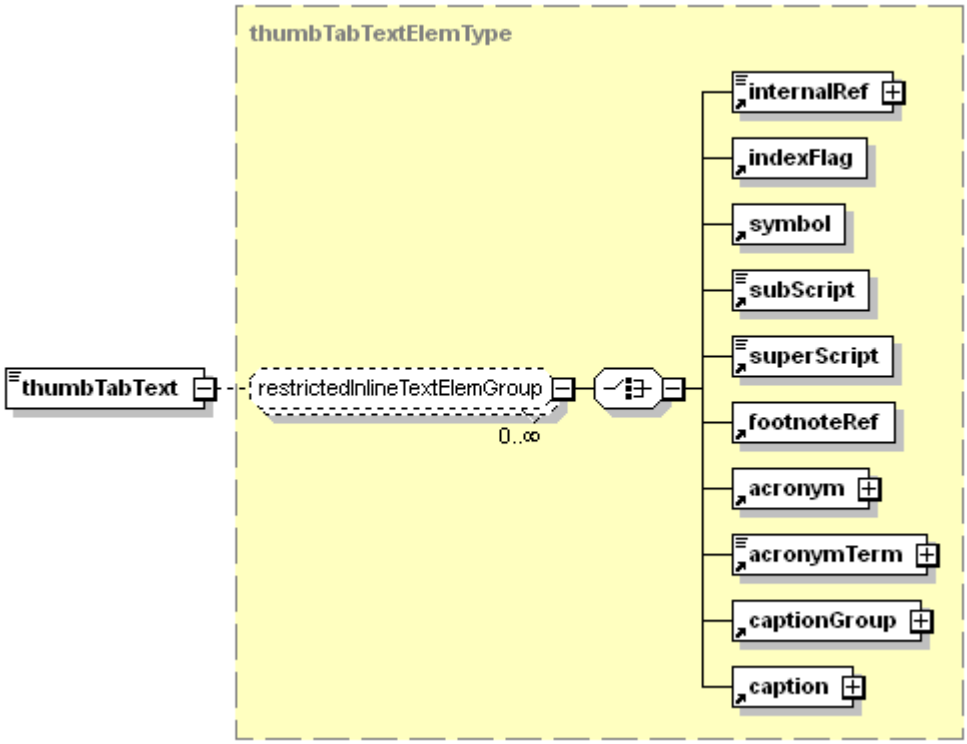
Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <thumbTabText>. Refer to Para 2.3.1.1.1.
- <warning>. Refer to Chap 3.9.3.
- <caution>. Refer to Chap 3.9.3.
- <note>. Refer to Chap 3.9.3.
- <crewMemberGroup>. Refer to Para 2.3.1.1.2.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7.
- <table>. Refer to Chap 3.9.5.2.1.6.
- <crewDrillStep>. Refer to Para 2.3.1.1.4.
- <if>. Refer to Para 2.3.1.1.9.
- <elseIf>. Refer to Para 2.3.1.1.11.
- <case>. Refer to Para 2.3.1.1.12.
- <subCrewDrill>. Refer to Para 2.3.1.1.13.
- <endMatter>. Refer to Para 2.3.1.1.14.

2.3.1.1.1 Tab text

Description: The element <thumbTabText> contains thumb tab text for the drill or subdrill.

Markup element: <thumbTabText>



ICN-83007-0000000090-001-01

Fig 4 Element <thumbTabText>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <internalRef>. Refer to Chap 3.9.5.2.1.2.
- <indexFlag>. Refer to Chap 3.9.5.2.1.10.
- <symbol>. Refer to Chap 3.9.5.2.1.10.
- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.
- <footnoteRef>. Refer to Chap 3.9.5.2.1.10.
- <acronym>. Refer to Chap 3.9.5.2.1.10.
- <acronymTerm>. Refer to Chap 3.9.5.2.1.10.
- <captionGroup>. Refer to Chap 3.9.5.2.1.4.
- <caption>. Refer to Chap 3.9.5.2.1.4.

2.3.1.1.2 Crew

Description: The element <crewMemberGroup> contains the identification of the crew/operator responsible for carrying out an action.

Markup element: <crewMemberGroup>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `actionResponsibility` (O), the responsibility for performing the actions. The attribute `actionResponsibility` can have one of the following values:
  - "`all`" - all of the crew/operator listed are responsible
  - "`any`" - any of the crew/operator listed are responsible
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`crewMember`>. Refer to Para 2.3.1.1.3.

2.3.1.1.3 Crew member

Description: The element <`crewMember`> contains the identification of a crew/operator member.

Markup element: <`crewMember`>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `crewMemberType` (M), the type of crew member. The attribute `crewMemberType` can have one of the following values:
  - "`cm01`" thru "`cm99`". Refer to Chap 3.9.6.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

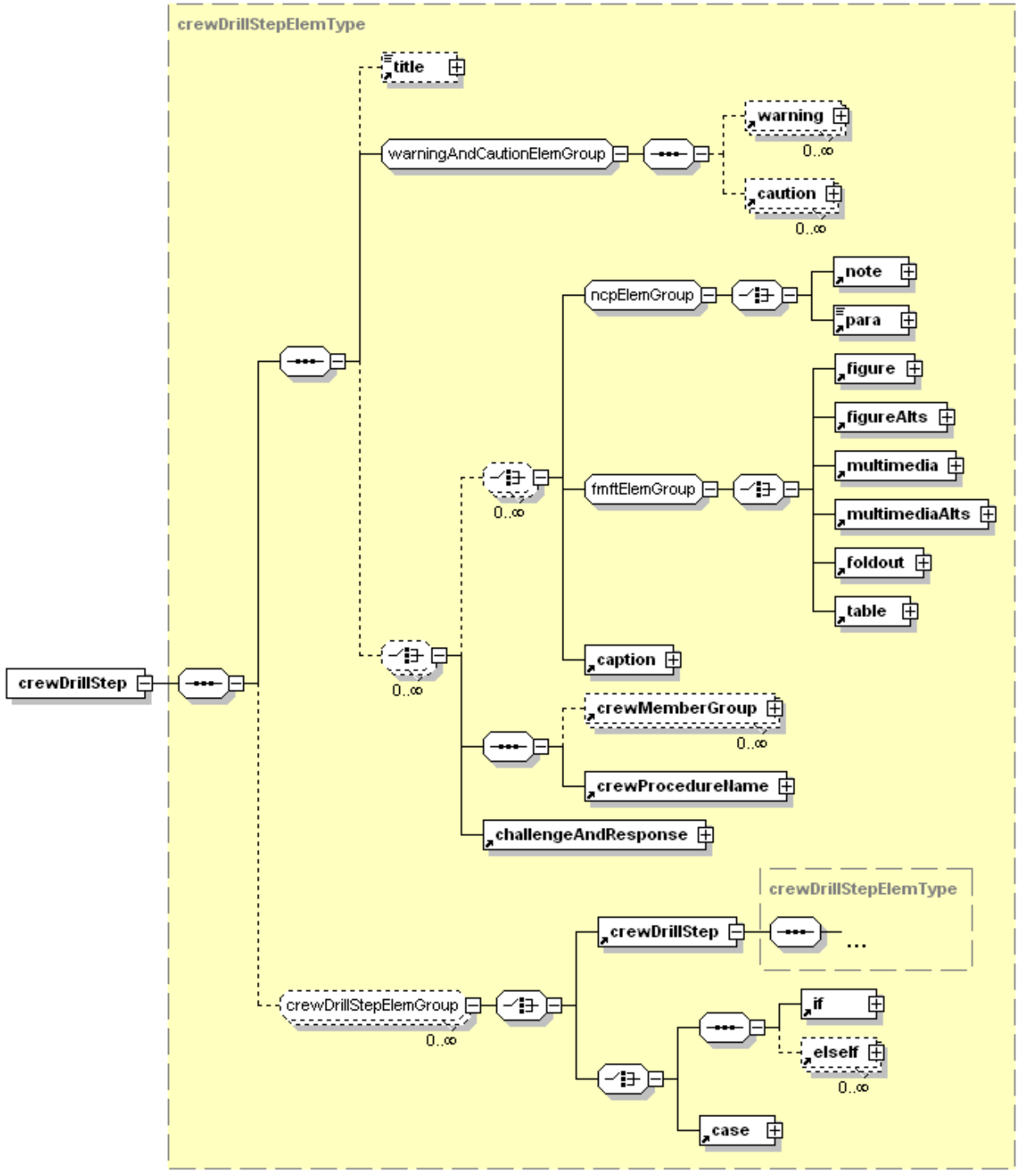
Child elements:

- None

2.3.1.1.4 Crew drill step

Description: The element <`crewDrillStep`> contains a step in a crew/operator data module.

Markup element: <`crewDrillStep`>



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Fig 5 Element <crewDrillStep>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- warningRefs (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- cautionRefs (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- stepLabel (O), the label of the step
- keepWithNext (O), indicates whether a step is presented together with the next step. The attribute keepWithNext has no meaning when placed on a final step. It can have one of the following values:
  - "0" (D) - No, the step need not be kept with the next sibling step
  - "1" - Yes, the step must be kept with the next sibling step (if one exists) and therefore, all children of the step for which the attribute is set must be kept together as well (if possible)
- memorizeStepsFlag (O), indicates whether a step must be memorized by crew/operator. The attribute memorizeStepsFlag can have one of the following values:
  - "0" (D) - No, the step need not be memorized
  - "1" - Yes, the step must be memorized by the crew/operator
- separatorStyle (O), the separator characters between a challenge and a response. The attribute separatorStyle can have one of the following values:
  - "dot" (D) - a sequence of dots
  - "line" - a line
  - "none" - no separator
- orderedStepsFlag (O), indicates whether the drill steps are a chronologically ordered list. The attribute orderedStepsFlag can have one of the following values:
  - "1" (D) - Yes, the list is chronologically ordered
  - "0" - No, the list is not chronologically ordered
- crewStepCondition (O), the special conditions associated with a crew step. The attribute crewStepCondition can have one or more of the following values:
  - "csc01" thru "csc99". Refer to Chap 3.9.6.1.
- independentCheck (O), the step must be checked by a supervisor with a given qualification
- skillLevelCode (O), the skill level required for the step. The attribute skillLevelCode can have one of the following values:
  - "sk01" thru "sk99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

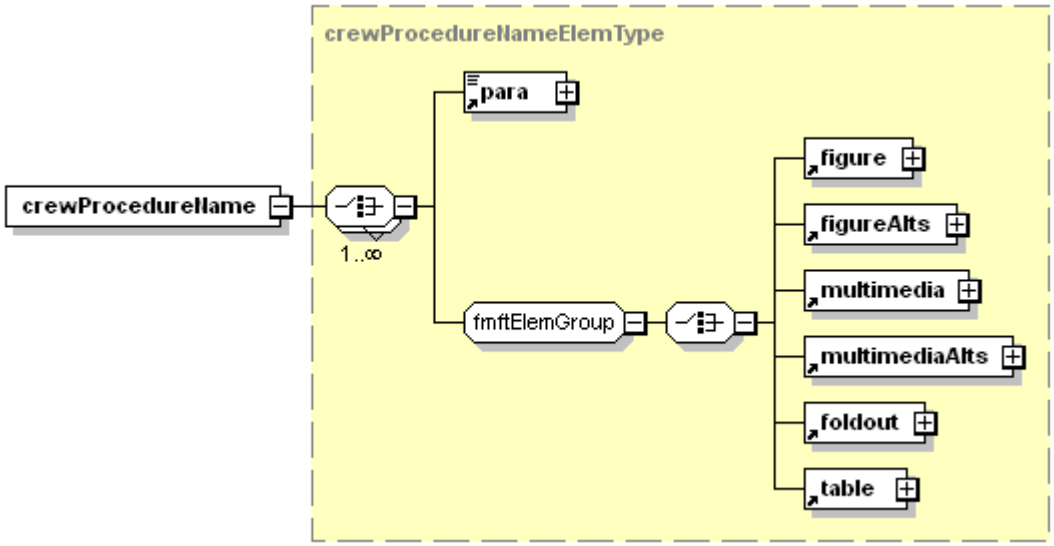
Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <warning>. Refer to Chap 3.9.3.
- <caution>. Refer to Chap 3.9.3.
- <note>. Refer to Chap 3.9.3.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7.
- <table>. Refer to Chap 3.9.5.2.1.6.
- <caption>. Refer to Chap 3.9.5.2.1.4.
- <crewMemberGroup>. Refer to Para 2.3.1.1.2.
- <crewProcedureName>. Refer to Para 2.3.1.1.5.
- <challengeAndResponse>. Refer to Para 2.3.1.1.6.
- <crewDrillStep>. Refer to Para 2.3.1.1.4.
- <if>. Refer to Para 2.3.1.1.9.
- <elseIf>. Refer to Para 2.3.1.1.11.
- <case>. Refer to Para 2.3.1.1.12.

2.3.1.1.5 Crew/operator procedure

Description: The element <crewProcedureName> contains the crew/operator procedure.

Markup element: <crewProcedureName>



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Fig 6 Element <crewProcedureName>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.

– `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

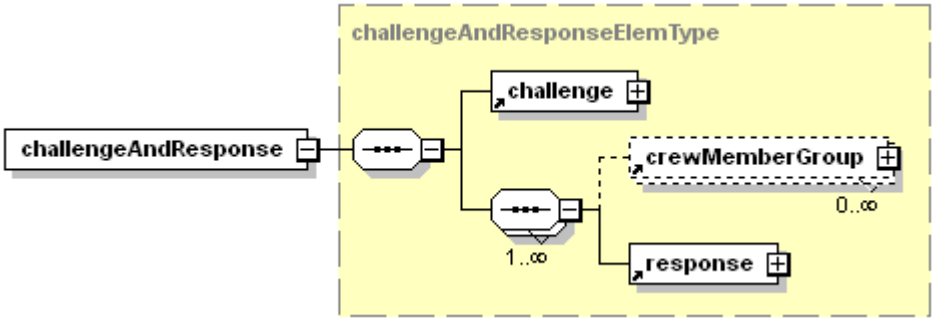
Child elements:

– <`para`>. Refer to Chap 3.9.5.2.1.10.
– <`figure`>. Refer to Chap 3.9.5.2.1.7.
– <`figureAlts`>. Refer to Chap 3.9.5.2.1.7.
– <`multimedia`>. Refer to Chap 3.9.5.2.1.7.
– <`multimediaAlts`>. Refer to Chap 3.9.5.2.1.7.
– <`foldout`>. Refer to Chap 3.9.5.2.1.7.
– <`table`>. Refer to Chap 3.9.5.2.1.6.

2.3.1.1.6 Crew/operator challenge and response

Description: The element <`challengeAndResponse`> contains the crew/operator challenge and response.

Markup element: <`challengeAndResponse`>



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Fig 7 Element <`challengeAndResponse`>

Attributes:

– None

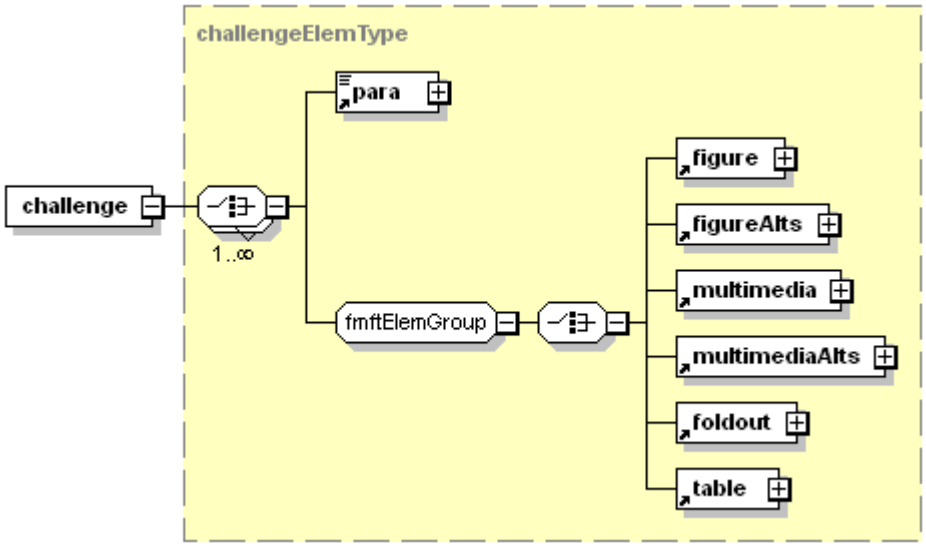
Child elements:

– <`challenge`>. Refer to Para 2.3.1.1.7.
– <`crewMemberGroup`>. Refer to Para 2.3.1.1.2.
– <`response`>. Refer to Para 2.3.1.1.8.

2.3.1.1.7 Challenge

Description: The element <`challenge`> contains the crew/operator challenge.

Markup element: <`challenge`>



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Fig 8 Element <challenge>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

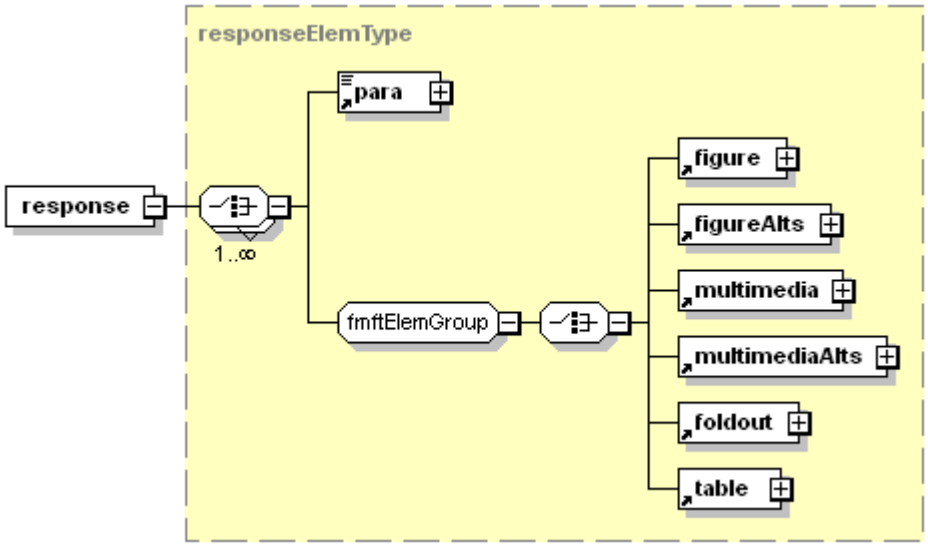
Child elements:

- <para>. Refer to Chap 3.9.5.2.1.10.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7.
- <table>. Refer to Chap 3.9.5.2.1.6.

2.3.1.1.8 Response

Description: The element <response> contains the expected response to the challenge.

Markup element: <response>



ICN-83007-0000000094-001-01

Fig 9 Element <response>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

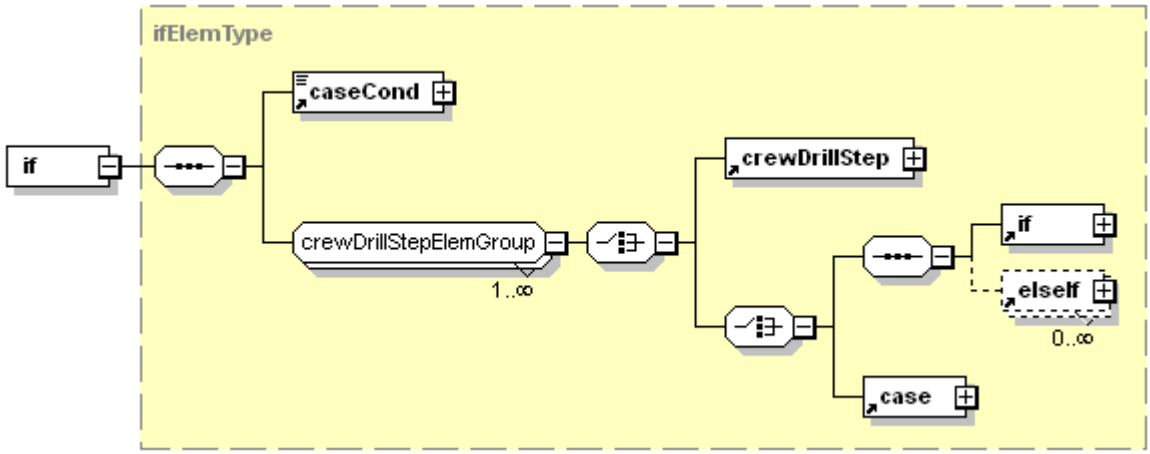
Child elements:

- <para>. Refer to Chap 3.9.5.2.1.10.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7.
- <table>. Refer to Chap 3.9.5.2.1.6.

2.3.1.1.9 If statement

Description: The element <if> contains an "if" statement.

Markup element: <if>



ICN-83007-0000000095-001-01

Fig 10 Element <if>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`caseCond`>. Refer to Para 2.3.1.1.10.
- <`crewDrillStep`>. Refer to Para 2.3.1.1.4.
- <`elseIf`>. Refer to Para 2.3.1.1.11.
- <`if`>. Refer to Para 2.3.1.1.9.
- <`case`>. Refer to Para 2.3.1.1.12.

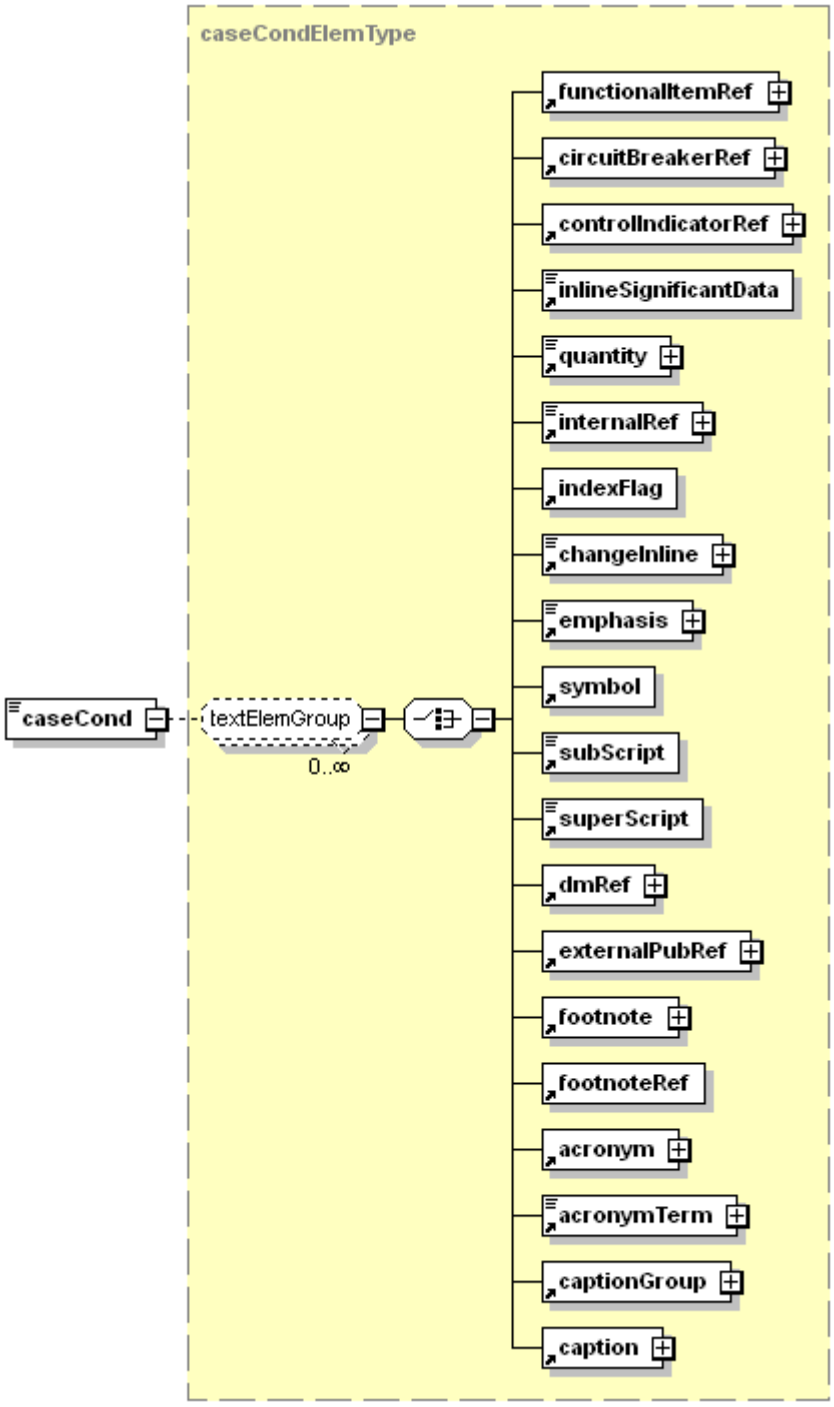
Markup example:

```
<if>
<caseCond>Handlebars twist in stem</caseCond>
<crewDrillStep>
<crewProcedureName><para>Tighten clamp bolt</para>
</crewProcedureName>
</crewDrillStep>
</if>
```

2.3.1.1.10 Condition statement

Description: The element <`caseCond`> contains the condition as part of an "if" statement.

Markup element: <`caseCond`>



ICN-83007-0000000096-001-01

Fig 11 Element <caseCond>

Attributes:

- `securityClassification` (O), `commercialClassification` (O), `caveat` (O), and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

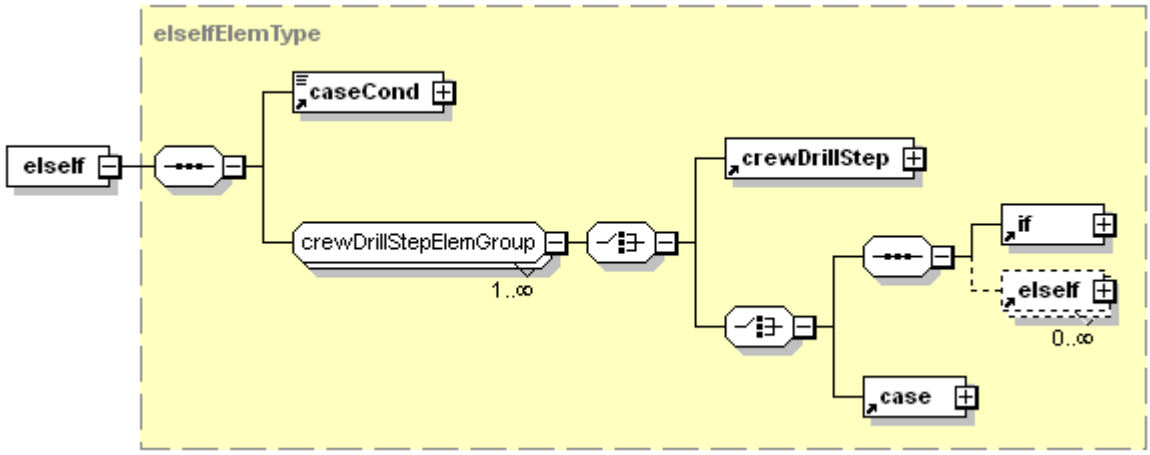
Child elements:

- <functionalItemRef>. Refer to Chap 3.9.5.1.
- <circuitBreakerRef>. Refer to Chap 3.9.5.2.1.10.
- <controlIndicatorRef>. Refer to Chap 3.9.5.2.1.10.
- <inlineSignificantData>. Refer to Chap 3.9.5.2.1.10.
- <quantity>. Refer to Chap 3.9.5.2.1.10.
- <internalRef>. Refer to Chap 3.9.5.2.1.2.
- <indexFlag>. Refer to Chap 3.9.5.2.1.10.
- <changeInline>. Refer to Chap 3.9.5.2.1.1.
- <emphasis>. Refer to Chap 3.9.5.2.1.10.
- <symbol>. Refer to Chap 3.9.5.2.1.10.
- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.
- <dmRef>. Refer to Chap 3.9.5.2.1.2.
- <externalPubRef>. Refer to Chap 3.9.5.2.1.2.
- <footnote>. Refer to Chap 3.9.5.2.1.10.
- <footnoteRef>. Refer to Chap 3.9.5.2.1.10.
- <acronym>. Refer to Chap 3.9.5.2.1.10.
- <acronymTerm>. Refer to Chap 3.9.5.2.1.10.
- <captionGroup>. Refer to Chap 3.9.5.2.1.4.
- <caption>. Refer to Chap 3.9.5.2.1.4.

2.3.1.1.11 Else-if statement

Description: The element <elseIf> contains an "if" statement to be used if another "if" condition is not met.

Markup element: <elseIf>



ICN-83007-0000000097-001-01

Fig 12 Element <elseIf>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O), and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <caseCond>. Refer to Para 2.3.1.1.10.
- <crewDrillStep>. Refer to Para 2.3.1.1.4.
- <case>. Refer to Para 2.3.1.1.12.
- <if>. Refer to Para 2.3.1.1.9.
- <elseIf>. Refer to Para 2.3.1.1.11.

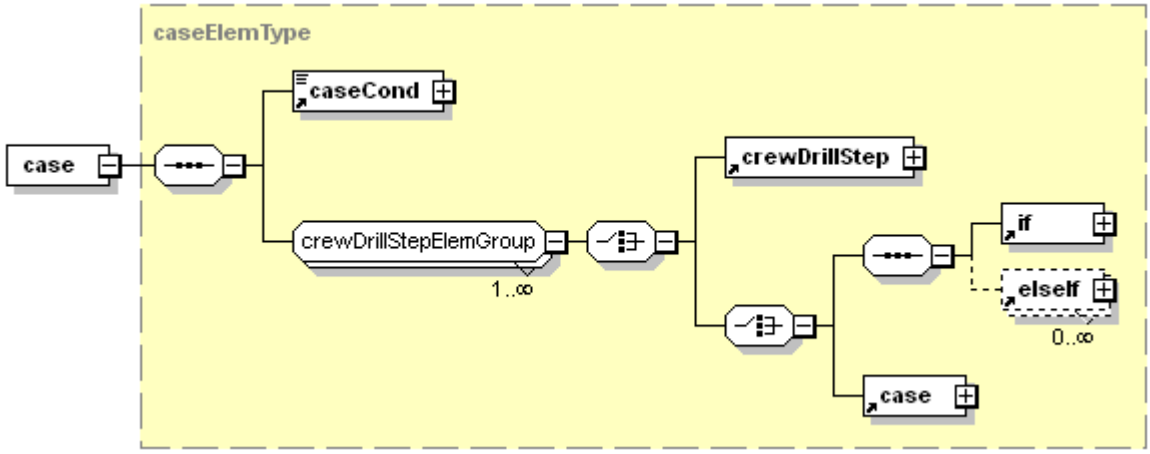
Markup example:

```
<elseIf>
<caseCond>Clamp loose</caseCond>
<crewDrillStep>
<crewProcedureName>
<para>Tighten clamp</para>
</crewProcedureName>
</crewDrillStep>
</elseIf>
```

2.3.1.1.12 *Case statement*

Description: The element <case> contains a case as part of the list of possible cases.

Markup element: <case>



ICN-83007-0000000098-001-01

Fig 13 Element <case>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <caseCond>. Refer to Para 2.3.1.1.10.
- <crewDrillStep>. Refer to Para 2.3.1.1.4.
- <case>. Refer to Para 2.3.1.1.12.
- <if>. Refer to Para 2.3.1.1.9.
- <elseIf>. Refer to Para 2.3.1.1.11.

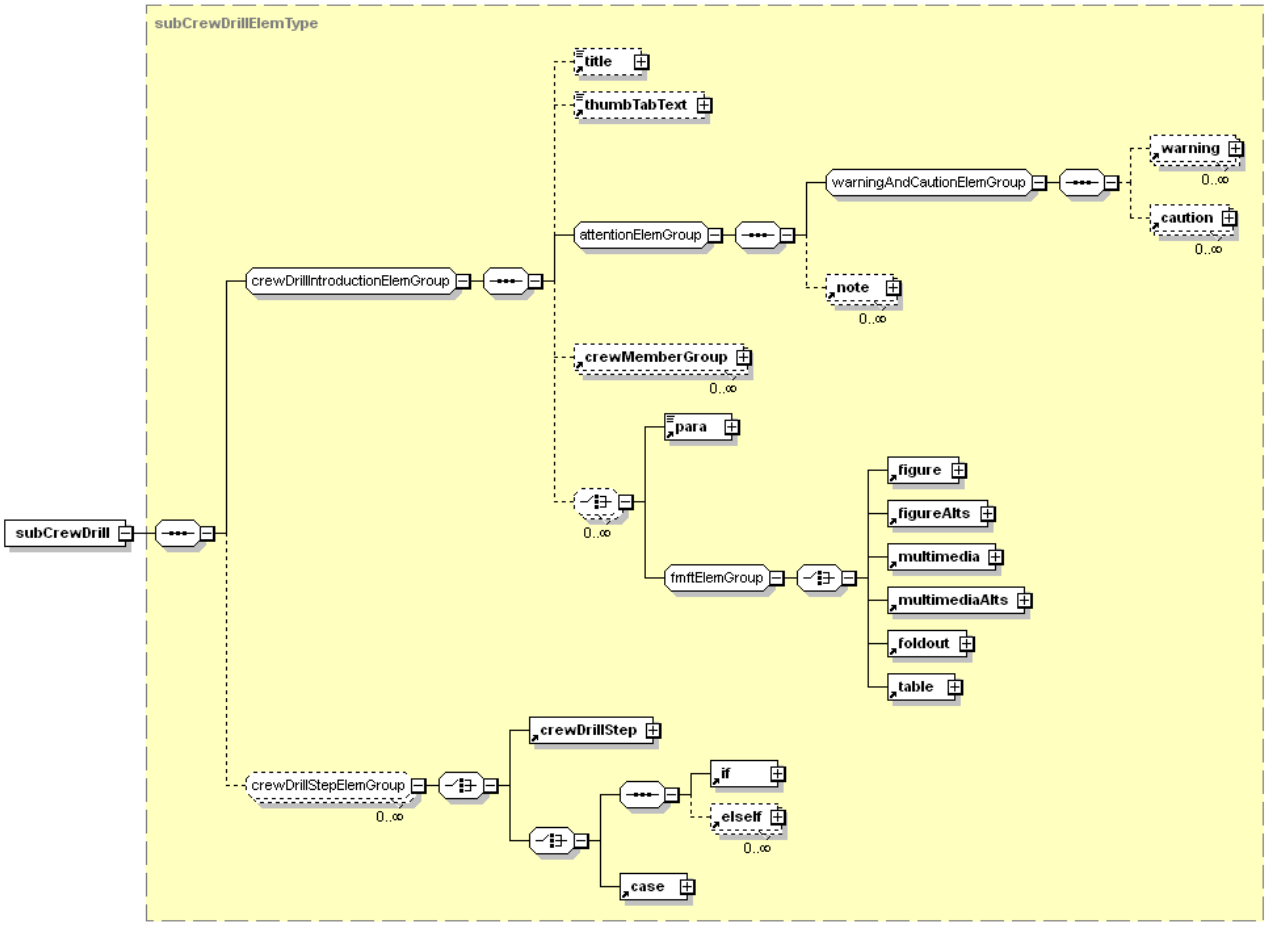
Markup example:

```
<case>
<caseCond>Dial set to A</caseCond>
<crewDrillStep>
<crewProcedureName>
<para>Set dial to B</para>
</crewProcedureName>
</crewDrillStep>
</case>
<case>
<caseCond>Dial set to B</caseCond>
<crewDrillStep>
<crewProcedureName>
<para>Do nothing</para>
</crewProcedureName>
</crewDrillStep>
</case>
```

2.3.1.1.13 Subdrill statement

Description: The element <subCrewDrill> contains a subdrill, which is part of a crew/operator drill.

Markup element: <subCrewDrill>



ICN-83007-0000000099-001-01

Fig 14 Element <subCrewDrill>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `warningRefs` (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `cautionRefs` (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `orderedStepsFlag` (O), indicates whether the drill steps are a chronologically ordered list. The attribute `orderedStepsFlag` can have one of the following values:
  - "`1`" (D) - Yes, the list is chronologically ordered
  - "`0`" - No, the list is not chronologically ordered
- `independentCheck` (O), the subdrill must be checked by a supervisor with a given qualification
- `skillLevelCode` (O), the skill level required for the subdrill. The attribute `skillLevelCode` can have one of the following values:

- "sk01" thru "sk99". Refer to Chap 3.9.6.1.

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <title>. Refer to Chap 3.9.5.2.1.5.
– <thumbTabText>. Refer to Para 2.3.1.1.1.
– <warning>. Refer to Chap 3.9.3.
– <caution>. Refer to Chap 3.9.3.
– <note>. Refer to Chap 3.9.3.
– <crewMemberGroup>. Refer to Para 2.3.1.1.2.
– <para>. Refer to Chap 3.9.5.2.1.10.
– <figure>. Refer to Chap 3.9.5.2.1.7.
– <figureAlts>. Refer to Chap 3.9.5.2.1.7.
– <multimedia>. Refer to Chap 3.9.5.2.1.7.
– <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
– <foldout>. Refer to Chap 3.9.5.2.1.7.
– <table>. Refer to Chap 3.9.5.2.1.6.
– <crewDrillStep>. Refer to Para 2.3.1.1.4.
– <if>. Refer to Para 2.3.1.1.9.
– <elseIf>. Refer to Para 2.3.1.1.11.
– <case>. Refer to Para 2.3.1.1.12.

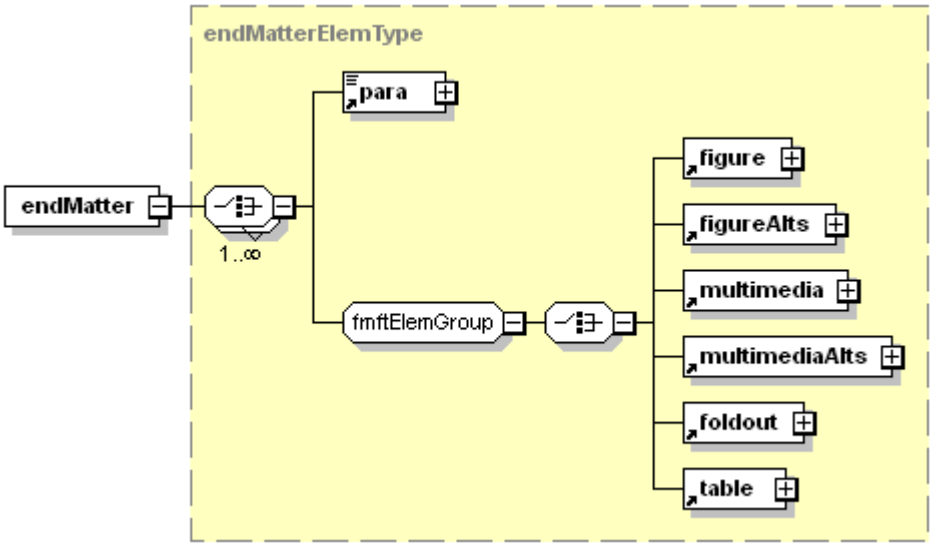
Markup example:

```
<subCrewDrill>
<title>Callipers</title>
<crewDrillStep>
<challengeAndResponse>
<challenge>
<para>Link Wire</para>
</challenge>
<response>
<para>Firmly attached</para>
</response>
</challengeAndResponse>
</crewDrillStep>
</subCrewDrill>
```

2.3.1.1.14 End matter statement

Description: The element <endMatter> contains end matter using the element <para>.

Markup element: <endMatter>



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Fig 15 Element <endMatter>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

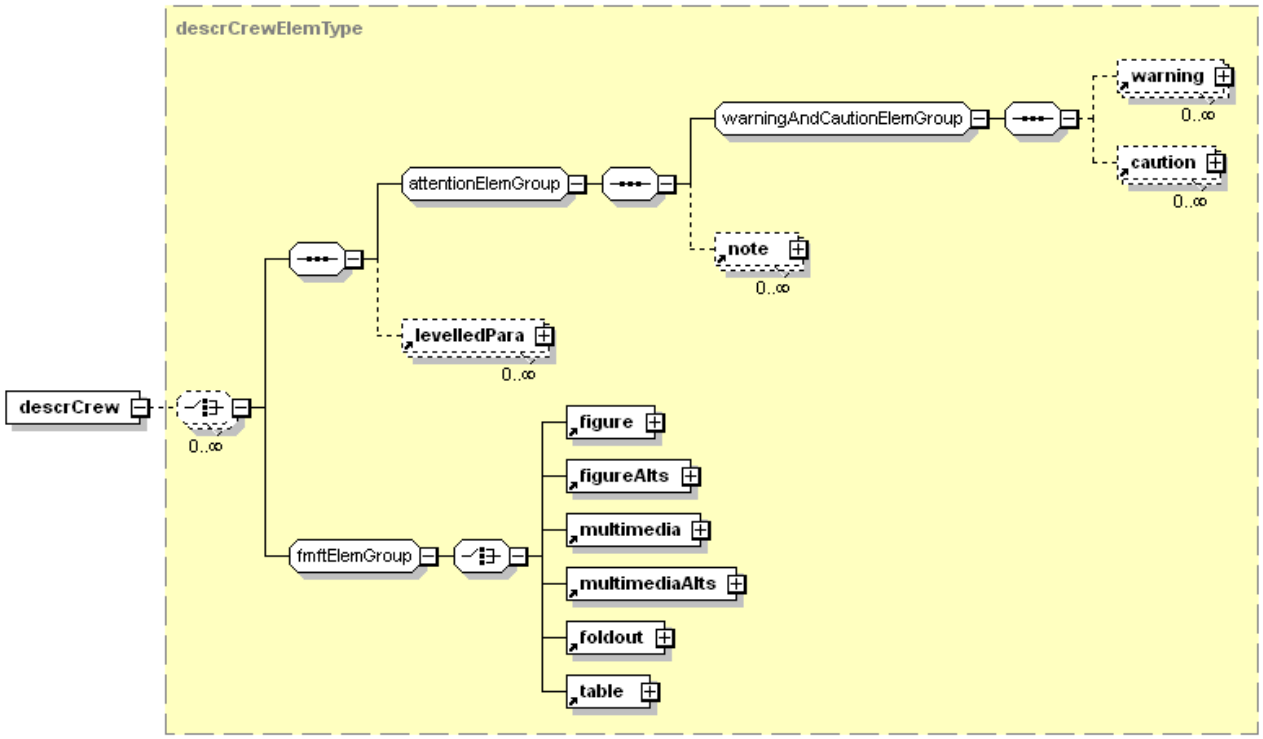
Child elements:

- <para>. Refer to Chap 3.9.5.2.1.10.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7.
- <table>. Refer to Chap 3.9.5.2.1.6.

2.3.2 Descriptive information for crew/operators

Description: The element <descrCrew> contains descriptive information for use by crew/operators.

Markup element: <descrCrew>



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Fig 16 Element <descrCrew>

Attributes:

- `warningRefs` (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `cautionRefs` (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O), and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`warning`>. Refer to Chap 3.9.3.
- <`caution`>. Refer to Chap 3.9.3.
- <`note`>. Refer to Chap 3.9.3.
- <`levelledPara`>. Refer to Chap 3.9.5.2.2 with the inclusion of the element <`crewDrill`>. Refer to Para 2.3.1.1.
- <`figure`>. Refer to Chap 3.9.5.2.1.7.
- <`figureAlts`>. Refer to Chap 3.9.5.2.1.7.
- <`multimedia`>. Refer to Chap 3.9.5.2.1.7.
- <`multimediaAlts`>. Refer to Chap 3.9.5.2.1.7.
- <`foldout`>. Refer to Chap 3.9.5.2.1.7.
- <`table`>. Refer to Chap 3.9.5.2.1.6.

Markup example:

```
<descrCrew>
<levelledPara>
```

```
<title>Introduction</title>
<para>Data about the bicycle and its control system is given in
this document. This data will help you operate the
bicycle.</para>
</levelledPara>
</descrCrew>
```

3 Example

```
<crewRefCard>
<crewDrill>
<crewMemberGroup>
<crewMember crewMemberType="cm02"></crewMember>
<crewMember crewMemberType="cm03"></crewMember>
</crewMemberGroup>
<crewDrillStep>
<crewProcedureName>
<para>Tighten stem</para>
</crewProcedureName>
<if>
<caseCond>Stem is loose</caseCond>
<crewDrillStep><para>Tighten clamp bolt</para></crewDrillStep>
</if>
<elseIf>
<caseCond>Handlebars twist in stem</caseCond>
</elseIf>
</crewDrillStep>something required here</crewDrillStep>
</crewDrillStep>
<crewDrillStep>
<challengeAndResponse>
<challenge>
<para>Floodlights</para>
</challenge>
<response>
<para>ON if required</para>
</response>
</challengeAndResponse>
</crewDrillStep>
</crewDrill>
</crewRefCard>
```

Chapter 3.9.5.2.7

Content section - Parts information

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Chap 3.9.5.1	Data modules - Identification and status section
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Chap 3.9.5.2.1.7	Common constructs - Figures, multimedia and foldouts
Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.2.11.3	Common information repository - Parts
Chap 3.9.5.2.11.6	Common information repository - Enterprise information
Chap 3.9.5.3	Data modules - Applicability
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Chap 4.3.8	Data module code - Item location code
Chap 5.3.1.3	Common requirements - Illustrated parts data
Chap 7.7.4	Guidance and examples - XLink
Chap 8	SNS, information codes and learn codes

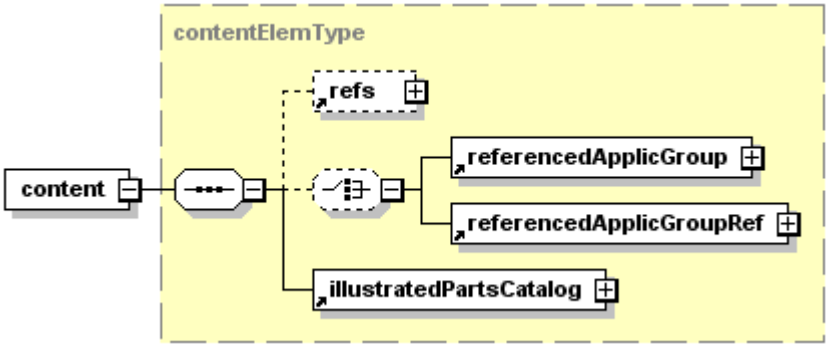
1 General

The IPD Schema is used to capture and represent parts lists and IPD. This information can be drawn from an S2000M provisioning database or from engineering data for a non-S2000M project.

2 Parts information

Description: The element <content> contains the illustrated parts catalog information of a data module.

Markup element: <content>



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Fig 1 Element <content>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

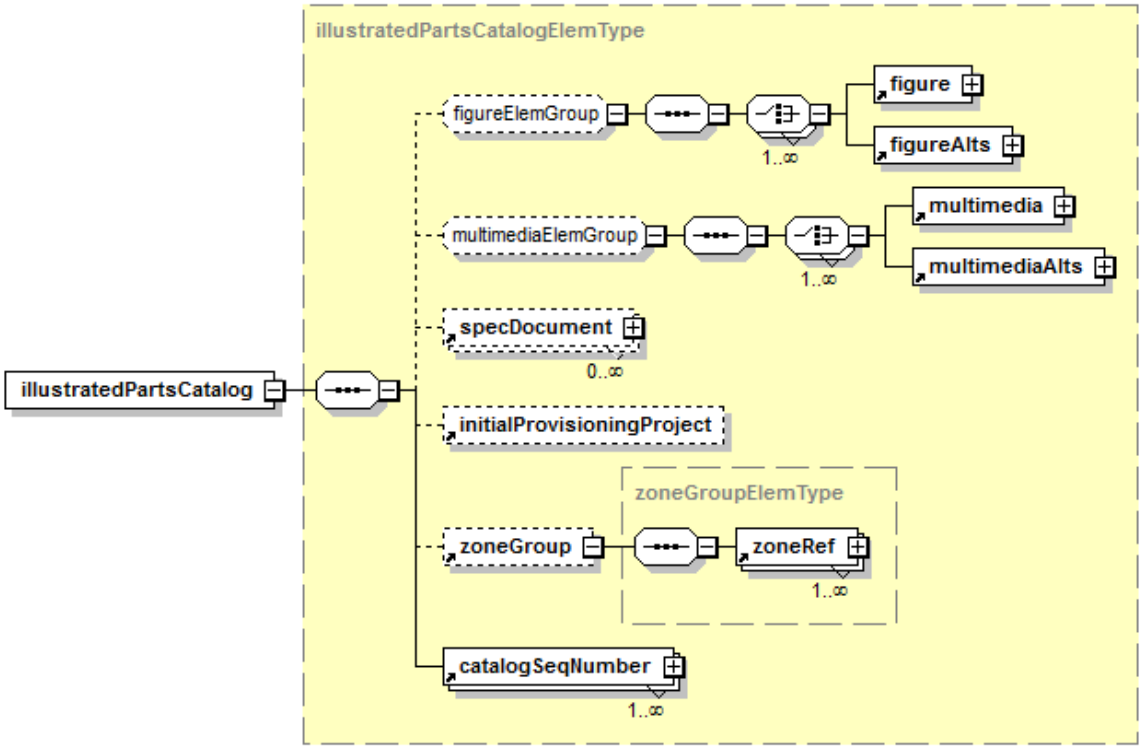
Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
- <illustratedPartsCatalog>. Refer to Para 2.1.

2.1 Illustrated parts catalog

Description: The element <illustratedPartsCatalog> contains the illustrated parts catalog information of a data module (excluding references).

Markup element: <illustratedPartsCatalog>



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Fig 2 Element <illustratedPartsCatalog>

Attributes:

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– <figure>. Refer to Chap 3.9.5.2.1.7.
– <figureAlts>. Refer to Chap 3.9.5.2.1.7.
– <multimedia>. Refer to Chap 3.9.2.4.
– <multimediaAlts>. Refer to Chap 3.9.2.1.7.
– <specDocument>, indicates the design office drawing from which the IPD figure is derived. Refer to Chap 3.9.5.2.11.7.
– <initialProvisioningProject>. Refer to Para 2.2.
– <zoneGroup>. Refer to Para 2.3.
– <catalogSeqNumber>. Refer to Para 2.4.

Markup example:

```
<illustratedPartsCatalog>
<figure>...</figure>
<initialProvisioningProject... />
<catalogSeqNumber systemCode="72" subSystemCode="0"
subSubSystemCode="1" assyCode="67" figureNumber="10" item="001"
itemVariant="A" indenture="1">...</catalogSeqNumber>
</illustratedPartsCatalog>
```

2.2 Initial provisioning project number

Description: The element <initialProvisioningProject> contains the information regarding the initial provisioning project (IPP).

Markup element: <initialProvisioningProject>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- initialProvisioningProjectNumber (M), provides the means to break the complete IPP information into manageable sections. This allows for the identification of spares and the regulation of processes by section. The first five characters contain the CAGE code. The sixth to the ninth characters are a serial number allocated by the project or the organization. The initial provisioning project number (IPPN) must be unique.
- initialProvisioningProjectNumberSubject (M), the IPPN subject which contains the first 19 characters of the description for part (DFP) in accordance with S2000M
- fileIdent (O), the file identifier (FID) which indicates whether the IPPN is for the complete Product or a component. The attribute can have one of the following values:
  - "s" - complete Product
  - "t" - component part of the Product
- languageCode (O), the language code (LGE) which contains the code for the language in which the data is transmitted. It must be populated with the user (nation) code.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<initialProvisioningProject
initialProvisioningProjectNumber="F61172312"
initialProvisioningProjectNumberSubject="Servo actuator"
fileIdent="t"/>
```

2.3 Zones

Description: The element <zoneGroup> contains the zoning information of a figure, in order to know where components, described in a figure, are installed on the Product. For instance, in case of damage, this enables that all figures impacted by the damage can easily be identified.

Markup element: <zoneGroup>

Attributes:

- None

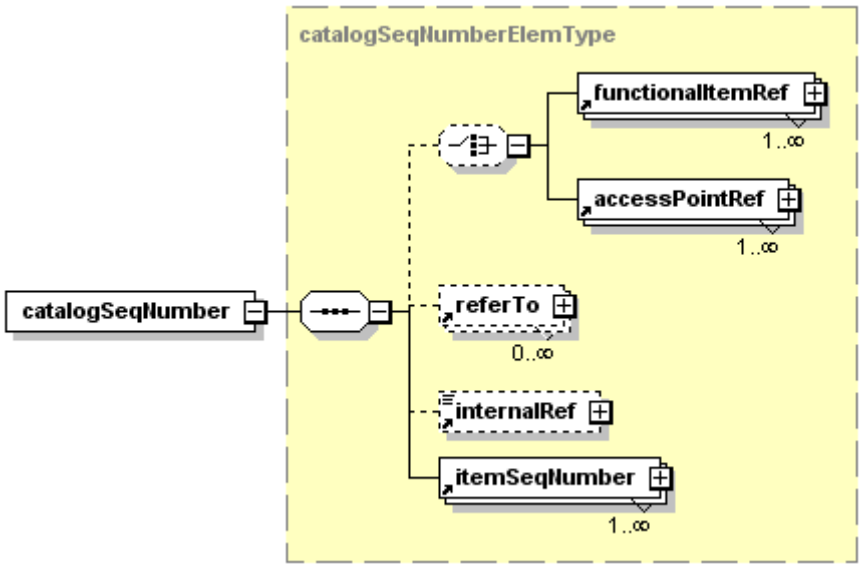
Child elements:

- <zoneRef>. Refer to Chap 3.9.5.2.1.10.

2.4 Catalog sequence number

Description: The element <catalogSeqNumber> contains the catalog sequence number and all related parts information.

Markup element: <catalogSeqNumber>



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Fig 3 Element <catalogSeqNumber>

There are specific rules for IPD data modules as follows:

- Chapterized IPD data modules have a data module code with the SNS of the Product as given in Chap 8
- Non-chapterized IPD data modules, where S2000M is used, have a data module code with a specific SNS as given in Chap 4.3.3
- For a non-chapterized IPD, where S2000M is not used, the project defines values for the SNS attributes and follows the rules for a chapterized IPD. Refer to Chap 4.3.3.

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- systemCode (O), the system code of the data module code of the IPD data module that contains the CSN. For a non-chapterized IPD, the attribute systemCode must not be used. For a chapterized IPD, the attribute systemCode is mandatory. Refer to default BREX rules BREX-S1-00087 and BREX-S1-00088.
- subSystemCode (O), the subsystem code of the data module code of the IPD data module that contains the CSN. For a non-chapterized IPD, the attribute subSystemCode must not be used. For a chapterized IPD, the attribute subSystemCode is mandatory. Refer to default BREX rules BREX-S1-00087 and BREX-S1-00088.
- subSubSystemCode (O), the sub-subsystem code of the data module code of the IPD data module that contains the CSN. For a non-chapterized IPD, the attribute subSubSystemCode must not be used. For a chapterized IPD, the attribute

subSubSystemCode is mandatory. Refer to default BREX rules BREX-S1-00087 and BREX-S1-00088.

- assyCode (O), the assembly code of the data module code of the IPD data module that contains the CSN. For a non-chapterized IPD, the attribute assyCode must not be used. For a chapterized IPD, the attribute assyCode is mandatory. Refer to default BREX rules BREX-S1-00087 and BREX-S1-00088.
- figureNumber (M), the figure number (as specified in the disassembly code) of the data module code of the IPD data module that contains the CSN
- figureNumberVariant (O), the figure number variant (as specified in the disassembly code variant) of the data module code of the IPD data module that contains the CSN. If there is no figure number variant, then the disassembly code variant of the IPD data module code must be "0". Refer to default BREX rules BREX-S1-00081, BREX-S1-00083 and BREX-S1-00085.
- item (M), the item number of the CSN
- itemVariant (O), the item number variant of the CSN. Refer to default BREX rules BREX-S1-00082, BREX-S1-00084 and BREX-S1-00086.
- indenture (M), the indenture level (IND) of an item. This single character numeric code indicates the hierarchical level of an item within the breakdown of a figure. The attribute can have one of the following values:
  - "1" thru "9" - the indenture level of an item
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <functionalItemRef>. Refer to Para 2.4.1.
- <accessPointRef>. Refer to Chap 3.9.5.2.1.10.
- <referTo>. Refer to Para 2.4.2.
- <internalRef>.Refer to Chap 3.9.5.2.1.2.
- <itemSeqNumber>. Refer to Para 2.5.

The CSN attributes are used to build up a code for hyperlinking and for creating the data module code of the IPD data module that contains the CSN. The code is made up as shown in Table 2 and Table 3.

Table 2 Catalog sequence number - When using a six-character SNS

Position	Content for chapterized IPD	Content for non-chapterized IPD	CSN attribute
1 and 2	System (from the SNS)	omit the attribute	systemCode
3	Subsystem (from the SNS)	omit the attribute	subSystemCode
4	Sub-subsystem (from the SNS)	omit the attribute	subSubSystemCode
5 and 6	Unit or assembly (from the SNS)	omit the attribute	assyCode
7 and 8	Figure number	Figure number	figureNumber
9	Figure number variant	Figure number variant	figureNumberVariant

Position	Content for chapterized IPD	Content for non-chapterized IPD	CSN attribute
10, 11 and 12	Item number	Item number	`Item`
13	Item number variant	Item number variant	`itemVariant`

Table 3 Catalog sequence number - When using a nine-character SNS

Position	Content for chapterized IPD	Content for non-chapterized IPD - S2000M only	CSN attribute
1, 2 and 3	System incl material item category code (from the SNS)	omit the attribute	`systemCode`
4	Subsystem (from the SNS)	omit the attribute	`subSystemCode`
5	Sub-subsystem (from the SNS)	omit the attribute	`subSubSystemCode`
6, 7, 8 and 9	Unit or assembly (from the SNS)	omit the attribute	`assyCode`
10 and 11	Figure number	Figure number	`figureNumber`
12	Figure number variant	Figure number variant	`figureNumberVariant`
13, 14 and 15	Item number	Item number	`Item`
16	Item number variant	Item number variant	`itemVariant`

When a CSN is given for the Product (chapterized IPD), the complete content of the CSN must be provided. If the figure number variant (attribute `figureNumberVariant`) and the item number variant (attribute `itemVariant`) do not apply to this figure, then these attributes must not be used.

For example, the following markup:

```
<catalogSeqNumber systemCode="72" subSystemCode="0"
subSubSystemCode="1" assyCode="67" figureNumber="10"
item="000" indenture="1">...</catalogSeqNumber>
```

gives the CSN reference "72-01-67 Fig 10 Item 000".

When a CSN is contained in the separate IP presentation of equipment (non-chapterized IPD) then only the last seven characters are applicable, and the first six characters are to be filled with spaces. This means that the CSN attributes `systemCode`, `subSystemCode`, `subSubSystemCode` and `assyCode` must not be used.

For example, the following markup:

```
<catalogSeqNumber figureNumber="01"
item="001">...</catalogSeqNumber>
```

gives the CSN reference "Fig 01 Item 001".

2.4.1 Functional item

Description: The element <functionalItemRef> contains a functional item and allows referring to its definition in the functional item common information repository (CIR) data module, for a project or an organization implementing the CIR.

This optional link is addressed through either the identification of the functional item or the identification of the access point. Refer to Chap 3.9.5.2.1.10.

For IPD, the functional item can be populated at the CSN level or at the item sequence number (ISN) level.

A functional item is also known as a reference designator.

For more information on the element <functionalItemRef>, refer to Chap 3.9.5.1.

2.4.2 Refer to

Description: The element <referTo> contains a reference to multiple IPP or CSN.

Note

The next higher assembly and refer for detail values provides a two-way link between the two locations that an item has when it appears in the breakdown of one figure and is 'referred out' to a separate figure which is created to present the breakdown of that item.

Markup element: <referTo>

Attributes:

- applicRefIds (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- refType (O), the qualifier of the "refer to" link. The attribute can have one of the following values:
  - "rft01" thru "rft08". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <initialProvisioningProjectRef>. Refer to Para 2.4.2.1.
- <catalogSeqNumberRef>. Refer to Para 2.4.2.2.
- <functionalItemRef>. Refer to Chap 3.9.5.1.
- <refs>. Refer to Chap 3.9.5.2.1.2.

2.4.2.1 Refer to IPP

Description: The element <initialProvisioningProjectRef> contains a reference to another IPP for non-chapterized IPD (in an electronic IPD publication it mainly addresses the first CSN of the referenced IPPN).

Markup element: <initialProvisioningProjectRef>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `initialProvisioningProjectNumber` (M), the IPPN of the referenced IPP.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.4.2.2 Refer to CSN

Description: The element <`catalogSeqNumberRef`> contains a reference to another CSN. For non-S2000M projects the attributes `systemCode`, `subSystemCode`, `subsubSystemCode` and `assyCode` are used to refer to the SNS of the reference target. For non-S2000M projects, the attributes `initialProvisioningProjectNumber` and `responsiblePartnerCompanyCode` must not be used.

Markup element: <`catalogSeqNumberRef`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `modelIdentCode` (O), the model identification code or project name. Refer to Chap 4.3.1.
- `systemDiffCode` (O), the system difference code. Refer to Chap 4.3.2.
- `systemCode` (O), the system code of the data module code of the IPD data module that contains the CSN. For non-chapterized IPD, S2000M only, the attribute `systemCode` must not be used. For chapterized IPD, the attribute `systemCode` is mandatory. Refer to default BREX rule BREX-S1-00089.
- `subSystemCode` (O), the subsystem code of the data module code of the IPD data module that contains the CSN. For non-chapterized IPD, S2000M only, the attribute `subSystemCode` must not be used. For chapterized IPD, the attribute `subSystemCode` is mandatory. Refer to default BREX rule BREX-S1-00089.
- `subSubSystemCode` (O), the sub-subsystem code of the data module code of the IPD data module that contains the CSN. For non-chapterized IPD, S2000M only, the attribute `subSubSystemCode` must not be used. For chapterized IPD, the attribute `subSubSystemCode` is mandatory. Refer to default BREX rule BREX-S1-00089.
- `assyCode` (O), the assembly code of the data module code of the IPD data module that contains the CSN. For non-chapterized IPD, S2000M only, the attribute `assyCode` must not be used. For a chapterized IPD, the attribute `assyCode` is mandatory. Refer to default BREX rule BREX-S1-00089.
- `figureNumber` (M), the figure number (as specified in the disassembly code) of the data module code of the IPD data module that contains the CSN

- `figureNumberVariant` (O), the figure number variant (as specified in the disassembly code variant) of the data module code of the IPD data module that contains the CSN. If there is no figure number variant, then the disassembly code variant of the IPD data module code must be "`0`".
- `item` (M), the item of the CSN
- `itemVariant` (O), the item variant of the CSN
- `itemLocationCode` (O), the item location code. Refer to Chap 4.3.8.
- `itemSeqNumberValue` (O), the referenced ISN
- `initialProvisioningProjectNumber` (O), the referenced IPPN. This is used for non-chapterized CSN references, in projects or organizations using S2000M, in accordance with Para 2.2.
- `responsiblePartnerCompanyCode` (O), the responsible partner company expressed as a project specific, one-character code when referencing a non-chapterized parts data module. Refer to Chap 4.3.3.

  Note

  This code identifies an enterprise like a CAGE code. However, it must be a single character code, because it is used to generate the reference data module code. Refer to Chap 5.3.1.3.

- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Note

For chapterized IPD, to define the data module code that contains the given CSN, use the attributes `modelIdentCode`, `systemDiffCode`, `systemCode`, `subsystemCode`, `subsubsystemCode`, `assyCode`, `figureNumber` (which will be the disassembly code) and `figureNumberVariant` (which will be the disassembly code variant), value "`941`" (which is always the information code on an IPD data module), the value "`A`" (which is always the `infoCodeVariant` for IPD data modules) and the value "`D`" of the attribute `itemLocationCode`, as shown in the markup example.

For non-chapterized IPD, non-S2000M projects have defined values for the SNS attributes and follow the rules for a chapterized IPD.

For non-chapterized IPD, S2000M projects apply the same method, but substitute the absent values of the attributes `systemCode`, `subSystemCode`, `subSubSystemCode`, `subSubSystemCode` and `assyCode` with the values "`Z`" or "`ZZ`", followed by the value of the attribute `responsiblePartnerCompanyCode`, followed by the last four characters of the value of attribute `initialProvisioningProjectNumber`, as defined in Para 2.2.

Note

The element <`catalogSeqNumberRef`> also includes five attributes normally populated by applications to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

- <`refs`>. Refer to Chap 3.9.5.2.1.2.

Markup examples:

The following markup example will generate a link to the IPD data module DMC-E2-A-11-22-33-01A-941A-D and refers to the CSN "11-22-33 Fig 01A Item 001A".

```
<catalogSeqNumberRef modelIdentCode="E2" systemDiffCode="A"
systemCode="11" subSystemCode="2" subSubSystemCode="2"
assyCode="33" figureNumber="01" figureNumberVariant="A"
item="001" itemVariant="A" itemSeqNumberValue="00A"
itemLocationCode="D"/>
```

The following markup example will generate a link to the IPD data module DMC-E2-A-11-22-33-010-941A-D and refers to CSN "11-22-33-01 Fig 01 Item 001A".

```
<catalogSeqNumberRef modelIdentCode="E2" systemDiffCode="A"
systemCode="11" subSystemCode="2" subSubSystemCode="2"
assyCode="33" figureNumber="01" item="001" itemVariant="A"
itemSeqNumberValue="00A" itemLocationCode="D"/>
```

The following markup example will generate a link to the non-chapterized IPD data module DMC-E2-A-ZR-99-AA-010-941A-D and refers to CSN "Fig 01 Item 001A".

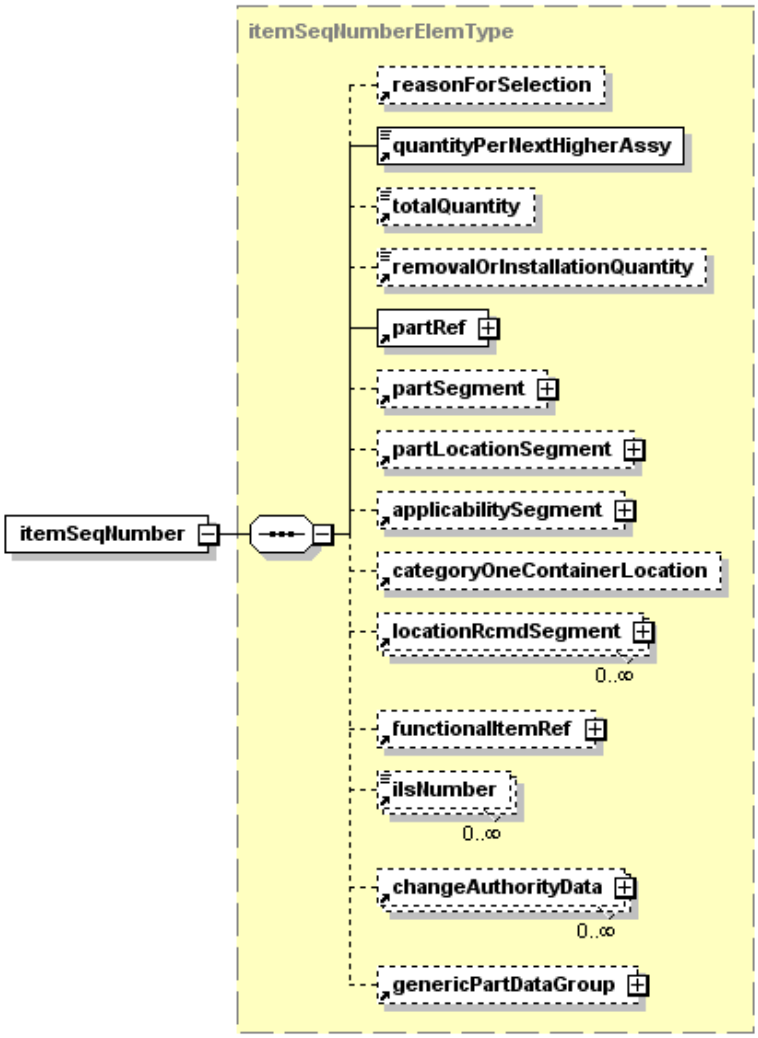
```
<catalogSeqNumberRef responsiblePartnerCompanyCode="R"
initialProvisioningProjectNumber="F611799AA" modelIdentCode="E2"
systemDiffCode="A" figureNumber="01" item="001" itemVariant="A"
itemSeqNumberValue="00A" itemLocationCode="D"/>
```

```
<reqSpares>
<spareDescrGroup>
<spareDescr id="spa-0987">
<name>Blade, LP Compressor</name>
<natoStockNumber natoSupplyClass="2840"
natoCodificationBureau="99" natoItemIdentNumberCore="1234524"/>
<catalogSeqNumberRef modelIdentCode="E2" systemDiffCode="A"
systemCode="72" subSystemCode="3" subSubSystemCode="2"
assyCode="10" figureNumber="01" figureNumberVariant="A"
item="010" itemVariant="A" itemLocationCode="D"
itemSeqNumberValue="00A"/>
<reqQuantity unitOfMeasure="EA">23</reqQuantity>
</spareDescr>
<spareDescr id="spa-0752">
<name>Retainer, Blade, LP Compressor</name>
<natoStockNumber natoSupplyClass="2840"
natoCodificationBureau="99" natoItemIdentNumberCore="1234584"/>
<catalogSeqNumberRef modelIdentCode="E2" systemDiffCode="A"
systemCode="72" subSystemCode="3" subSubSystemCode="2"
assyCode="10" figureNumber="01" figureNumberVariant="A"
item="040" itemVariant="A" itemLocationCode="D"
itemSeqNumberValue="00A"/>
<reqQuantity unitOfMeasure="EA">23</reqQuantity>
</spareDescr>
</spareDescrGroup>
</reqSpares>
```

2.5 Item sequence number

Description: The element <itemSeqNumber> contains the item sequence number. It also contains elements which store metadata about the item.

Markup element: <itemSeqNumber>



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Fig 4 Element <itemSeqNumber>

Attributes:

- applicRefIds (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- itemSeqNumberValue (M), contains the ISN. Positions one and two of the ISN comprise a sequence number, the first number being "00". Position three contains an alphanumeric variant code.

- partStatus (O), the status of the part according to the product configuration (basic part, spare, etc). The attribute can have one of the following values:
  - "pst01" thru "pst99". Refer to Chap 3.9.6.1.
- partCharacteristic (O), indicates special part characteristics. The attribute can have one or more of the following values:
  - "pc01" thru "pc99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <reasonForSelection>. Refer to Para 2.5.1.
- <quantityPerNextHigherAssy>. Refer to Para 2.5.2.
- <totalQuantity>. Refer to Para 2.5.3.
- <removalOrInstallationQuantity>, the quantity needed for one component. This quantity is provided for parts that need to be manipulated to remove or install a given component. Refer to Para 2.5.4.
- <partRef>, the part reference. Refer to Chap 3.9.5.2.1.10.
- <partSegment>, the part identity information. Refer to Para 2.5.5.
- <partLocationSegment>, the part location information. Refer to Para 2.5.6.
- <applicabilitySegment>, the applicability information. Refer to Para 2.5.7.
- <categoryOneContainerLocation>, the container information. Refer to Para 2.5.8.
- <locationRcmdSegment>, the location recommendation information. Refer to Para 2.5.9.
- <functionalItemRef>, the functional item reference. Refer to Chap 3.9.5.1.
- <ilsNumber>, the integrated logistics information. Refer to Para 2.5.10.
- <changeAuthorityData>, the change authority information. Refer to Para 2.5.11.
- <genericPartDataGroup>, the project specific information. Refer to Para 2.5.12.

2.5.1 Reason for selection

Description: The element <reasonForSelection> contains the reason for selection (RFS) of an item.

Markup element: <reasonForSelection>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- reasonForSelectionValue (M), the RFS value. The attribute can have one of the following values:
  - "0" thru "9". Refer to Table 4.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Table 4 Reason for selection

Value	Reason
"0"	Not a recommended spare
"1"	Wear
"2"	Maintenance damage
"3"	Loss
"4"	Vibration
"5"	Corrosion
"6"	Deterioration
"7"	Extreme temperature
"8"	Other
"9"	Accidental damage (Insurance)

Child elements:

- None

2.5.2 Quantity per next higher assembly

Description: The element <quantityPerNextHigherAssy> contains the quantity per next higher assembly (QNA) of an item. If the item is included for reference only the letters "REF" are entered. If the quantity cannot be established or it is otherwise not appropriate to include the data, the letters "AR" (as required) are entered.

Markup element: <quantityPerNextHigherAssy>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

2.5.3 Total quantity

Description: The element <totalQuantity> contains the total number of units of the subject part used in the complete assembly of the Product. This information can be used to build the alphanumerical index.

Markup element: <totalQuantity>

Attributes:

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- None

2.5.4 Removal or installation quantity

Description: The element <`removalOrInstallationQuantity`> contains the number of units of the subject part required to remove or install one component. This information can be used to build the alphanumerical index.

Markup element: <`removalOrInstallationQuantity`>

Attributes:

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

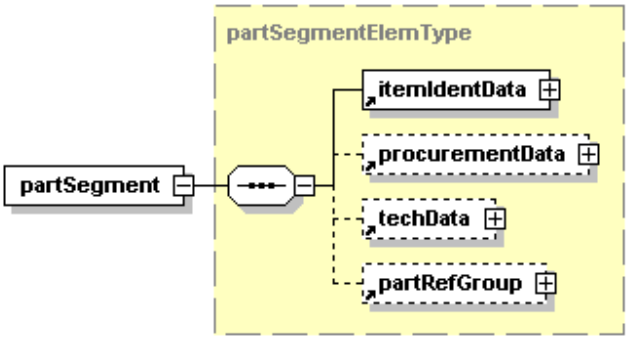
- None

2.5.5 Part data

Description: The element <`partSegment`> contains data pertaining to the part, independent of the location. The element <`partSegment`> is optional as part data can also be stored in the part CIR. Refer to Chap 3.9.5.2.11.3.

For an S2000M project, the element <`partSegment`> partly corresponds to the S2000M part identity segment (PAS). It "partly" corresponds because it has additional information suitable for a non-S2000M project.

Markup element: <`partSegment`>



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Fig 5 Element <`partSegment`>

Attributes:

- None

Child elements:

- <itemIdentData>. Refer to Para 2.5.5.1.
- <procurementData>. Refer to Para 2.5.5.1.7.
- <techData>. Refer to Para 2.5.5.3.
- <partRefGroup>. Refer to Para 2.5.5.4.

Business rule decision point BRDP-S1-00219 - Use of the element <partSegment> in the element <itemSeqNumber>:

- Decide whether to use the element <partSegment> to store the part data in the IPD data module each time the part is listed or store the part data once externally in the part CIR data module.

  Note

  The element <partSegment> must be used for S2000M IPD data modules.

2.5.5.1 Description data

Description: The element <itemIdentData> groups the properties that describe the part.

Markup element: <itemIdentData>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <descrForPart>. Refer to Para 2.5.5.1.1.
- <partKeyword>. Refer to Para 2.5.5.1.2.
- <shortName>. Refer to Para 2.5.5.1.3.
- <overLengthPartNumber>. Refer to Para 2.5.5.1.4.
- <limitedPartNumber>. Refer to Para 2.5.5.1.5.
- <customerStockNumber>. Refer to Para 2.5.5.1.6.
- <natoStockNumber>. Refer to Para 2.5.5.1.7.

2.5.5.1.1 Description for part

Description: The element <descrForPart> contains a detailed description for a part. It corresponds to the S2000M data element DFP and must be the identifying noun of the item, followed by appropriate adjective and further details, if necessary.

Markup element: <descrForPart>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

2.5.5.1.2 Part keyword

Description: The element <partKeyword> contains the single word name of a part as defined by the project or the organization.

Markup element: <partKeyword>

Note

The element <partKeyword> must not be used for S2000M IPD projects.

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

Markup example:

```
<partKeyword>PANEL</partKeyword>
```

2.5.5.1.3 Part short name

Description: The element <shortName> gives an abbreviated alternate name of the part corresponding to the element <name>. This short form for the name of the part is meant to be presented in the narrative of the data module to make reading easier.

Markup element: <shortName>

Attributes:

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

Markup example:

```
<shortName>INSIDE CONTROL</shortName>
```

2.5.5.1.4 Original part number

Description: The element <overLengthPartNumber> contains the original part number of a part. It can be used when the attribute partNumberValue contains a re-identified part number.

Markup element: <overLengthPartNumber>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<overLengthPartNumber>FDBA57-8-3ASNK090A499
</overLengthPartNumber>
```

2.5.5.1.5 Limited part number

Description: The element <limitedPartNumber> contains the shortened part number when the over length part number is used throughout the documentation.

Markup element: <limitedPartNumber>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<limitedPartNumber>1124587-69</limitedPartNumber>
```

2.5.5.1.6 Customer stock number

Description: The element <customerStockNumber> contains the stock number assigned by the customer to identify and control the part in its inventory and control system. As this number depends on the customer, the attribute applicRefId and the referenced element <applic> must both be populated in accordance with Chap 3.9.5.3.

Markup element: <customerStockNumber>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<customerStockNumber>AFR281324</customerStockNumber>
```

2.5.5.1.7 NATO stock number

Description: The element <natoStockNumber> contains the NATO stock number (NSN) of the equipment. The primary method to populate the element <natoStockNumber> is to populate its constituent parts by using the three attributes natoSupplyClass, natoCodificationBureau and natoItemIdentNumberCore.

Note

An alternative method is to populate its child element <fullNatoStockNumber> ready for presentation.

Note

It is recommended not to use the textual content of the element <natoStockNumber> itself.

The NSN is built up of 13 digits:

- NATO supply classification (NSC) - 4 digits
- National codification bureau (NCB) - 2 digits
- Non-significant number assigned by the NCB - 7 digits

Note

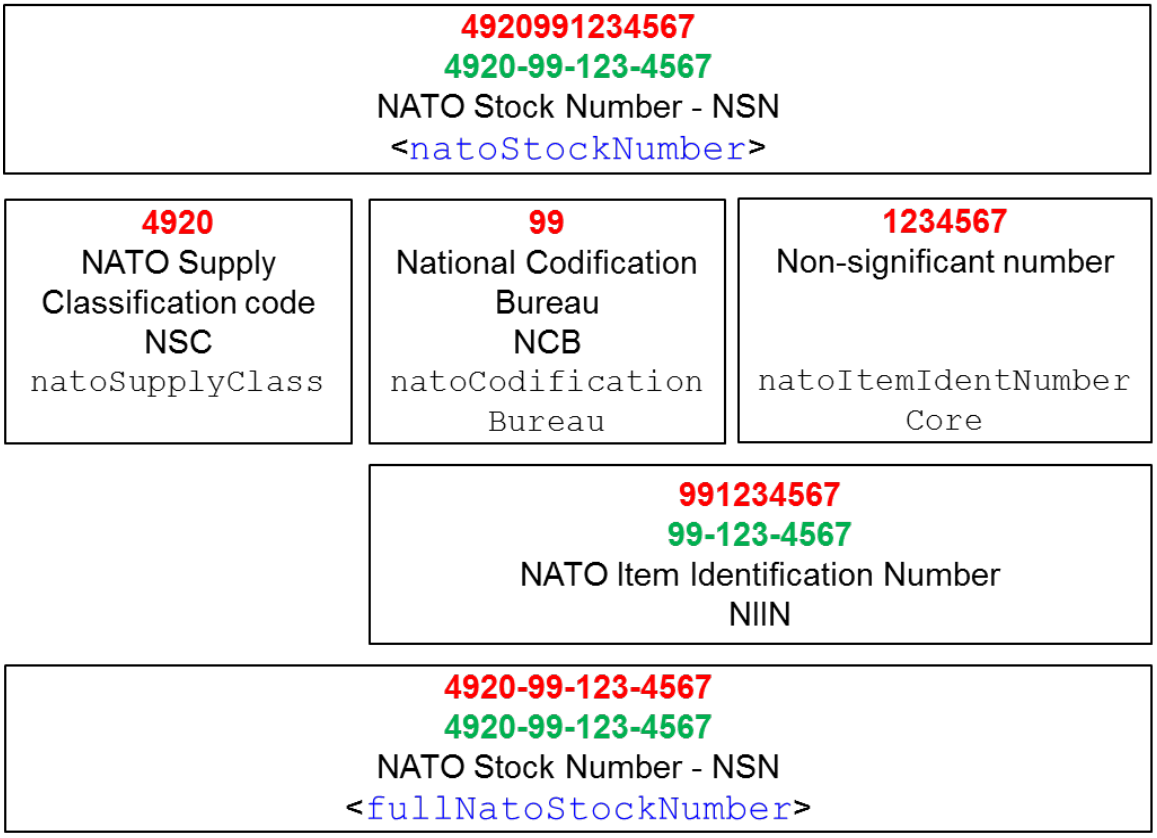
The non-significant number is split into three + four digits, separated by a hyphen, at presentation.

Note

The NSN can be incomplete in an IPD. For example, the NCB and/or the non-significant number not being set yet. When used in procedures, for example, in preliminary requirements, the complete NSN must be given.

Example:

Refer to Fig 6.



ICN-S1000D-A-030905-D-F6117-00011-A-001-01

Fig 6 NSN data format and format for presentation

Markup element: <natoStockNumber>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- natoSupplyClass (O), the NSC (first part of the NSN)
- natoCodificationBureau (O), the NCB (second part of the NSN)
- natoItemIdentNumberCore (O), the non-significant number (third part of the NSN)

  Note

  The content of the attribute natoItemIdentNumberCore must not include hyphens.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <fullNatoStockNumber>, contains the NSN as a text string with its constituent parts separated by hyphens (eg, "4920-99-123-4567") ready for presentation. Refer to Fig 6.
- <refs>. Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<natoStockNumber natoSupplyClass="4920"
natoCodificationBureau="99" natoItemIdentNumberCore="1234567"/>
```

2.5.5.2 Procurement data

Description: The element <procurementData> groups the properties to procure a part.

Markup element: <procurementData>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <enterpriseRef>. Refer to Para 2.5.5.2.1.
- <buyerFurnishedEquipFlag>. Refer to Para 2.5.5.2.3.
- <sourcingType>. Refer to Para 2.5.5.2.4.

2.5.5.2.1 Reference to an enterprise

Description: The element <enterpriseRef> contains data about an enterprise and also allows referring to its position in the enterprise CIR. In the context of the part data, the element <enterpriseRef> can be used to indicate the authorized prime source supplier for the part or to specify additional suppliers.

Markup element: <enterpriseRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- enterpriseType (O), the type of enterprise. Refer to Chap 3.9.5.2.11.6.
- enterpriseRefType (O), indicates whether the specified enterprise is a manufacturer, a supplier, an optional supplier, etc
- manufacturerCodeValue (M), the CAGE code of the enterprise
- qualifiedSiteFlag (O), indicates whether the site must be qualified
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>, the full name of the enterprise. Refer to Para 2.5.5.2.2.
- <shortName>, the short name of the part. Refer to Para 2.5.5.1.3.
- <dmRef>. Refer to Chap 3.9.5.2.1.2.

2.5.5.2.2 Name of an enterprise

Description: The element <name> contains the full name of an enterprise.

Markup element: <name>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<name>ACME Widget Company</name>
```

2.5.5.2.3 Buyer furnished equipment flag

Description: The element <buyerFurnishedEquipFlag> indicates whether the customer furnishes the part or not, that is, it enables the data user to identify a buyer furnished equipment (BFE) part. As this value depends on the customer, the attribute applicRefId can be used to specify for which customer(s) the information is valid. Refer to Chap 3.9.5.3.

Note

The use of the element <buyerFurnishedEquipFlag> is deprecated in S1000D Issue 4.2. It is kept in Issue 4.2 for upward compatibility reasons. Its use is restricted to legacy projects. For new projects in accordance with S1000D Issue 5.0, BFE parts must be identified using the element <sourcingType>. Refer to Para 2.5.5.2.4.

Markup element: <buyerFurnishedEquipFlag>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

2.5.5.2.4 Sourcing type

Description: The element <sourcingType> indicates how the part can be procured. It can be used, for example, to indicate whether the part is a BFE part or a seller furnished equipment (SFE) part. It can also be used to indicate if the part sourcing is supervised by a specific contract. This value can be customer-dependent so the attribute applicRefId can be used to specify the customer(s) for which the information is valid.

Markup element: <sourcingType>

Attributes:

– applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
– sourcingTypeValue (M), the type of sourcing (BFE, SFE, contract-dependent, etc). The attribute can have one of the following values:
  • "stv01" thru "stv99". Refer to Chap 3.9.6.1.
– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

2.5.5.3 Technical data

Description: The element <techData> contains the technical properties related to the part.

Markup element: <techData>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– etopsFlag (O), indicates whether the part is an extended twin operations part or not. The attribute can have one of the following values:
  • "1" - Yes, for ETOPS parts
  • "0" - No, for non-ETOPS parts

  Note
  Refer to Chap 9.2.2 for the acronym ETOPS.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <sparePartClass>. Refer to Para 2.5.5.3.1.
- <partUsage>. Refer to Para 2.5.5.3.2.
- <specDocument>. Refer to Para 2.5.5.3.3.
- <quantity>. Refer to Chap 3.9.5.2.1.10.
- <quantityGroup>. Refer to Chap 3.9.5.2.1.10.
- <physicalSecurityPilferageCode>. Refer to Para 2.5.5.3.4.
- <fitmentCode>. Refer to Para 2.5.5.3.5.
- <unitOfIssue>. Refer to Para 2.5.5.3.6.
- <unitOfIssueQualificationSegment>. Refer to Para 2.5.5.3.7.
- <specialStorage>. Refer to Para 2.5.5.3.8.
- <calibrationMarker>. Refer to Para 2.5.5.3.9.
- <placardText>. Refer to Para 2.5.5.3.10.
- <hazardousClass>. Refer to Para 2.5.5.3.11.

2.5.5.3.1 Spare parts classification

Description: The element <sparePartClass> contains the spare parts classification (SPC).

Markup element: <sparePartClass>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- sparePartClassCode (M), specifies the class of the spare part. The attribute can have one of the following values:
  - "0" - non-procurable parts
  - "1" - expendable parts
  - "2" - rotable parts
  - "6" - repairable parts
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.5.5.3.2 Part usage

Description: The element <partUsage> contains information about the usage of a part.

Markup element: <partUsage>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- partUsageCode (M), the code classifying the use of the part. The attribute can have one of the following values:
  - "pu01" thru "pu99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.5.5.3.3 Specification

Description: The element <specDocument> contains identifications of the part specifications. This includes information such as drawing numbers for manufacturer parts and standard specification numbers for standard parts.

Markup element: <specDocument>. Refer to Chap 3.9.5.2.11.7.

Markup example:

```
<specDocument manufacturerCodeValue="I9009"
specDocumentNumber="86-2-IEC" specDocumentType="specification"/>
```

2.5.5.3.4 Physical security/pilferage code

Description: The element <physicalSecurityPilferageCode> indicates the degree of security risk or pilferage controls for storage and retrieval of physical assets.

Markup element: <physicalSecurityPilferageCode>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Business rule decision point BRDP-S1-00221 - Use of the element <physicalSecurityPilferageCode> in the element <techData> within the element <itemSeqNumber>:

- Decide whether and how to use the element <physicalSecurityPilferageCode>. S2000M lists the possible codes in the data definition for physical security pilferage code (PSC).

2.5.5.3.5 Fitment code

Description: The element <fitmentCode> indicates whether an item can be fitted as supplied.

Markup element: <fitmentCode>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- fitmentCodeValue (M), contains the fitment code and can have one of the following values:
  - "1" - the part needs drilling, reaming or trimming during fitting which usually is carried out at organizational or intermediate level
  - "m" - the part needs depot or industrial maintenance organization level facilities for fitting
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

2.5.5.3.6 Unit of issue

Description: The element <unitOfIssue> contains the unit of issue (UOI) information. The unit of issue indicates the physical measurement, count or container in which the item is issued.

Markup element: <unitOfIssue>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

2.5.5.3.7 PCS data

Description: The element <unitOfIssueQualificationSegment> identifies an S2000M unit of issue qualification segment (PCS).

Note

The element <unitOfIssueQualificationSegment> must not be used unless the element <unitOfIssue> is present. Refer to default BREX rule BREX-S1-00091.

Markup element: <unitOfIssueQualificationSegment>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- unitOfMeasure (M), the unit of measure for the item
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <quantityPerUnit>, the quantity of items per unit of issue

Business rule decision point BRDP-S1-00222 - Use of the attribute `unitOfMeasure` in the element <`unitOfIssueQualificationSegment`> within the element <`techData`>:

– Decide on the range and definitions of the values for the attribute `unitOfMeasure`.

Note

When the IPD data modules are created from S2000M, the list of allowed unit of measure (UOM) values must contain those defined in the data definition in S2000M. When S2000M is used, it is strongly recommended to use the S2000M UOM values throughout the project.

2.5.5.3.8 Special storage

Description: The element <`specialStorage`> indicates whether an item requires special storage. <`specialStorage`>0</`specialStorage`> indicates that the item does not require special storage. <`specialStorage`>1</`specialStorage`> indicates that the item has special storage requirements. If the content of <`specialStorage`> is set to "`1`" then the content of element <`reasonForSelection`> must not be "`0`".

Markup element: <`specialStorage`>

Attributes:

– `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

– None

2.5.5.3.9 Calibration marker

Description: The element <`calibrationMarker`> identifies items that require calibration. The content of element must be "1" if an item requires calibration.

Markup element: <`calibrationMarker`>

Attributes:

– `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

– None

2.5.5.3.10 Placard text

Description: The element <`placardText`> is for placards only. The element <`placardText`> contains the text that shows on a placard.

Markup element: <`placardText`>

Attributes:

– None

Child elements:

– None

Markup example:

```
<placardText>MAXIMUM LOAD WEIGHT 300 KG</placardText>
```

2.5.5.3.11 Hazardous part

Description: The element <hazardousClass> identifies hazardous parts. In addition, the class of hazard can be specified by the attribute hazardousClassValue.

Markup element: <hazardousClass>

Attributes:

– hazardousClassValue (O), indicates the class of hazard (eg, Class1: Explosive, Class 2: Compressed gasses, Class 3: Flammable liquids). The attribute can have one of the following values:

- "hz01" thru "hz99". Refer to Chap 3.9.6.1.

Child elements:

– None

2.5.5.4 Relationships with other parts

Description: The element <partRefGroup> contains the different types of relationships with other parts.

Markup element: <partRefGroup>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <replacedBy>. Refer to Para 2.5.5.4.1.
– <optionalPart>. Refer to Para 2.5.5.4.3.
– <preferredSparePart>. Refer to Para 2.5.5.4.4.
– <alteredFromPart>. Refer to Para 2.5.5.4.5.
– <localFabricationMaterial>. Refer to Para 2.5.5.4.7.

2.5.5.4.1 Replacement relationship

Description: The element <replacedBy> provides a part that can replace the defined part, ie, it indicates the interchangeable parts. A new part is defined as interchangeable to an old part following a design modification. The installation of an interchangeable part changes the product configuration. Several types of interchangeability are possible, and the interchangeability relationship can depend on applicability statements, functional items and technical conditions.

The interchangeable part can be identified by:

- using the part number and manufacturer code (allowing then to refer to the part common information repository data module, if it is implemented) or
- using the reference to the catalog sequence number where the part is described

Markup element: <replacedBy>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- replacementCode (M), the type of replacement relationship (one or two ways, with condition or not). The definition of the codes is left to each project or organization.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <partRef>. Refer to Chap 3.9.5.2.1.10.
- <catalogSeqNumberRef>. Refer to Para 2.4.2.2.
- <functionalItemRef>. Refer to Chap 3.9.5.1.
- <replacementCond>. Refer to Para 2.5.5.4.2.

2.5.5.4.2 Replacement condition

Description: The element <replacementCond> specifies the condition that must be fulfilled for the replacement, if any.

Markup element: <replacementCond>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<replacementCond>EXCEPT IN THE HEATER ASSY</replacementCond>
```

2.5.5.4.3 Optional part

Description: The element <optionalPart> provides one or several optional parts that are equivalent alternatives to the defined part. It represents a choice between parts that are exactly

the same (fit, form and function) but have different manufacturers (this often occurs for standard parts). The installation of an optional part does not change the product configuration.

The optional part can be identified by:

- using the part number and manufacturer code (allowing then to refer to the part common information repository data module, if it is implemented) or
- using the reference to the catalog sequence number where the part is described

Markup element: <optionalPart>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <partRef>. Refer to Chap 3.9.5.2.1.10.
- <catalogSeqNumberRef>. Refer to Para 2.4.2.2.

Business rule decision point BRDP-S1-00223 - Use of the element <optionalPart> in the element <partRefGroup> within the element <itemSeqNumber>:

- Decide on the method of identification of the optional part.

Markup example:

Part number 2 is optional to part number 1

```
<partSpec>
<partIdent partNumberValue="1".../>
...
<partRefGroup>
<optionalPart>
<partRef partNumberValue="2".../>
</optionalPart>
</partRefGroup>
</partSpec>
```

2.5.5.4.4 Preferred spare part

Description: The element <preferredSparePart> provides one or several preferred spare parts, ie, alternative parts that are recommended by the data provider. The installation of a preferred spare part does not change the product configuration.

The preferred spare part can be identified by:

- using the part number and manufacturer code (allowing then to refer to the part common information repository data module, if it is implemented) or
- using the reference to the catalog sequence number where the part is described

Markup element: <preferredSparePart>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`partRef`>. Refer to Chap 3.9.5.2.1.10.
- <`catalogSeqNumberRef`>. Refer to Para 2.4.2.2.

Business rule decision point BRDP-S1-00224 - Use of the element <`preferredSparePart`> in the element <`partRefGroup`> within the element <`itemSeqNumber`>:

- Decide on the method of identification of the preferred spare part.

Markup example:

Part number 3 is preferred to part number 1

```
<partSpec>
<partIdent partNumberValue="1".../>
...
<partRefGroup>
<preferredSparePart>
<partRef partNumberValue="3".../>
</preferredSparePart>
</partRefGroup>
</partSpec>
```

2.5.5.4.5 Altered from parts

Description: The element <`alteredFromPart`> provides one or several parts from which the defined part has been modified. The altered from parts can be used on condition that a modification has been performed. The description of the modification can be provided.

The altered from part can be identified by:

- using the part number and manufacturer code (allowing then to refer to the part common information repository data module, if it is implemented) or
- using the reference to the catalog sequence number where the part is described

Markup element: <`alteredFromPart`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <partRef>. Refer to Chap 3.9.5.2.1.10.
- <catalogSeqNumberRef>. Refer to Para 2.4.2.2.
- <alteredFromPartDescr>. Refer to Para 2.5.5.4.6.

Business rule decision point BRDP-S1-00225 - Use of the element <alteredFromPart> in the element <partRefGroup> within the element <itemSeqNumber>:

- Decide on the method of identification of the altered from part.

Markup example:

Part number 1 has been altered from part number 4

```
<partSpec>
<partIdent partNumberValue="1".../>
...
<partRefGroup>
<alteredFromPart>
<partRef partNumberValue="4".../>
</alteredFromPart>
</partRefGroup>
</partSpec>
```

2.5.5.4.6 Altered from part modification

Description: The element <alteredFromPartDescr> contains the modification to be performed on one altered from part.

Markup element: <alteredFromPartDescr>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

Part number 1 has been altered from part number 4

```
<alteredFromPartDescr>Loose part included in the
assembly.</alteredFromPartDescr>
```

2.5.5.4.7 Manufactured from part

Description: The element <localFabricationMaterial> specifies one or several raw parts from which the defined part can be manufactured and their dimensions or quantity. The altered from parts can be used on condition that a modification has been performed. The description of the modification can be provided.

The raw material part can be identified by:

- using the part number and manufacturer code (allowing then to refer to the part common information repository data module, if it is implemented) or
- using the reference to the catalog sequence number where the part is described

Markup element: <localFabricationMaterial>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <partRef>. Refer to Chap 3.9.5.2.1.10.
- <catalogSeqNumberRef>. Refer to Para 2.4.2.2.
- <quantity>. Refer to Chap 3.9.5.2.1.10.

Business rule decision point BRDP-S1-00226 - Use of the element <localFabricationMaterial>:

- Decide on the method of identification of the local fabrication material.

Markup example:

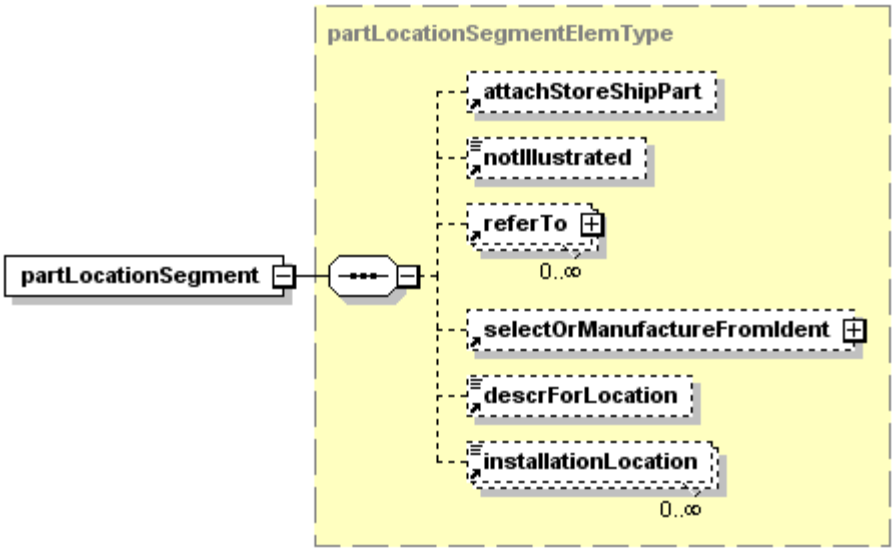
Part number 1 can be manufactured from part number 2 and part number 3.

```
<partSpec>
<partIdent partNumberValue="1".../>
...
<partRefGroup>
<localFabricationMaterial>
<partRef partNumberValue="2".../>
<partRef partNumberValue="3".../>
</localFabricationMaterial>
</partRefGroup>
</partSpec>
```

2.5.6 Part location data

Description: The element <partLocationSegment> identifies an S2000M part location data segment (CBS).

Markup element: <partLocationSegment>



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Fig 7 Element <partLocationSegment>

Attributes:

– None

Child elements:

– <attachStoreShipPart>. Refer to Para 2.5.6.1.
– <notIllustrated>. Refer to Para 2.5.6.2.
– <referTo>. Refer to Para 2.4.2.
– <selectOrManufactureFromIdent>. Refer to Para 2.5.6.3.
– <descrForLocation>. Refer to Para 2.5.6.5.
– <installationLocation>, the precise indication, where the part is located on the Product. X, Y, Z coordinates are used for this purpose. Refer to Chap 3.9.5.2.1.9.

2.5.6.1 Attaching storage or shipping part

Description: The element <attachStoreShipPart> indicates if an item is an attaching, storage or shipping part.

Markup element: <attachStoreShipPart>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– attachStoreShipPartCode (M). The attribute can have one of the following values:
  - "1" - attaching part
  - "2" - storage part
  - "3" - shipping part

Note
Storage parts are used only when a unit is in storage and shipping parts are used only when a unit is being shipped.

- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.5.6.2 Not illustrated

Description: The element <`notIllustrated`> indicates that an item has not been illustrated. If an item has not been illustrated the element <`notIllustrated`> is populated with a hyphen "-".

Markup element: <`notIllustrated`>

Attributes:

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- None

2.5.6.3 Select or manufacture from identifier

Description: The element <`selectOrManufactureFromIdent`> indicates that an item must be selected to suit specific operating conditions, or that the item can be locally manufactured.

Markup element: <`selectOrManufactureFromIdent`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `selectOrManufactureValue` (M), the type of selection to make. Refer to Table 5. The attribute can have one of the following values:
  - "`f`" - select on fit
  - "`t`" - select on test
  - "`m`" - manufacture from
  - "`r`" - reworked from
  - "`p`" - repaired from
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Table 5 Values for the attribute selectOrManufactureValue

Value	Reason	Meaning
"f"	Select on fit	Applied against items which vary in physical dimension (eg, washers, shims, oversize/undersize parts)
"t"	Select on test	Applied against items which vary in electrical characteristics (eg, resistors, capacitors)
"m"	Manufacture from	Applied against items which can be locally manufactured or programmed
"r"	Reworked from	Applied against items which can be produced by the reworking of a pre-modified item. Reference to modification instructions is obligatory.
"p"	Repaired from	Applied against items which can be repaired from special repair parts, repair kits or part kits

Child elements:

- <selectOrManufacture>. Refer to Para 2.5.6.4.

2.5.6.4 Select or manufacture

Description: The element <selectOrManufacture> identifies the range of items to be used for the selection, manufacture, rework or repair of an item. Items must be identified using the CSN, figure number and item number or just the item number as appropriate.

Markup element: <selectOrManufacture>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

2.5.6.5 Description for location

Description: The element <descrForLocation> contains a description for the location of the item which complements the description of the item stored in the element <descrForPart>.

Markup element: <descrForLocation>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

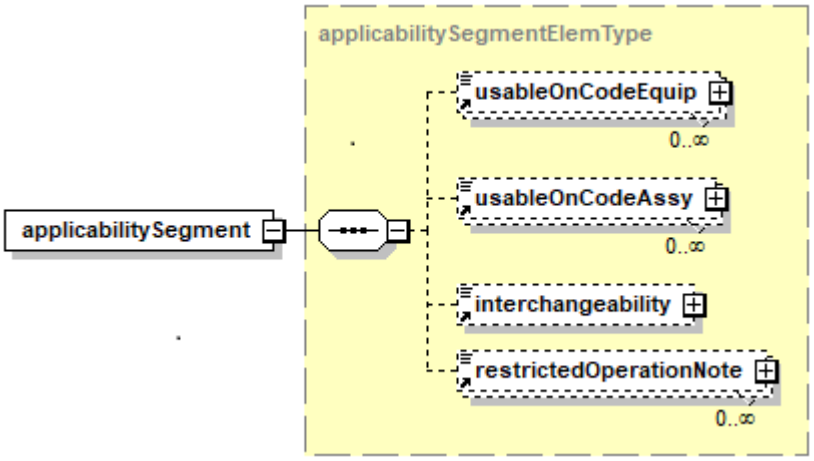
Child elements:

- None

2.5.7 Applicability segment

Description: The element <applicabilitySegment> identifies an S2000M applicability segment.

Markup element: <applicabilitySegment>



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Fig 8 Element <applicabilitySegment >

Attributes:

- None

Child elements:

- <usableOnCodeEquip>. Refer to Para 2.5.7.1.
- <usableOnCodeAssy>. Refer to Para 2.5.7.2.
- <interchangeability>. Refer to Para 2.5.7.3.
- <restrictedOperationNote>. Refer to Para 2.5.7.4.

2.5.7.1 Usable on code equipment

Description: The element <usableOnCodeEquip> contains the equipment variants and configurations to which the item is applied. The element <usableOnCodeEquip> is used for non-chapterized IPD.

Markup element: <usableOnCodeEquip>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Business rule decision point BRDP-S1-00229 - Use of the element <usableOnCodeEquip> in the element <applicabilitySegment> within the element <itemSeqNumber>:

- Decide whether and how to use the element <usableOnCodeEquip>. If used, decide on the values and their definitions. S2000M lists the possible codes and their usage in the data definition for usable on code equipment (UCE).

2.5.7.2 Usable on code assembly

Description: The element <usableOnCodeAssy> contains the assembly variants and configuration variants to which the item is applied. The element <usableOnCodeAssy> is used for chapterized IPD.

Markup element: <usableOnCodeAssy>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Business rule decision point BRDP-S1-00230 - Use of the element <usableOnCodeAssy> in the element <applicabilitySegment> within the element <itemSeqNumber>:

- Decide whether and how to use the element <usableOnCodeAssy>. If used, decide on the values and their definitions. S2000M lists the possible codes and their usage in the data definition for usable on code assembly (UCA).

2.5.7.3 Interchangeability

Description: The element <interchangeability> contains the interchangeability of two or more items at the same location. The element <interchangeability> will only be populated if the element <reasonForSelection> does not contain "0".

Markup element: <interchangeability>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Business rule decision point BRDP-S1-00231 - Use of the element <interchangeability> in the element <applicabilitySegment> within the element <itemSeqNumber>:

- Decide whether and how to use the element <interchangeability>. If used, decide on the values and their definitions. S2000M lists the possible codes and their usage in the definition for interchangeability (ICY).

2.5.7.4 Restricted operation notes

Description: The element <restrictedOperationNote> contains messages related to specific operations, and more precisely when the installation of the parts limits the Product in its operations and/or systems.

Examples:

- ETOPS (Refer to Chap 9.2.2) restrictions (eg, "Not approved for ETOPS")
- Compliance with the RNP (Required Navigation Performance) system (eg, "Not RNP system compliant")
- Compliance with the OMTS (On-board Mobile Telephony System) system (eg, "Not OMTS system compliant")

Note

When using the element <restrictedOperationNote>, the relevant information must also be covered in the operational and maintenance publication.

Markup element: <restrictedOperationNote>

Attributes:

- operationType (O), the type of operation or system which is concerned by the restriction message. The attribute can have one or more of the following values:
  - "op01" thru "op99". Refer to Chap 3.9.6.1.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

2.5.8 Category 1 container location

Description: The element <categoryOneContainerLocation> contains the location at which the data record of an item's category 1 container is held.

Markup element: <categoryOneContainerLocation>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- modelIdentCode (O), the model identification code or project name. Refer to Chap 4.3.1.
- systemDiffCode (O), the system difference code. Refer to Chap 4.3.2.
- systemCode (O). Refer to Para 2.4.2.2.
- subSystemCode (O). Refer to Para 2.4.2.2.
- subSubSystemCode (O). Refer to Para 2.4.2.2.
- assyCode (O). Refer to Para 2.4.2.2.
- figureNumber (M). Refer to Para 2.4.2.2.
- figureNumberVariant (O). Refer to Para 2.4.2.2.
- item (M). Refer to Para 2.4.2.2.
- itemVariant (O). Refer to Para 2.4.2.2.
- itemLocationCode (O), the item location code. Refer to Chap 4.3.8.
- itemSeqNumberValue (O), the ISN of the item's category 1 container
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Note

Refer to the attribute list in Para 2.4 for details of how the CSN is used to create a hyperlink to the IPD data module.

Note

The attributes modelIdentCode, systemDiffCode and itemLocationCode are not needed for S2000M projects as the container location is normally within the same figure. When needed, non-S2000M projects can use these attributes.

Note

The element also includes five attributes normally populated by applications to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

- None

2.5.9 CES data - Location recommendation segment

Description: The element <locationRcmdSegment> identifies an S2000M location recommendation segment (CES). The element <locationRcmdSegment> is only mandatory for S2000M programs.

Markup element: <locationRcmdSegment>

Attributes:

- None

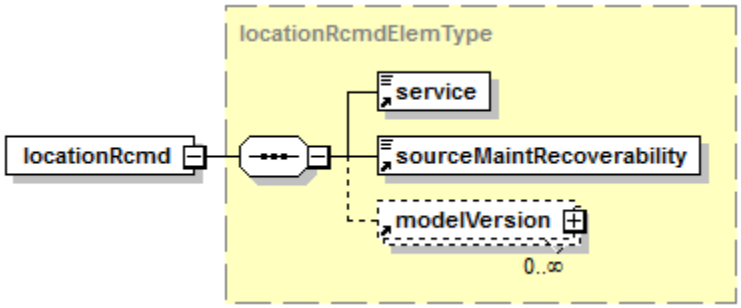
Child elements:

– <locationRcmd>, provides information for each location recommendation. Refer to Para 2.5.9.1.

2.5.9.1 Location recommendation

Description: The element <locationRcmd > provides information for each location recommendation.

Markup element: <locationRcmd>



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Fig 9 Element <locationRcmd>

Attributes:

– None

Child elements:

– <service>. Refer to Para 2.5.9.2.
– <sourceMaintRecoverability>. Refer to Para 2.5.9.3.
– <modelVersion>. Refer to Para 2.5.9.4.

2.5.9.2 Service

Description: The element <service> identifies the user service to which specific data is applicable. The text content of the element has three characters. The first two characters must be populated with the user nation code. The third character is project or organization specific.

Markup element: <service>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

Business rule decision point BRDP-S1-00232 - Use of the element <service> in the element <locationRcmdSegment> within the element <itemSeqNumber>:

- Decide on the values and definitions of the third character of the element <service>.

2.5.9.3 Source maintenance and recoverability

Description: The element <sourceMaintRecoverability> identifies maintenance activities which are performed on an item. The population of this element is in accordance with Table 6.

Table 6 Source maintenance and recoverability

Position	Content
1 and 2	Source code indicating the means of acquiring the item
3	Maintenance code indicating the lowest maintenance level allowed to remove, replace or use the item
4	Maintenance code indicating the lowest maintenance level allowed to repair the item
5	Recoverability code indicating disposal action to be taken for unserviceable items
6	Defined by the project or the organization

Markup element: <sourceMaintRecoverability>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Business rule decision point BRDP-S1-00233 - Use of the element <sourceMaintRecoverability> in the element <locationRcmdSegment> within the element <itemSeqNumber>:

- Decide which values to use for the sixth character of the element <sourceMaintRecoverability> and allocate suitable definitions.

2.5.9.4 Model version

Description: The element <modelVersion> identifies the specific version of the product (described by the model identification code) on which an item is fitted in this location.

Markup element: <modelVersion>

Attributes:

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `modelVersionValue` (M), the identification of the specific version of the equipment to which the item is fitted in this location
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`effectivity`>. Refer to Para 2.5.9.5.

Business rule decision point BRDP-S1-00234 - Use of the element <`modelVersion`> in the element <`locationRcmdSegment`> within the element <`itemSeqNumber`>:

- Decide whether and how to use the element <`modelVersion`>. If used, decide on the values and their definitions.

2.5.9.5 Effectivity

Description: The element <`effectivity`> identifies the range of products on which the item is fitted in this location.

Note

In general, S1000D does not use effectivity. However, it is included in the IPD Schema because that Schema reflects that part of the S2000M message.

Markup element: <`effectivity`>

Attributes:

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- None

Business rule decision point BRDP-S1-00235 - Use of the element <`effectivity`> in the element <`locationRcmdSegment`> within the element <`itemSeqNumber`>:

- Decide whether and how to use the element <`effectivity`>. If used, decide on its range and the definition of the values to be used.

2.5.10 Integrated logistic support number

Description: The element <`ilsNumber`> contains an interdisciplinary cross reference to an integrated logistic support number.

Markup element: <`ilsNumber`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.5.11 Change authority data

Description: The element <changeAuthorityData> contains conditions impacting a part or a wire. These impacting conditions indicate why the installation of this part or wire is allowed. Generally, this indication consists of a condition (eg, design office modification, Service bulletin, or customer originated change).

Markup element: <changeAuthorityData>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- condValue (O), the status for which the condition is listed, for example, "Pre" or "Post"
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <changeAuthority>. Refer to Para 2.5.11.1.
- <refs>. Refer to Chap 3.9.5.2.1.2.

2.5.11.1 Change authority

Description: The element <changeAuthority> represents one impacting condition. It corresponds to the S2000M definition of change authority number (CAN).

Either the content of element <changeAuthority> or its attributes can be used to store the CAN information.

Markup element: <changeAuthority>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- condNumber (O), the identifier of the change authority document
- manufacturerCodeValue (O), the CAGE code of the manufacturer
- condTypeName (O), the name of the condition type
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

2.5.12 Non-S2000M data

Description: The element <genericPartDataGroup> contains any project or organization specific data.

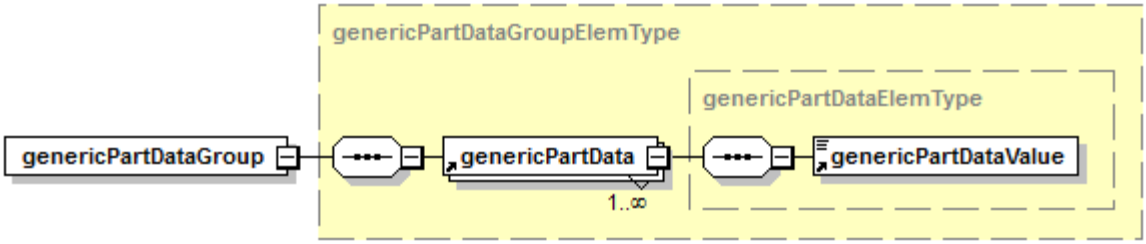
The current IPD structure strongly relies on the S2000M data organization. For non-S2000M projects, some specific data cannot be covered by the existing S2000M data elements. For that purpose, the element <genericPartDataGroup> allows the definition and storage of any kind of non-S2000M data within the IPD content.

The IPD team must nevertheless first analyze the correspondence between the source data and the S2000M data elements which are already addressable by the current IPD Schema. If there is compliance, the existing S2000M data must be used. Otherwise the new data is populated in the element <genericPartDataGroup> with its name and value.

Note

Non-S2000M illustrated parts data modules must follow the rules defined for chapterized parts data modules.

Markup element: <genericPartDataGroup>



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Fig 10 Element <genericPartDataGroup>

Attributes:

– None

Child elements:

– <genericPartData>. Refer to Para 2.5.12.1.

Business rule decision point BRDP-S1-00237 - Use of BREX to define the non-S2000M elements:

– Decide whether to use BREX for the definition of the non-S2000M elements.

2.5.12.1 Generic part data

Description: The element <genericPartData> contains one project or organization specific part data item not covered by any of the other data elements in the IPD Schema.

Markup element: <genericPartData>

Attributes:

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `genericPartDataName` (M), a suitable name to identify the data item
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`genericPartDataValue`>. Refer to Para 2.5.12.2.

2.5.12.2 Generic part data value

Description: The element <`genericPartDataValue`> contains the non-S2000M data value.

Markup element: <`genericPartDataValue`>

Attributes:

- None

Child elements:

- None

2.6 Parts data element mapping

As the IPD Schema can be used to capture and represent parts lists and IPD initially drawn from an S2000M parts database, Table 7 describes the mapping between the initial S2000M elements (defined through their S2000M text element identifier) and the IPD Schema elements and attributes.

Table 7 Parts data element mapping

Text element identifier	Data element name	M/O	Mapping to Schema elements/attributes
ASP	Attaching, storage or shipping part	O	`<attachStoreShipPart attachStoreShipPartCode="...">`
CAN	Change authority number	O	`<changeAuthorityData> <changeAuthority>...</changeAuthority> </changeAuthorityData>`
CMK	Calibration marker	O	`<calibrationMarker>... </calibrationMarker>`
CSN	Catalog sequence number	M	`<catalogSeqNumber systemCode="..." subSystemCode="..." subSubSystemCode="..." assyCode="..." figureNumber="..." figureNumberVariant="..." item="..." itemVariant="...">`

Text element identifier	Data element name	M/O	Mapping to Schema elements/attributes
CTL	Category 1 container location	O	<categoryOneContainerLocation modelIdentCode="..." systemDiffCode="..." systemCode="..." subSystemCode="..." subSubSystemCode="..." assyCode="..." figureNumber="..." figureNumberVariant="..." itemLocationCode="D" item="..." itemVariant="..." itemSeqNumberValue="...">
DFL	Description for location	O	<descrForLocation>... </descrForLocation>
DFP	Description for part	M	<descrForPart>...</descrForPart>
EFY	Effectivity	O	<effectivity>...</effectivity>
FID	File identifier	O	<initialProvisioningProject fileIdent="..."/>
FTC	Fitment code	O	<fitmentCode fitmentCodeValue="...">
ICN	Information control number	O	<graphic infoEntityIdent="ICN-...">
ICY	Interchangeability	O	<interchangeability>... </interchangeability>
ILS	Integrated logistic support number	O	<ilsNumber>...</ilsNumber>
IND	Indenture	M	<catalogSeqNumber indenture="...">
IPP	Initial provisioning project number	M	<initialProvisioningProject initialProvisioningProjectNumber= "..."/>
IPS	Initial provisioning project number subject	M	<initialProvisioningProject initialProvisioningProjectNumberSubject ="..."/>
ISN	Item sequence number	M	<itemSeqNumber itemSeqNumberValue="...">
ITY	Item type	O	<partUsage partUsageCode="pu.."/>
LGE	Language code	M	<initialProvisioningProject languageCode="..."/>
MFC	CAGE code of manufacturer	M	<partRef manufacturerCodeValue"..."/>
MFM	Select or manufacture from range	O	<selectOrManufacture>... </selectOrManufacture>
MOI	Model identification code	M	<dmCode modelIdentCode">... </dmCode>

Text element identifier	Data element name	M/O	Mapping to Schema elements/attributes
MOV	Model version	O	`<modelVersion modelVersionValue="...">`
NIL	Not illustrated	O	`<notIllustrated>`
NSN	NATO stock number	O	Composite data element composed of NSC and NIN
NSC	NATO supply class	M	`<natoStockNumber natoSupplyClass="...">`
NIN	NATO item identification number	O	`<natoStockNumber natoCodificationBureau="..." natoItemIdentNumberCore="...">`
PNR	Part number	M	`<partRef partNumberValue="..."/>`
PSC	Physical security pilferage code	O	`<physicalSecurityPilferageCode>... </physicalSecurityPilferageCode>`
QNA	Quantity per next higher assembly	M	`<quantityPerNextHigherAssy>... </quantityPerNextHigherAssy>`
QUI	Quantity per unit of issue	O	`<quantityPerUnit>... </quantityPerUnit>`
RFD	Reference designator	O	`<functionalItemRef>... </functionalItemRef>`
RFS	Reason for selection	O	`<reasonForSelection reasonForSelectionValue="..."/>`

RTX	Refer to	O	`<referTo> <initialProvisioningProjectRef initialProvisioningProjectNumber= "...">`
			or
			`<referTo> <initialProvisioningProjectRef initialProvisioningProjectNumber= "..." responsiblePartnerCompanyCode="...">`
			or
			`<referTo> <catalogSeqNumberRef modelIdentCode="..." systemDiffCode="..." systemCode="..." subSystemCode="..." subSubSystemCode="..." assyCode="..." figureNumber="..." figureNumberVariant="..." itemLocationCode="..." item="..." itemVariant="..." itemSeqNumberValue="...">`

Text element identifier	Data element name	M/O	Mapping to Schema elements/attributes

SID	Subject identification	M	Composite data element composed of (MFC) and (PNR)
			`<subjectIdent>`
			`<manufacturerCode>...`
			`</manufacturerCode>`
			`<partNumber>..</partNumber>`
			`</subjectIdent>`

SMF	Select or manufacture from identifier	O	`<selectOrManufactureFromIdent selectOrManufactureValue ="...">`
SMR	Source maintenance recoverability	M	`<sourceMaintRecoverability>...</sourceMaintRecoverability>`
SPC	Spare parts classification	O	`<sparePartClass sparePartClassCode="…"/>`
SRV	Service	M	`<service>...</service>`
STR	Special storage	O	`<specialStorage>...</specialStorage>`
TQL	Total quantity	O	`<totalQuantity>...</totalQuantity>`

TYP	Type of location designator	O	`<functionalItemRef functionalItemType="fit.."/>`
			or:
			`<accessPointRef accessPointTypeValue="accpnl.."/>`

UCA	Usable on code assembly	O	`<usableOnCodeAssy>...</usableOnCodeAssy>`
UCE	Usable on code equipment	O	`<usableOnCodeEquip>...</usableOnCodeEquip>`
UOI	Unit of issue	O	`<unitOfIssue>...</unitOfIssue>`
UOM	Unit of measure	O	`<unitOfIssueQualificationSegment unitOfMeasure="...">`

3 Examples

3.1 Refer to

A reference from one item to two higher assemblies (item 040 part of project 23121101 and item 010 part of project 23121110) will be authored as follows:

```
<referTo refType="rft01">
<catalogSeqNumberRef responsiblePartnerCompanyCode="R"
initialProvisioningProjectNumber="K03781101"
modelIdentCode="..." systemDiffCode="..." figureNumber="..."
figureNumberVariant="..." itemLocationCode="D" item="040"
itemVariant="..."/>
<catalogSeqNumberRef responsiblePartnerCompanyCode="F"
initialProvisioningProjectNumber="K03781110"
modelIdentCode="..." systemDiffCode="..." figureNumber="..."
```

```
figureNumberVariant="..." itemLocationCode="D" item="010"
itemVariant="..."/>
</referTo>
```

A reference from one item to a sub-decomposition item (item 050 part of project K03781101) will be authored as follows:

```
<referTo refType="rft02">
<catalogSeqNumberRef responsiblePartnerCompanyCode="F"
initialProvisioningProjectNumber="23121101" modelIdentCode="..."
systemDiffCode="..." figureNumber="..."
figureNumberVariant="..." itemLocationCode="D" item="050"
itemVariant="..."/>
</referTo>
```

If the sub-decomposition item referred is given in a non-chapterized IPD, then a direct reference to the IPPN only will be addressed:

```
<referTo refType="rft02">
<initialProvisioningProjectRef
initialProvisioningProjectNumber="KZ9990001"/>
</referTo>
```

3.2 Generic parts data

Markup for the management of, ie, distributing level (nid), keywords (key) desiccating standard (dhy), storage container (emb) and nota (xnt) can be authored as follows:

```
<genericPartDataGroup>
<genericPartData genericPartDataName="nid">
<genericPartDataValue>2</genericPartDataValue></genericPartData>
<genericPartData genericPartDataName="key">
<genericPartDataValue>Bicycle</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="dhy">
<genericPartDataValue>F2408:1-4UD:02</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="emb">
<genericPartDataValue>KZ999:LNS10276051</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="xnt">
<genericPartDataValue>SP</genericPartDataValue>
</genericPartData>
</genericPartDataGroup>
```

3.3 Illustrated parts data content

```
<illustratedPartsCatalog>
<figure id="fig-0001">
<title>Bicycle</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-D000000-0-U8025-
00536-A-01-1"/>
</figure>
<initialProvisioningProject
initialProvisioningProjectNumber="KZ9990001"
initialProvisioningProjectNumberSubject="BICYCLE"
```

```
fileIdent="s"/>
<catalogSeqNumber systemCode="00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" figureNumber="01"
figureNumberVariant="A" item="000" itemVariant="A"
indenture="1">
<itemSeqNumber itemSeqNumberValue="00A">
<reasonForSelection reasonForSelectionValue="0"/>
<quantityPerNextHigherAssy>REF</quantityPerNextHigherAssy>
<partRef partNumberValue=" BICYCLE-001" manufacturerCodeValue="
KZ999"/>
<partSegment>
<itemIdentData>
<descrForPart>Bicycle</descrForPart>
</itemIdentData>
</partSegment>
<locationRcmdSegment>
<locationRcmd>
<service>UKA</service>
<sourceMaintRecoverability>XB</sourceMaintRecoverability>
<modelVersion modelVersionValue="MB"/>
</locationRcmd>
</locationRcmdSegment>
<genericPartDataGroup>
<genericPartData genericPartDataName="qre">
<genericPartDataValue>2</genericPartDataValue></genericPartData>
<genericPartData genericPartDataName="xnt">
<genericPartDataValue>SP</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="key">
<genericPartDataValue>Bicycle</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="emb">
<genericPartDataValue>KZ999:LNS10276051</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="nse">
<genericPartDataValue>8145144345</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="dhy">
<genericPartDataValue>F2408:1-4UD:02</genericPartDataValue>
</genericPartData>
</genericPartDataGroup>
</itemSeqNumber>
</catalogSeqNumber>
<catalogSeqNumber systemCode="00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" figureNumber="01"
figureNumberVariant="A" item="001" indenture="2">
<itemSeqNumber itemSeqNumberValue="00A">
<reasonForSelection reasonForSelectionValue="1"/>
<quantityPerNextHigherAssy>1</quantityPerNextHigherAssy>
<partRef partNumberValue=" BICYCLE-001/1"
manufacturerCodeValue=" KZ999"/>
<partSegment>
```

```
<itemIdentData>
<descrForPart>Frame assembly</descrForPart>
</itemIdentData>
<techData>
<unitOfIssue>EA</unitOfIssue>
<specialStorage>0</specialStorage>
</techData>
</partSegment>
<locationRcmdSegment>
<locationRcmd>
<service>UKA</service>
<sourceMaintRecoverability>PAODD</sourceMaintRecoverability>
<modelVersion modelVersionValue="MB">
</modelVersion>
</locationRcmd>
</locationRcmdSegment>
</itemSeqNumber>
</catalogSeqNumber>
...
<catalogSeqNumber systemCode="00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" figureNumber="01"
figureNumberVariant="A" item="006" indenture="3">
<itemSeqNumber itemSeqNumberValue="00A">
<reasonForSelection reasonForSelectionValue="1"/>
<quantityPerNextHigherAssy>1</quantityPerNextHigherAssy>
<partRef partNumberValue="LRU1001"
manufacturerCodeValue="KZ777"/>
<partSegment>
<itemIdentData>
<descrForPart>Light system</descrForPart>
</itemIdentData>
<techData>
<physicalSecurityPilferageCode>J</physicalSecurityPilferageCode>
<unitOfIssue>EA</unitOfIssue>
<specialStorage>1</specialStorage>
</techData>
</partSegment>
<partLocationSegment>
<referTo refType="rft01">
<catalogSeqNumberRef modelIdentCode="S1000DBIKE"
systemDiffCode="AAA" systemCode="00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" figureNumber="01"
figureNumberVariant="A" itemLocationCode="D" item="040" />
<catalogSeqNumberRef modelIdentCode="S1000DBIKE"
systemDiffCode="AAA" systemCode="00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" figureNumber="01"
figureNumberVariant="A" itemLocationCode="D" item="010"/>
</referTo>
</partLocationSegment>
<locationRcmdSegment>
<locationRcmd>
<service>UKA</service>
```

```
<sourceMaintRecoverability>PAFFD</sourceMaintRecoverability>
<modelVersion modelVersionValue="MB">
</modelVersion>
</locationRcmd>
</locationRcmdSegment>
</itemSeqNumber>
</catalogSeqNumber>
...
</illustratedPartsCatalog>
```

3.3.1 Illustrated part data content with hotspots

In case of the project or organization decision to use the generic hot spots mechanism within illustrated part data modules, the previous markup becomes:

```
<illustratedPartsCatalog>
<figure id="fig-0001">
<title>Bicycle</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-D000000-0-U8025-
00536-A-01-1">
<hotspot applicationStructureIdent="HOT0001"
applicationStructureName="1" id="fig-0001-gra-0001-hot-0001">
</hotspot>
...
<hotspot applicationStructureIdent="HOT0006"
applicationStructureName="6" id="fig-0001-gra-0001-hot-0006">
</hotspot>
...
</graphic>
</figure>
<initialProvisioningProject
initialProvisioningProjectNumber="KZ9990001"
initialProvisioningProjectNumberSubject="BICYCLE"
fileIdent="s"/>
<catalogSeqNumber systemCode="00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" figureNumber="01"
figureNumberVariant="A" item="000" indenture="1">
<itemSeqNumber itemSeqNumberValue="00A">
<reasonForSelection reasonForSelectionValue="0"/>
<quantityPerNextHigherAssy>REF</quantityPerNextHigherAssy>
<partRef partNumberValue="BICYCLE-001"
manufacturerCodeValue="KZ999"/>
<partSegment>
<itemIdentData>
<descrForPart>Bicycle</descrForPart>
</itemIdentData>
</partSegment>
<locationRcmdSegment>
<locationRcmd>
<service>UKA</service>
<sourceMaintRecoverability>XB</sourceMaintRecoverability>
<modelVersion modelVersionValue="MB"></modelVersion>
</locationRcmd>
</locationRcmdSegment>
```

```
<genericPartDataGroup>
<genericPartData genericPartDataName="qre">
<genericPartDataValue>2</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="xnt">
<genericPartDataValue>SP</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="key">
<genericPartDataValue>Bicycle</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="emb">
<genericPartDataValue>KZ999:LNS10276051</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="nse">
<genericPartDataValue>8145144345</genericPartDataValue>
</genericPartData>
<genericPartData genericPartDataName="dhy">
<genericPartDataValue>F2408:1-4UD:02</genericPartDataValue>
</genericPartData>
</genericPartDataGroup>
</itemSeqNumber>
</catalogSeqNumber>
<catalogSeqNumber systemCode="00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" figureNumber="01"
figureNumberVariant="A" item="001" indenture="2">
<internalRef internalRefId="fig-0001-gra-0001-hot-0001"
internalRefTargetType="irtt11">
</internalRef>
<itemSeqNumber itemSeqNumberValue="00A">
<reasonForSelection reasonForSelectionValue="1"/>
<quantityPerNextHigherAssy>1</quantityPerNextHigherAssy>
<partRef partNumberValue="BICYCLE-001/1"
manufacturerCodeValue="KZ999"/>
<partSegment>
<itemIdentData>
<descrForPart>Frame assembly</descrForPart>
</itemIdentData>
<techData>
<unitOfIssue>EA</unitOfIssue>
<specialStorage>0</specialStorage>
</techData>
</partSegment>
<locationRcmdSegment>
<locationRcmd>
<service>UKA</service>
<sourceMaintRecoverability>PAODD</sourceMaintRecoverability>
<modelVersion modelVersionValue="MB"></modelVersion>
</locationRcmd>
</locationRcmdSegment>
</itemSeqNumber>
</catalogSeqNumber>
...
```

```
<catalogSeqNumber systemCode="00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" figureNumber="01"
figureNumberVariant="A" item="006" indenture="3">
<internalRef internalRefId="fig-0001-gra-0001-hot-0006"
internalRefTargetType="irtt11"></internalRef>
<itemSeqNumber itemSeqNumberValue="00A">
<reasonForSelection reasonForSelectionValue="1"/>
<quantityPerNextHigherAssy>1</quantityPerNextHigherAssy>
<partRef partNumberValue="LRU1001"
manufacturerCodeValue="KZ777"/>
<partSegment>
<itemIdentData>
<descrForPart>Light system</descrForPart>
</itemIdentData>
<techData>
<physicalSecurityPilferageCode>J</physicalSecurityPilferageCode>
<unitOfIssue>EA</unitOfIssue>
<specialStorage>1</specialStorage>
</techData>
</partSegment>
<partLocationSegment>
<referTo refType="rft01">
<catalogSeqNumberRef modelIdentCode="S1000DBIKE"
systemDiffCode="AAA" systemCode="00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" figureNumber="01"
figureNumberVariant="A" itemLocationCode="D" item="040"/>
<catalogSeqNumberRef modelIdentCode="S1000DBIKE"
systemDiffCode="AAA" systemCode="00" subSystemCode="0"
subSubSystemCode="0" assyCode="00" figureNumber="01"
figureNumberVariant="A" itemLocationCode="D" item="050"/>
</referTo>
</partLocationSegment>
<locationRcmdSegment>
<locationRcmd>
<service>UKA</service>
<sourceMaintRecoverability>PAFFD</sourceMaintRecoverability>
<modelVersion modelVersionValue="MB"></modelVersion>
</locationRcmd>
</locationRcmdSegment>
</itemSeqNumber>
</catalogSeqNumber>
...
</illustratedPartsCatalog>
```

Chapter 3.9.5.2.8

Content section - Battle damage assessment and repair information

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1 General

The battle damage assessment and repair Schema and the guidelines for its use will be included in a future issue of this specification.

Chapter 3.9.5.2.9

Content section - Wiring data

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Chap 3.9.5.2.9.4	Wiring data - Electrical equipment
Chap 3.9.5.2.9.5	Wiring data - Standard parts, Connector
Chap 3.9.5.2.9.6	Wiring data - Standard parts, Distribution part
Chap 3.9.5.2.9.7	Wiring data - Standard parts, Accessory
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Chap 3.9.5.2.9.9	Wiring data - Standard parts, Shrink sleeve
Chap 3.9.5.2.9.10	Wiring data - Standard parts, Identification sleeve
Chap 3.9.5.2.9.11	Wiring data - Standard parts, Conduit
Chap 3.9.5.2.9.12	Wiring data - Standard parts, Wire material
Chap 3.9.5.2.9.13	Wiring data - Wiring data description Schema basic rules

1 General

Wiring data consists of two data module types, each with a dedicated Schema:

- Wiring data
- Wiring data description

The purpose of the wiring data description data modules is to define the occurrence, the names and the meanings of the elements and attributes that are used in the wiring data modules.

Although the use of the wiring data description data module type is a project or an organization decision, it is recommended that wiring data description data modules are created for the project.

2 Wiring data

The content section of wiring data data modules is described in the following chapters:

- Wiring data - Wiring data Schema basic rules. Refer to Chap 3.9.5.2.9.1.
- Wiring data - Wire. Refer to Chap 3.9.5.2.9.2.
- Wiring data - Harness. Refer to Chap 3.9.5.2.9.3.
- Wiring data - Electrical equipment. Refer to Chap 3.9.5.2.9.4.
- Wiring data - Standard parts, Connector. Refer to Chap 3.9.5.2.9.5.
- Wiring data - Standard parts, Distribution part. Refer to Chap 3.9.5.2.9.6.
- Wiring data - Standard parts, Accessory. Refer to Chap 3.9.5.2.9.7.
- Wiring data - Standard parts, Solder sleeve. Refer to Chap 3.9.5.2.9.8.
- Wiring data - Standard parts, Shrink sleeve. Refer to Chap 3.9.5.2.9.9.
- Wiring data - Standard parts, Identification sleeve. Refer to Chap 3.9.5.2.9.10.
- Wiring data - Standard parts, Conduit. Refer to Chap 3.9.5.2.9.11.
- Wiring data - Standard parts, Wire material. Refer to Chap 3.9.5.2.9.12.
- Wiring data - Wiring data description Schema basic rules. Refer to Chap 3.9.5.2.9.13.

Chapter 3.9.5.2.9.1

Wiring data - Wiring data Schema basic rules

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Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.9.2	Wiring data - Wire
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Chap 3.9.5.2.9.9	Wiring data - Standard parts, Shrink sleeve
Chap 3.9.5.2.9.10	Wiring data - Standard parts, Identification sleeve
Chap 3.9.5.2.9.11	Wiring data - Standard parts, Conduit

Chap 3.9.5.2.9.12	Wiring data - Standard parts, Wire material
Chap 3.9.5.3	Data modules - Applicability
Chap 5.2.1.4	Common information sets - Wiring data

1 General

The wiring data Schema is used to capture and represent the wiring data of the Product such as wire data, harness data, electrical equipment data and standard parts data. The use of the common elements and attributes is detailed in Chap 3.9.5.2.1.

The granularity of wiring data data modules must follow the breakdown reflected by the SNS, providing wiring data at:

- system
- subsystem
- sub-subsystem levels

as required by the:

- maintenance philosophy
- scope and depth of information

For details on the scope and depth of information, refer to Chap 5.2.1.4.

2 Wiring data

2.1 Schema basic rules

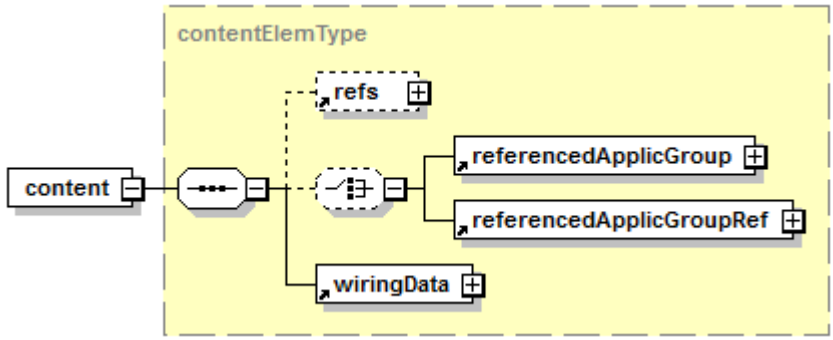
The wiring data Schema has structural elements that are used to provide information about wire data, harness data, electrical equipment data and electrical standard parts data as follows:

- List of wires. Refer to Chap 3.9.5.2.9.2.
- List of harnesses. Refer to Chap 3.9.5.2.9.3.
- List of electrical equipment. Refer to Chap 3.9.5.2.9.4.
- List of electrical standard parts with the following subordinated lists:
  - List of connectors. Refer to Chap 3.9.5.2.9.5.
  - List of distribution parts. Refer to Chap 3.9.5.2.9.6.
  - List of accessories. Refer to Chap 3.9.5.2.9.7.
  - List of solder sleeves. Refer to Chap 3.9.5.2.9.8.
  - List of shrink sleeves. Refer to Chap 3.9.5.2.9.9.
  - List of identification sleeves. Refer to Chap 3.9.5.2.9.10.
  - List of conduits. Refer to Chap 3.9.5.2.9.11.
  - List of wire materials. Refer to Chap 3.9.5.2.9.12.

2.2 Content

Description: The element <content> of this Schema is used to capture and represent the wiring data of the Product.

Markup element: <content>



ICN-C0419-S1000D0208-002-01

Fig 1 Element <content>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

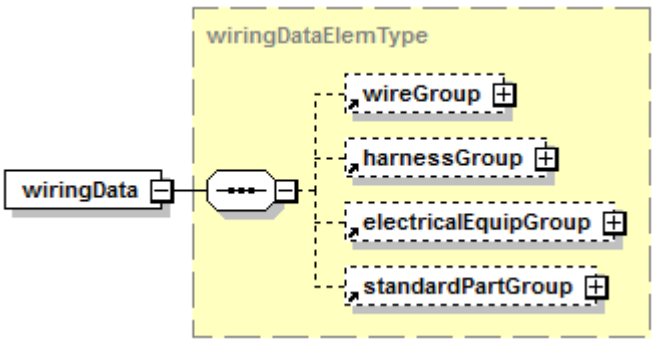
Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
- <wiringData>. Refer to Para 2.3.

2.3 Element <wiringData>

Description: The element <wiringData> is used as a container for the lists of wires, harnesses, electrical equipment and electrical standard parts.

Markup element: <wiringData>



ICN-C0419-S1000D0210-001-01

Fig 2 Element <wiringData>

Attributes:

- None

Child elements:

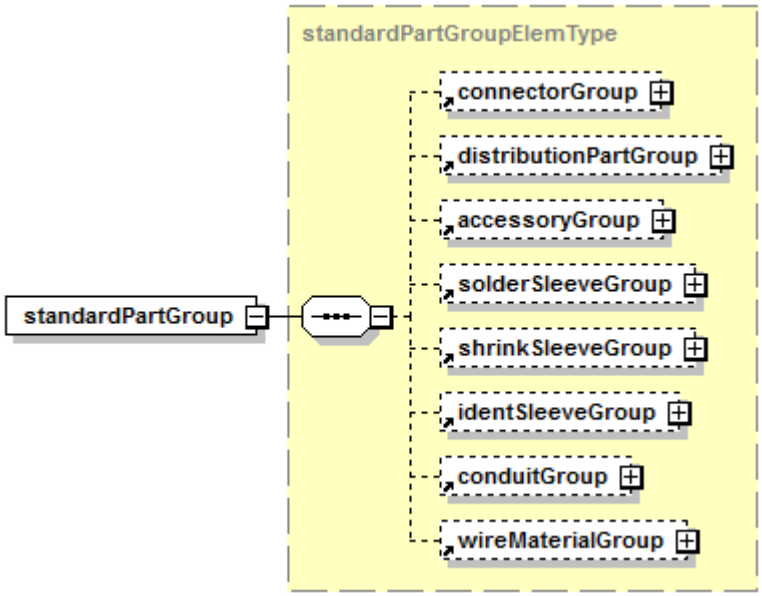
- <wireGroup>, the list of wires. Refer to Chap 3.9.5.2.9.2.
- <harnessGroup>, the list of harnesses. Refer to Chap 3.9.5.2.9.3.

- <electricalEquipGroup>, the list of electrical equipment. Refer to Chap 3.9.5.2.9.4.
- <standardPartGroup>, the list of electrical standard parts. Refer to Para 2.3.1.

2.3.1 Electrical standard parts

Description: The element <standardPartGroup> is used as a container for the different categories of electrical standard parts data.

Markup element: <standardPartGroup>



ICN-C0419-S1000D0211-001-01

Fig 3 Element <standardPartGroup>

Attributes:

- None

Child elements:

- <connectorGroup>, the list of connectors. Refer to Chap 3.9.5.2.9.5.
- <distributionPartGroup>, the list of distribution parts. Refer to Chap 3.9.5.2.9.6.
- <accessoryGroup>, the list of accessories. Refer to Chap 3.9.5.2.9.7.
- <solderSleeveGroup>, the list of solder sleeves. Refer to Chap 3.9.5.2.9.8.
- <shrinkSleeveGroup>, the list of shrink sleeves. Refer to Chap 3.9.5.2.9.9.
- <identSleeveGroup>, the list of identification sleeves. Refer to Chap 3.9.5.2.9.10.
- <conduitGroup>, the list of conduits. Refer to Chap 3.9.5.2.9.11.
- <wireMaterialGroup>, the list of wire materials. Refer to Chap 3.9.5.2.9.12.

Chapter 3.9.5.2.9.2

Wiring data - Wire

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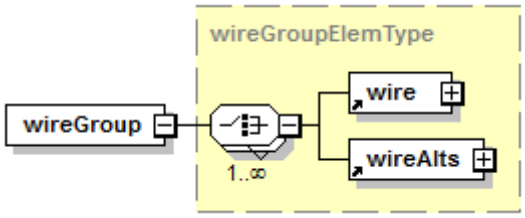
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Chap 4.13.3	Optimizing and reuse - Alternates concept

1 General

The element <wire> and its child elements are used to capture and represent the wires, which are installed in the Product, and the related information.

2 Element <wire> and child elements

Description: The element <wire>, within the list of wires element <wireGroup>, contains wire information about the Product's wiring. The wires are the electrical connections between two equipment, different contacts of an equipment, etc. Electrical wires of a system are often bundled into harnesses.

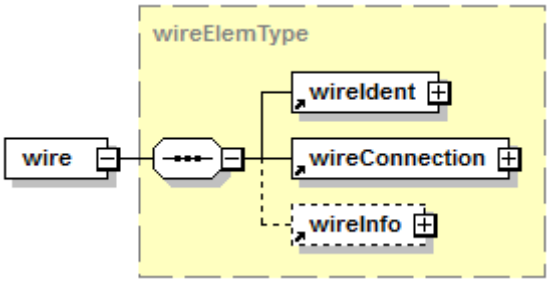


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Fig 1 Element <wireGroup>

It is strongly recommended to define wire applicability precisely and populate the elements and attributes in accordance with the project or the organization specific rules. It is further recommended to use at least the version and version number information given in the Product's cross-reference table. Wires with modifications must in addition use the information given in the conditions cross-reference table.

Markup element: <wire>



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Fig 2 Element <wire>

Attributes:

- wireState (O), the electrical state of a wire. Normally, wires are divided into physical electrical wires and logical connections (eg, the connection of a circuit breaker to the bus bar by a screw). The attribute wireState can have one of the following values:
  - "active" - for wires which are active in one of the system circuits
  - "stowed" - for wires which are stowed (not connected) at least on one end
  - "pigtail" - for wires which are connected only at one end to an equipment of the system for measurement purposes
  - "notactiv" - for wires which are not active in one of the system circuits
  - "logconn" - for electrical connections in one of the system circuits which are not realized by a physical wire or do not have a wire identification (in some cases called flying leads)
- changeInfo (O), the change information of a wire in connection with the related modification. The attribute changeInfo can have one of the following values:
  - "add" - for wires which are added to the system circuits by a modification
  - "delete" - for wires which are removed from the system circuits by a modification
  - "modify" - for wires which are modified in the system circuits by a modification
- applicRefId (O), the applicability information of a wire by referencing the element <applic>. Refer to Chap 3.9.5.3.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <wireIdent>, the wire identification. Refer to Para 2.1.
- <wireConnection>, the wire connection. Refer to Para 2.2.
- <wireInfo>, the wire information. Refer to Para 2.3.

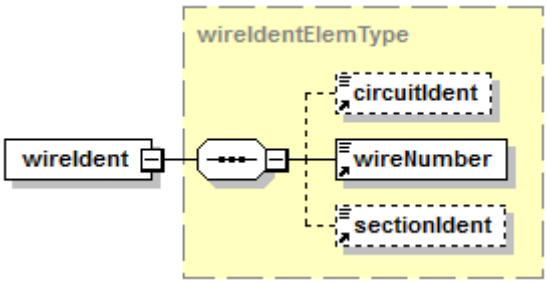
Markup example:

```
<wiringData>
<wireGroup>
<wire wireState="active" applicRefId="app-0001">
<wireIdent>
<wireNumber>BT2AA</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3000VN"/>
</fromEquip>
</wireConnection>
</wire>
</wireGroup>
</wiringData>
```

2.1 Wire identification

Description: The element <wireIdent> is the unique identifier of a wire in the system.

Markup element: <wireIdent>



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Fig 3 Element <wireIdent>

Attributes:

- contextIdent (O), the context identification which is used in combination with the attribute manufacturerCodeValue to ensure the uniqueness of manufacturer wire data. Context identification contains an identifier (eg, the part number of the next higher assembly that has been given to the assembly by the manufacturer).
- manufacturerCodeValue (O), the identification of the manufacturer (eg, the CAGE code), which is used in combination with the attribute contextIdent to ensure uniqueness of manufacturer wire data.

- `itemOriginator` (O), the origin of the wire (eg, whether a wire is an aircraft manufacturer wire or a supplier wire). Values and their meanings are defined by using the BREX mechanism. Refer to Chap 3.9.6.1 and Chap 4.10.

Child elements:

- <`circuitIdent`>, the circuit code. Refer to Para 2.1.1.
- <`wireNumber`>, the wire identification number. Refer to Para 2.1.2.
- <`sectionIdent`>, the wire section identification. Refer to Para 2.1.3.

Markup example:

```
<wireIdent contextIdent="PN-AC-12561"
manufacturerCodeValue="F0001" itemOriginator="orig01">
<wireNumber>BT2AA</wireNumber>
</wireIdent>
```

2.1.1 Circuit code

Description: Projects with electrical wiring often consist of several systems or circuits. If the allocation of a wire to a system must be reflected in the wire identification, then the element <`circuitIdent`> must be populated with the identifier for this system/circuit. Table 2 gives examples of circuit codes.

Table 2 Circuit codes

Circuit code	System/Circuit
AG	Gun system
LD	Lighting control
YD	Armament control system

Markup element: <`circuitIdent`>

Attributes:

- None

Child elements:

- None

2.1.2 Wire identification number

Description: All wires must have a wire identification number. If there is no further breakdown, using the circuit code element <`circuitIdent`> and the wire section identification element <`sectionIdent`>, then the element <`wireNumber`> must contain the complete wire identification.

If a conductor runs through non-functional breaks (eg, a terminal junction module or a splice), the wire identification number must be the same for the two wires, but the section identifications are different.

Markup element: <`wireNumber`>

Attributes:

- None

Child elements:

– None

2.1.3 Wire section identification

Description: Wires which are connected by non-functional breaks such as connectors, terminal junction modules, splices, etc, often get the same wire identification number and different section identifications. In this case, the element <sectionIdent> must be populated with the identifiers for these different sections.

Markup element: <sectionIdent>

Attributes:

– None

Child elements:

– None

2.1.4 Markup examples

2.1.4.1 Wire identification example using circuit code and section identification

The following markup example shows the wire identification for section AA of wire number 0486 within the armament control system (YD).

```
<wireIdent>
<circuitIdent>YD</circuitIdent>
<wireNumber>0486</wireNumber>
<sectionIdent>AA</sectionIdent>
</wireIdent>
```

2.1.4.2 Wire identification example without using circuit code and section identification

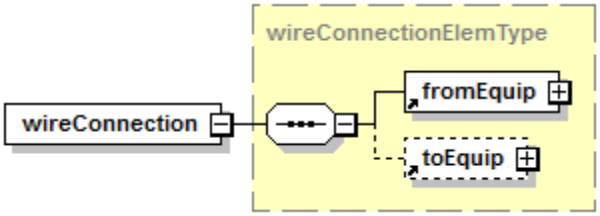
The following example shows the markup of wire W5250-2023B-24 that is installed in the panel with the part number P1650-411, supplied by the manufacturer with the identification F2345:

```
<wireIdent contextIdent="P1650-411"
manufacturerCodeValue="F2345" itemOriginator="orig02">
<wireNumber>W5250-2023B-24</wireNumber>
</wireIdent>
```

2.2 Wire connection

Description: The element <wireConnection> contains connection information for the two ends of a wire. In special cases (eg, wires with wireState = "pigtail" or "notactiv") only the connection of one wire end is used.

Markup element: <wireConnection>



ICN-C0419-S1000D0232-001-01

Fig 4 Element <wireConnection>

Attributes:

– None

Child elements:

– <fromEquip>, the from equipment information. Refer to Para 2.2.1.
– <toEquip>, the equipment information which must be populated for all wires with two relevant wire ends, otherwise not. Refer to Para 2.2.1.

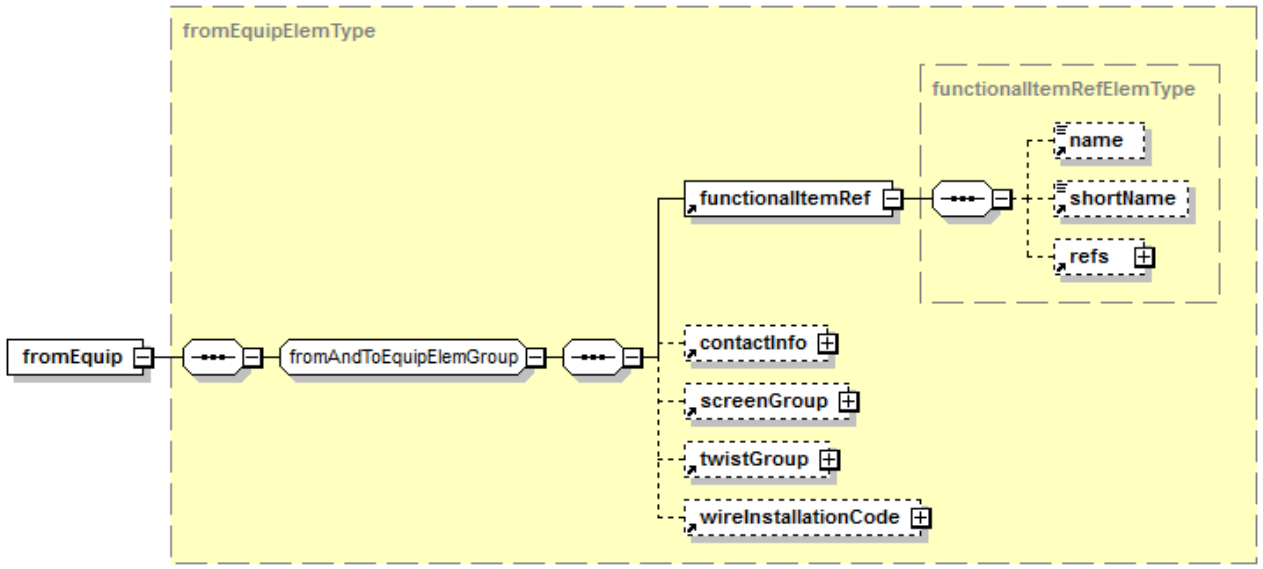
Markup example:

```
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="6QXA"/>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="6712VR"/>
</toEquip>
</wireConnection>
```

2.2.1 Content model electrical equipment

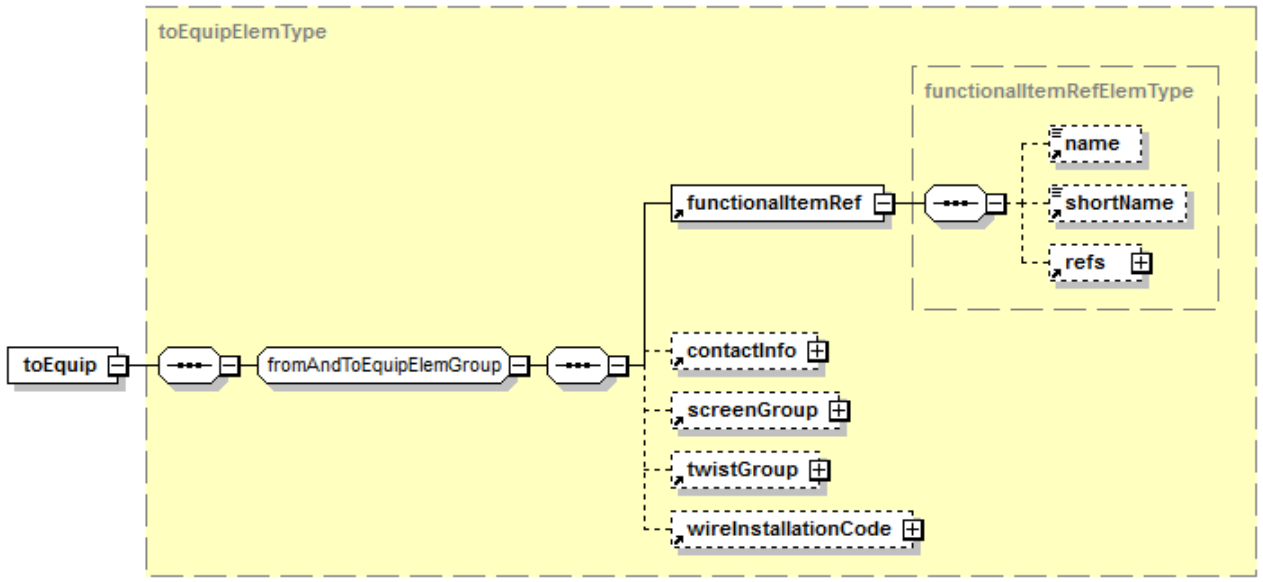
Description: The content model electrical equipment defines the child elements of the elements <fromEquip> and <toEquip>, which contain the wire connection information for the two wire ends.

Markup elements: <fromEquip> and <toEquip>



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Fig 5 Element <fromEquip>



ICN-C0419-S1000D0234-001-01

Fig 6 Element <toEquip>

Attributes:

– None

Child elements:

– <functionalItemRef>, the functional item reference. Functional items are also known as reference designators. Refer to Chap 3.9.5.1.
– <contactInfo>, the contact information. Refer to Para 2.2.1.1.
– <screenGroup>, the list of screens. Refer to Para 2.2.1.2.
– <twistGroup>, the twist information group. Refer to Para 2.2.1.3.
– <wireInstallationCode>, the wire installation code. Refer to Para 2.2.1.4.

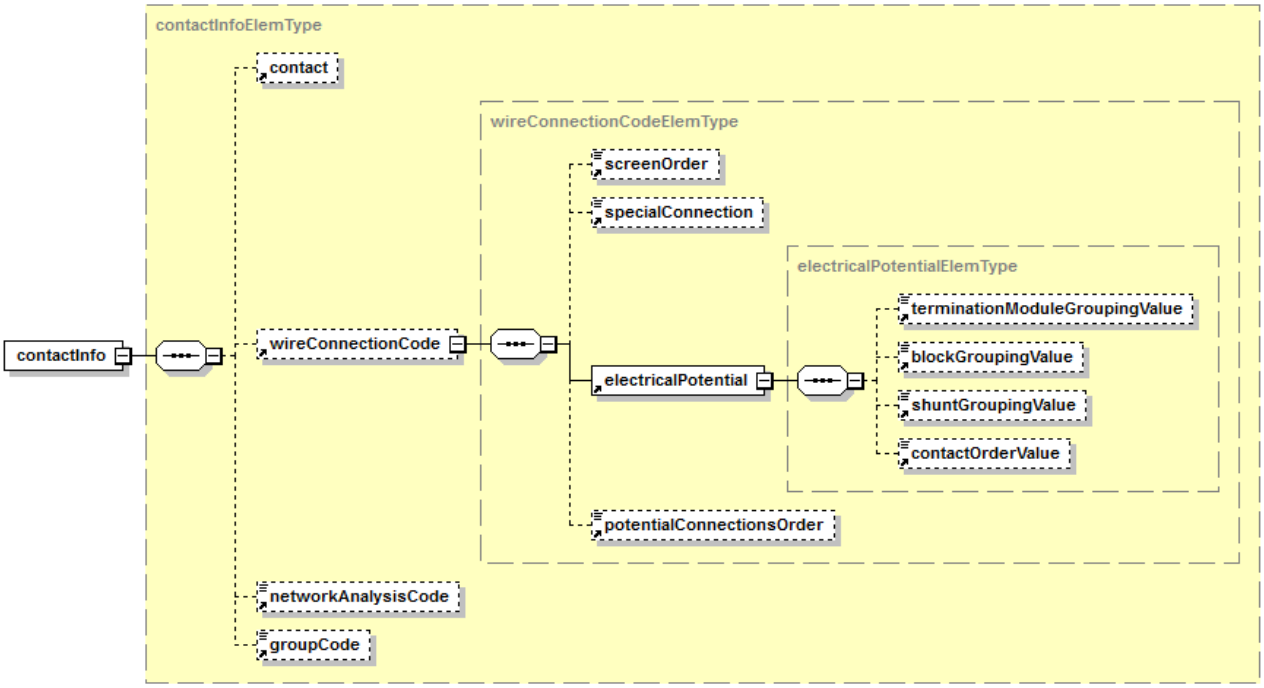
Markup example:

```
<fromEquip>
<functionalItemRef functionalItemNumber="Sensor"/>
<contactInfo>
<contact>
<contactInfo contactIdent="S"/>
</contact>
</contactInfo>
<screenGroup>
<screen>SCT1</screen>
</screenGroup>
</fromEquip>
```

2.2.1.1 Contact information

Description: The element <contactInfo> contains child elements that identify the contact to which the wire end is connected.

Markup element: <contactInfo>



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Fig 7 Element <contactInfo>

Attributes:

– None

Child elements:

– <contact>, the contact identification. Refer to Para 2.2.1.1.1.
– <wireConnectionCode>, the wire connection code. Refer to Para 2.2.1.1.2.
– <networkAnalysisCode>, the network analysis code. Refer to Para 2.2.1.1.11.
– <groupCode>, the group code. Refer to Para 2.2.1.1.12.

Markup example:

```
<contactInfo>
<contact contactIdent="GND"/>
<wireConnectionCode>
<electricalPotential>
<contactOrderValue>1</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
<groupCode>G1-</groupCode>
</contactInfo>
```

2.2.1.1.1 Contact identification

Description: The element <contact> describes the contact identification by its attributes. Normally, wires are connected to contacts with a given name. If not, the attribute contactIdent has no value for those contacts where at least one of the other attributes is used. If none of the attributes is used, the element <contact> must not be used at all.

Markup element: <contact>

Attributes:

- contactIdent (M), the identification of the contact (eg, "A", "1")
- contactFunction (O), the functional identification of the contact (eg, "ON", "OFF", "BRIGHT" or "DIM")
- contactType (O), the type of the contact (eg, "BASE", "PIN", "SOCKET", "COAX" or "BUS")
- connectedFlag (O), the information whether the wire is connected to the contact (stowed wires). The attribute connectedFlag can have one of the following values:
  - "0" - No, the wire is not connected to the contact
  - "1" - Yes, the wire is connected to the contact
- contactPartNumber (O), the part number of the contact to which the wire end is connected
- wireInstallationDirection (O), the direction information for non-symmetric wires

Child elements:

- None

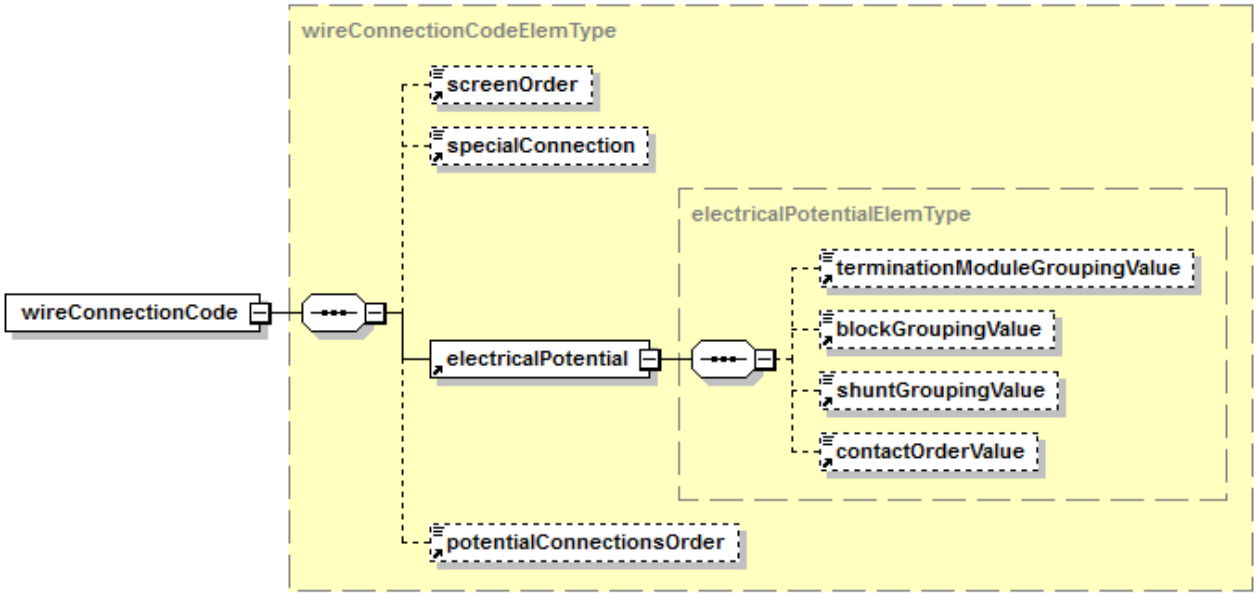
Markup examples:

```
<contact contactIdent="1" contactFunction="BRIGHT"/>
<contact contactIdent="A1" contactType="BASE"/>
<contact contactIdent="1" contactPartNumber="JN1003S-12"/>
<contact contactIdent="AA1" wireInstallationDirection="A"/>
```

2.2.1.1.2 Wire connection code

Description: The element <wireConnectionCode> is used for generic identification of the electrical potential to which a wire end is connected. This can be the basis to arrange the ends of the wires in a specific order for graphical display purposes and to generate a connection analysis.

Markup element: <wireConnectionCode>



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Fig 8 Element <wireConnectionCode>

Attributes:

– None

Child elements:

– <screenOrder>, the shielding order information. Refer to Para 2.2.1.1.3.
– <specialConnection>, the special connections information. Refer to Para 2.2.1.1.4.
– <electricalPotential>, the electrical potential information. Refer to Para 2.2.1.1.5.
– <potentialConnectionsOrder>, the potential connections information. Refer to Para 2.2.1.1.10.

Markup example:

```
<wireConnectionCode>
<electricalPotential>
<contactOrderValue>2</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
```

2.2.1.1.3 Shielding order

Description: The element <screenOrder> contains an ascending numerical value, which represents the order of the wires connected to an equipment for graphical presentation of the shielding situation.

Note

Screen connections (eg, from a screen to the shell of an equipment) must always have a lower value than the wires which are shielded by this screen.

Markup element: <screenOrder>

Attributes:

– None

Child elements:

– None

Markup example:

```
<screenOrder>3</screenOrder>
```

2.2.1.1.4 Special connections

Description: The element <specialConnection> contains a numerical value and must be used for all wires, that are connected to "special contacts" of an equipment such as stowed wires and wires connected to the shell of this equipment.

In the graphical presentation, these wires are always, depending on the given value, shown after the wires, which are connected to real contacts of the equipment.

Wires with the wire state value "logconn", which are connected to special contacts (eg, when a shield is electrically connected to the shell of a connector by the cable clamp that is represented by the logical connection wire), must not get allocated data in element <specialConnection>.

Markup element: <specialConnection>

Attributes:

– None

Child elements:

– None

Markup example:

```
<specialConnection>100</specialConnection>
```

2.2.1.1.5 Electrical potential

Description: The element <electricalPotential> is used to order the wires based on project or organization specific rules, using the relation to termination module, block and shunt, or pole and position, and the contact identification.

There are two different cases for coding of the electrical potential information:

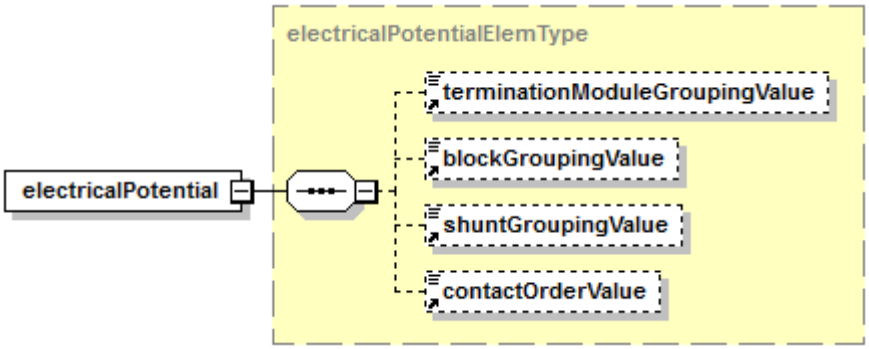
– equipment without internal logic
– equipment with internal logic

Equipment without internal logic. Equipment, such as connectors, earth bolts, etc, do not have an internal logic. The ascending values in element <contactOrderValue> represent the order of the equipment contacts to facilitate graphical presentation and connection analysis. Contacts of the equipment to which no physical wire is connected are included by wires with the wire state value "notactiv". For equipment without internal logic, the elements <terminationModuleGroupingValue>, <blockGroupingValue> and <shuntGroupingValue> must not be used.

Equipment with internal logic. Equipment, such as switches, relays and terminal junction modules have an internal logic. That means, the equipment has internal connections, which connect different contacts of the equipment electrically. For switches and relays, these electrical connections depend on the switch/relay position. The internal electrical connections are the

basis for the coding of the elements <terminationModuleGroupingValue>, <blockGroupingValue> and <shuntGroupingValue>. Examples for the population of these elements are given in Para 3.1.

Markup element: <electricalPotential>



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Fig 9 Element <electricalPotential>

Attributes:

– None

Child elements:

– <terminationModuleGroupingValue>, used for contacts that belong to the same module of a termination module assembly. Refer to Para 2.2.1.1.6.
– <blockGroupingValue>, used for contacts that belong to the same block of a termination module assembly or the same pole of a switch or a relay. Refer to Para 2.2.1.1.7.
– <shuntGroupingValue>, contains an identical alphanumerical value for all contacts that belong to the same shunt/bus of a termination module or the same position of a switch or a relay. Refer to Para 2.2.1.1.8.
– <contactOrderValue>, contains an alphanumerical value that represents the ascending order of the equipment contacts to facilitate graphical presentation and connection analysis. Contacts of the equipment to which no physical wire is connected are included by wires with the wire state value "notactiv". Refer to Para 2.2.1.1.9.

Markup example:

```
<electricalPotential>
<terminationModuleGroupingValue>1
</terminationModuleGroupingValue>
<blockGroupingValue>1</blockGroupingValue>
<shuntGroupingValue>1</shuntGroupingValue>
<contactOrderValue>1</contactOrderValue>
</electricalPotential>
```

2.2.1.1.6 Termination module grouping information

Description: The element <terminationModuleGroupingValue> is only used for equipment with internal logic. It provides grouping information for contacts that belong to the same module of a termination module assembly.

It must contain an identical alphanumerical value for all these contacts.

Markup element: <terminationModuleGroupingValue>

Attributes:

– None

Child elements:

– None

Markup example:

```
<terminationModuleGroupingValue>1
</terminationModuleGroupingValue>
```

2.2.1.1.7 Block grouping information

Description: The element <blockGroupingValue> is only used for equipment with internal logic. It provides grouping information for contacts that belong to the same block of a termination module assembly or the same pole of a switch or a relay.

It must contain an identical alphanumerical value for all these contacts.

Markup element: <blockGroupingValue>

Attributes:

– None

Child elements:

– None

Markup example:

```
<blockGroupingValue>1</blockGroupingValue>
```

2.2.1.1.8 Shunt grouping information

Description: The element <shuntGroupingValue> is only used for equipment with internal logic. It provides grouping information for contacts that belong to the same shunt/bus of a termination module or the same position of a switch or a relay.

It must contain an identical alphanumerical value for all these contacts.

Markup element: <shuntGroupingValue>

Attributes:

– None

Child elements:

– None

Markup example:

```
<shuntGroupingValue>1</shuntGroupingValue>
```

2.2.1.1.9 Contact order information

Description: The element <contactOrderValue> is used to order the wire ends, connected to equipment with internal logic, in addition to the termination module, block and shunt grouping information.

All wires, which are not connected to base contacts of switches and relays, must get values higher than the values of base contacts. In this case, the base contact (supply) will be shown before the different positions of the switch/relay in the graphical presentation of the wires connected to this equipment.

When more than one wire is connected to an electrical potential, all these wires must have the same content in the element <contactOrderValue>.

Note

More than one wire can be connected to earth bolts. However, modifications in the wiring and splits in the applicability of the system can cause a situation where more than one wire is connected to the same contact of equipment. For coding purposes the wires of all applicability ranges and modifications are taken into consideration.

Note

More than one wire can also be connected to data bus contacts. The contact is composed of physically different pins. Therefore, the wire ends that are connected to the physically different pins of the composed contact must get different values in the element <contactOrderValue>.

Markup element: <contactOrderValue>

Attributes:

– None

Child elements:

– None

Markup example:

```
<contactOrderValue>3</contactOrderValue>
```

2.2.1.1.10 Potential connections order

Description: The element <potentialConnectionsOrder> is used in the situation when more than one wire is connected to an electrical potential (eg, an earth bolt). All these wires must have the same value for the electrical potential block grouping information in the wire connection code. In this case, these wires must have ascending numerical values at the potential connections of the wire connection code, which orders the wire to facilitate graphical presentation.

Markup element: <potentialConnectionsOrder>

Attributes:

– None

Child elements:

– None

Markup example:

```
<potentialConnectionsOrder>2</potentialConnectionsOrder>
```

2.2.1.1.11 Network analysis code

Description: The element <networkAnalysisCode> describes the behavior of the wire end in the network connection analysis in relation to other wires via the equipment. It is based on the behavior of the equipment to which the wire end is connected. This information can be used as the basis for the analysis of electrical connections in a system.

The network analysis code must contain a two-digit numerical value and is used for the analysis of the electrical connections in a system. It defines for every wire end, whether it is a starting point, the end of a connection analysis or whether the analysis is continued via equipment connections (eg, connectors, switches).

The values given in Table 3 are recommended.

Table 3 Network analysis codes

Value	Meaning for connection analysis
01	Starting point and end of connection analysis
02	Starting point, analysis continued via a plug/receptacle connection (transfer point)
03	Starting point, analysis continued via an equipment connection with internal logic (eg, terminal junction modules (transfer point))
04	Starting point, analysis continued via an equipment connection with internal logic and alternative switch positions (eg, switches and relays (transfer point))
05	No starting point and end of connection analysis
06	No starting point, analysis continued at the same equipment
07	Starting point with special usage (depth of iteration 1) and end of connection analysis
08	Starting point and end of connection analysis with special usage
11	Starting point and end of connection analysis for data bus systems (similar to value 01)
12	Starting point, analysis continued via a plug/receptacle connection (transfer point) for data bus systems (similar to value 02)
17	Starting point with special usage (depth of iteration 1) and end of connection analysis for data bus systems (similar to value 07)

Markup element: <networkAnalysisCode>

Attributes:

– None

Child elements:

– None

Markup example:

```
<networkAnalysisCode>04</networkAnalysisCode>
```

2.2.1.1.12 Group code

Description: The element <groupCode> indicates the physical grouping of wires connected to the same contact. For example, where multiple wires are connected to a terminal stud using multiple ring terminals, each wire connected to the same ring terminal must have the same group code (eg, A). Wires that are connected to the same terminal stud but to another ring terminal must have another group code (eg, B). This means that an identical group code indicates wires, which are physically connected to the same ring terminal.

Markup element: <groupCode>

Attributes:

– None

Child elements:

– None

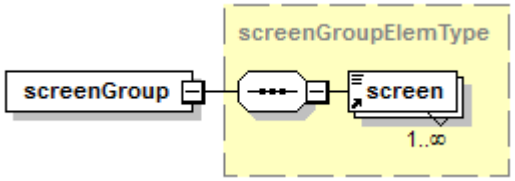
Markup example:

```
<groupCode>B</groupCode>
```

2.2.1.2 List of screens

Description: The element <screenGroup> is used as a container for the screen/shield information.

Markup element: <screenGroup>



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Fig 10 Element <screenGroup>

Attributes:

– None

Child elements:

– <screen>, the screen/shield information. Refer to Para 2.2.1.2.1.

2.2.1.2.1 Screen/shield information

Description: The element <screen> and its attributes contain information about the type of the wire in a shielding situation and the identification of the screen to which the wire end is connected.

Note

The term 'shielding situation' is used in this chapter when it is necessary to describe the terminations of screens that shield wires. This information is essential for maintenance personnel in order to enable them to make the correct terminations of screens.

Note

The screen/shield information provides a unique identifier to screens (eg, over all screens or screens of a cable), which shield a wire or a cable. When shielded wires are connected to the equipment, the ends of their screens are connected to a pin or a chassis of the equipment by using an active wire or by clamping or soldering the screen with the shell as for wiring data with a logical connection. It is also possible that the screen end is left open, which means that there is no connection to any equipment.

It is recommended to populate the element <screen> and the available attributes as follows:

In special cases an overall screen covers shielded wires. For graphical display purposes the attribute screenLevel defines the hierarchy of the screens with two-digit numeric data for

screen connections. Inner screens must have lower values, starting with value "01". Shielded wires must have the screen level attribute screenLevel value set to "00".

The attribute screenType defines the type of a wire in a shielding situation by two-digit numeric data. The attribute screenType is used for graphical display purposes. The values given in Table 4 are recommended.

Table 4 Types of a wire in a shielding situation

Value	Meaning (Type of wire)
01	Shielded wire
02	Virtual screen connection
03	Connection from a screen to a shell
04	Connection from a screen to a pin of the equipment (pin screen)
05	Connection of two screens (screen link)
06	Connection from a screen to another equipment (screen follower) and PIGTAIL wire to a screen
07	Connection from a screen to one of the shielded wires
90	Unshielded wire
99	Wire for which the shielding situation cannot be shown

The attribute screenStyle defines the presentation format of a screen. It is only used for screen connections. Shielded wires must have the screen style attribute screenStyle value set to "00". If used, the values given in Table 5 are recommended.

Table 5 Types of a screen

Value	Meaning (Type of screen)
01	Normal screen
02	Screen of a data bus cable
03	Screen of a coaxial cable
04	Outer screen of a tri-axial cable
05	Inner screen of a tri-axial cable

The element <screen> itself contains, if applicable, the identification of the screen to which the wire is connected

Markup element: <screen>

Attributes:

- screenLevel (O), the physical level of the screen in a shielding situation. Outer screens (over all screens) must have higher values than inner screens (screens of cables).
- screenType (O), the type of the wire in a shielding situation

Note

The attribute screenType describes the connection type of a wire (normally on both ends of the screen, a wire is connected to pin screens for example), connected to this screen or the shielded wire itself. Screen information for the complete screen is provided in the element <wireInfo>. Therefore, it is recommended not to use the attribute screenType in this context.

– screenStyle (O), the style for the graphical presentation of the screen in a shielding situation

Child elements:

– None

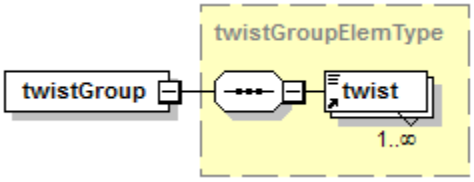
Markup example:

```
<screen screenLevel="01" screenType="03"
screenStyle="01">SCT1</screen>
```

2.2.1.3 Twisting of twisted wires

Description: The element <twistGroup> is used as a container for the twist information.

Markup element: <twistGroup>



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Fig 11 Element <twistGroup>

Attributes:

– None

Child elements:

– <twist>, the twist information. Refer to Para 2.2.1.3.1.

2.2.1.3.1 Twist information

Description: The element <twist> and its attribute twistingType contain information about the twisting of a wire. The element <twist> must contain all twist information of the wire. The attribute twistingType specifies the type of twisting in coded form. Twist information can be different on both sides of a wire. The element <twist> must contain the twist information on this side of the wire.

Table 6 gives the recommended codes for twisting types.

Table 6 Twist type codes

Twisting type code	Twisting type
1	Twisting of multi-core cables
2	Manually twists

Twisting type code	Twisting type
3	Manually twists of already twisted wires

Markup element: <twist>

Attributes:

– twistingType (O), the type of twisting

Child elements:

– None

Markup example:

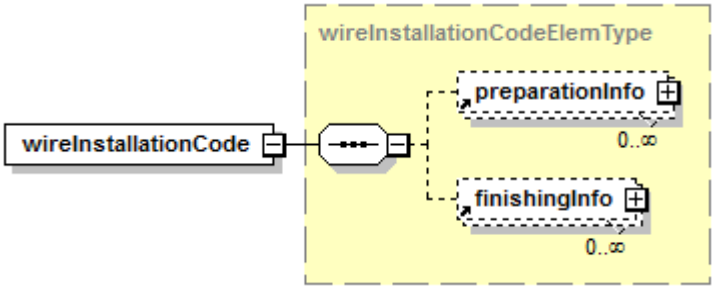
The following markup example shows the twisting of a wire that is manually twisted with one or more other wires. All wires that are twisted together have the same twist identifier T%CM0005AA.

```
<twist twistingType="2">T%CM0005AA</twist>
```

2.2.1.4 Wire installation code

Description: The element <wireInstallationCode> contains the information for preparation and finishing of the wire for connection purposes.

Markup element: <wireInstallationCode>



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Fig 12 Element <wireInstallationCode>

Attributes:

– None

Child elements:

– <preparationInfo>, the wire preparation information. Refer to Para 2.2.1.4.1.
– <finishingInfo>, the wire finishing information. Refer to Para 2.2.1.4.1.

Markup example:

The following markup example shows the preparation information for a wire end. It shows the preparation instruction in coded form PRE609 and gives a reference to the instruction sheet.

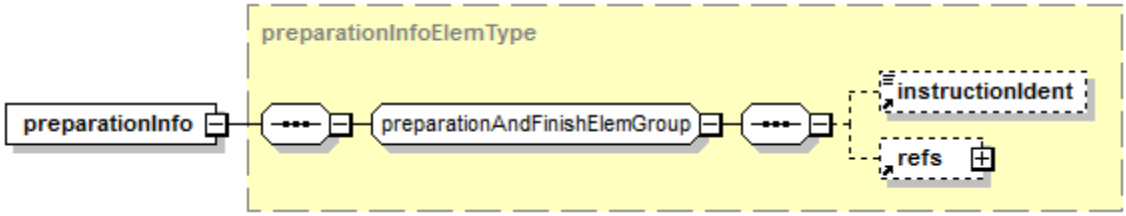
```
<wireInstallationCode>
<preparationInfo>
<instructionIdent>PRE609</instructionIdent>
```

```
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="1B" systemDiffCode="B" systemCode="20"
subSystemCode="9" subSubSystemCode="0" assyCode="16"
disassyCode="09" disassyCodeVariant="A" infoCode="010"
infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent>
</dmRef>
</refs>
</preparationInfo>
</wireInstallationCode>
```

2.2.1.4.1 Content model preparationInfo/finishingInfo

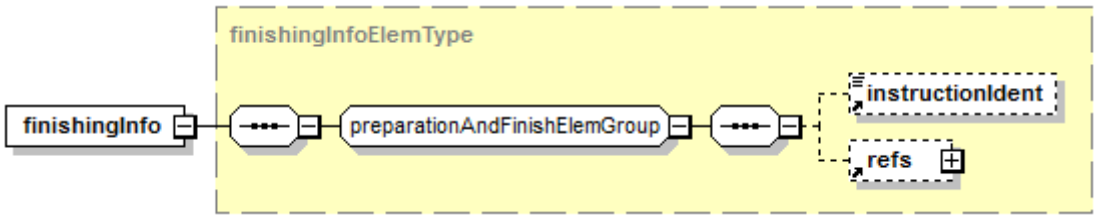
Description: For wires, the content model preparationInfo/finishingInfo defines the child elements <preparationInfo> and <finishingInfo>.

Markup elements: <preparationInfo> and <finishingInfo>



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Fig 13 Element <preparationInfo>



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Fig 14 Element <finishingInfo>

Attributes:

– None

Child elements:

– <instructionIdent>, the wire preparation or finishing information in coded form. Refer to Para 2.2.1.4.2.
– <refs>, the references to detailed instructions for preparation or finishing of a wire. Refer to Chap 3.9.5.2.1.2.

2.2.1.4.2 Preparation/finishing information identification

Description: The element <instructionIdent> gives wire preparation or finishing information in coded form.

Markup element: <instructionIdent>

Attributes:

– None

Child elements:

– None

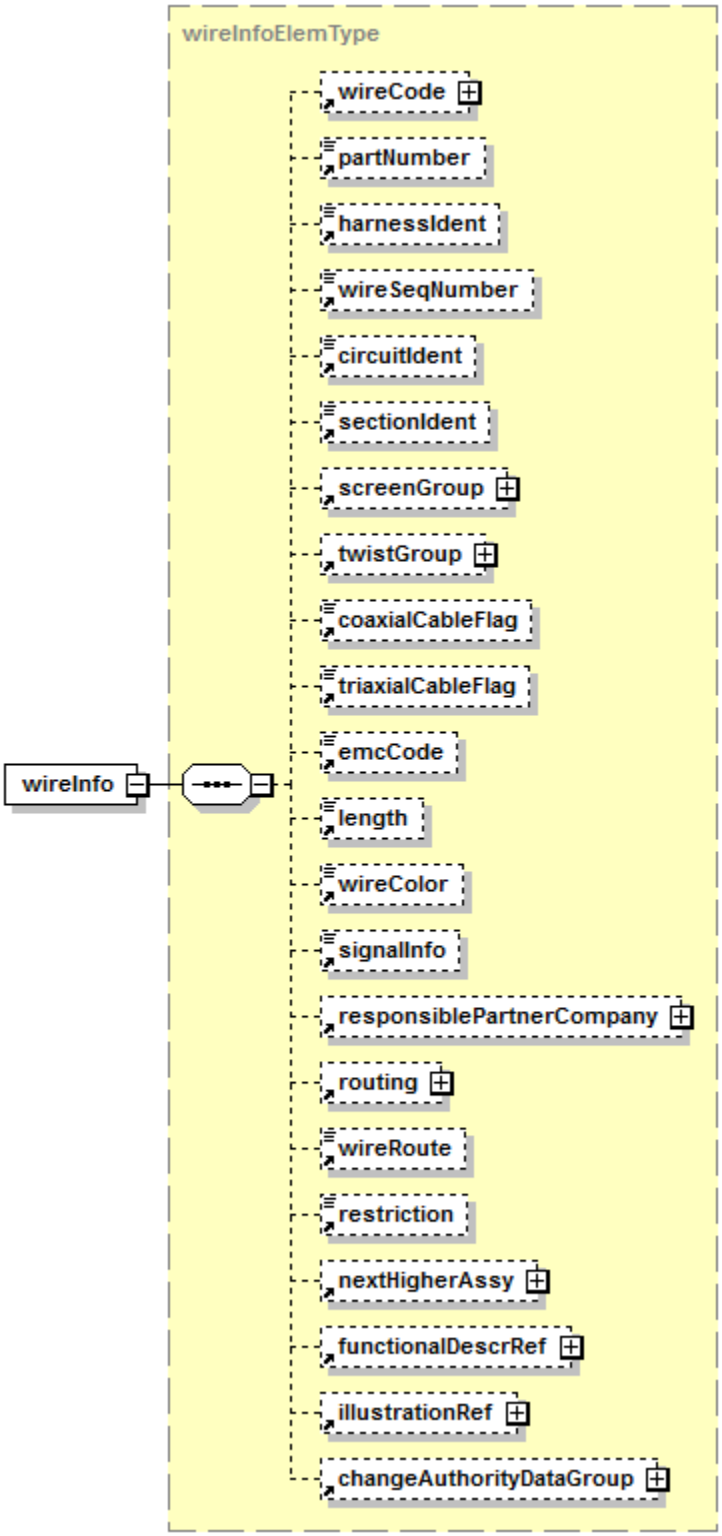
Markup example:

```
<instructionIdent>PRE609</instructionIdent>
```

2.3 Wire information

Description: The element <wireInfo> contains child elements, which describe properties of the wire and other information related to the complete wire.

Markup element: <wireInfo>



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Fig 15 Element <wireInfo>

Attributes:

– None

Child elements:

– <wireCode>, the wire code. Refer to Para 2.3.1.
– <partNumber>, the wire part number. Refer to Para 2.3.2.
– <harnessIdent>, the identification of the harness to which the wire belongs. Refer to Para 2.3.3.
– <wireSeqNumber>, the wire sequential number. Refer to Para 2.3.4.
– <circuitIdent>, the circuit code. Refer to Para 2.3.5.
– <sectionIdent>, the wire section identification. Refer to Para 2.3.6.
– <screenGroup>, the list of screens. Refer to Para 2.3.7.
– <twistGroup>, the twisting information of twisted wires. Refer to Para 2.3.8.
– <coaxialCableFlag>, the coaxial information. Refer to Para 2.3.9.
– <triaxialCableFlag>, the tri-axial information. Refer to Para 2.3.10.
– <emcCode>, the electromagnetic compatibility (EMC) code. Refer to Para 2.3.11.
– <length>, the wire length. Refer to Para 2.3.12.
– <wireColor>, the wire color. Refer to Para 2.3.13.
– <signalInfo>, the wire signal information. Refer to Para 2.3.14.
– <responsiblePartnerCompany>, the company or the organization, which is responsible for the wire data. Refer to Para 2.3.15.
– <routing>, the wire routing information. Refer to Para 2.3.16.
– <wireRoute>, the wire route lane code. Refer to Para 2.3.17.
– <restriction>, the wire restriction information. Refer to Para 2.3.18.
– <nextHigherAssy>, the identification of the next higher assembly. Refer to Para 2.3.19.
– <functionalDescrRef>, the functional description reference. Refer to Para 2.3.20.
– <illustrationRef>, the reference to circuit or wiring diagrams. Refer to Para 2.3.21.
– <changeAuthorityDataGroup>, the group of change authority information. Refer to Para 2.3.22.

Markup example:

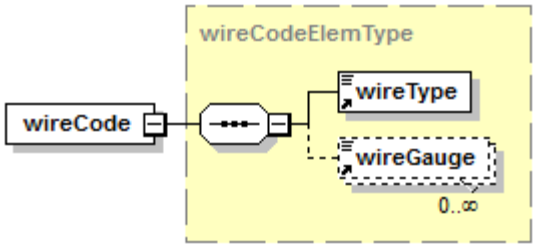
```
<wireInfo>
<harnessIdent>2309VB</harnessIdent>
<wireColor>B</wireColor>
<signalInfo>115V AC, 400Hz</signalInfo>
</wireInfo>
```

2.3.1 Wire code

Description: The element <wireCode> gives information on the type of a wire and its gauge.

For one type of wire material more than one wire gauge can be available. In this case, the wires normally get different part numbers, so that for all wire sizes a different wire material element <wireMaterial> is used. It is also possible to use the wire gauge element <wireGauge> multiple times to show the gauge of a wire in different units of measure.

Markup element: <wireCode>



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Fig 16 Element <wireCode>

Attributes:

– None

Child elements:

– <wireType>, the wire type. Refer to Para 2.3.1.1.
– <wireGauge>, the wire gauge. Refer to Para 2.3.1.2.

Markup example:

```
<wireCode>
<wireType>CH</wireType>
</wireCode>
```

2.3.1.1 Wire type

Description: The element <wireType> gives information on the type of a wire. Normally, the wire type is defined in coded form. Table 7 shows examples for the coding of wire types.

Table 7 Wire type codes

Wire type code	Wire type
CH	600V, 150°C, Single, Nickel-Coated Copper
PC	600V, 150°C, Multi-Core, 2 cores, Overall Sheathed, Nickel-Coated Copper
QC	600V, 150°C, Multi-Core, 3 cores, Overall Sheathed, Nickel-Coated Copper

Markup element: <wireType>

Attributes:

– None

Child elements:

– None

Business rule decision point BRDP-S1-00239 - Use of the element <wireType>:

– Decide on the definition of wire type content/codes.

Markup example:

```
<wireType>QC</wireType>
```

2.3.1.2 Wire gauge

Description: The element <wireGauge> contains the gauge of a wire. The measure type is given in the attribute wireGaugeType.

Markup element: <wireGauge>

Attributes:

– wireGaugeType (M), the type of measure for the wire gauge. The attribute wireGaugeType can have one of the following values:

- "proj" - for wires which gauge type is measured in a project or an organization specific unit
- "awg" - for wires which gauge type is measured in accordance with the American Wire Gauge units
- "mt" - for wires which gauge type is measured in a metric unit

Child elements:

– None

Markup example:

```
<wireGauge wireGaugeType="awg">006</wireGauge>
```

2.3.2 Wire part number

Description: The element <partNumber> contains the project specific part number of a wire. If applicable, the properties of a wire with a specific part number are given in the element <wireMaterial> within the electrical standard parts branch of the wiring data Schema. Refer to Chap 3.9.5.2.9.12. The part number is the unique identifier. Refer to Chap 3.9.5.2.1.9.

Markup element: <partNumber>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

Markup example:

```
<partNumber>JN1018QC020</partNumber>
```

2.3.3 Harness identification

Description: The element <harnessIdent> contains the identification of the harness to which the wire belongs. For more detailed information about the population of this element. Refer to Chap 3.9.5.2.9.3.

Markup element: <harnessIdent>

Attributes:

– `contextIdent` (O), `manufacturerCodeValue` (O) and `itemOriginator` (O), further qualifies the harness identification. Refer to Chap 3.9.5.2.9.3.

Child elements:

– None

Markup example:

```
<harnessIdent>1109VB</harnessIdent>
```

2.3.4 Wire sequential number

Description: The element <`wireSeqNumber`> contains the sequential number of a wire, which can be part of the entire wire identification.

The wire sequential number must be used if the entire wire identification including its sequential number is not given in the element <`wireNumber`>. Refer to Para 2.1.2.

For projects or organizations that hold the sequential wire number in the element <`wireNumber`> of the wire identification, the population of the element <`wireSeqNumber`> is not necessary.

Markup element: <`wireSeqNumber`>

Attributes:

– None

Child elements:

– None

Business rule decision point BRDP-S1-00240 - Use of the element <`wireSeqNumber`>:

– Decide whether and how to use the wire sequential number.

Note

The element <`wireSeqNumber`> must be used if the wire sequential number is not given in the element <`wireNumber`>.

Markup example:

The following markup example shows a wire with the identification W0237-0161-24B. The sequential number of the wire (0161) (eg, in the harness), is given in element <`wireSeqNumber`>.

```
<wire wireState="active">
<wireIdent>
<wireNumber>W0237-0161-24B</wireNumber>
</wireIdent>
<wireInfo>
<wireSeqNumber>0161</wireSeqNumber>
</wireInfo>
</wire>
```

2.3.5 Circuit code

Description: For projects that do not use the circuit code of a wire in the identification of the wire itself, the element <circuitIdent> is additionally available in the element <wireInfo>.

For projects or organizations that hold the circuit code in the element <circuitIdent> of the wire identification, the population of the element <circuitIdent> is not necessary here. Refer to Para 2.1.1.

Markup element: <circuitIdent>

Attributes:

– None

Child elements:

– None

Markup example:

```
<circuitIdent>234</circuitIdent>
```

2.3.6 Wire section identification in the wire information branch

Description: For projects that do not use the wire section identification in the identification of the wire itself, the element <sectionIdent> is additionally available in the wire information element <wireInfo>.

For projects or organizations that hold the wire section identification in the element <sectionIdent> of the wire identification, the population of the element <sectionIdent> is not necessary here. Refer to Para 2.1.3.

Markup element: <sectionIdent>

Attributes:

– None

Child elements:

– None

Markup example:

```
<sectionIdent>567</sectionIdent>
```

2.3.7 List of screens

Description: The element <screenGroup> contains the screen/shield information. Refer to Para 2.2.1.2.

2.3.8 Twisting of twisted wires

Description: The element <twistGroup> contains the twist information. Refer to Para 2.2.1.3.

2.3.9 Coaxial information

Description: The element <coaxialCableFlag> identifies coaxial cables. In many cases, a coaxial cable is indicated by the letter "Y" in the element content.

Markup element: <coaxialCableFlag>

Attributes:

– None

Child elements:

– None

Markup example:

```
<coaxialCableFlag>Y</coaxialCableFlag>
```

2.3.10 Tri-axial information

Description: The element <triaxialCableFlag> identifies tri-axial cables. In many cases, a tri-axial cable is indicated by the letter "Y" in the element content.

Markup element: <triaxialCableFlag>

Attributes:

– None

Child elements:

– None

Markup example:

```
<triaxialCableFlag>Y</triaxialCableFlag>
```

2.3.11 Electromagnetic compatibility code

Description: The element <emcCode> identifies the electromagnetic compatibility (EMC) classification of a wire.

Normally, the EMC classification is defined in coded form. Table 8 gives examples for the coding of EMC classifications.

Table 8 EMC codes

EMC code	EMC classification
E	Emissive wire
S	Susceptible wire

Markup element: <emcCode>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows the EMC code of an emissive wire.

```
<emcCode>E</emcCode>
```

2.3.12 Length information

Description: The element <length> contains the length of a wire. It is recommended to specify in the attribute wireLengthType, whether the length information gives the design length, the real length, or a critical length.

Markup element: <length>

Attributes:

- unitOfMeasure (O), the unit of measure for the wire length
- wireLengthType (O), the type of wire length information. The attribute wireLengthType can have one of the following values:
  - "critical" - the new wire must have exactly this defined length when a wire change is performed. Otherwise, the data delivered through the wire will not be accurate.
  - "estimated"- the wire length corresponds with the cut length without any constraints to the final length (after installation of the wire)
  - "final"- the wire length corresponds with the length after installation of the wire

Child elements:

- None

Markup example:

The following markup example shows the length information of a wire with an estimated length of 2150 millimeter.

```
<length unitOfMeasure="mm" wireLengthType="estimated">2150
</length>
```

2.3.13 Color information

Description: The element <wireColor> identifies the color of a wire. Normally, the color information is defined in coded form. Table 9 gives examples for the coding of color information.

Table 9 Color codes

Color code	Color of the wire sheathing
W	White
Y	Yellow
R	Red
G	Green
B	Blue
BK	Black

Markup element: <wireColor>

Attributes:

- None

Child elements:

– None

Markup example:

The following markup example shows the color information of a red sheathed wire.

```
<wireColor>R</wireColor>
```

2.3.14 Signal information

Description: The element <signalInfo> contains information about the signals on a wire. This can be the signal name, the effective voltage, the effective current or the waveform of the signal.

Markup element: <signalInfo>

Attributes:

– None

Child elements:

– None

Markup example:

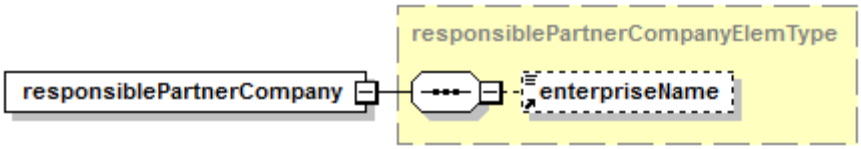
The following markup example shows the information for a signal on the wire, which is specified as a 115 volt alternating current with a frequency of 400 hertz.

```
<signalInfo>115V AC, 400Hz</signalInfo>
```

2.3.15 Responsible partner company

Description: The element <responsiblePartnerCompany> indicates the company or the organization, which is responsible for the wire data. Refer to Chap 3.9.5.1.

Markup element: <responsiblePartnerCompany>



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Fig 17 Element <responsiblePartnerCompany>

Attributes:

– enterpriseCode (O), the CAGE code of the enterprise (for clarification: "responsible company or organization")
– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

– <enterpriseName> (O), the name of the enterprise/manufacturer/supplier. Refer to Chap 3.9.5.1.

Note

The use of the child element <enterpriseName> can considerably increase the amount of data to be stored and exchanged. Therefore it is recommended to use only

the attribute enterpriseCode in context with the element <wire> instead of, or in addition to the child element <enterpriseName>.

Markup example:

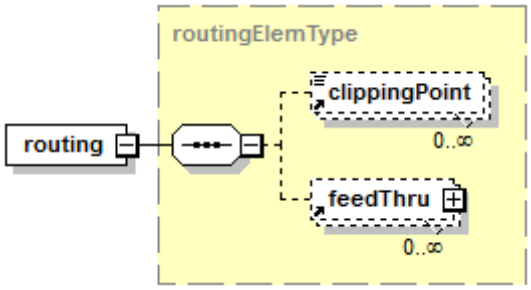
The following markup example shows the responsible partner company information of a wire. The responsible partner company is indicated by its CAGE code.

```
<responsiblePartnerCompany enterpriseCode="K0999"/>
```

2.3.16 Routing

Description: The element <routing> contains routing information of a wire via clipping points and special components (eg, current transformers, panels or bungs), through which wires pass.

Markup element: <routing>



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Fig 18 Element <routing>

Attributes:

– None

Child elements:

– <clippingPoint>, the clipping point information for a wire. Refer to Para 2.3.16.1.
– <feedThru>, the information about the equipment through which a wire passes. Refer to Para 2.3.16.2.

Markup example:

```
<routing>
<clippingPoint>271-11</clippingPoint>
<clippingPoint>271-12</clippingPoint>
<feedThru>
<functionalItemRef functionalItemNumber="42XU4T"/>
</feedThru>
</routing>
```

2.3.16.1 Clipping point information

Description: The clipping points of a wire that fastens it to the structure of an aircraft, an equipment, etc, are listed in the <clippingPoint> elements. If used, every clipping point must be populated in exactly one of the <clippingPoint> elements (ie, the clipping point identification contains only one clipping point that fastens the wire to the structure).

Markup element: <clippingPoint>

Attributes:

– None

Child elements:

– None

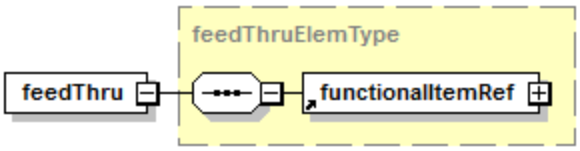
Markup example:

```
<clippingPoint>271-11</clippingPoint>
```

2.3.16.2 Feed-thru information

Description: If a wire passes through equipment (eg, a current transformer), this is identified by using the feed-thru element <feedThru>.

Markup element: <feedThru>



ICN-C0419-S1000D0274-001-01

Fig 19 Element <feedThru>

Attributes:

– holeIdent (O), the hole identifier

Child elements:

– <functionalItemRef>, the identification of the equipment through which a wire passes. Functional items are also known as reference designators. Refer to Chap 3.9.5.1.

Markup example:

The following markup example shows a wire that passes thru the hole with the identification '3' of equipment '42XU4T'.

```
<feedThru holeIdent="3">
<functionalItemRef functionalItemNumber="42XU4T"/>
</feedThru>
```

2.3.17 Wire route lane code

Description: The element <wireRoute> contains lane codes for wires, which belong to a primary system, and must be given a routing apart from other wires of the system.

Markup element: <wireRoute>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows a wire that belongs to lane 'L1'.

```
<wireRoute>L1</wireRoute>
```

2.3.18 Wire restriction

Description: The element <restriction> contains restrictions concerning a wire.

Markup element: <restriction>

Attributes:

– None

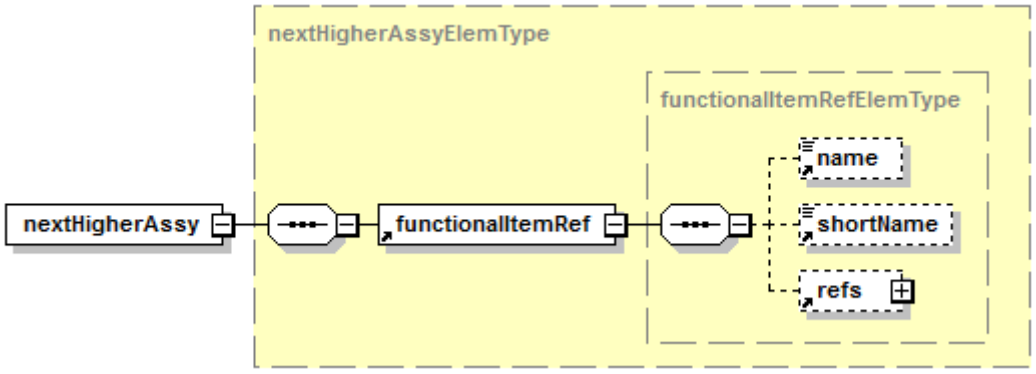
Child elements:

– None

2.3.19 Next higher assembly

Description: For wires that are part of a physical or logical assembly (eg, a box and/or a panel), the element <nextHigherAssy> can be used to identify this equipment.

Markup element: <nextHigherAssy>



ICN-C0419-S1000D0277-001-01

Fig 20 Element <nextHigherAssy>

Attributes:

– None

Child elements:

– <functionalItemRef>, the identification of the physical or logical assembly to which the wire belongs. Functional items are also known as reference designators. Refer to Chap 3.9.5.1.

Markup example:

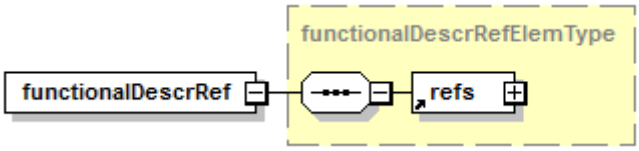
The following markup example shows a wire that is installed in the next higher assembly 231VU.

```
<nextHigherAssy>
<functionalItemRef functionalItemNumber="231VU"/>
</nextHigherAssy>
```

2.3.20 Functional description reference

Description: The element <functionalDescrRef> contains references to other parts of the electrical system publications for further information about a wire (eg, a description of how it is made and its function). Refer to Chap 3.9.5.2.1.2.

Markup element: <functionalDescrRef>



ICN-C0419-S1000D0278-001-01

Fig 21 Element <functionalDescrRef>

Attributes:

– None

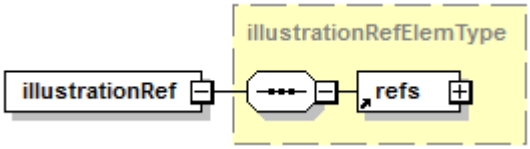
Child elements:

– <refs>, the functional description reference information. Refer to Chap 3.9.5.2.1.2.

2.3.21 Illustration reference

Description: The element <illustrationRef> contains references to other parts of the electrical system publications that contain wiring illustrations. Such an illustration can show circuit or wiring diagrams. Refer to Chap 3.9.5.2.1.2.

Markup element: <illustrationRef>



ICN-C0419-S1000D0279-001-01

Fig 22 Element <illustrationRef>

Attributes:

– None

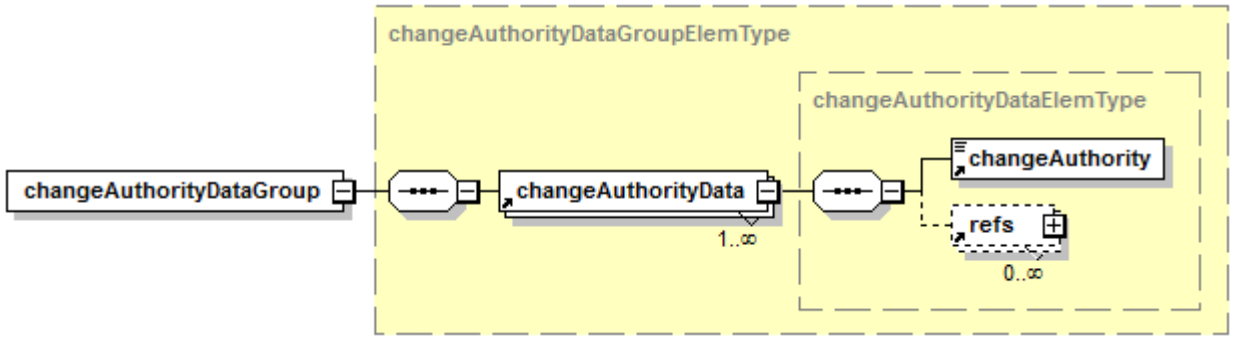
Child elements:

– <refs>, the illustration reference information. Refer to Chap 3.9.5.2.1.2.

2.3.22 Change authority data group

Description: The element <changeAuthorityDataGroup> contains a list of conditions impacting the wire.

Markup element: <changeAuthorityDataGroup>



ICN-C0419-S1000D0280-001-01

Fig 23 Element <changeAuthorityDataGroup>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <changeAuthorityData>, contains a single condition impacting the wire. Refer to Chap 3.9.5.2.7.

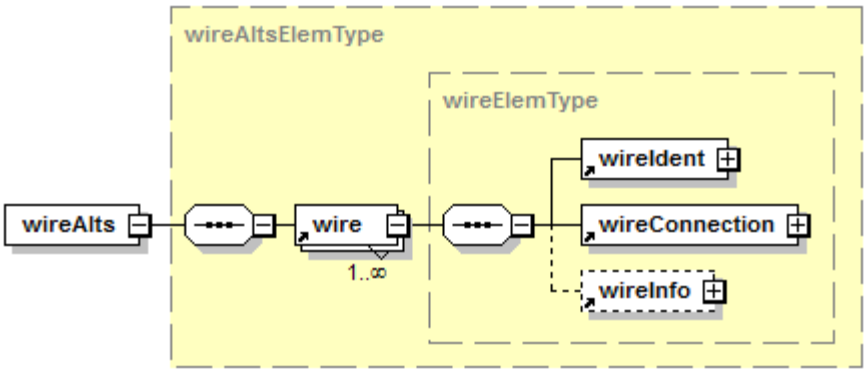
Markup example:

```
<changeAuthorityDataGroup>
<changeAuthorityData>
<changeAuthority condNumber="2012-26-51" condTypeName="AD"/>
</changeAuthorityData>
</changeAuthorityDataGroup>
```

2.4 Element <wireAlts>

Description: The element <wireAlts>, within the element <wireGroup>, provides the capability to group several alternate solutions of wire data for different applicability annotations. Refer to Chap 4.13.3 for information related to the use of the alternates group mechanism in data module content.

Markup element: <wireAlts>



ICN-C0419-S1000D0281-001-01

Fig 24 Element <wireAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <wire>, the wire data. Refer to Para 2.

Markup example:

```
<wiringData>
<wireGroup>
<wireAlts>
<wire wireState="active" applicRefId="app-0001">
<wireIdent>
<wireNumber>QX24QA</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="6QXA"/>
</fromEquip>
</wireConnection>
<wireInfo>
<wireCode>
<wireType>AP</wireType>
</wireCode>
</wireInfo>
</wire>
<wire wireState="notactiv" applicRefId="app-0002">
<wireIdent>
```

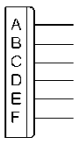
```
<wireNumber>NC00001NA</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="61UR"/>
</fromEquip>
</wireConnection>
<wireInfo>
<wireCode>
<wireType>TB</wireType>
</wireCode>
</wireInfo>
</wire>
</wireAlts>
</wireGroup>
</wiringData>
```

3 Examples

3.1 Wire connection code examples

3.1.1 Connector with six contacts

The following Fig 25 and Table 10 show the content of the wire connection code and its child elements for a connector with six contacts.



ICN-C0419-S1000D0124-004-01

Fig 25 Coding of wire connection code child elements - Connector

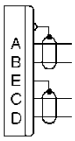
Table 10 Coding of wire connection code child elements - Connector

Contact identification	Screen order	Special connection	Electrical potential				Potential connections order
			Termination module grouping value	Block grouping value	Shunt grouping value	Contact order value	
A						1	
B						2	
C						3	
D						4	

Contact identification	Screen order	Special connection	Electrical potential				Potential connections order
			Termination module grouping value	Block grouping value	Shunt grouping value	Contact order value	
E						5	
F						6	

3.1.2 Connector with five contacts and shielded wires

The following Fig 26 and Table 11 show the content of the wire connection code and its child elements for a connector with five contacts when shielded wires are connected to.



ICN-C0419-S1000D0187-002-01

Fig 26 Coding of wire connection code child elements - Connector with shielded wires

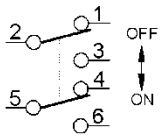
Table 11 Coding of wire connection code child elements - Connector with shielded wires

Contact identification	Screen order	Special connection	Electrical potential				Potential connections order
			Termination module grouping value	Block grouping value	Shunt grouping value	Contact order value	
	1	1				0	
A	2					1	
B	3					2	
C	5					3	
D	6					4	
E	4					5	

3.1.3 Switch with two poles and two positions

In the following example a switch with two poles (1-2-3, 4-5-6) and two positions (OFF-ON) is shown. Refer to Fig 27. In this example, all contacts, which are not base contacts, have

allocated a higher value than the base contacts by adding an offset of 100 to order the base contacts before the non-base contacts. Refer to Table 12.



ICN-C0419-S1000D0125-003-01

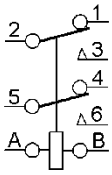
Fig 27 Coding of wire connection code child elements - Switch

Table 12 Coding of wire connection code child elements - Switch

Contact identification	Screen order	Special connection	Electrical potential				Potential connections order
			Termination module grouping value	Block grouping value	Shunt grouping value	Contact order value	
1				1	1	101	
2				1	1	2	
3				1	2	103	
4				2	1	104	
5				2	1	5	
6				2	2	106	

3.1.4 Relay with two poles

A relay with two poles (1-2-3, 4-5-6) is shown in the following example. Refer to Fig 28. Here, again all contacts of a pole, which are not base contacts, have allocated a higher value than the base contacts by adding an offset of 100. The coil of the relay has the lowest block grouping value 1 and will be displayed in a graphical presentation before the poles of the relay. Refer to Table 13.



ICN-C0419-S1000D0126-003-01

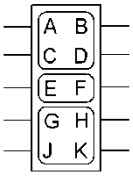
Fig 28 Coding of wire connection code child elements - Relay

Table 13 Coding of wire connection code child elements - Relay

Contact identification	Screen order	Special connection	Electrical potential				Potential connections order
			Termination module grouping value	Block grouping value	Shunt grouping value	Contact order value	
A				1	1	7	
B				1	1	8	
1				2	1	101	
2				2	1	2	
3				2	2	103	
4				3	1	104	
5				3	1	5	
6				3	2	106	

3.1.5 Block of a termination module assembly

The following example shows one block of a termination module assembly. The block contains three shunts/busses. Refer to Fig 29. The contacts are ordered alphabetically by the contact order value. The different values for the shunt grouping information can be used to group and order the wires, connected to the same busses, for graphical presentation purposes. Refer to Table 14.



ICN-C0419-S1000D0127-003-01

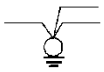
Fig 29 Coding of wire connection code child elements - Terminal junction module

Table 14 Coding of wire connection code child elements - Terminal junction module

Contact identification	Screen order	Special connection	Electrical potential				Potential connections order
			Termination module grouping value	Block grouping value	Shunt grouping value	Contact order value	
A			1	1	1	1	
B			1	1	1	2	
C			1	1	1	3	
D			1	1	1	4	
E			1	1	2	5	
F			1	1	2	6	
G			1	1	3	7	
H			1	1	3	8	
J			1	1	3	9	
K			1	1	3	10	

3.1.6 Earth bolt

Wires, connected to earth bolts, must have allocated the same value in the contact order element <`contactOrderValue`> and ascending values in the potential connections order element <`potentialConnectionsOrder`> as shown in Fig 30 and Table 15.



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Fig 30 Coding of wire connection code child elements - Earth bolt

Table 15 Coding of wire connection code child elements - Earth bolt

Contact identification	Screen order	Special connection	Electrical potential				Potential connections order
			Termination module grouping value	Block grouping value	Shunt grouping value	Contact order value	
						1	1
						1	2
						1	3

3.2 Wire end information of a screened and twisted wire

This example shows the wire end information of a screened and twisted wire that is connected to contact A of the connector 1071VP.

```
<fromEquip>
<functionalItemRef  functionalItemNumber="1071VP"/>
<contactInfo>
<contact contactIdent="A"/>
<wireConnectionCode>
<screenOrder>2</screenOrder>
<electricalPotential>
<contactOrderValue>1</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>02</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="00" screenType="01" screenStyle="00">
</screen>
</screenGroup>
<twistGroup>
<twist>C%FM0447AB</twist>
</twistGroup>
</fromEquip>
```

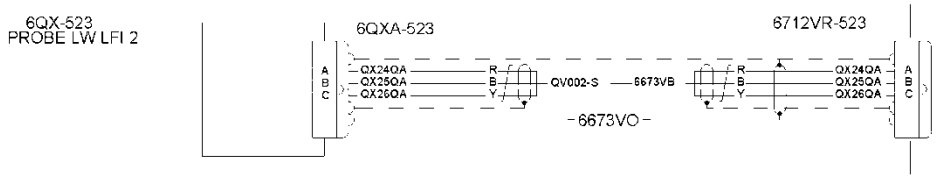
3.3 Wire end information of a logical connection wire

This example shows the wire end information of a logical connection wire, connecting screen FM0447AB to the shell of the connector 1071VP.

```
<fromEquip>
<functionalItemRef functionalItemNumber="1071VP"/>
<contactInfo>
<wireConnectionCode>
<screenOrder>1</screenOrder>
<electricalPotential>
<contactOrderValue>0</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="01" screenType="03" screenStyle="01">
FM0447AB</screen>
</screenGroup>
</fromEquip>
```

3.4 Wire end information of wires connecting a plug and a receptacle

The following example shows the wire end information of the wires, connecting plug 6QXA and receptacle 6712VR as shown in Fig 31.



ICN-C0419-S1000D0186-002-01

Fig 31 Wire connection markup example 6QXA - 6712VR

```
<wireGroup>
<wire wireState="active">
<wireIdent>
<wireNumber>QX24QA</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="6QXA"/>
<contactInfo>
contact contactIdent="A"/>
<wireConnectionCode>
<screenOrder>3</screenOrder>
<electricalPotential>
<contactOrderValue>1</contactOrderValue>
```

```
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="00" screenType="01" screenStyle="00">
</screen>
</screenGroup>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="6712VR"/>
<contactInfo>
<contact contactIdent="A"/>
<wireConnectionCode>
<screenOrder>3</screenOrder>
<electricalPotential>
<contactOrderValue>1</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>02</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="00" screenType="01" screenStyle="00">
</screen>
</screenGroup>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="active">
<wireIdent>
<wireNumber>QX25QA</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="6QXA"/>
<contactInfo>
<contact contactIdent="B"/>
<wireConnectionCode>
<screenOrder>4</screenOrder>
<electricalPotential>
<contactOrderValue>2</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="00" screenType="01" screenStyle="00">
</screen>
</screenGroup>
</fromEquip>
<toEquip>
```

```
<functionalItemRef functionalItemNumber="6712VR"/>
<contactInfo>
<contact contactIdent="B"/>
<wireConnectionCode>
<screenOrder>4</screenOrder>
<electricalPotential>
<contactOrderValue>2</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>02</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="00" screenType="01" screenStyle="00">
</screen>
</screenGroup>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="active">
<wireIdent>
<wireNumber>QX26QA</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="6QXA"/>
<contactInfo>
<contact contactIdent="C"/>
<wireConnectionCode>
<screenOrder>5</screenOrder>
<electricalPotential>
<contactOrderValue>3</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="00" screenType="01" screenStyle="00">
</screen>
</screenGroup>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="6712VR"/>
<contactInfo>
<contact contactIdent="C"/>
<wireConnectionCode>
<screenOrder>5</screenOrder>
<electricalPotential>
<contactOrderValue>3</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>02</networkAnalysisCode>
```

```
</contactInfo>
<screenGroup>
<screen screenLevel="00" screenType="01" screenStyle="00">
</screen>
</screenGroup>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="logconn">
<wireIdent>
<wireNumber>NC00001LC</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="6QXA"/>
<contactInfo>
<wireConnectionCode>
<screenOrder>1</screenOrder>
<electricalPotential>
<contactOrderValue>0</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="02" screenType="03" screenStyle="01">
</screen>
</screenGroup>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="6QXA"/>
<contactInfo>
<wireConnectionCode>
<screenOrder>1</screenOrder>
<electricalPotential>
<contactOrderValue>0</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="02" screenType="03"
screenStyle="01">6673VO</screen>
</screenGroup>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="logconn">
<wireIdent>
<wireNumber>NC00002LC</wireNumber>
```

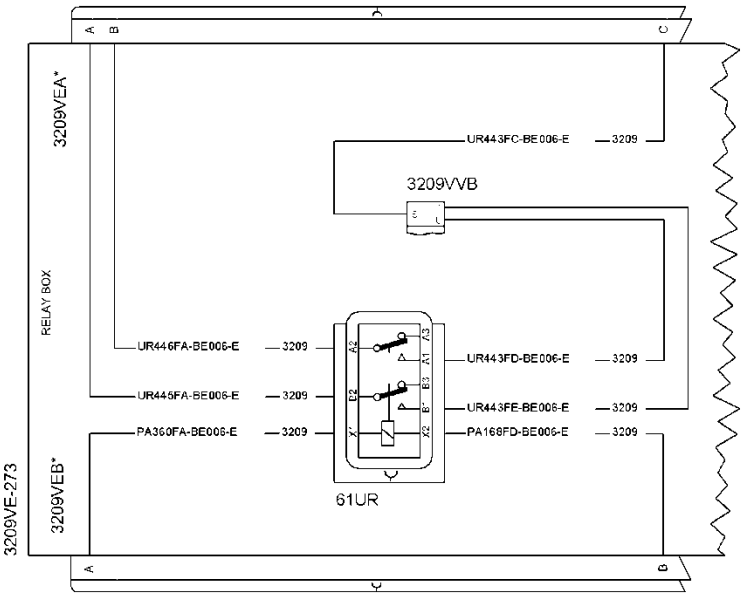
```
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="6QXA"/>
<contactInfo>
<wireConnectionCode>
<screenOrder>2</screenOrder>
<electricalPotential>
<contactOrderValue>0</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="01" screenType="03" screenStyle="01">
</screen>
</screenGroup>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="6QXA"/>
<contactInfo>
<wireConnectionCode>
<screenOrder>2</screenOrder>
<electricalPotential>
<contactOrderValue>0</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="01" screenType="03"
screenStyle="01">QX24QA</screen>
</screenGroup>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="logconn">
<wireIdent>
<wireNumber>NC00003LC</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="6712VR"/>
<contactInfo>
<wireConnectionCode>
<screenOrder>1</screenOrder>
<electricalPotential>
<contactOrderValue>0</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
```

```
</contactInfo>
<screenGroup>
<screen screenLevel="02" screenType="03" screenStyle="01">
</screen>
</screenGroup>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="6712VR"/>
<contactInfo>
<wireConnectionCode>
<screenOrder>1</screenOrder>
<electricalPotential>
<contactOrderValue>0</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="02" screenType="03"
screenStyle="01">6673VO</screen>
</screenGroup>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="logconn">
<wireIdent>
<wireNumber>NC00004LC</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="6712VR"/>
<contactInfo>
<wireConnectionCode>
<screenOrder>2</screenOrder>
<electricalPotential>
<contactOrderValue>0</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="01" screenType="03" screenStyle="01">
</screen>
</screenGroup>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="6712VR"/>
<contactInfo>
<wireConnectionCode>
<screenOrder>2</screenOrder>
<electricalPotential>
```

```
<contactOrderValue>0</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
<screenGroup>
<screen screenLevel="01" screenType="03"
screenStyle="01">QX24QA</screen>
</screenGroup>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
</wireGroup>
```

3.5 Wire end information of wires in a relay box

The following example shows the wire end information of some wires in a relay box, connecting relay 61UR, terminal junction module 3209VVB and receptacle on the relay box 3209VE as shown in Fig 32.



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Fig 32 Wire connection markup example 3209VE

```
<wireGroup>
<!-- ... -->
<wire wireState="active">
<wireIdent>
<wireNumber>PA0168FD</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3209VEB*"/>
<contactInfo>
<contact contactIdent="B"/>
```

```
<wireConnectionCode>
<electricalPotential>
<contactOrderValue>2</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>02</networkAnalysisCode>
</contactInfo>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="61UR"/>
<contactInfo>
<contact contactIdent="X2"/>
<wireConnectionCode>
<electricalPotential>
<blockGroupingValue>01</blockGroupingValue>
<shuntGroupingValue>01</shuntGroupingValue>
<contactOrderValue>108</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>04</networkAnalysisCode>
</contactInfo>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="active">
<wireIdent>
<wireNumber>PA0360FA</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3209VEB*"/>
<contactInfo>
<contact contactIdent="A"/>
<wireConnectionCode>
<electricalPotential>
<contactOrderValue>1</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>02</networkAnalysisCode>
</contactInfo>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="61UR"/>
<contactInfo>
<contact contactIdent="X1"/>
<wireConnectionCode>
<electricalPotential>
<blockGroupingValue>01</blockGroupingValue>
<shuntGroupingValue>01</shuntGroupingValue>
<contactOrderValue>107</contactOrderValue>
</electricalPotential>
```

```
</wireConnectionCode>
<networkAnalysisCode>04</networkAnalysisCode>
</contactInfo>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="active">
<wireIdent>
<wireNumber>UR0443FC</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3209VEA*"/>
<contactInfo>
<contact contactIdent="C"/>
<wireConnectionCode>
<electricalPotential>
<contactOrderValue>3</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>02</networkAnalysisCode>
</contactInfo>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="3209VVB"/>
<contactInfo>
<contact contactIdent="S"/>
<wireConnectionCode>
<electricalPotential>
<terminationModuleGroupingValue>01
</terminationModuleGroupingValue>
<blockGroupingValue>01</blockGroupingValue>
<shuntGroupingValue>06</shuntGroupingValue>
<contactOrderValue>19</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>02</networkAnalysisCode>
</contactInfo>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="active">
<wireIdent>
<wireNumber>UR0443FD</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3209VVB"/>
<contactInfo>
<contact contactIdent="U"/>
```

```
<wireConnectionCode>
<electricalPotential>
<terminationModuleGroupingValue>01
</terminationModuleGroupingValue>
<blockGroupingValue>01</blockGroupingValue>
<shuntGroupingValue>06</shuntGroupingValue>
<contactOrderValue>21</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>04</networkAnalysisCode>
</contactInfo>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="61UR"/>
<contactInfo>
<contact contactIdent="A1"/>
<wireConnectionCode>
<electricalPotential>
<blockGroupingValue>02</blockGroupingValue>
<shuntGroupingValue>02</shuntGroupingValue>
<contactOrderValue>101</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>04</networkAnalysisCode>
</contactInfo>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="active">
<wireIdent>
<wireNumber>UR0443FE</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3209VVB"/>
<contactInfo>
<contact contactIdent="T"/>
<wireConnectionCode>
<electricalPotential>
<terminationModuleGroupingValue>01
</terminationModuleGroupingValue>
<blockGroupingValue>01</blockGroupingValue>
<shuntGroupingValue>06</shuntGroupingValue>
<contactOrderValue>20</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>03</networkAnalysisCode>
</contactInfo>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="61UR"/>
```

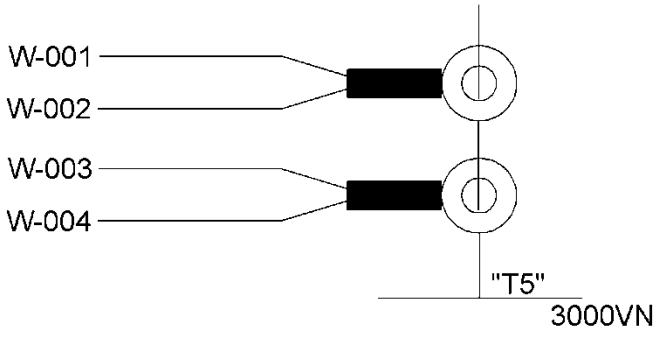
```
<contactInfo>
<contact contactIdent="B1"/>
<wireConnectionCode>
<electricalPotential>
<blockGroupingValue>03</blockGroupingValue>
<shuntGroupingValue>02</shuntGroupingValue>
<contactOrderValue>104</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>04</networkAnalysisCode>
</contactInfo>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="active">
<wireIdent>
<wireNumber>UR0445FA</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3209VEA*"/>
<contactInfo>
<contact contactIdent="A"/>
<wireConnectionCode>
<electricalPotential>
<contactOrderValue>1</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>02</networkAnalysisCode>
</contactInfo>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="61UR"/>
<contactInfo>
<contact contactIdent="B2"/>
<wireConnectionCode>
<electricalPotential>
<blockGroupingValue>03</blockGroupingValue>
<shuntGroupingValue>01</shuntGroupingValue>
<contactOrderValue>5</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>04</networkAnalysisCode>
</contactInfo>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="active">
<wireIdent>
<wireNumber>UR0446FA</wireNumber>
```

```
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3209VEA*"/>
<contactInfo>
<contact contactIdent="B"/>
<wireConnectionCode>
<electricalPotential>
<contactOrderValue>2</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>02</networkAnalysisCode>
</contactInfo>
</fromEquip>
<toEquip>
<functionalItemRef functionalItemNumber="61UR"/>
<contactInfo>
<contact contactIdent="A2"/>
<wireConnectionCode>
<electricalPotential>
<blockGroupingValue>02</blockGroupingValue>
<shuntGroupingValue>01</shuntGroupingValue>
<contactOrderValue>2</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>04</networkAnalysisCode>
</contactInfo>
</toEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="notactiv">
<wireIdent>
<wireNumber>NC00001NA</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="61UR"/>
<contactInfo>
<contact contactIdent="A3"/>
<wireConnectionCode>
<electricalPotential>
<blockGroupingValue>02</blockGroupingValue>
<shuntGroupingValue>01</shuntGroupingValue>
<contactOrderValue>103</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
</fromEquip>
</wireConnection>
<!-- ... -->
```

```
</wire>
<wire wireState="notactiv">
<wireIdent>
<wireNumber>NC00002NA</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="61UR"/>
<contactInfo>
<contact contactIdent="B3"/>
<wireConnectionCode>
<electricalPotential>
<blockGroupingValue>03</blockGroupingValue>
<shuntGroupingValue>01</shuntGroupingValue>
<contactOrderValue>106</contactOrderValue>
</electricalPotential>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
</contactInfo>
</fromEquip>
</wireConnection>
<!-- ... -->
</wire>
</wireGroup>
```

3.6 Grouping of wires

The following example shows the grouping of four wires that are connected to the terminal stud with the contact identifier T5. The wires W-001 and W-002 are connected to one ring terminal, the wires W-003 and W-004 are connected to another ring terminal. Refer to Fig 33. Group code "A" is assigned to W-001 and W-002 and group code "B" to W-003 and W-004.



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Fig 33 Group code example

```
<wireGroup>
<wire wireState="active">
<wireIdent>
<wireNumber>W-001</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3000VN"/>
```

```
<contactInfo>
<contact contactIdent="T5"/>
<wireConnectionCode>
<electricalPotential>
<contactOrderValue>1</contactOrderValue>
</electricalPotential>
<potentialConnectionsOrder>1</potentialConnectionsOrder>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
<groupCode>A</groupCode>
</contactInfo>
</fromEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="active">
<wireIdent>
<wireNumber>W-002</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3000VN"/>
<contactInfo>
<contact contactIdent="T5"/>
<wireConnectionCode>
<electricalPotential>
<contactOrderValue>1</contactOrderValue>
</electricalPotential>
<potentialConnectionsOrder>2</potentialConnectionsOrder>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
<groupCode>A</groupCode>
</contactInfo>
</fromEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="active">
<wireIdent>
<wireNumber>W-003</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3000VN"/>
<contactInfo>
<contact contactIdent="T5"/>
<wireConnectionCode>
<electricalPotential>
<contactOrderValue>1</contactOrderValue>
</electricalPotential>
<potentialConnectionsOrder>3</potentialConnectionsOrder>
</wireConnectionCode>
```

```
<networkAnalysisCode>01</networkAnalysisCode>
<groupCode>B</groupCode>
</contactInfo>
</fromEquip>
</wireConnection>
<!-- ... -->
</wire>
<wire wireState="active">
<wireIdent>
<wireNumber>W-004</wireNumber>
</wireIdent>
<wireConnection>
<fromEquip>
<functionalItemRef functionalItemNumber="3000VN"/>
<contactInfo>
<contact contactIdent="T5"/>
<wireConnectionCode>
<electricalPotential>
<contactOrderValue>1</contactOrderValue>
</electricalPotential>
<potentialConnectionsOrder>4</potentialConnectionsOrder>
</wireConnectionCode>
<networkAnalysisCode>01</networkAnalysisCode>
<groupCode>B</groupCode>
</contactInfo>
</fromEquip>
</wireConnection>
<!-- ... -->
</wire>
</wireGroup>
```

3.7 Wire information

The following markup example shows the wire information for a shielded and twisted wire of type TB with the project specific wire gauge 002. The wire belongs to harness 2309VB. Further wire information elements are shown in the example.

```
<wireInfo>
<wireCode>
<wireType>TB</wireType>
<wireGauge wireGaugeType="proj">002</wireGauge>
</wireCode>
<harnessIdent>2309VB</harnessIdent>
<screenGroup>
<screen>FC0342AH</screen>
</screenGroup>
<twistGroup>
<twist twistingType="1">C%FC0342AH</twist>
</twistGroup>
<coaxialCableFlag>N</coaxialCableFlag>
<triaxialCableFlag>N</triaxialCableFlag>
<emcCode>E</emcCode>
<length unitOfMeasure="mm">3000</length>
<wireColor>B</wireColor>
```

```
<signalInfo>115V AC, 400Hz</signalInfo>
<responsiblePartnerCompany enterpriseCode="K0999"/>
<routing>
<clippingPoint>271-11</clippingPoint>
<clippingPoint>273-2</clippingPoint>
</routing>
<wireRoute>L1</wireRoute>
<illustrationRef>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="1B" systemDiffCode="B" systemCode="91"
subSystemCode="3" subSubSystemCode="1" assyCode="10"
disassyCode="00" disassyCodeVariant="A" infoCode="051"
infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
</illustrationRef>
</wireInfo>
```

Chapter 3.9.5.2.9.3

Wiring data - Harness

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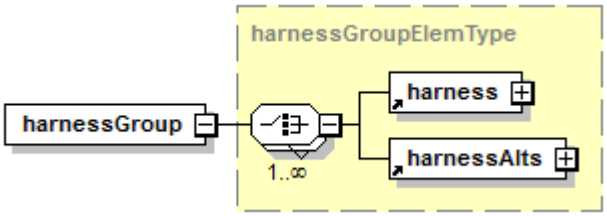
Chap No./Document No.	Title
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Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.7	Content section - Parts information
Chap 3.9.5.2.9.2	Wiring data – Wire
Chap 3.9.5.2.9.4	Wiring data - Electrical equipment
Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.6.1	Attributes - Project configurable values
Chap 4.10	Information management - Business rules exchange
Chap 4.13.3	Optimizing and reuse - Alternates concept

1 General

The element <harness> and its child elements are used to capture and represent the harnesses that are installed in the Product and their related information.

2 Element <harness> and child elements

Description: The element <harness> is contained within the element <harnessGroup> to provide a list of harnesses. It contains harness information of the Product's wiring. The electrical wires of a system are often divided into separate harnesses.

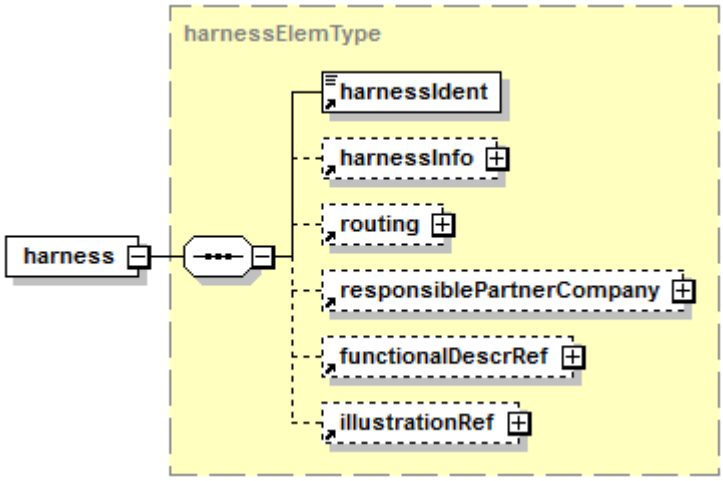


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Fig 1 Element <harnessGroup>

It is strongly recommended to define harness applicability precisely and populate the elements and attributes in accordance with the project or the organization specific rules. It is further recommended to use at least the version and version number information given in the products cross-reference table. In addition, harnesses with modifications must use the information given in the conditions cross-reference table.

Markup element: <harness>



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Fig 2 Element <harness>

Attributes:

- `applicRefId` (O), the applicability information of a harness by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `changeInfo` (O), the change information of a harness in connection with the related modification. This attribute can have one of the following values:
  - "`add`" - for harnesses which are added to the systems circuits by a modification
  - "`delete`" - for harnesses which are removed from the systems circuits by a modification
  - "`modify`" - for harnesses which are modified in the systems circuits by a modification
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O) , the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`harnessIdent`>, the harness identification. Refer to Para 2.1.
- <`harnessInfo`>, the harness information. Refer to Para 2.2.
- <`routing`>, the harness routing information. Refer to Para 2.3.
- <`responsiblePartnerCompany`>, the company or the organization that is responsible for the harness data. Refer to Para 2.4.
- <`functionalDescrRef`>, the functional description reference. Refer to Para 2.5.
- <`illustrationRef`>, the reference to harness illustrations. Refer to Para 2.6.

Markup example:

```
<wiringData>
<harnessGroup>
<harness applicRefId="app-0001">
<harnessIdent>W5250</harnessIdent>
<harnessInfo><harnessName>E ROUTE RH</harnessName></harnessInfo>
<routing>
<clippingPoint>271-11</clippingPoint>
<clippingPoint>273-2</clippingPoint>
```

```
</routing>
<responsiblePartnerCompany enterpriseCode="K0378"/>
</harness>
</harnessGroup>
</wiringData>
```

2.1 Harness identification

Description: The element <harnessIdent> contains the unique identifier of a harness in the system. It is the link between the harness and the included wires.

Markup element: <harnessIdent>

Attributes:

- contextIdent (O), the context identification which is used in combination with the attribute manufacturerCodeValue to ensure the uniqueness of manufacturer harness data. Context identification contains an identifier (eg, the part number of the next higher assembly that has been given to the assembly by the manufacturer).
- manufacturerCodeValue (O), the identification of the manufacturer (eg, the CAGE code), which is used in combination with the attribute contextIdent to ensure uniqueness of manufacturer harness data.
- itemOriginator (O), the origin of the harness (eg, whether a harness is an aircraft manufacturer harness or a supplier harness). Values and their meanings are defined by using the BREX mechanism. Refer to Chap 3.9.6.1 and Chap 4.10.

Child elements:

- None

Markup examples:

The first example shows a harness with the identification 1310VB.

```
<harnessIdent>1310VB</harnessIdent>
```

The second example shows the markup of harness W5250 that is installed in the panel with the part number P1650-411, supplied by the manufacturer with the identification 01234.

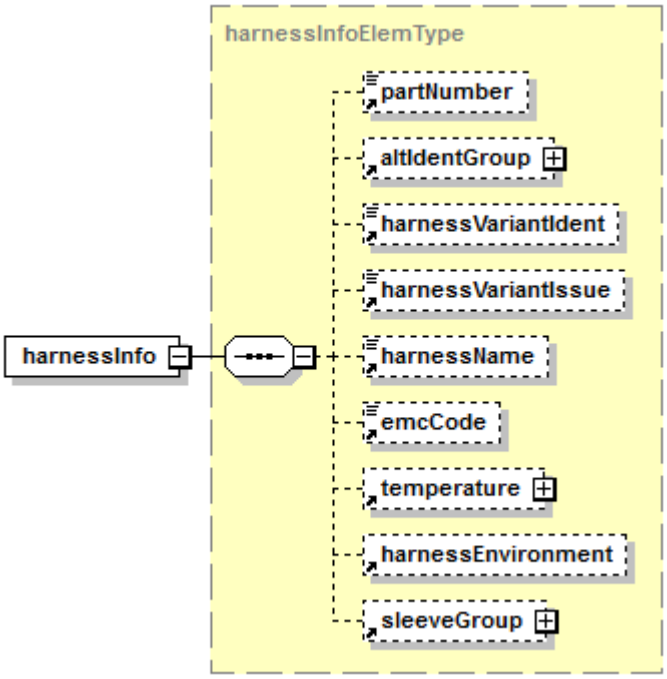
```
<harnessIdent contextIdent="P1650-411"
manufacturerCodeValue="01234" itemOriginator="orig02">W5250
</harnessIdent>
```

2.2 Harness information

Description: The element <harnessInfo> contains harness information for the detailed identification of a harness (eg, the part number and alternative identifications that can be used to identify this harness).

If the element <harnessInfo> is used, then it is recommended that at least the child element <partNumber> is populated for detailed identification of the harness.

Markup element: <harnessInfo>



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Fig 3 Element <harnessInfo>

Attributes:

– None

Child elements:

– <partNumber>, the harness part number. Refer to Para 2.2.1.
– <altIdentGroup>, the list of alternative harness identifications. Refer to Para 2.2.2.
– <harnessVariantIdent>, the harness variant identification. Refer to Para 2.2.3.
– <harnessVariantIssue>, the harness variant issue. Refer to Para 2.2.4.
– <harnessName>, the harness name. Refer to Para 2.2.5.
– <emcCode>, the harness separation code. Refer to Para 2.2.6.
– <temperature>, the harness temperature rating. Refer to Para 2.2.7.
– <harnessEnvironment>, the harness environmental information. Refer to Para 2.2.8.
– <sleeveGroup>, the list of harness sleeves. Refer to Para 2.2.9.

Markup example:

```
<harnessInfo>
<partNumber>J92101310-407</partNumber>
<harnessVariantIdent>407</harnessVariantIdent>
<harnessVariantIssue>B</harnessVariantIssue>
<harnessName>E ROUTE RH</harnessName>
<emcCode>E</emcCode>
</harnessInfo>
```

2.2.1 Part number

Description: The element <partNumber> contains the project or the organization specific part number of the harness. Refer to Chap 3.9.5.2.1.9.

2.2.2 Alternative identifications

Description: The element <altIdentGroup> is used as a container for the subordinate alternative identification elements. Refer to Chap 3.9.5.2.9.4.

2.2.3 Harness variant

Description: The element <harnessVariantIdent> contains the variant of a harness. Improvements during series production or engineering requirements are reasons why different harnesses are used in one type of system. This element identifies the different harnesses. A harness variant can be part of the project or the organization specific part number.

Markup element: <harnessVariantIdent>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows the variant 410 of harness J92223100-410.

```
<harnessVariantIdent>410</harnessVariantIdent>
```

2.2.4 Harness variant issue

Description: The element <harnessVariantIssue> contains the issue of a harness variant.

Markup element: <harnessVariantIssue>

Attributes:

– None

Child elements:

– None

Markup example:

```
<harnessVariantIssue>A</harnessVariantIssue>
```

2.2.5 Harness name

Description: The element <harnessName> contains the name of a harness.

Markup element: <harnessName>

Attributes:

– None

Child elements:

– None

Markup example:

```
<harnessName>FCS LANE 1 FORWARD EQUIPMENT BAY</harnessName>
```

2.2.6 Harness separation code

Description: The element <emcCode> contains the electromagnetic compatibility (EMC) classification of a harness.

Markup element: <emcCode>

Attributes:

– None

Child elements:

– None

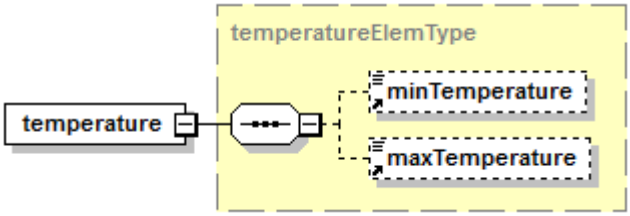
Markup example:

```
<emcCode>E</emcCode>
```

2.2.7 Harness temperature rating

Description: The element <temperature> describes the minimum and maximum temperature rating for which the harness is approved.

Markup element: <temperature>



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Fig 4 Element <temperature>

Attributes:

– None

Child elements:

– <minTemperature>, the minimum temperature rating. Refer to Para 2.2.7.1.
– <maxTemperature>, the maximum temperature rating. Refer to Para 2.2.7.1.

Markup example:

The following markup example shows the maximum temperature rating for a harness, in this case 500 degrees Fahrenheit.

```
<temperature>
<maxTemperature unitOfMeasure="degF">500</maxTemperature>
</temperature>
```

2.2.7.1 Harness temperature rating child elements

Description: The elements <minTemperature> and <maxTemperature> give the lower and upper temperature rating boundaries for a harness.

Markup elements: <minTemperature> and <maxTemperature>

Attributes:

– `unitOfMeasure` (O), the unit of measure for the temperature

Child elements:

– None

Markup example:

```
<temperature>
<minTemperature unitOfMeasure="degC">-10</minTemperature>
<maxTemperature unitOfMeasure="degC">60</maxTemperature>
</temperature>
```

2.2.8 Harness environment

Description: The element <`harnessEnvironment`> contains information concerning the environment in which a harness is located.

Markup element: <`harnessEnvironment`>

Attributes:

– `highVibrationFlag` (O), indicates if a harness is located in a high vibration environment. The attribute can have one of the following values:

- "`0`" (D) - the harness is not located in a high vibration environment
- "`1`" - the harness is located in a high vibration environment

– `hydraulicFlag` (O), indicates if a harness is located in a hydraulic environment. The attribute can have one of the following values:

- "`0`" (D) - the harness is not located in a hydraulic environment
- "`1`" - the harness is located in a hydraulic environment

Child elements:

– None

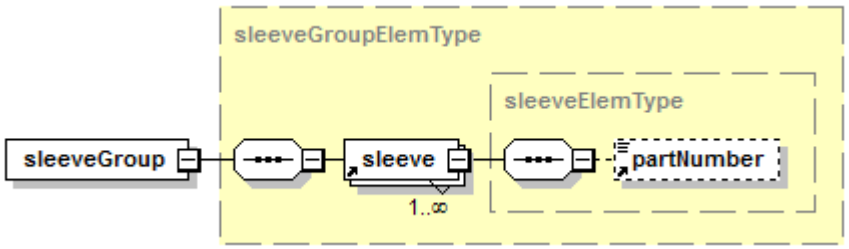
Markup example:

```
<harnessEnvironment highVibrationFlag="1" hydraulicFlag="0"/>
```

2.2.9 List of harness sleeves

Description: The element <`sleeveGroup`> contains a list of sleeves that are used on the harness.

Markup element: <`sleeveGroup`>



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Fig 5 Element <`sleeveGroup`>

Attributes:

– None

Child elements:

– <sleeve>, the harness sleeve information. Refer to Para 2.2.9.1.

Markup example:

```
<sleeveGroup>
<sleeve><partNumber>SPN1234</partNumber></sleeve>
<sleeve><partNumber>SPN4321</partNumber></sleeve>
</sleeveGroup>
```

2.2.9.1 Harness sleeve information

Description: The element <sleeve> contains information about a harness sleeve.

Markup element: <sleeve>

Attributes:

– sleeveMaterial (O), the material of which the sleeve is made

Child elements:

– <partNumber>, the part number of the harness sleeve. Refer to Para 2.2.1.

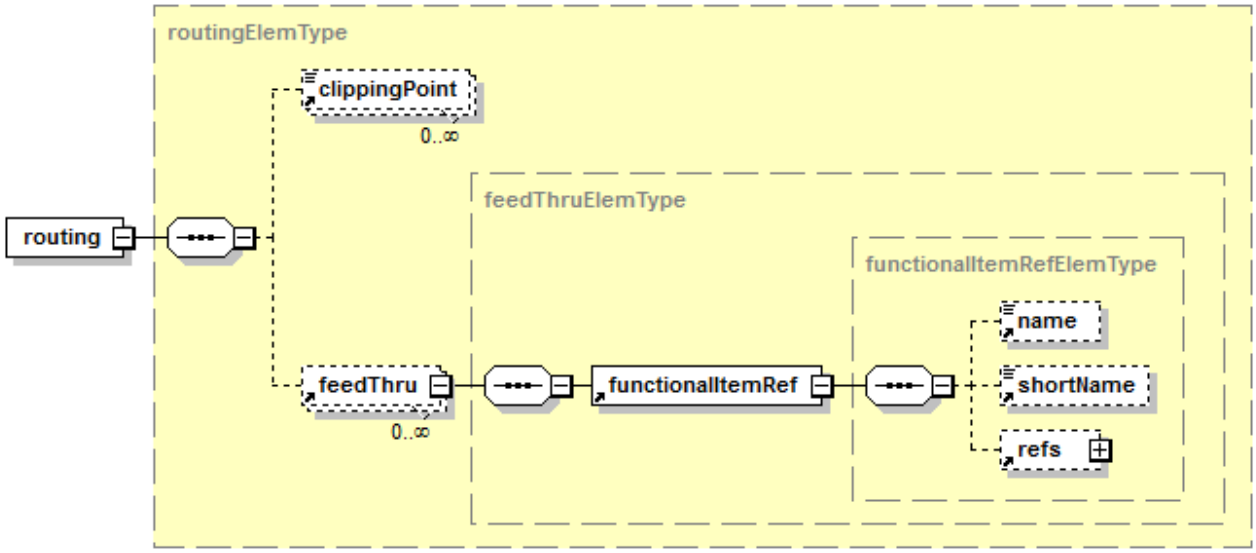
Markup example:

```
<sleeveGroup>
<sleeve sleeveMaterial="Teflon">
<partNumber>SLV-5678</partNumber>
</sleeve>
</sleeveGroup>
```

2.3 Routing

Description: The element <routing> contains routing information of a harness via clipping points. It can also contain routing information through special components (eg, panels or bungs).

Markup element: <routing>



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Fig 6 Element <routing>

Attributes:

– None

Child elements:

– <clippingPoint>, the clipping point information for a harness. Refer to Chap 3.9.5.2.9.2.
– <feedThru>, the information about the equipment through which a harness passes. Refer to Chap 3.9.5.2.9.2.

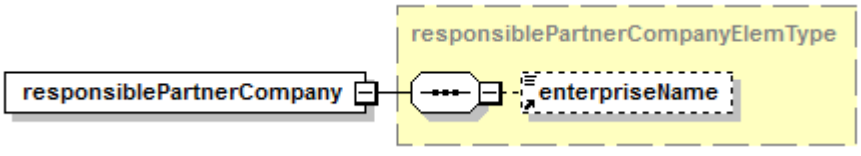
Markup example:

```
<routing>
<clippingPoint>271-11</clippingPoint>
<clippingPoint>273-2</clippingPoint>
</routing>
```

2.4 Responsible partner company

Description: The element <responsiblePartnerCompany> contains the company or the organization that is responsible for the harness data. Refer to Chap 3.9.5.1.

Markup element: <responsiblePartnerCompany>



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Fig 7 Element <responsiblePartnerCompany>

Attributes:

– enterpriseCode (O), the CAGE code of the responsible company or organization
– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

– <enterpriseName>, the name of the responsible company or organization. Refer to Para 2.4.1.

Note

The use of the child element <enterpriseName> can considerably increase the amount of data to be stored and exchanged. Therefore it is recommended to use only the attribute enterpriseCode in context with the element <harness> to indicate the responsible partner company instead of or in addition using the child element <enterpriseName>.

Markup example:

The following markup example shows the responsible partner company information of a harness. The responsible partner company is indicated by its CAGE code.

```
<responsiblePartnerCompany enterpriseCode="K0378"/>
```

2.4.1 Responsible partner company name

Description: The element <enterpriseName> contains the name of the company or the organization that is responsible for the data. Refer to Chap 3.9.5.1.

Markup element: <enterpriseName>

Attributes:

– None

Child elements:

– None

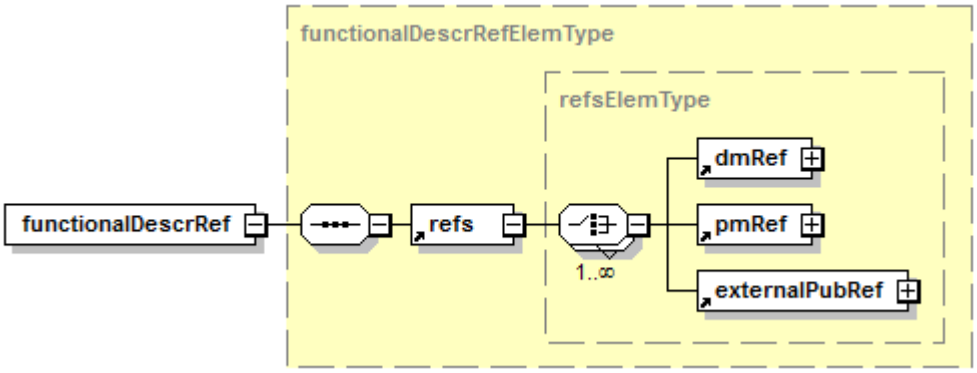
Markup example:

```
<enterpriseName>Amphenol Ltd<harn</enterpriseName>
```

2.5 Functional description reference

Description: The element <functionalDescrRef> contains references to other parts of the electrical system publications for further information about a harness (eg, a description of how it is made and its function).

Markup element: <functionalDescrRef>



ICN-C0419-S1000D0291-001-01

Fig 8 Element <functionalDescrRef>

Attributes:

– None

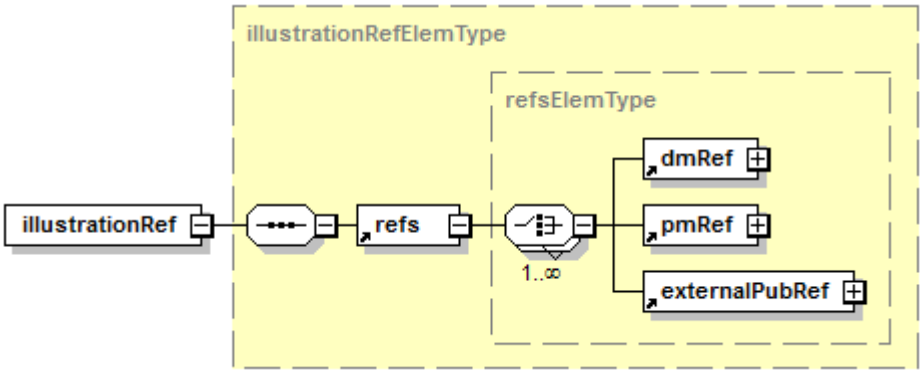
Child elements:

– <refs>, the functional description reference information. Refer to Chap 3.9.5.2.1.2.

2.6 Illustration reference

Description: The element <illustrationRef> contains references to other parts of the electrical system publications that show harness illustrations. These illustrations can show the routing of the harness.

Markup element: <illustrationRef>



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Fig 9 Element <illustrationRef>

Attributes:

– None

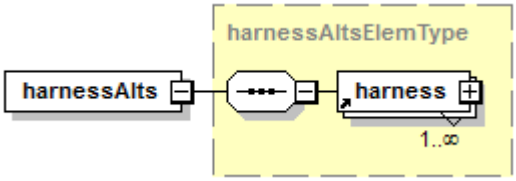
Child elements:

– <refs>, the illustration reference information. Refer to Chap 3.9.5.2.1.2.

2.7 Element <harnessAlts>

Description: The element <harnessAlts>, within the list of harnesses element <harnessGroup>, provides the capability to group several alternate solutions of harness data for different applicability annotations. Refer to Chap 4.13.3 for information related to the use of the alternates group mechanism in data module content.

Markup element: <harnessAlts>



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Fig 10 Element <harnessAlts>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`harness`>, the harness data. Refer to Para 2.

Markup example:

```
<wiringData>
<harnessGroup>
<harnessAlts>
<harness applicRefId="app-0001">
<harnessIdent>Lamp1</harnessIdent>
<harnessInfo>
<partNumber>Front light_501</partNumber>
<harnessVariantIdent>501</harnessVariantIdent>
<harnessVariantIssue>A</harnessVariantIssue>
<harnessName>Front light harness</harnessName>
<emcCode>LS3</emcCode>
<temperature>
<minTemperature unitOfMeasure="degC">-10</minTemperature>
</temperature>
<sleeveGroup>
<sleeve>
<partNumber>SPN1234</partNumber>
</sleeve>
<sleeve>
<partNumber>SPN4321</partNumber>
</sleeve>
</sleeveGroup>
</harnessInfo>
<routing>...</routing>
<responsiblePartnerCompany enterpriseCode="U8025"/>
</harness>
<harness applicRefId="app-0002">
<harnessIdent>Lamp2</harnessIdent>
<harnessInfo>
<partNumber>Rear light_503</partNumber>
<harnessVariantIdent>503</harnessVariantIdent>
<harnessVariantIssue>A</harnessVariantIssue>
<harnessName>Rear light harness</harnessName>
<emcCode>LS3</emcCode>
<harnessEnvironment hydraulicFlag="1"/>
</harnessInfo>
<responsiblePartnerCompany enterpriseCode="U8025"/>
```

```
</harness>
</harnessAlts>
</harnessGroup>
</wiringData>
```

Chapter 3.9.5.2.9.4

Wiring data - Electrical equipment

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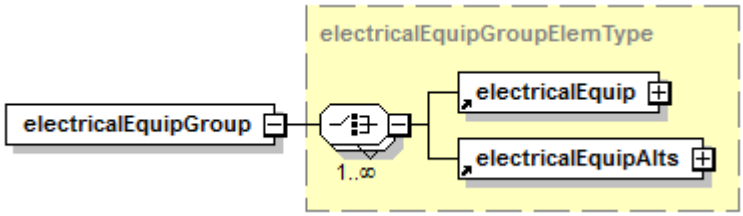
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Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.2.9.2	Wiring data - Wire
Chap 3.9.5.3	Data modules - Applicability
Chap 4.13.3	Optimizing and reuse - Alternates concept

1 General

The element <electricalEquip> and the child elements are used to capture and represent the electrical equipment that is installed in the Product, and related information.

2 Element <electricalEquip> and child elements

Description: The element <electricalEquip> is contained within the list of electrical equipment element <electricalEquipGroup>. It contains electrical equipment information of the Product's wiring.

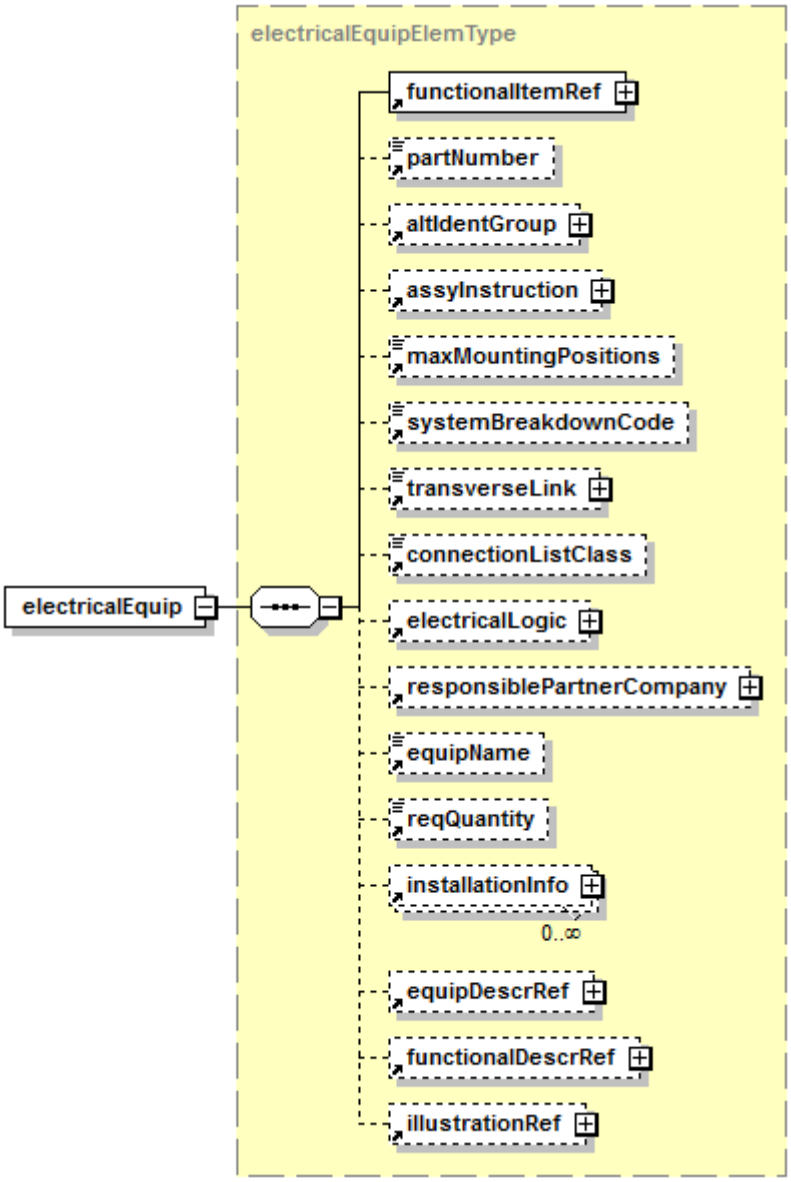


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Fig 1 Element <`electricalEquipGroup`>

It is strongly recommended to define the electrical equipment applicability precisely and populate it in accordance with the project or the organization specific rules. It is further recommended to use at least the version and version number information given in the products cross-reference table. Electrical equipment with modifications must in addition use the information given in the conditions cross-reference table.

Markup element: <`electricalEquip`>



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Fig 2 Element <`electricalEquip`>

Attributes:

- `applicRefId` (O), the applicability information of electrical equipment by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `changeInfo` (O), the change information of electrical equipment in connection with the related modification. The attribute can have one of the following values:
  - "`add`" - for electrical equipment that is added to the systems circuits by a modification
  - "`delete`" - for electrical equipment that is removed from the systems circuits by a modification
  - "`modify`" - for electrical equipment that is modified in the systems circuits by a modification

- `equipState` (O), the electrical state of equipment. The different values of this attribute are used to distinguish electrical equipment with allocated functional item, electrical equipment that has no functional item allocated, and placeholders for empty positions on panels, etc. Functional items are also known as reference designators. The attribute `equipState` can have one of the following values:
  - "`active`" - for electrical equipment, which is installed in one of the systems circuits and has a functional item allocated
  - "`notactiv`" - for electrical equipment, which is not active in one of the systems circuits. A not active electrical equipment is used as a placeholder, where for example no component is installed in a position of a circuit breaker panel
  - "`logequip`" - for electrical equipment, which is installed in one of the systems circuits and has no functional item allocated
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`functionalItemRef`>, the functional item reference. Functional items are also known as reference designators. Refer to Chap 3.9.5.1.
- <`partNumber`>, the part number. Refer to Para 2.1.
- <`altIdentGroup`>, the list of alternative identifications. Refer to Para 2.2.
- <`assyInstruction`>, the assembly instruction information. Refer to Para 2.3.
- <`maxMountingPositions`>, the maximum number of mounting positions. Refer to Para 2.4.
- <`systemBreakdownCode`>, the system breakdown code. Refer to Para 2.5.
- <`transverseLink`>, the transverse link information. Refer to Para 2.6.
- <`connectionListClass`>, the connection list class. Refer to Para 2.7.
- <`electricalLogic`>, the electrical logic information. Refer to Para 2.8.
- <`responsiblePartnerCompany`>, the company or the organization which is responsible for the electrical equipment data. Refer to Para 2.9.
- <`equipName`>, the electrical equipment name. Refer to Para 2.10.
- <`reqQuantity`>, the required quantity information. Refer to Para 2.11.
- <`installationInfo`>, the installation information. Refer to Para 2.12.
- <`equipDescrRef`>, the electrical equipment description reference. Refer to Para 2.13.
- <`functionalDescrRef`>, the functional description reference. Refer to Para 2.14.
- <`illustrationRef`>, the reference to electrical equipment illustrations. Refer to Para 2.15.

Markup example:

```
<wiringData>
<electricalEquipGroup>
<electricalEquip equipState="active" applicRefId="app-0001">
<functionalItemRef functionalItemNumber="AC1650"/>
<partNumber>JN1022-GA45AX</partNumber>
<connectionListClass>15</connectionListClass>
<electricalLogic>
<electricalEquipState initialStateFlag="1">
<electricalEquipConnection>
<contact contactIdent="C"/>
<contact contactIdent="NC"/>
</electricalEquipConnection>
```

```
<electricalStateDescr>DEENERGIZED</electricalStateDescr>
</electricalEquipState>
<electricalEquipState>
<electricalEquipConnection>
<contact contactIdent="C"/>
<contact contactIdent="NO"/>
</electricalEquipConnection>
<electricalStateDescr>ENERGIZED</electricalStateDescr>
</electricalEquipState>
</electricalLogic>
<responsiblePartnerCompany enterpriseCode="K0378"/>
<equipName>BATTERY MASTER SWITCH</equipName>
<installationInfo>
<nextHigherAssy>
<functionalItemRef functionalItemNumber="AC1600"/>
</nextHigherAssy>
<positionOnNextHigherAssy mountPosition="5">
</positionOnNextHigherAssy>
</installationInfo>
</electricalEquip>
</electricalEquipGroup>
</wiringData>
```

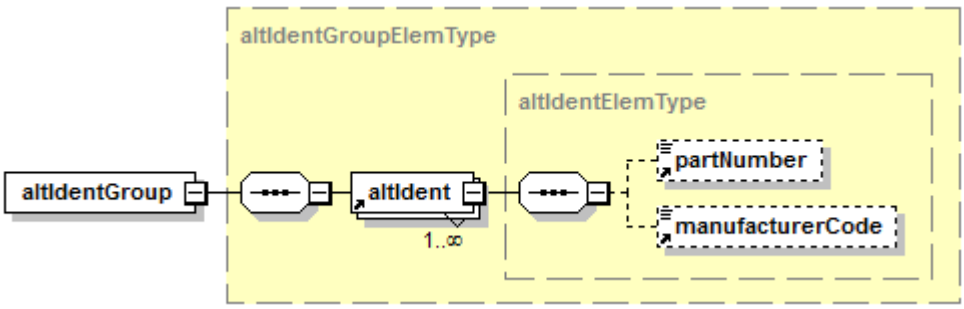
2.1 Part number

Description: The element <partNumber> contains the project or the organization specific part number of the electrical equipment. Refer to Chap 3.9.5.2.1.9.

2.2 Alternative identifications

Description: The list of alternative identifications element <altIdentGroup> is used as a container for the subordinate alternative identification elements.

Markup element: <altIdentGroup>



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Fig 3 Element <altIdentGroup>

Attributes:

– None

Child elements:

– <altIdent>, the alternative identification. Refer to Para 2.2.1.

Markup example:

```
<altIdentGroup>
<altIdent>
<partNumber>711-5016-3(462)</partNumber>
<manufacturerCode>K5678</manufacturerCode>
</altIdent>
<altIdent>
<partNumber>713-5018-2(469)</partNumber>
<manufacturerCode>K5678</manufacturerCode>
</altIdent>
</altIdentGroup>
```

2.2.1 Alternative identification

Description: The alternative identification element <altIdent> is used for additional identification of electrical equipment. An alternative identification can contain a manufacturer part number and the related manufacturer code.

Markup element: <altIdent>

Attributes:

– None

Child elements:

– <partNumber>, the electrical equipment alternative part number. Refer to Para 2.1.
– <manufacturerCode>, the CAGE code of the electrical equipment manufacturer. Refer to Para 2.2.1.1.

Markup example:

The following markup example shows an alternative identification for part number JN1032A3:

```
<altIdentGroup>
<altIdent>
<partNumber>711-5016-3(462)</partNumber>
<manufacturerCode>K5678</manufacturerCode>
</altIdent>
</altIdentGroup>
```

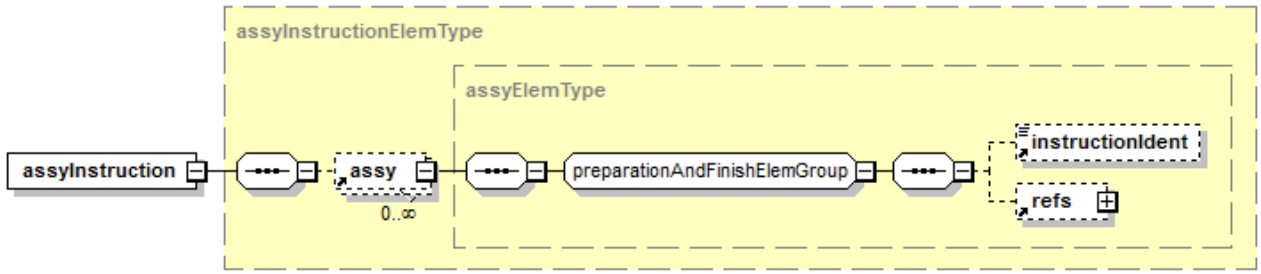
2.2.1.1 Electrical equipment manufacturer code

Description: The electrical equipment manufacturer code element <manufacturerCode> is used in conjunction with the alternative electrical equipment part number. It contains the CAGE code of the electrical equipment manufacturer. Refer to Chap 3.9.5.2.1.9.

2.3 Assembly instructions

Description: The element <assyInstruction> is used as a container for the subordinate electrical equipment assembly information.

Markup element: <assyInstruction>



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Fig 4 Element <assyInstruction>

Attributes:

– None

Child elements:

– <assy>, the assembly information for the electrical equipment. Refer to Para 2.3.1.

2.3.1 Assembly information

Description: The electrical equipment assembly information element <assy> contains subordinate assembly information for the electrical equipment in coded form, and references detailed assembly instructions.

Markup element: <assy>

Attributes:

– None

Child elements:

– <instructionIdent>, the electrical equipment assembly information in coded form. Refer to Para 2.3.1.1.
– <refs>, the references to detailed instructions for assembling the electrical equipment. Refer to Chap 3.9.5.2.1.2

Markup example:

```
<assy>
<instructionIdent>ASSY806</instructionIdent>
</assy>
```

2.3.1.1 Assembly information identification

Description: The element <instructionIdent> gives electrical equipment assembly information in coded form.

Markup element: <instructionIdent>

Attributes:

– None

Child elements:

– None

Markup example:

```
<instructionIdent>ASSY806</instructionIdent>
```

2.4 Maximum number of mounting positions

Description: The element <maxMountingPositions> contains the number of mounting positions on a next higher assembly (eg, a circuit breaker panel). This element is only used for equipment that has mounting positions for other electrical equipment (eg, connectors or circuit breakers).

Markup element: <maxMountingPositions>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows the next higher assembly panel AC1650, which has six mounting positions.

```
<electricalEquip equipState="active">
<functionalItemRef functionalItemNumber="AC1650"/>
<maxMountingPositions>6</maxMountingPositions>
</electricalEquip>
```

2.5 System breakdown code

Description: Equipment of complex systems is divided into subsystems using the system breakdown code element <systemBreakdownCode>. This element can be used to provide the system breakdown code of such equipment.

Markup element: <systemBreakdownCode>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

– None

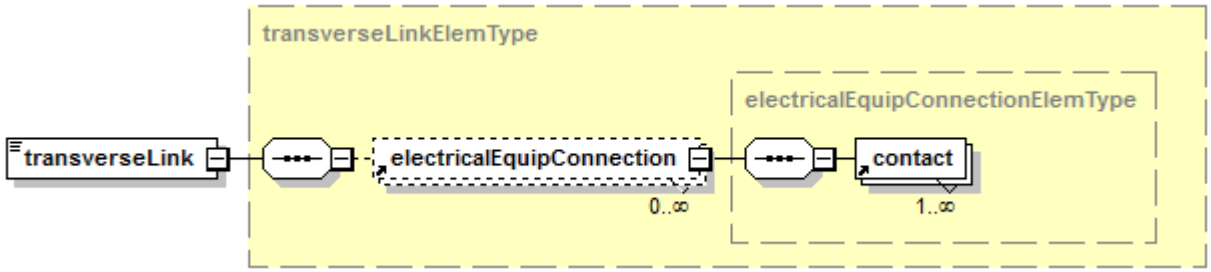
Markup example:

```
<systemBreakdownCode>24-31-02-00</systemBreakdownCode>
```

2.6 Transverse link

Description: The element <transverseLink> provides information about internally or externally realized electrical connections of different contacts/bolts of equipment (eg, terminal strips).

Markup element: <transverseLink>



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Fig 5 Element <transverseLink>

Attributes:

– None

Child elements:

– <electricalEquipConnection>, the electrical equipment connection information. Refer to Para 2.6.1.

Markup example:

```
<transverseLink>
<electricalEquipConnection>
<contact contactIdent="1"/>
<contact contactIdent="2"/>
</electricalEquipConnection>
<electricalEquipConnection>
<contact contactIdent="3"/>
</electricalEquipConnection>
</transverseLink>
```

2.6.1 Electrical equipment connections

Description: The element <electricalEquipConnection> gives information about the electrical connections that belong to a transverse link.

Markup element: <electricalEquipConnection>

Attributes:

– connectionType (O), the type of connection. As an example, consider a relay. The connections of the poles are direct, done by a piece of metal, but the contacts of the relay coil(s) must also be shown. In this case connectionType="direct" means it is a direct connection, connectionType="coil" means that a coil must be shown between the contacts. Connection types can also be identified by using coded values like "1" - direct connection, "2" - coil, etc.

Child elements:

– <contact>, the contact identification. Refer to Para 2.6.1.1.

Business rule decision point BRDP-S1-00241 - Use of the element <electricalEquipConnection>:

– Decide whether and how to use electrical equipment connection information, in particular define the values of attribute connectionType consistently.

2.6.1.1 Contact identification

Description: The element <contact> describes the contact identification by its attributes. Refer to Chap 3.9.5.2.9.2.

Markup example:

The following example shows the markup for coding the transverse links of electrical equipment. The contacts/bolts 1, 2, 3 and 4 are electrically connected, and the contacts/bolts 5 and 6 are electrically connected.

```
<transverseLink>
<electricalEquipConnection>
<contact contactIdent="1"/>
<contact contactIdent="2"/>
<contact contactIdent="3"/>
<contact contactIdent="4"/>
</electricalEquipConnection>
<electricalEquipConnection>
<contact contactIdent="5"/>
<contact contactIdent="6"/>
</electricalEquipConnection>
</transverseLink>
```

2.7 Connection list class

Description: The element <connectionListClass> describes special groups of electrical equipment (eg, switches, connectors) in coded form.

It is recommended to use the connection list class element <connectionListClass> as given in Table 2.

Table 2 Connection list classes

Connection list class	Electrical equipment group
1	Connectors, single
2	VR-/VP- Connectors, single
3	VR-/VP- Connectors
4	VE- Connectors, single
5	VE- Connectors
6	Earth bolts
7	Terminal junction modules
8	Terminal strips, single
9	Terminal strips, double
10	Relays, Contactors
11	Bungs
12	Splices
13	Electrical equipment whose connected wires are not part of the considered project wiring

Connection list class	Electrical equipment group
14	Bus bars
15	Switches
16	Electrical equipment with no internal logic
17	Virtual connectors
18	Electrical equipment with internal logic
19	Terminals for bonding
20	Connectors, data bus, single
21	Data bus couplers
23	Connectors, data bus
25	Circuit breakers, fuses

Markup element: <connectionListClass>

Attributes:

– None

Child elements:

– None

Markup example:

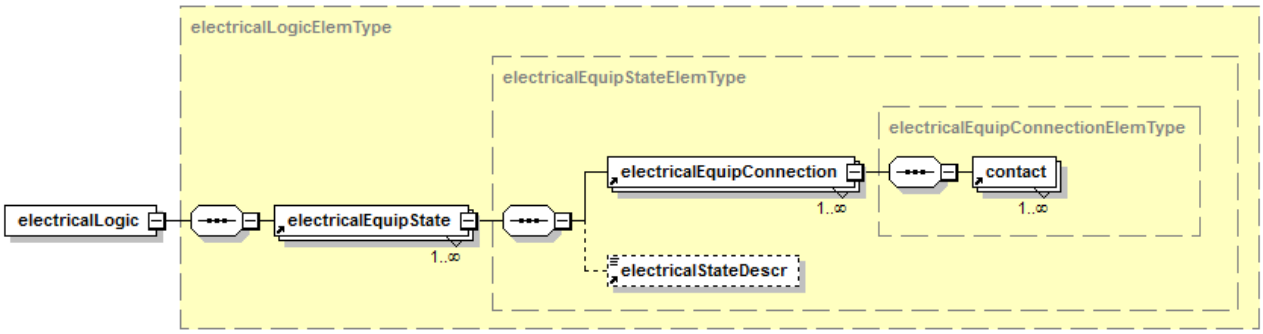
The following markup example shows the connection list class information of a switch.

```
<connectionListClass>15</connectionListClass>
```

2.8 Electrical logic

Description: The element <electricalLogic> provides an optional container for electrical states and internal connections between contacts for electrical or electronic equipment.

Markup element: <electricalLogic>



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Fig 6 Element <electricalLogic>

Attributes:

– None

Child elements:

– <electricalEquipState>, the electrical equipment state. Refer to Para 2.8.1.

2.8.1 Electrical equipment state

Description: The electrical equipment state element <electricalEquipState> provides state information for each connection to some particular electrical equipment.

Markup element: <electricalEquipState>

Attributes:

– initialStateFlag (O), indicates whether the state information is the initial state of the electrical equipment or not. The attribute can have one of the following values:
  - "1" - for electrical states that are initial states
  - "0" - for electrical states that are not initial states. In this case, the attribute initialStateFlag can be dropped.

Child elements:

– <electricalEquipConnection>, the electrical equipment connection information. Refer to Para 2.8.1.1.
– <electricalStateDescr>, the description of an electrical state. Refer to Para 2.8.1.2.

2.8.1.1 Electrical equipment connections

Description: The electrical equipment connection element <electricalEquipConnection> must be used and gives information about the connections that belong to the same electrical state. Refer to Para 2.6.1.

2.8.1.2 Electrical state description

Description: The electrical state description element <electricalStateDescr> contains the narrative description of an electrical state, for example "ENERGIZED".

Markup element: <electricalStateDescr>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example describes a switch, which has two states: DEENERGIZED and ENERGIZED. In the initial state or the default state (initialStateFlag="1"), the switch connects contacts C and NC. In the other state (initialStateFlag="0") it connects contacts C and NO.

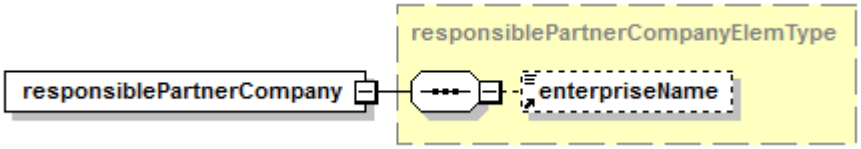
```
<electricalLogic>
<electricalEquipState initialStateFlag="1">
<electricalEquipConnection>
<contact contactIdent="C"/>
```

```
<contact contactIdent="NC"/>
</electricalEquipConnection>
<electricalStateDescr>DEENERGIZED</electricalStateDescr>
</electricalEquipState>
<electricalEquipState>
<electricalEquipConnection>
<contact contactIdent="C"/>
<contact contactIdent="NO"/>
</electricalEquipConnection>
<electricalStateDescr>ENERGIZED</electricalStateDescr>
</electricalEquipState>
</electricalLogic>
```

2.9 Responsible partner company

Description: The element <responsiblePartnerCompany> contains the company or the organization, which is responsible for the electrical equipment. Refer to Chap 3.9.5.1.

Markup element: <responsiblePartnerCompany>



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Fig 7 Element <responsiblePartnerCompany>

Attributes:

- enterpriseCode (O), the CAGE code of the responsible company or organization
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

- <enterpriseName>, the name of the responsible company or organization. Refer to Chap 3.9.5.1.

Note

The use of the child element <enterpriseName> can considerably increase the amount of data to be stored and exchanged. Therefore, it is recommended to use only the attribute enterpriseCode in context with the element <electricalEquip> to indicate the responsible partner company instead of or in addition using the child element <enterpriseName>.

Markup example:

```
<responsiblePartnerCompany enterpriseCode="K0378"/>
```

2.10 Electrical equipment name

Description: The element <equipName> describes the electrical equipment. A standard name, like SWITCH, can be used or a name that defines the electrical equipment in conjunction with its use on the system, for example BATTERY MASTER SWITCH.

Markup element: <equipName>

Attributes:

– None

Child elements:

– None

Markup example:

```
<equipName>BATTERY MASTER SWITCH</equipName>
```

2.11 Quantity

Description: The element <reqQuantity> contains the number of multiple occurrence electrical equipment installed in the Product, for example an aircraft.

It is recommended to use the quantity element <reqQuantity> only for multiple occurrence electrical equipment.

Markup element: <reqQuantity>

Attributes:

– unitOfMeasure (O), the unit of measure for the quantity
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

Markup example:

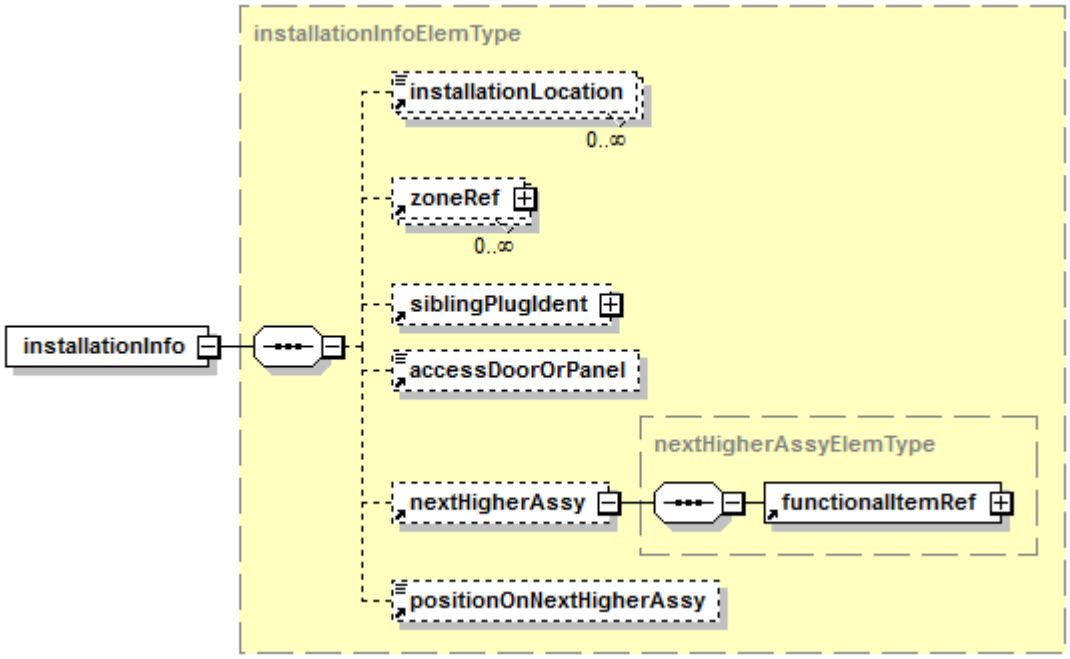
The following markup shows an example for using the element <reqQuantity> for multiple occurrence electrical equipment that is installed three times in the aircraft.

```
<reqQuantity>3</reqQuantity>
```

2.12 Installation information

Description: The element <installationInfo> contains electrical equipment installation information. The element is repeatable to cover multiple occurrence electrical equipment.

Markup element: <installationInfo>



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Fig 8 Element <`installationInfo`>

Attributes:

– `installationIdent` (O), contains a unique value for every instance of the functional item. Functional items are also known as reference designators. The instance identifier is necessary to achieve a 1:1 relationship between a plug and the mating connector.

Child elements:

– <`installationLocation`>, the installation location. Refer to Chap 3.9.5.2.1.9.
– <`zoneRef`>, the zone reference. Refer to Chap 3.9.5.2.1.10.
– <`siblingPlugIdent`>, the twin connector identification. Refer to Para 2.12.1.
– <`accessDoorOrPanel`>, the access door or panel. Refer to Para 2.12.2.
– <`nextHigherAssy`>, the next higher assembly. Refer to Para 2.12.3.
– <`positionOnNextHigherAssy`>, the position on the next higher assembly. Refer to Para 2.12.4.

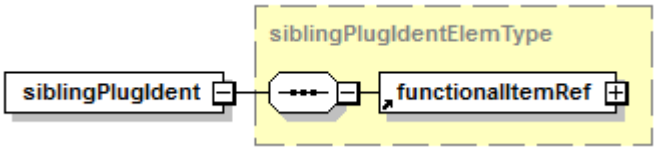
Markup example:

Refer to Para 3.1.

2.12.1 Twin connector identification

Description: The element <`siblingPlugIdent`> contains the functional item of the mate connector in the subordinate element <`functionalItemRef`>. That means, the plug gets as twin connector identification the functional item of the receptacle, and the receptacle gets as twin connector identification the functional item of the plug. Functional items are also known as reference designators.

Markup element: <`siblingPlugIdent`>



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Fig 9 Element <siblingPlugIdent>

Attributes:

– None

Child elements:

– <functionalItemRef>, the identification of the twin connector. Functional items are also known as reference designators. Refer to Chap 3.9.5.1.

Markup example:

The following markup example shows the identification twin connector 1071VR (of the connector 1071VP).

```
<siblingPlugIdent>
<functionalItemRef functionalItemNumber="1071VR"/>
</siblingPlugIdent>
```

2.12.2 Access door or panel

Description: The element <accessDoorOrPanel> contains information about doors or panels to be opened for getting access to the electrical equipment.

Markup element: <accessDoorOrPanel>

Attributes:

– None

Child elements:

– None

Markup example:

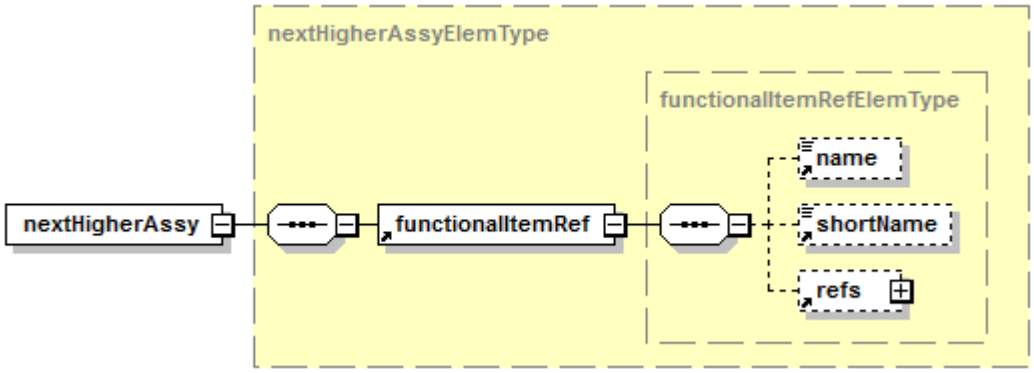
The following markup example shows that door L107 has to be opened for getting access to the electrical equipment.

```
<accessDoorOrPanel>L107</accessDoorOrPanel>
```

2.12.3 Next higher assembly

Description: Electrical equipment, which is part of a physical or logical assembly (eg, a box), the next higher assembly element <nextHigherAssy> can be used to identify this assembly.

Markup element: <nextHigherAssy>



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Fig 10 Element <nextHigherAssy>

Attributes:

– None

Child elements:

– <functionalItemRef>, the identification of the next higher assembly of the electrical equipment. Functional items are also known as reference designators. Refer to Chap 3.9.5.1.

Markup example:

The following markup example shows electrical equipment, which is part of the box 1004VE.

```
<nextHigherAssy>
<functionalItemRef functionalItemNumber="1004VE"/>
</nextHigherAssy>
```

2.12.4 Position on next higher assembly

Description: Electrical equipment, which is mounted on a physical assembly (eg, a box or a panel), has allocated the identification of the position on the next higher assembly element <positionOnNextHigherAssy>. The position is indicated either by a direct position or by grid coordinates.

Markup element: <positionOnNextHigherAssy>

Attributes:

– mountPosition (O), the direct position number on which the electrical equipment is mounted to the next higher assembly
– mountRow (O), the row information on which the electrical equipment is mounted to the next higher assembly. This attribute is normally used in combination with the attribute mountColumn
– mountColumn (O), the column information on which the electrical equipment is mounted to the next higher assembly. This attribute is normally used in combination with the attribute mountRow

Child elements:

– None

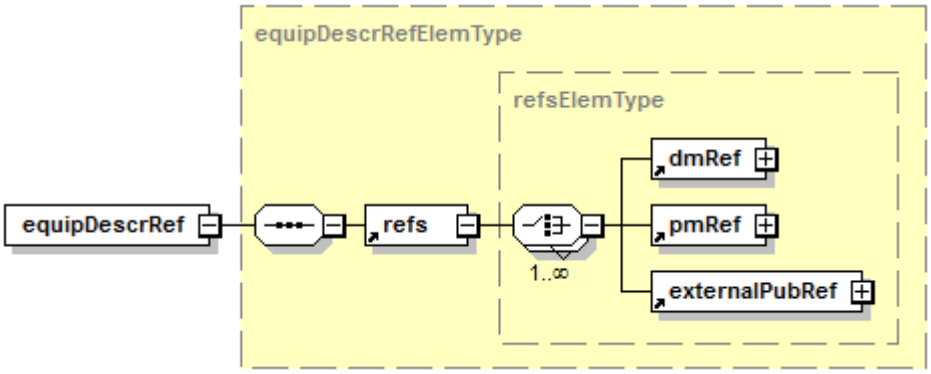
Markup example:

Refer to Para 3.2.

2.13 Electrical equipment description reference

Description: The element <equipDescrRef> contains references to other parts of the electrical system publications, which give further information about this electrical equipment, such as the description of how it is made.

Markup element: <equipDescrRef>



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Fig 11 Element <equipDescrRef>

Attributes:

– None

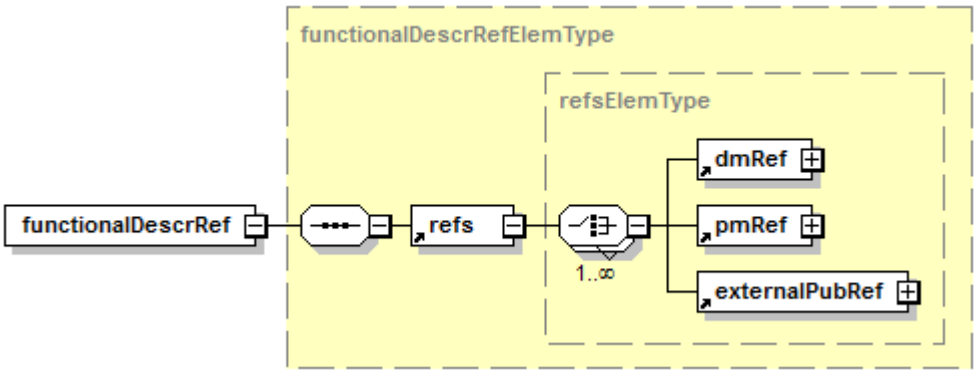
Child elements:

– <refs>, the electrical equipment description reference information. Refer to Chap 3.9.5.2.1.2.

2.14 Functional description reference

Description: The functional description reference element <functionalDescrRef> contains references to other parts of the electrical system publications for further information about the electrical equipment (eg, a description of its function).

Markup element: <functionalDescrRef>



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Fig 12 Element <functionalDescrRef>

Attributes:

– None

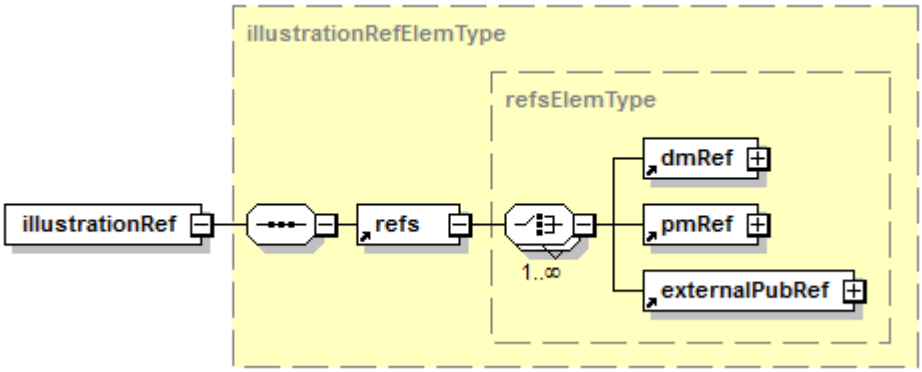
Child elements:

– <refs>, the functional description reference information. Refer to Chap 3.9.5.2.1.2.

2.15 Illustration reference

Description: The element <illustrationRef> contains references to other parts of the electrical system publications, which show illustrations of the electrical equipment.

Markup element: <illustrationRef>



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Fig 13 Element <illustrationRef>

Attributes:

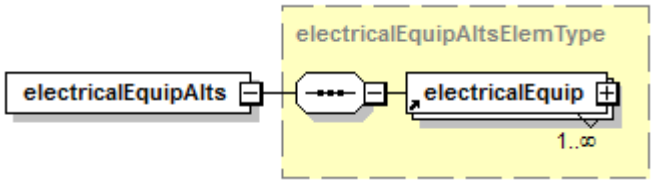
– None

Child elements:

– <refs>, the illustration reference information. Refer to Chap 3.9.5.2.1.2.

2.16 Element <electricalEquipAlts>

Description: The element <electricalEquipAlts>, within the list of electrical equipment element <electricalEquipGroup>, provides the capability to group several alternate solutions of electrical equipment data for different applicability annotations. Refer to Chap 4.13.3 for information related to the use of the alternates group mechanism in data module content.



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Fig 14 Element <electricalEquipAlts>

Markup element: <electricalEquipAlts>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`electricalEquip`>, the electrical equipment data. Refer to Para 2.

Markup example:

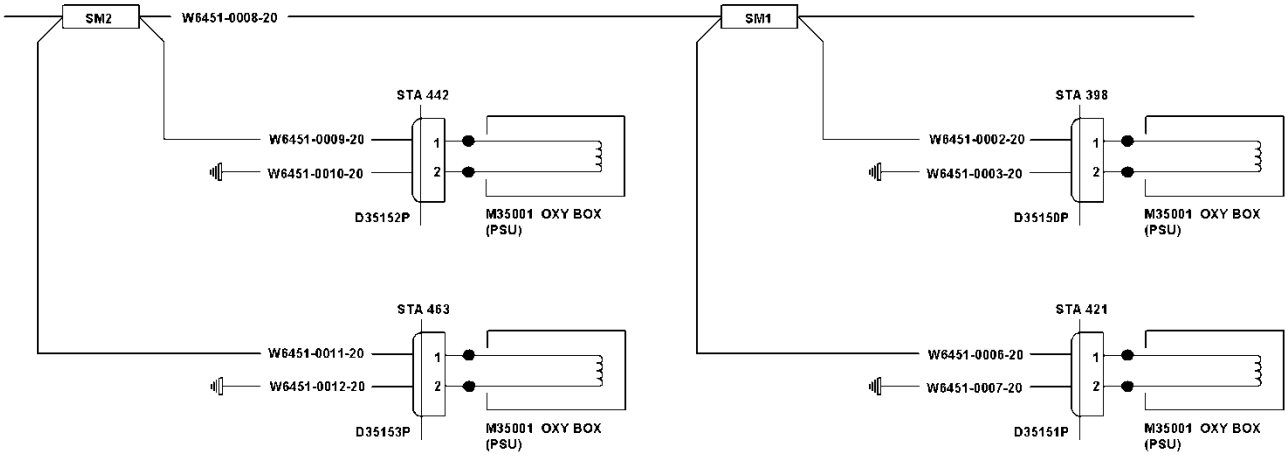
```
<wiringData>
<electricalEquipGroup>
<electricalEquipAlts>
<electricalEquip equipState="active" applicRefId="app-0001">
<functionalItemRef functionalItemNumber="AC1650"/>
</electricalEquip>
<electricalEquip equipState="notactiv" applicRefId="app-0002">
<functionalItemRef functionalItemNumber="AC1651"/>
</electricalEquip>
</electricalEquipAlts>
</electricalEquipGroup>
</wiringData>
```

3 Markup examples

3.1 Multiple occurrence electrical equipment

The following markup example shows the use of attribute `installationIdent` for multiple occurrence electrical equipment. The equipment M35001 OXY BOX (PSU) with the functional item number M35001 is used four times in this example. A functional item is also known as a reference designator. The four electrical equipment instances are connected to D35150P thru D35153P. For details refer to Fig 15.

The markup example also shows a reference to the fourth instance D35153P in the second occurrence of element <`electricalEquip`>.



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Fig 15 Multiple occurrence electrical equipment example

```
<electricalEquip>
<functionalItemRef functionalItemNumber="M35001"/>
<installationInfo installationIdent="1">
<installationLocation installationLocationType="instloctyp02">
398</installationLocation>
<siblingPlugIdent>
<functionalItemRef functionalItemNumber="D35150P"/>
</siblingPlugIdent>
</installationInfo>
<installationInfo installationIdent="2">
<installationLocation installationLocationType="instloctyp02">
421</installationLocation>
<siblingPlugIdent>
<functionalItemRef functionalItemNumber="D35151P"/>
</siblingPlugIdent>
</installationInfo>
<installationInfo installationIdent="3">
<installationLocation installationLocationType="instloctyp02">
442</installationLocation>
<siblingPlugIdent>
<functionalItemRef functionalItemNumber="D35152P"/>
</siblingPlugIdent>
</installationInfo>
<installationInfo installationIdent="4">
<installationLocation installationLocationType="instloctyp02">
463</installationLocation>
<siblingPlugIdent>
<functionalItemRef functionalItemNumber="D35153P"/>
</siblingPlugIdent>
</installationInfo>
</electricalEquip>
<electricalEquip>
<functionalItemRef functionalItemNumber="D35153P"/>
<installationInfo>
<installationLocation installationLocationType="instloctyp02">
463</installationLocation>
<siblingPlugIdent>
<functionalItemRef functionalItemNumber="M35001"/>
</siblingPlugIdent>
</installationInfo>
</electricalEquip>
```

3.2 Position on next higher assembly

3.2.1 Connector

The following markup example shows connector D4532J, which is mounted on position 5 of the next higher assembly AC1650.

```
<electricalEquip equipState="active">
<functionalItemRef functionalItemNumber="D4532J"/>
<installationInfo>
<nextHigherAssy>
<functionalItemRef functionalItemNumber="AC1650"/>
</nextHigherAssy>
```

```
<positionOnNextHigherAssy mountPosition="5">
</positionOnNextHigherAssy>
</installationInfo>
</electricalEquip>
```

3.2.2 Circuit breaker

The following markup example shows circuit breaker CB0225, which is mounted in row C and column 7 of the next higher assembly P320.

```
<electricalEquip equipState="active">
<functionalItemRef functionalItemNumber="CB0225"/>
<installationInfo>
<nextHigherAssy>
<functionalItemRef functionalItemNumber="P320"/>
</nextHigherAssy>
<positionOnNextHigherAssy mountRow="C" mountColumn="7">
</positionOnNextHigherAssy>
</installationInfo>
</electricalEquip>
```

Chapter 3.9.5.2.9.5

Wiring data - Standard parts, Connector

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Table 1 References

Chap No./Document No.	Title
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Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.9.2	Wiring data - Wire
Chap 3.9.5.2.9.4	Wiring data - Electrical equipment
Chap 3.9.5.3	Data modules - Applicability

1 General

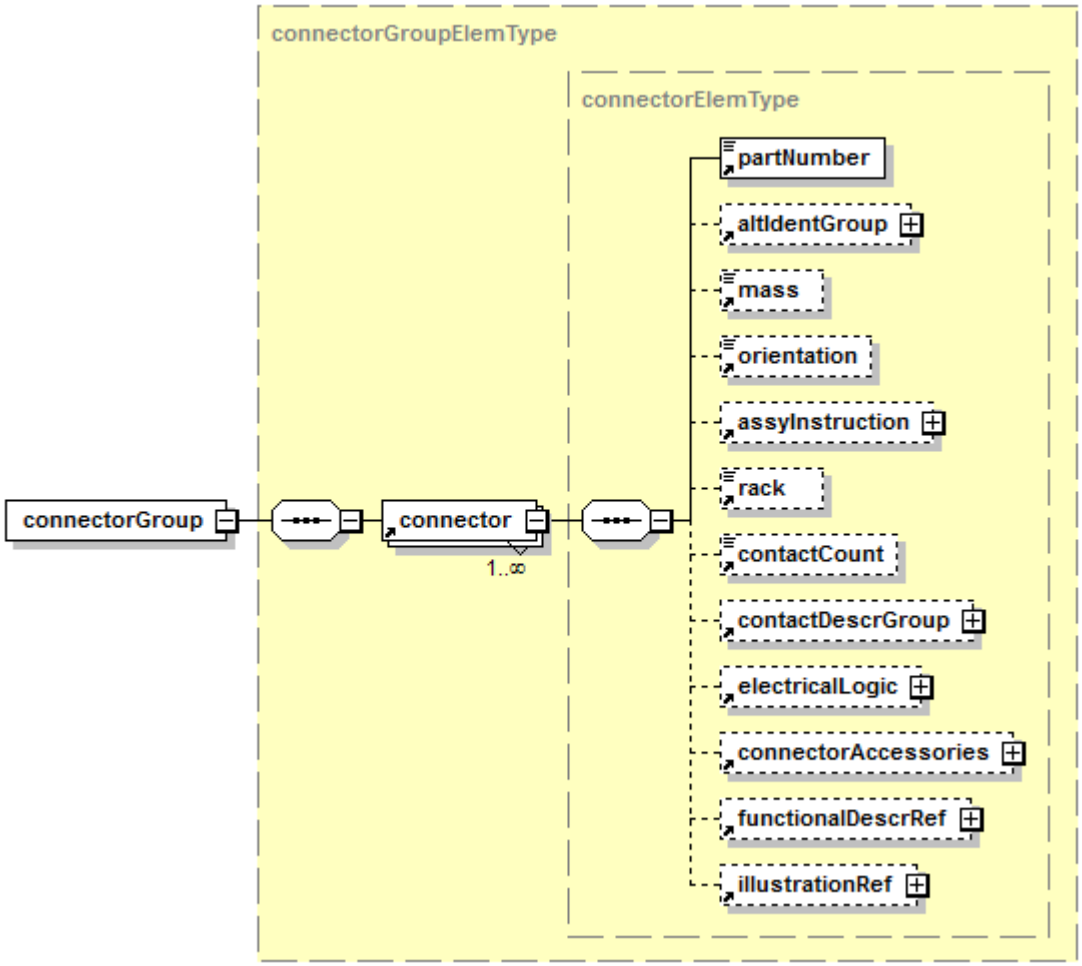
The element <connector> and its child elements are used to capture and represent connectors, which are used for the Product, and the related standard parts information.

2 Element <connector> and child elements

Description: The element <connector> is contained in the connector list element <connectorGroup>. The list of connectors is a child element of the list of standard parts element <standardPartGroup>.

The element <connector> contains information concerning the properties of connectors used in the Product's wiring. It is also used to describe terminal modules, switches and relays.

Markup element: <connector>



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Fig 1 Element <connector>

Attributes:

- `applicRefId` (O), the applicability of a connector by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`partNumber`>, the part number of the connector. Refer to Para 2.1.
- <`altIdentGroup`>, the list of alternative identifications. Refer to Para 2.2.
- <`mass`>, the mass information. Refer to Para 2.3
- <`orientation`>, the orientation information. Refer to Para 2.4
- <`assyInstruction`>, the assembly instruction information. Refer to Para 2.5.
- <`rack`>, the rack information. Refer to Para 2.6.
- <`contactCount`>, the contact count. Refer to Para 2.7.
- <`contactDescrGroup`>, the list of contact descriptions. Refer to Para 2.8.
- <`electricalLogic`>, the electrical logic information. Refer to Para 2.9.4

- <connectorAccessories>, the list of accessories. Refer to Para 2.10.
- <functionalDescrRef>, the functional description reference. Refer to Para 2.11.
- <illustrationRef>, the reference to illustrations. Refer to Para 2.12.

Markup example:

```
<wiringData>
<standardPartGroup>
<connectorGroup>
<connector><partNumber>JN1003S-12</partNumber></connector>
<connector><partNumber>JN1018QC020</partNumber></connector>
</connectorGroup>
</standardPartGroup>
</wiringData>
```

2.1 Part number

Description: The element <partNumber> contains the project or the organization specific part number of a connector. This element must be populated in accordance with Chap 3.9.5.2.1.9. The part number serves as a link to the equipment. Refer to Chap 3.9.5.2.9.4.

2.2 Alternative identifications

Description: The element <altIdentGroup> contains a list of alternative identifications for connectors, described by manufacturer part numbers and the related manufacturer. Refer to Chap 3.9.5.2.9.4.

2.3 Mass

Description: The element <mass> contains the mass of a connector.

Markup element: <mass>

Attributes:

- unitOfMeasure (O), the unit of measure for the connector mass

Child elements:

- None

Markup example:

```
<mass unitOfMeasure="kg">0,0154</mass>
```

2.4 Orientation

Description: The element <orientation> contains orientation/polarization information about a connector. Polarization information is normally given as part of the connector's part number. The polarization code can represent the angle between the main keyway and the other keyways of the connector.

Markup element: <orientation>

Attributes:

- None

Child elements:

- None

Markup example:

The following markup example shows the use of the element <orientation> by inserting the polarization code of the connector (eg, JN1003A1335PA):

```
<orientation>A</orientation>
```

2.5 Assembly instructions

Description: The element <assyInstruction> is used as a container for the subordinate connector assembly information. Refer to Chap 3.9.5.2.9.4.

2.6 Rack

Description: The element <rack> contains rack information about rack & panel connectors. If the part number of the complete rack & panel connector is used to describe the different inserts, then the element <rack> must be used to define which insert of the connector is described in this context. An element <connector> is required for all inserts of the rack & panel connector.

Markup element: <rack>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows the use of element <rack> for the insert A of the rack & panel connector (eg, JN1123FP1CGK11):

```
<rack>A</rack>
```

2.7 Contact count

Description: The element <contactCount> contains the number of contacts of the connector.

Markup element: <contactCount>

Attributes:

– None

Child elements:

– None

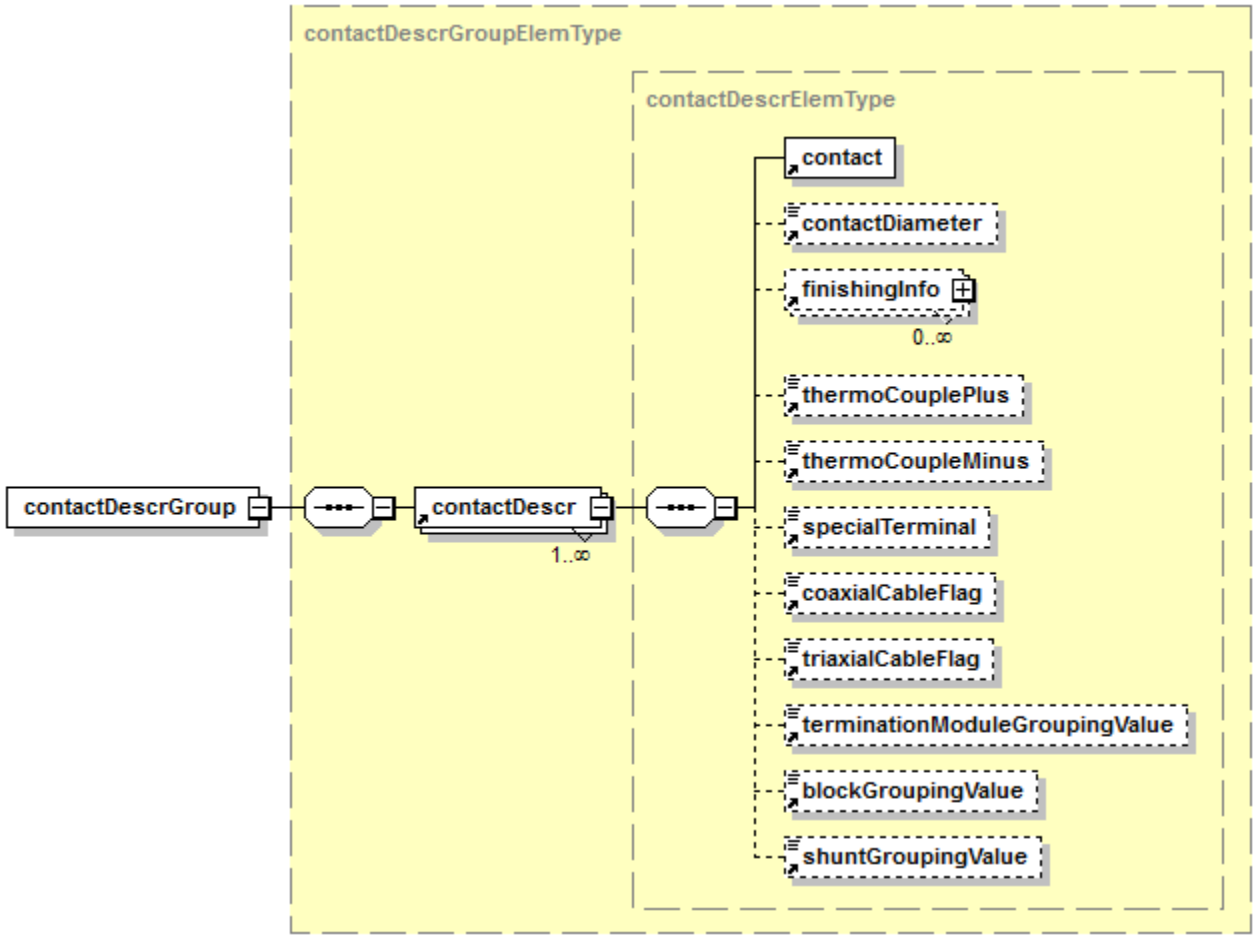
Markup example:

```
<contactCount>40</contactCount>
```

2.8 List of contact descriptions

Description: The element <contactDescrGroup> contains a list of contact descriptions.

Markup element: <contactDescrGroup>



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Fig 2 Element <contactDescrGroup>

Attributes:

– None

Child elements:

– <contactDescr>, the contact description. Refer to Para 2.8.1.

Markup example:

```
<contactDescrGroup>
<contactDescr><contact contactIdent="1"/></contactDescr>
<contactDescr><contact contactIdent="2"/></contactDescr>
</contactDescrGroup>
```

2.8.1 Contact description

Description: The element <contactDescr> contains a list of contact descriptions.

Markup element: <contactDescr>

Attributes:

– None

Child elements:

- <contact>, the contact identification. Refer to Para 2.8.1.1.
- <contactDiameter>, the contact diameter. Refer to Para 2.8.1.2.
- <finishingInfo>, the finishing information for the connection of wires. Refer to Para 2.8.1.3.
- <thermoCouplePlus>, identifies the positive contact of thermocouples. Refer to Para 2.8.1.4.
- <thermoCoupleMinus>, identifies the negative contact of thermocouples. Refer to Para 2.8.1.5.
- <specialTerminal>, the special terminal information. Refer to Para 2.8.1.6.
- <coaxialCableFlag>, the coaxial information. Refer to Para 2.8.1.7.
- <triaxialCableFlag>, the tri-axial information. Refer to Para 2.8.1.8.
- <terminationModuleGroupingValue>, used for contacts that belong to the same module of a termination module assembly. Refer to Para 2.8.1.9.
- <blockGroupingValue>, used for contacts that belong to the same block of a termination module assembly or the same pole of a switch or a relay. Refer to Para 2.8.1.10.
- <shuntGroupingValue>, used for contacts that belong to the same shunt/bus of a termination module or the same position of a switch or a relay. Refer to Para 2.8.1.11.

2.8.1.1 Contact identification

Description: The element <contact> describes the contact identification through its attributes. Refer to Chap 3.9.5.2.9.2.

Normally, the attribute contactFunction is not used in this context. The attributes connectedFlag and wireInstallationDirection must not be used in this context.

2.8.1.2 Contact diameter

Description: The element <contactDiameter> describes the diameter of a contact.

Markup element: <contactDiameter>

Attributes:

- unitOfMeasure (O), the unit of measure for the contact diameter

Child elements:

- None

Markup example:

The following example shows the markup of a 1,15 millimeter contact diameter.

```
<contactDiameter unitOfMeasure="mm">1,15</contactDiameter>
```

2.8.1.3 Finishing information

Description: The element <finishingInfo> contains the finishing information for the connection of wires to a contact. Refer to Chap 3.9.5.2.9.2.

2.8.1.4 Thermocouple plus

Description: The element <thermoCouplePlus> identifies the positive contact of thermocouples. It is recommended to identify thermocouple contacts by populating this element

with the value "Y". If the contact is not a thermocouple plus, this element can be populated with the value "N", or not used at all.

Markup element: <thermoCouplePlus>

Attributes:

– None

Child elements:

– None

Markup example:

The following example shows the markup of a contact, which is the positive contact of a thermocouple.

```
<thermoCouplePlus>Y</thermoCouplePlus>
```

2.8.1.5 Thermocouple minus

Description: The element <thermoCoupleMinus> identifies the negative contact of thermocouples. It is recommended to identify thermocouple contacts by populating this element with the value "Y". If the contact is not a thermocouple minus, this element can be populated with the value "N", or not used at all.

Markup element: <thermoCoupleMinus>

Attributes:

– None

Child elements:

– None

Markup example:

The following example shows the markup of a contact, which is the negative contact of a thermocouple.

```
<thermoCoupleMinus>Y</thermoCoupleMinus>
```

2.8.1.6 Special terminal information

Description: The element <specialTerminal> identifies special terminals. It is recommended to define all special terminals and to identify them by populating this element with the value "Y". If the contact is not a special terminal, this element can be populated with the value "N", or not used at all.

Markup element: <specialTerminal>

Attributes:

– None

Child elements:

– None

Markup example:

The example shows the markup of a contact, which is a special terminal.

```
<specialTerminal>Y</specialTerminal>
```

2.8.1.7 Coaxial information

Description: The coax information element <coaxialCableFlag> identifies coaxial contacts. It is recommended to identify coaxial contacts by populating this element with the value "Y". If the contact is not a coaxial contact, this element can be populated with the value "N", or not used at all.

Markup element: <coaxialCableFlag>

Attributes:

– None

Child elements:

– None

Markup example:

The example shows the markup of a coaxial contact.

```
<coaxialCableFlag>Y</coaxialCableFlag>
```

2.8.1.8 Tri-axial information

Description: The tri-axial information element <triaxialCableFlag> identifies tri-axial contacts. It is recommended to identify tri-axial contacts by populating this element with the value "Y". If the contact is not a tri-axial contact, this element can be populated with the value "N", or not used at all.

Markup element: <triaxialCableFlag>

Attributes:

– None

Child elements:

– None

Markup example:

The example shows the markup of a tri-axial contact.

```
<triaxialCableFlag>Y</triaxialCableFlag>
```

2.8.1.9 Termination module grouping information

Description: The element <terminationModuleGroupingValue> identifies the terminal modules on a mounting rail. If possible, this element gets allocated the same value that is used for the coding of the termination module grouping element <terminationModuleGroupingValue> as child element of the electrical potential element <electricalPotential> in the wire connection code. Refer to Chap 3.9.5.2.9.2.

Markup element: <terminationModuleGroupingValue>

Attributes:

– None

Child elements:

– None

2.8.1.10 Block grouping information

Description: The element <blockGroupingValue> contains the block information of terminal modules. If possible, this element gets allocated the same value that is used for the coding of the block grouping element <blockGroupingValue> as child element of the electrical potential element <electricalPotential> in the wire connection code. Refer to Chap 3.9.5.2.9.2.

Markup element: <blockGroupingValue>

Attributes:

– None

Child elements:

– None

2.8.1.11 Shunt grouping information

Description: The element <shuntGroupingValue> is used to divide contacts of terminal modules, which are electrically connected, into groups, the busses. If possible, this element gets allocated the same value that is used for the coding of the shunt element <shuntGroupingValue> as child element of the electrical potential element <electricalPotential> in the wire connection code. Refer to Chap 3.9.5.2.9.2.

Markup element: <shuntGroupingValue>

Attributes:

– None

Child elements:

– None

2.9 Electrical logic

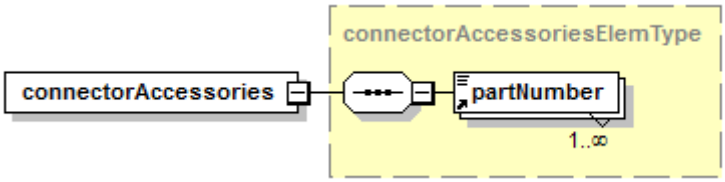
Description: In this context, the electrical logic element <electricalLogic> provides an optional container for electrical states and internal connections between contacts for standard parts. Refer to Chap 3.9.5.2.9.4.

2.10 List of accessories

Description: The element <connectorAccessories> contains the part numbers of accessories for the connector.

More than one accessory of the same kind can be available for a connector (eg, cable clamps with different angular positions). In this case, all possible accessories can be added to the connector, which results in more than one cable clamp appearing in the list of accessories. Another method in this case is to use different connector containers for the same connector, listing only one accessory of the same kind. This second method can generate a considerable amount of connector data. Therefore it is recommended to list all available accessories in one data set.

Markup element: <connectorAccessories>



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Fig 3 Element <connectorAccessories>

Attributes:

– None

Child elements:

– <partNumber>, the part number of an accessory. Refer to Para 2.1.

Markup example:

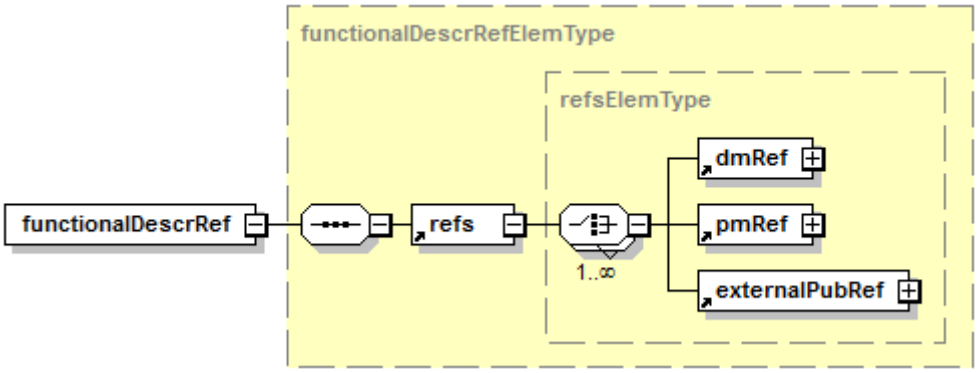
The following markup example shows the use of the element <connectorAccessories> for the connector JN1003FG22-35PN1.

```
<connectorAccessories>
<partNumber>JN1003P22</partNumber>
<partNumber>JN1003C22</partNumber>
<partNumber>JN1003D22</partNumber>
<partNumber>JN1003K22</partNumber>
<partNumber>JN1003L22</partNumber>
<partNumber>JN1003MA22</partNumber>
<partNumber>JN1003MB22</partNumber>
<partNumber>JN1003MF22</partNumber>
<partNumber>JN1003N22</partNumber>
</connectorAccessories>
```

2.11 Functional description reference

Description: The functional description reference element <functionalDescrRef> contains references to other parts of the electrical system publications for further information about a connector (eg, a description of how it is made (specification of the connector)). References must be populated in accordance with Chap 3.9.5.2.1.2.

Markup element: <functionalDescrRef>



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Fig 4 Element <functionalDescrRef>

Attributes:

– None

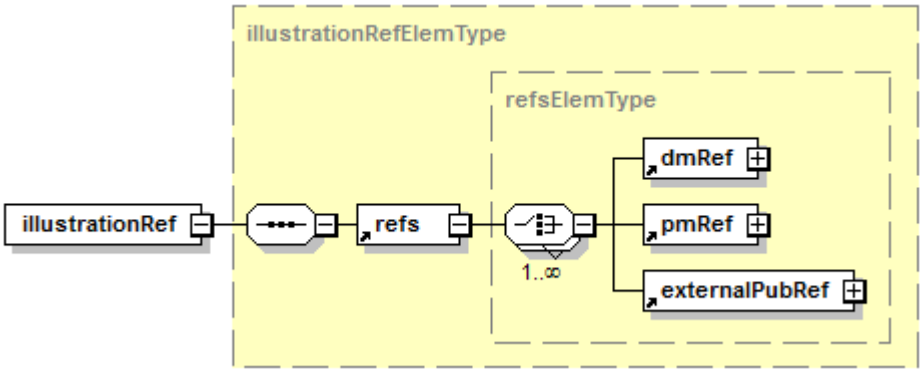
Child elements:

– <refs>, the functional description reference information. Refer to Chap 3.9.5.2.1.2.

2.12 Illustration reference

Description: The illustration reference element <illustrationRef> contains references to other parts of the electrical system publications, which show illustrations of the connector (eg, the insert arrangement of the connector). References must be populated in accordance with Chap 3.9.5.2.1.2.

Markup element: <illustrationRef>



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Fig 5 Element <illustrationRef>

Attributes:

– None

Child elements:

– <refs>, the illustration reference information. Refer to Chap 3.9.5.2.1.2.

3 Examples

The following markup example shows the use of the element <contactDescrGroup> for a terminal junction module with two busses, 1-2 and 3-4, and four contacts of the diameter 1,15 mm.

```
<contactDescrGroup>
<contactDescr>
<contact contactIdent="1"/>
<contactDiameter unitOfMeasure="mm">1,15</contactDiameter>
<thermoCouplePlus>N</thermoCouplePlus>
<thermoCoupleMinus>N</thermoCoupleMinus>
<specialTerminal>N</specialTerminal>
<coaxialCableFlag>N</coaxialCableFlag>
<triaxialCableFlag>N</triaxialCableFlag>
<terminationModuleGroupingValue>1
</terminationModuleGroupingValue>
<blockGroupingValue>1</blockGroupingValue>
```

```
<shuntGroupingValue>1</shuntGroupingValue>
</contactDescr>
<contactDescr>
<contact contactIdent="2"/>
<contactDiameter unitOfMeasure="mm">1,15</contactDiameter>
<thermoCouplePlus>N</thermoCouplePlus>
<thermoCoupleMinus>N</thermoCoupleMinus>
<specialTerminal>N</specialTerminal>
<coaxialCableFlag>N</coaxialCableFlag>
<triaxialCableFlag>N</triaxialCableFlag>
<terminationModuleGroupingValue>1
</terminationModuleGroupingValue>
<blockGroupingValue>1</blockGroupingValue>
<shuntGroupingValue>1</shuntGroupingValue>
</contactDescr>
<contactDescr>
<contact contactIdent="3"/>
<contactDiameter unitOfMeasure="mm">1,15</contactDiameter>
<thermoCouplePlus>N</thermoCouplePlus>
<thermoCoupleMinus>N</thermoCoupleMinus>
<specialTerminal>N</specialTerminal>
<coaxialCableFlag>N</coaxialCableFlag>
<triaxialCableFlag>N</triaxialCableFlag>
<terminationModuleGroupingValue>1
</terminationModuleGroupingValue>
<blockGroupingValue>1</blockGroupingValue>
<shuntGroupingValue>2</shuntGroupingValue>
</contactDescr>
<contactDescr>
<contact contactIdent="4"/>
<contactDiameter unitOfMeasure="mm">1,15</contactDiameter>
<thermoCouplePlus>N</thermoCouplePlus>
<thermoCoupleMinus>N</thermoCoupleMinus>
<specialTerminal>N</specialTerminal>
<coaxialCableFlag>N</coaxialCableFlag>
<triaxialCableFlag>N</triaxialCableFlag>
<terminationModuleGroupingValue>1
</terminationModuleGroupingValue>
<blockGroupingValue>1</blockGroupingValue>
<shuntGroupingValue>2</shuntGroupingValue>
</contactDescr>
</contactDescrGroup>
```

Chapter 3.9.5.2.9.6

Wiring data - Standard parts, Distribution part

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Chap 3.9.5.2.9.5	Wiring data - Standard parts, Connector
Chap 3.9.5.3	Data modules - Applicability

1 General

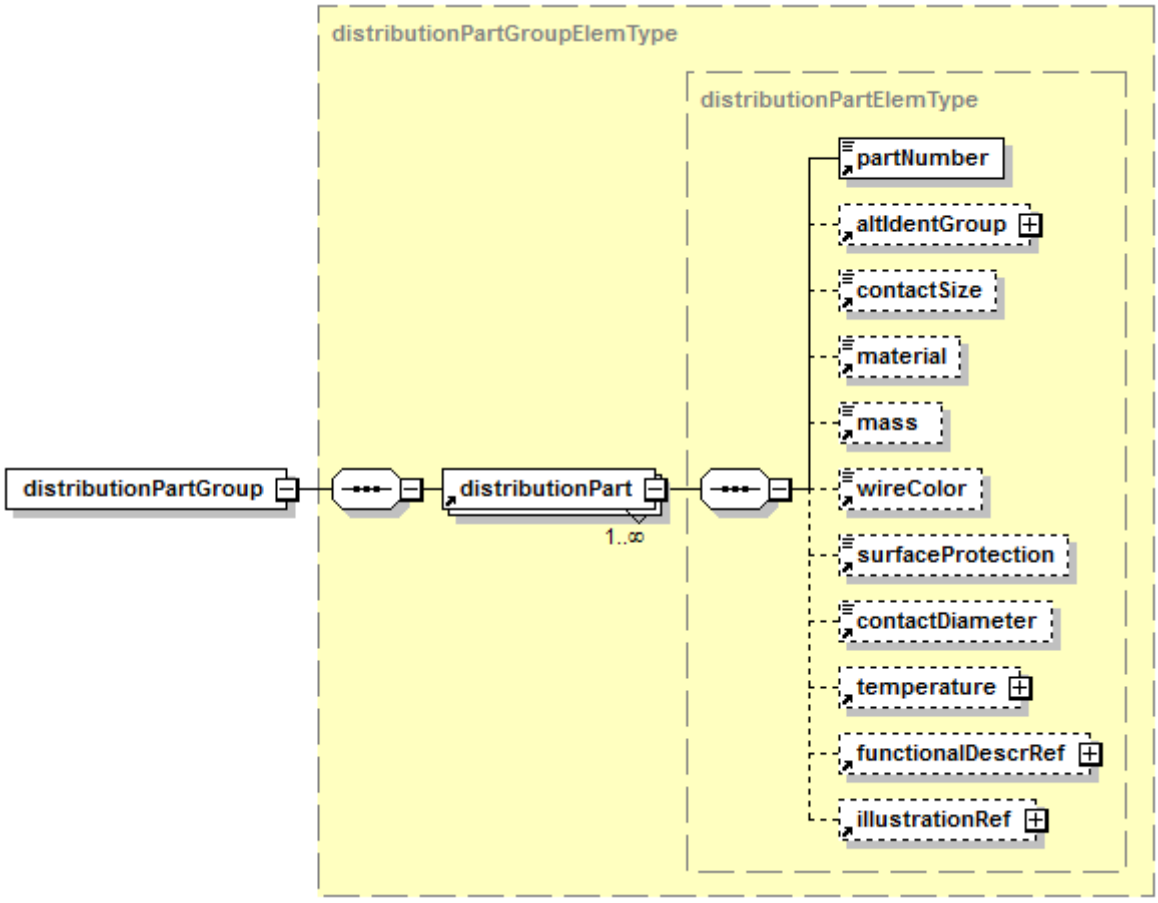
The element <distributionPart> and its child elements are used to capture and represent distribution parts, which are used for the Product, and the related standard parts information.

2 Element <distributionPart> and child elements

Description: The element <distributionPart> is contained in the list of distribution parts element <distributionPartGroup>. The list of distribution parts is a child element of the list of the standard parts element <standardPartGroup>.

It contains information concerning the properties of distribution parts, like contacts and splices, used in the Product's wiring.

Markup element: <distributionPart>



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Fig 1 Element <distributionPart>

Attributes:

- `applicRefId` (O), the applicability information of a distribution part by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- **Child elements**:
- <`partNumber`>, the part number of the distribution part. Refer to Para 2.1.
- <`altIdentGroup`>, the list of alternative identifications. Refer to Para 2.2.
- <`contactSize`>, the contact size. Refer to Para 2.3.
- <`material`>, the material information. Refer to Para 2.4.
- <`mass`>, the mass of the distribution part. Refer to Para 2.5.
- <`wireColor`>, the color information. Refer to Para 2.6.
- <`surfaceProtection`>, the surface protection information. Refer to Para 2.7.
- <`contactDiameter`>, the contact diameter. Refer to Para 2.8.
- <`temperature`>, the temperature information. Refer to Para 2.9.
- <`functionalDescrRef`>, the functional description reference. Refer to Para 2.10.
- <`illustrationRef`>, the reference to illustrations. Refer to Para 2.11.

Markup example:

```
<wiringData>
<standardPartGroup>
<distributionPartGroup>
<distributionPart>
<partNumber>PAN6466A</partNumber>
</distributionPart>
<distributionPart>
<partNumber>PAN7568A</partNumber>
</distributionPart>
</distributionPartGroup>
</standardPartGroup>
</wiringData>
```

2.1 Part number

Description: The element <`partNumber`> contains the project or the organization specific part number of a distribution part. Refer to Chap 3.9.5.2.1.9. The part number serves as a link to the electrical equipment. Refer to Chap 3.9.5.2.9.4.

2.2 Alternative identifications

Description: The element <`altIdentGroup`> contains a list of alternative identifications for distribution parts, described by manufacturer part numbers and the related manufacturer. Refer to Chap 3.9.5.2.9.4.

2.3 Contact size

Description: The element <`contactSize`> contains size information about a distribution part, normally for a contact.

Markup element: <`contactSize`>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows the use of the element <contactSize> for the contact JN1003S12 of size 12.

```
<contactSize>12</contactSize>
```

2.4 Material

Description: The element <material> describes the material of which the distribution part is made.

Markup element: <material>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows the use of the element <material> for a distribution part made of copper alloy.

```
<material>Copper alloy</material>
```

2.5 Mass

Description: The element <mass> contains the mass information of a distribution part. If used, this element must be populated in accordance with Chap 3.9.5.2.9.5.

2.6 Color

Description: The element <wireColor> contains the color information of a distribution part. This element can be used to indicate the color codes (color bands) of contacts or splices. Refer to Chap 3.9.5.2.9.2.

Markup example:

The following markup example shows the use of the element <wireColor> for a contact with a three-color band of the colors orange, blue and green.

```
<wireColor>Orange/Blue/Green</wireColor>
```

2.7 Protection

Description: The element <surfaceProtection> contains the protection information applied to the surface of a distribution part.

Markup element: <surfaceProtection>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows the use of the element <surfaceProtection> for a gold plated contact.

```
<surfaceProtection>Gold plated</surfaceProtection>
```

2.8 Contact diameter

Description: The element <contactDiameter> describes the diameter of a distribution part, normally for contacts. Refer to Chap 3.9.5.2.9.5.

Markup example:

The following markup example shows the use of the element <contactDiameter> for a contact of the size 12 (outer diameter = 2,41 millimeter).

```
<contactDiameter unitOfMeasure="mm">2,41</contactDiameter>
```

2.9 Temperature

Description: The element <temperature> describes the minimum and maximum temperature for which the distribution part is approved. Refer to Chap 3.9.5.2.9.3.

Markup example:

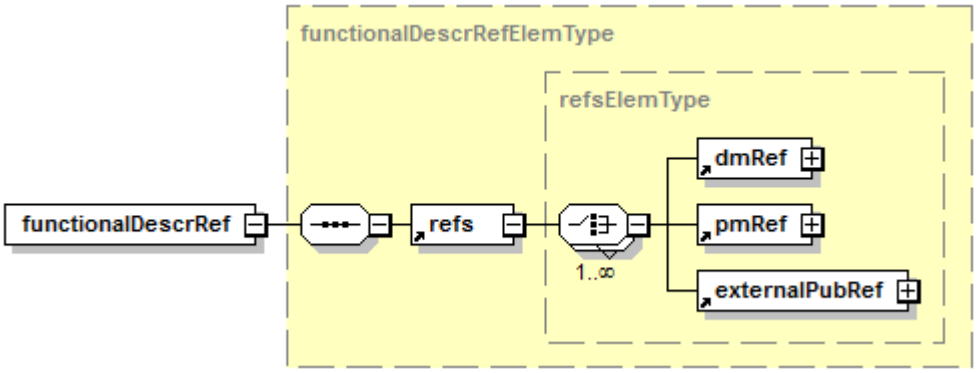
The following markup example shows the use of the element <temperature> for a distribution part, which is approved for temperatures from -55° C to 150° C.

```
<temperature>
<minTemperature unitOfMeasure="degC">-55</minTemperature>
<maxTemperature unitOfMeasure="degC">150</maxTemperature>
</temperature>
```

2.10 Functional description reference

Description: The element <functionalDescrRef> contains references to other parts of the electrical system publications for further information about a distribution part (eg, a description of how it is made (specification of the distribution part)).

Markup element: <functionalDescrRef>



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Fig 2 Element <functionalDescrRef>

Attributes:

– None

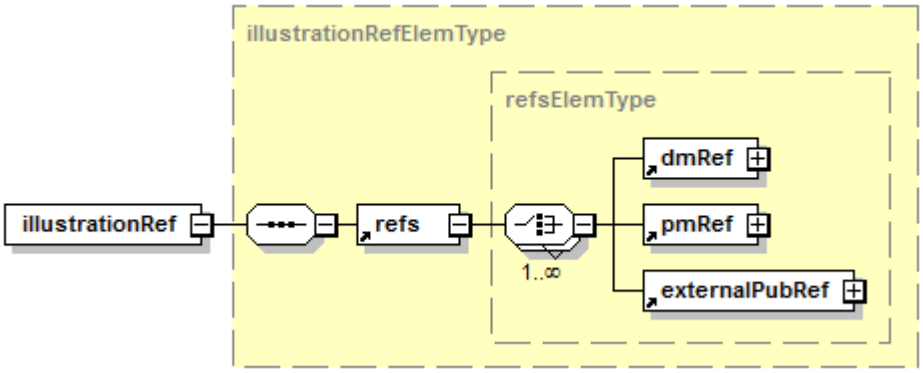
Child elements:

– <refs>, the functional description reference information. Refer to Chap 3.9.5.2.1.2.

2.11 Illustration reference

Description: The element <illustrationRef> contains references to other parts of the electrical system publications, which show illustrations of the distribution part.

Markup element: <illustrationRef>



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Fig 3 Element <illustrationRef>

Attributes:

– None

Child elements:

– <refs>, the illustration reference information. Refer to Chap 3.9.5.2.1.2.

Chapter 3.9.5.2.9.7

Wiring data - Standard parts, Accessory

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Chap 3.9.5.2.9.4	Wiring data - Electrical equipment
Chap 3.9.5.2.9.5	Wiring data - Standard parts, Connector
Chap 3.9.5.3	Data modules - Applicability

1 General

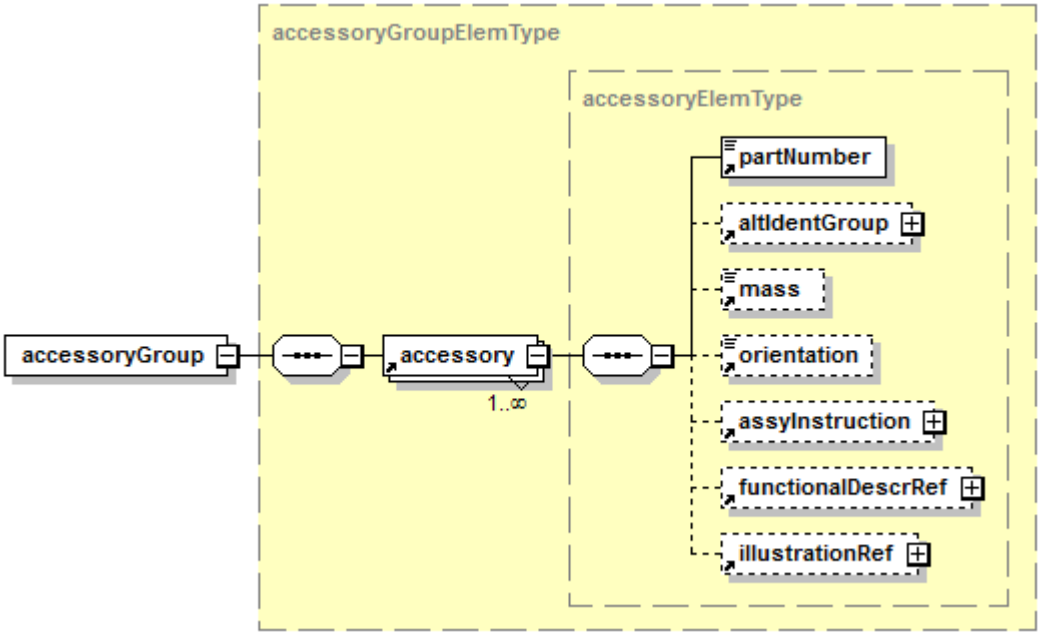
The element <accessory> and its child elements are used to capture and represent accessories, which are used for the Product, and the related standard parts information.

2 Element <accessory> and child elements

Description: The element <accessory> is contained in the list of accessories element <accessoryGroup>. The list of accessories is a child element of the list of the standard parts element <standardPartGroup>.

It contains information concerning the properties of accessories used in the Product's wiring.

Markup element: <accessory>



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Fig 1 Element <accessoryGroup>

Attributes:

- applicRefId (O), the applicability information of an accessory by referencing the element <applic>. Refer to Chap 3.9.5.3.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <partNumber>, the part number of the accessory. Refer to Para 2.1.
- <altIdentGroup>, the list of alternative identifications. Refer to Para 2.2.
- <mass>, the mass of the accessory. Refer to Para 2.3.
- <orientation>, the orientation information. Refer to Para 2.4.
- <assyInstruction>, the assembly instruction information. Refer to Para 2.5.
- <functionalDescrRef>, the functional description reference. Refer to Para 2.6.
- <illustrationRef>, the reference to illustrations. Refer to Para 2.7.

Markup example:

```
<wiringData>
<standardPartGroup>
<accessoryGroup>
<accessory><partNumber>accy_123</partNumber></accessory>
<accessory><partNumber>accy_456</partNumber></accessory>
</accessoryGroup>
</standardPartGroup>
</wiringData>
```

2.1 Part number

Description: The element <partNumber> contains the project or the organization specific part number of an accessory. Refer to Chap 3.9.5.2.1.9. The part number is the link of the accessory with its properties to the list of accessories element <connectorAccessories>. Refer to Chap 3.9.5.2.9.5.

2.2 Alternative identifications

Description: The element <altIdentGroup> contains alternative identifications of an accessory, described by manufacturer part numbers and the related manufacturer. Refer to Chap 3.9.5.2.9.4.

2.3 Mass

Description: The element <mass> contains the mass information of an accessory. Refer to Chap 3.9.5.2.9.5.

2.4 Orientation

Description: The element <orientation> contains orientation information of an accessory. Orientation information of accessories is normally part of the accessory part number in coded form. The orientation can represent the angle of a cable clamp. Refer to Chap 3.9.5.2.9.5.

Markup example:

The following markup example shows the use of the element <orientation> to indicate the orientation of a 90° cable clamp.

```
<orientation>90</orientation>
```

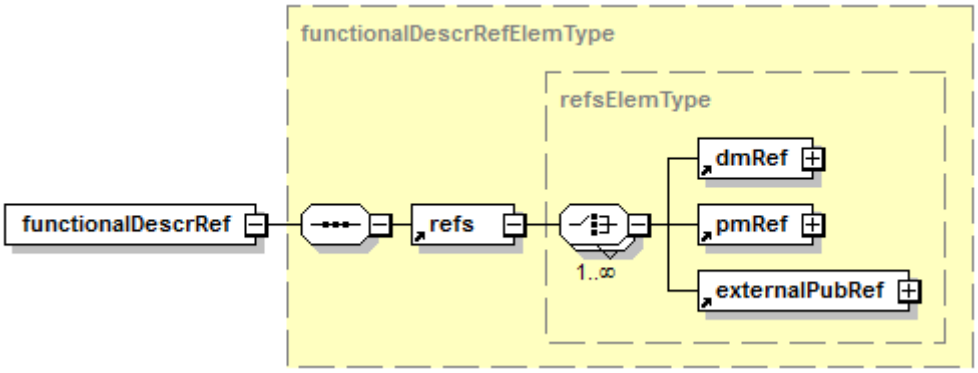
2.5 Assembly instructions

Description: The element <assyInstruction> is used as a container for the subordinate accessory assembly information.

2.6 Functional description reference

Description: The functional description reference element <functionalDescrRef> contains references to other parts of the electrical system publications for further information about an accessory (eg, a description of how it is made (specification of the accessory)).

Markup element: <functionalDescrRef>



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Fig 2 Element <functionalDescrRef>

Attributes:

– None

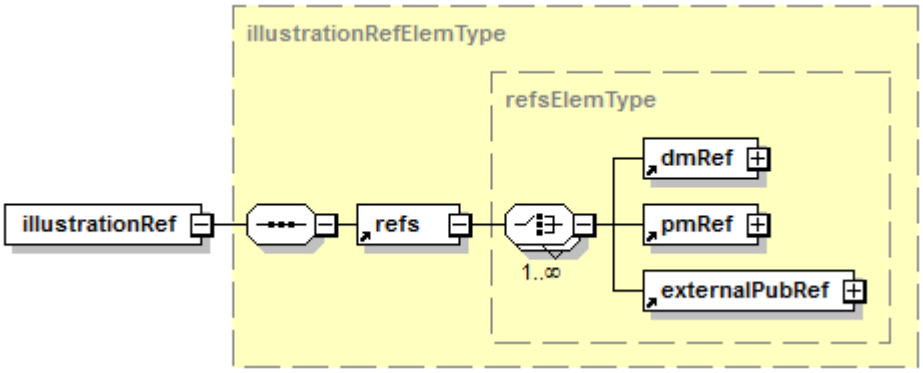
Child elements:

– <refs>, the functional description reference information. Refer to Chap 3.9.5.2.1.2.

2.7 Illustration reference

Description: The Illustration reference element <illustrationRef> contains references to other parts of the electrical system publications, which show illustrations of the accessory.

Markup element: <illustrationRef>



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Fig 3 Element <illustrationRef>

Attributes:

– None

Child elements:

– <refs>, the illustration reference information. Refer to Chap 3.9.5.2.1.2.

Chapter 3.9.5.2.9.8

Wiring data - Standard parts, Solder sleeve

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Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.9.4	Wiring data - Electrical equipment
Chap 3.9.5.2.9.5	Wiring data - Standard parts, Connector
Chap 3.9.5.3	Data modules - Applicability

1 General

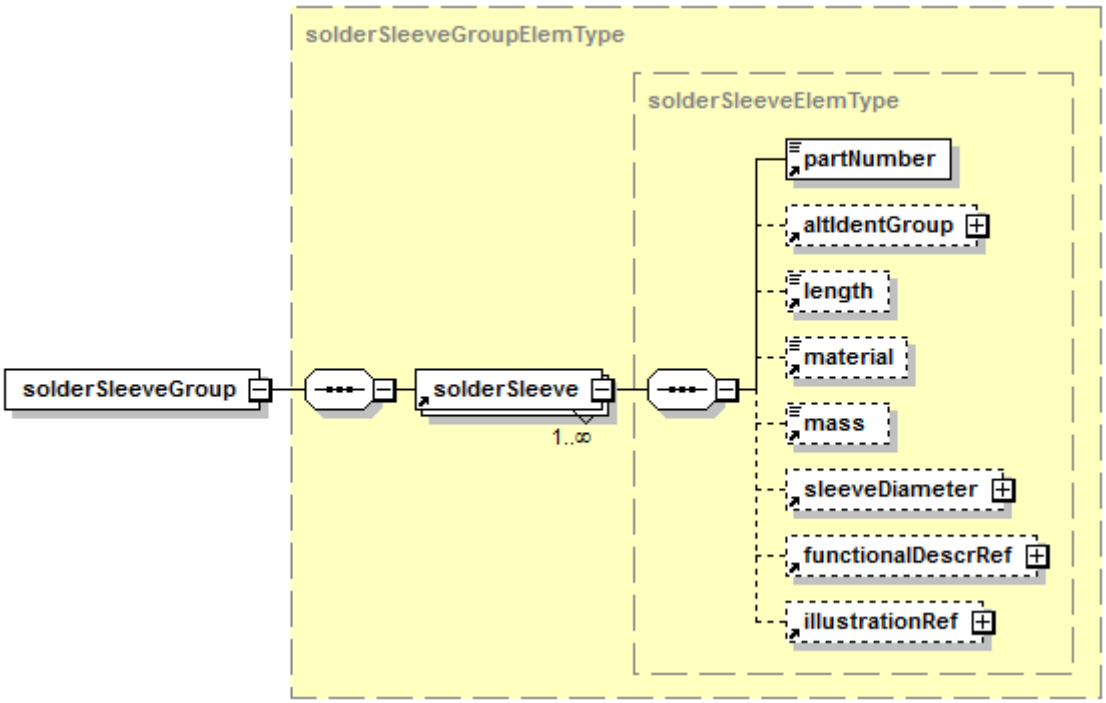
The element <solderSleeve> and its child elements are used to capture and represent solder sleeves that are used for the Product, and the related standard parts information.

2 Description of element <solderSleeve> and child elements

Description: The element <solderSleeve> is contained in the list of solder sleeves element <solderSleeveGroup>. The list of solder sleeves is a child element of the list of the standard parts element <standardPartGroup>.

It contains information concerning the properties of solder sleeves used in the Product's wiring.

Markup element: <solderSleeve>



ICN-C0419-S1000D0309-001-01

Fig 1 Element <solderSleeve>

Attributes:

- applicRefId (O), the applicability information of a solder sleeve by referencing the element <applic>. Refer to Chap 3.9.5.3.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <partNumber>, the part number of the solder sleeve. Refer to Para 2.1.
- <altIdentGroup>, the list of alternative identifications. Refer to Para 2.2.
- <length>, the length of the solder sleeve. Refer to Para 2.3.
- <material>, the material of the solder sleeve. Refer to Para 2.4.

- <mass>, the mass of the solder sleeve. Refer to Para 2.5.
- <sleeveDiameter>, the sleeve diameter. Refer to Para 2.6.
- <functionalDescrRef>, the functional description reference. Refer to Para 2.7.
- <illustrationRef>, the reference to illustrations. Refer to Para 2.8.

Markup example:

```
<wiringData>
<standardPartGroup>
<solderSleeveGroup>
<solderSleeve><partNumber>solder_987</partNumber></solderSleeve>
<solderSleeve><partNumber>solder_654</partNumber></solderSleeve>
</solderSleeveGroup>
</standardPartGroup>
</wiringData>
```

2.1 Part number

Description: The element <partNumber> contains the project or the organization specific part number of a solder sleeve. Refer to Chap 3.9.5.2.1.9.

2.2 Alternative identification

Description: The element <altIdentGroup> contains alternative identifications of a solder sleeve, described by manufacturer part numbers and the related manufacturer. Refer to Chap 3.9.5.2.9.4.

2.3 Length

Description: The element <length> contains the length information of a solder sleeve.

Note

The attribute wireLengthType provides additional length information for wires. It must not be used to describe the length of solder sleeves.

Markup element: <length>

Attributes:

- unitOfMeasure (O), the unit of measure for the solder sleeve length
- wireLengthType (O), the type of wire length, must not be used for solder sleeves

Child elements:

- None

Markup example:

The following markup example shows the use of the element <length> to provide length information for a solder sleeve with part number PAN6468A.

```
<length unitOfMeasure="mm">14,23</length>
```

2.4 Material

Description: The element <material> describes the material of which a solder sleeve is made.

Markup element: <material>

Attributes:

– None

Child elements:

– None

Markup example:

```
<material>Nickel</material>
```

2.5 Mass

Description: The element <mass> contains the mass information of a solder sleeve. Refer to Chap 3.9.5.2.9.5.

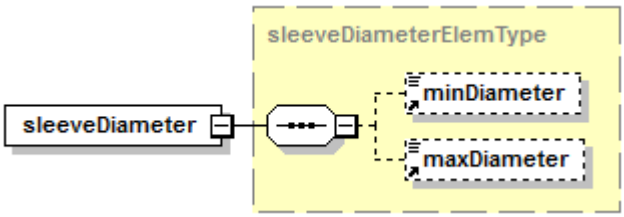
Markup example:

```
<mass unitOfMeasure="g">0,226</mass>
```

2.6 Sleeve diameter

Description: The element <sleeveDiameter> contains the minimum and maximum diameter of a solder sleeve. Solder sleeves are normally defined by using several diameters (eg, diameters of the sleeve, or entry diameters). If this element is used, it must be defined which diameter is given.

Markup element: <sleeveDiameter>



ICN-C0419-S1000D0310-001-01

Fig 2 Element <sleeveDiameter>

Attributes:

– None

Child elements:

– <minDiameter>, the minimum diameter of a solder sleeve. Refer to Para 2.6.1.
– <maxDiameter>, the maximum diameter of a solder sleeve. Refer to Para 2.6.2.

Markup example:

The following markup example shows the use of the element <sleeveDiameter> and its child elements to provide entry diameter information for a solder sleeve.

```
<sleeveDiameter>
<minDiameter unitOfMeasure="mm">2,04</minDiameter>
<maxDiameter unitOfMeasure="mm">5,08</maxDiameter>
</sleeveDiameter>
```

2.6.1 Minimum sleeve diameter

Description: The element <minDiameter> contains the minimum diameter of a solder sleeve.

Markup element: <minDiameter>

Attributes:

– unitOfMeasure (O), the unit of measure for the solder sleeve diameter

Child elements:

– None

2.6.2 Maximum sleeve diameter

Description: The element <maxDiameter> contains the maximum diameter of a solder sleeve.

Markup element: <maxDiameter>

Attributes:

– unitOfMeasure (O), the unit of measure for the solder sleeve diameter

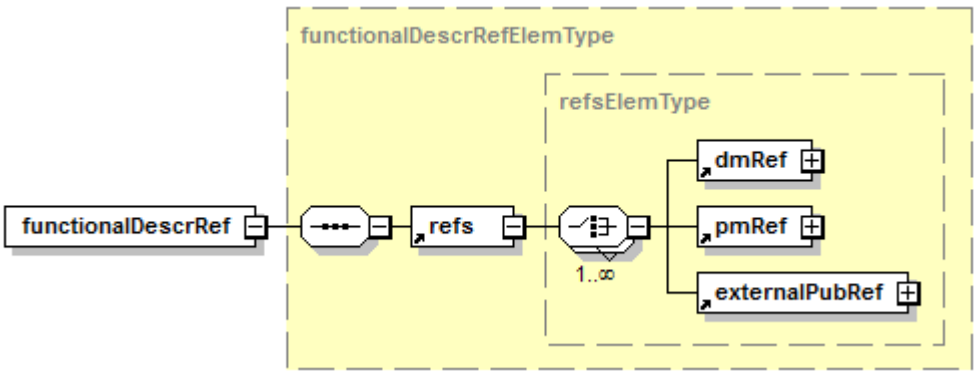
Child elements:

– None

2.7 Functional description reference

Description: The element <functionalDescrRef> contains references to other parts of the electrical system publications for further information about a solder sleeve (eg, a description of how it is made (specification of the sleeve)).

Markup element: <functionalDescrRef>



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Fig 3 Element <functionalDescrRef>

Attributes:

– None

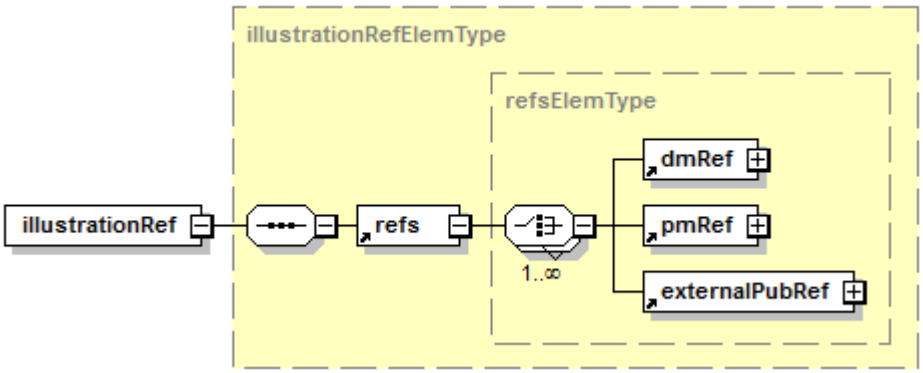
Child elements:

– <refs>, the functional description reference information. Refer to Chap 3.9.5.2.1.2.

2.8 Illustration reference

Description: The element <illustrationRef> contains references to other parts of the electrical system publications, which show illustrations of the solder sleeve.

Markup element: <illustrationRef>



ICN-C0419-S1000D0292-001-01

Fig 4 Element <illustrationRef>

Attributes:

– None

Child elements:

– <refs>, the illustration reference information. Refer to Chap 3.9.5.2.1.2.

Chapter 3.9.5.2.9.9

Wiring data - Standard parts, Shrink sleeve

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Chap 3.9.5.2.9.2	Wiring data - Wire
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Chap 3.9.5.2.9.8	Wiring data - Standard parts, Solder sleeve
Chap 3.9.5.3	Data modules - Applicability

1 General

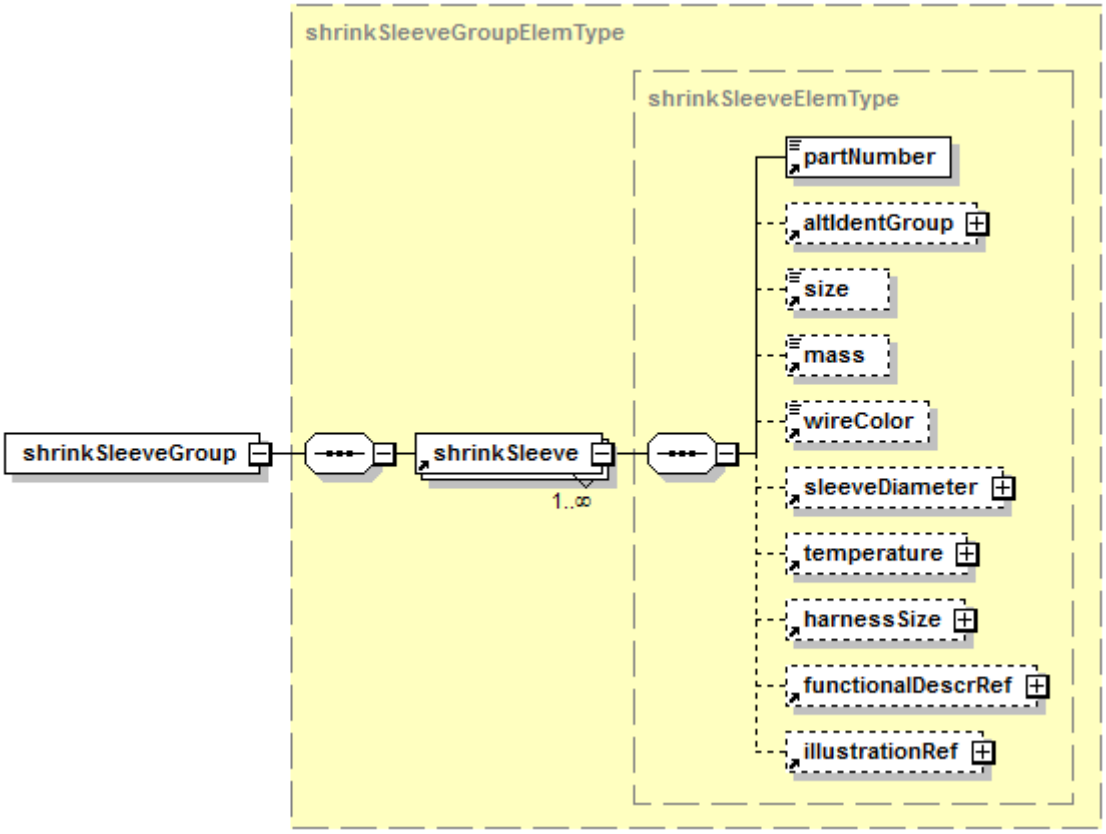
The element <shrinkSleeve> and its child elements are used to capture and represent shrink sleeves, which are used for the Product, and the related standard parts information.

2 Element <shrinkSleeve> and child elements

Description: The element <shrinkSleeve> is contained in the list of shrink sleeves element <shrinkSleeveGroup>. The list of shrink sleeves is a child element of the list of the standard parts element <standardPartGroup>.

It contains information concerning the properties of shrink sleeves used in the Product's wiring.

Markup element: <shrinkSleeve>



ICN-C0419-S1000D0311-001-01

Fig 1 Element <shrinkSleeve>

Attributes:

- `applicRefId` (O), the applicability information of a shrink sleeve by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`partNumber`>, the part number of the shrink sleeve. Refer to Para 2.1.
- <`altIdentGroup`>, the list of alternative identifications. Refer to Para 2.2.
- <`size`>, the size information of the shrink sleeve. Refer to Para 2.3.
- <`mass`>, the mass of the shrink sleeve. Refer to Para 2.4.
- <`wireColor`>, the color information of the shrink sleeve. Refer to Para 2.5.
- <`sleeveDiameter`>, the sleeve diameter. Refer to Para 2.6.
- <`temperature`>, the temperature information. Refer to Para 2.7.
- <`harnessSize`>, the harness size. Refer to Para 2.8.
- <`functionalDescrRef`>, the functional description reference. Refer to Para 2.9.
- <`illustrationRef`>, the reference to illustrations. Refer to Para 2.10.

Markup example:

```
<wiringData>
<standardPartGroup>
<shrinkSleeveGroup>
<shrinkSleeve><partNumber>shrink_456</partNumber></shrinkSleeve>
<shrinkSleeve><partNumber>shrink_789</partNumber></shrinkSleeve>
</shrinkSleeveGroup>
</standardPartGroup>
</wiringData>
```

2.1 Part number

Description: The element <`partNumber`> contains the project or the organization specific part number of a shrink sleeve. Refer to Chap 3.9.5.2.1.9.

2.2 Alternative identifications

Description: The element <`altIdentGroup`> contains alternative identifications of a shrink sleeve, described by manufacturer part numbers and the related manufacturer. Refer to Chap 3.9.5.2.9.4.

2.3 Size

Description: The element <`size`> contains the size information of a shrink sleeve.

Markup element: <`size`>

Attributes:

- `unitOfMeasure` (O), the unit of measure for the shrink sleeve size

Child elements:

- None

Markup example:

```
<size unitOfMeasure="in">3/16</size>
```

2.4 Mass

Description: The element <mass> contains the mass information of a shrink sleeve. Refer to Chap 3.9.5.2.9.5.

Markup example:

```
<mass unitOfMeasure="kg/m">0,350</mass>
```

2.5 Color

Description: The element <wireColor> contains the color information of a shrink sleeve. Refer to Chap 3.9.5.2.9.2.

Markup example:

```
<wireColor>Transparent</wireColor>
```

2.6 Sleeve diameter

Description: The element <sleeveDiameter> contains the minimum and maximum diameter of a shrink sleeve. Shrink sleeves are normally defined by using diameter information before and after shrinking. If this element is used, it must be defined which diameter is given.

Markup element: <sleeveDiameter>

Attributes:

- None

Child elements:

- <minDiameter>, the minimum diameter of a shrink sleeve. Refer to Chap 3.9.5.2.9.8.
- <maxDiameter>, the maximum diameter of a shrink sleeve. Refer to Chap 3.9.5.2.9.8.

Markup example:

The following markup example shows the use of the element <sleeveDiameter> for a shrink sleeve. The minimum diameter contains the minimum diameter before shrinking, the maximum diameter contains the maximum diameter after shrinking.

```
<sleeveDiameter>
<minDiameter unitOfMeasure="mm">1,6</minDiameter>
<maxDiameter unitOfMeasure="mm">0,8</maxDiameter>
</sleeveDiameter>
```

2.7 Temperature

Description: The element <temperature> describes the minimum and maximum temperature, for which the shrink sleeve is approved. Refer to Chap 3.9.5.2.9.3.

Markup example:

The following markup example shows the use of the element <temperature> to provide the approved operating temperature range for a shrink sleeve.

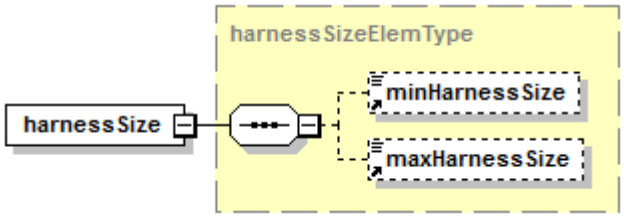
```
<temperature>
<minTemperature unitOfMeasure="degC">-55</minTemperature>
```

```
<maxTemperature unitOfMeasure="degC">175</maxTemperature>
</temperature>
```

2.8 Harness size

Description: The element <harnessSize> describes the minimum and the maximum size of the harness, to which a shrink sleeve can be applied.

Markup element: <harnessSize>



ICN-C0419-S1000D0312-001-01

Fig 2 Element <harnessSize>

Attributes:

– None

Child elements:

– <minHarnessSize>, the minimum harness size. Refer to Para 2.8.1.
– <maxHarnessSize>, the maximum harness size. Refer to Para 2.8.2.

Markup example:

The following markup example shows the use of the element <harnessSize> and its child elements to provide harness size information for a shrink sleeve.

```
<harnessSize>
<minHarnessSize unitOfMeasure="mm">0,8</minHarnessSize>
<maxHarnessSize unitOfMeasure="mm">1,2</maxHarnessSize>
</harnessSize>
```

2.8.1 Minimum harness size

Description: The element <minHarnessSize> contains the minimum harness size.

Markup element: <minHarnessSize>

Attributes:

– unitOfMeasure (O), the unit of measure for the minimum harness size

Child elements:

– None

2.8.2 Maximum harness size

Description: The element <maxHarnessSize> contains the maximum harness size.

Markup element: <maxHarnessSize>

Attributes:

– unitOfMeasure (O), the unit of measure for the maximum harness size

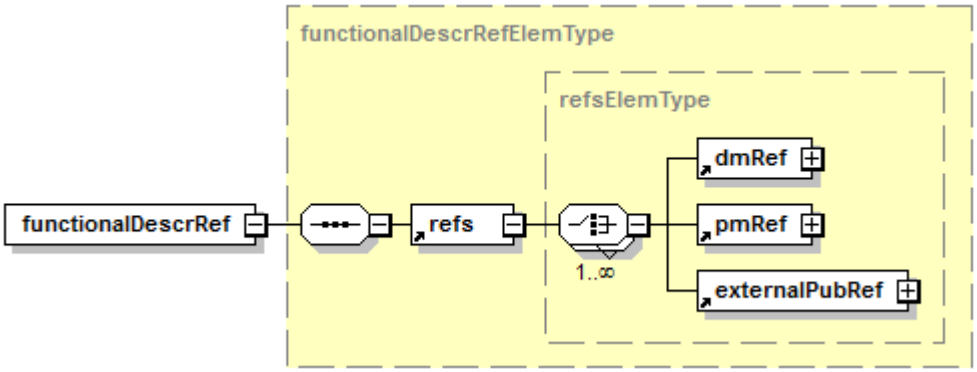
Child elements:

– None

2.9 Functional description reference

Description: The element <functionalDescrRef> contains references to other parts of the electrical system publications for further information about a shrink sleeve (eg, a description of how it is made (specification of the sleeve)).

Markup element: <functionalDescrRef>



ICN-C0419-S1000D0291-001-01

Fig 3 Element <functionalDescrRef>

Attributes:

– None

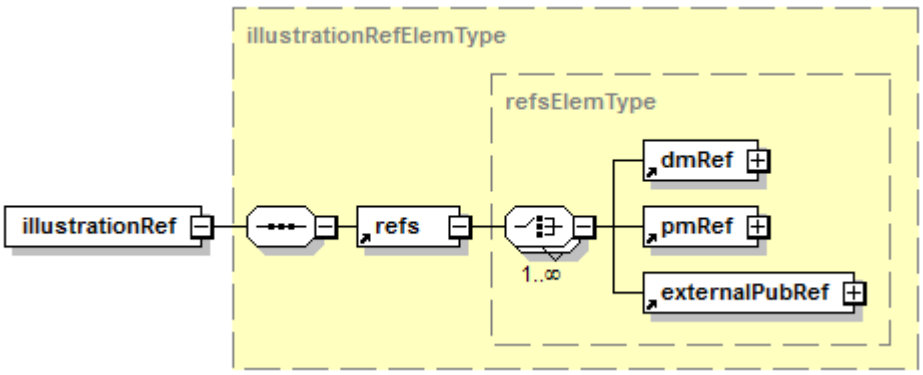
Child elements:

– <refs>, the functional description reference information. Refer to Chap 3.9.5.2.1.2.

2.10 Illustration reference

Description: The element <illustrationRef> contains references to other parts of the electrical system publications, which show illustrations of the shrink sleeve.

Markup element: <illustrationRef>



ICN-C0419-S1000D0292-001-01

Fig 4 Element <illustrationRef>

Attributes:

– None

Child elements:

– <refs>, the illustration reference information. Refer to Chap 3.9.5.2.1.2.

Chapter 3.9.5.2.9.10

Wiring data - Standard parts, Identification sleeve

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Chap 3.9.5.2.9.5	Wiring data - Standard parts, Connector
Chap 3.9.5.2.9.8	Wiring data - Standard parts, Solder sleeve
Chap 3.9.5.3	Data modules - Applicability

1 General

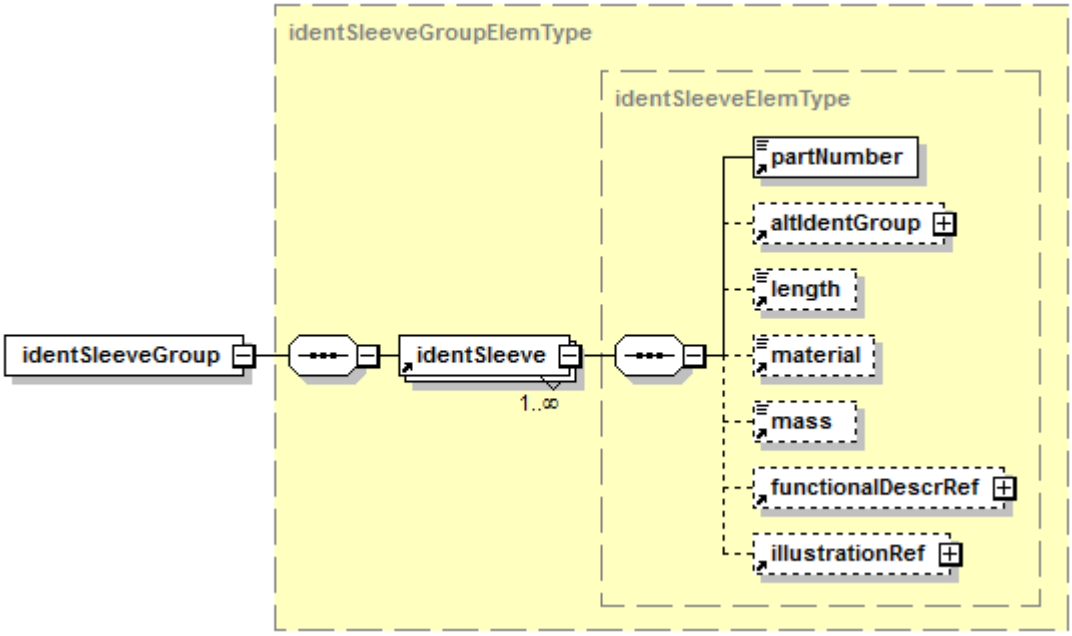
The element <identSleeve> and its child elements are used to capture and represent identification sleeves, which are used for the Product, and the related standard parts information.

2 Element <identSleeve> and child elements

Description: The element <identSleeve> is contained in the list of identification sleeves element <identSleeveGroup>. The list of identification sleeves is a child element of the list of the standard parts element <standardPartGroup>.

It contains information concerning the properties of identification sleeves used in the Product's wiring.

Markup element: <identSleeve>



ICN-C0419-S1000D0313-001-01

Fig 1 Element <identSleeve>

Attributes:

- applicRefId (O), the applicability information of an identification sleeve by referencing the element <applic>. Refer to Chap 3.9.5.3.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <partNumber>, the part number of the identification sleeve. Refer to Para 2.1.
- <altIdentGroup>, the list of alternative identifications. Refer to Para 2.2.
- <length>, the length of the identification sleeve. Refer to Para 2.3.
- <material>, the material of the identification sleeve. Refer to Para 2.4.

- <mass>, the mass of the identification sleeve. Refer to Para 2.5.
- <functionalDescrRef>, the functional description reference. Refer to Para 2.6.
- <illustrationRef>, the reference to illustrations. Refer to Para 2.7.

Markup example:

```
<wiringData>
<standardPartGroup>
<identSleeveGroup>
<identSleeve><partNumber>ident_642</partNumber></identSleeve>
<identSleeve><partNumber>ident_531</partNumber></identSleeve>
</identSleeveGroup>
</standardPartGroup>
</wiringData>
```

2.1 Part number

Description: The part number element <partNumber> contains the project or the organization specific part number of an identification sleeve. Refer to Chap 3.9.5.2.1.9.

2.2 Alternative identifications

Description: The element <altIdentGroup> contains alternative identifications of an identification sleeve, described by manufacturer part numbers and the related manufacturer. Refer to Chap 3.9.5.2.9.4.

2.3 Length

Description: The element <length> contains the length information of an identification sleeve. Refer to Chap 3.9.5.2.9.8.

Note

The attribute wireLengthType provides additional length information for wires. It must not be used to describe the length of identification sleeves.

Markup element: <length>

2.4 Material

Description: The element <material> describes the material of which an identification sleeve is made. Refer to Chap 3.9.5.2.9.8.

Markup element: <material>

Markup example:

The following example shows the use of the element <material> for an identification sleeve.

```
<material>PVC-Nitrile</material>
```

2.5 Mass

Description: The element <mass> contains the mass information of an identification sleeve. Refer to Chap 3.9.5.2.9.5.

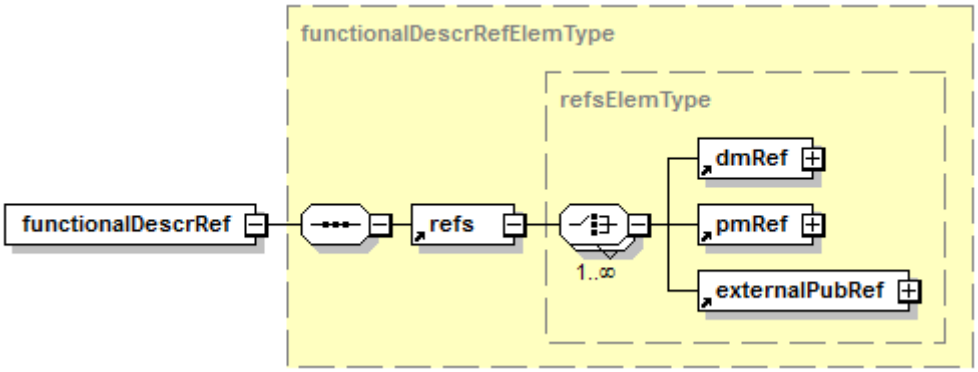
Markup example:

```
<mass unitOfMeasure="kg">0,0001</mass>
```

2.6 Functional description reference

Description: The functional description reference element <functionalDescrRef> contains references to other parts of the electrical system publications for further information about an identification sleeve (eg, a description of how it is made (specification of the sleeve)).

Markup element: <functionalDescrRef>



ICN-C0419-S1000D0291-001-01

Fig 2 Element <functionalDescrRef>

Attributes:

– None

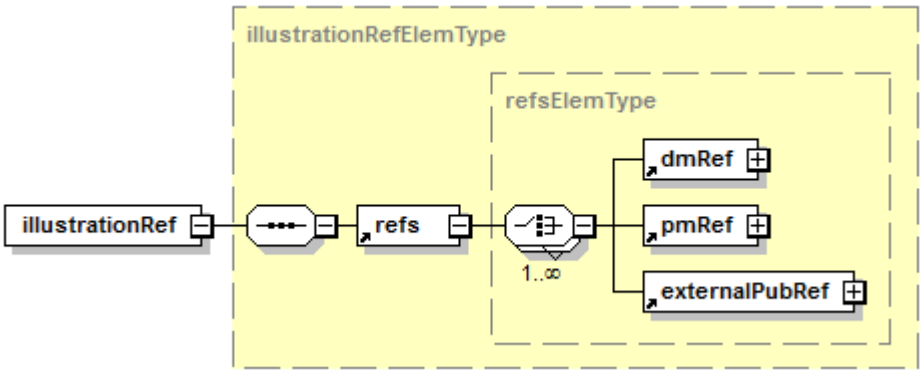
Child elements:

– <refs>, the functional description reference information. Refer to Chap 3.9.5.2.1.2.

2.7 Illustration reference

Description: The Illustration reference element <illustrationRef> contains references to other parts of the electrical system publications, which show illustrations of the identification sleeve.

Markup element: <illustrationRef>



ICN-C0419-S1000D0292-001-01

Fig 3 Element <illustrationRef>

Attributes:

– None

Child elements:

– <refs>, the illustration reference information. Refer to Chap 3.9.5.2.1.2.

Chapter 3.9.5.2.9.11

Wiring data - Standard parts, Conduit

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Chap 3.9.5.2.9.9	Wiring data - Standard parts, Shrink sleeve

Chap No./Document No.	Title
Chap 3.9.5.3	Data modules - Applicability

1 General

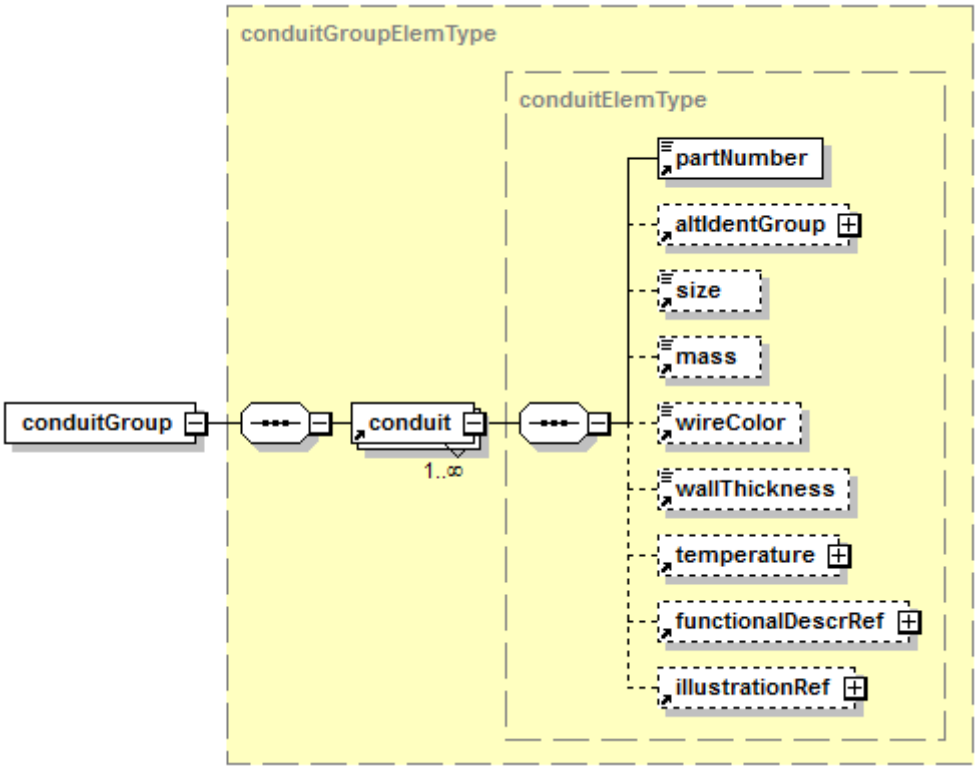
The element <conduit> and its child elements are used to capture and represent conduits, which are used for the Product, and the related standard parts information.

2 Element <conduit> and child elements

Description: The element <conduit> is contained in the list of conduits element <conduitGroup>. The list of conduits is a child element of the list of the standard parts element <standardPartGroup>.

It contains information concerning the properties of conduits used in the Product's wiring.

Markup element: <conduit>



ICN-C0419-S1000D0314-001-01

Fig 1 Element <conduit>

Attributes:

- applicRefId (O), the applicability information of a conduit by referencing the element <applic>. Refer to Chap 3.9.5.3.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <partNumber>, the part number of the conduit. Refer to Para 2.1.
- <altIdentGroup>, the list of alternative identifications. Refer to Para 2.2.
- <size>, the size of the conduit. Refer to Para 2.3.
- <mass>, the mass of the conduit. Refer to Para 2.4.
- <wireColor>, the color information. Refer to Para 2.5.
- <wallThickness>, the wall thickness of the conduit. Refer to Para 2.6.
- <temperature>, the temperature information. Refer to Para 2.7.
- <functionalDescrRef>, the functional description reference. Refer to Para 2.8.
- <illustrationRef>, the reference to illustrations. Refer to Para 2.9.

Markup example:

```
<wiringData>
<standardPartGroup>
<conduitGroup>
<conduit><partNumber>condt_468</partNumber></conduit>
<conduit><partNumber>condt_579</partNumber></conduit>
</conduitGroup>
</standardPartGroup>
</wiringData>
```

2.1 Part number

Description: The element <partNumber> contains the project or the organization specific part number of a conduit. Refer to Chap 3.9.5.2.1.9.

2.2 Alternative identifications

Description: The element <altIdentGroup> contains alternative identifications of a conduit, described by manufacturer part numbers and the related manufacturer. Refer to Chap 3.9.5.2.9.4.

2.3 Size

Description: The element <size> contains the size information of a conduit. Refer to Chap 3.9.5.2.9.9.

Normally, the inside diameter and the outer diameter are available for a conduit. It is also possible, that the size is identified by a size code. Then the attribute unitOfMeasure must not be used.

Markup element: <size>

Markup example:

The following markup example shows the use of the element <size> for a conduit, giving its outer diameter.

```
<size unitOfMeasure="mm">11,4</size>
```

2.4 Mass

Description: The element <mass> contains the mass information of a conduit. Refer to Chap 3.9.5.2.9.5.

Markup example:

```
<mass unitOfMeasure="g/m">4,67</mass>
```

2.5 Color information

Description: The element <wireColor> contains the color information of a conduit. Refer to Chap 3.9.5.2.9.2.

Markup example:

```
<wireColor>Black</wireColor>
```

2.6 Wall thickness

Description: The element <wallThickness> contains the information of the wall thickness of a conduit.

Markup element: <wallThickness>

Attributes:

– unitOfMeasure (O), the unit of measure for the wall thickness

Child elements:

– None

Markup example:

```
<wallThickness unitOfMeasure="mm">0,15</wallThickness>
```

2.7 Temperature

Description: The element <temperature> describes the minimum and maximum temperature, for which the conduit is approved. Refer to Chap 3.9.5.2.9.3.

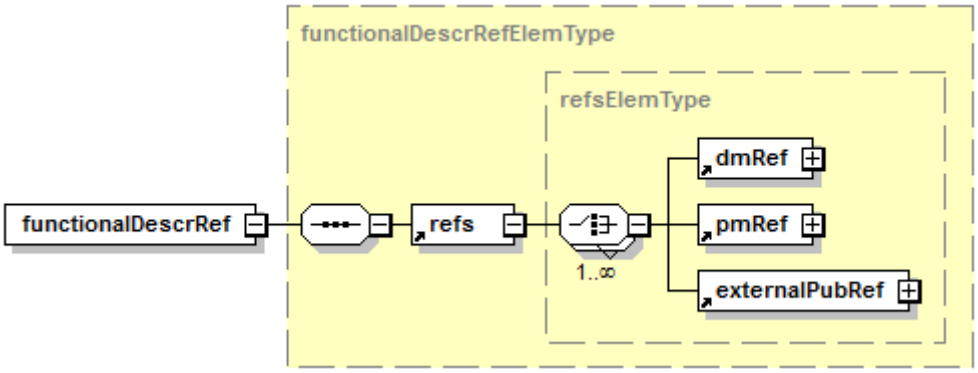
Markup example:

```
<temperature>
<minTemperature unitOfMeasure="degC">-55</minTemperature>
<maxTemperature unitOfMeasure="degC">200</maxTemperature>
</temperature>
```

2.8 Functional description reference

Description: The element <functionalDescrRef> contains references to other parts of the electrical system publications for further information about a conduit (eg, a description of how it is made (specification of the conduit)).

Markup element: <functionalDescrRef>



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Fig 2 Element <functionalDescrRef>

Attributes:

– None

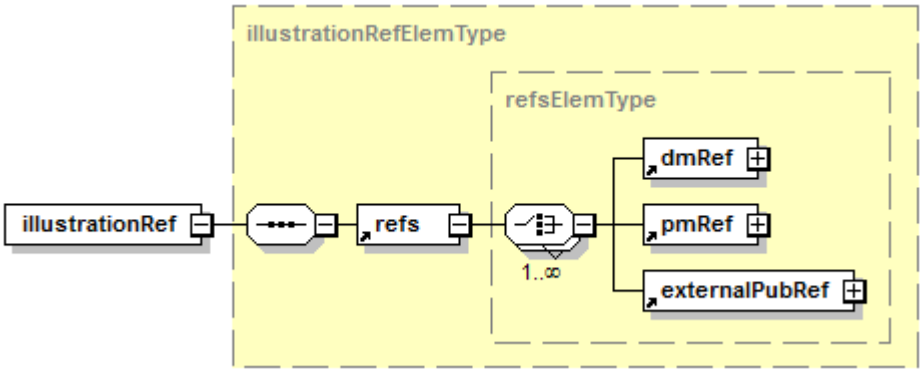
Child elements:

– <refs>, the functional description reference information. Refer to Chap 3.9.5.2.1.2.

2.9 Illustration reference

Description: The element <illustrationRef> contains references to other parts of the electrical system publications, which show illustrations of the conduit.

Markup element: <illustrationRef>



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Fig 3 Element <illustrationRef>

Attributes:

– None

Child elements:

– <refs>, the illustration reference information. Refer to Chap 3.9.5.2.1.2.

Chapter 3.9.5.2.9.12

Wiring data - Standard parts, Wire material

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1 General

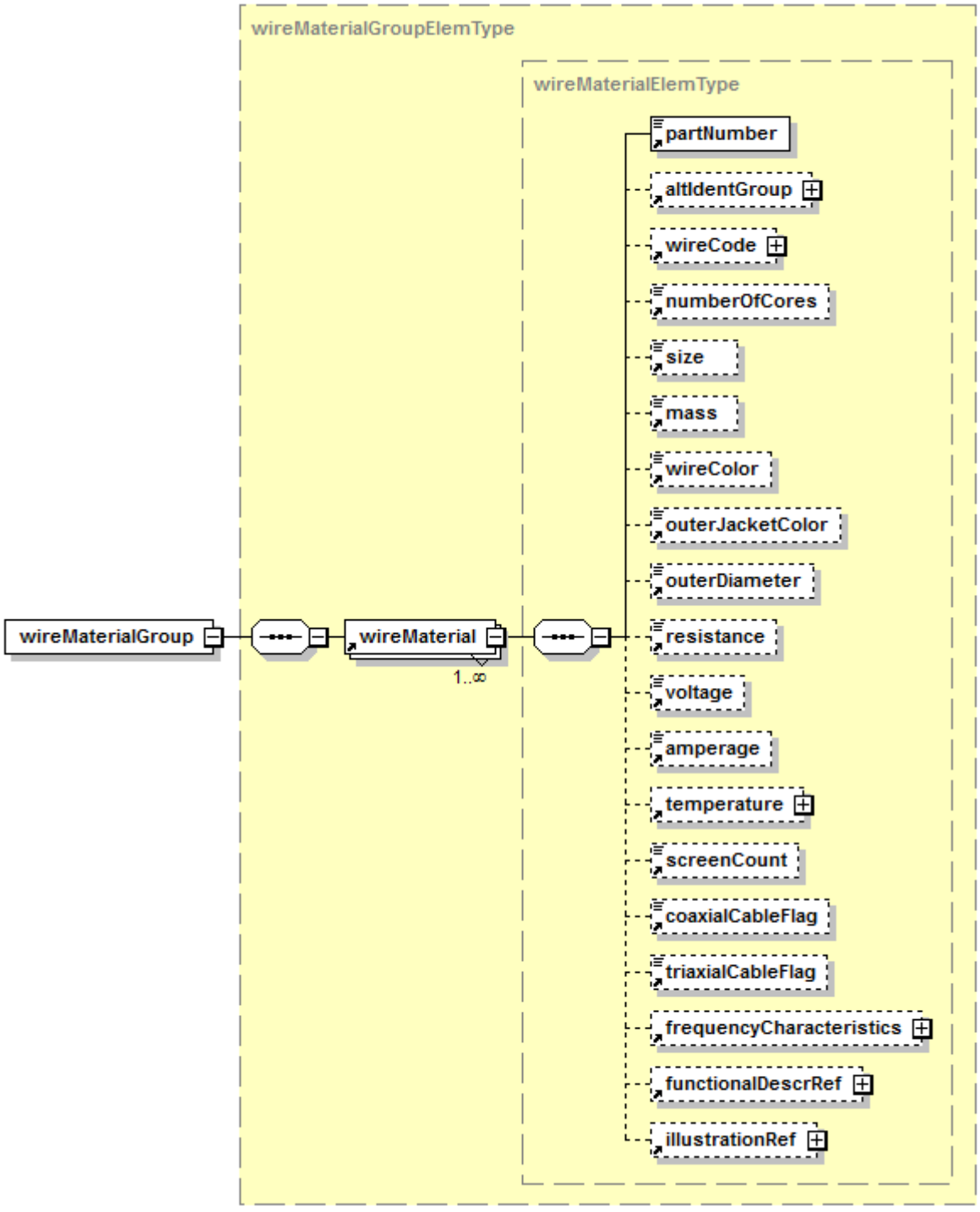
The element <wireMaterial> and its child elements are used to capture and represent wire material, which is used for the Product, and the related standard parts information.

2 Element <wireMaterial> and child elements

Description: The element <wireMaterial> is contained in the list of wire material element <wireMaterialGroup>. The list of wire material is a child element of the list of standard parts element <standardPartGroup>.

It contains information concerning the properties of wire material used in the Product's wiring.

Markup element: <wireMaterial>



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Fig 1 Element <wireMaterialGroup>

Attributes:

- `applicRefId` (O), the applicability information of the wire material by referencing the element <applic>. Refer to Chap 3.9.5.3.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <partNumber>, the part number of the wire material. Refer to Para 2.1.
- <altIdentGroup>, the list of alternative identifications. Refer to Para 2.2.
- <wireCode>, the wire code. Refer to Para 2.3.
- <numberOfCores>, the number of cores. Refer to Para 2.4.
- <size>, the size of the wire material. Refer to Para 2.5.
- <mass>, the mass of the wire material. Refer to Para 2.6.
- <wireColor>, the color information. Refer to Para 2.7.
- <outerJacketColor>, the outer jacket color. Refer to Para 2.8.
- <outerDiameter>, the outer diameter. Refer to Para 2.9.
- <resistance>, the resistance information. Refer to Para 2.10.
- <voltage>, the voltage information. Refer to Para 2.11.
- <amperage>, the amperage information. Refer to Para 2.12.
- <temperature>, the temperature information. Refer to Para 2.13.
- <screenCount>, the number of screens. Refer to Para 2.14.
- <coaxialCableFlag>, the coaxial information. Refer to Para 2.15.
- <triaxialCableFlag>, the tri-axial information. Refer to Para 2.16.
- <frequencyCharacteristics>, the frequency characteristics. Refer to Para 2.17.
- <functionalDescrRef>, the functional description reference. Refer to Para 2.18.
- <illustrationRef>, the reference to illustrations. Refer to Para 2.19.

Markup example:

```
<wiringData>
<standardPartGroup>
<wireMaterialGroup>
<wireMaterial><partNumber>Connector_C1</partNumber></wireMateria
l>
<wireMaterial><partNumber>Diode_D2</partNumber></wireMaterial>
</wireMaterialGroup>
</standardPartGroup>
</wiringData>
```

2.1 Part number

Description: The element <partNumber> contains the project or the organization specific part number of the wire material. Refer to Chap 3.9.5.2.1.9.

2.2 Alternative identifications

Description: The element <altIdentGroup> contains alternative identifications of the wire material, described by manufacturer part numbers and the related manufacturer. Refer to Chap 3.9.5.2.9.4.

2.3 Wire code

Description: The element <wireCode> gives information about the type of a wire and its gauge through its child elements. Refer to Chap 3.9.5.2.9.2.

For one type of wire material more than one wire gauge can be available. In this case, the wires normally get different part numbers, so that for all wire sizes a different wire material element

<wireMaterial> is used. It is also possible to use the wire gauge element <wireGauge> multiple times to show the gauge of a wire in different units of measure.

Markup example:

The following markup example shows the use of the element <wireCode> for wire material, which contains the wire gauge in metric units.

```
<wireCode>
<wireType>QC</wireType>
<wireGauge wireGaugeType="mt">1,82</wireGauge>
</wireCode>
```

2.4 Core

Description: The element <numberOfCores> contains the number of cores of the wire material.

Markup element: <numberOfCores>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows the use of the element <numberOfCores> for wire material with three cores.

```
<numberOfCores>3</numberOfCores>
```

2.5 Size

Description: The element <size> contains the size information of wire material. Refer to Chap 3.9.5.2.9.9.

The size of the wire material is often part of the part number of the wire material. It can also be given by the element <wireGauge>. In this case, the element <size> must not be used.

Markup element: <size>

Markup example:

The following markup example shows the use of the element <size> for wire material, providing size information in coded form (as it is part of the part number of the wire material, eg, JN1008QC030).

```
<size>030</size>
```

2.6 Mass

Description: The element <mass> contains the mass information of wire material. Refer to Chap 3.9.5.2.9.5.

Markup example:

```
<mass unitOfMeasure="kg/km">58,7</mass>
```

2.7 Color information

Description: The element <wireColor> contains the color information of wire material. Due to the fact that it is only for single use, the color of the cores of multiple core cables must be given in a single element <wireColor>. Refer to Chap 3.9.5.2.9.2.

2.8 Outer jacket color

Description: The element <outerJacketColor> contains the color information of the outer jacket of wire material.

Markup element: <outerJacketColor>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows the use of the element <outerJacketColor> for wire material with a white outer jacket.

```
<outerJacketColor>W</outerJacketColor>
```

2.9 Outer diameter

Description: The element <outerDiameter> contains the outer diameter of wire material.

Markup element: <outerDiameter>

Attributes:

– unitOfMeasure (O), the unit of measure for the wire material outer diameter

Child elements:

– None

Markup example:

The following markup example shows the use of the element <outerDiameter> to provide outer diameter information for wire material in mm.

```
<outerDiameter unitOfMeasure="mm">4,85</outerDiameter>
```

2.10 Resistance

Description: The element <resistance> contains the direct current resistance information of wire material.

Markup element: <resistance>

Attributes:

– unitOfMeasure (O), the unit of measure for the direct current resistance

Child elements:

– None

Markup example:

The following markup example shows the use of the element <resistance> for wire material in mΩ per m.

```
<resistance unitOfMeasure="mohm/m">6,8</resistance>
```

2.11 Voltage

Description: The element <voltage> contains the voltage information of wire material.

Markup element: <voltage>

Attributes:

– unitOfMeasure (O), the unit of measure for the voltage

Child elements:

– None

Markup example:

The following markup example shows the use of the element <voltage> to provide voltage information for wire material in Volts.

```
<voltage unitOfMeasure="V">600</voltage>
```

2.12 Amperage

Description: The element <amperage> contains the amperage information of wire material.

Markup element: <amperage>

Attributes:

– unitOfMeasure (O), the unit of measure for the amperage

Child elements:

– None

Markup example:

The following markup example shows the use of the element <amperage> for wire material in Ampere.

```
<amperage unitOfMeasure="A">10</amperage>
```

2.13 Temperature

Description: The element <temperature> describes the minimum and maximum temperature, for which the wire material is approved. In many cases, only the maximum working temperature of wire material is available. Refer to Chap 3.9.5.2.9.3.

Markup example:

The following markup example shows the use of the element <temperature> by providing the maximum working temperature of the wire material.

```
<temperature>
<maxTemperature unitOfMeasure="degC">260</maxTemperature>
</temperature>
```

2.14 Screen count

Description: The element <screenCount> contains the number of screens of the wire material.

Markup element: <screenCount>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows the use of the element <screenCount> for wire material with one screen (eg, a coaxial cable).

```
<screenCount>1</screenCount>
```

2.15 Coaxial information

Description: The element <coaxialCableFlag> indicates coaxial wire material. Refer to Chap 3.9.5.2.9.5.

Markup element: <coaxialCableFlag>

Markup examples:

The following markup example shows the use of the element <coaxialCableFlag> for coaxial wire material.

```
<coaxialCableFlag>Y</coaxialCableFlag>
```

The following markup example shows the use of the element <coaxialCableFlag> for non-coaxial wire material.

```
<coaxialCableFlag>N</coaxialCableFlag>
```

2.16 Tri-axial information

Description: The element <triaxialCableFlag> indicates tri-axial wire material. Refer to Chap 3.9.5.2.9.5.

Markup element: <triaxialCableFlag>

Markup example:

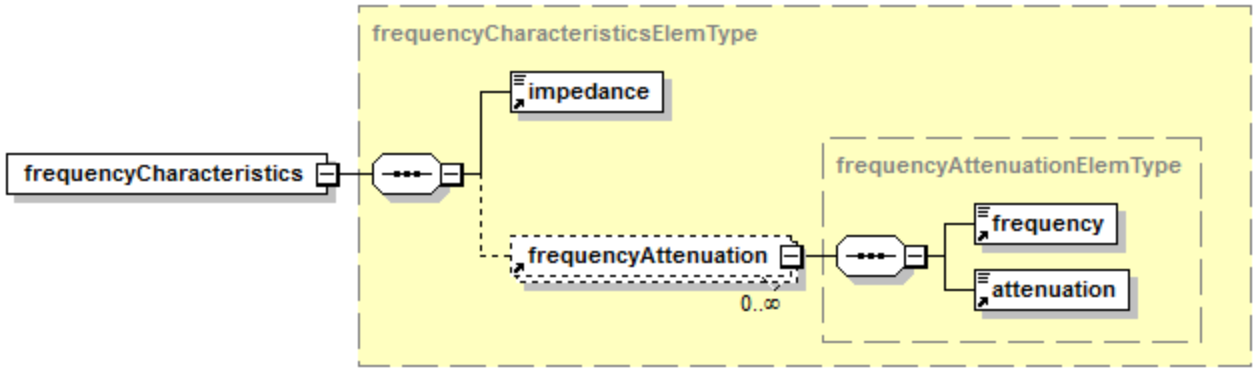
The following markup example shows the use of the element <triaxialCableFlag> for tri-axial wire material.

```
<triaxialCableFlag>Y</triaxialCableFlag>
```

2.17 Frequency characteristics

Description: The element <frequencyCharacteristics> contains alternating current frequency characteristics of wire material.

Markup element: <frequencyCharacteristics>



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Fig 2 Element <frequencyCharacteristics>

Attributes:

– None

Child elements:

– <impedance>, the impedance information. Refer to Para 2.17.1.
– <frequencyAttenuation>, the frequency and attenuation information. Refer to Para 2.17.2.

Markup example:

The following markup example shows the use of the element <frequencyCharacteristics> for wire material. The impedance of the wire material is 50 Ω, the frequency and the attenuation are provided as given in Table 2.

Table 2 Frequency characteristics

Frequency	Attenuation
20 MHz	14 dB/100m
100 MHz	31 dB/100m

```
<frequencyCharacteristics>
<impedance unitOfMeasure="ohm">50</impedance>
<frequencyAttenuation>
<frequency unitOfMeasure="MHz">20</frequency>
<attenuation unitOfMeasure="dB/100m">14</attenuation>
</frequencyAttenuation>
<frequencyAttenuation>
<frequency unitOfMeasure="MHz">100</frequency>
<attenuation unitOfMeasure="dB/100m">31</attenuation>
</frequencyAttenuation>
</frequencyCharacteristics>
```

2.17.1 Impedance

Description: The element <impedance> contains the alternating current impedance of wire material, normally of a cable.

Markup element: <impedance>

Attributes:

– `unitOfMeasure` (O), the unit of measure for the impedance

Child elements:

– None

2.17.2 Frequency and attenuation

Description: The element <`frequencyAttenuation`> contains the frequency and attenuation information of wire material.

Markup element: <`frequencyAttenuation`>

Attributes:

– None

Child elements:

– <`frequency`>, the frequency information. Refer to Para 2.17.2.1.
– <`attenuation`>, the attenuation information. Refer to Para 2.17.2.2.

2.17.2.1 Frequency

Description: The element <`frequency`> contains the frequency of wire material in relation to the attenuation.

Markup element: <`frequency`>

Attributes:

– `unitOfMeasure` (O), the unit of measure for the frequency

Child elements:

– None

2.17.2.2 Attenuation

Description: The element <`attenuation`> contains the attenuation information of wire material.

Markup element: <`attenuation`>

Attributes:

– `unitOfMeasure` (O), the unit of measure for the attenuation

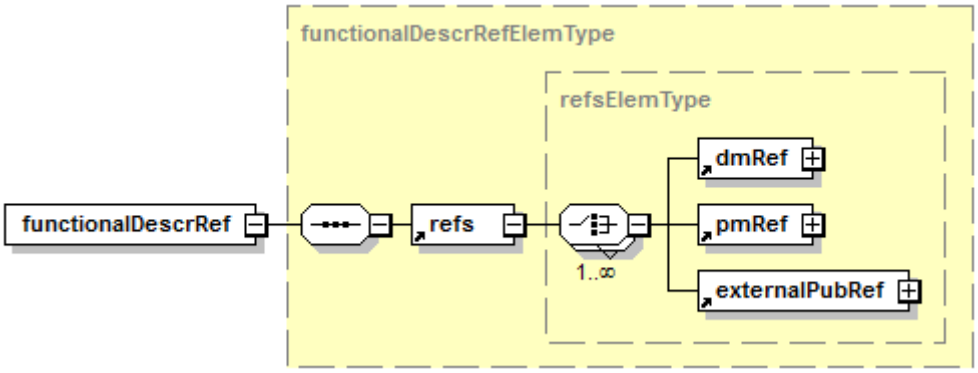
Child elements:

– None

2.18 Functional description reference

Description: The element <`functionalDescrRef`> contains references to other parts of the electrical system publications for further information about wire material (eg, a description of how it is made (specification of the wire material)).

Markup element: <`functionalDescrRef`>



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Fig 3 Element <functionalDescrRef>

Attributes:

– None

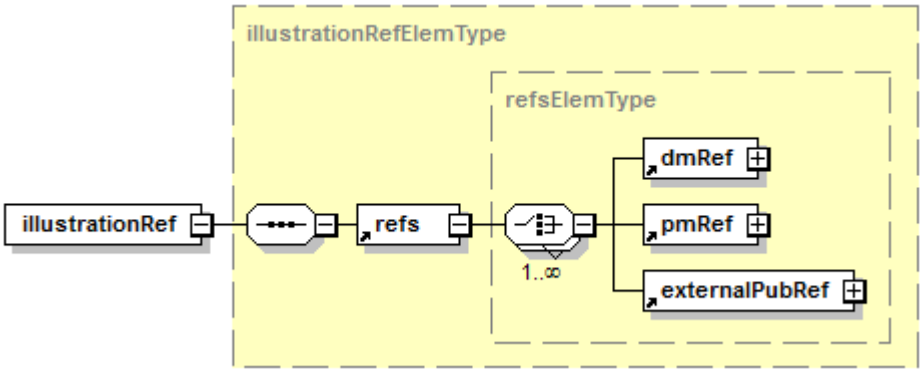
Child elements:

– <refs>, the functional description reference information. Refer to Chap 3.9.5.2.1.2.

2.19 Illustration reference

Description: The element <illustrationRef> contains references to other parts of the electrical system publications, which show illustrations of the wire material.

Markup element: <illustrationRef>



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Fig 4 Element <illustrationRef>

Attributes:

– None

Child elements:

<refs>, the illustration reference information. Refer to Chap 3.9.5.2.1.2.

Chapter 3.9.5.2.9.13

Wiring data - Wiring data description Schema basic rules

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Chap 3.9.5.2.9.1	Wiring data - Wiring data Schema basic rules
Chap 3.9.5.3	Data modules - Applicability

1 General

The wiring data description Schema is used for configuration and declaration of the elements of the wiring data Schema. It is recommended to declare elements of the wiring data Schema, which describe the components used in the Product's wiring, in the wiring data description data module(s) of the project. Elements of the wiring data Schema which are not used, must not be defined in the wiring data description data module(s) prepared for the project.

It is possible to prepare more than one wiring data description data module. The different data modules can then contain the definitions of the used elements in different languages. It is also possible to generate different wiring data description data modules for different presentation purposes, which means, the elements provided for maintenance personnel can differ from the elements for final assembly personnel. For data exchange purposes, the wiring data description data module(s) can be used to define the wiring data/elements that will be exchanged.

The wiring data description can be used in an interactive wiring publication for headlines, brief descriptions, or for configuration and control of the interactive wiring publication according to the specific naming conventions of a project or an organization.

Common elements and attributes must be populated in accordance with Chap 3.9.5.2.1. Recommended wiring specific restrictions are detailed in this chapter.

2 Wiring data description

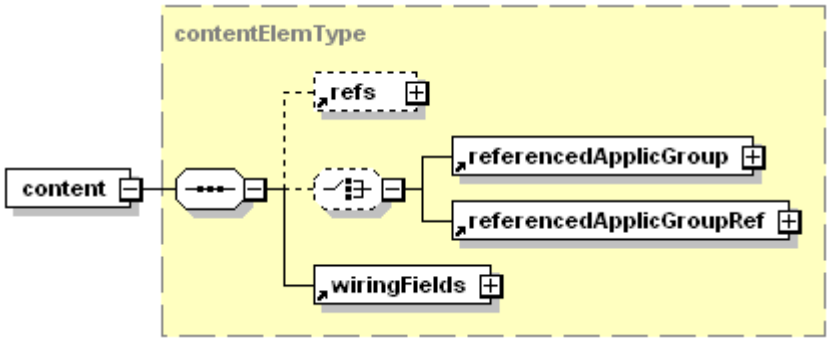
2.1 Schema basic rules

The wiring data description Schema is used to configure and declare the elements of the wiring data Schema. Refer to Chap 3.9.5.2.9.1.

2.2 Content

Description: The element <content> of this Schema is used to capture and represent the wiring data/field descriptions of the Product.

Markup element: <content>



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Fig 1 Element <content>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

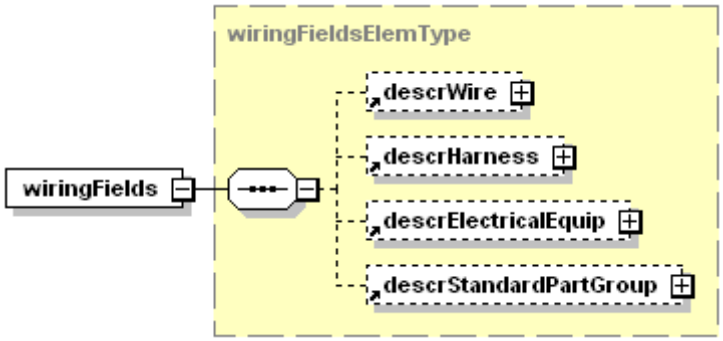
Child elements:

– <refs>. Refer to Chap 3.9.5.2.1.2.
– <referencedApplicGroup>. Refer to Chap 3.9.5.3.
– <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
– <wiringFields>. Refer to Para 2.3.

2.3 Element <wiringFields>

Description: The wiring data description Schema defines the major element <wiringFields>, which contains the child elements for wire data/fields description, harness data/fields description, equipment data/fields description and standard parts data/fields description.

Markup element: <wiringFields>



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Fig 2 Element <wiringFields>

Attributes:

– None

Child elements:

– <descrWire>, the wire data/fields description. Refer to Para 2.5.
– <descrHarness>, the harness data/fields description. Refer to Para 2.6.

- <descrElectricalEquip>, the electrical equipment data/fields description. Refer to Para 2.7.
- <descrStandardPartGroup>, the standard parts data/fields description. Refer to Para 2.8.

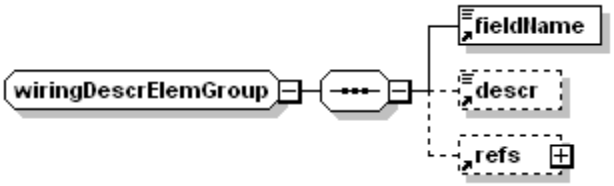
Markup example:

```
<wiringFields>
<descrWire>
<descrWireNumber>
<fieldName>Wire Number</fieldName>
</descrWireNumber>
</descrWire>
<descrHarness>
<descrHarnessIdent>
<fieldName>Harness Identification</fieldName>
</descrHarnessIdent>
</descrHarness>
<descrElectricalEquip>
<descrFunctionalItemRef>
<fieldName>Functional Item</fieldName>
</descrFunctionalItemRef>
</descrElectricalEquip>
<descrStandardPartGroup>
<descrConnector>
<descrPartNumber>
<fieldName>Manufacturer Part Number</fieldName>
</descrPartNumber>
</descrConnector>
</descrStandardPartGroup>
</wiringFields>
```

2.4 Common constructs

Description: The description and declaration information for wiring data elements is given by a block of three elements. These are:

- the data/field name. Refer to Para 2.4.1.
- the data/field description. Refer to Para 2.4.2.
- the reference information. Refer to Para 2.4.3.



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Fig 3 Common wiring data description constructs

2.4.1 Data/field name

Description: The element <fieldName> contains the name of the data field (ie, the project or the organization specific naming of electrical data).

Markup element: <fieldName>

Attributes:

– None

Child elements:

– None

Markup example:

The following markup example shows the use of the element <fieldName> as a child element of <descrPartNumber>.

```
<fieldName>Part number</fieldName>
```

Further examples for the use of <fieldName> are given below in this chapter.

2.4.2 Data/field description

Description: The element <descr> contains the description of the data field (ie, the project or the organization specific description of electrical data). The element <descr> can in addition contain declarations of the described data.

Markup element: <descr>

Attributes:

– changeType (O), changeMark (O) and reasonforUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

Markup example:

The following markup example shows the use of the element <descr> as a child element of <descrPartNumber>. It is shown in the context of the list of solder sleeves element <solderSleeveGroup>.

```
<descr>Part number provides the project or the organization
specific part number of the solder sleeve. Manufacturer part
numbers are available in the section 'Alternative
identifications'.</descr>
```

Further examples for the use of the element <descr> are given below.

2.4.3 Data/field references

Description: The data/field references element <refs> contains references to other parts of the electrical system publications, which give additional information. Refer to Chap 3.9.5.2.1.2.

Markup element: <refs>

Attributes:

– None

Child elements:

- <dmRef>, the reference to a data module. Refer to Chap 3.9.5.2.1.2.
- <pmRef>, the reference to a publication module. Refer to Chap 3.9.5.2.1.2.
- <externalPubRef>, the reference to an external publication. Refer to Chap 3.9.5.2.1.2.

2.5 Wire data/field descriptions

Description: The element <descrWire> contains all relevant elements to describe the wire data elements of the project.

Markup element: <descrWire>



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Fig 4 Element <descrWire>

Attributes:

– None

Child elements:

– <descrCircuitIdent>, the circuit code description. Refer to Para 2.5.1.
– <descrWireNumber>, the wire number description. Refer to Para 2.5.2.
– <descrSectionIdent>, the section identification description. Refer to Para 2.5.3.
– <descrWireType>, the wire type description. Refer to Para 2.5.4.
– <descrWireGauge>, the wire gauge description. Refer to Para 2.5.5.
– <descrPartNumber>, the part number description. Refer to Para 2.5.6.
– <descrHarnessIdent>, the harness identification description. Refer to Para 2.5.7.
– <descrWireSeqNumber>, the wire sequential number description. Refer to Para 2.5.8.
– <descrWireInfoCircuitIdent>, the wire information circuit code description. Refer to Para 2.5.9.
– <descrWireInfoSectionIdent>, the description of the wire section identification for the wire information branch. Refer to Para 2.5.10.
– <descrEmcCode>, the electromagnetic compatibility (EMC) code description. Refer to Para 2.5.11.
– <descrLength>, the length description. Refer to Para 2.5.12.
– <descrWireColor>, the color description. Refer to Para 2.5.13.
– <descrTwist>, the twist description. Refer to Para 2.5.14.
– <descrCoaxialCableFlag>, the coaxial information description. Refer to Para 2.5.15.
– <descrTriaxialCableFlag>, the tri-axial information description. Refer to Para 2.5.16.
– <descrSignalInfo>, the signal description. Refer to Para 2.5.17.
– <descrFunctionalItemRef>, the functional item reference description. Functional items are also known as reference designators. Refer to Para 2.5.18.
– <descrContact>, the contact description. Refer to Para 2.5.19.
– <descrWireConnectionCode>, the wire connection code description. Refer to Para 2.5.20.
– <descrNetworkAnalysisCode>, the network analysis code description. Refer to Para 2.5.21.
– <descrGroupCode>, the group code description. Refer to Para 2.5.22.
– <descrScreen>, the screen information description. Refer to Para 2.5.23.
– <descrPreparationInfo>, the preparation information description. Refer to Para 2.5.24.
– <descrFinishingInfo>, the finishing information description. Refer to Para 2.5.25.
– <descrResponsiblePartnerCompany>, the responsible partner company information description. Refer to Para 2.5.26.
– <descrRouting>, the routing description. Refer to Para 2.5.27.
– <descrFeedThru>, the feed-thru information description. Refer to Para 2.5.28.
– <descrWireRoute>, the wire route lane code description. Refer to Para 2.5.29.
– <descrRestriction>, the wire restrictions description. Refer to Para 2.5.30.
– <descrNextHigherAssy>, the next higher assembly information description. Refer to Para 2.5.31.
– <descrFunctionalDescrRef>, the functional description reference description. Refer to Para 2.5.32.

– <descrIllustrationRef>, the illustration reference description. Refer to Para 2.5.33.

Markup example:

```
<descrWire><descrWireNumber>
<fieldname>Wire Number</fieldname>
</descrWireNumber></descrWire>
```

2.5.1 Circuit code description

Description: The element <descrCircuitIdent> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the circuit code child element <circuitIdent> of the element <wireIdent>.

Markup element: <descrCircuitIdent>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

Markup example:

```
<descrCircuitIdent>
<fieldName>Circuit Code</fieldName>
<descr>Aircraft electrical systems are identified by a primary
alphabetic letter (eg, A = Armament). A circuit within a system
is identified by the primary alphabetic letter (system
identification) and a secondary letter (subsystem
identification). Both letters together make the circuit code
(eg, AG = Gun System).</descr>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="1B" systemDiffCode="B" systemCode="91"
subSystemCode="0" subSubSystemCode="0" assyCode="12"
disassyCode="03" disassyCodeVariant="A" infoCode="018"
infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
</descrCircuitIdent>
```

2.5.2 Wire number description

Description: The element <descrWireNumber> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the wire number element <wireNumber>.

Markup element: <descrWireNumber>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.3 Section identification description

Description: The element <descrSectionIdent> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the section identification child element <sectionIdent> of the element <wireIdent>.

Markup element: <descrSectionIdent>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.4 Wire type description

Description: The element <descrWireType> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the wire type element <wireType>.

Markup element: <descrWireType>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.5 Wire gauge description

Description: The element <descrWireGauge> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the wire gauge element <wireGauge>.

Markup element: <descrWireGauge>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.6 Part number description

Description: The element <descrPartNumber> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the part number element <partNumber>.

Markup element: <descrPartNumber>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.7 Harness identification description

Description: The element <descrHarnessIdent> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the harness identification element <harnessIdent>.

Markup element: <descrHarnessIdent>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.8 Wire sequential number description

Description: The element <descrWireSeqNumber> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the wire sequential number element <wireSeqNumber>.

Markup element: <descrWireSeqNumber>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.9 Wire information circuit code description

Description: The element <descrWireInfoCircuitIdent> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the circuit code child element <circuitIdent> of the element <wireInfo>.

Markup element: <descrWireInfoCircuitIdent>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.10 Wire section identification description for the wire information branch

Description: The element <descrWireInfoSectionIdent> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the wire section identification child element <sectionIdent> of the element <wireInfo>

Markup element: <descrWireInfoSectionIdent>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.11 EMC code description

Description: The element <descrEmcCode> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the EMC code element <emcCode>.

Markup element: <descrEmcCode>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.12 Length description

Description: The element <descrLength> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the length element <length>.

Markup element: <descrLength>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.13 Color information description

Description: The element <descrWireColor> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the wire color element <wireColor>.

Markup element: <descrWireColor>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.14 Twist information description

Description: The element <descrTwist> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the twist element <twist>.

Markup element: <descrTwist>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.15 Coaxial information description

Description: The element <descrCoaxialCableFlag> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the coaxial information element <coaxialCableFlag>.

Markup element: <descrCoaxialCableFlag>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.16 Tri-axial information description

Description: The element <descrTriaxialCableFlag> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the tri-axial information element <triaxialCableFlag>.

Markup element: <descrTriaxialCableFlag>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.17 Signal information description

Description: The element <descrSignalInfo> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the signal information element <signalInfo>.

Markup element: <descrSignalInfo>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.18 Functional item reference description

Description: The element <descrFunctionalItemRef> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the functional item reference element <functionalItemRef>. Functional items are also known as reference designators.

Markup element: <descrFunctionalItemRef>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.19 Contact information description

Description: The element <descrContact> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the contact information element <contact>.

Markup element: <descrContact>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.20 Wire connection code description

Description: The element <descrWireConnectionCode> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the wire connection code element <wireConnectionCode>.

Markup element: <descrWireConnectionCode>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.21 Network analysis code description

Description: The element <descrNetworkAnalysisCode> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the network analysis code element <networkAnalysisCode>.

Markup element: <descrNetworkAnalysisCode>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.22 Group code description

Description: The element <descrGroupCode> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the group code element <groupCode>.

Markup element: <descrGroupCode>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.23 Screen information description

Description: The element <descrScreen> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the screen information element <screen>.

Markup element: <descrScreen>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.24 Preparation information description

Description: The element <descrPreparationInfo> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the preparation information element <preparationInfo>.

Markup element: <descrPreparationInfo>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.25 Finishing information description

Description: The element <descrFinishingInfo> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the finishing information element <finishingInfo>.

Markup element: <descrFinishingInfo>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.26 Responsible partner company information description

Description: The element <descrResponsiblePartnerCompany> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the responsible partner company information element <responsiblePartnerCompany>.

Markup element: <descrResponsiblePartnerCompany>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.27 Routing description

Description: The element <descrRouting> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the clipping point identification child element <clippingPoint> of the routing information element <routing>.

Markup element: <descrRouting>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.28 Feed-thru information description

Description: The element <descrFeedThru> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the functional item reference element <functionalItemRef> and the attribute holeIdent of the feed-thru information element <feedThru>.

Markup element: <descrFeedThru>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.29 Wire route lane code description

Description: The element <descrWireRoute> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the wire route lane code element <wireRoute>.

Markup element: <descrWireRoute>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.30 Wire restrictions information description

Description: The element <descrRestriction> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the wire restrictions information element <restriction>.

Markup element: <descrRestriction>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.31 Next higher assembly information description

Description: The element <descrNextHigherAssy> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the next higher assembly information element <nextHigherAssy>.

Markup element: <descrNextHigherAssy>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.32 Functional description reference description

Description: The element <descrFunctionalDescrRef> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the functional description reference element <functionalDescrRef>.

Markup element: <descrFunctionalDescrRef>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.5.33 Illustration reference description

Description: The element <descrIllustrationRef> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the illustration reference element <illustrationRef>.

Markup element: <descrIllustrationRef>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.6 Harness data/field descriptions

Description: The element <descrHarness> contains all relevant elements to describe the harness data elements of the project.

Markup element: <descrHarness>



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Fig 5 Element <descrHarness>

Attributes:

– None

Child elements:

– <descrHarnessIdent>, the harness identification description. Refer to Para 2.5.7.
– <descrPartNumber>, the part number description. Refer to Para 2.5.6.
– <descrAltPartNumber>, the alternative part number description. Refer to Para 2.6.1.
– <descrManufacturerCode>, the manufacturer code description. Refer to Para 2.6.2.
– <descrHarnessVariantIdent>, the harness variant identification description. Refer to Para 2.6.3.
– <descrHarnessVariantIssue>, the harness variant description. Refer to Para 2.6.4.
– <descrHarnessName>, the harness name description. Refer to Para 2.6.5.
– <descrEmcCode>, the EMC code description. Refer to Para 2.5.11.
– <descrMinTemperature>, the minimum temperature description. Refer to Para 2.6.6.
– <descrMaxTemperature>, the maximum temperature description. Refer to Para 2.6.7.
– <descrHarnessEnvironment>, the harness environment description. Refer to Para 2.6.8.
– <descrSleeve>, the harness sleeve description. Refer to Para 2.6.9.
– <descrRouting>, the routing description. Refer to Para 2.5.27.
– <descrFeedThru>, the feed-thru information description. Refer to Para 2.5.28.
– <descrResponsiblePartnerCompany>, the responsible partner company information description. Refer to Para 2.5.26.
– <descrFunctionalDescrRef>, the functional description reference description. Refer to Para 2.5.32.
– <descrIllustrationRef>, the illustration reference description. Refer to Para 2.5.33.

Markup example:

```
<descrHarness>
<descrHarnessIdent>
<fieldName>Loom identification</fieldName>
<descr>All looms that are installed in the aircraft are
identified by a loom identification (eg, 3001VB).</descr>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="1B" systemDiffCode="B" systemCode="92"
subSystemCode="0" subSubSystemCode="0" assyCode="00"
disassyCode="00" disassyCodeVariant="A" infoCode="040"
infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
</descrHarnessIdent>
</descrHarness>
```

2.6.1 Alternative part number description

Description: The element <descrAltPartNumber> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the part number child element <partNumber> of the element <altIdent> within the list of alternative identifications.

Markup element: <descrAltPartNumber>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.6.2 Manufacturer code description

Description: The element <descrManufacturerCode> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the manufacturer code child element <manufacturerCode> of the element <altIdent> within the list of alternative identifications.

Markup element: <descrManufacturerCode>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.6.3 Harness variant identification description

Description: The element <descrHarnessVariantIdent> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the harness variant identification element <harnessVariantIdent>.

Markup element: <descrHarnessVariantIdent>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.6.4 Harness variant issue description

Description: The element <descrHarnessVariantIssue> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the harness variant issue element <harnessVariantIssue>.

Markup element: <descrHarnessVariantIssue>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.6.5 Harness name description

Description: The element <descrHarnessName> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the harness name element <harnessName>.

Markup element: <descrHarnessName>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.6.6 Minimum temperature description

Description: The element <descrMinTemperature> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the minimum temperature element <minTemperature>.

Markup element: <descrMinTemperature>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.6.7 Maximum temperature description

Description: The element <descrMaxTemperature> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the maximum temperature element <maxTemperature>.

Markup element: <descrMaxTemperature>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.6.8 Harness environment description

Description: The element <descrHarnessEnvironment> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the harness environment element <harnessEnvironment>.

Markup element: <descrHarnessEnvironment>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.6.9 Harness sleeve description

Description: The element <descrSleeve> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the part number element <partNumber> and the attribute sleeveMaterial of the harness sleeve element <sleeve>.

Markup element: <descrSleeve>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7 Electrical equipment data/field descriptions

Description: The element <descrElectricalEquip> contains all relevant elements to describe the electrical equipment data elements of the project.

Markup element: <descrElectricalEquip>



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Fig 6 Element <descrElectricalEquip>

Attributes:

– None

Child elements:

- <descrFuntionalItemRef>, the functional item reference description. Functional items are also known as reference designators. Refer to Para 2.5.18.
- <descrPartNumber>, the part number description. Refer to Para 2.5.6.
- <descrAltPartNumber>, the alternative part number description. Refer to Para 2.6.1.
- <descrManufacturerCode>, the manufacturer code description. Refer to Para 2.6.2.
- <descrInstallationLocation>, the installation location information description. Refer to Para 2.7.1.
- <descrAccessDoorOrPanel>, the access door or panel information description. Refer to Para 2.7.2.
- <descrAssy>, the assembly information description. Refer to Para 2.7.3.
- <descrNextHigherAssy>, the next higher assembly information description. Refer to Para 2.5.31.
- <descrPositionOnNextHigherAssy>, the position on next higher assembly description. Refer to Para 2.7.4.
- <descrMaxMountingPositions>, the maximum number of mounting positions description. Refer to Para 2.7.5.
- <descrSystemBreakdownCode>, the system breakdown code description. Refer to Para 2.7.6.
- <descrSiblingPlugIdent>, the sibling plug identification description. Refer to Para 2.7.7.
- <descrTransverseLink>, the transverse link information description. Refer to Para 2.7.8.
- <descrConnectionListClass>, the connection list class description. Refer to Para 2.7.9.
- <descrElectricalContact>, the electrical connection contact description. Refer to Para 2.7.10.
- <descrElectricalStateDescr>, the electrical state information description. Refer to Para 2.7.11.
- <descrResponsiblePartnerCompany>, the responsible partner company information description. Refer to Para 2.5.26.
- <descrEquipName>, the equipment name description. Refer to Para 2.7.12.
- <descrReqQuantity>, the quantity information description. Refer to Para 2.7.13.
- <descrEquipDescrRef>, the equipment description reference description. Refer to Para 2.7.14.
- <descrFunctionalDescrRef>, the functional description reference description. Refer to Para 2.5.32.
- <descrIllustrationRef>, the illustration reference description. Refer to Para 2.5.33.

Markup example:

```
<descrElectricalEquip>
<descrFunctionalItemRef>
<fieldName>Functional item</fieldName>
<descr>Each item of equipment within a system / circuit is
identified by its circuit code with a sequential number before
it (eg, 1AG). If items of equipment are used by more than one
system, they are identified by the use of a systems letter V.
The systems letter V will have an equipment sequential number
```

```
before it. The second letter after the V identifies the type of
equipment used, and is identified within the system V.
Connectors are identified by an additional letter. The letter
will come after the equipment ident (eg, 1AGA).</descr>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="1B" systemDiffCode="B" systemCode="91"
subSystemCode="0" subSubSystemCode="0" assyCode="12"
disassyCode="02" disassyCodeVariant="A" infoCode="018"
infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
</descrFunctionalItemRef>
</descrElectricalEquip>
```

2.7.1 Installation location information description

Description: The element <descrInstallationLocation> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the installation location information child element <installationLocation> of the element <installationInfo>.

Markup element: <descrInstallationLocation>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.2 Access door or panel information description

Description: The element <descrAccessDoorOrPanel> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the access door or panel child element <accessDoorOrPanel> of the element <installationInfo>.

Markup element: <descrAccessDoorOrPanel>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.3 Assembly information description

Description: The element <descrAssy> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the assembly information child element <assy> of the assembly instructions element <assyInstruction>.

Markup element: <descrAssy>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.4 Position on next higher assembly description

Description: The element <descrPositionOnNextHigherAssy> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the position on next higher assembly child element <positionOnNextHigherAssy> of the element <installationInfo>.

Markup element: <descrPositionOnNextHigherAssy>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.5 Maximum number of mounting positions description

Description: The element <descrMaxMountingPositions> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the maximum number of mounting positions element <maxMountingPositions>.

Markup element: <descrMaxMountingPositions>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.6 System breakdown code description

Description: The element <descrSystemBreakdownCode> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the system breakdown code element <systemBreakdownCode>.

Markup element: <descrSystemBreakdownCode>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.7 Sibling plug identification description

Description: The element <descrSiblingPlugIdent> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the functional item reference child element

<functionalItemRef> of the sibling plug identification element <siblingPlugIdent>.

Markup element: <descrSiblingPlugIdent>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.8 Transverse link information description

Description: The element <descrTransverseLink> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the contact identification child element <contact> of the electrical equipment connection element <electricalEquipConnection> within the transverse link element <transverseLink>.

Markup element: <descrTransverseLink>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.9 Connection list class description

Description: The element <descrConnectionListClass> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the connection list class element <connectionListClass>.

Markup element: <descrConnectionListClass>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.10 Electrical connection contact description

Description: The element <descrElectricalContact> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the electrical connection contact child element <contact> of the electrical equipment connection element <electricalEquipConnection>.

Markup element: <descrElectricalContact>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.11 Electrical state information description

Description: The element <descrElectricalStateDescr> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the electrical state description child element <electricalStateDescr> of the electrical equipment state information element <electricalEquipState>.

Markup element: <descrElectricalStateDescr>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.12 Electrical equipment name description

Description: The element <descrEquipName> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the electrical equipment name element <equipName>.

Markup element: <descrEquipName>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.13 Quantity description

Description: The element <descrReqQuantity> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the required quantity information element <reqQuantity>.

Markup element: <descrReqQuantity>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.7.14 Electrical equipment description reference description

Description: The element <descrEquipDescrRef> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the electrical equipment description reference element <equipDescrRef>.

Markup element: <descrEquipDescrRef>

Attributes:

– None

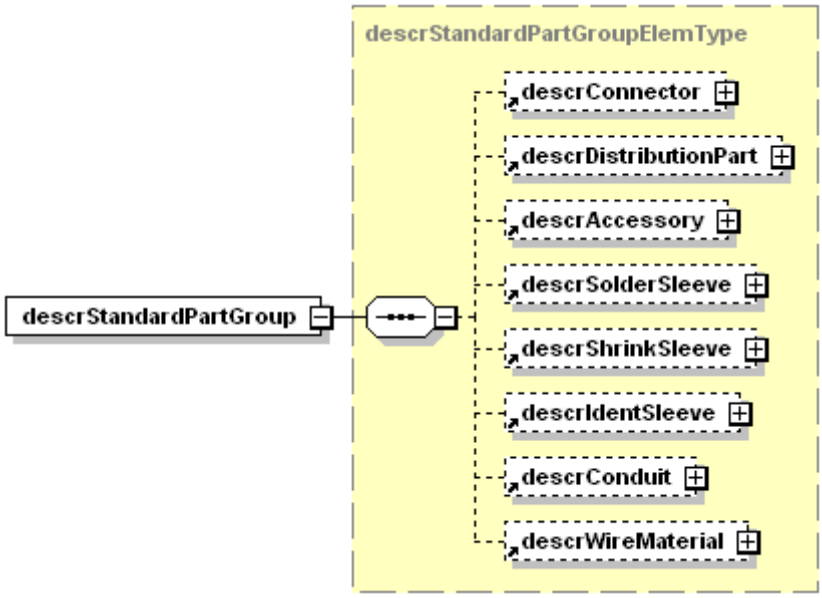
Child elements:

– Refer to Para 2.4.

2.8 Standard parts data/field descriptions

Description: The element <descrStandardPartGroup> contains child elements, which describe the electrical standard parts data elements.

Markup element: <descrStandardPartGroup>



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Fig 7 Element <descrStandardPartGroup>

Attributes:

– None

Child elements:

– <descrConnector>, the connector data/field descriptions. Refer to Para 2.8.1.
– <descrDistributionPart>, the distribution part data/field descriptions. Refer to Para 2.8.2.
– <descrAccessory>, the accessory data/field descriptions. Refer to Para 2.8.3.
– <descrSolderSleeve>, the solder sleeve data/field descriptions. Refer to Para 2.8.4.
– <descrShrinkSleeve>, the shrink sleeve data/field descriptions. Refer to Para 2.8.5.
– <descrIdentSleeve>, the identification sleeve data/field descriptions. Refer to Para 2.8.6.
– <descrConduit>, the conduit data/field descriptions. Refer to Para 2.8.7.
– <descrWireMaterial>, the wire material data/field descriptions. Refer to Para 2.8.8.

2.8.1 Connector data/field descriptions

Description: The element <descrConnector> contains all relevant elements to describe the connector data elements of the project.

Markup element: <descrConnector>



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Fig 8 Element <descrConnector>

Attributes:

– None

Child elements:

– <descrPartNumber>, the part number description. Refer to Para 2.5.6.
– <descrAltPartNumber>, the alternative part number description. Refer to Para 2.6.1.
– <descrManufacturerCode>, the manufacturer code description. Refer to Para 2.6.2.
– <descrMass>, the mass information description. Refer to Para 2.8.1.1.
– <descrOrientation>, the orientation information description. Refer to Para 2.8.1.2.
– <descrAssy>, the assembly information description. Refer to Para 2.7.3.
– <descrRack>, the rack information description. Refer to Para 2.8.1.3.
– <descrContactCount>, the contact count description. Refer to Para 2.8.1.4.
– <descrContact>, the contact information description. Refer to Para 2.5.19.
– <descrContactDiameter>, the contact diameter description. Refer to Para 2.8.1.5.
– <descrFinishingInfo>, the finishing information description. Refer to Para 2.5.25.
– <descrThermoCouplePlus>, the thermocouple plus information description. Refer to Para 2.8.1.6.
– <descrThermoCoupleMinus>, the thermocouple minus information description. Refer to Para 2.8.1.7.
– <descrSpecialTerminal>, the special terminal information description. Refer to Para 2.8.1.8.
– <descrCoaxialCableFlag>, the coaxial information description. Refer to Para 2.5.15.
– <descrTriaxialCableFlag>, tri-axial information description. Refer to Para 2.5.16.
– <descrTerminationModuleGroupingValue>, the termination module grouping information description. Refer to Para 2.8.1.9.
– <descrBlockGroupingValue>, the block grouping information description. Refer to Para 2.8.1.10.
– <descrShuntGroupingValue>, the shunt grouping information description. Refer to Para 2.8.1.11.
– <descrElectricalContact>, the electrical connections contact description. Refer to Para 2.7.10.
– <descrElectricalStateDescr>, the electrical state information description. Refer to Para 2.7.11.
– <descrAccessoryPartNumber>, the accessory information description. Refer to Para 2.8.1.12.
– <descrFunctionalDescrRef>, the functional description reference description. Refer to Para 2.5.32.
– <descrIllustrationRef>, the illustration reference description. Refer to Para 2.5.33.

Markup example:

The following markup example shows the definition of the elements <partNumber> and <manufacturerCode> of the alternate identification of connector data. No references are applicable.

```
<descrAltPartNumber>
<fieldName>Manufacturer part number</fieldName>
```

```
<descr>Manufacturer part number provides manufacturer part
numbers, which show cross reference part numbers to the standard
part number of the connector.</descr>
</descrAltPartNumber>
<descrManufacturerCode>
<fieldName>Manufacturer</fieldName>
<descr>Manufacturer shows the manufacturer of the connector,
described by manufacturer part number.</descr>
</descrManufacturerCode>
```

2.8.1.1 Mass information description

Description: The element <descrMass> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the mass information element <mass>.

Markup element: <descrMass>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.1.2 Orientation information description

Description: The element <descrOrientation> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the orientation information element <orientation>.

Markup element: <descrOrientation>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.1.3 Rack information description

Description: The element <descrRack> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the rack information element <rack>.

Markup element: <descrRack>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.1.4 Contact count description

Description: The element <descrContactCount> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the contact count element <contactCount>.

Markup element: <descrContactCount>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.1.5 Contact diameter description
Description: The element <descrContactDiameter> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the contact diameter element <contactDiameter>.

Markup element: <descrContactDiameter>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.1.6 Thermocouple plus information description
Description: The element <descrThermoCouplePlus> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the thermocouple plus information element <thermoCouplePlus>.

Markup element: <descrThermoCouplePlus>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.1.7 Thermocouple minus information description
Description: The element <descrThermoCoupleMinus> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the thermocouple minus information element <thermoCoupleMinus>.

Markup element: <descrThermoCoupleMinus>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.1.8 Special terminal information description
Description: The element <descrSpecialTerminal> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other

data modules or publications for the special terminal information element <specialTerminal>.

Markup element: <descrSpecialTerminal>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.1.9 Termination module grouping information description

Description: The element <descrTerminationModuleGroupingValue> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the termination module grouping information child element <terminationModuleGroupingValue> of the contact description element <contactDescr>.

Markup element: <descrTerminationModuleGroupingValue>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.1.10 Block grouping information description

Description: The element <descrBlockGroupingValue> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the block grouping information child element <blockGroupingValue> of the contact description element <contactDescr>.

Markup element: <descrBlockGroupingValue>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.1.11 Shunt grouping information description

Description: The element <descrShuntGroupingValue> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the shunt grouping information child element <shuntGroupingValue> of the contact description element <contactDescr>.

Markup element: <descrShuntGroupingValue>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.1.12 Accessory part number description

Description: The element <descrAccessoryPartNumber> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the accessory part number child element <partNumber> of the list of accessories element <connectorAccessories>.

Markup element: <descrAccessoryPartNumber>

Attributes:

– None

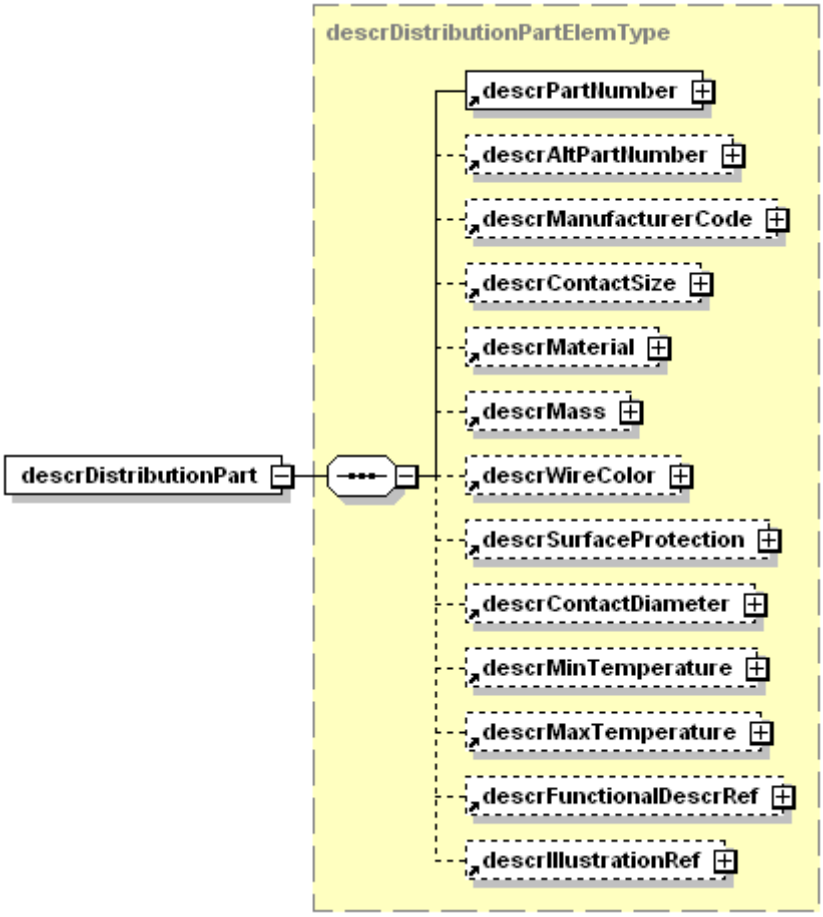
Child elements:

– Refer to Para 2.4.

2.8.2 Distribution part data/field descriptions

Description: The element <descrDistributionPart> contains all relevant elements to describe the distribution part data elements of the project.

Markup element: <descrDistributionPart>



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Fig 9 Element <descrDistributionPart>

Attributes:

– None

Child elements:

- <descrPartNumber>, the part number description. Refer to Para 2.5.6.
- <descrAltPartNumber>, the alternative part number description. Refer to Para 2.6.1.
- <descrManufacturerCode>, the manufacturer code description. Refer to Para 2.6.2.
- <descrContactSize>, the contact size description. Refer to Para 2.8.2.1.
- <descrMaterial>, the material information description. Refer to Para 2.8.2.2.
- <descrMass>, the mass information description. Refer to Para 2.8.1.1.
- <descrWireColor>, the color information description. Refer to Para 2.5.13.
- <descrSurfaceProtection>, the surface protection information description. Refer to Para 2.8.2.3.
- <descrContactDiameter>, the contact diameter description. Refer to Para 2.8.1.5.
- <descrMinTemperature>, the minimum temperature description. Refer to Para 2.6.6.
- <descrMaxTemperature>, the maximum temperature description. Refer to Para 2.6.7.
- <descrFunctionalDescrRef>, the functional description reference description. Refer to Para 2.5.32.
- <descrIllustrationRef>, the illustration reference description. Refer to Para 2.5.33.

Markup example:

The following markup example shows the definition of the element <wireColor> of distribution part data. No references are applicable.

```
<descrWireColor>
<fieldName>Color codes</fieldName>
<descr>Color codes provide, if applicable, the colors of the
color bands of contacts that identify the size of the
contact.</descr>
</descrWireColor>
```

2.8.2.1 Contact size description

Description: The element <descrContactSize> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the contact size element <contactSize>.

Markup element: <descrContactSize>

Attributes:

- None

Child elements:

- Refer to Para 2.4.

2.8.2.2 Material information description

Description: The element <descrMaterial> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the material information element <material>.

Markup element: <descrMaterial>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.2.3 Surface protection information description

Description: The element <descrSurfaceProtection> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the surface protection information element <surfaceProtection>.

Markup element: <descrSurfaceProtection>

Attributes:

– None

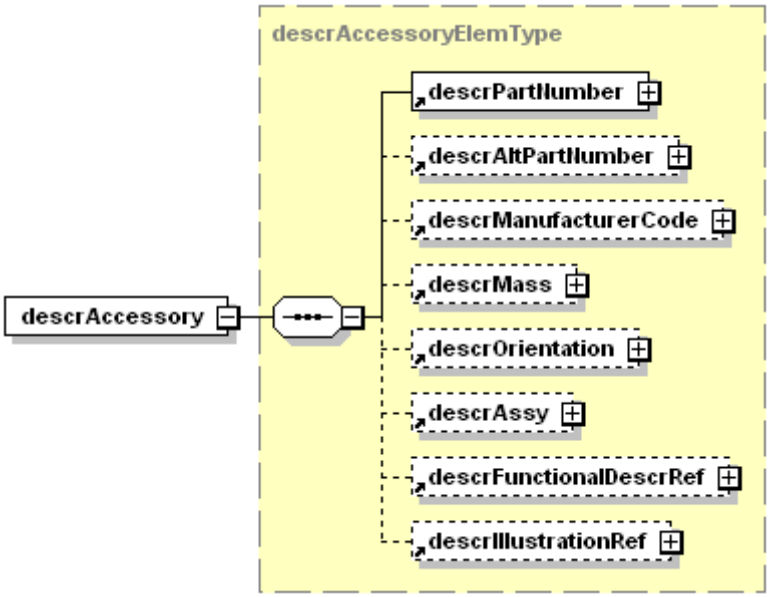
Child elements:

– Refer to Para 2.4.

2.8.3 Accessory data/field descriptions

Description: The element <descrAccessory> contains all relevant elements to describe the accessory data elements of the project.

Markup element: <descrAccessory>



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Fig 10 Element <descrAccessory>

Attributes:

– None

Child elements:

– <descrPartNumber>, the part number description. Refer to Para 2.5.6.

- <descrAltPartNumber>, the alternative part number description. Refer to Para 2.6.1.
- <descrManufacturerCode>, the manufacturer code description. Refer to Para 2.6.2.
- descrMass>, the mass information description. Refer to Para 2.8.1.1.
- <descrOrientation>, the orientation information description. Refer to Para 2.8.1.2.
- <descrAssy>, the assembly information description. Refer to Para 2.7.3.
- <descrFunctionalDescrRef>, the functional description reference description. Refer to Para 2.5.32.
- <descrIllustrationRef>, the illustration reference description. Refer to Para 2.5.33.

Markup example:

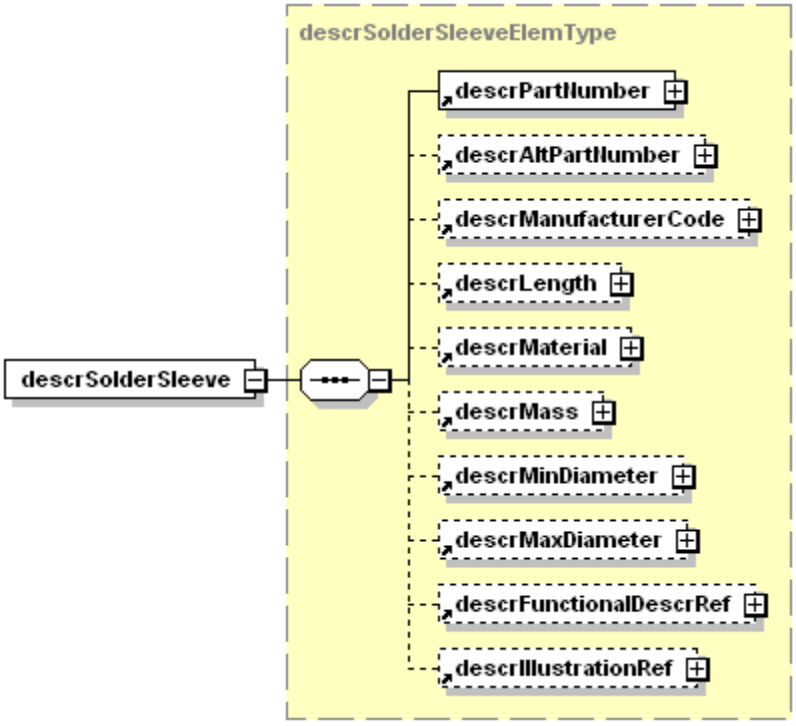
The following markup example shows the definition of the element <orientation> of accessory data. No references are applicable.

```
<descrOrientation>
<fieldName>Cable clamp orientation</fieldName>
<descr>Cable clamp orientation provides information of the
angular position of the cable clamp in degrees.</descr>
</descrOrientation>
```

2.8.4 Solder sleeve data/field descriptions

Description: The element <descrSolderSleeve> contains all relevant elements to describe the solder sleeve data elements of the project.

Markup element: <descrSolderSleeve>



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Fig 11 Element <descrSolderSleeve>

Attributes:

– None

Child elements:

– <descrPartNumber>, the part number description. Refer to Para 2.5.6.
– <descrAltPartNumber>, the alternative part number description. Refer to Para 2.6.1.
– <descrManufacturerCode>, the manufacturer code description. Refer to Para 2.6.2.
– <descrLength>, the length description. Refer to Para 2.5.12.
– <descrMaterial>, the material information description. Refer to Para 2.8.2.2.
– <descrMass>, the mass information description. Refer to Para 2.8.1.1.
– <descrMinDiameter>, the minimum diameter description. Refer to Para 2.8.4.1.
– <descrMaxDiameter>, the maximum diameter description. Refer to Para 2.8.4.2.
– <descrFunctionalDescrRef>, the functional description reference description. Refer to Para 2.5.32.
– <descrIllustrationRef>, the illustration reference description. Refer to Para 2.5.33.

Markup example:

The following markup example shows the definition of the elements <minDiameter> and <maxDiameter> of solder sleeve data.

```
<descrMinDiameter>
<fieldName>Entry diameter 'd' min</fieldName>
<descr>The entry diameter 'd' min describes the minimum diameter
of the stripped wires in the center of the solder sleeve.
</descr>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="1B" systemDiffCode="B" systemCode="91"
subSystemCode="0" subSubSystemCode="0" assyCode="33"
disassyCode="08" disassyCodeVariant="A" infoCode="040"
infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
</descrMinDiameter>
<descrMaxDiameter>
<fieldName>Entry diameter 'D' max</fieldName>
<descr>The entry diameter 'D' max describes the maximum diameter
of the unstripped wires at the edge of the solder sleeve.
</descr>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="1B" systemDiffCode="B" systemCode="91"
subSystemCode="0" subSubSystemCode="0" assyCode="33"
disassyCode="08" disassyCodeVariant="A" infoCode="040"
infoCodeVariant="A" itemLocationCode="A"/>
```

```
</dmRefIdent>
</dmRef>
</refs>
</descrMaxDiameter>
```

2.8.4.1 Minimum diameter description

Description: The element <descrMinDiameter> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the minimum diameter child element <minDiameter> of the sleeve diameter element <sleeveDiameter>.

Markup element: <descrMinDiameter>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.4.2 Maximum diameter description

Description: The element <descrMaxDiameter> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the maximum diameter child element <maxDiameter> of the sleeve diameter element <sleeveDiameter>.

Markup element: <descrMaxDiameter>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.5 Shrink sleeve data/field descriptions

Description: The element <descrShrinkSleeve> contains all relevant elements to describe the shrink sleeve data elements of the project.

Markup element: <descrShrinkSleeve>



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Fig 12 Element <descrShrinkSleeve>

Attributes:

– None

Child elements:

– <descrPartNumber>, the part number description. Refer to Para 2.5.6.
– <descrAltPartNumber>, the alternative part number description. Refer to Para 2.6.1.
– <descrManufacturerCode>, the manufacturer code description. Refer to Para 2.6.2.
– <descrSize>, the size information description. Refer to Para 2.8.5.1.
– <descrMass>, the mass information description. Refer to Para 2.8.1.1.
– <descrWireColor>, the color information description. Refer to Para 2.5.13.
– <descrMinDiameter>, the minimum diameter description. Refer to Para 2.8.4.1.
– <descrMaxDiameter>, the minimum diameter description. Refer to Para 2.8.4.2.
– <descrMinTemperature>, the minimum temperature description. Refer to Para 2.6.6.
– <descrMaxTemperature>, the maximum temperature description. Refer to Para 2.6.7.

- <descrMinHarnessSize>, the minimum harness size description. Refer to Para 2.8.5.2.
- <descrMaxHarnessSize>, the maximum harness size description. Refer to Para 2.8.5.3.
- <descrFunctionalDescrRef>, the functional description reference description. Refer to Para 2.5.32.
- <descrIllustrationRef>, the illustration reference description. Refer to Para 2.5.33.

Markup example:

The following example shows the definition of the elements <minTemperature> and <maxTemperature> of shrink sleeve data. No references are applicable.

```
<descrMinTemperature>
<fieldName>Minimum ambient temperature</fieldName>
<descr>The minimum ambient temperature indicates the minimum
temperature, where application of the shrink sleeve is
recommended.</descr>
</descrMinTemperature>
<descrMaxTemperature>
<fieldName>Maximum ambient temperature</fieldName>
<descr>The maximum ambient temperature indicates the maximum
temperature, where application of the shrink sleeve is
recommended.</descr>
</descrMaxTemperature>
```

2.8.5.1 Size information description

Description: The element <descrSize> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the size information element <size>.

Markup element: <descrSize>

Attributes:

- None

Child elements:

- Refer to Para 2.4.

2.8.5.2 Minimum harness size description

Description: The element <descrMinHarnessSize> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the minimum harness size child element <minHarnessSize> of the harness size element <harnessSize>.

Markup element: <descrMinHarnessSize>

Attributes:

- None

Child elements:

- Refer to Para 2.4.

2.8.5.3 Maximum harness size description

Description: The element <descrMaxHarnessSize> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the maximum harness size child element <maxHarnessSize> of the harness size element <harnessSize>.

Markup element: <descrMaxHarnessSize>

Attributes:

– None

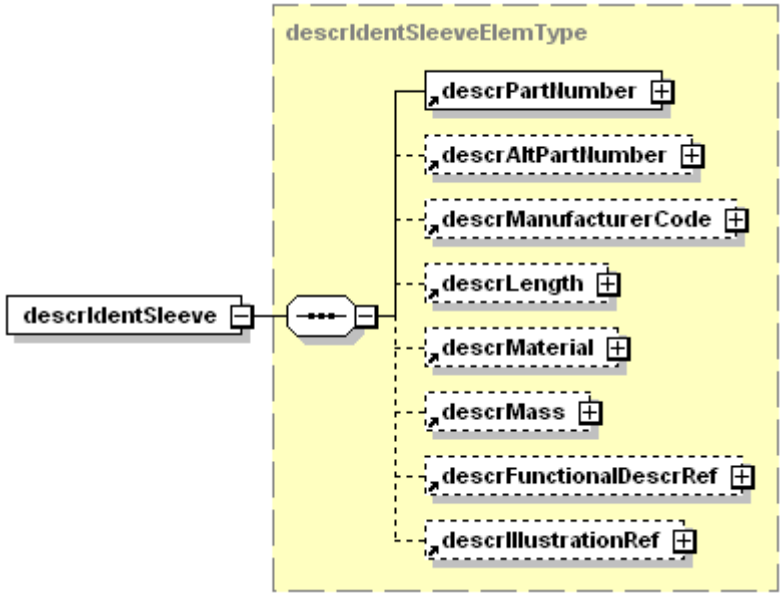
Child elements:

– Refer to Para 2.4.

2.8.6 Identification sleeve data/field descriptions

Description: The element <descrIdentSleeve> contains all relevant elements to describe the identification sleeve data elements of the project.

Markup element: <descrIdentSleeve>



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Fig 13 Element <descrIdentSleeve>

Attributes:

– None

Child elements:

– <descrPartNumber>, the part number description. Refer to Para 2.5.6.
– <descrAltPartNumber>, the alternative part number description. Refer to Para 2.6.1.
– <descrManufacturerCode>, the manufacturer code description. Refer to Para 2.6.2.
– <descrLength>, the length description. Refer to Para 2.5.12.
– <descrMaterial>, the material information description. Refer to Para 2.8.2.2.

- <descrMass>, the mass information description. Refer to Para 2.8.1.1.
- <descrFunctionalDescrRef>, the functional description reference description. Refer to Para 2.5.32.
- <descrIllustrationRef>, the illustration reference description. Refer to Para 2.5.33.

Markup example:

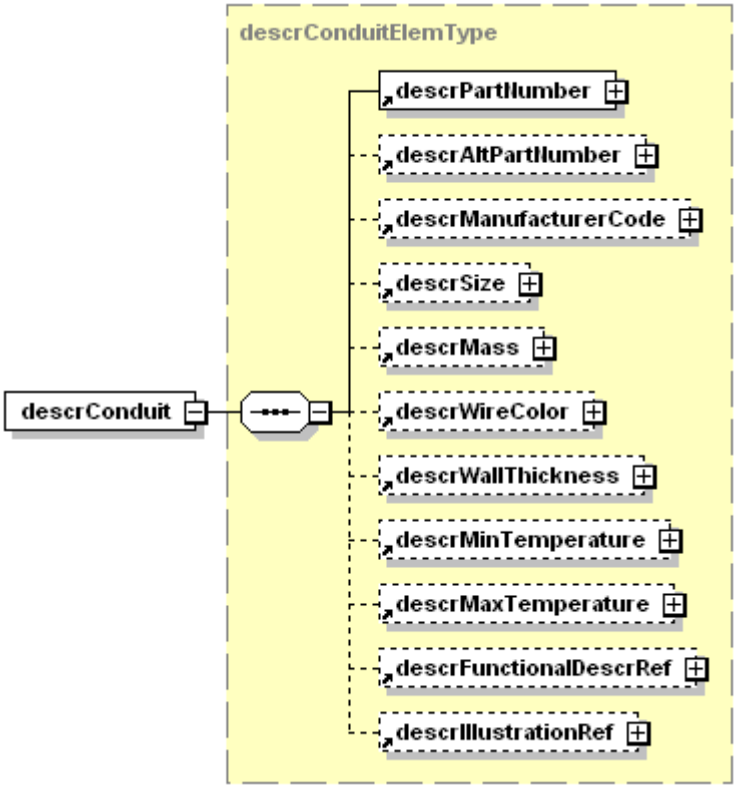
The following markup example shows the definition of the element <length> of identification sleeve data. No references are applicable.

```
<descrLength>
<fieldName>Sleeve length</fieldName>
<descr>Sleeve length provides information on the length of the
identification sleeve.</descr>
</descrLength>
```

2.8.7 Conduit data/field descriptions

Description: The element <descrConduit> contains all relevant elements to describe the conduit data elements of the project.

Markup element: <descrConduit>



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Fig 14 Element <descrConduit>

Attributes:

- None

Child elements:

- <descrPartNumber>, the part number description. Refer to Para 2.5.6.
- <descrAltPartNumber>, the alternative part number description. Refer to Para 2.6.1.
- <descrManufacturerCode>, the manufacturer code description. Refer to Para 2.6.2.
- <descrSize>, the size information description. Refer to Para 2.8.5.1.
- <descrMass>, the mass information description. Refer to Para 2.8.1.1.
- <descrWireColor>, the color information description. Refer to Para 2.5.13.
- <descrWallThickness>, the wall thickness description. Refer to Para 2.8.7.1.
- <descrMinTemperature>, the minimum temperature description. Refer to Para 2.6.6.
- <descrMaxTemperature>, the maximum temperature description. Refer to Para 2.6.7.
- <descrFunctionalDescrRef>, the functional description reference description. Refer to Para 2.5.32.
- <descrIllustrationRef>, the illustration reference description. Refer to Para 2.5.33.

Markup example:

The following markup example shows the definition of the element <wallThickness> of conduit data. No references are applicable.

```
<descrWallThickness>
<fieldName>Wall thickness</fieldName>
<descr>Wall thickness provides the wall thickness information of
the conduit in millimeter.</descr>
</descrWallThickness>
```

2.8.7.1 Wall thickness description

Description: The element <descrWallThickness> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the wall thickness element <wallThickness>.

Markup element: <descrWallThickness>

Attributes:

- None

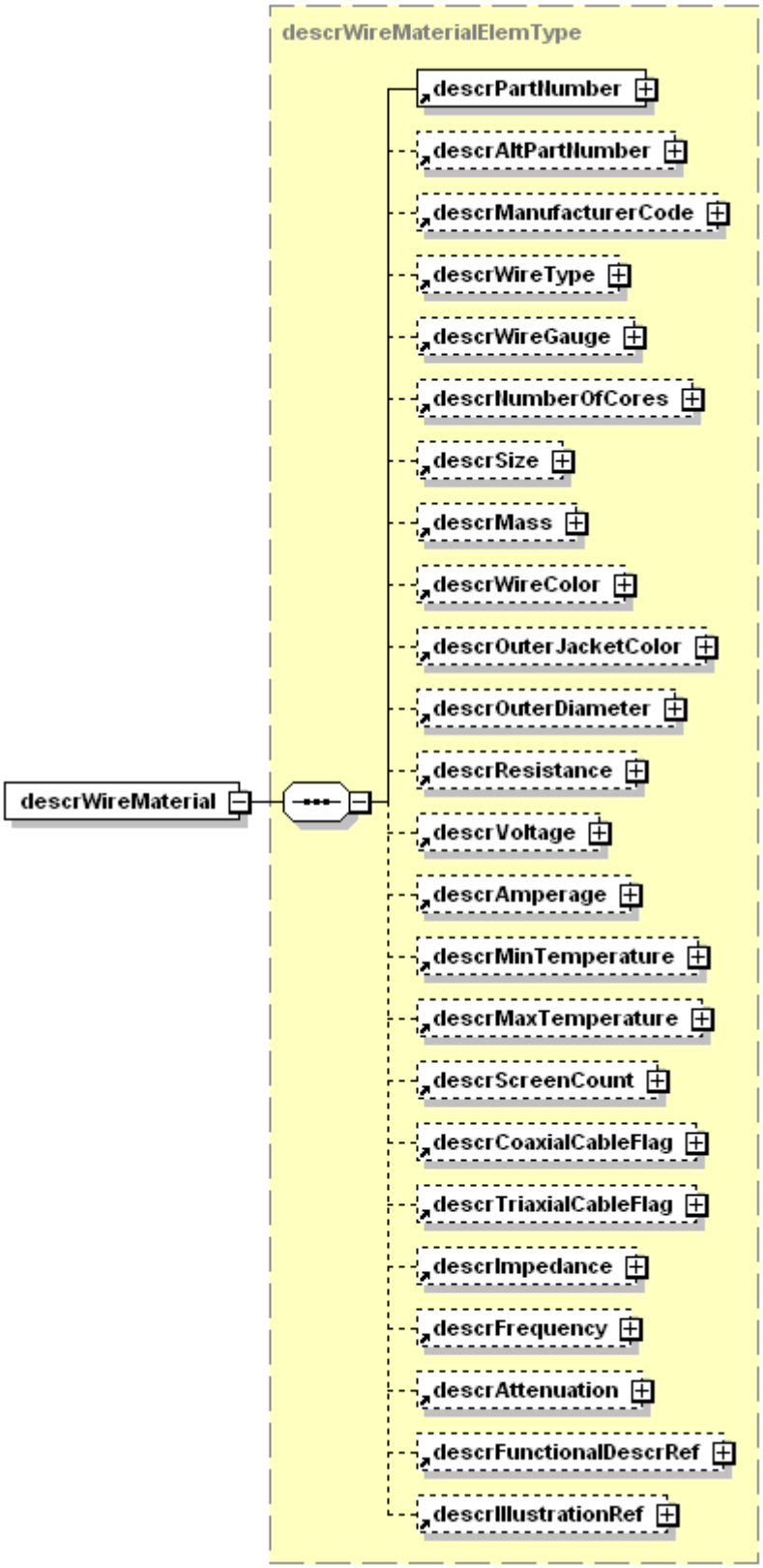
Child elements:

- Refer to Para 2.4.

2.8.8 Wire material data/field descriptions

Description: The element <descrWireMaterial> contains all relevant elements to describe the wire material data elements of the project.

Markup element: <descrWireMaterial>



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Fig 15 Element <descrWireMaterial>

Attributes:

– None

Child elements:

– <descrPartNumber>, the part number description. Refer to Para 2.5.6.
– <descrAltPartNumber>, the alternative part number description. Refer to Para 2.6.1.
– <descrManufacturerCode>, the manufacturer code description. Refer to Para 2.6.2.
– <descrWireType>, the wire type description. Refer to Para 2.5.4.
– <descrWireGauge>, the wire gauge description. Refer to Para 2.5.5.
– <descrNumberOfCores>, the number of cores description. Refer to Para 2.8.8.1.
– <descrSize>, the size information description. Refer to Para 2.8.5.1.
– <descrMass>, the mass information description. Refer to Para 2.8.1.1.
– <descrWireColor>, the color information description. Refer to Para 2.5.13.
– <descrOuterJacketColor>, the outer jacket color description. Refer to Para 2.8.8.2.
– <descrOuterDiameter>, the outer diameter description. Refer to Para 2.8.8.3.
– <descrResistance>, the resistance information description. Refer to Para 2.8.8.4.
– <descrVoltage>, the voltage information description. Refer to Para 2.8.8.5.
– <descrAmperage>, the amperage information description. Refer to Para 2.8.8.6.
– <descrMinTemperature>, the minimum temperature description. Refer to Para 2.6.6.
– <descrMaxTemperature>, the maximum temperature description. Refer to Para 2.6.7.
– <descrScreenCount>, the screen count description. Refer to Para 2.8.8.7.
– <descrCoaxialCableFlag>, the coaxial information description. Refer to Para 2.5.15.
– <descrTriaxialCableFlag>, tri-axial information description. Refer to Para 2.5.16.
– <descrImpedance>, the impedance information description. Refer to Para 2.8.8.8.
– <descrFrequency>, the frequency information description. Refer to Para 2.8.8.9.
– <descrAttenuation>, the attenuation information description. Refer to Para 2.8.8.10.
– <descrFunctionalDescrRef>, the functional description reference description. Refer to Para 2.5.32.
– <descrIllustrationRef>, the illustration reference description. Refer to Para 2.5.33.

Markup example:

The following markup example shows the definition of the element <wireColor> of wire material data. No references are applicable.

```
<descrWireColor>
<fieldName>Wire color</fieldName>
<descr>Wire color provides information on the color of the wire
sheathing. For multi-core cables, the colors of the single wire
sheathings are shown, separated by slashes (eg,
red/blue/yellow).</descr>
</descrWireColor>
```

2.8.8.1 Core description

Description: The element <descrNumberOfCores> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the number of cores element <numberOfCores>.

Markup element: <descrNumberOfCores>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.8.2 Outer jacket color description

Description: The element <descrOuterJacketColor> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the outer jacket color element <outerJacketColor>.

Markup element: <descrOuterJacketColor>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.8.3 Outer diameter description

Description: The element <descrOuterDiameter> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the outer diameter element <outerDiameter>.

Markup element: <descrOuterDiameter>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.8.4 Resistance information description

Description: The element <descrResistance> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the resistance information element <resistance>.

Markup element: <descrResistance>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.8.5 Voltage information description

Description: The element <descrVoltage> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the voltage information element <voltage>.

Markup element: <descrVoltage>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.8.6 Amperage information description

Description: The element <descrAmperage> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the amperage information element <amperage>.

Markup element: <descrAmperage>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.8.7 Screen count description

Description: The element <descrScreenCount> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the screen count element <screenCount>.

Markup element: <descrScreenCount>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.8.8 Impedance information description

Description: The element <descrImpedance> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the impedance information child element <impedance> of the frequency characteristics element <frequencyCharacteristics>.

Markup element: <descrImpedance>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.8.9 Frequency information description

Description: The element <descrFrequency> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the frequency information child element <frequency> of the frequency and attenuation element <frequencyAttenuation>.

Markup element: <descrFrequency>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

2.8.8.10 Attenuation information description

Description: The element <descrAttenuation> contains child elements, which provide a project or an organization specific name, a brief description and a reference to other data modules or publications for the attenuation information child element <attenuation> of the frequency and attenuation element <frequencyAttenuation>.

Markup element: <descrAttenuation>

Attributes:

– None

Child elements:

– Refer to Para 2.4.

Chapter 3.9.5.2.10

Content section - Process data module

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Chap 4.13.3	Optimizing and reuse - Alternates concept
Chap 6.4	Information presentation and use - Functionality

Chap No./Document No.	Title
Chap 7.6.1	Software requirements - Process data module requirements

1 General

The process data module Schema is used to capture and represent process information. The process data module contains interactive processing structures to provide the capability to sequence other data modules or steps within it, based on static or dynamic state information.

The process data module can be of any type: procedural, fault, descriptive, etc. Its content can include preliminary requirements and requirements after job completion. The process data module is useful to achieve capabilities of the functionality matrix in categories of (refer to Chap 6.4):

1 diagnostics (particularly dynamic diagnostics, or system simulation)

2 external processes, where data is captured in the IETP and transmitted to the external process or vice versa

3 navigation and tracking in areas of filtering (only displaying data to the user that are applicable) and dialog-driven interaction

These concepts are explained in more detail in the following chapters:

- Process data module - Content. Refer to Chap 3.9.5.2.10.1.
- Process data module - Dialogs. Refer to Chap 3.9.5.2.10.2.
- Process data module - Expressions, variables and external applications. Refer to Chap 3.9.5.2.10.3.
- Process data module - Logic engine. Refer to Chap 3.9.5.2.10.4.
- Process data module - Example process data module. Refer to Chap 3.9.5.2.10.5.

Sequencing, based on state information, together with management of dynamic and static state information are required capabilities to achieve intelligent, interactive data display. This functionality is fundamental to testing and troubleshooting sequences, where the next test is often based on the result of the current test (dynamic state information) or the input from the product interface (via the external application interface). The functionality also allows the presentation of information to the user to be customized to the product configuration or any system state.

Sequencing is accomplished by a software component called the logic engine. Refer to Chap 3.9.5.2.10.4. This software component is only required for processing process data modules. Its function is basically to determine what to display next.

The process data module contains structures for traversing steps and data modules in a defined order and in if-then-else branches and loops. The process data module also filters steps and data modules based on the value of state variables as defined in Chap 3.9.5.2.10.3 (eg, [*Model* equal "B" or *Test passed* equal TRUE]) which are stored in the state table.

Note

In this chapter, variable names appear in *italics* and expressions in [brackets].

If the required variable values are not in the state table, the process data module gathers information from the user or other sources to populate the state table and then use that information to make branching and filtering decisions. When sequencing data modules, no change to the data module itself is required, and thus data modules can be reused in many sequences.

1.1 Interactive presentation functionality

The interactive presentation functionality is enabled through structures provided in the process data module. The functionality is implemented in the logic engine, a software component that processes the interactive structures. Refer to Chap 3.9.5.2.10.4. Detailed processing instructions are given in Chap 7.6.1.

1.1.1 Screen-based information grouping

The process data module is designed for interactive electronic display. Information to be displayed simultaneously on the same screen is grouped on a node. Refer to Chap 3.9.5.2.10.1. After viewing a screen of data, the user must provide an acknowledgement to move to the next node in the sequence.

1.1.2 State information

The power of the process data module is in its ability to capture, store, and act upon state information (the values of defined variables such as *`Model, Serial Number`*, *`Power Source`*, or *`Continuity Exists`*). State information is normally captured via user dialogs and stored in the state table. When the logic engine requires a variable value to determine what to display next, it searches the state table for this value.

1.1.3 Sequencing based on static/dynamic state information

The viewing system must support simple sequencing. This allows for the authoring of a maintenance stream such as:

- open door 1
- open circuit breaker B
- functional test B
- close circuit breaker B
- close door 1

where data items of the maintenance stream are data modules, steps, or a combination of both. The user will be automatically directed from one data item to another when the user acknowledges the completion of the instruction within the current data item.

There is also a need to sequence information in a non-linear stream based on system state. For instance, the user needs to see the information within data module A if continuity existed at a designated pin, but needs to see the information within data modules B and D if it did not. In another case, the user needs to loop through a series of rigging steps until a certain gap is less than 1,5 cm.

1.1.4 Context filtering based on static/dynamic state information

Context filtering of data means that the user does not select information to view, but is only presented with information that applies to the current situation. This filtering is normally tied to the configuration or state of the product under maintenance.

There is also a need to handle cases where the filtering is not configuration related, for example:

- The data only applies when the unit is deployed in the field rather than being at a maintenance facility.
- The data only applies in a certain range of sensor reading values from the equipment.

Context filtering is achieved by attaching conditions to pieces of data that describe under what circumstances that data applies.

Hence, procedure A can have a condition attached to it making it applicable when the unit under maintenance is an "A" model with serial number greater than 155678. Procedure A will only be seen under those circumstances.

In the same manner, procedure B can be applicable when using battery power and procedure C can be applicable when using APU power. In this case, procedures B and C are authored as "alternatives" of one another. They can be grouped together and when accessed for maintenance, the appropriate one is used based on the type of power employed.

Most process data module elements have associated "Alts" elements allowing this grouping of data items that serve the same purpose but apply under different conditions. The "Alts" element is a powerful construct that, for example, allows an author to create one procedure that handles different configurations of the Product by employing alternative steps where the configuration differences drive unique data. This concept is discussed in Chap 3.9.5.2.10.1 and Chap 4.13.3.

1.1.5 State table management

In order to sequence and context filter data, the system must be capable of collecting and maintaining the system state. This is achieved through the use of state variables and expressions that use these variables.

The system maintains a list of variables and their associated values. This list is called the state table. Any information that is required to make a filtering, branching, looping decision, or that is needed to pass to an external application must be defined as a variable and stored in the state table.

The system obtains values for variables through user dialogs, external application interfaces, or authored variable assignments. The system uses these variable values to evaluate expressions. The result of an expression evaluation determines which data the user will see.

2 Process information

2.1 Schema basic rules

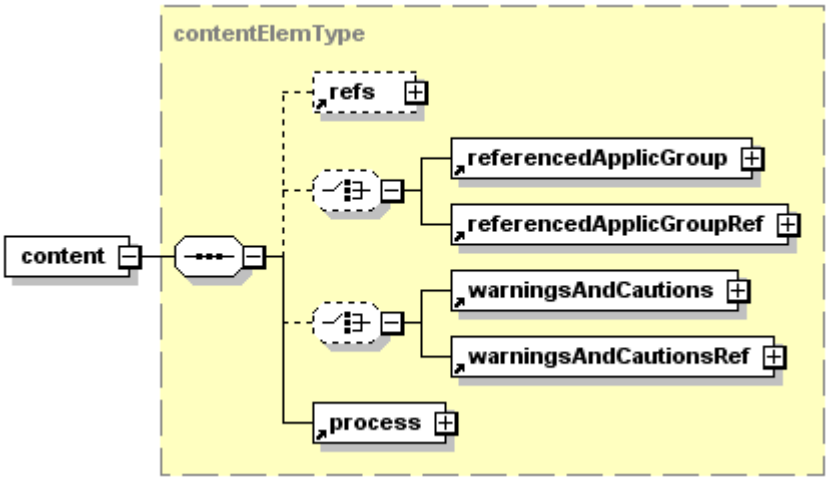
The process data module uses sequencing and filtering constructs to provide a seamless, logical flow of information to the user. This flow is implemented by the logic engine software component.

The user will move through a sequence of data items based on how the process data module author intended. The user can be asked questions to facilitate if-then-else branching and applicability filtering. The author decides what the user sees, and what choices the user has. The user acknowledges the completion of the instruction within a data item, and the logic engine determines the next data item for viewing based on state information. Primary constructs of the process data module are described in the chapters referenced in Para 1.

2.2 Content

Description: The element <content> contains the content section of the process data module.

Markup element: <content>



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Fig 1 Element <content>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`refs`>. Refer to Chap 3.9.5.2.1.2.
- <`referencedApplicGroup`>. Refer to Chap 3.9.5.3.
- <`referencedApplicGroupRef`>. Refer to Chap 3.9.5.3.
- <`warningsAndCautions`>. Refer to Chap 3.9.3.
- <`warningsAndCautionsRef`>. Refer to Chap 3.9.3.
- <`process`>. Refer to Chap 3.9.5.2.10.1.

Chapter 3.9.5.2.10.1

Process data module - Content

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1 General

The process data module contains elements from the procedural data module such as warnings and cautions, procedural steps, preliminary requirements and requirements after job completion. Beyond that, the process data module contains interactive processing elements to provide the capability to sequence data modules or steps within it based on static or dynamic state information. The process data module can be of any type: procedural, fault, descriptive, etc. Its content can include preliminary requirements and requirements after job completion.

Sequencing, based on current state information, allows the process data module author to achieve intelligent, interactive data display. This functionality is fundamental to testing and troubleshooting sequences where the next test is often based on the result of the current test (dynamic state information) or input from the product interface (via the external application interface). It also allows the presentation of information to the user to be customized to the product configuration or any system state.

The process data module contains structures for traversing steps and data modules in a defined order and also in if-then-else branches and loops. The process data module also filters steps and data modules based on the value of state variables (eg, [*Model* equal "B" or *Test passed* equal TRUE]).

Note

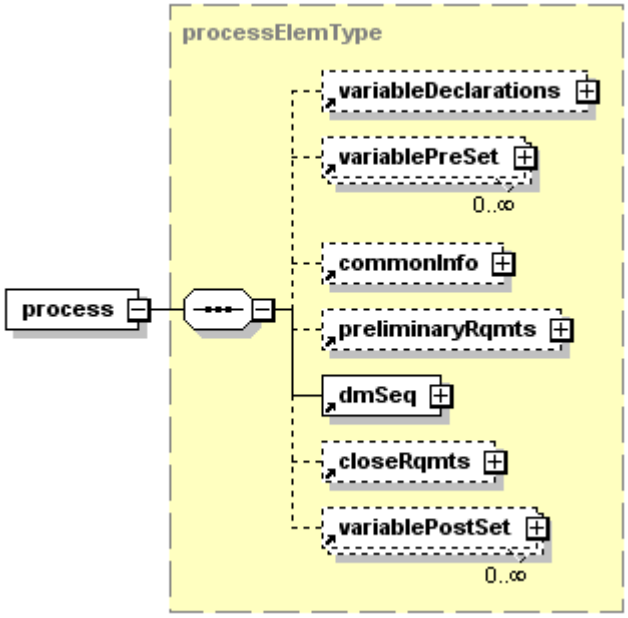
In this chapter, variable names appear in *italics* and expressions in [brackets].

The process data module can gather information from the user or other sources to populate state information and then use that information to make branching and filtering decisions. When sequencing data modules, no change to the data module itself is required, and thus data modules can be reused in many sequences.

2 Process

Description: The element <process> is the top-level element which contains the process flow constructs.

Markup element: <process>



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Fig 1 Element <process>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <variableDeclarations>. Refer to Para 2.1.
- <variablePreSet>. Refer to Para 2.3.1.10.
- <commonInfo>. Refer to Chap 3.9.5.2.1.12.
- <preliminaryRqmts>. Refer to Chap 3.9.5.2.1.9 and Para 2.2.
- <dmSeq>. Refer to Para 2.3.
- <closeRqmts>. Refer to Chap 3.9.5.2.1.9 and Para 2.2.
- <variablePostSet>. Refer to Para 2.3.1.14.

2.1 Variable declarations (local)

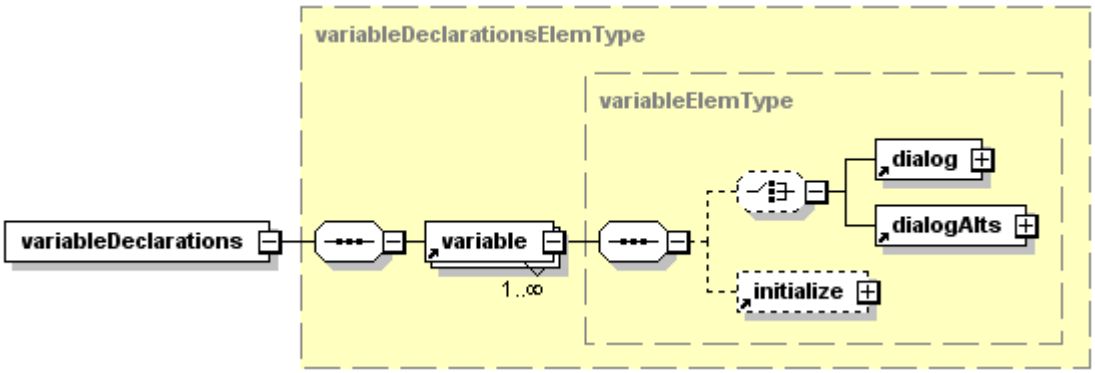
Local variables are declared in the process data module in which they are used by the element <variableDeclarations>. These variables are available only in the data module in which they are declared.

Note

Global variables, which are called global properties, are declared within the ACT and CCT data modules as product attributes and conditions. This enables the IETP software to use them both as global properties in the process data module and applicability properties IETP-wide. Once declared, these global properties are available for use in any process data module in the same way a local variable can be used. Refer to Chap 3.9.5.2.10.3 for further discussion of local variables and global properties.

Description: Variable declarations define and can initialize one to many local variables that are used within the process data module.

Markup element: <variableDeclarations>



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Fig 2 Element <variableDeclarations>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

– <variable>. Refer to Chap 3.9.5.2.10.3.

Markup example:

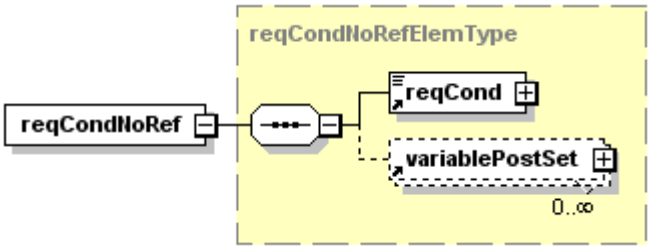
```
<variableDeclarations>
<variable valueType="string" variableName="name"/>
<variable valueType="string" variableName="level">
<initialize>
<expression><stringValue>amateur</stringValue></expression>
</initialize>
</variable>
</variableDeclarations>
```

2.2 Preliminary requirements and requirements after job completion

Description: Preliminary requirements and requirements after job completion in the process data module are identical to those elements in a procedural data module with one difference. In the process data module, one to many optional elements <variablePostSet> (refer to Para 2.3.1.14) can be authored in conjunction with all child elements of element

<reqCondGroup> except element <noConds>. This feature allows the author to assert a variable value to the state table based on a required condition or requirement after job completion being satisfied. An example usage is to track doors opened or closed, power applied, etc. Refer to Chap 3.9.5.2.1.9 for complete descriptions of elements <preliminaryRqmts> and <closeRqmts>. For viewer behavior, refer to Chap 7.6.1.1.

Markup element: <reqCondNoRef>, like and similar to <reqCondDm>, <reqCondCircuitBreaker>, <reqCondPm> and <reqCondExternalPub>



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Fig 3 Element <reqCondNoRef>

Attributes: Refer to Chap 3.9.5.2.1.9.

Child elements:

- <reqCond>. Refer to Chap 3.9.5.2.1.9.
- <variablePostSet>. Refer to Para 2.3.1.14.

Markup example:

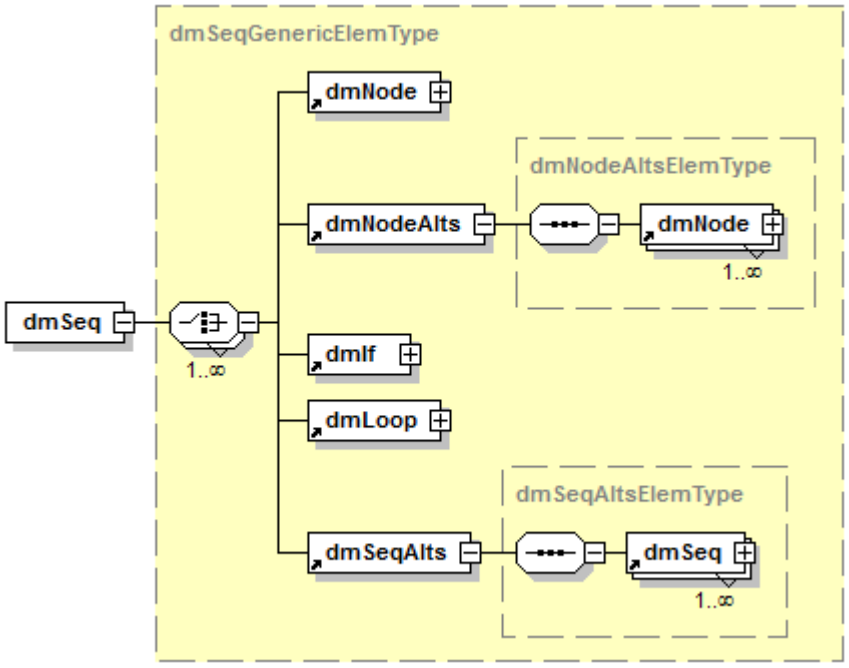
```
<reqCondNoRef>
<reqCond>Turn power off.</reqCond>
<variablePostSet>
<assertion>
<variableRef variableName="powerApplied"/>
<expression>
<booleanValue><falseValue/></booleanValue>
</expression>
</assertion>
</variablePostSet>
</reqCondNoRef>
```

2.3 Data module sequences

Description: A data module sequence determines the order of steps, dialogs, external application calls, data module references, and/or conditional actions within the data module.

Markup element: <dmSeq>

The element <dmSeq> contains a one to many choice sequence of elements defined below. The contents of the element <dmSeq> are processed in sequential order by the logic engine. The results of the processing determine whether or not the content of a particular element in the sequence is displayed or traversed. In the examples in Chap 3.9.5.2.10.4 all occurrences of the element <dmNode> are subject to the process data module's expanded applicability processing (refer to Para 2.3.1.9) which can filter them out. In addition, the element <dmIf>, and/or the element <dmLoop> structures require processing to determine what is displayed.



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Fig 4 Element <dmSeq>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `independentCheck` (O). Refer to Chap 3.9.5.1.
- `skillLevelCode` (O) Refer to Chap 3.9.5.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`dmNode`>. Refer to Para 2.3.1.
- <`dmNodeAlts`>. Refer to Para 2.3.2.
- <`dmIf`>. Refer to. Para 2.3.3.
- <`dmLoop`>. Refer to Para 2.3.4.
- <`dmSeqAlts`>. Refer to Para 2.3.3.1.1.

Markup example:

```
<dmSeq>
<dmNode>
<proceduralStep>
<title>Introduction</title>
<para>Because you are an inexperienced user, you will be
presented a brief introduction on how to operate a
bicycle</para>
</proceduralStep>
```

```
</dmNode>
<dmNode>
<dmRef>
<dmRefIdent>
<dmCode assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="043" infoCodeVariant="A" itemLocationCode="A"
modelIdentCode="S1000DBIKE" subSubSystemCode="0"
subSystemCode="0" systemCode="D00" systemDiffCode="AAA"/>
</dmRefIdent>
</dmRef>
</dmNode>
</dmSeq>
```

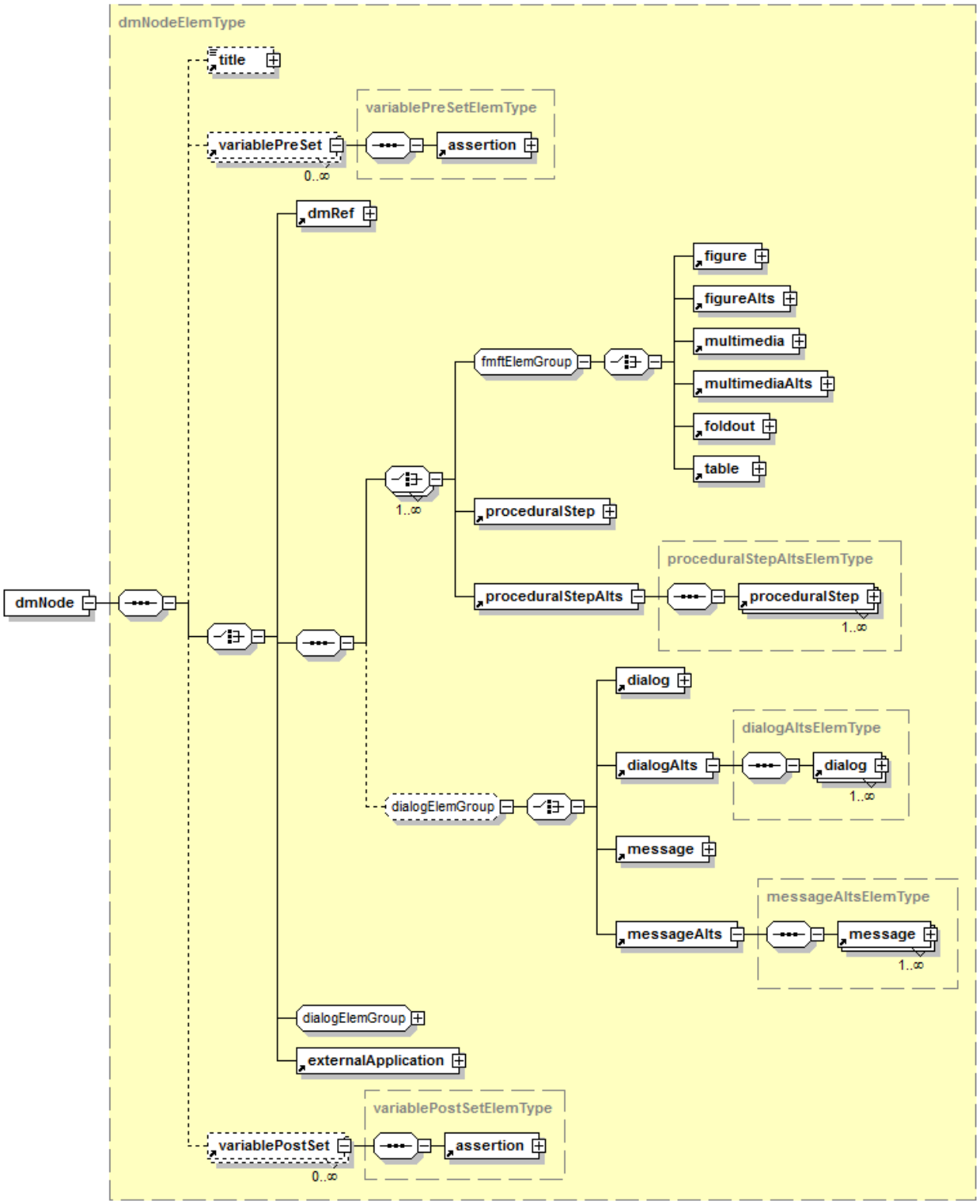
2.3.1 Data module node

Description: A data module node represents technical information that is to be displayed on one screen. This screen can be scrollable.

In a process data module, technical content is "wrapped" in the element <dmNode> structure allowing applicability (refer to Para 2.3.1.9) and variable settings, using element <variablePreSet> (refer to Para 2.3.1.10) and <variablePostSet> (refer to Para 2.3.1.14), to be applied to the content. The element <title> provides a descriptive heading, which applies to the whole node.

It is important to remember that the element <dmNode> represents one screen of data, and if a dialog or message appears on the screen, it must appear after a procedural step or by itself. Reasons for this are (1) dialogs can alter the state information possibly changing the applicability of something after the dialog on the screen, and (2) dialogs have navigation choices which would allow the user to exit the screen before reading everything on it.

Markup element: <dmNode>



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Fig 5 Element <dmNode>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>. Refer to Chap 3.9.5.2.1.5.
- <`variablePreSet`>. Refer to Para 2.3.1.10.
- <`dmRef`>. Refer to Chap 3.9.5.2.1.2.
- <`figure`>. Refer to Chap 3.9.5.2.1.7.
- <`figureAlts`>. Refer to Chap 3.9.5.2.1.7.
- <`foldout`>. Refer to Chap 3.9.5.2.1.7.
- <`table`>. Refer to Chap 3.9.5.2.1.6.
- <`multimedia`>. Refer to Chap 3.9.5.2.1.7.
- <`multimediaAlts`>. Refer to Chap 3.9.5.2.1.7.
- <`proceduralStep`>. Refer to Para 2.3.1.2.
- <`proceduralStepAlts`>. Refer to Para 2.3.1.3.
- <`dialog`>. Refer to Chap 3.9.5.2.10.2.
- <`dialogAlts`>. Refer to Para 2.3.1.6.
- <`message`>. Refer to Para 2.3.1.7.
- <`messageAlts`>. Refer to Para 2.3.1.8.
- <`externalApplication`>. Refer to Chap 3.9.5.2.10.3.
- <`variablePostSet`>. Refer to Para 2.3.1.14.

Markup example:

A simple example showing the use of a title on the element <`dmNode`>:

```
<dmNode>
<title>Prerequisities</title>
<proceduralStep>
<para>Please make sure you are familiar with the functional
description of a bicycle.</para>
</proceduralStep>
</dmNode>
```

A more comprehensive example indicating the use of variable pre-settings within the element <`dmNode`> structure:

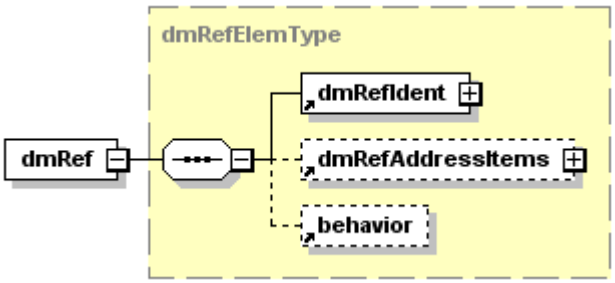
```
<dmNode>
<title>Specification Table from Technical data</title>
<variablePreSet id="A12345">
...</variablePreSet>
<dmRef referredFragment="tab-001">
```

```
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA2" subSystemCode="2" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="030" infoCodeVariant="A" itemLocationCode="A"/>
<issueInfo issueNumber="002" inWork="00"/>
</dmRefIdent>
<dmRefAddressItems>
<dmTitle>
<techName>Handlebar</techName>
<infoName>Technical data</infoName>
</dmTitle>
</dmRefAddressItems>
</dmRef>
</dmNode>
```

2.3.1.1 Data module reference behavior

Description: References are implemented in accordance with Chap 3.9.5.2.1.2. When an element <dmNode> contains an element <dmRef>, the data module referenced is displayed depending on the values of the attributes linkActuate and linkShow of the child element <behavior> of element <dmRef>.

Markup element: <behavior>



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Fig 6 Element <behavior>

Attributes:

– linkShow (O). The attribute linkShow can have one of the following values:

- "newPane" - opens another window for the referenced data allowing the user to view the reference alongside the current data.
- "embedInContext" - displays the linked data inline at the point where the data module reference occurred. This is useful when there are data that can be used verbatim in several data modules and maintained in a separate data module to itself.
- "replaceAndReturnToSource" - replaces the current screen of data with the referenced data and then return the user to the origin of the data module reference when Next to continue is pressed. This is normal reference handling where the user views the reference and then returns to the original procedure.
- "replaceAndNoReturn" - replaces the current screen of data with the referenced data and not provide a Next option. "replaceAndNoReturn" conceptually breaks the connection with the referencing data. It is useful in a troubleshooting situation when the fault has been isolated, the user is referenced to a remedy, and there is no reason for the user to return to the troubleshooting procedure.

– linkActuate (O). The attribute linkActuate can have one of the following values:

  - "onLoad" - the referenced data to be automatically displayed with no action by the user
  - "onRequest" - requires the user to click or otherwise indicate to view the referenced data at this time

Child elements:

– None

Markup example:

```
<dmRef>
<dmRefIdent>
<dmCode assyCode="0000" disassyCode="00"
disassyCodeVariant="000" infoCode="000" infoCodeVariant="0"
itemLocationCode="A" modelIdentCode="AA" subSubSystemCode="0"
subSystemCode="0" systemCode="01" systemDiffCode="AAA"/>
</dmRefIdent>
<behavior linkShow="replaceAndReturnToSource"
linkActuate="onRequest"/>
</dmRef>
```

2.3.1.2 Procedural step

Description: The element <proceduralStep> is implemented as in the procedural data module in accordance with Chap 3.9.5.2.3. An addition to the step model in the process data module is the ability to include the element <variableRef> or the element <globalPropertyRef> within the element <para>. The use of these elements will include the local variable or global property value from the process data module state table in the paragraph text. Uses of this capability might be to display to the end user a test result received from an external application or the result of a calculation performed by the logic engine needed to perform a task.

The element <proceduralStep> also provides for subordinate steps, by nesting the element <proceduralStep>, and the element <proceduralStepAlts> described in Para 2.3.1.3. The step structure allows for substeps creating a hierarchical structure. This structure would be evident on the screen in an IETP. If more than one step of the same level occurs in the content, it will be evident on screen that the steps are at the same level of hierarchy. When the element <proceduralStep> is the content of an element <dmNode>, all child elements <proceduralStep> and their content will be displayed as one screen of information.

Within an element <dmNode>, after the element <proceduralStep> content, one of the following options can be inserted:

– the element <dialog>
– the element <dialogAlts>
– the element <message>
– element <messageAlts>

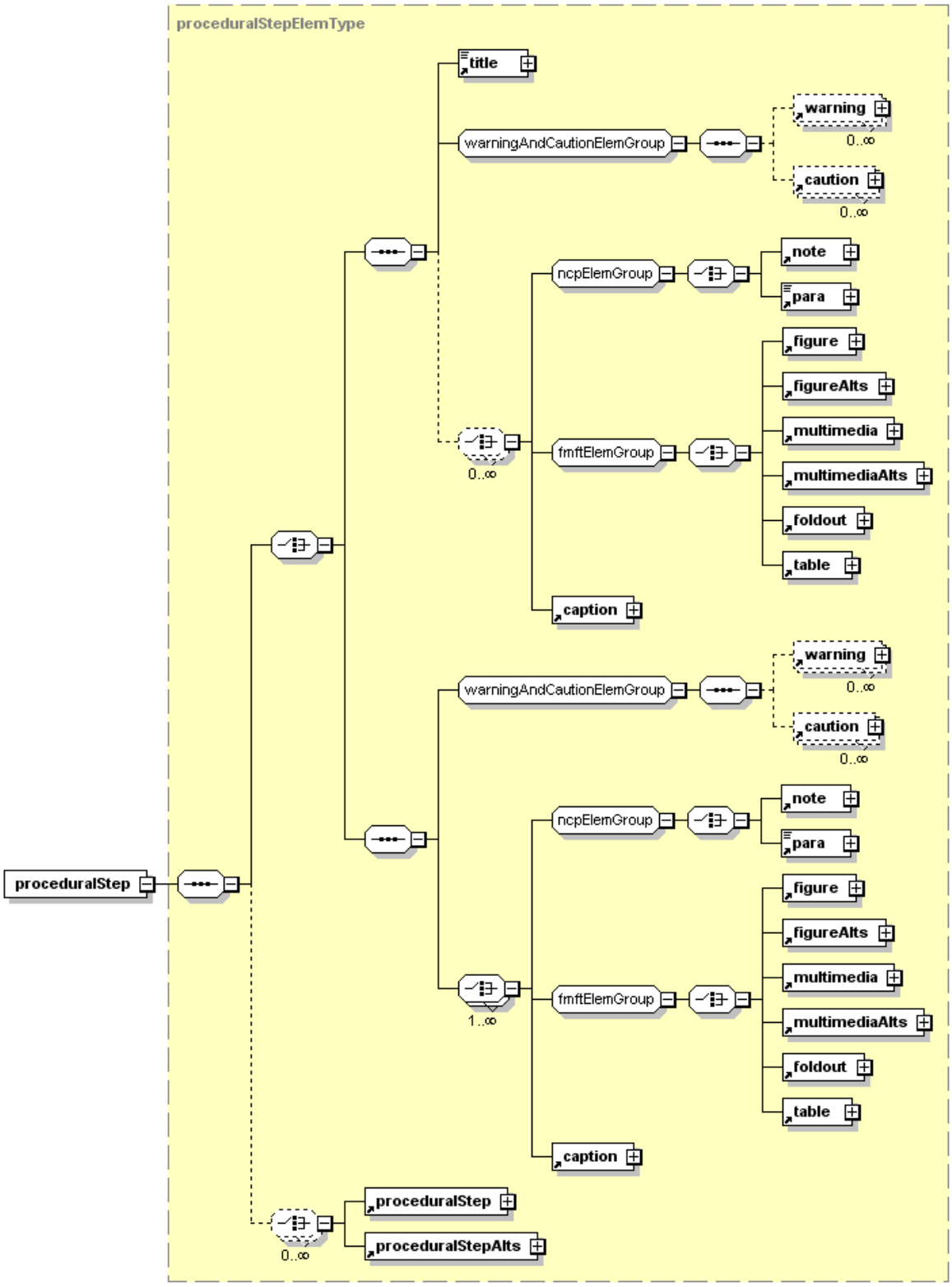
This allows an author to generate a screen of data with a user question or message at the end. It must be at the end of the screen content because the OK and Cancel buttons on a dialog are used for navigation to another screen. Expected viewer behavior is that Next and Previous functions on the screen will be disabled yielding to the OK and Cancel buttons on the dialog. OK will advance to the next screen. Cancel will move back to the previous screen. For dialog

content, refer to Chap 3.9.5.2.10.2. For viewer handling of a node with steps and a dialog, refer to Chap 7.6.1.1.

Note

Authors must be careful using references with behavior "`replaceAndNoReturn`" on a node with step content and a dialog. Any user taking a "`replaceAndNoReturn`" link will never interact with the dialog following the step content.

Markup element: <`proceduralStep`>



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Fig 7 Element <proceduralStep>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `cautionRefs` (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `itemCharacteristic` (O), the characteristics of the item that is the subject of a given procedural step. The attribute `itemCharacteristic` can have one or more of the following values:
  - "`ic01`" thru "`ic99`", refer to Chap 3.9.6.1.
- `keepWithNext` (O), the step must be presented together with the next step, if possible. Refer to Chap 3.9.5.2.3.
- `warningRefs` (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `independentCheck` (O). Refer to Chap 3.9.5.2.3.
- `skillLevelCode` (O). Refer to Chap 3.9.5.2.3.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>. Refer to Chap 3.9.5.2.1.5.
- <`warning`>. Refer to Chap 3.9.3.
- <`caution`>. Refer to Chap 3.9.3.
- <`note`>. Refer to Chap 3.9.3.
- <`para`>. Refer to Chap 3.9.5.2.1.10.
- <`figure`>. Refer to Chap 3.9.5.2.1.7.
- <`figureAlts`>. Refer to Chap 3.9.5.2.1.7.
- <`multimedia`>. Refer to Chap 3.9.5.2.1.7.
- <`multimediaAlts`>. Refer to Chap 3.9.5.2.1.7.
- <`foldout`>. Refer to Chap 3.9.5.2.1.7.
- <`table`>. Refer to Chap 3.9.5.2.1.6.
- <`caption`>. Refer to Chap 3.9.5.2.1.4.

Markup example:

```
<dmNode>
<title>Practical part</title>
<proceduralStep>
<para>Take the bicycle from the garage.</para>
</proceduralStep>
<proceduralStep>
<para>Clean the dust from the bicycle.</para>
</proceduralStep>
<proceduralStep>
```

```
<para>Sit on the bike.</para>
</proceduralStep>
<proceduralStep>
<para>...and (RIDE)!</para>
</proceduralStep>
</dmNode>
```

2.3.1.3 Procedural step alternates group

Description: The element <proceduralStepAlts> provides the capability to group in one structure several potential steps of data for display. Only one or none will be displayed depending on the applicability assigned to the element <proceduralStep> within the element <proceduralStepAlts>. Refer to Para 2.3.2 and Chap 4.13.3 for more information about the alternates group concept.

Markup element: <proceduralStepAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- altsName (O), the name of the alternates group
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <proceduralStep>. Refer to Para 2.3.1.2.

Markup example:

```
<dmNode>
<proceduralStepAlts>
<proceduralStep applicRefId="applic1">
...
</proceduralStep>
<proceduralStep applicRefId="applic2">
...
</proceduralStep>
</proceduralStepAlts>
</dmNode>
```

2.3.1.4 External application

Description: The element <externalApplication> is a mechanism for launching an external application in the midst of a process data module. This application might be a wiring data viewer, a calculator, a diagnostic test, etc. Refer to Chap 3.9.5.2.10.3 for expanded coverage of the element <externalApplication>.

2.3.1.5 Dialog

Description: The element <dialog> allows the logic engine to interact with the user. It provides a means to obtain variable values from the user by asking a question. Refer to Chap 3.9.5.2.10.2 for expanded coverage of the element <dialog>.

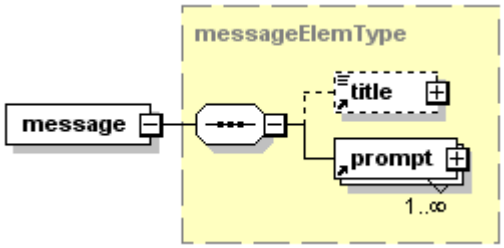
2.3.1.6 Dialog alternates group

Description: The element <dialogAlts> groups configuration or situation unique dialogs for display to the user. Only one or none will be displayed depending on the applicability assigned to each element <dialog> within the element <dialogAlts>. Refer to Chap 3.9.5.2.10.2 for expanded coverage of the element <dialogAlts>, and refer to Chap 4.13.3 and Para 2.3.2 for more information about the alternates group concept.

2.3.1.7 User message

Description: The element <message> provides information from the IETP to the user or additional instructions or details about a dialog.

Markup element: <message>



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Fig 8 Element <message>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- submitCaption (O), the caption used for the submit function push button. Refer to Chap 3.9.6.1.
- cancelCaption (O), the caption used for the cancel function push button. Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <title>, the dialog title bar text. Refer to Chap 3.9.5.2.1.5.
- <prompt>. Refer to Chap 3.9.5.2.10.2.

The element <message> can contain applicability, the element <title> and must contain one or more of the element <prompt> to be displayed to the user.

Markup example:

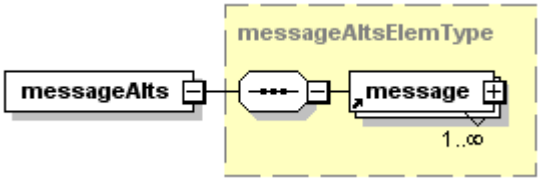
```
<message>
<prompt>
<paraBasic>Age must be within 4 to 100</paraBasic>
</prompt>
```

```
<prompt>
<paraBasic>All fields are mandatory</paraBasic>
</prompt>
</message>
```

2.3.1.8 Alternate message

Description: The element <messageAlts> contains alternative messages, one or none of which are applicable in a given situation and will be displayed to the user. Refer to Chap 4.13.3 and Para 2.3.2 for more information about the alternates group concept.

Markup element: <messageAlts>



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Fig 9 Element <messageAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- altsName (O), name for alt group.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <message>. Refer to Para 2.3.1.7.

Markup example:

```
<messageAlts>
<message>
<prompt>
<paraBasic>Age out of range</paraBasic>
</prompt>
</message>
</messageAlts>
```

2.3.1.9 Applicability

The attribute applicRefId references an applicability structure which determines whether or not the element is displayed. Applicability is available on the child elements of the element <dmNode> such as the element <dmRef>, the element <proceduralStep>, the element <dialog>, the element <menuChoice> and others. The element <applic> and the attribute applicRefId are described in Chap 3.9.5.3.

In the process data module, an expression can be authored as a part of the applicability structure. This is useful if filtering based on a variable that has not been declared as a global property, or if a more robust set of operators with which to filter (eg, mathematical operations) is needed.

How applicability is authored in a process data module largely depends on the logic engine employed in the viewer.

(1) If the goal is totally automated context filtering of the data, and the logic engine cannot automatically filter based on standard applicability, all of the filtering conditions, configuration ([*Model* equal "F4J"]) and other ([*Test Passed* equal TRUE]), must be authored in the element <expression>.

(2) If the goal is automated context filtering of the data, and the logic engine will do that using the standard S1000D applicability structure, the standard structure can be authored as in any other data module type. If an expression is authored also such as [*Test Passed* equal TRUE], it will be logically "anded" with the standard applicability structure.

Business rule decision point BRDP-S1-00244 - Use of applicability for variables in process data modules:

- Decide on the level of applicability filtering. This is established based on viewer capability and portability of the data.

2.3.1.10 Variable preset

Description: A child of both the element <process> and the element <dmNode>, the element <variablePreSet> assigns a value to a local variable or global property before its parent element is traversed. The element <variablePreSet> contains the element <assertion>. An assertion contains the element <variableRef> or <globalPropertyRef> and the element <expression>. The element <variableRef> and the element <globalPropertyRef> have attributes which uniquely define a local variable or global property. The element <variableRef> has the attribute variableName. The element <globalPropertyRef> has attributes applicPropertyIdent and applicPropertyType. When an element <variablePreSet> is encountered in the data, the logic engine evaluates the expression and assigns the resulting value to the local variable or global property identified by the element <variableRef> or the element <globalPropertyRef>. One use case is that the element <variablePreSet> is used on an element <dmNode> with an external application call in order to assign values to one or more of the parameter variables to be passed to the application. On the element <process>, it can be necessary to preset to "noValue" the value of a global property representing wind speed prior to beginning a procedure because the wind speed can have changed since the value of that property was last accessed.

Markup element: <variablePreSet>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

- <assertion> assigns a value to a variable or global property. Refer to Para 2.3.1.11.

Markup example:

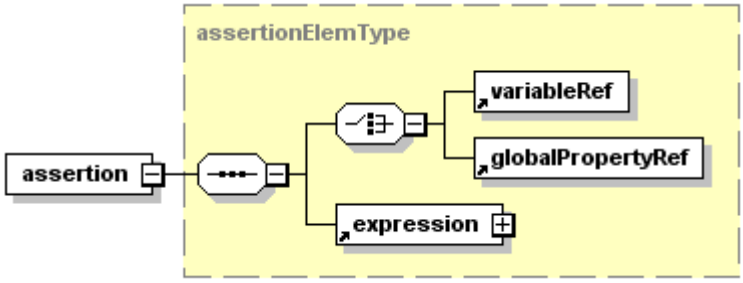
```
<variablePreSet>
<assertion>
```

```
<variableRef variableName="tourMistakes"/>
<expression>
<integerValue>0</integerValue>
</expression>
</assertion>
</variablePreSet>
```

2.3.1.11 Assertion

Description: The element <assertion> assigns a value to a local variable or global property.

Markup element: <assertion>



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Fig 10 Element <assertion>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

- <variableRef>. Refer to Para 2.3.1.12.
- <globalPropertyRef>. Refer to Para 2.3.1.13.
- <expression>. Refer to Chap 3.9.5.2.10.3.

When an assertion is evaluated, the resulting value of the expression is assigned to the local variable or global property referenced by the element <variableRef> or the element <globalPropertyRef>.

Markup example:

```
<assertion>
<variableRef variableName="level"/>
<expression>
<stringValue>experienced</stringValue>
</expression>
</assertion>
```

2.3.1.12 Variable reference

Description: The element <variableRef> points to a local variable.

Markup element: <variableRef>

Attributes:

- variableName (M), the name of the variable

Child elements:

– None

2.3.1.13 Global property reference

Description: The element <globalPropertyRef> points to a global property.

Markup element: <globalPropertyRef>

Attributes:

– applicPropertyIdent (M), the identifier of the global property
– applicPropertyType (M), the type (product attribute or condition) of the global property

Child elements:

– None

Markup example:

```
<globalPropertyRef applicPropertyIdent="I10"
applicPropertyType="condition"/>
```

2.3.1.14 Variable postset

Description: The element <variablePostSet> mirrors the element <variablePreSet>. It contains an assertion and assigns a value to a variable after the element <dmNode> or the element <process> has been traversed. For example, a variable *postSet* could be used on a step to apply power to assert to the state table that power has been applied for future reference by the logic engine. Likewise, a variable *postSet* could be used on a process to record in the state table the fact that some component has been replaced which can be used downstream in the maintenance flow.

Markup element: <variablePostSet>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

– <assertion>. Refer to Para 2.3.1.11.

Markup example:

```
<variablePostSet>
<assertion>
<variableRef variableName="powerApplied"/>
<expression>
<booleanValue><trueValue/></booleanValue>
</expression>
</assertion>
</variablePostSet>
```

2.3.2 Data module node alternates group

Description: An alternative (or conditional) node is a group of objects, one or none of which will be applicable and thus displayed in a given situation.

The following discussion of the element <dmNodeAlts> applies to any other alternates group such as:

- the element <dmSeqAlts>
- the element <proceduralStepAlts>
- the element <figureAlts>
- the element <multimediaAlts>
- the element <dialogAlts>
- the element <messageAlts>

The alternates group concept is detailed in Chap 4.13.3.

The element <dmNodeAlts> (a group of node alternatives) provides the ability to group occurrences of the element <dmNode> together which apply in different contextual situations. Only one node or none of the group will be displayed. For example, three versions of a "disconnect connector" step can exist in the element <dmNodeAlts> due to equipment configuration differences. For any configuration, only one version of the step applies. The logic engine will evaluate the applicability expression for all occurrences of the element <dmNode> within the element <dmNodeAlts>. Only the first node whose applicability expression evaluates to TRUE will be displayed. There need not be an occurrence of the element <dmNode> within the element <dmNodeAlts> that is applicable to every possible situation. In such cases, the logic engine simply moves on to the next element <dmNode>. Every node in an alternative node must have applicability. Applicability on the alternative elements is optional in the content section of the Schema with the exception of the element <dmSeqAlts> within the element <dmIf>. For alternative processing, however, applicability is required on the alternative elements.

Applicability on the nodes of an alternates group must be mutually exclusive. Although the Schema does not require the alternative element <dmNode> to have mutually exclusive applicability (or the attribute applicRefId at all), it is important to understand the danger of overlapping applicability on alternative nodes. At most one will pass through the logic engine to be displayed to the user, and if more than one applies, the user will miss something. A node with no applicability always applies. There can be reasons to author overlapping applicability within an alternates group, but it is not recommended.

Markup element: <dmNodeAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- altsName (O), the name of alternates group
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <dmNode>. Refer to Para 2.3.1.

Markup example:

```
<dmNodeAlts>
<dmNode applicRefId="wrongAnswer">
<proceduralStep>
<title>Wrong answer!</title>
<para>You will be given the introduction once again.</para>
<para>Number of mistakes: <variableRef
variableName="tourMistakes"/></para>
</proceduralStep>
</dmNode>
<dmNode applicRefId="rightAnswer">
<proceduralStep>
<title>Correct!</title>
<para>You can now continue with the practical part of this
manual.</para>
</proceduralStep>
</dmNode>
</dmNodeAlts>
```

2.3.3 Data module branch

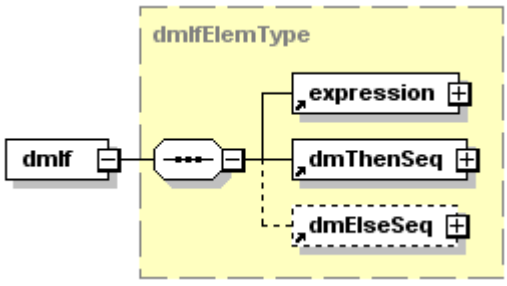
Description: A branch sends the user down separate data paths based on state information such as configuration information, or how the user has answered questions. Branches can be nested.

The element <dmIf> uses the same logic as the "if-then-else" statement in a programming language. An element <dmIf> contains an expression that the logic engine evaluates to determine whether the element <dmThenSeq> or the element <dmElseSeq> is to be traversed.

The element <dmThenSeq> defines the data module node, alternative sequence, branch, or loops to be traversed if the element <dmIf> expression evaluates to TRUE. Element <dmThenSeq> is required.

The element <dmElseSeq> defines a data module node, alternative sequence, branch, or loops to be traversed if the element <dmIf> expression evaluates to FALSE. The element <dmElseSeq> is optional.

Markup element: <dmIf>



ICN-76301-S1000D0014-001-01

Fig 11 Element <dmIf>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <expression>. Refer to Chap 3.9.5.2.10.3.
- <dmThenSeq>. Refer to Para 2.3.3.1.
- <dmElseSeq>. Refer to Para 2.3.3.1.

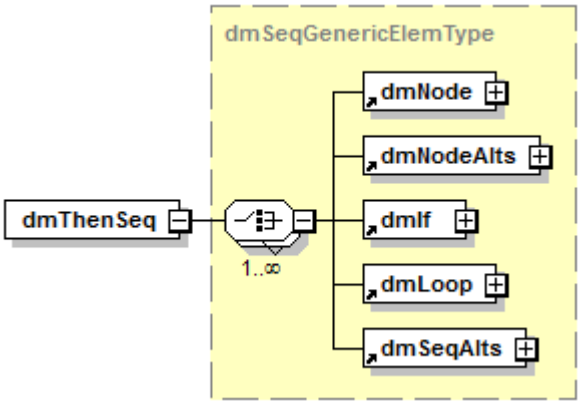
Markup example:

```
<dmIf>
<expression>
<expression>
<booleanFunction booleanAction="not"/>
<expression>
<variableRef variableName="level"/>
</expression>
</expression>
<booleanOperator booleanOperation="equal"/>
<expression>
<stringValue>experienced</stringValue>
</expression>
</expression>
<dmThenSeq>
<dmNode>
<dialog>
<message>
<prompt>
<paraBasic>Inexperienced users can not access this
data.</paraBasic>
</prompt>
</message>
</dialog>
</dmNode>
</dmThenSeq>
</dmIf>
```

2.3.3.1 Data module branch result

Description: The element <dmThenSeq> and the element <dmElseSeq> are identical and contain data module nodes, alternative sequences, branches, or loops to be traversed depending on the evaluation of the element <dmIf> expression.

Markup elements: <dmThenSeq> and <dmElseSeq>



ICN-76301-S1000D0015-002-01

Fig 12 Element <dmThenSeq>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `independentCheck` (O). Refer to Chap 3.9.5.1.
- `skillLevelCode` (O) Refer to Chap 3.9.5.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`dmNode`>. Refer to Para 2.3.1.
- <`dmNodeAlts`>. Refer to Para 2.3.2.
- <`dmSeqAlts`>. Refer to Para 2.3.3.1.1.
- <`dmIf`>. Refer to. Para 2.3.3.
- <`dmLoop`>. Refer to Para 2.3.4.

Markup example:

```
<dmThenSeq>
<dmNode>
<dialog>
<message>
<prompt>
<paraBasic>Inexperienced users can not access this
data.</paraBasic>
</prompt>
</message>
</dialog>
</dmNode>
</dmThenSeq>
<dmElseSeq>
```

```
<dmNode>
<dialog>
<message>
<prompt>
<paraBasic>Experienced users can access this data.</paraBasic>
</prompt>
</message>
</dialog>
</dmNode>
</dmElseSeq>
```

2.3.3.1.1 Data module alternative sequence

Description: An alternative (or conditional) sequence is a group of sequence orders where one or none will be applicable and thus executed in a given situation. The element <dmSeqAlts> contains one or more order of data module sequences. Each child element <dmSeq> has an attribute applicRefId referring to a pre-defined element <applic>. Refer to Para 2.3.2 and Chap 4.13.3 for more information about the alternates group concept.

Markup element: <dmSeqAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- altsName (O), the name of the alternates group
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <dmSeq>. Refer to Para 2.3.

Markup example:

```
<dmSeqAlts>
<dmSeq applicRefId="applic001">
...
</dmSeq>
<dmSeq applicRefId="applic002">
...
</dmSeq>
</dmSeqAlts>
```

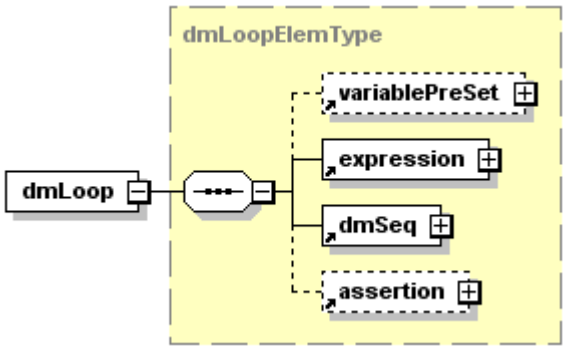
2.3.4 Data module loops

Description: A loop repeats a sequence of information as long as the loop condition (based on the state information) is true.

The element <dmLoop> provides a capability similar to programming language loops. It provides the syntax for creating WHILE (eg, WHILE a gap measurement < 1,5) or FOR NEXT (eg, FOR NEXT 5 times) loops, whichever applies to the situation. The element <dmLoop> contains an expression that is the WHILE condition for the loop and the element <dmSeq> (the

content of the loop). The user will traverse the data module sequence as long as the expression evaluates to TRUE. The author is responsible for providing a way to update the variable or global property used in the WHILE condition so that the “truth” of the condition can change and the user can exit the loop. Optionally a loop can contain a loop entrance assertion (described by the element <variablePreSet>) and a loop end assertion (described by the element <assertion>) enabling counters to be implemented. The loop entrance assertion is made when (and only when) the user first enters the loop (eg, [*Counter* = 0]). The loop end assertion (eg, [*Counter* = *Counter* + 1]) is made each time the user reaches the end of the loop sequence described by the element <dmSeq>. The loop condition might be [*Counter* <= 5].

Markup element: <dmLoop>



ICN-76301-S1000D0018-001-01

Fig 13 Element <dmLoop>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <variablePreSet>. Refer to Para 2.3.1.10.
- <expression>. Refer to Chap 3.9.5.2.10.3.
- <dmSeq>. Refer to Para 2.3.
- <assertion>. Refer to Para 2.3.1.11.

Markup example:

```
<dmLoop>
<expression>
<expression>
<variableRef variableName="tourFinished"/>
</expression>
```

```
<numberOperator numberOperation="equal"/>
<expression>
<booleanValue><falseValue/></booleanValue>
</expression>
</expression>
<dmSeq>
<dmNode>
<proceduralStep>
<title>Introduction</title>
<para>Because you are an inexperienced user, you will be
presented a brief introduction on how to operate a
bicycle.</para>
</proceduralStep>
<proceduralStep>
<para>Click <emphasis>next</emphasis>.</para>
</proceduralStep>
</dmNode>
<dmNode>
<proceduralStep>
<para>Before you can, you will be given a simple question to
test whether you read the instructions carefully.</para>
</proceduralStep>
</dmNode>
<dmNode>
<dialog>
<menu choiceSelection="single" choiceType="select">
<prompt>
<paraBasic>The rear brake is operated by</paraBasic>
</prompt>
<menuChoice>
<prompt>
<paraBasic>Left brake lever</paraBasic>
</prompt>
<assertion>
<variableRef variableName="tourCorrectAnswer"/>
<expression>
<booleanValue><falseValue/></booleanValue>
</expression>
</assertion>
</menuChoice>
<menuChoice>
<prompt>
<paraBasic>Right brake lever</paraBasic>
</prompt>
<assertion>
<variableRef variableName="tourCorrectAnswer"/>
<expression>
<booleanValue><trueValue/></booleanValue>
</expression>
</assertion>
<assertion>
<variableRef variableName="tourFinished"/>
```

```
<expression>
<booleanValue><trueValue/></booleanValue>
</expression>
</assertion>
</menuChoice>
</menu>
</dialog>
</dmNode>
</dmSeq>
</dmLoop>
```

Chapter 3.9.5.2.10.2

Process data module - Dialogs

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Chap No./Document No.	Title
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Chap 3.9.5.2.1.5	Common constructs - Titles
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.2.10.1	Process data module - Content
Chap 3.9.5.2.10.3	Process data module - Expressions, variables and external applications
Chap 3.9.5.2.10.4	Process data module - Logic engine
Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.6.1	Attributes - Project configurable values

1 General

Dialogs in the process data module are discussed here. The process data module contains interactive processing structures to provide the capability to sequence other data modules or steps within it based on static or dynamic state information. State information can often be provided by the IETP user through use of a dialog. This is particularly true in the case of diagnostics and fault isolation where the user tests a function and then can report the results to the IETP by answering a dialog.

2 Collection of user information

The primary method of populating the state table for use in context filtering, branching, or looping is asking the user for information through a dialog.

2.1 Definition

The element <dialog> enables the process data module to collect information from the user (eg, "Has component B been installed?", "Did continuity exist?") and assign values to global properties and local variables. Dialogs can be presented in four dialog types as a:

- menu, using the element <menu>
- "fill-in-the-blank", using the element <userEntry>
- push button, using the element <pushButton>
- message, using the element <message>

For examples of all four types, refer to Para 2.4. The four dialog types can have multiple occurrences. Multiple dialog types can be grouped and arranged horizontally, using the element <dialogGroup>. When the user responds to a dialog and selects the navigation submit function, the logic engine updates the state table based on the response. Dialog elements can contain applicability and be contained in alternative elements to allow different dialogs to be displayed depending on the product configuration or other state variables. Dialog elements can contain enabling or disabling conditions for data entry fields dependent on the user input.

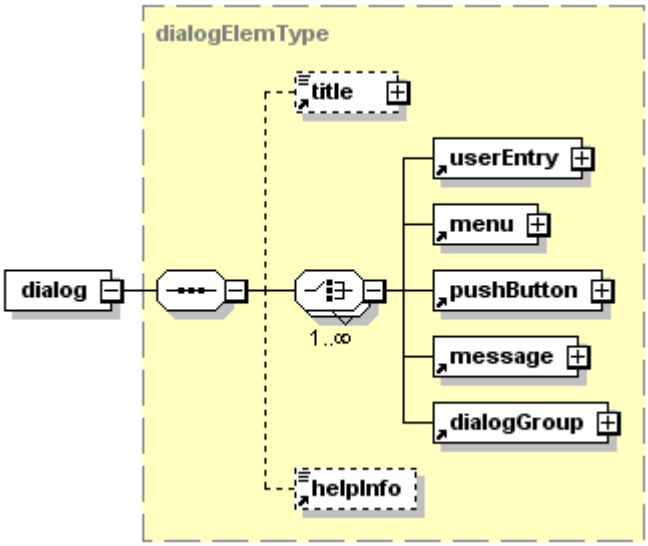
2.1.1 Dialog usage

A dialog is the method for a user to assign a value to a variable or global property. To facilitate this for local variables, a dialog can be associated with a variable in the markup. This association is not required, but it is recommended if a dialog is the primary source of the variable's value. Global properties (declared as product attributes or conditions) have the required elements for a viewer to construct a dialog if needed. Refer to Chap 3.9.5.2.10.3. The logic engine will automatically construct a global property dialog or display a variable's associated dialog if it needs a value for expression evaluation and none exists in the state table. If there is no associated dialog and no value for a local variable in the state table, an error will be generated.

Authors must ensure that all variables and global properties have values (through the element <variablePreSet> or the element <variablePostSet) or means to obtain values (associated dialogs for local variables or required dialog elements for global properties) prior to their use in expressions. Dialogs can be explicitly authored in the element <dmNode>. This is useful if there is a variable/global property with no associated or constructible dialog and its value needs to be populated. Explicit dialogs can also be used to force a question to the user to update the value of a dynamic variable already in the state table. For example, if looping is based on a temperature that will change as the user progresses through the loop sequence (loop WHILE condition: [*Temperature* greaterThan 5000]), there is a need to query for the updated temperature at the end of the loop sequence with an explicit dialog and update the value so that the user can eventually exit the loop. The logic engine will not automatically display a dialog to obtain the value of a variable or global property when evaluating the loop WHILE condition if there is already a value in the state table.

2.2 Dialog

Markup element: <dialog>



ICN-76301-S1000D0019-001-01

Fig 1 Element <dialog>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- submitCaption (O), the caption used for the submit function push button. Refer to Chap 3.9.6.1.
- cancelCaption (O), the caption used for the cancel function push button. Refer to Chap 3.9.6.1.
- resetCaption (O), the caption used for the optional reset function push button. Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>, the dialog title bar text. Refer to Chap 3.9.5.2.1.5.
- Select at least one of the following:
  - <userEntry>. Refer to Para 2.2.1.4.
  - <menu>. Refer to Para 2.2.1.
  - <pushButton>. Refer to Para 2.2.1.5.
  - <message>, provides information from the IETP to the user or additional instructions or details about a parent dialog. Refer to Chap 3.9.5.2.10.1.
  - <dialogGroup>. Refer to Para 2.2.1.6.
- <helpInfo>, provides additional textual information relative to the dialog

Business rule decision point BRDP-S1-00246 - Use of dialogs to declare unassigned variables in process data modules:

– Decide whether to use a dialog to assign values to an unassigned variable.

Business rule decision point BRDP-S1-00247 - Use of default values in a dialog in process data modules:

– Decide whether a variable default value will be displayed in a dialog.

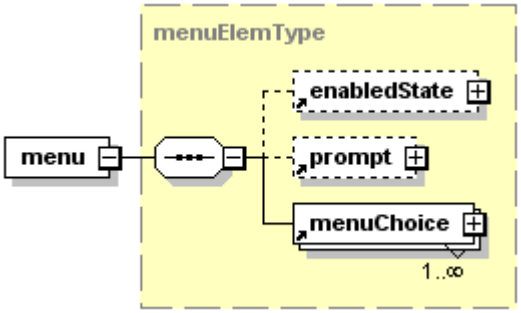
Markup example:

```
<dialog>
<userEntry>
<prompt>
<paraBasic>Enter your name</paraBasic>
</prompt>
<variableRef variableName="name"/>
</userEntry>
</dialog>
```

2.2.1 User menus

Description: Menus are the most popular way of getting information from a user. The process data module dialog menu has some powerful features.

Markup element: <menu>



ICN-76301-S1000D0020-001-01

Fig 2 Element <menu>

Attributes:

– applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– choiceSelection (O), indicates whether single or multiple choices can be selected. The attribute choiceSelection can have one of the following values:

- "single" (D) - only a single choice from the list must be selected, usually presented as a radio button
- "multiple" - a single choice or several choices from the list can be selected, usually presented as a checkbox. At least one choice must be selected. All choices selected are processed.

If the multiple choices describe the same variable, the variable must have the attribute valueType "set-string", "set-real" or "set-integer". A set variable can be multi-valued where other types of variables cannot. For example, an author can inquire

of the end user "Which warning tones were heard?" and provide the choices: "Stall", "Engine fire", "APU Fire", "Unsafe landing". When the user selects one or more of these choices, the values would be added to the set-string variable *Warning tones*. Global properties cannot be set type variables. This is because product attributes and conditions cannot be sets.

– `choiceType` (M), indicates how the menu choices are displayed. The attribute `choiceType` can have one of the following values:

  - "`select`" - the menu choices are displayed as selection (radio or checkbox)
  - "`pulldown`" - the menu choices are displayed as a scrollable list

– `menuChoiceFlow` (O), indicates the display direction of the menu choices. The attribute `menuChoiceFlow` can have one of the following values:

  - "`list`" (D) - the menu choices are listed vertically
  - "`inline`" - the menu choices are listed horizontally

– `mandatory` (O), indicates if a menu choice must be selected before dialog submittal. The attribute `mandatory` can have one of the following values:

  - "`1`" (D) - at least one menu choice must be selected
  - "`0`" - no menu choice must be selected

– `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

– <`enabledState`>, an expression which indicates if the menu is active or inactive. Refer to Para 2.2.1.3.
– <`prompt`>, the question for the user. Refer to Para 2.2.1.1.
– <`menuChoice`>. Refer to Para 2.2.1.2.

Markup example:

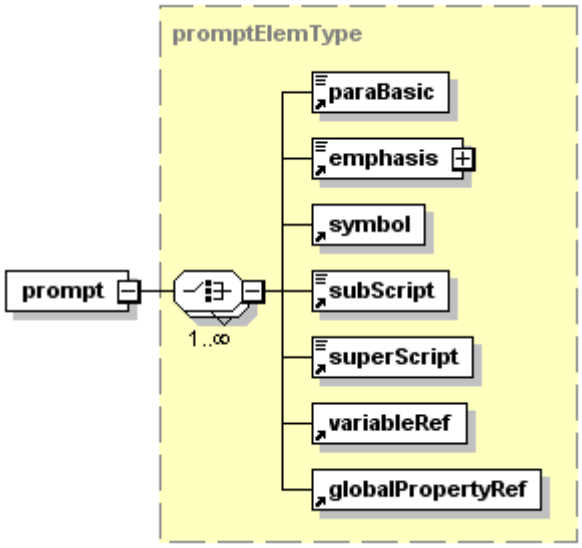
```
<menu choiceSelection="single" choiceType="select">
<prompt>
<paraBasic>Did you ever ride a bicycle?</paraBasic>
</prompt>
<menuChoice>
<prompt>
<paraBasic>Yes</paraBasic>
</prompt>
<assertion>
<variableRef variableName="level"/>
<expression>
<stringValue>experienced</stringValue>
</expression>
</assertion>
</menuChoice>
<menuChoice>
<prompt>
<paraBasic>No</paraBasic>
</prompt>
```

```
<noAssertions/>
</menuChoice>
</menu>
```

2.2.1.1 User prompts

Description: The element <prompt> contains text that is the question or information for the user.

Markup element: <prompt>



ICN-76301-S1000D0021-001-01

Fig 3 Element <prompt>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- textDisplayPosition (O), the text display placement in relationship to the data entry or selection. If the attribute is not used, the IETP implies that the text is positioned above for a user menu question, left for a user entry question, and right for menu choice text. The attribute textDisplayPosition can have one of the following values:
  - "top" - the prompt is positioned above the data entry information
  - "bottom" - the prompt is positioned below the data entry information
  - "right" - the prompt is positioned right of the data entry information
  - "left" - the prompt is positioned left of the data entry information

Child elements:

- <paraBasic>. Refer to Chap 3.9.5.2.1.10.
- <emphasis>. Refer to Chap 3.9.5.2.1.10.
- <symbol>. Refer to Chap 3.9.5.2.1.10.
- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.
- <variableRef>, allows a variable value to be contained in the prompt text. Refer to the markup example in Para 2.2.
- <globalPropertyRef>. Refer to Chap 3.9.5.2.10.1.

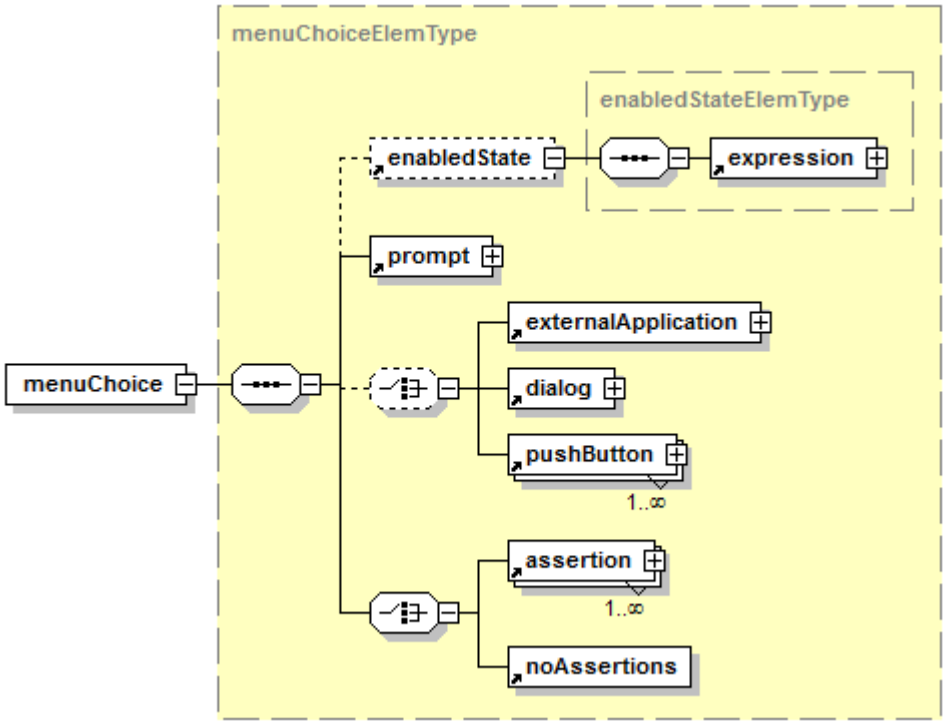
Markup example:

```
<prompt>
<paraBasic>Did you ever ride a bicycle?</paraBasic>
</prompt>
```

2.2.1.2 User choices

Description: The element <menuChoice> represents one possible answer to the prompt question. The text of the answer is marked up by the element <prompt>.

Markup element: <menuChoice>



ICN-SYU52-AASER00028-001-01

Fig 4 Element <menuChoice>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- menuChoiceDefaultFlag (O), indicates if this choice is to appear pre-selected in the dialog. The attribute menuChoiceDefaultFlag can have one of the following values:
  - "1" - the choice is pre-selected
  - "0" (D) - the choice is not pre-selected
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <enabledState>. Refer to Para 2.2.1.3.
- <prompt>. Refer to Para 2.2.1.1.
- <externalApplication>. Refer to Chap 3.9.5.2.10.3.
- <dialog>. Refer to Para 2.2.
- <pushButton>. Refer to Para 2.2.1.5.
- <assertion>. Refer to Chap 3.9.5.2.10.1.
- <noAssertions>, used when no state table variables are changed.

The element <menuChoice> must contain either one or more element <assertion> or an element <noAssertions>. If the user selects the choice and assertion(s) exist, the assertion(s) will be made to the state table after dialog submittal. If the element <noAssertions> exists, the state table is not updated. The purpose of a dialog is to assign the value of a state variable so that the logic engine can use that value in a later expression evaluation. Normally, the element <menuChoice> will have one assertion assigning a value to a state variable.

The element <menuChoice> can contain applicability to allow menu dialogs to be customized for different product configurations.

The element <menuChoice> can contain an enable/disable expression (element <enabledState>) indicating if the menu choice is active or inactive to allow menu dialogs to be customized.

The element <menuChoice> can contain an associated action as either an external application (element <externalApplication>) or a secondary dialog (element <dialog>). The associated action can be used to provide additional information (sound, image, execute diagnostic test, etc) to assist with the dialog selection. The action is executed by selecting the menu choice. The element <menuChoice> can contain a third choice - one to many push buttons (element <pushButton>). Push buttons can be used to execute dialogs and external applications as well. Regardless of how the action is executed, after the action is completed, control returns to the dialog.

The element <menuChoice> has the attribute menuChoiceDefaultFlag, which indicates if this choice is to appear pre-selected in the dialog.

Markup example:

```
<menu choiceSelection="multiple" choiceType="select">
<menuChoice>
<prompt>
<paraBasic>Yes</paraBasic>
</prompt>
<assertion>
<variableRef variableName="level"/>
<expression>
<stringValue>experienced</stringValue>
</expression>
</assertion>
</menuChoice>
<menuChoice>
<prompt>
<paraBasic>No</paraBasic>
```

```
</prompt>
<noAssertions/>
</menuChoice>
</menu>
```

2.2.1.3 User enabling/disabling entry

Description: The element <enabledState> contains an expression that evaluates state variables to determine if data entry field input is permitted or inhibited (usually the data entry is visible but dimmed or grayed out).

The element <enabledState> is evaluated when data input is entered within the dialog and before the dialog is submitted. Typically, this is used when a user selects a menu choice that requires additional data entry information, while other menu choices do not require the additional data entry.

An example is a dialog containing both a menu and a user entry dialog. The menu has two choices: integer (assertion is [*datatype* = "integer"]) and real (assertion is [*datatype* = "real"]). The user entry dialog requests a real precision value (enable expression is [*datatype* equal "real"]). If the integer choice is selected from the menu, the user entry is disabled. If the real choice is selected, the user entry is enabled.

Markup element: <enabledState>

Attributes:

– None

Child elements:

– <expression>. Refer to Chap 3.9.5.2.10.3.

Markup example:

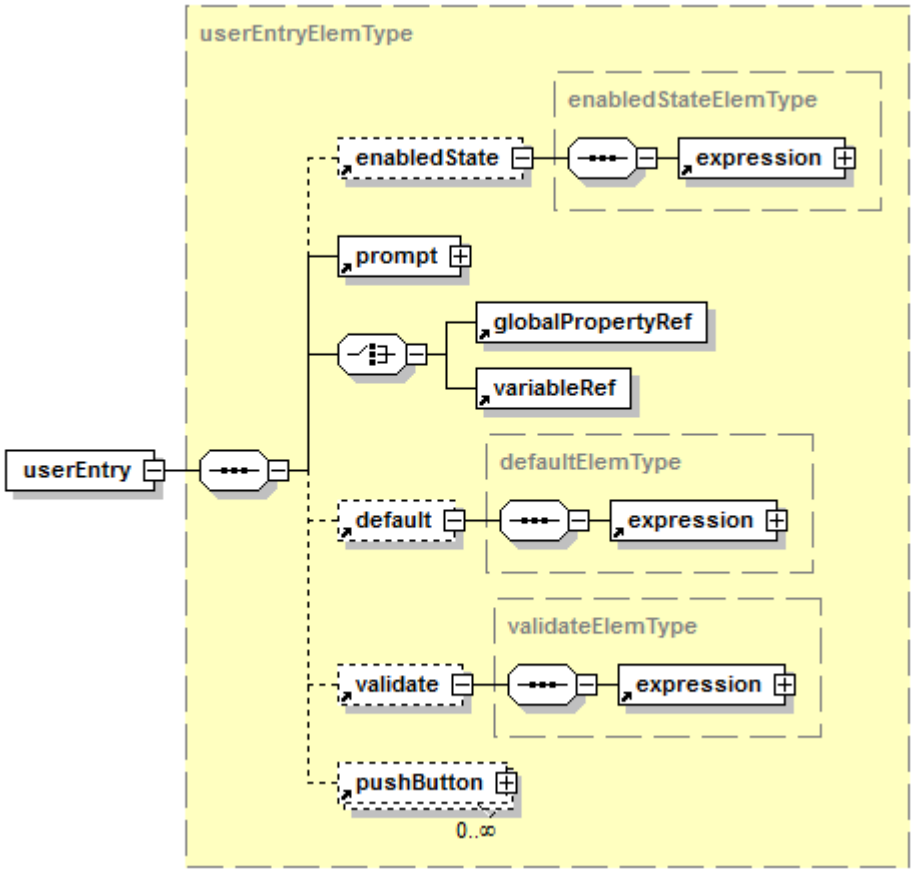
```
<dialog submitCaption="ok01" cancelCaption="ca01">
<dialogGroup>
<title>Driving Condition</title>
<menu choiceType="select" choiceSelection="single">
<menuChoice>
<prompt><paraBasic>Day</paraBasic></prompt>
<assertion>
<variableRef variableName="condition"/>
<expression><stringValue>day</stringValue></expression>
</assertion>
</menuChoice>
<menuChoice>
<prompt><paraBasic>Night</paraBasic></prompt>
<assertion>
<variableRef variableName="condition"/>
<expression><stringValue>night</stringValue></expression>
</assertion>
</menuChoice>
</menu>
</dialogGroup>
<dialogGroup dialogSeparator="1">
<title>Bike Checklist</title>
<menu choiceType="select" choiceSelection="multiple">
```

```
<menuChoice>
<prompt><paraBasic>Wearing Helmet</paraBasic></prompt>
<assertion>
<variableRef variableName="helmet"/>
<expression>
<booleanValue><trueValue/></booleanValue>
</expression>
</assertion>
</menuChoice>
<menuChoice>
<enabledState>
<expression>
<expression><variableRef variableName="condition"/></expression>
<booleanOperator booleanOperation="equal"/>
<expression><stringValue>night</stringValue></expression>
</expression>
</enabledState>
<prompt><paraBasic>Headlight On</paraBasic></prompt>
<assertion>
<variableRef variableName="headlight"/>
<expression>
<booleanValue><trueValue/></booleanValue>
</expression>
</assertion>
</menuChoice>
<menuChoice>
<prompt><paraBasic>Correct Air Pressure in
Tire</paraBasic></prompt>
<assertion>
<variableRef variableName="air pressure"/>
<expression>
<booleanValue><trueValue/></booleanValue>
</expression>
</assertion>
</menuChoice>
<menuChoice>
<prompt><paraBasic>Mirror is Adjusted</paraBasic></prompt>
<assertion>
<variableRef variableName="mirror"/>
<expression>
<booleanValue><trueValue/></booleanValue>
</expression>
</assertion>
</menuChoice>
</menu>
</dialogGroup>
</dialog>
```

2.2.1.4 User entry dialog

Description: A user entry dialog receives data input by the user.

Markup element: <userEntry>



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Fig 5 Element <userEntry>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `mandatory` (O), indicates if an entry must be provided before dialog submittal. The attribute `mandatory` can have one of the following values:
  - "1" (D) - user must provide entry
  - "0" - no entry is required
- `dataEntryFieldLength` (O), the entry field length in number of characters
- `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <enabledState>. Refer to Para 2.2.1.3.
- <prompt>. Refer to Para 2.2.1.1.
- <globalPropertyRef>. Refer to Chap 3.9.5.2.10.1.
- <variableRef>. Refer to Chap 3.9.5.2.10.1.
- <default>. Refer to Para 2.2.1.4.1.

- <validate>. Refer to Para 2.2.1.4.2.
- <pushButton>. Refer to Para 2.2.1.5.

The element <userEntry> contains the element <prompt> and the element <variableRef> to receive the value entered by the user.

The element <userEntry> can contain the element <default> containing a default value for the user entry.

The element <userEntry> can contain applicability to allow user entry dialogs to be customized for different product configurations.

The element <userEntry> can contain an enable/disable expression indicating if the user entry is active or inactive to allow the dialog to be customized.

The element <userEntry> can contain a data entry validation expression for both numerical and non-numerical data.

The attribute dataEntryFieldLength indicates the user entry field length in characters. When entered data is longer than the field, the data is scrolled to allow the additional information. The default length is 20.

Markup example:

```
<userEntry>
<prompt>
<paraBasic>Enter your name</paraBasic>
</prompt>
<variableRef variableName="name"/>
</userEntry>
```

2.2.1.4.1 *Default user entry*

Description: The user entry can have a default value that pre-populates the user entry field with the value.

Markup element: <default>

Attributes:

- None

Child elements:

- <expression>. Refer to Chap 3.9.5.2.10.3.

The default value is assigned by using the optional element <default> that contains the element <expression>. The evaluated expression result is the default value used in the user entry field. The expression can contain:

- a fixed value (entered as a data type (integer, real, or string))
- a state variable reference (including the user entry state variable reference)
- an expression evaluated result from state variable references and/or fixed values (*Pressure* + 20,0).

Markup example:

```
<userEntry>
<prompt>
<paraBasic>Enter your name</paraBasic>
```

```
</prompt>
<variableRef variableName="name"/>
<default>
<expression><stringValue>Jane Doe</stringValue>
</expression>
</default>
</userEntry>
```

2.2.1.4.2 Validate user entry

Description: The element <validate> is used for validating the user entry through an expression evaluation (refer to Chap 3.9.5.2.10.4) of the input information.

The validation authenticates both numerical and non-numerical input.

– Validating numerical user entry inputs

  The numerical validation expression determines if the input value is in a specified number range. The expression uses standard numerical comparison operators (ie, equal, greaterThan, lessThanOrEqual) and connects the numerical comparisons with a Boolean connector (ie, or, and, exclusiveOr).

  An example is to validate that a pressure is entered in the range from 0 to 90 p.s.i. A state variable *Pressure* is used, and the validation expression is given as [[*Pressure* >= 0] and [*Pressure* <= 90]]. A user entry that is < 0 or > 90 indicates an invalid value.

– Validating non-numerical (character string) user entry inputs

  The non-numerical validation expression can use various expression operators to determine the user entry length, included or excluded within a "set-string", or correct alpha or numerical text is entered in the correct sequence.

  An example is to validate that five characters are entered for a CAGE code. A state variable *CAGEC* is used and the validation expression is given as [sizeOf (*CAGEC*) = 5]. A user entry that is less or more than five characters indicates an invalid value.

Attributes:

– errorMessage (O), the text displayed to the user if validation fails

Child elements:

– <expression>. Refer to Chap 3.9.5.2.10.3.

Markup example:

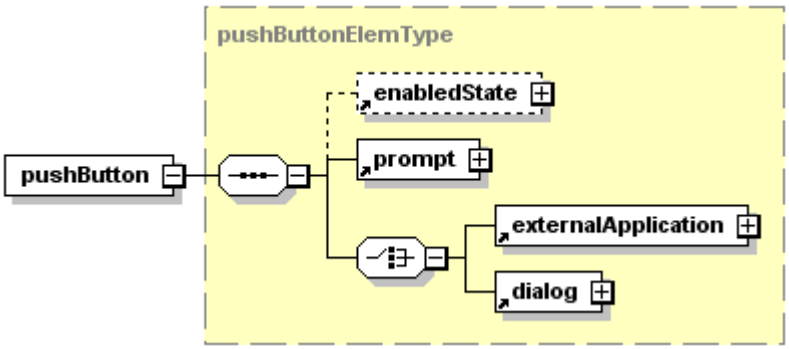
```
<validate errorMessage="Age must be within 4 to 100">
<expression>
<expression>
<expression>
<variableRef variableName="age"/>
</expression>
<numberOperator numberOperation="greaterThanOrEqual"/>
<expression>
<integerValue>4</integerValue>
</expression>
</expression>
<booleanOperator booleanOperation="and"/>
```

```
<expression>
<expression>
<variableRef variableName="age"/>
</expression>
<numberOperator numberOperation="lessThanOrEqual"/>
<expression>
<integerValue>100</integerValue>
</expression>
</expression>
</expression>
</validate>
```

2.2.1.5 Push button

Description: The element <pushButton> provides a means to supply information for the data field entry(s) through an external application (eg, diagnostic test, sound, and video) or a secondary dialog (eg, advanced features).

Markup element: <pushButton>



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Fig 6 Element <pushButton>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <enabledState>. Refer to Para 2.2.1.3.
- <prompt>. Refer to Para 2.2.1.1.
- <externalApplication>. Refer to Chap 3.9.5.2.10.3.
- <dialog>. Refer to Para 2.2.

The element <pushButton> must contain the element <prompt> and either the element <externalApplication> or the element <dialog>. The element <prompt> provides the button caption.

The element <pushButton> can contain an enable/disable expression indicating whether the push button is active or inactive to allow the dialog to be customized.

Markup example:

```
<pushButton>
<prompt>
<paraBasic>View video</paraBasic>
</prompt>
<externalApplication application="videoApp">
<paraBasic>S1000D and Me</paraBasic>
</externalApplication>
</pushButton>
```

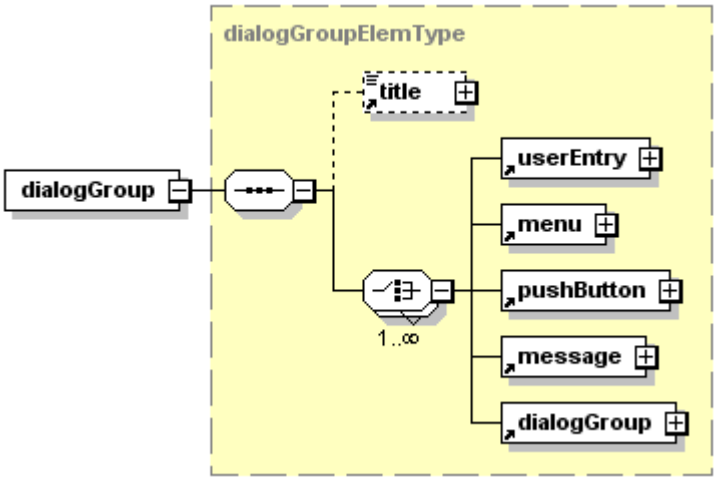
2.2.1.6 Dialog layout

Description: The element <dialogGroup> allows the positioning of multiple dialog elements within one dialog either vertically or horizontally.

When multiple dialog types (menu, user entry, push button, and message) are used in a single dialog, the author can describe simple formatting instructions to the IETP to provide a logical flow to the dialog. The following elements and attributes can affect dialog layout:

- The attribute position of element <prompt> specifies the prompt position as above, bottom, left or right of the dialog component.
- The attribute menuChoiceFlow of element <menu> describes the user menu choice direction as vertical or horizontal.
- The attribute dataEntryFieldLength of element <userEntry> describes the data entry field width in characters.
- When using multiple dialog types, the dialog types can be grouped to change the flow direction using the element <dialogGroup>. The element <dialogGroup> arranges the dialog types from vertical alignment to horizontal alignment. Nested dialog groups change the flow direction from either vertical alignment to horizontal alignment or horizontal alignment to vertical alignment. The elements within the element <dialog> normally have a vertical alignment (top to bottom), however, the dialog type elements within the element <dialogGroup> would change the alignment to horizontal (left to right) (refer to Fig 8). The element <dialogGroup> has the attribute dialogSeparator which indicates that the group dialog has a separator marking (ie, horizontal bar, boxed).

Markup element: <dialogGroup>



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Fig 7 Element <dialogGroup>

Attributes:

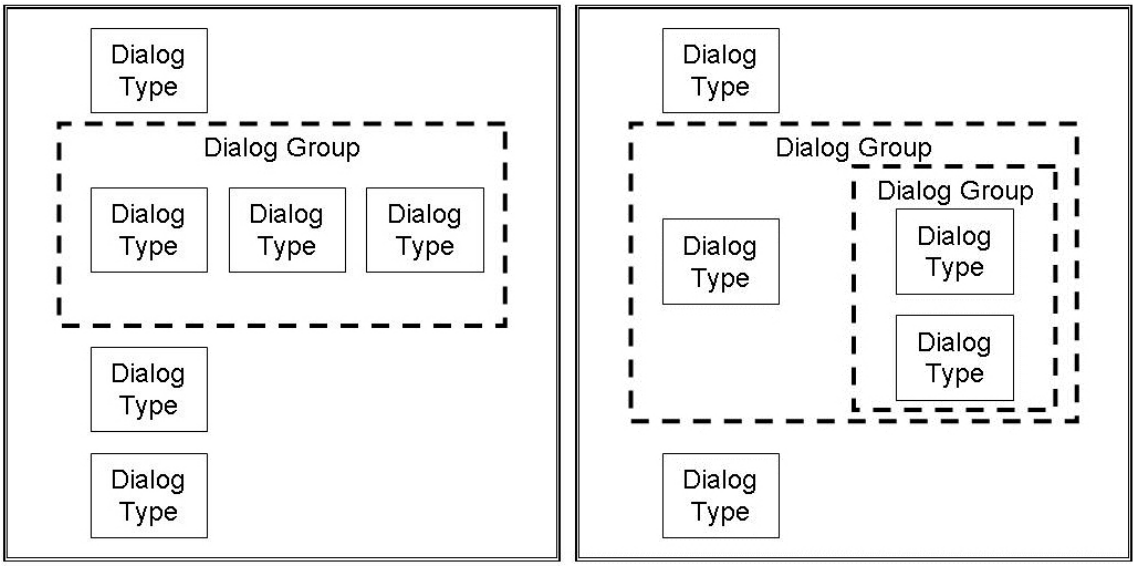
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `dialogSeparator` (O), the dialog separator marking indication. The attribute `dialogSeparator` can have one of the following values:
  - "`1`" - separator marking
  - "`0`" (D) - no separator marking
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- Same child elements as the element <`dialog`> without the element <`helpInfo`>. Refer to Para 2.2.

Markup example:

```
<dialog>
<dialogGroup>
<userEntry>
<prompt><paraBasic>Enter your name</paraBasic></prompt>
<variableRef variableName="name"/>
</userEntry>
<menu choiceSelection="single" choiceType="select">
<prompt><paraBasic>Did you ever ride a
bicycle?</paraBasic></prompt>
<menuChoice>
<prompt><paraBasic>Yes</paraBasic></prompt>
<assertion>
<variableRef variableName="level"/>
<expression><stringValue>experienced</stringValue></expression>
</assertion>
</menuChoice>
<menuChoice>
<prompt><paraBasic>No</paraBasic></prompt>
<noAssertions/>
</menuChoice>
</menu>
</dialogGroup>
<dialogGroup dialogSeparator="1">
<message>
<prompt><paraBasic>You must be an experienced user to access
this data.</paraBasic></prompt>
</message>
</dialogGroup>
</dialog>
```

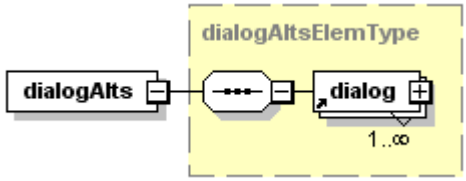


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Fig 8 Single and nested dialog group alignment - Example

2.3 Dialog alternates

Markup element: <dialogAlts>



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Fig 9 Element <dialogAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- altsName (O), a name for the alternate group
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <dialog>. Refer to Para 2.2.

Markup example:

Refer to the element <proceduralStepAlts> in Chap 3.9.5.2.10.1 for like and similar markup.

```
<dialogAlts>
<dialog applicRefId="applic3">
<userEntry dataEntryFieldLength="3">
<prompt>
<paraBasic>Enter your age</paraBasic>
</prompt>
<variableRef variableName="age"/></userEntry>
</dialog>
<dialog applicRefId="applic4">
<userEntry dataEntryFieldLength="3">
<prompt>
<paraBasic>How old do you feel?</paraBasic>
</prompt>
<variableRef variableName="age"/></userEntry>
</dialog>
</dialogAlts>
```

2.4 Example dialogs

2.4.1 User menu with single selection markup

The example markup (refer to Table 2) and example IETP dialog (refer to Fig 10) is for a single selection menu dialog. In the example, the user is required to select one menu choice as determined by the value "`single`" of attribute `choiceSelection` and by the value "`1`" (true) of attribute `mandatory` on element <`menu`> (line 3 in the markup example below). The example menu has three menu choices. Each choice asserts the same state variable (*`CheckCondition`*) but assigns a different value (the first-choice asserts "`tire`" (lines 7-12), the second choice asserts "`brake`" (lines 16-21), and the third choice asserts "`light`" (lines 36-41)).

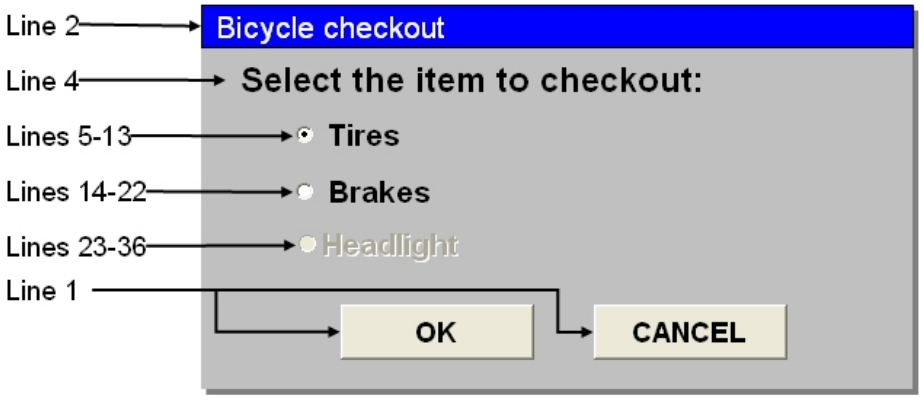
The first menu choice (lines 5-13) is pre-selected (defaulted) by the value "`1`" (true) of attribute `menuChoiceDefaultFlag`.

The third menu choice has the element <`enabledState`> (lines 24-34). The logic engine evaluates the expression and determines if the choice is active (evaluates to TRUE) or disabled (evaluates to FALSE) (the enable expression is [*`Environment`* `equal` "night"]). In this example the state variable *`Environment`* was previously asserted to "day". The third choice is disabled (grayed out) since the element <`enabledState`> for the menu choice evaluates to FALSE.

Table 2 User menu with single selection markup - Example

Line	Markup
1	`<dialog submitCaption="ok01" cancelCaption="ca01">`
2	`<title>Bicycle checkout</title>`
3	`<menu choiceType="select" menuChoiceFlow="list" choiceSelection="single" mandatory="1">`
4	`<prompt><paraBasic>Select the item to checkout:</paraBasic></prompt>`
5	`<menuChoice menuChoiceDefaultFlag="1">`
6	`<prompt><paraBasic>Tires</paraBasic></prompt>`
7	`<assertion>`
8	`<variableRef variableName="CheckCondition"/>`

Line	Markup
9	<expression>
10	<stringValue>tire</stringValue>
11	</expression>
12	</assertion>
13	</menuChoice>
14	<menuChoice menuChoiceDefaultFlag="0">
15	<prompt><paraBasic>Brakes</paraBasic></prompt>
16	<assertion>
17	<variableRef variableName="CheckCondition"/>
18	<expression>
19	<stringValue>brake</stringValue>
20	</expression>
21	</assertion>
22	</menuChoice>
23	<menuChoice menuChoiceDefaultFlag="0">
24	<enabledState>
25	<expression>
26	<expression>
27	<variableRef variableName="Environment"/>
28	</expression>
29	<stringOperator stringOperation="equal"/>
30	<expression>
31	<stringValue>night</stringValue>
32	</expression>
33	</expression>
34	</enabledState>
35	<prompt><paraBasic>Headlight</paraBasic></prompt>
36	<assertion>
37	<variableRef variableName="CheckCondition"/>
38	<expression>
39	<stringValue>light</stringValue>
40	</expression>
41	</assertion>
42	</menuChoice>
43	</menu>
44	</dialog>



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Fig 10 Multiple choice dialog menu - Example

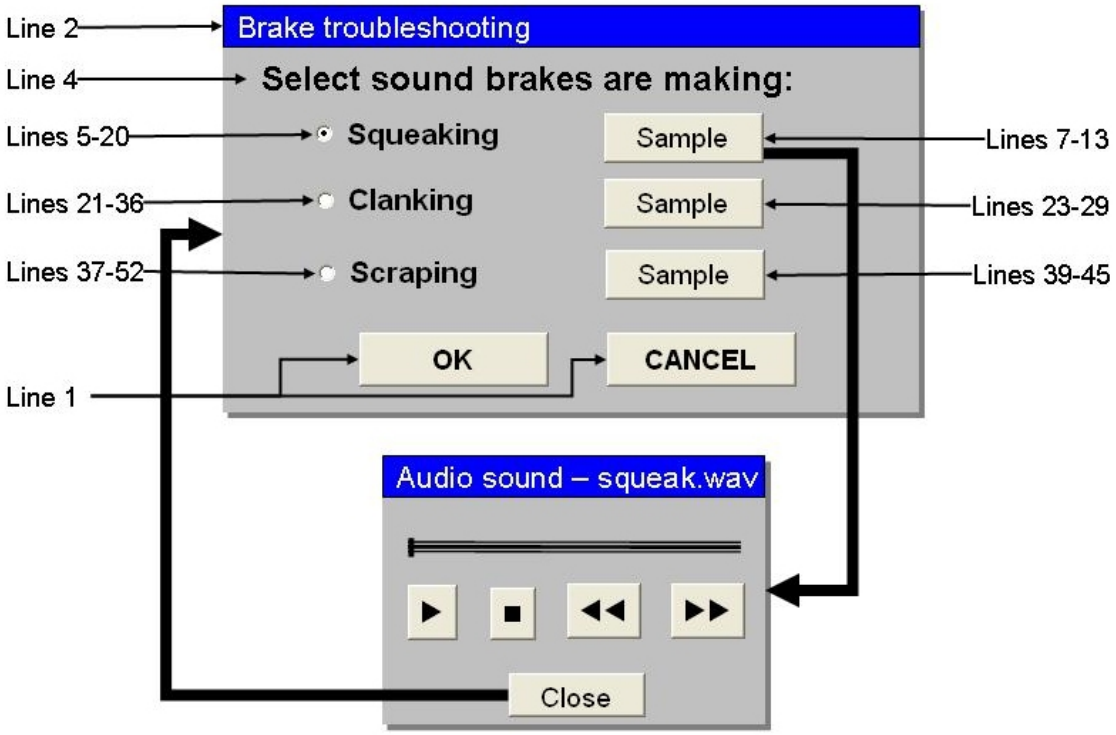
2.4.2 User menu with push button external application launch

The example markup (refer to Table 3) and example IETP dialog (refer to Fig 11) is for a menu dialog object using associated push buttons to launch an external application. In the example, each menu choice has prompted text (element <prompt>) (lines 6, 22 and 38 in the markup example below), a push button to launch an external application (element <pushButton>) (lines 7-13, 23-29, 39-45) and an assertion indicating the menu choice selected (element <assertion>) (lines 14-19, 30-35, 46-51). When a push button is selected, the external application is launched and executed. After the external application is completed and closed, control returns to the dialog.

Table 3 User menu with push button markup - Example

Line	Markup
1	`<dialog submitCaption="ok01" cancelCaption="ca01">`
2	`<title>Brake troubleshooting</title>`
3	`<menu choiceType="select" menuChoiceFlow="list" choiceSelection="single" mandatory="1">`
4	`<prompt><paraBasic>Select sound brakes are making:</paraBasic></prompt>`
5	`<menuChoice menuChoiceDefaultFlag="1">`
6	`<prompt><paraBasic>Squeaking</paraBasic></prompt>`
7	`<pushButton>`
8	`<prompt><paraBasic>Sample</paraBasic></prompt>`
9	`<externalApplication application="sound">`
10	`<paraBasic>Play audio sounds</paraBasic>`
11	`<send><stringValue>squeak.wav</stringValue></send>`
12	`</externalApplication>`
13	`</pushButton>`
14	`<assertion>`
15	`<variableRef variableName="BrakeSound"/>`
16	`<expression>`
17	`<stringValue>squeak</stringValue>`

Line	Markup
18	</expression>
19	</assertion>
20	</menuChoice>
21	<menuChoice menuChoiceDefaultFlag="0">
22	<prompt><paraBasic>Clanking</paraBasic></prompt>
23	<pushButton>
24	<prompt><paraBasic>Sample</paraBasic></prompt>
25	<externalApplication application="sound">
26	<paraBasic>Play audio sounds</paraBasic>
27	<send><stringValue>clank.wav</stringValue></send>
28	</externalApplication>
29	</pushButton>
30	<assertion>
31	<variableRef variableName="BrakeSound"/>
32	<expression>
33	<stringValue>clank</stringValue>
34	</expression>
35	</assertion>
36	</menuChoice>
37	<menuChoice menuChoiceDefaultFlag="0">
38	<prompt><paraBasic>Scraping</paraBasic></prompt>
39	<pushButton>
40	<prompt><paraBasic>Sample</paraBasic></prompt>
41	<externalApplication application="sound">
42	<paraBasic>Play audio sounds</paraBasic>
43	<send><stringValue>scrap.wav</stringValue></send>
44	</externalApplication>
45	</pushButton>
46	<assertion>
47	<variableRef variableName="BrakeSound"/>
48	<expression>
49	<stringValue>scrap</stringValue>
50	</expression>
51	</assertion>
52	</menuChoice>
53	</menu>
54	</dialog>



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Fig 11 Dialog user menu with push button session - Example

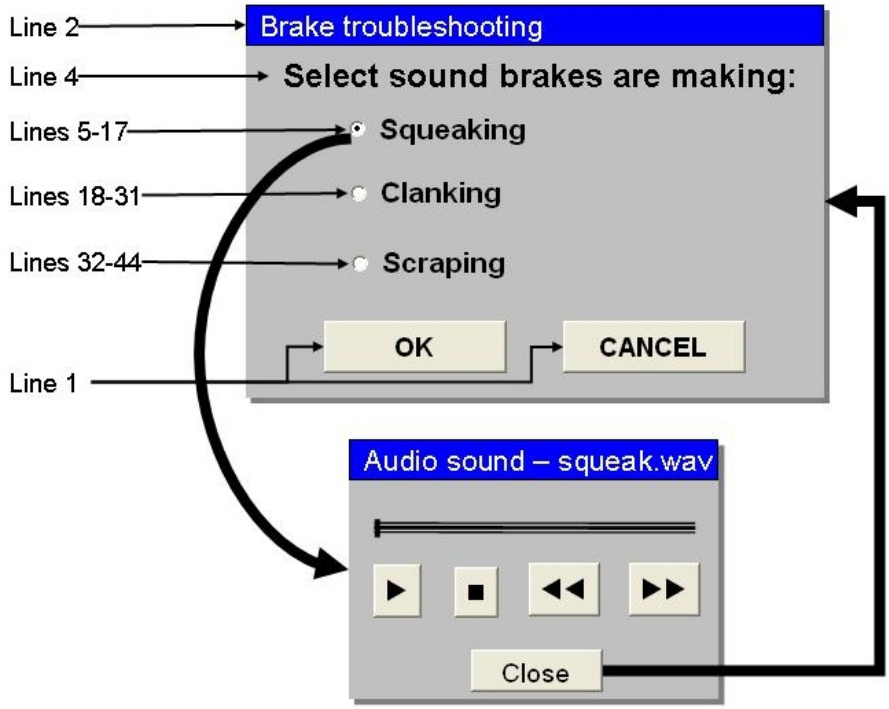
2.4.3 User menu with external application launched from menu choice

The example markup (refer to Table 4) and example IETP dialog (refer to Fig 12) is for a menu dialog object with associated external application that is launched when selected. In the example, each menu choice has prompted text (element <prompt>) (lines 6, 19, 33, in the markup example below), an external application (element <externalApplication>) (lines 7-10, 20-23, 34-37), and an assertion indicating the menu choice selected (element <assertion>) (lines 11-16, 24-29, 38-43). When a menu choice is selected, the external application is immediately launched and executed. After the external application is completed and closed, control returns to the dialog.

Table 4 User menu with external application markup - Example

Line	Markup
1	`<dialog submitCaption="ok01" cancelCaption="ca01">`
2	`<title>Brake troubleshooting</title>`
3	`<menu choiceType="select" menuChoiceFlow="list" choiceSelection="single" mandatory="1">`
4	`<prompt><paraBasic>Select sound brakes are making:</paraBasic></prompt>`
5	`<menuChoice menuChoiceDefaultFlag="1">`
6	`<prompt><paraBasic>Squeaking</paraBasic></prompt>`
7	`<externalApplication application="sound">`
8	`<paraBasic>Play audio sounds</paraBasic>`
9	`<send><stringValue>squeak.wav</stringValue></send>`

Line	Markup
10	</externalApplication>
11	<assertion>
12	<variableRef variableName="BrakeSound"/>
13	<expression>
14	<stringValue>squeak</stringValue>
15	</expression>
16	</assertion>
17	</menuChoice>
18	<menuChoice menuChoiceDefaultFlag="0">
19	<prompt><paraBasic>Clanking</paraBasic></prompt>
20	<externalApplication application="sound">
21	<paraBasic>Play audio sounds</paraBasic>
22	<send><stringValue>clank.wav</stringValue></send>
23	</externalApplication>
24	<assertion>
25	<variableRef variableName="BrakeSound"/>
26	<expression>
27	<stringValue>clank</stringValue>
28	</expression>
29	</assertion>
30	</menuChoice>
31	<menuChoice menuChoiceDefaultFlag="0">
32	<prompt><paraBasic>Scraping</paraBasic></prompt>
33	<externalApplication application="sound">
34	<paraBasic>Play audio sounds</paraBasic>
35	<send><stringValue>scrap.wav</stringValue></send>
36	</externalApplication>
37	<assertion>
38	<variableRef variableName="BrakeSound"/>
39	<expression>
40	<stringValue>scrap</stringValue>
41	</expression>
42	</assertion>
43	</menuChoice>
44	</menu>
45	</dialog>



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Fig 12 Dialog user menu with external application session - Example

2.4.4 User dialog entry example

The example markup (refer to Table 5) and example IETP dialog (refer to Fig 13) is for a user entry dialog object using an entry validation and an assigned default entry value. The example depicts a dialog with a prompt and user entry data field.

The element <`prompt`> appears left of the user entry (no attribute `textDisplayPosition` is defined, therefore the inferred user entry prompt position is "left") (line 4, in the markup example below).

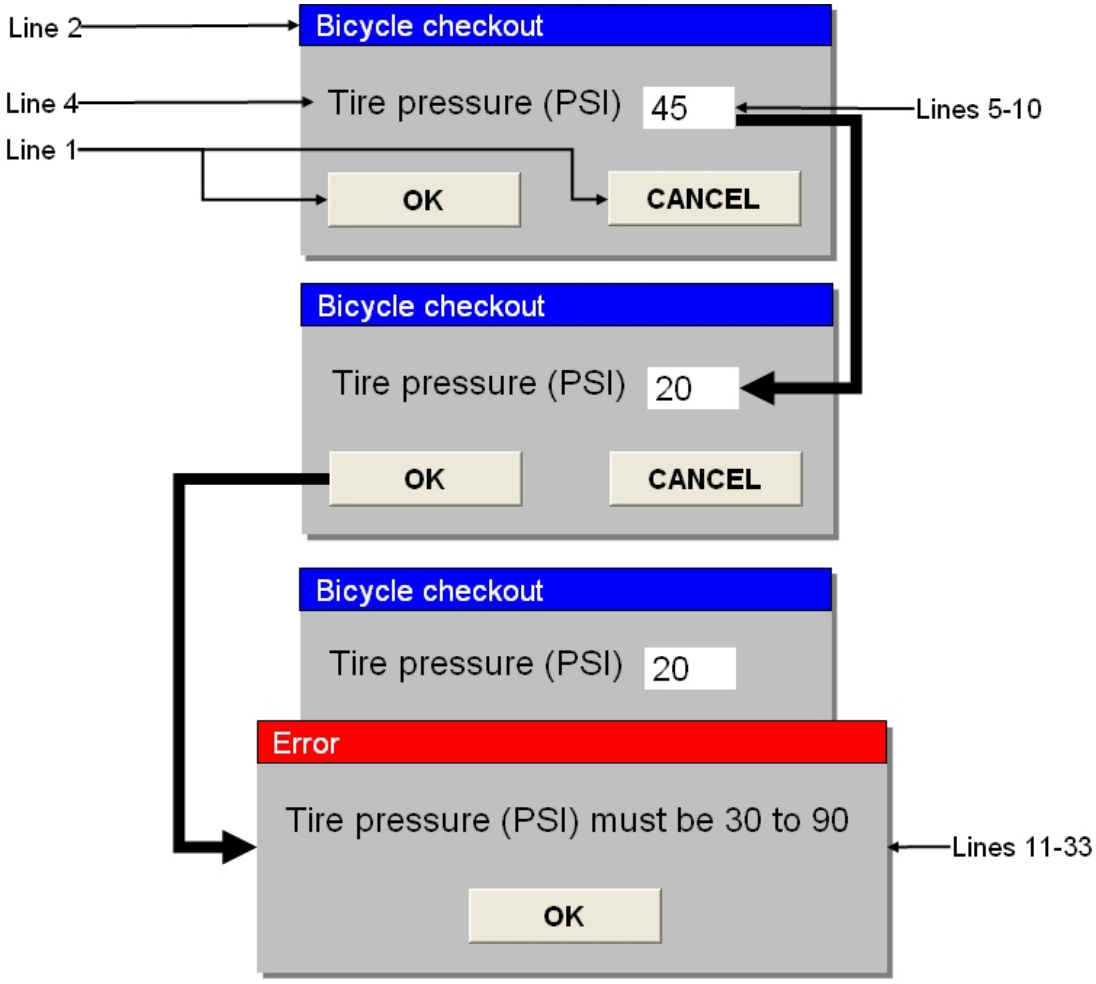
The user entry data will be asserted to the state variable named *`Pressure`* as defined by the attribute `variableName` (line 5) on element <`variableRef`>.

The default value is derived from the state variable *`Pressure`* (asserted prior to the integer value "45") and is assigned using the element <`default`> (lines 6-10) that evaluates the associated expression (the logic engine returns the stored value, "45", from the state table variable *`Pressure`*). The element <`validate`> defines that the allowable integer range is 30 thru 90 (lines 11-33). The attribute `errorMessage` on element <`validate`> contains an error message to be shown when the evaluated expression (30 ≤ *`Pressure`* ≤ 90) is false.

Table 5 Push button markup - Example

Line	Markup
1	`<dialog submitCaption="ok01" cancelCaption="ca01">`
2	`<title>Bicycle checkout</title>`
3	`<userEntry mandatory="1" dataEntryFieldLength="1">`
4	`<prompt><paraBasic>Tire pressure (PSI)</paraBasic></prompt>`

Line	Markup
5	<variableRef variableName="Pressure"/>
6	<default>
7	<expression>
8	<variableRef variableName="Pressure"/>
9	</expression>
10	</default>
11	<validate errorMessage="Tire pressure (PSI) must be 30 to 90">
12	<expression>
13	<expression>
14	<expression>
15	<integerValue>30</integerValue>
16	</expression>
17	<numberOperator numberOperation="lessThanOrEqual"/>
18	<expression>
19	<variableRef variableName="Pressure"/>
20	</expression>
21	</expression>
22	<booleanOperator booleanOperation="and"/>
23	<expression>
24	<expression>
25	<variableRef variableName="Pressure"/>
26	</expression>
27	<numberOperator numberOperation="lessThanOrEqual"/>
28	<expression>
29	<integerValue>90</integerValue>
30	</expression>
31	</expression>
32	</expression>
33	</validate>
34	</userEntry>
35	</dialog>



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Fig 13 Validate dialog entry session - Example

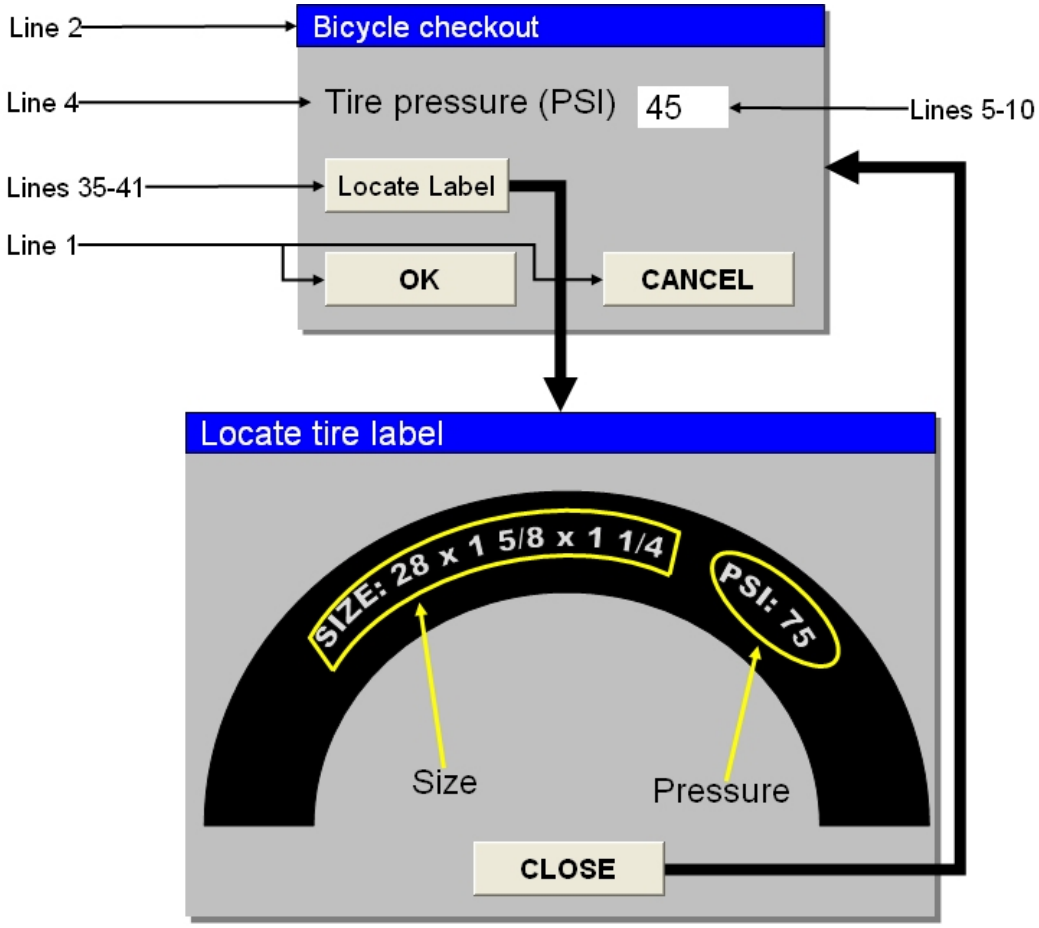
2.4.5 Push button example

The example markup (refer to Table 6) and example IETP dialog (refer to Fig 14) is for a push button dialog object. In the example, the user needs to locate where to find the tire label information. When selected, the push button "Locate Tire Label" (lines 35-41, in the markup example below) launches an external application that displays an illustration about the tire label components. After closing the illustration, control returns to the dialog.

Table 6 Push button markup - Example:

Line	Markup
1	`<dialog submitCaption="ok01" cancelCaption="ca01">`
2	`<title>Bicycle checkout</title>`
3	`<userEntry mandatory="1" dataEntryFieldLength="1">`
4	`<prompt><paraBasic>Tire pressure (PSI)</paraBasic></prompt>`
5	`<variableRef variableName="Pressure"/>`
6	`<default>`
7	`<expression>`
8	`<variableRef variableName="Pressure"/>`

Line	Markup
9	</expression>
10	</default>
11	<validate errorMessage="Tire pressure (PSI) must be 30 to 90">
12	<expression>
13	<expression>
14	<expression>
15	<integerValue>30</integerValue>
16	</expression>
17	<numberOperator numberOperation="lessThanOrEqual"/>
18	<expression>
19	<variableRef variableName="Pressure"/>
20	</expression>
21	</expression>
22	<booleanOperator booleanOperation="and"/>
23	<expression>
24	<expression>
25	<variableRef variableName="Pressure"/>
26	</expression>
27	<numberOperator numberOperation="lessThanOrEqual"/>
28	<expression>
29	<integerValue>90</integerValue>
30	</expression>
31	</expression>
32	</expression>
33	</validate>
34	</userEntry>
35	<pushButton>
36	<prompt><paraBasic>Locate Tire Label</paraBasic></prompt>
37	<externalApplication application="illustrate">
38	<paraBasic>Display CGM graphic</paraBasic>
39	<send><stringValue>tirelocate.cgm</stringValue></send>
40	</externalApplication>
41	</pushButton>
42	</dialog>



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Fig 14 Dialog push button session - Example

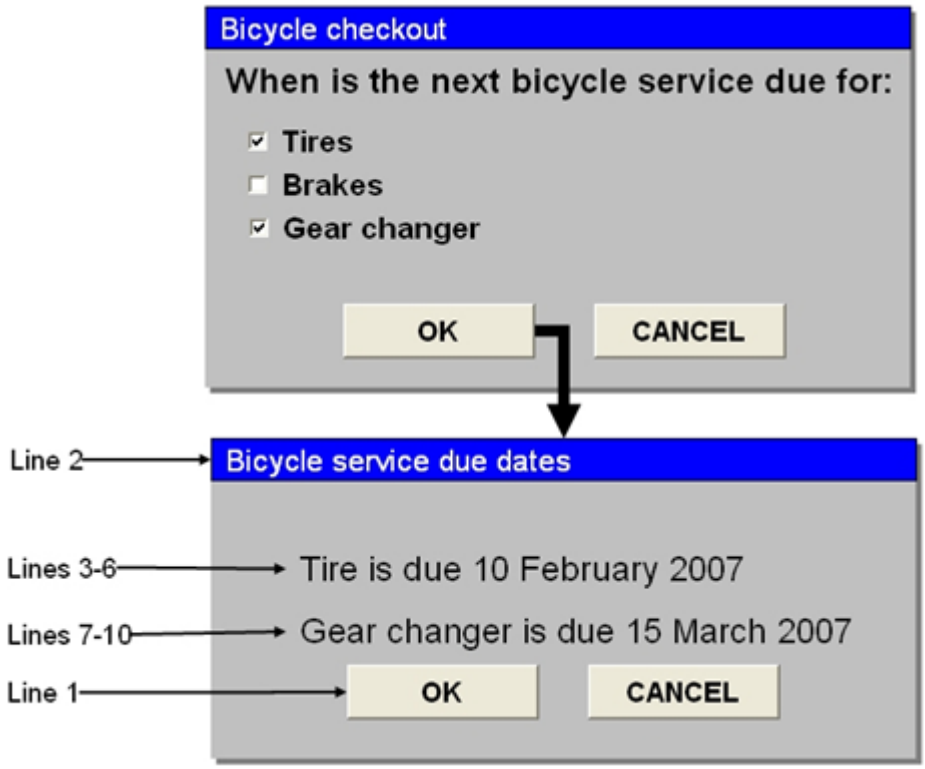
2.4.6 User message example

The example markup (refer to Table 7) and example IETP dialog (refer to Fig 15) is for a message dialog object as a response from the IETP. In the example, the user selects the bicycle component(s) for service information and submits the information to the IETP. The IETP processes service dates requests, stores the information in the state variables *TireDue* and *GearDue*. Results are displayed in a dialog message (obtaining the information from state variables *TireDue* and *GearDue*).

Table 7 User message markup - Example

Line	Markup
1	`<message submitCaption="ok01" cancelCaption="ca01">`
2	`<title>Bicycle service due dates</title>`
3	`<prompt>`
4	`<paraBasic>Tire is due </paraBasic>`
5	`<variableRef variableName="TireDue"/>`
6	`</prompt>`
7	`<prompt>`
8	`<paraBasic>Gear changer is due </paraBasic>`

Line	Markup
9	<variableRef variableName="GearDue"/>
10	</prompt>
11	</message>



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Fig 15 Dialog user message session - Example

2.4.7 Complex dialog layout example

The example markup (refer to Table 8) and example IETP dialog (refer to Fig 16) is a combination of the three dialog types (menu, user entry, and message) using dialog grouping to display the information in a more logical layout.

The first dialog group (element <dialogGroup>, lines 3-89 in the markup example below) contains information on the bicycle tire size. The dialog group has the common title "Tire size" (line 4). The dialog types (element <menu> (lines 5-42) and element <userEntry> (lines 43-88)) are aligned horizontally (side-by-side). The group determines the tire size by:

- Measurement methods, of which the tire has four: ISO (ETRTO) (metric) (element <menuChoice>, lines 6-14), Fractional (U.S.) (element <menuChoice>, lines 15-23), Decimal (U.S.) (element <menuChoice>, lines 24-32), and French (metric) (element <menuChoice>, lines 33-41) that are displayed in a dialog pull down menu (value of attribute choiceType is "pulldown" on element <menu>, line 5).
- Tire size, of which there are three:
  - **ISO (ETRTO)** requires one user entry (value of attribute mandatory on element <userEntry> is "1" (lines 43-46)) and disables the remaining two user entries

(element <enable> expression [*TireSizeMethod* notEqual "iso"] (lines 47-61) and second element <enable> expression [[*TireSizeMethod* equal "fractional"] OR [*TireSizeMethod* equal "decimal"]] (lines 62-88))

- **French** requires two user entries (value of attribute mandatory on element <userEntry> is "1" (lines 43-46 and 47-61)) and disables the remaining one user entry (element <enable> expression [[*TireSizeMethod* equal "fractional"] OR [*TireSizeMethod* equal "decimal"]] (lines 62-88))
- **Fractional** and **Decimal** require two user entries (value of attribute mandatory on element <userEntry> is "1" (lines 43-46 and 47-61)) and the third user entry is optional (value of attribute mandatory on element <userEntry> is "0" (lines 62-88)).

The second dialog group (element <dialogGroup> (lines 90-126)) contains information on the bicycle tire style. A separator divides to the two groups by setting the attribute dialogSeparator to "1" (line 90). The dialog group has a common title "Tire style" (line 91). The dialog types (element <menu> (lines 92-120) and element <message> (lines 121-125)) are aligned horizontally (side-by-side) and the group determines the tire style by:

- Tire style, of which there are three: Touring (lines 93-101), Racing (lines 102-110), and/or All Terrain (lines 111-119). Some tires are designed for one, two or all tire styles requiring a dialog multiple selection menu.
- a message (element <message> (lines 121-125)) to the user indicating that some bicycle tire style combinations cannot be possible

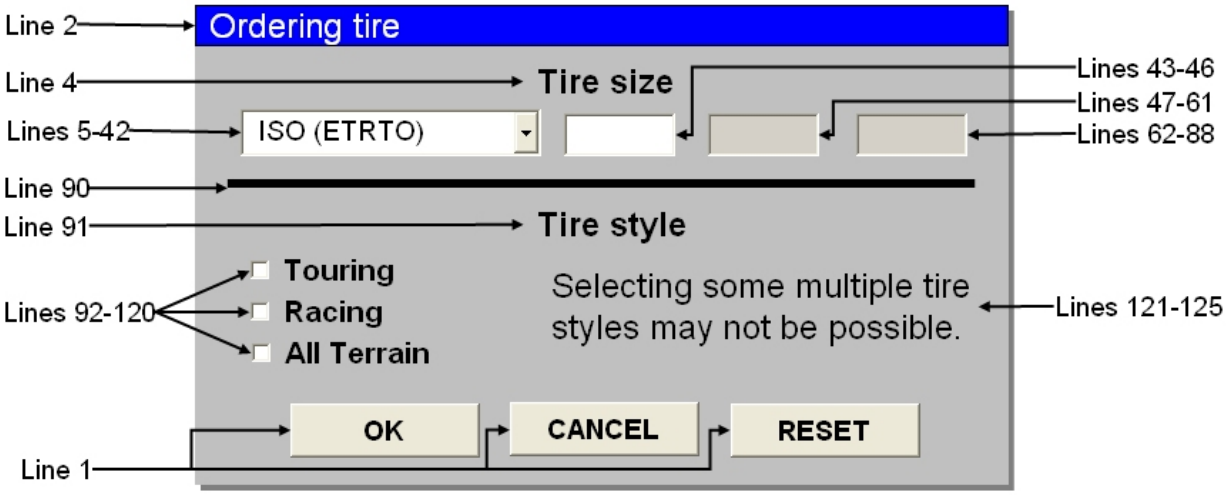
Table 8 Complex dialog markup - Example

Line	Markup
1	`<dialog submitCaption="ok01" cancelCaption="ca01">`
2	`<title>Ordering tire</title>`
3	`<dialogGroup dialogSeparator="0">`
4	`<title>Tire size</title>`
5	`<menu choiceType="pulldown" menuChoiceFlow="list" choiceSelection="single" mandatory="1">`
6	`<menuChoice menuChoiceDefaultFlag="1">`
7	`<prompt><paraBasic>ISO (ETRTO)</paraBasic></prompt>`
8	`<assertion>`
9	`<variableRef variableName="TireSizeMethod"/>`
10	`<expression>`
11	`<stringValue>iso</stringValue>`
12	`</expression>`
13	`</assertion>`
14	`</menuChoice>`
15	`<menuChoice menuChoiceDefaultFlag="0">`
16	`<prompt><paraBasic>Fractional</paraBasic></prompt>`
17	`<assertion>`
18	`<variableRef variableName="TireSizeMethod"/>`
19	`<expression>`

Line	Markup
20	<stringValue>fractional</stringValue>
21	</expression>
22	</assertion>
23	</menuChoice>
24	<menuChoice menuChoiceDefaultFlag="0">
25	<prompt><paraBasic>Decimal</paraBasic></prompt>
26	<assertion>
27	<variableRef variableName="TireSizeMethod"/>
28	<expression>
29	<stringValue>decimal</stringValue>
30	</expression>
31	</assertion>
32	</menuChoice>
33	<menuChoice menuChoiceDefaultFlag="0">
34	<prompt><paraBasic>French</paraBasic></prompt>
35	<assertion>
36	<variableRef variableName="TireSizeMethod"/>
37	<expression>
38	<stringValue>french</stringValue>
39	</expression>
40	</assertion>
41	</menuChoice>
42	</menu>
43	<userEntry mandatory="1" dataEntryFieldLength="6">
44	<prompt><paraBasic></paraBasic></prompt>
45	<variableRef variableName="size1"/>
46	</userEntry>
47	<userEntry mandatory="1" dataEntryFieldLength="6">
48	<enabledState>
49	<expression>
50	<expression>
51	<variableRef variableName="TireSizeMethod"/>
52	</expression>
53	<stringOperator stringOperation="notEqual"/>
54	<expression>
55	<stringValue>iso</stringValue>
56	</expression>
57	</expression>

Line	Markup
58	</enabledState>
59	<prompt><paraBasic></paraBasic></prompt>
60	<variableRef variableName="size2"/>
61	</userEntry>
62	<userEntry mandatory="0" dataEntryFieldLength="6">
63	<enabledState>
64	<expression>
65	<expression>
66	<expression>
67	<variableRef variableName="TireSizeMethod"/>
68	</expression>
69	<stringOperator stringOperation="equal"/>
70	<expression>
71	<stringValue>fractional</stringValue>
72	</expression>
73	</expression>
74	<booleanOperator booleanOperation="or"/>
75	<expression>
76	<expression>
77	<variableRef variableName="TireSizeMethod"/>
78	</expression>
79	<stringOperator stringOperation="equal"/>
80	<expression>
81	<stringValue>decimal</stringValue>
82	</expression>
83	</expression>
84	</expression>
85	</enabledState>
86	<prompt><paraBasic></paraBasic></prompt>
87	<variableRef variableName="size3"/>
88	</userEntry>
89	</dialogGroup>
90	<dialogGroup dialogSeparator="1">
91	<title>Tire style</title>
92	<menu choiceType="select" menuChoiceFlow="list" choiceSelection="multiple" mandatory="1">
93	<menuChoice menuChoiceDefaultFlag="0">
94	<prompt><paraBasic>Touring</paraBasic></prompt>
95	<assertion>

Line	Markup
96	<variableRef variableName="TireStyle"/>
97	<expression>
98	<stringValue>tour</stringValue>
99	</expression>
100	</assertion>
101	</menuChoice>
102	<menuChoice menuChoiceDefaultFlag="0">
103	<prompt><paraBasic>Racing</paraBasic></prompt>
104	<assertion>
105	<variableRef variableName="TireStyle"/>
106	<expression>
107	<stringValue>race</stringValue>
108	</expression>
109	</assertion>
110	</menuChoice>
111	<menuChoice menuChoiceDefaultFlag="0">
112	<prompt><paraBasic>All Terrain</paraBasic></prompt>
113	<assertion>
114	<variableRef variableName="TireStyle"/>
115	<expression>
116	<stringValue>allterrain</stringValue>
117	</expression>
118	</assertion>
119	</menuChoice>
120	</menu>
121	<message>
122	<prompt>
123	<paraBasic>Selecting some multiple tire styles can not be possible.</paraBasic>
124	</prompt>
125	</message>
126	</dialogGroup>
127	</dialog>



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Fig 16 Complex dialog layout - Example

Chapter 3.9.5.2.10.3

Process data module - Expressions, variables, external applications

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Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.5.3.1	Applicability - Applicability cross-reference table
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Chap 4.14.2	Applicability - Conditions cross-reference table
Chap 7.6.1.4	Process data module requirements - Expression evaluation

1 General

The content of expressions, variables, and external applications is described here. Variables and expressions are cornerstones of the process data module as they enable the logic engine to perform automated data filtering and navigation through the data module.

Sequencing, based on state information, together with management of dynamic and static state information are required capabilities to achieve intelligent, interactive data display. This functionality is fundamental to testing and troubleshooting sequences where the next test is often based on the result of the current test (dynamic state information) or input from the product interface (via the external application interface). It also allows the presentation of information to the user to be customized to the product configuration or any system state.

The process data module contains structures for traversing steps and data modules in a defined order and in if-then-else branches and loops driven by the valuation of expressions. The process data module also filters steps and data modules based on the value of state variables, eg, [*Model* equal "B" or *Test passed* equal TRUE] which are stored in the state table. (In this chapter, variable names appear in *italics*, expressions are given in [brackets])

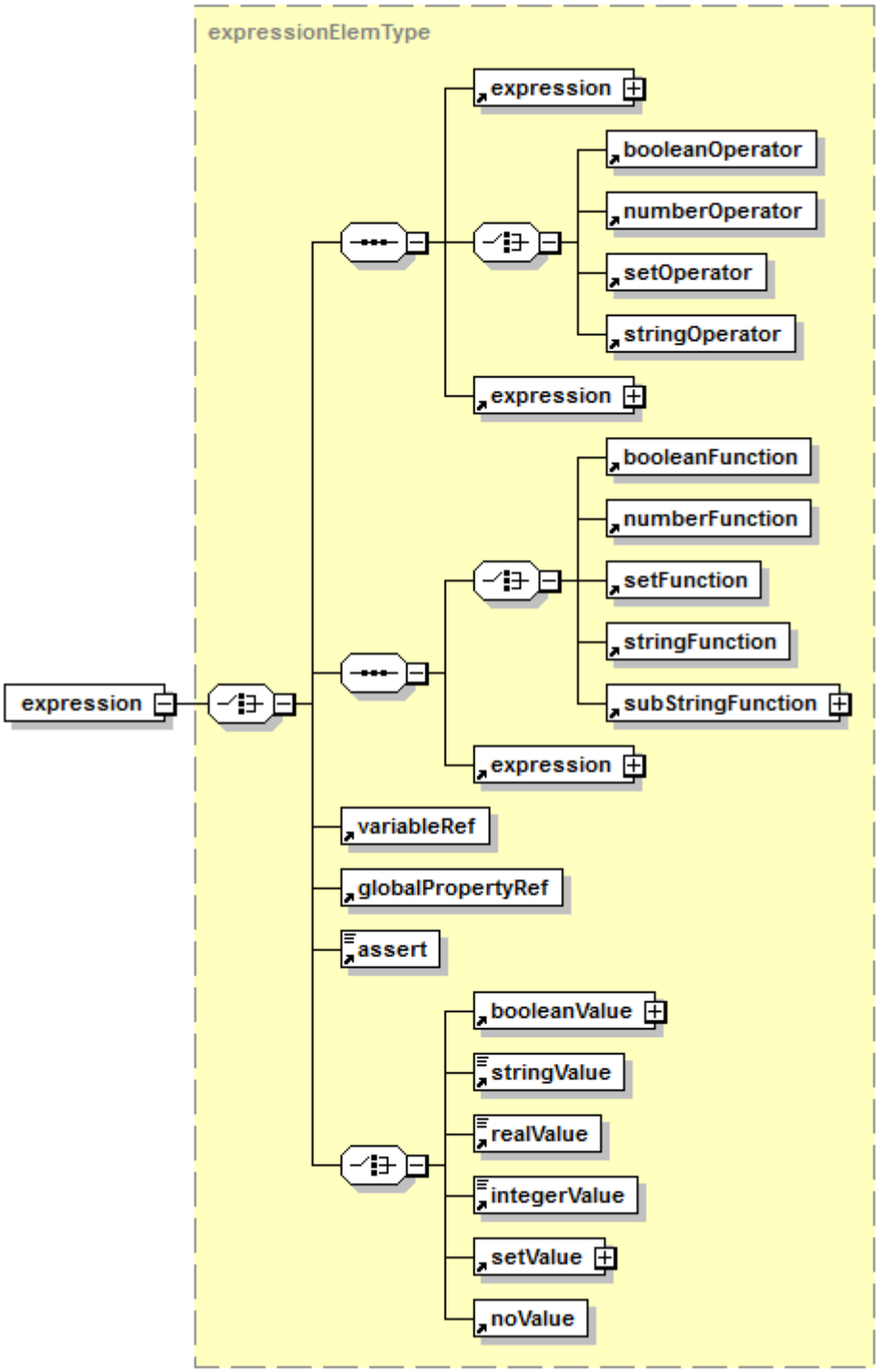
2 Expression, variable, external application content

2.1 Expressions

Description: Expressions are combinations of variables or global properties and operators. The logic engine evaluates expressions primarily in order to determine what is displayed to the user as in applicability ([*Model* = "T"]) and branching ([If *Error Condition* = "4"]) and loop (WHILE [*Counter* < "5"]) conditions. Expressions are also used to assign a value to a variable or global property ([*Ave* = Sum / 3]). Refer to Chap 7.6.1.4 for detailed information.

The element <expression> defines something to be evaluated by the logic engine. Expressions are used to assign values to variables in assertions, eg, the value of the expression [*Counter* plus 1] might be assigned to the variable *Counter*. They are also used in applicability, branches, and other constructs to determine what is displayed to the user. In element <applic>, for example, if the expression [*Item deployed* equal TRUE] evaluates to TRUE, the data item containing the applicability is displayed and vice versa. Expressions are authored by combining variables (or other expressions) and values with binary or unary operators. In their simplest form, an expression can be just a variable/global property or a value. The element <assert> can also be used to simplify the authoring of complicated expressions.

Markup element: <expression>



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Fig 1 Element <`expression`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `humanReadableForm` (O), the textual form of the expression to be used in printing

Child elements:

- <booleanOperator>. Refer to Chap 7.6.1.4.
- <numberOperator>. Refer to Chap 7.6.1.4.
- <setOperator>. Refer to Chap 7.6.1.4.
- <stringOperator>. Refer to Chap 7.6.1.4.
- <booleanFunction>. Refer to Chap 7.6.1.4.
- <numberFunction>. Refer to Chap 7.6.1.4.
- <setFunction>. Refer to Chap 7.6.1.4.
- <stringFunction>. Refer to Chap 7.6.1.4.
- <subStringFunction>. Refer to Chap 7.6.1.4.
- <booleanValue>. Refer to Chap 7.6.1.4.
- <stringValue>. Refer to Chap 7.6.1.4.
- <realValue>. Refer to Chap 7.6.1.4.
- <integerValue>. Refer to Chap 7.6.1.4.
- <setValue>. Refer to Chap 7.6.1.4.
- <noValue>. Refer to Chap 7.6.1.4.
- <variableRef>. Refer to Chap 3.9.5.2.10.1.
- <globalPropertyRef>. Refer to Chap 3.9.5.2.10.1.
- <assert>. Refer to Chap 3.9.5.3.
- <expression>. Refer to Para 2.1.

Markup example:

```
<expression>
<stringValue>experienced</stringValue>
</expression>
<expression>
<integerValue>0</integerValue>
</expression>
<expression>
<expression>
<variableRef variableName="tourFinished"/>
</expression>
<numberOperator numberOperation="equal"/>
<expression>
<booleanValue><falseValue/></booleanValue>
</expression>
</expression>
```

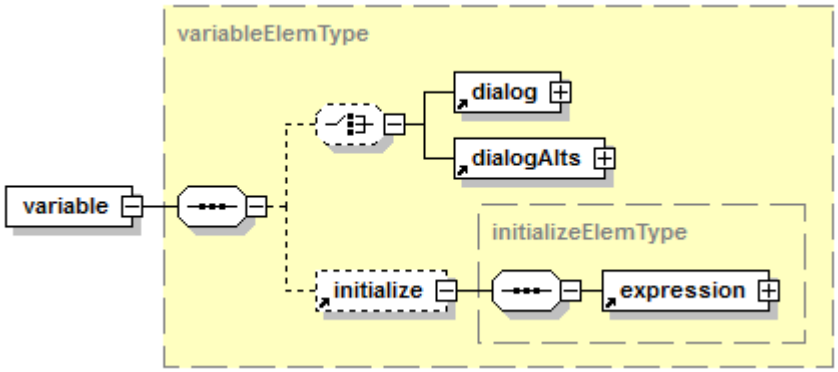
2.2 Variables (local)

Description: Variables define pieces of information required by the logic engine to context filter, branch, etc, within a process data module. Variables can be global or local in scope. Local variables are defined in the element <variable> described below. Local variables are only available to the process data module in which they are declared.

If a variable must be available to several process data modules, it must be declared in the ACT or CCT as a product attribute or condition. It will then be recognized by the logic engine as a global property and made available to all process data modules. Refer to Chap 3.9.5.3.1 and Chap 3.9.5.3.2 for descriptions of the element <productAttribute> and the element <condition>. More information is provided in Chap 4.14.1 and Chap 4.14.2 on these concepts.

In the process data module, the element <productAttribute> and the element <condition> can be used in the applicability structure as well as in expressions, assertions, etc. These elements are initialized in the PCT. They will not have a dialog as part of their content compared to local variables. However, they have a prompt available in their definitions which can be used to query the user for the value of the product attribute or condition as well as enumeration label attributes which can be used as menu choices in an IETP software constructed dialog. Dialogs, such as are defined for local variables, can also be authored for global properties on the element <dmNode> or the element <proceduralStep>.

Markup element: <variable>



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Fig 2 Element <variable>

Attributes:

- variableName (M), a short name for the variable. The attribute variableName is not normally seen by the end user.
- variableDescr (O), a human-readable description of the variable. Often the variable name is not descriptive enough. The description is not normally seen by the end user.
- productConfigurationFlag (O), a flag indicating if this variable describes the configuration of the Product. For example, *Model* and *Serial number* are configuration variables. In an implementation where the IETP can extract configuration information from a configuration management system, the attribute productConfigurationFlag identifies which variable values the IETP might query for.
- valueType (O), the type of the variable value. The attribute valueType can have one of the following values:
  - "boolean" - boolean type values are TRUE or FALSE
  - "string" - string type values are alphanumeric
  - "integer" (D) - integer type values are numeric and contain no decimal point
  - "real" - real type values are numeric and contain a decimal point
  - "set-string", "set-real", or "set-integer" - set type values represent an unordered list of like value types: string, real, or integer
- valuePrecision (O), the precision of real type data
- variableScope (O), the scope of the variable. The attribute variableScope can have only one value:
  - "local" (D) - the scope is for the entire user session. "local" is the only scope supported for variables declared within the process data module.

Child elements:

- <dialog>. Refer to Chap 3.9.5.2.10.2.
- <dialogAlts>. Refer to Chap 3.9.5.2.10.2.
- <initialize>. Refer to Para 2.2.1.

The element <variable> can have different values at different times in the same way as a programming variable. Variables and their values are stored in the state table and the values are used when evaluating expressions. In Para 2.1, *Counter* and *Item deployed* are variables. The element <variable> contains an optional dialog that can be used by the logic engine to obtain the value for the variable if no value has been asserted. It also contains an optional element <initialize> that is used to set an initial value for the variable using the element <expression>.

Business rule decision point BRDP-S1-00248 - Use of the attribute variableName in the element <variable> in process data modules:

- Decide on naming conventions to be used in setting variable names.

Business rule decision point BRDP-S1-00249 - Use of the attribute variableType in the element <variable> in process data modules:

- Decide whether to use the attribute variableType and decide on the rules for selection of the defined values.

Markup example:

```
<variableDeclarations>
<variable valueType="string" variableName="name"></variable>
<variable valueType="string" variableName="level">
<initialize>
<expression><stringValue>amateur</stringValue></expression>
</initialize>
</variable>
</variableDeclarations>
```

2.2.1 Initialize

Description: The element <initialize> is used to set an initial value for the variable using the element <expression>.

Markup element: <initialize>

Attributes:

- None

Child elements:

- <expression>. Refer to Para 2.1.

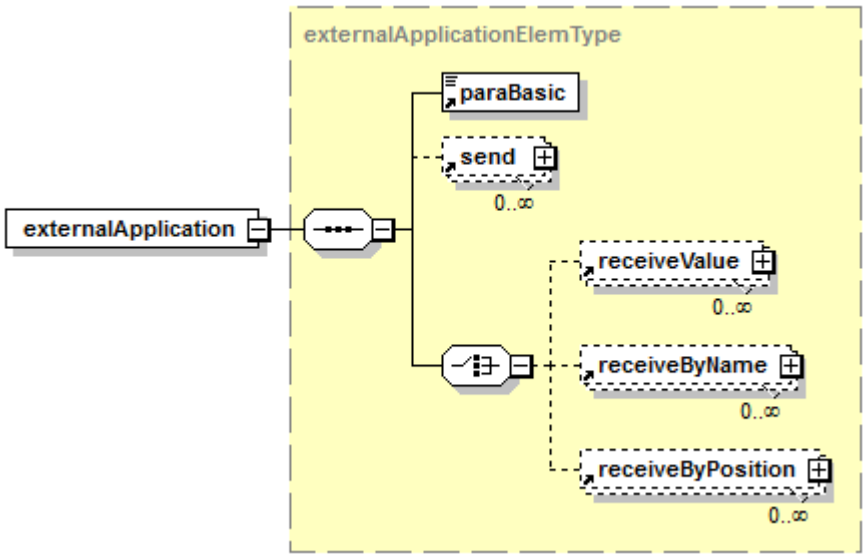
Markup example:

```
<initialize>
<expression>
<stringValue>amateur</stringValue>
</expression>
</initialize>
```

2.3 External application interface

Description: The element <externalApplication> provides the capability to launch an external program from the IETP. Parameter data can be passed to the program and values can be received back from the program. Parameter data can be passed to the application in the form of variable values or strings. Data received from an external application must be assigned to a previously defined variable of the appropriate type. External application calls can only appear in the element <dmNode>.

Markup element: <externalApplication>



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Fig 3 Element <externalApplication>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- application (M), the entity reference to the external application.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <paraBasic>. Refer to Para 2.3.1.
- <send>. Refer to Para 2.3.2.
- <receiveValue>. Refer to Para 2.3.3.
- <receiveByName>. Refer to Para 2.3.4.
- <receiveByPosition>. Refer to Para 2.3.5.

Markup example:

```
<dmNode>
<externalApplication application="MMS">
```

```
<paraBasic>Update the Maintenance Management System
(MMS)</paraBasic>
<send>
<sendName>code</sendName>
<variableRef variableName="ECU.fault-code"/>
</send>
</externalApplication>
</dmNode>
```

2.3.1 Para basic

Description: The element <paraBasic> contains a description of the external application or other information that will be displayed to the user.

Markup element: <paraBasic>

Attributes:

– None

Child elements:

– None

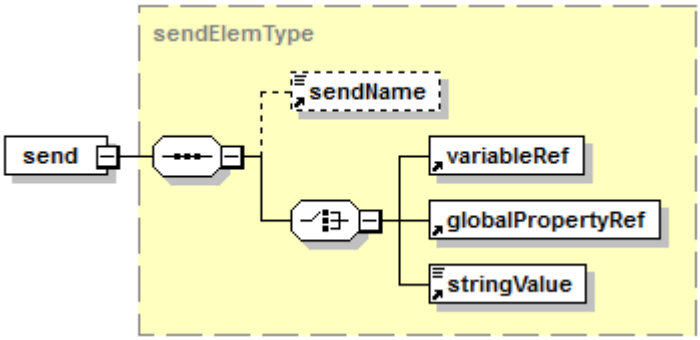
Markup example:

```
<paraBasic>Update the Maintenance Management System
(MMS)</paraBasic>
```

2.3.2 Send

Description: The element <send> defines parameters to send to the called application. The element <send> contains an optional element <sendName> and the element <variableRef>, the element <globalPropertyRef> or the element <stringValue>. Send parameters can be either local variable or global property values or strings. The element <sendName> defines the parameter name used by the external application. When used in conjunction with the element <variableRef>, the element <globalPropertyRef> or the element <stringValue>, it clearly defines each sending parameter.

Markup element: <send>



ICN-76301-S1000D0037-001-01

Fig 4 Element <send>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <sendName>, the parameter name used by the external application. Refer to Para 2.3.2.1.
- Choice of either:
  - <variableRef>. Refer to Chap 3.9.5.2.10.1.
  - <globalPropertyRef>. Refer to Chap 3.9.5.2.10.1.
  - <stringValue>, the send value is a fixed value. Refer to Chap 7.6.1.4.

Markup example:

```
<externalApplication application="MMS">
<paraBasic>Update the Maintenance Management System
(MMS)</paraBasic>
<send>
<sendName>code</sendName>
<variableRef variableName="ECU.fault-code"/>
</send>
</externalApplication>
```

2.3.2.1 Send name

Description: The element <sendName> contains a character string giving the name of a parameter sent to and used by a called external application.

Markup element: <sendName>

Attributes:

- None

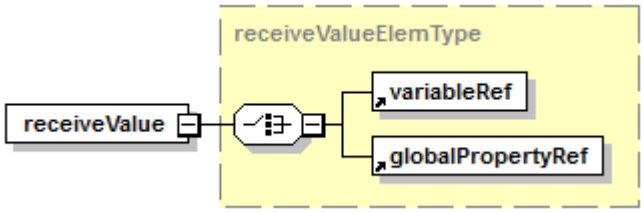
Child elements:

- None

2.3.3 Receive value

Description: The element <receiveValue> contains the element <variableRef> or the element <globalPropertyRef> which is the local variable or global property to be assigned the value received from the external application. When the returned values exceed the number of receive value definitions, the remaining receive value information is discarded.

Markup element: <receiveValue>



ICN-76301-S1000D0038-001-01

Fig 5 Element <receiveValue>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`variableRef`>, the state table variable to receive the returned value. Refer to Chap 3.9.5.2.10.1.
- <`globalPropertyRef`>, the state table global property to receive the returned value. Refer to Chap 3.9.5.2.10.1.

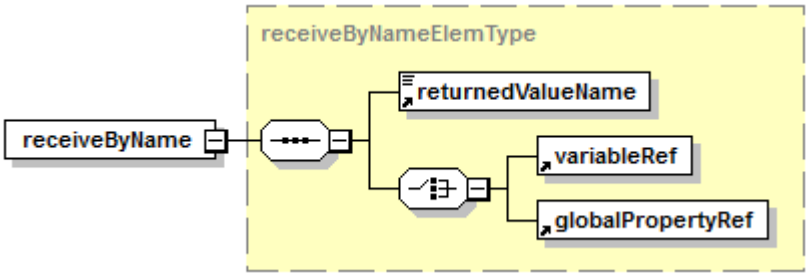
Markup example:

```
<externalApplication application="MMS">
<paraBasic>Receive Maintainer Name</paraBasic>
<receiveValue>
<variableRef variableName="Maintainer"/>
</receiveValue>
</externalApplication>
```

2.3.4 Receive by name

Description: The element <`receiveByName`> is used when the external application returns data in name/value pairs. The element <`receiveByName`> contains the element <`returnedValueName`> that is the name of the returned value, and the element <`variableRef`> or the element <`globalPropertyRef`> defining the local variable or global property to be updated with the returned value. When the external application returns a returned value name not defined by the element <`returnedValueName`>, that name/value pair is discarded.

Markup element: <`receiveByName`>



ICN-76301-S1000D0039-001-01

Fig 6 Element <receiveByName>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <returnedValueName>, a parameter name returned from the external application. Refer to Para 2.3.4.1.
- <variableRef>, the state table variable to receive the returned value. Refer to Chap 3.9.5.2.10.1.
- <globalPropertyRef>, the state table global property to receive the returned value. Refer to Chap 3.9.5.2.10.1.

Markup example:

```
<externalApplication application="MMS">
<paraBasic>Receive test results</paraBasic>
<receiveByName>
<returnedValueName>testresult</returnedValueName>
<variableRef variableName="Result Test 5"/>
</receiveByName>
</externalApplication>
```

2.3.4.1 Returned value name

Description: The element <returnedValueName> contains a character string giving then name of a parameter returned from a called external application.

Markup element: <returnedValueName>

Attributes:

- None

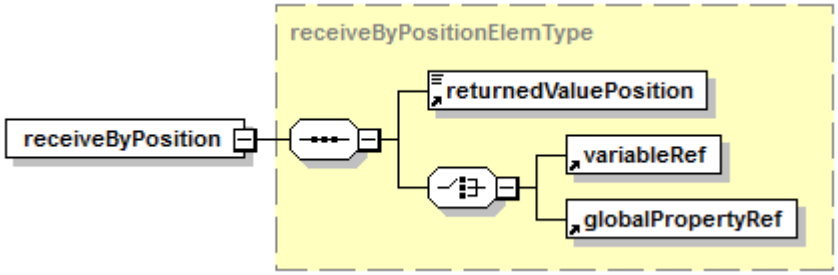
Child elements:

- None

2.3.5 Receive by position

Description: The element <receiveByPosition> is used when the external application returns data in a stream of delimited values by position. The element <receiveByPosition> contains the element <returnedValuePosition>, the position of a returned value starting with 1, and the element <variableRef> or the element <globalPropertyRef> defining the variable to be updated with the returned value. When a returned value position is not defined, the information in that position is discarded.

Markup element: <receiveByPosition>



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Fig 7 Element <receiveByPosition>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <returnedValuePosition>, the parameter position in the returned external application list. Refer to Para 2.3.5.1.
- <variableRef>, the state table variable to receive the returned value. Refer to Chap 3.9.5.2.10.1.
- <globalPropertyRef>, the state table global property to receive the returned value. Refer to Chap 3.9.5.2.10.1.

Markup example:

```
<externalApplication application="MMS">
<paraBasic>Receive test scores</paraBasic>
<receiveByPosition>
<returnedValuePosition>1</returnedValuePosition>
<variableRef variableName="Score Test 1"/>
</receiveByPosition>
<receiveByPosition>
<returnedValuePosition>5</returnedValuePosition>
<variableRef variableName="Score Test 2"/>
</receiveByPosition>
</externalApplication>
```

2.3.5.1 Returned value position

Description: The element <returnedValuePosition> contains a character string giving the parameter position in the list returned from an external application.

Markup element: <returnedValuePosition>

Attributes:

– None

Child elements:

– None

Chapter 3.9.5.2.10.4

Process data module - Logic engine

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Chap 6.4	Information presentation/use - Functionality
Chap 7.6.1	Software requirements - Process data module requirements
Chap 7.6.1.1	Process data module requirements – Navigation
Chap 7.6.1.3	Process data module requirements – Variable and global property management
Chap 7.6.1.5	Process data module requirements – Dialogs
Chap 7.6.1.7	Process data module requirements – Error handling

1 General

This chapter introduces the logic engine. The logic engine is a software component that executes the process data module (Refer to Chap 4.11 for the specification and Chap 7.6.1 for the requirements). It implements the behavior associated with process data module Schema elements. The primary job of the logic engine is to determine what to display next. In order to do that, it must traverse process data module elements, maintain a state table, display dialogs and evaluate expressions.

The process data module contains interactive processing structures to provide the capability to sequence other data modules or steps within it based on static or dynamic state information. The process data module is useful to achieve capabilities of the Functionality Matrix in categories of (1) diagnostics (particularly dynamic diagnostics, or system simulation), (2) external processes where data is captured in the IETP and transmitted to the external process or vice versa, and (3) navigation and tracking in areas of filtering (only displaying to the user data that applies to him) and dialog-driven interaction. Refer to Chap 6.4.

Sequencing, based on state information, together with management of dynamic and static state information are required capabilities to achieve intelligent, interactive data display. This functionality is fundamental to testing and troubleshooting sequences where the next test is often based on the result of the current test (dynamic state information) or input from the Product interface (via the external application interface). It also allows the presentation of information to the user to be customized to the Product configuration or any system state.

The process data module contains structures for traversing steps and data modules in a defined order and in if-then-else branches and loops. The process data module will also filter steps and data modules based on the value of state variables, eg [*Model* equal "B" or *Test passed* equal TRUE] which are stored in the state table. (In this chapter, variable names will appear in *italics*, expressions will be in [brackets]) If the required variable values are not in the State table, it will gather information from the user or other sources to populate the state table and then use that information to make branching and filtering decisions. When sequencing data modules, no change to the data module itself is required, and thus data modules can be reused in many sequences.

2 Logic engine tasks

2.1 Traverse process data module elements

The logic engine works through occurrences of the element <dmSeq> that are defined in a process data module. It processes each of element <dmNode>, element <dmIf>, and element <dmLoop> in order until there are none left to process. Refer to Chap 7.6.1.1 for detail on this processing.

For the element <dmNode>, the logic engine must evaluate applicability expressions for filtering, update the state table with variablePreSet assertions, provide content to be displayed to the user and again update the state table with variablePostSet assertions.

For the element <dmIf>, the logic engine must evaluate the condition and based on the result of the evaluation, process the element <dmThenSeq> or the element <dmElseSeq>.

For the element <dmLoop>, the logic engine must update the state table with the loop entrance assertion, evaluate the WHILE condition and, based on the result, process the element <dmSeq> contained in the element <dmLoop> or bypass it. At the end of the data module sequence, the logic engine updates the state table with the loop end assertion, re-evaluates the WHILE condition and either processes the data module sequence again or exits the loop.

2.2 Maintain state variables

In order to perform context filtering and sequencing, the logic engine must populate, store, retrieve, update, and delete state information in the state table. Refer to Chap 7.6.1.3 for details on these operations.

The logic engine populates the state table by accepting assertions from elements of the process data module (<variablePreSets>, <variablePostSets>, <dialogs>, <externalApplications>, <assertions>). The state table is simply a collection of variables and their values.

The logic engine utilizes the state information from the state table to evaluate expressions used in applicability, data module branches, and data module loops. In order to perform expression evaluations the logic engine must retrieve the required data from the state table. If the required data is not present there, the logic engine must acquire the data using dialogs which can be associated to the variable during the variable declaration. In the case that a variable is used in an expression and has no value in the state table and no associated dialog, ie there is no way to obtain a value, the logic engine will throw an error condition and stop processing. This is considered a fatal error (refer to Chap 7.6.1.7).

2.3 Present dialogs

A dialog is an authored construct presented to the end user, using the element <dialog>, to find the value of a variable. Dialogs can be menu type, using the element <menu> or "fill-in-the-blank" type, using the element <userEntry>. The logic engine must display dialogs when:

- dialogs are explicitly authored in the element <dmNode>
- the logic engine requires a value for a local variable to evaluate an expression and the state table holds no value for it. In this case, the logic engine displays the dialog associated with the variable in question.
- the logic engine requires a value for a global property to evaluate an expression and the state table holds no value for it. In this case, the logic engine generates for display a dialog from data in the ACT or CCT in order to obtain a value for the property in question.

Refer to Chap 7.6.1.5 for details on the generation and display of dialogs.

2.4 Evaluate expressions

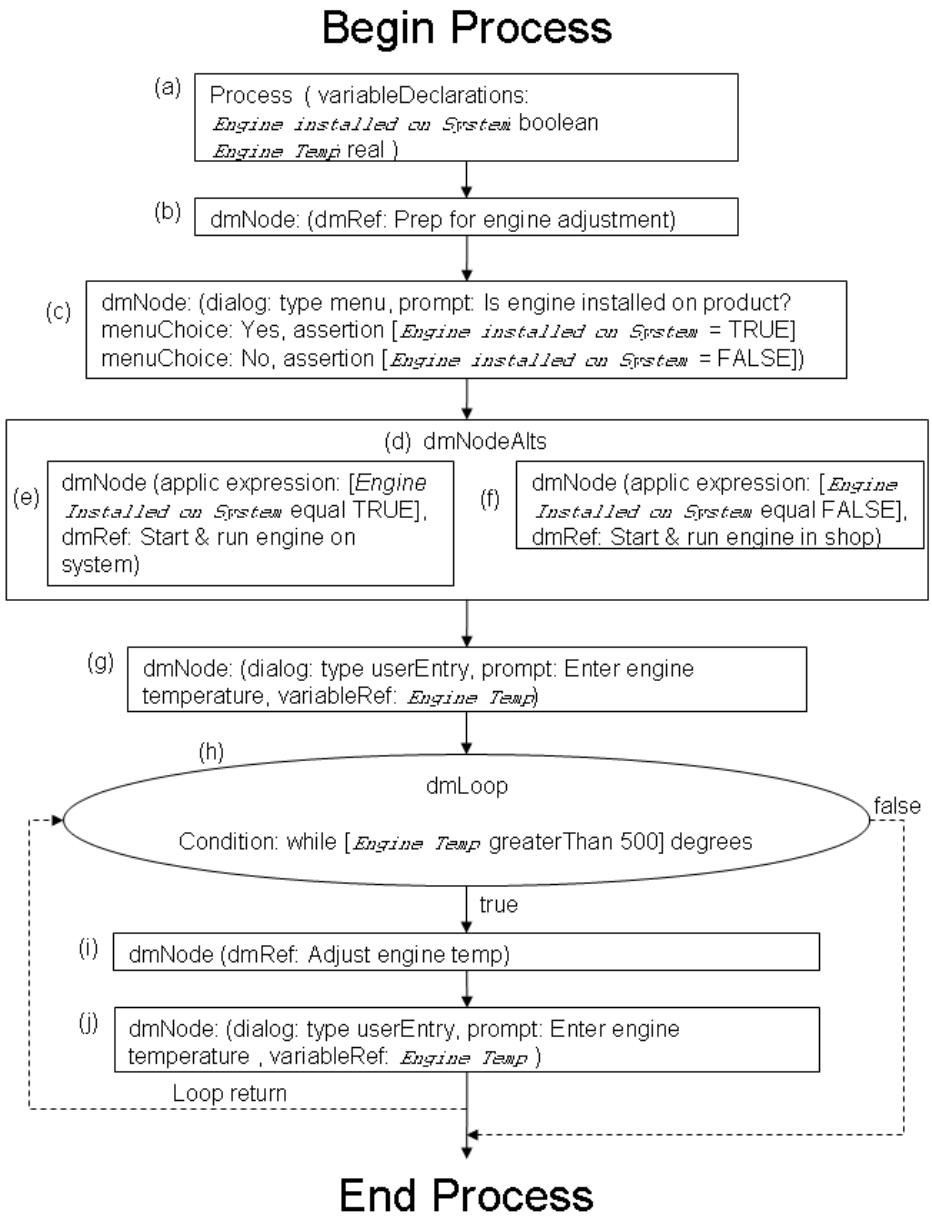
In order to sequence elements of a process data module, it is necessary to evaluate expressions found in If and Loop statements. It is also possible to encounter an expression within the applicability structure in a process data module. Using data from the state table, the logic engine must be able to determine the truth of expressions such as [*Fault message* equal "Restart"], [*Continuity exists* = TRUE], and [*Gap* < 1,5]. In certain circumstances, the logic engine will populate the state table with values from evaluating expressions. For example, in FOR loops the logic engine can evaluate expressions such as [*Counter* = Counter + 1] and update variable *Counter* accordingly.

Expressions can be complex, such as: [[*Model* = "A"] and [[*Block* = "3"] or [*Block* = "4"]] or [*Change_2 installed* = TRUE]].

3 Example process diagrams

The following illustrate sample process data modules as executed by a logic engine. A step by step description of processing follows each diagram.

Fig 1 and Fig 2 are authoring views of a process data module. The step by step description that follows each figure explains how the logic engine processes the authored data. Fig 3 is the end user view of Fig 2 - the result of logic engine processing. It shows the screens the user will see and the contents of the state table that determine what the user sees.



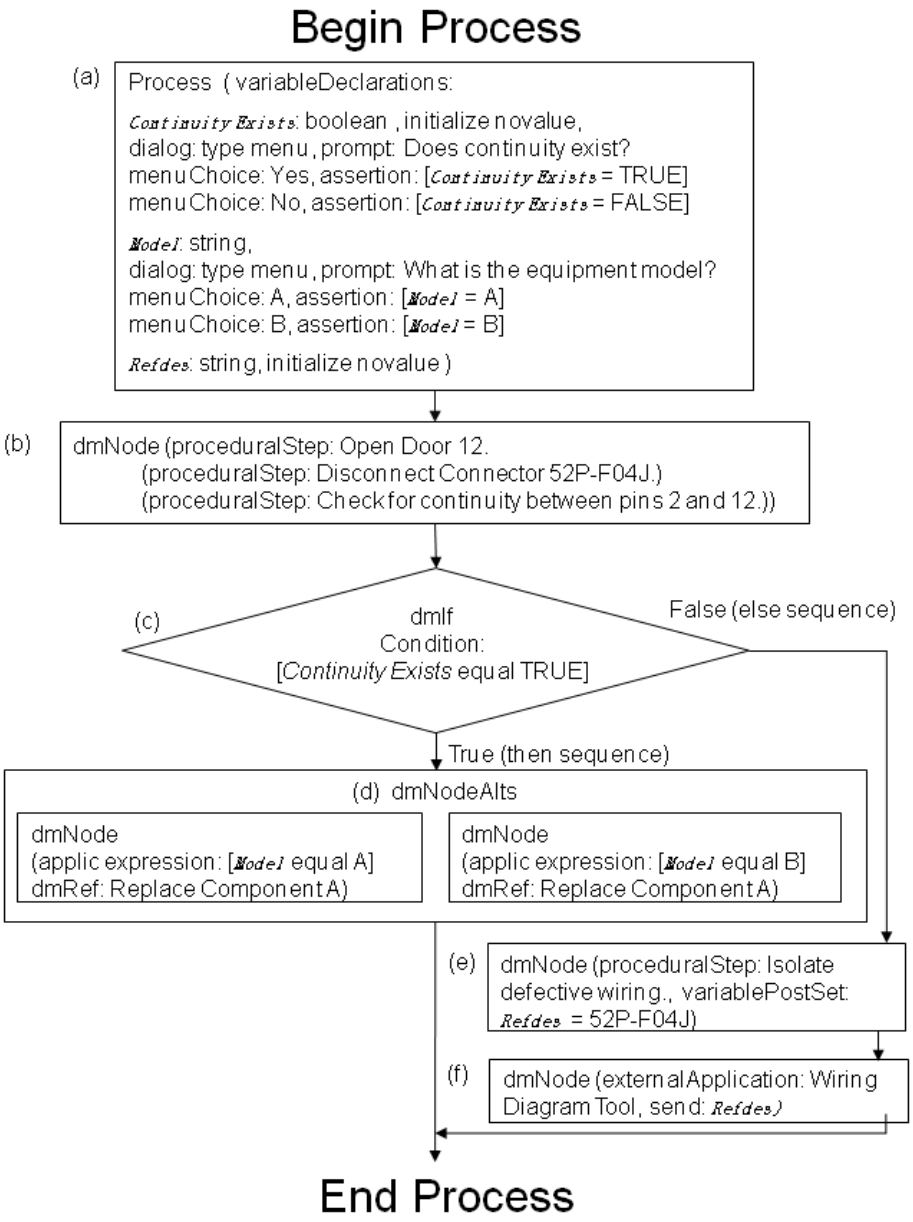
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Fig 1 Process diagram - Example sequencing data modules

In Fig 1 above, the logic engine would:

- Step a (refer to (a) on diagram):
  Set up the state table for variables declared in the process element. Declare variable *Engine installed on system* to be type Boolean and variable Engine temp to be type real. With no initialize attribute, both variables will have value "noValue". This example illustrates variables without associated dialogs.
- Step b:
  The first element in the process data module sequence is the element <dmNode> containing a reference to the data module entitled "Prep for engine adjustment". Before displaying this data module, its applicability must be processed. If indeed the data module is to be displayed, the logic engine will provide it for display and stop. The user will press "Next" to proceed.

- Step c:
  The next element <dmNode> contains an element <dialog>. This dialog was explicitly authored in this location to obtain a value for variable *Engine Installed on System* in order for the logic engine to process the following element <dmNodeAlts>. The user will select a menu choice. When the user hits OK on the dialog, the assertions associated with the element <menuChoice> selected will be made to the state table and the logic engine will move to the next element in the process.
- Step d:
  The next element is a <dmNodeAlts>. The element <dmNodeAlts> contains two elements <dmNode> containing element <dmRef>. Each element <dmNode> also contains an element <expression> to be evaluated about variable *Engine installed on system*. The logic engine will examine its state table to find a value for the variable and evaluate the first element <dmNode> (e) element <expression>.
- Step e:
  If this element <expression> evaluates to TRUE, the data module entitled "Start and run engine on system" will be displayed. Processing will stop until the user presses "Next". At that point, the logic engine will move past the element <dmNodeAlts> to the next element in the process. If the element <expression> does not evaluate to TRUE, the logic engine will evaluate the element <expression> on the next element <dmNode> in the element <dmNodeAlts> (f).
- Step f:
  If this element <expression> evaluates to TRUE, the data module entitled "Start and run engine in shop" will be seen. Processing will stop until the user presses "Next". If the element <expression> evaluates to FALSE, the logic engine will display nothing and move to the next element in the process.
- Step g:
  This element <dmNode> contains an element <dialog> explicitly authored at this place in order to populate the state table with a value for variable *Engine Temp*, which the logic engine will need to process the following loop. The user will provide a value for the variable which will be asserted to the state table.
- Step h:
  When "OK" is pressed, the logic engine will move to the element <dmLoop>. The loop condition [*Engine temp* greaterThan 500 degrees] will be evaluated using the *Engine temp* value just obtained from the preceding dialog.
- Step i:
  If the condition element <expression> evaluates to TRUE, the adjustment data module will be displayed. Processing will then stop until the user presses "Next". If the condition element <expression> evaluates to FALSE, the loop will not be traversed and the user will exit the process.
- Step j:
  When the user presses "Next", another *Engine temp* dialog will be displayed. The user's input will be recorded in the state table. At this point, the logic engine returns to step h and once again evaluates the loop condition. When the loop condition fails to be TRUE, the user will exit the element <dmLoop> and the process data module ends. The user will be informed that he has reached the end of task.



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Fig 2 Process diagram - Example dmNodeAlts, external application

The procedure in Fig 2 would be processed as follows:

- Step a:
  Set up the variables to be used in the process. Three variables are defined. The variable `Continuity Exists` is defined as Boolean and initialized to "`noValue`". A dialog is provided for this variable. The variable Model is defined as a string variable. It is not initialized which allows it to maintain the value currently in the state table. If there is none, it will be initialized to "`noValue`". A dialog is provided for variable Model. The variable `Refdes` is defined as a string variable. It is initialized to "`noValue`" to discard the current value if one exists. The value of `Refdes` is always provided by the author. No dialog is required.
- Step b:
  This is a Step hierarchy on the first element <`dmNode`>. The logic engine would resolve

applicability on the element <dmNode> and the step content. Then the step content would be displayed on one screen such that the step hierarchy is clear to the viewer. After viewing, the user will press "Next" to proceed.

- Step c:
  The logic engine will attempt to evaluate the element <expression> [Continuity Exists equal TRUE]. There is no value for variable Continuity Exists in the state table, so the logic engine will display its associated dialog in order to obtain a value from the user. If the element <expression> evaluates to TRUE, the logic engine will begin processing (d), the element <dmNodeAlts>. If the element <expression> evaluates to FALSE, the logic engine will process element <dmNode> (e).
- Step d:
  The two elements <dmNode> in the alternative group have mutually exclusive applicability. The logic engine will evaluate the applicability expression on the element <dmNodeAlts> members until one is found with a TRUE expression. If and when this occurs, the logic engine will provide the element <dmRef> from the element <dmNode> for display. After viewing, the user will press "Next" to continue. If no element <dmNode> in the element <dmNodeAlts> passes applicability processing, the logic engine will process the next element in the sequence, or, if there is none, end the Process.
- Step e:
  The element <proceduralStep> content will be displayed on the screen. The user will press "Next" to continue and the element <assertion> in the element <variablePostSet> will assign a value of “52P-J024” to variable *Refdes* in the state table.
- Step f:
  This element <externalApplication> calls a wiring diagram tool. The author passes the reference designator (*Refdes*) of the connector under consideration to the wiring tool. The wiring tool takes control at this point and does whatever it is designed to do. Meanwhile, the logic engine processes the next element in the sequence. The user can close the external application whenever he/she wishes and continue in the IETP.

End User View & State Table

State Table after variable declarations:
Model = B
Continuity Exists = novalue
Refdes = novalue

Screen 1 – Step content

Open door 12
Disconnect connector 52P-F04J.
Check for continuity between pins 2 and 12.

User presses Next

Screen 2 - Dialog

Does Continuity Exist?
☐ Yes
☐ No
OK Cancel

User answers Yes and presses OK

State Table after Dialog:
Model = B
Continuity Exists = TRUE
Refdes = novalue

Screen 3 – Referenced data scrolls as required in original window

DM Replace Component A
Model B
Materials Required: …
Person: …
1. Open door 13
2. Remove Component A
3. …

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Fig 3 End user view of Fig 2 process diagram

Chapter 3.9.5.2.10.5

Process data module - Example

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References

Table 1 References

Chap No./Document No.	Title
None	

1 General

The markup for a complete process data module plus screens depicting what the end user would see when progressing through the process is shown.

2 Example process data module

The example markup below (refer to Table 2) and the example IETP dialog (refer to Fig 1 thru Fig 9) represent an entire process data module, which includes external application, dialog box, procedural steps, and alternative choice.

The first part is the data module identification and status section (element <identAndStatusSection>, lines 2-13 in the markup example below) containing the

data module code and various status type information. Most information is left out except for the applicability conditions within the data module (element <referencedApplicGroup>, lines 15-32). The information contained in the element <referencedApplicGroup> defines the applicability conditions used throughout the data module. The first applicability (lines 16-23) is when the user selects a correct answer, and the second applicability (lines 24-31) is when the user selects a wrong answer. The system filters the information when a reference from the alternative choice is requested.

The data module variables are declared in lines 33-40 and initialized to a value, as applicable.

The first node (screen of information) is in lines 42-49 and shown in Fig 1. The node begins a procedure to familiarize the user with the bike and provide a data module reference to the introduction.

The second node is in lines 50-83 and shown in Fig 2. The node is a dialog asking for information about the user. The dialog will verify (lines 60-62) the user's age is between 4 and 100. Fig 3 shows that when an invalid age is entered the error message (attribute errorMessage) is displayed. Additionally, the dialog determines if the user has ridden a bike previously (lines 64-74) through a menu selection. The information entered determines the nodes shown to the user (refer to Fig 4). Lines 76-81 contain a reminder to the user about the dialog requirements.

Lines 84-161 evaluate John Smith's bike riding experience with the element <dmIf>. If John has not ridden a bike before, he will need some training before operating the bike. Otherwise, he will proceed directly to operating procedures (lines 162-176 and shown in Fig 9).

Unfortunately, John is inexperienced and requires additional information and training about the bike. John is required to pass a test before he can continue to operate the bike. John will repeat (lines 87-159) the loop nodes until he passes the test (line 94). The system keeps track of the number of attempts John takes to pass the test. In the variable declarations, the counting variable *tourMistakes* is initialized to "0" (lines 88-93).

The next node (lines 96-104 and Fig 5) informs John that additional training is needed, since he is inexperienced. The following node (lines 105-107) is linked to a description data module to familiarize John with the bike. The node was personalized by using the variable name in the procedural step (line 99).

After completing the description data module, John is shown the next node (lines 108-113 and Fig 6) informing him that he will be tested on knowledge obtained. John can re-read the description data module by clicking the **BACK** button or clicking the **NEXT** button to take the test.

The test node (lines 114-142) is a menu dialog asking John which lever is the rear brake. If John selects the left brake lever (which is incorrect) the variable *tourCorrectAnswer* is asserted to FALSE and the variable *tourMistakes* is incremented (lines 120-127). If John selects the right brake lever (which is correct) the variable *tourCorrectAnswer* is asserted to TRUE and variable *tourFinished* is asserted to TRUE (lines 131-138).

After the test questions have been answered, the next node is determined by applicability of the test answer (lines 143-157). The first alternative node (lines 144-150) references the applicability "wrongAnswer" (located at lines 24-31) that evaluates the variable *tourCorrectAnswer* = FALSE. The second alternative node (lines 151-156) references the applicability "rightAnswer" (located at lines 16-23) that evaluates the variable *tourCorrectAnswer* = TRUE.

Since John selected the left brake lever (he did not read carefully) the first alternative node is shown (refer to Fig 7) and displays the number of mistakes made by John by using the element <variableRef> and the variable *tourMistakes* (line 148). Too bad for John, he now

must repeat the previous nodes to continue, since the criteria to remain in the loop is the variable *tourFinished* = FALSE (line 94). John will repeat the nodes in Fig 5 and Fig 6. This time John read carefully and passed the test (refer to Fig 8), and the asserted variable *tourFinished* is set to TRUE allowing him to exit the loop.

John has passed the test and is shown the last node (lines 162-176 and Fig 9), the procedure showing how to operate the bike.

Table 2 Process data module markup - Example

Line	Markup
1	<dmodule>
2	<identAndStatusSection>
3	<dmAddress>...</dmAddress>
4	<dmStatus>
5	<security securityClassification="01"/>
6	<responsiblePartnerCompany>...</responsiblePartnerCompany>
7	<originator>...</originator>
8	<applicCrossRefTableRef>...</applicCrossRefTableRef>...
9	<applic>...</applic>
10	<brexDmRef>...</brexDmRef>
11	<qualityAssurance>...</qualityAssurance>
12	</dmStatus>
13	</identAndStatusSection>
14	<content>
15	<referencedApplicGroup>
16	<applic id="rightAnswer">
17	<displayText><simplePara>Inexperienced rider has the right answer.</simplePara></displayText>
18	<expression>
19	<expression><variableRef variableName="tourCorrectAnswer"/> </expression>
20	<booleanOperator booleanOperation="equal"/>
21	<expression><booleanValue><trueValue/></booleanValue> </expression>
22	</expression>
23	</applic>
24	<applic id="wrongAnswer">
25	<displayText><simplePara>Inexperienced rider has the wrong answer.</simplePara></displayText>
26	<expression>
27	<expression><variableRef variableName="tourCorrectAnswer"/> </expression>
28	<booleanOperator booleanOperation="equal"/>

Line	Markup
29	<expression><booleanValue><falseValue/></booleanValue> </expression>
30	</expression>
31	</applic>
32	</referencedApplicGroup> <process>
33	<variableDeclarations>
34	<variable valueType="string" variableName="name"/>
35	<variable valueType="integer" variableName="age"/>
36	<variable valueType="string" variableName="level"> <initialize><expression><stringValue>amateur</stringValue> </expression></initialize></variable>
37	<variable valueType="boolean" variableName="tourCorrectAnswer"> <initialize> <expression><booleanValue><falseValue/></booleanValue> </expression></initialize></variable>
38	<variable valueType="boolean" variableName="tourFinished"> <initialize> <expression><booleanValue><falseValue/></booleanValue> </expression></initialize></variable>
39	<variable valueType="integer" variableName="tourMistakes"/>
40	</variableDeclarations>
41	<dmSeq>
42	<dmNode>
43	<proceduralStep>
44	<title>Prerequisities</title>
45	<para>Please make sure you are familiar with the functional description of a bicycle:
46	<dmRef><dmRefIdent> <dmCode assyCode="00" disassyCode="00" disassyCodeVariant="AA" infoCode="042" infoCodeVariant="A" itemLocationCode="A" modelIdentCode="S1000DBIKE" subSubSystemCode="0" subSystemCode="0" systemCode="D00" systemDiffCode="AAA"/></dmRefIdent></dmRef>
47	</para>
48	</proceduralStep>
49	</dmNode>
50	<dmNode>
51	<dialog>
52	<dialogGroup>
53	<userEntry>
54	<prompt><paraBasic>Enter your name</paraBasic></prompt>

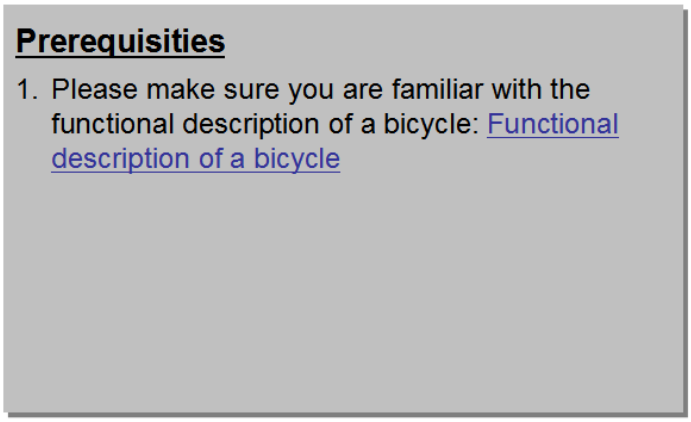
Line	Markup
55	<variableRef variableName="name"/>
56	</userEntry>
57	<userEntry dataEntryFieldLength="3">
58	<prompt><paraBasic>Enter your age</paraBasic></prompt>
59	<variableRef variableName="age"/>
60	<validate errorMessage="Age must be within 4 to 100">
61	<expression><expression> <expression><variableRef variableName="age"/></expression> <numberOperator numberOperation="greaterThanOrEqual"/> <expression><integerValue>4</integerValue></expression> </expression> <booleanOperator booleanOperation="and"/> <expression> <expression><variableRef variableName="age"/></expression> <numberOperator numberOperation="lessThanOrEqual"/> <expression><integerValue>100</integerValue></expression> </expression></expression>
62	</validate>
63	</userEntry>
64	<menu choiceSelection="single" choiceType="select">
65	<prompt><paraBasic>Did you ever ride a bicycle?</paraBasic> </prompt>
66	<menuChoice>
67	<prompt><paraBasic>Yes</paraBasic></prompt>
68	<assertion><variableRef variableName="level"/> <expression><stringValue>experienced</stringValue> </expression></assertion>
69	</menuChoice>
70	<menuChoice>
71	<prompt><paraBasic>No</paraBasic></prompt>
72	<noAssertions/>
73	</menuChoice>
74	</menu>
75	</dialogGroup>
76	<dialogGroup dialogSeparator="1">
77	<message>
78	<prompt><paraBasic>Age must be within 4 to 100</paraBasic> </prompt>
79	<prompt><paraBasic>All fields are mandatory</paraBasic></prompt>
80	</message>
81	</dialogGroup>
82	</dialog>

Line	Markup
83	</dmNode>
84	<dmIf>
85	<expression><booleanFunction booleanAction="not"/> <expression><expression> <variableRef variableName="level"/></expression> <numberOperator numberOperation="equal"/> <expression><stringValue>experienced</stringValue> </expression></expression></expression>
86	<dmThenSeq>
87	<dmLoop>
88	<variablePreSet>
89	<assertion>
90	<variableRef variableName="tourMistakes"/>
91	<expression><integerValue>0</integerValue></expression>
92	</assertion>
93	</variablePreSet>
94	<expression><expression> <variableRef variableName="tourFinished"/></expression> <numberOperator numberOperation="equal"/> <expression><booleanValue><falseValue/></booleanValue> </expression></expression>
95	<dmSeq>
96	<dmNode>
97	<proceduralStep>
98	<title>Introduction</title>
99	<para>Dear <variableRef variableName="name"/>, because you are an inexperienced user, you will be presented a brief introduction on how to operate a bicycle.</para>
100	</proceduralStep>
101	<proceduralStep>
102	<para>Click <emphasis>next</emphasis>.</para>
103	</proceduralStep>
104	</dmNode>
105	<dmNode>
106	<dmRef><dmRefIdent> <dmCode assyCode="00" disassyCode="00" disassyCodeVariant="AA" infoCode="043" infoCodeVariant="A" itemLocationCode="A" modelIdentCode="S1000DBIKE" subSubSystemCode="0" subSystemCode="0" systemCode="D00" systemDiffCode="AAA"/></dmRefIdent></dmRef>
107	</dmNode>
108	<dmNode>

Line	Markup
109	<proceduralStep>
110	<title>Did you really read the instructions?</title>
111	<para>Before you can proceed to the practical section of this manual, you will be given a simple question to test whether you read the instructions carefully.</para>
112	</proceduralStep>
113	</dmNode>
114	<dmNode>
115	<dialog>
116	<menu choiceSelection="single" choiceType="select">
117	<prompt><paraBasic>The rear brake is operated by</paraBasic></prompt>
118	<menuChoice>
119	<prompt><paraBasic>Left brake lever</paraBasic></prompt>
120	<assertion>
121	<variableRef variableName="tourCorrectAnswer"/>
122	<expression><booleanValue><falseValue/></booleanValue> </expression>
123	</assertion>
124	<assertion>
125	<variableRef variableName="tourMistakes"/>
126	<expression><expression> <variableRef variableName="tourMistakes"/></expression> <numberOperator numberOperation="plus"/> <expression><integerValue>1</integerValue></expression> </expression>
127	</assertion>
128	</menuChoice>
129	<menuChoice>
130	<prompt><paraBasic>Right brake lever</paraBasic></prompt>
131	<assertion>
132	<variableRef variableName="tourCorrectAnswer"/>
133	<expression><booleanValue><trueValue/></booleanValue> </expression>
134	</assertion>
135	<assertion>
136	<variableRef variableName="tourFinished"/>
137	<expression><booleanValue><trueValue/></booleanValue> </expression>
138	</assertion>
139	</menuChoice>

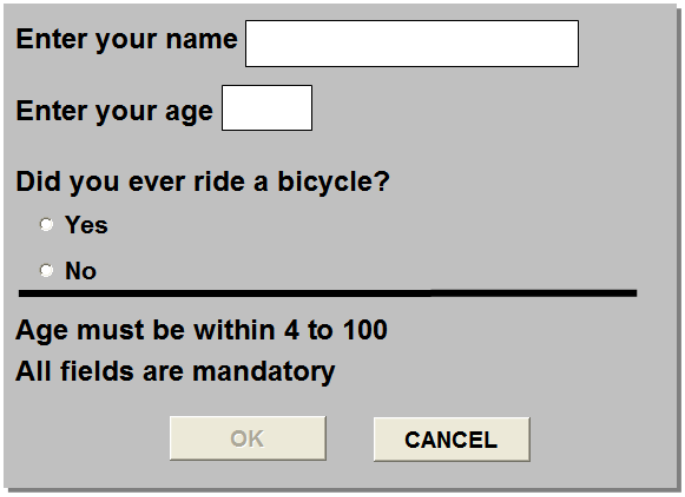
Line	Markup
140	</menu>
141	</dialog>
142	</dmNode>
143	<dmNodeAlts>
144	<dmNode applicRefId="wrongAnswer">
145	<proceduralStep>
146	<title>Wrong answer!</title>
147	<para>You will be given the introduction once again.</para>
148	<para>Number of mistakes: <variableRef variableName="tourMistakes"/></para>
149	</proceduralStep>
150	</dmNode>
151	<dmNode applicRefId="rightAnswer">
152	<proceduralStep>
153	<title>Correct!</title>
154	<para>You can now continue with the practical part of this manual.</para>
155	</proceduralStep>
156	</dmNode>
157	</dmNodeAlts>
158	</dmSeq>
159	</dmLoop>
160	</dmThenSeq>
161	</dmIf>
162	<dmNode>
163	<title>Practical part</title>
164	<proceduralStep>
165	<para>Take the bicycle from the garage.</para>
166	</proceduralStep>
167	<proceduralStep>
168	<para>Clean the bicycle.</para>
169	</proceduralStep>
170	<proceduralStep>
171	<para>Sit on the bike.</para>
172	</proceduralStep>
173	<proceduralStep>
174	<para>...and RIDE!</para>
175	</proceduralStep>
176	</dmNode>

Line	Markup
177	</dmSeq>
178	</process>
179	</content>
180	</dmodule>



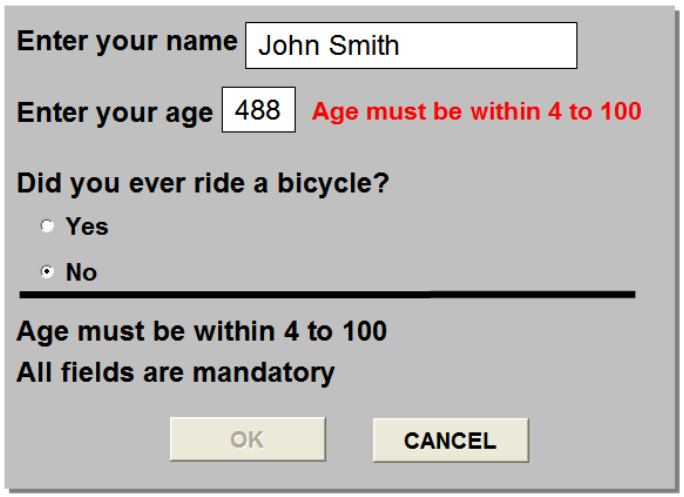
ICN-S1000D-A-030905-A-83007-00012-A-01-1

Fig 1 Process data module node 1 - Example



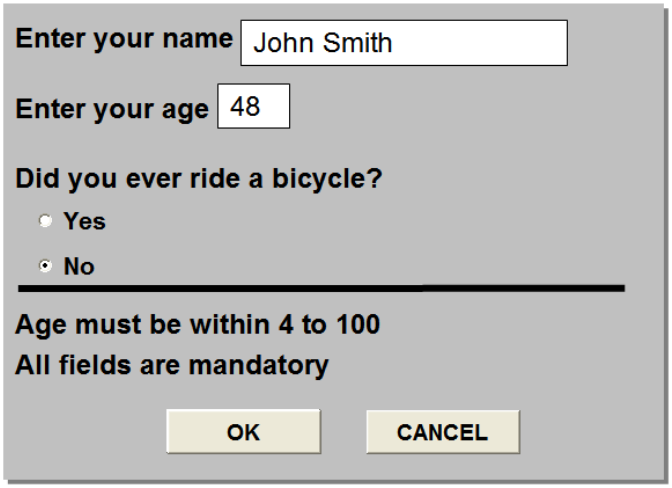
ICN-S1000D-A-030905-A-83007-00013-A-01-1

Fig 2 Process data module node 2 - Example



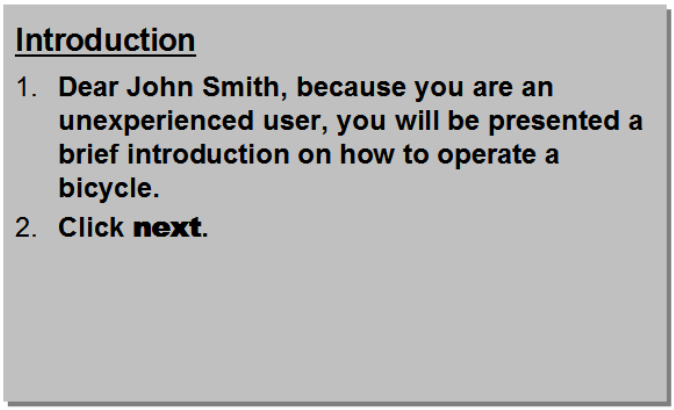
ICN-S1000D-A-030905-A-83007-00014-A-01-1

Fig 3 Process data module node 2 with invalid entry - Example



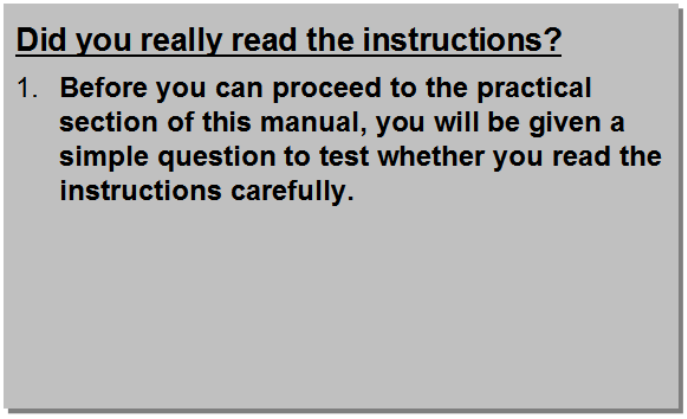
ICN-S1000D-A-030905-A-83007-00015-A-01-1

Fig 4 Process data module node 2 with valid entries - Example



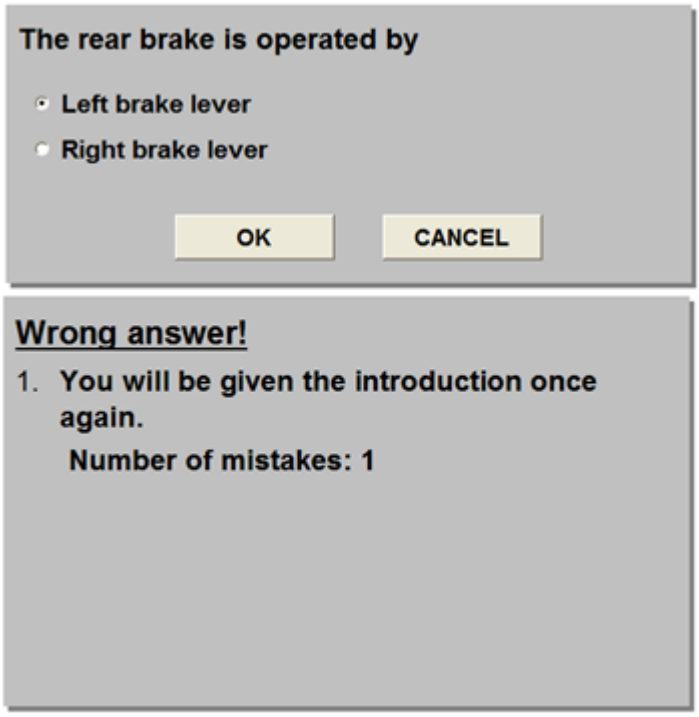
ICN-S1000D-A-030905-A-83007-00016-A-01-1

Fig 5 Process data module node 3 - Example



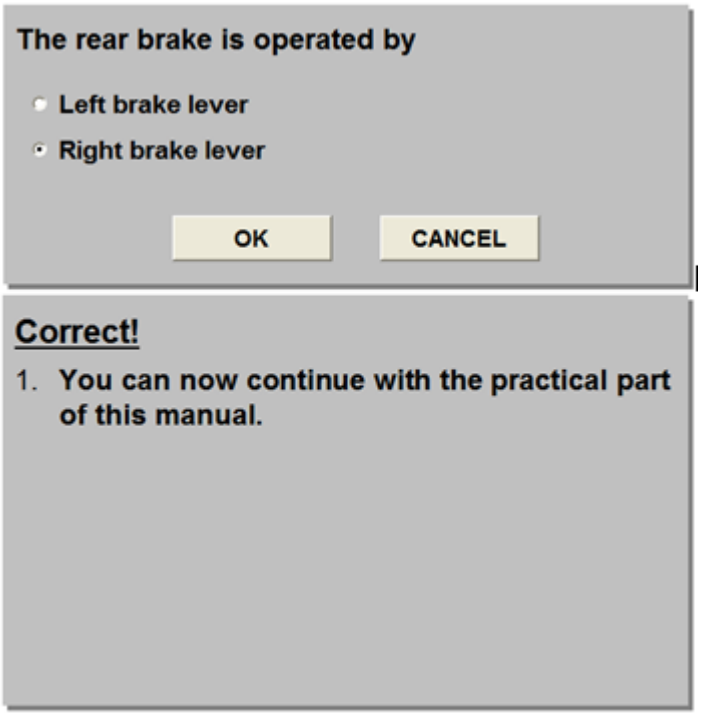
ICN-S1000D-A-030905-A-83007-00017-A-01-1

Fig 6 Process data module node 5 - Example



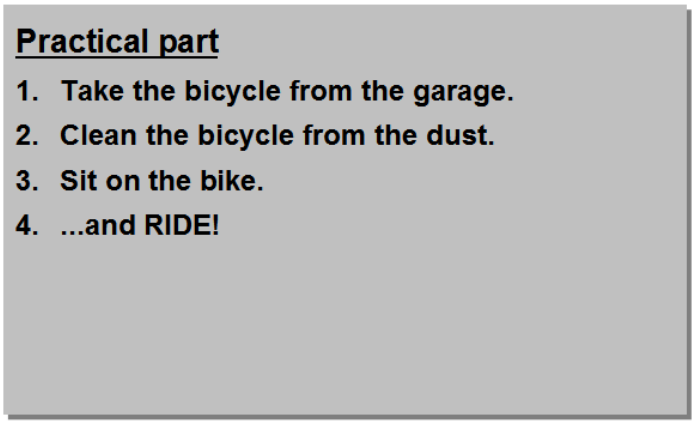
ICN-S1000D-A-030905-A-83007-00018-A-01-1

Fig 7 Process data module node 6 with wrong answer and node 7 - Example



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Fig 8 Process data module node 6 with right answer and node 7 - Example



ICN-S1000D-A-030905-A-83007-00020-A-01-1

Fig 9 Process data module node 8 - Example

Chapter 3.9.5.2.11

Content section - Common information repository

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Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.7	Common constructs - Figures, multimedia and foldouts
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Chap 3.9.5.2.11.3	Common information repository - Parts
Chap 3.9.5.2.11.4	Common information repository - Zones
Chap 3.9.5.2.11.5	Common information repository - Access points
Chap 3.9.5.2.11.6	Common information repository - Enterprise information
Chap 3.9.5.2.11.7	Common information repository - Supplies

Chap No./Document No.	Title
Chap 3.9.5.2.11.8	Common information repository - Supplies, requirements
Chap 3.9.5.2.11.9	Common information repository - Tools
Chap 3.9.5.2.11.10	Common information repository - Functional and/or physical areas
Chap 3.9.5.2.11.11	Common information repository - Controls and indicators
Chap 3.9.5.2.11.12	Common information repository - Applicability annotations
Chap 3.9.5.2.11.13	Common information repository - Warnings
Chap 3.9.5.2.11.14	Common information repository - Cautions
Chap 3.9.5.3	Data modules - Applicability
Chap 4.13.1	Optimizing and reuse - Common information repository concept
Chap 4.13.3	Optimizing and reuse - Alternates concept
Chap 7.3.3	CSDB objects - Multimedia

1 General

The content section of a Common Information Repository (CIR) data module must be structured in accordance with one of the following information types:

- Functional items. Refer to Chap 3.9.5.2.11.1.
- Circuit breakers. Refer to Chap 3.9.5.2.11.2.
- Parts. Refer to Chap 3.9.5.2.11.3.
- Zones. Refer to Chap 3.9.5.2.11.4.
- Access points. Refer to Chap 3.9.5.2.11.5.
- Enterprise information. Refer to Chap 3.9.5.2.11.6.
- Supplies. Refer to Chap 3.9.5.2.11.7.
- Supplies, requirements. Refer to Chap 3.9.5.2.11.8.
- Support equipment. Refer to Chap 3.9.5.2.11.9.
- Functional and/or physical areas. Refer to Chap 3.9.5.2.11.10.
- Controls and indicators. Refer to Chap 3.9.5.2.11.11.
- Applicability annotations. Refer to Chap 3.9.5.2.11.12.
- Warnings. Refer to Chap 3.9.5.2.11.13.
- Cautions. Refer to Chap 3.9.5.2.11.14.

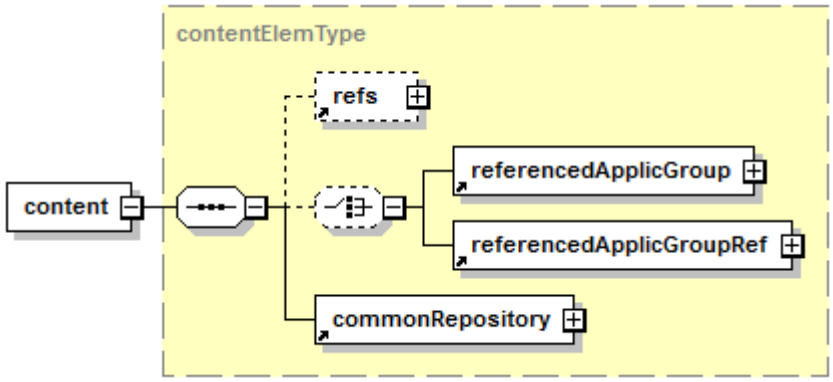
The general mechanism of CIR data modules is described in Chap 4.13.1.

2 CIR data module content

2.1 Content

Description: The element <content> contains the content section of the CIR data module.

Markup element: <content>



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Fig 1 Element <content>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

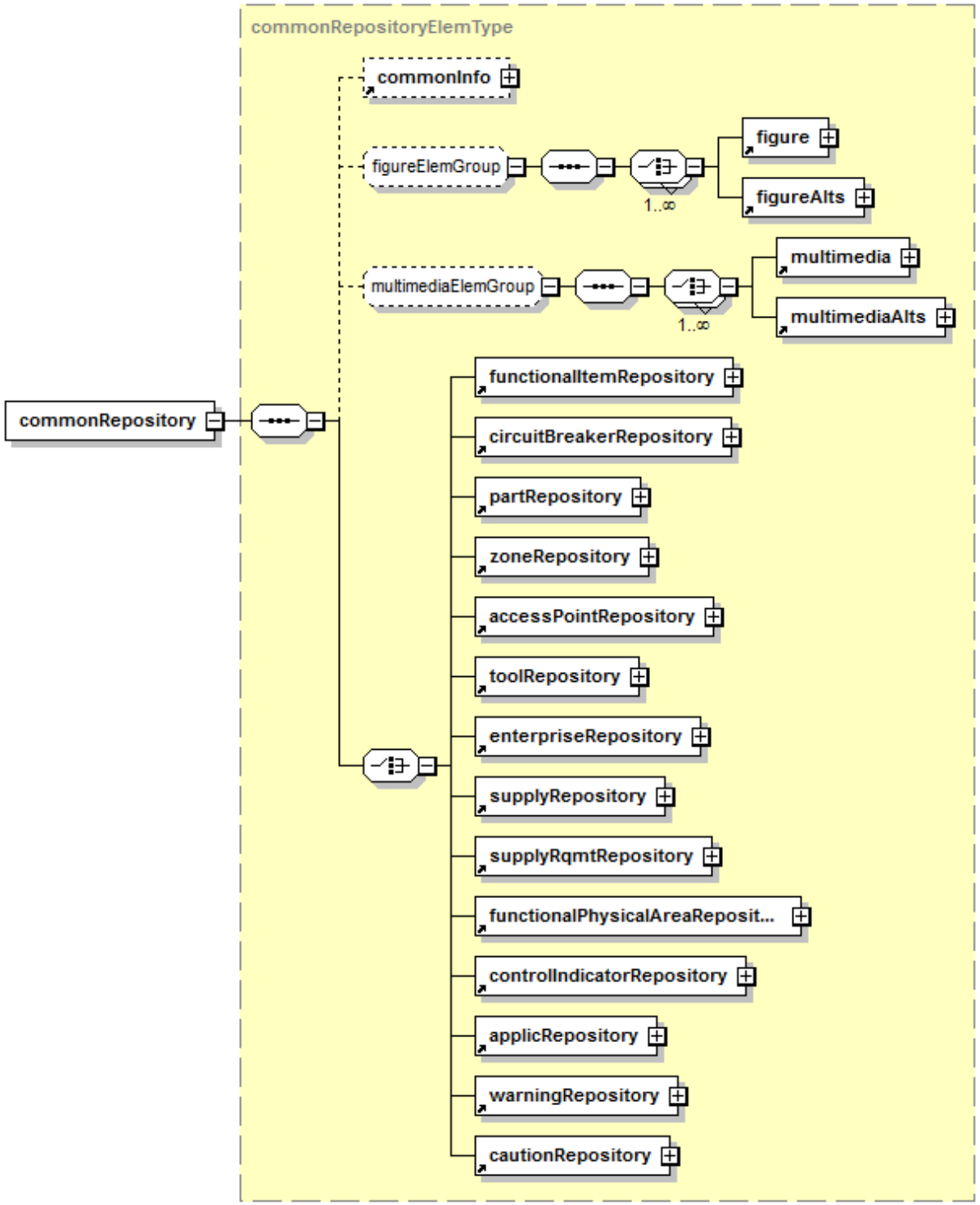
Child elements:

- <refs>, the references to data modules, publication modules and non-S1000D publications or documents given in the data module. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>, the applicability annotations directly collected in the data module. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>, the applicability annotations collected in the data module using the applicability annotations CIR. Refer to Chap 3.9.5.3.
- <commonRepository>. Refer to Para 2.1.1.

2.1.1 Common information repository

Description: The element <commonRepository> contains one type of CIR data module from the list of CIR data module types. For each CIR type, it is possible to add an introductory text (element <commonInfo>) and to store illustrations (element <figure> and/or <figureAlts>) or multimedia objects (elements <multimedia> and/or <multimediaAlts>) associated to the CIR entries.

Markup element: <commonRepository>



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Fig 2 Element <`commonRepository`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`commonInfo`>, introductory information. Refer to Chap 3.9.5.2.1.12.
- <`figure`>, illustrations associated to common information. Refer to Chap 3.9.5.2.1.7.
- <`figureAlts`>, groups of alternate illustrations associated to common information. Refer to Chap 4.13.3 for details on the alternates concept.
- <`multimedia`>, multimedia objects associated to common information. Refer to Chap 7.3.3.
- <`multimediaAlts`>, groups of alternate multimedia objects associated to common information. Refer to Chap 4.13.3 for details on the alternates concept.

One and only one of the following elements has to be used, depending on the information type:

- <`functionalItemRepository`>, for functional items. Refer to Chap 3.9.5.2.11.1.
- <`circuitBreakerRepository`>, for circuit breakers. Refer to Chap 3.9.5.2.11.2.
- <`partRepository`>, for parts. Refer to Chap 3.9.5.2.11.3.
- <`zoneRepository`>, for zones. Refer to Chap 3.9.5.2.11.4.
- <`accessPointRepository`>, for access points. Refer to Chap 3.9.5.2.11.5.
- <`toolRepository`>, for support equipment. Refer to Chap 3.9.5.2.11.9.
- <`enterpriseRepository`>, for enterprise information. Refer to Chap 3.9.5.2.11.6.
- <`supplyRepository`>, for supplies (intrinsic properties). Refer to Chap 3.9.5.2.11.7.
- <`supplyRqmtRepository`>, for supplies (requirements). Refer to Chap 3.9.5.2.11.8.
- <`functionalPhysicalAreaRepository`>, for functional and/or physical areas. Refer to Chap 3.9.5.2.11.10.
- <`controlIndicatorRepository`>, for control and indicators. Refer to Chap 3.9.5.2.11.11.
- <`applicRepository`>, for applicability annotations. Refer to Chap 3.9.5.2.11.12.
- <`warningRepository`>, for warnings. Refer to Chap 3.9.5.2.11.13.
- <`cautionRepository`>, for cautions. Refer to Chap 3.9.5.2.11.14.

3 Example

```
<content>
<commonRepository>
<commonInfo>
<commonInfoDescrPara>
<title>Introduction</title>
<para>The following table(s) and illustration(s) provide the
description and use of the functional items pertaining to the
mountain bicycles.</para>
</commonInfoDescrPara>
</commonInfo>
<functionalItemRepository>...</functionalItemRepository>
</commonRepository>
</content>
```

Chapter 3.9.5.2.11.1

Common information repository - Functional items

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Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.2.11.10	Common information repository - Functional and/or physical areas
Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.6.1	Attributes - Project configurable values

Chap No./Document No.	Title
Chap 4.13.1	Optimizing and reuse - Common information repository concept
Chap 4.13.3	Optimizing and reuse - Alternates concept

1 General

The functional items Common Information Repository (CIR) data module is used to store information about functional items within the Product. Refer to Chap 3.9.5.1.

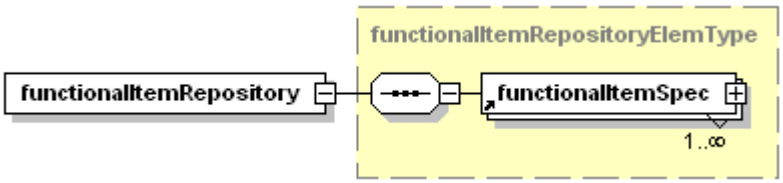
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Functional items CIR data module content

2.1 Functional item repository

Description: The element <functionalItemRepository> provides a list of functional items and their associated properties.

Markup element: <functionalItemRepository>



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Fig 1 Element <functionalItemRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <functionalItemSpec>. Refer to Para 2.1.1.

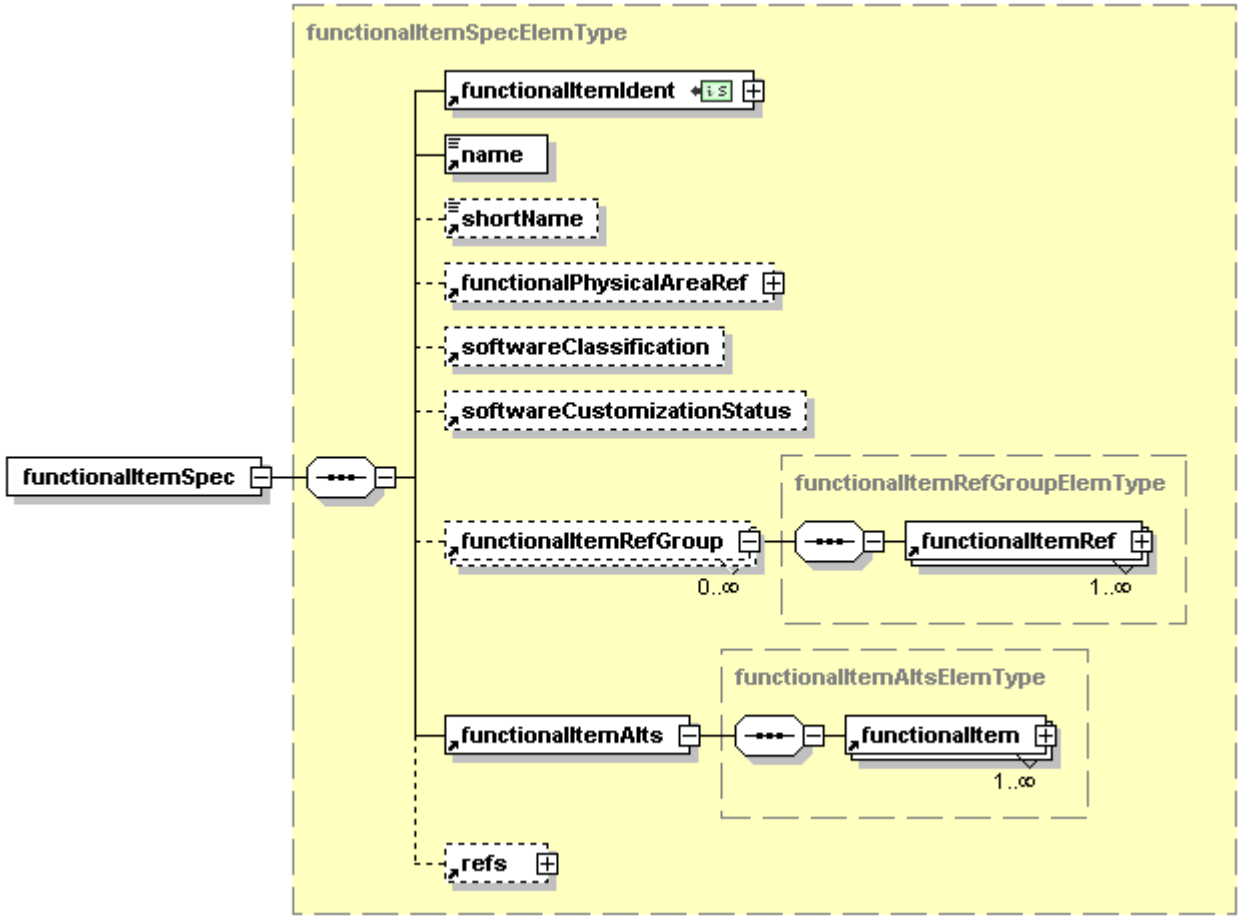
2.1.1 Functional item specification

Description: The element <functionalItemSpec> contains the associated properties of one functional item.

Some properties of the functional item can vary from one product instance to another. Such properties are managed under the functional item alternates (element <functionalItemAlts>), which can contain a reference to an applicability annotation. Refer to Chap 4.13.3 for details on the alternates concept.

For some properties appearing at both levels (eg, <name> or <shortName>), the following rule must be applied: if the property is fulfilled in the alternate element, it supersedes the generic value stored in the parent element.

Markup element: <functionalItemSpec>



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Fig 2 Element <functionalItemSpec>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <functionalItemIdent>. Refer to Para 2.1.1.1.
- <name>, the name of the functional item. Refer to Chap 3.9.5.2.1.10.
- <shortName>, abbreviated alternate name. Refer to Chap 3.9.5.2.1.10.

- <functionalPhysicalAreaRef>, a reference to a functional and/or physical area of the Product. Refer to Chap 3.9.5.2.11.10.
- <softwareClassification>. Refer to Para 2.1.1.2.
- <softwareCustomizationStatus>. Refer to Para 2.1.1.3.
- <functionalItemRefGroup>. Refer to Para 2.1.1.4.
- <functionalItemAlts>. Refer to Para 2.1.1.5.
- <refs>. References must be populated in accordance with Chap 3.9.5.2.1.2.

2.1.1.1 Functional item identifier

Description: The element <functionalItemIdent>, contrary to the attribute id, semantically identifies the functional item as a result of its attributes.

A functional item can be used to uniquely identify an item performing a function in a given system at a given position for a given Product.

For example a functional item can be the third pump in a hydraulic system for a given Product. Depending on the Product instance, this functional item can be mechanical or electrical and, so, can perform the function of a hydraulic pump.

The functional item is also known as the reference designator.

The codification of functional item identifier is up to the project or the organization.

Markup element: <functionalItemIdent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- functionalItemNumber (M), the functional item number as assigned by the functional item designer. Refer to Chap 3.9.5.1.
- functionalItemType (M), the functional item type. Projects or organizations are allowed to define their own functional item types. The attribute can have one of the following values:
  - "fit01" thru "fit99". Refer to Chap 3.9.6.1.
- installationIdent (O), the installation identifier
- contextIdent (O), the context identification which is used in combination with the attribute manufacturerCodeValue to ensure the uniqueness of supplier equipment data. The context identification contains an identifier, for example the part number of the next higher assembly that has been given to the assembly by the supplier.
- manufacturerCodeValue (O), the CAGE code of the functional item designer. As there is no standardized rule to assign a part number, the CAGE code of the functional item designer ensures the uniqueness of the functional item number.
- itemOriginator (O), used to indicate the origin of the equipment, for example if it is an aircraft manufacturer equipment or a supplier equipment. The attribute can have one of the following values:
  - "orig01" thru "orig99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<functionalItemIdent functionalItemNumber="8-DG-1"
functionalItemType="fit01" manufacturerCodeValue="FAPE3"/>
```

2.1.1.2 Software classification

Description: The element <softwareClassification> is used for software classification as defined by the regulation authorities.

Markup element: <softwareClassification>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- softwareClassificationValue (M), the classification of the software. Projects or organizations are allowed to define their own software classifications. The attribute can have one of the following values:
  - "scv01" thru "scv99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<softwareClassification softwareClassificationValue="scv05"/>
```

2.1.1.3 Software customization status

Description: The element <softwareCustomizationStatus> indicates if the software can be updated or customized by the operator.

Markup element: <softwareCustomizationStatus>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- softwareCustomizationStatusValue (M), the software customization status (eg, customization not allowed, customization allowed, customization mandatory). Projects or organizations are allowed to define their own software customization statuses. The attribute can have one of the following values:
  - "scs01" thru "scs99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

Markup example:

```
<softwareCustomizationStatus
softwareCustomizationStatusValue="scs01"/>
```

2.1.1.4 References to other functional items

Description: The element <functionalItemRefGroup> provides relationships and the types of relationships with other functional items (eg, sub-functional items or software functional items related to a hardware functional item).

Depending on the relationships, it can depend on the product instances or not. As a result, this element can be found at both container and alternate levels.

Markup element: <functionalItemRefGroup>. Refer to Fig 2.

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– functionalItemRefType (M), the type of the relationship between the two functional items. Projects or organizations are allowed to define their own functional item reference types. The attribute can have one of the following values:
  - "fir01" thru "fir99". Refer to Chap 3.9.6.1.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <functionalItemRef>, the references to the functional items. Refer to Chap 3.9.5.1.

Markup example:

```
<functionalItemRefGroup functionalItemRefType="fir03">
<functionalItemRef functionalItemNumber="1"/>
</functionalItemRefGroup>
```

2.1.1.5 Functional item alternate group

Description: The element <functionalItemAlts> is a group of functional item alternates.

Markup element: <functionalItemAlts>. Refer to Fig 2.

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

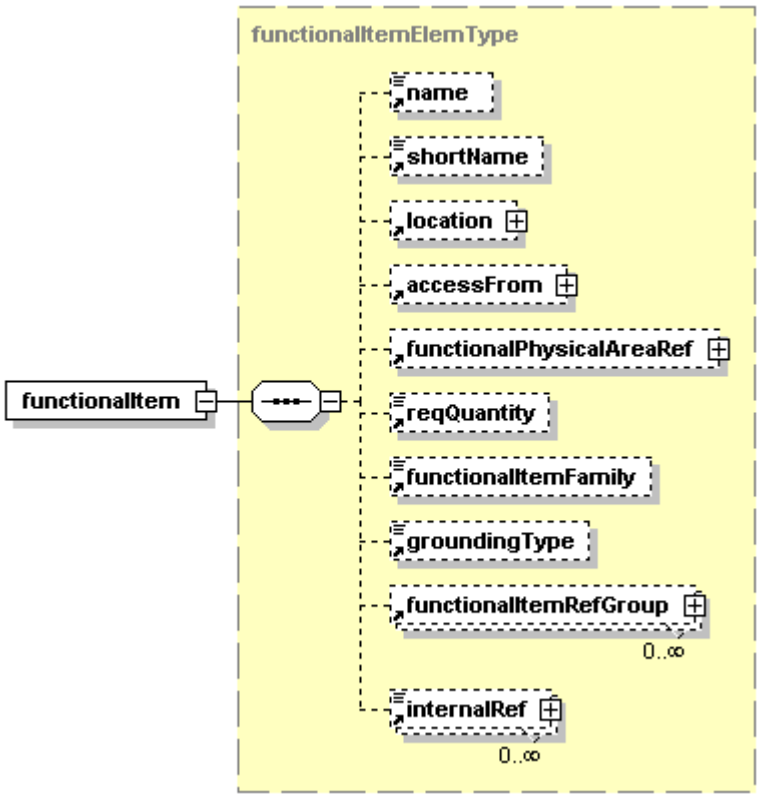
- <`functionalItem`>. Refer to Para 2.1.1.6.

2.1.1.6 Alternate functional item

Description: The element <`functionalItem`> contains information that describes the functional item and provides further information related to the functional item based on the Product configuration.

Configuration consistency between the various alternate functional items must be ensured. This means that, for a given Product configuration and under given operational conditions, only one alternate functional item is applicable at one time for a given functional item.

Markup element: <`functionalItem`>



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Fig 3 Element <`functionalItem`>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- altNumber (O), the alternate number to identify the alternate
- normativeComponentFlag (O), a flag to specify whether the functional item is a normative component or not. The attribute can have one of the following values:
  - "0" (D) - No, for non-normative component
  - "1" - Yes, for normative component
- sealedFlag (O), a flag to specify whether the functional item is protected with sealing material or not. The attribute can have one of the following values:
  - "0" (D) - No, for non-sealing protected functional item
  - "1" - Yes, for sealing protected functional item
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>, the name of the alternate functional item. Refer to Chap 3.9.5.2.1.10.
- <shortName>, abbreviated alternate name. Refer to Chap 3.9.5.2.1.10.
- <location>. Refer to Para 2.1.1.6.1.
- <accessFrom>. Refer to Para 2.1.1.6.2.
- <functionalPhysicalAreaRef>, a reference to a functional and/or physical area of the Product. Refer to Chap 3.9.5.2.11.10.
- <reqQuantity>, the required quantity. Refer to Chap 3.9.5.2.1.10.
- <functionalItemFamily>, the functional item family. Refer to Para 2.1.1.6.3.
- <groundingType>, the grounding type or bonding segregation. Refer to Para 2.1.1.6.4.
- <functionalItemRefGroup>. Refer to Para 2.1.1.4.
- <internalRef>, reference to the illustration and/or multimedia file where the functional item is illustrated. Refer to Chap 3.9.5.2.1.2.

Business rule decision point BRDP-S1-00251 - Use of the attribute altNumber in the functional items CIR:

- Decide whether to use the attribute altNumber, which values to use and allocate suitable definitions to the values.

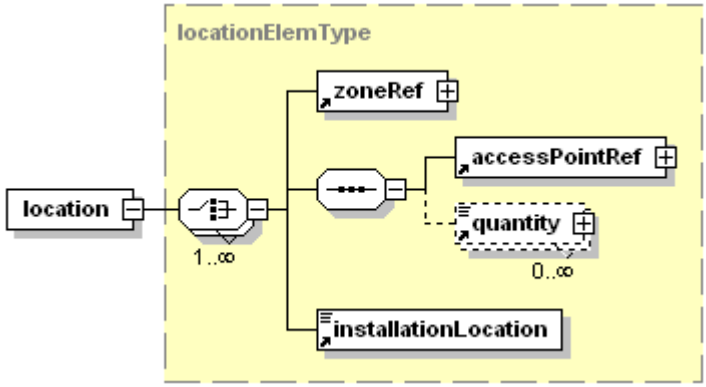
Markup example:

```
<functionalItem altNumber="00001" applicRefId="applic-001"
normativeComponentFlag="1">
<location><zoneRef zoneNumber="292"/></location>
</functionalItem>
```

2.1.1.6.1 Functional item location

Description: The element <location> specifies in which zone and/or on which electric panel, with coordinates if necessary, the functional item is located.

Markup element: <location>



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Fig 4 Element <location>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

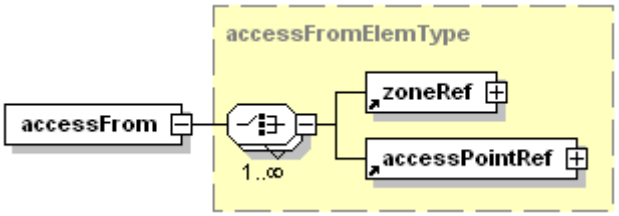
Child elements:

- <zoneRef>, the references to the zones. Refer to Chap 3.9.5.2.1.10.
- <accessPointRef>, the references to the access points. Refer to Chap 3.9.5.2.1.10.
- <quantity>, the coordinates on the access panel. Refer to Chap 3.9.5.2.1.10.
- <installationLocation>, the associated installation location information. Refer to Chap 3.9.5.2.1.9.

2.1.1.6.2 Accesses to the functional item

Description: The element <accessFrom> enables specifying the zone(s) and/or access point(s) from which the functional item can be reached.

Markup element: <accessFrom>



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Fig 5 Element <accessFrom>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <zoneRef>, the references to the zones. Refer to Chap 3.9.5.2.1.10.
- <accessPointRef>, the references to the access points. Refer to Chap 3.9.5.2.1.10.

2.1.1.6.3 Functional item family

Description: The element <functionalItemFamily> contains the family equipment the functional item belongs to, for example a technological category that characterizes it.

Markup element: <functionalItemFamily>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<functionalItemFamily>Connector</functionalItemFamily>
```

2.1.1.6.4 Grounding type

Description: The element <groundingType> is used for electrical functional items (grounding points). It indicates the grounding type or bonding segregation, which is necessary to perform the appropriate ground tests after installation. The grounding type is specified according to the current type, the voltage and the system essentiality (eg, current return for 230V DC power supply in non-essential system 2). The bonding segregation is specified according to signal type and system essentiality (eg, bonding point for wire linked to essential system 1).

Markup element: <groundingType>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<groundingType>DC1</groundingType>
```

3 Example

The following example illustrates a functional item which is configuration dependent. As the zone can differ from one Product range to another, two alternate functional items have been defined.

```
<commonRepository>
<functionalItemRepository>
<functionalItemSpec>
<functionalItemIdent functionalItemNumber="40-MJ-49"
functionalItemType="fit01"/>
<name>P/BSW-MANUA) INFLATION,(DOOR U3R</name>
<functionalPhysicalAreaRef systemCode="52" subSystemCode="7"
subSubSystemCode="1" assyCode="28"/>
<functionalItemAlts>
<functionalItem altNumber="00001" applicRefId="appl-001"
normativeComponentFlag="1">
<location><zoneRef zoneNumber="292"/></location>
</functionalItem>
<functionalItem altNumber="00002" applicRefId="appl-002">
<location><zoneRef zoneNumber="293"/></location>
</functionalItem>
</functionalItemAlts>
</functionalItemSpec>
</functionalItemRepository>
</commonRepository>
```

Chapter 3.9.5.2.11.2

Common information repository - Circuit breakers

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Chap 4.13.1	Optimizing and reuse - Common information repository concept
Chap 4.13.3	Optimizing and reuse - Alternates concept

1 General

The circuit breakers Common Information Repository (CIR) data module is used to store unique identification information about the circuit breakers and their electrical functions within the Product. Refer to Chap 3.9.5.2.1.10.

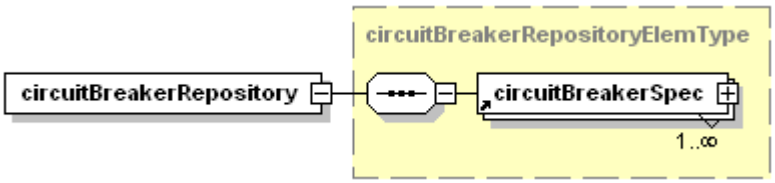
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Circuit breakers CIR data module content

2.1 Circuit breaker repository

Description: The element <circuitBreakerRepository> provides a list of circuit breakers and their associated properties.

Markup element: <circuitBreakerRepository>



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Fig 1 Element <circuitBreakerRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <circuitBreakerSpec>. Refer to Para 2.1.1.

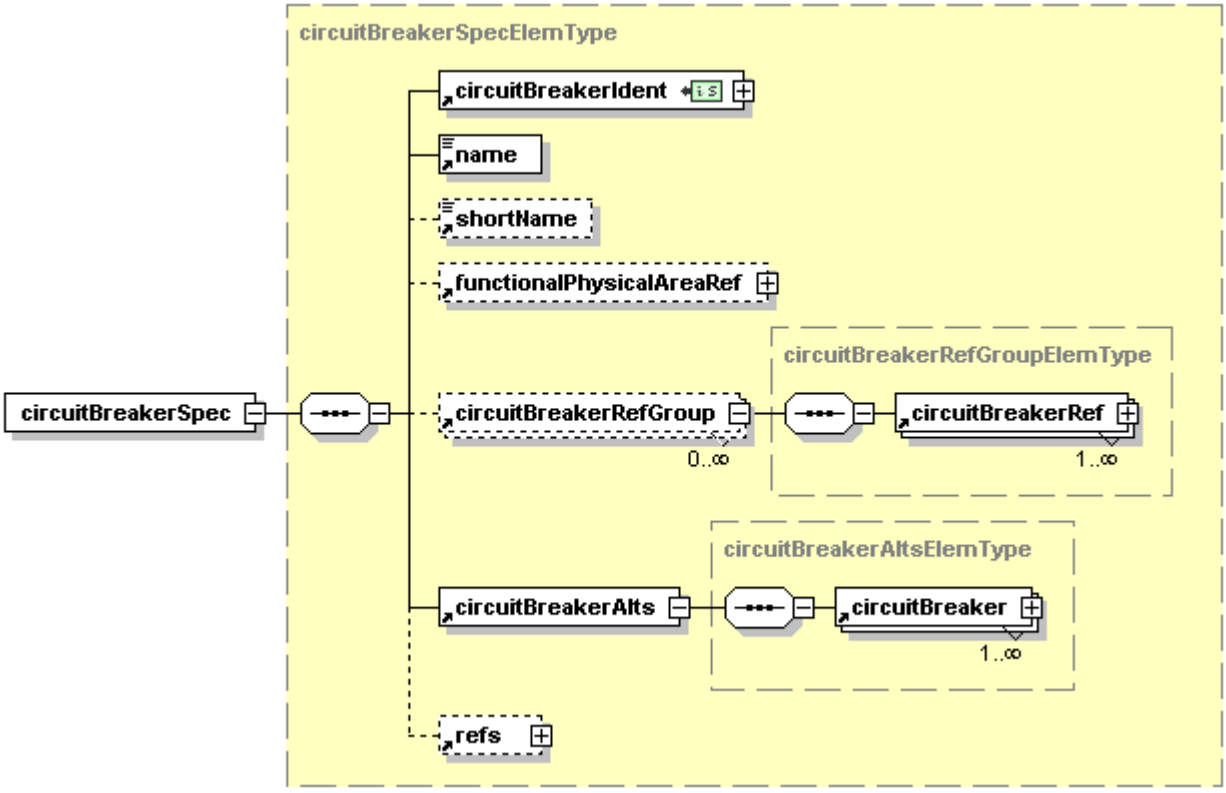
2.1.1 Circuit breaker specification

Description: The element <circuitBreakerSpec> contains the associated properties of one circuit breaker.

Some properties of the circuit breaker can vary from one product instance to another. Such properties are managed under the circuit breaker alternates (element <circuitBreakerAlts>), which can contain a reference to an applicability annotation. Refer to Chap 4.13.3 for details on the alternates concept.

For some properties appearing at both levels (eg, <name> or <shortName>), the following rule must be applied: if the property is fulfilled in the alternate element, it supersedes the generic value stored in the parent element.

Markup element: <circuitBreakerSpec>



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Fig 2 Element <circuitBreakerSpec>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <circuitBreakerIdent>. Refer to Para 2.1.1.1.
- <name>, the name of the circuit breaker. Refer to Chap 3.9.5.2.1.10.
- <shortName>, abbreviated alternate name. Refer to Chap 3.9.5.2.1.10.
- <functionalPhysicalAreaRef>, a reference to a functional and/or physical area of the Product. Refer to Chap 3.9.5.2.11.10.
- <circuitBreakerRefGroup>. Refer to Para 2.1.1.2.
- <circuitBreakerAlts>. Refer to Para 2.1.1.3.

- <refs>. References must be populated in accordance with Chap 3.9.5.2.1.2.

2.1.1.1 Circuit breaker identifier

Description: The element <circuitBreakerIdent> semantically identifies the circuit breaker as a result of the constraints on its attributes. Refer to Chap 3.9.5.

The circuit breaker can be used to uniquely identify a device that is used to break an electrical circuit or to render an electrical function inactive.

Markup element: <circuitBreakerIdent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- circuitBreakerNumber (M), the circuit breaker number as assigned by the circuit breaker designer. Refer to Chap 3.9.5.2.1.10.
- installationIdent (O), the installation identifier
- contextIdent (O), the context identification which is used in combination with the attribute manufacturerCodeValue to ensure the uniqueness of supplier circuit breaker data. The context identification contains an identifier, for example the part number of the next higher assembly that has been given to the assembly by the supplier.
- manufacturerCodeValue (O), the CAGE code of the circuit breaker designer. As there is no standardized rule to assign a part number, the CAGE code of the circuit breaker designer ensures the uniqueness of the circuit breaker number.
- itemOriginator (O), used to indicate the origin of the circuit breaker, for example if it is an aircraft manufacturer circuit breaker or a supplier circuit breaker. The attribute can have one of the following values:
  - "orig01" thru "orig99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<circuitBreakerIdent circuitBreakerNumber="9LW"/>
```

2.1.1.2 References to other circuit breakers

Description: The element <circuitBreakerRefGroup> provides relationships and the types of relationships with other circuit breakers. Refer to Fig 2.

Markup element: <circuitBreakerRefGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- circuitBreakerRefType (M), the type of the relationship with the circuit breaker. Projects or organizations are allowed to define their own circuit breaker reference types. The attribute can have one of the following values:
  - "cbr01" thru "cbr99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <circuitBreakerRef>, the references to the circuit breakers. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<circuitBreakerRefGroup circuitBreakerRefType="cbr01">
<circuitBreakerRef .../>
</circuitBreakerRefGroup>
```

2.1.1.3 Circuit breaker alternate group

Description: The element <circuitBreakerAlts> is a group of circuit breaker alternates. Refer to Fig 2.

Markup element: <circuitBreakerAlts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

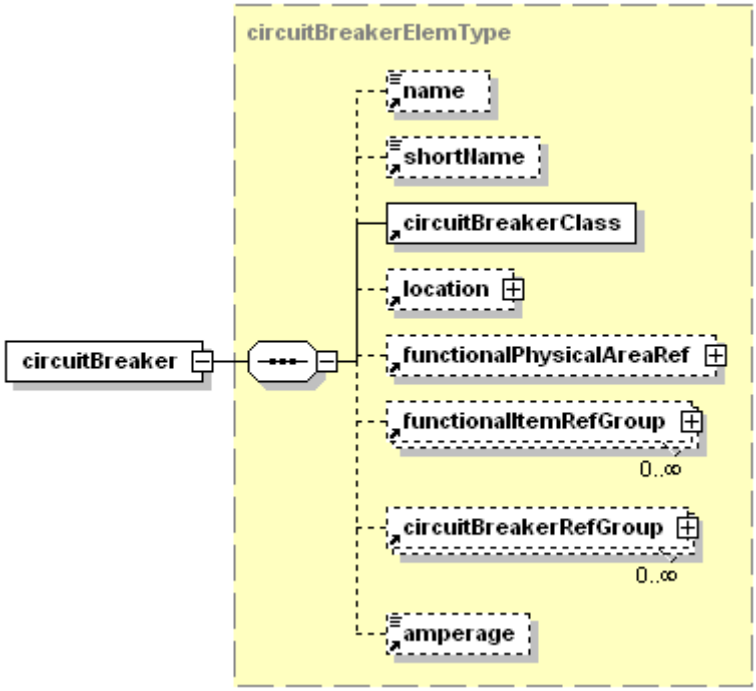
- <circuitBreaker>. Refer to Para 2.1.1.4.

2.1.1.4 Alternate circuit breaker

Description: The element <circuitBreaker> contains information that describes the circuit breaker and provides further information related to the circuit breaker based on the Product configuration.

Configuration consistency between the various alternate circuit breakers must be ensured. This means that for a given Product configuration and under given operational conditions, only one alternate circuit breaker is applicable at one time for a given circuit breaker.

Markup element: <circuitBreaker>



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Fig 3 Element <circuitBreaker>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `altNumber` (O), the alternate number to identify the alternate
- `monitoredFlag` (O), a flag to specify whether the circuit breaker is monitored or not. The attribute can have one of the following values:
  - "1" - Yes, for monitored circuit breakers
  - "0" - No, for non-monitored circuit breakers
- `collaredCircuitBreakerFlag` (O), a flag to specify whether the circuit breaker is fixed with a collar. The attribute can have one of the following values:
  - "1" - Yes, for collared circuit breakers
  - "0" - No, for non-collared circuit breakers
- `provisionedFlag` (O), a flag to specify whether the circuit breaker is a provisioned one. The attribute can have one of the following values:
  - "1" - Yes, for provisioned circuit breakers
  - "0" - No, for non-provisioned circuit breakers
- `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>, the name of the alternate circuit breaker. Refer to Chap 3.9.5.2.1.10.
- <shortName>, abbreviated alternate name. Refer to Chap 3.9.5.2.1.10.
- <circuitBreakerClass>. Refer to Para 2.1.1.4.1.
- <location>. Refer to Para 2.1.1.4.2.
- <functionalPhysicalAreaRef>, a reference to a functional and/or physical area of the Product. Refer to Chap 3.9.5.2.11.10.
- <functionalItemRefGroup>, references to associated functional items. Refer to Chap 3.9.5.2.11.1.
- <circuitBreakerRefGroup>. Refer to Para 2.1.1.2.
- <amperage>. Refer to Para 2.1.1.4.3.

Business rule decision point BRDP-S1-00252 - Use of the attribute altNumber in the circuit breakers CIR:

- Decide whether to use the attribute altNumber, which values to use and allocate suitable definitions to the values.

2.1.1.4.1 Circuit breaker class

Description: The element <circuitBreakerClass> indicates whether the circuit breaker is electronic or electro-mechanic.

Markup element: <circuitBreakerClass>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- circuitBreakerType (M), the circuit breaker type (eg, electronic, electro-mechanic). Projects or organizations are allowed to define their own circuit breaker types. The attribute can have one of the following values:
  - "cbt01" thru "cbt99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

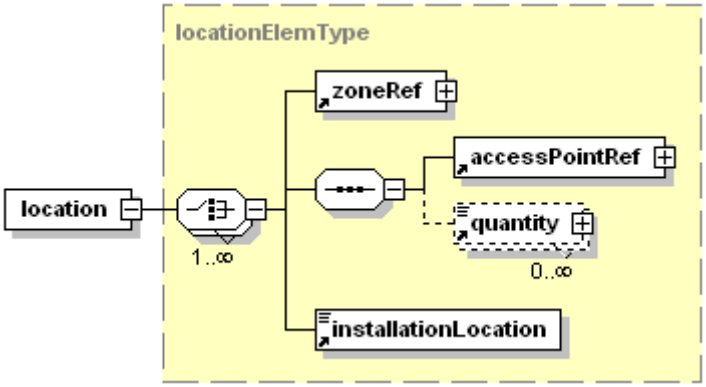
Child elements:

- None

2.1.1.4.2 Circuit breaker location

Description: The element <location> specifies in which zone and/or on which electric panel, with coordinates if necessary, the circuit breaker is located.

Markup element: <location>



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Fig 4 Element <location>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <zoneRef>, the references to the zones. Refer to Chap 3.9.5.2.1.10.
- <accessPointRef>, the references to the access points. Refer to Chap 3.9.5.2.1.10.
- <quantity>, the coordinates on the access panel. Refer to Chap 3.9.5.2.1.10.
- <installationLocation>, the associated installation location information. Refer to Chap 3.9.5.2.1.9.

2.1.1.4.3 Circuit breaker amperage

Description: The element <amperage> contains the amperage information of the circuit breaker.

Markup element: <amperage>

Attributes:

- unitOfMeasure (O), the unit of measure for the amperage

Child elements:

- None

Markup example:

```
<amperage unitOfMeasure="A">10</amperage>
```

3 Example

```
<content>
<referencedApplicGroup>
<applic id="appl-001">
```

```
<displayText><simplePara>SN: 1-5</simplePara></displayText>
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValues="1~5"/>
</applic>
<applic id="appl-002">
<displayText><simplePara>SN: 6-19</simplePara></displayText>
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValues="6~9"/>
</applic>
</referencedApplicGroup>
<commonRepository>
<circuitBreakerRepository>
<circuitBreakerSpec>
<circuitBreakerIdent
circuitBreakerNumber="CB9LW"></circuitBreakerIdent>
<name>FMC-C PWR SPLY</name>
<functionalPhysicalAreaRef systemCode="33" subSystemCode="2"
subSubSystemCode="0" assyCode="00"/>
<circuitBreakerAlts>
<circuitBreaker altNumber="0001" applicRefId="appl-001"
monitoredFlag="1" provisionedFlag="1">
<circuitBreakerClass circuitBreakerType="cbt01"/>
<location><zoneRef zoneNumber="121"/></location>
</circuitBreaker>
<circuitBreaker altNumber="0002" applicRefId="appl-002"
monitoredFlag="1" provisionedFlag="1">
<name>FMC-FAN PWR SPLY</name>
<circuitBreakerClass circuitBreakerType="cbt01"/>
<location><zoneRef zoneNumber="121"/></location>
</circuitBreaker>
</circuitBreakerAlts>
</circuitBreakerSpec>
</circuitBreakerRepository>
</commonRepository>
</content>
```

Chapter 3.9.5.2.11.3

Common information repository - Parts

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Chap 3.9.5.2.1.1	Common constructs - Change marking
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Chap 3.9.5.2.1.11	Common constructs - Controlled content
Chap 3.9.5.2.7	Content section - Parts information
Chap 4.13.1	Optimizing and reuse - Common information repository concept

1 General

The parts Common Information Repository (CIR) data module is used to capture and represent parts and their associated properties.

The part identification can be used to uniquely identify an item of the Product, forming part of an assembly or subassembly which is not normally broken down further.

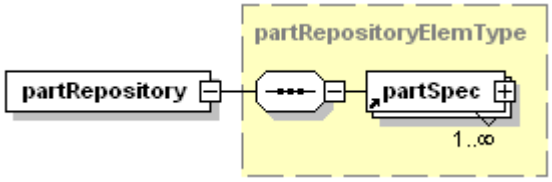
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Parts CIR data module content

2.1 Part repository

Description: The element <partRepository> provides a list of parts and their associated properties.

Markup element: <partRepository>



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Fig 1 Element <partRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

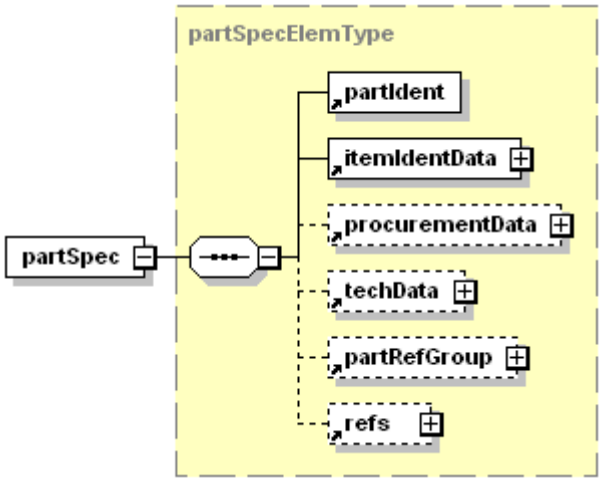
Child elements:

- <partSpec>. Refer to Para 2.1.1.

2.1.1 Part specification

Description: The element <partSpec> contains the associated properties of one part.

Markup element: <partSpec>



ICN-S1000D-A-03090502-A-FAPE3-00025-A-001-01

Fig 2 Element <partSpec>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`partIdent`>. Refer to Para 2.1.1.1.
- <`itemIdentData`>. Refer to Chap 3.9.5.2.7.
- <`procurementData`>. Refer to Chap 3.9.5.2.7.
- <`techData`>. Refer to Chap 3.9.5.2.7.
- <`partRefGroup`>. Refer to Chap 3.9.5.2.7.
- <`refs`>. Refer to Chap 3.9.5.2.1.2.

2.1.1.1 Part identifier

Description: The element <`partIdent`>, contrary to the attribute `id`, semantically identifies the part as a result of its attributes.

Markup element: <`partIdent`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `partNumberValue` (M), the part number together with the attribute `manufacturerCodeValue`, as the identifier of the part, in the part repository (implicit reference method). Refer to Chap 3.9.5.2.1.10.
- `manufacturerCodeValue` (M), the CAGE code of the part manufacturer. As there is no standardized rule to assign a part number, the CAGE code of the part manufacturer ensures the uniqueness of a part number. Refer to Chap 3.9.5.2.1.10.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

3 Example

```
<commonRepository>
<partRepository>
<partSpec>
<partIdent partNumberValue="0-0204504-1"
```

```
manufacturerCodeValue="F0286"/>
<itemIdentData>
<descrForPart>CONNECTOR</descrForPart>
<partKeyword>CONNECTR</partKeyword>
</itemIdentData>
<procurementData>
<enterpriseRef manufacturerCodeValue="F0286"
enterpriseType="supplier"/>
<enterpriseRef manufacturerCodeValue="F0286"
enterpriseType="optionalSupplier"/>
</procurementData>
<techData>
<sparePartClass sparePartClassCode="1"/>
<partUsage partUsageCode="pu30"/>
</techData>
<partRefGroup>
<optionalPart>
<partRef partNumberValue="M24308-2-288"
manufacturerCodeValue="81349"/>
</optionalPart>
<optionalPart>
<partRef partNumberValue="NSA938361-05"
manufacturerCodeValue="F5442"/>
</optionalPart>
</partRefGroup>
</partSpec>
<partSpec>
<partIdent partNumberValue="0008037-802"
manufacturerCodeValue="C2683"/>
<itemIdentData>
<descrForPart>PANEL-INSIDE CONTROL</descrForPart>
<partKeyword>PANEL</partKeyword>
</itemIdentData>
<procurementData>
<enterpriseRef manufacturerCodeValue="C2683"
enterpriseType="supplier"/>
<enterpriseRef manufacturerCodeValue="C2686"
enterpriseType="optionalSupplier"/>
</procurementData>
<techData>
<sparePartClass sparePartClassCode="2"/>
<partUsage partUsageCode="pu20"/>
</techData>
</partSpec>
</partRepository>
</commonRepository>
```

Chapter 3.9.5.2.11.4

Common information repository - Zones

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Chap 4.13.1	Optimizing and reuse - Common information repository concept

Chap No./Document No.	Title
Chap 4.13.3	Optimizing and reuse - Alternates concept

1 General

The zones Common Information Repository (CIR) data module is used to store information about zones within the Product. Refer to Chap 3.4.

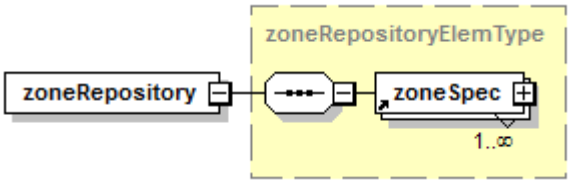
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Zones CIR data module content

2.1 Zone repository

Description: The element <zoneRepository> provides a list of zones and their associated properties.

Markup element: <zoneRepository>



ICN-S1000D-A-03090502-A-FAPE3-00027-A-001-01

Fig 1 Element <zoneRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <zoneSpec>. Refer to Para 2.1.1.

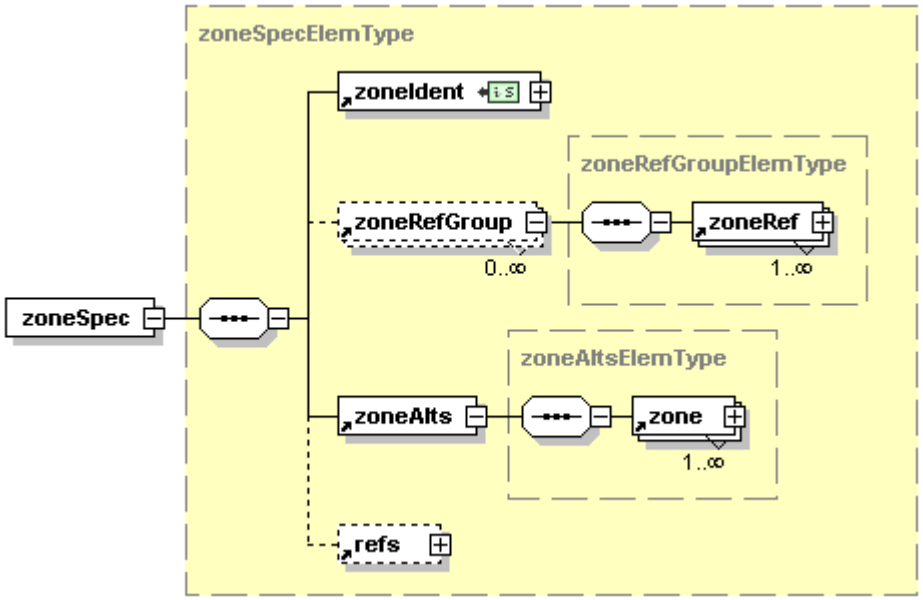
2.1.1 Zone specification

Description: The element <zoneSpec> contains the associated properties of one zone.

Some properties of the zone can vary from one product instance to another. Such properties are managed under the zone alternates (element <zoneAlts>), which can contain a reference to an applicability annotation. Refer to Chap 4.13.3 for details on the alternates concept.

For some properties appearing at both levels, the following rule must be applied: if the property is fulfilled in the alternate element, it supersedes the generic value stored in the parent element.

Markup element: <zoneSpec>



ICN-B6865-S1000D0007-001-01

Fig 2 Element <zoneSpec>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `zoneType` (O), the type of the zone. The attribute can have one of the following values:
  - "`majorzone`" - for a major structural area of the Product
  - "`subzone`" - for a subdivision of a major structural area of the Product
  - "`specifzone`" - for a specific zone of the Product
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`zoneIdent`>. Refer to Para 2.1.1.1.
- <`zoneRefGroup`>. Refer to Para 2.1.1.2.
- <`zoneAlts`>. Refer to Para 2.1.1.3.
- <`refs`>. References must be populated in accordance with Chap 3.9.5.2.1.2.

Markup example:

```
<zoneSpec>
<zoneIdent zoneNumber="..."/>
<zoneAlts>...</zoneAlts>
</zoneSpec>
```

2.1.1.1 Zone identifier

Description: The element <zoneIdent>, contrary to the attribute id, semantically identifies the zone as a result of its attributes.

Markup element: <zoneIdent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- zoneNumber (M), the zone number. Refer to Chap 3.4.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<zoneIdent zoneNumber="121"/>
```

2.1.1.2 References to other zones

Description: The element <zoneRefGroup> provides relationships and the types of relationships with other zones (eg, subzones). A proper use of this element enables the retrieval the zone breakdown (major zones that contain subzones that contain specific zones).

The types of relationships depend on the configuration of the Product. As a result, this element can be found at both the container and the alternate levels.

Markup element: <zoneRefGroup>. Refer to Fig 2.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- zoneRefType (M), the type of the relationship between the two child zones
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <zoneRef>, the references to the zones. The targets must be zone containers. Refer to Chap 3.9.5.2.1.10.

Business rule decision point BRDP-S1-00253 - Use of the attribute zoneRefType:

- Decide which values (eg, subzones) to use for the attribute zoneRefType and allocate suitable definitions to the values.

Markup example:

```
<zoneRefGroup zoneRefType="breakdown">
<zoneRef .../>
</zoneRefGroup>
```

2.1.1.3 Zone alternate group

Description: The element <zoneAlts> is a group of zone alternates.

Markup element: <zoneAlts>. Refer to Fig 2.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

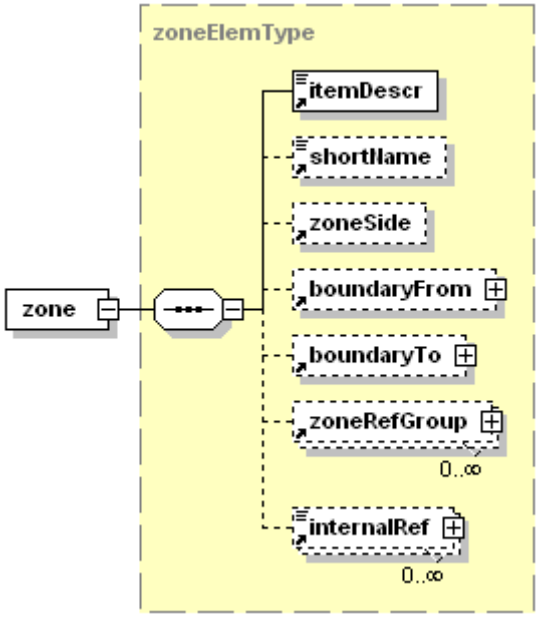
Child elements:

- <zone>. Refer to Para 2.1.1.4.

2.1.1.4 Alternate zone

Description: The element <zone> contains information that describes the zone and provides further information related to the zone based on the Product configuration.

Markup element: <zone>



ICN-S1000D-A-03090502-A-FAPE3-00032-A-001-01

Fig 3 Element <zone>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `altNumber` (O), the alternate number to identify the alternate
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`itemDescr`>. Refer to Para 2.1.1.4.1.
- <`shortName`>, abbreviated alternate name. Refer to Chap 3.9.5.2.1.10.
- <`zoneSide`>. Refer to Para 2.1.1.4.2.
- <`boundaryFrom`>. Refer to Para 2.1.1.4.3.
- <`boundaryTo`>. Refer to Para 2.1.1.4.3.
- <`zoneRefGroup`>. Refer to Para 2.1.1.2.
- <`internalRef`>, reference to the illustration and/or multimedia file where the zone is illustrated. Refer to Chap 3.9.5.2.1.2.

Business rule decision point BRDP-S1-00254 - Use of the attribute `altNumber` in the zones CIR:

- Decide whether to use the attribute `altNumber`, which values to use and allocate suitable definitions to the values.

Markup example:

```
<zone applicRefId="applic-001">
...
</zone>
```

2.1.1.4.1 Description

Description: The element <`itemDescr`> is used to contain the textual description of the parent element.

Markup element: <`itemDescr`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

Markup example:

```
<zone>
<itemDescr>LOWER THIRD OF FUSELAGE (BELOW CABIN FLOOR) INCLUDING
RADOME TO FORWARD FACE OF REAR PRESSURE BULKHEAD NOSE CONE
STA650 TO FR95</itemDescr>
...
</zone>
```

2.1.1.4.2 Zone side

Description: The element <zoneSide> indicates on which side of the Product the zone is located.

Markup element: <zoneSide>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– zoneSideValue (M), the side of the Product where the zone is located. The attribute can have one of the following values:

- "lh" - for a zone located on the left side of the Product
- "lr" - when the zone is not located on any side of the Product
- "rh" - for a zone located on the right side of the Product

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

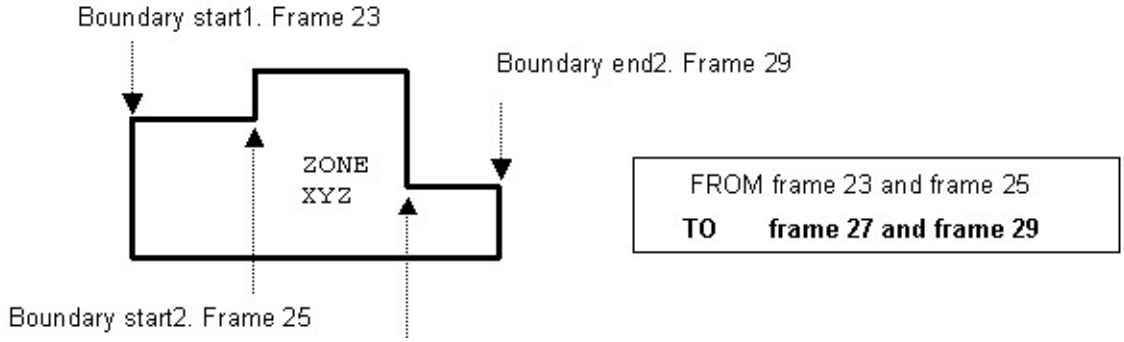
Markup example:

```
<zoneSide zoneSideValue="lh"/>
```

2.1.1.4.3 Zone boundaries

Description: The elements <boundaryFrom> and <boundaryTo> are used to define the boundaries of a zone, respectively the start and the end boundaries.

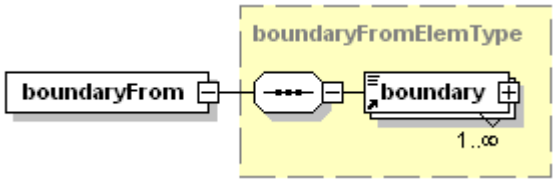
A zone can have several "from" boundaries and several "to" boundaries.



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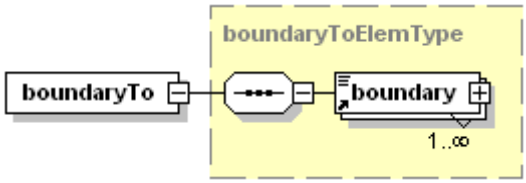
Fig 4 Zone boundaries

Markup elements: <boundaryFrom> and <boundaryTo>



ICN-S1000D-A-03090502-A-FAPE3-00035-A-001-01

Fig 5 Element <boundaryFrom>



ICN-S1000D-A-03090502-A-FAPE3-00036-A-001-01

Fig 6 Element <boundaryTo>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

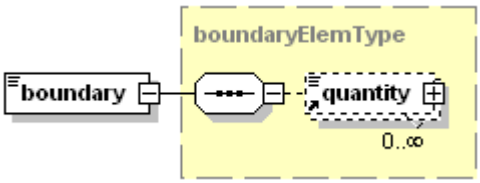
Child elements:

- <boundary>. Refer to Para 2.1.1.4.4.

2.1.1.4.4 Boundary

Description: The element <boundary> describes a boundary, which can be expressed textually or with specific measures (eg, rib or frame).

Markup element: <boundary>



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Fig 7 Element <boundary>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- textual characters. Refer to Chap 3.9.5.
- <`quantity`>, expression of the boundary in terms of stringers, ribs, frames or stations. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<boundary>Boundary start1. Frame 23</boundary>
```

3 Example

```
<content>
<referencedApplicGroup>
<applic id="appl-001">
<displayText><simplePara>Serial number (SN): 1-
999</simplePara></displayText>
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValues="1~999"/>
</applic>
</referencedApplicGroup>
<commonRepository>
<figure>
<title>Zoning - Figure 1</title>
<graphic
infoEntityIdent="ICN-AE-A-00000000-Z-SF518-00000-A-01-1"
id="fig-0001"/>
</figure>
<zoneRepository>
<zoneSpec zoneType="majorzone">
<zoneIdent zoneNumber="100"/>
<zoneRefGroup zoneRefType="contains"><zoneRef
zoneNumber="110"/></zoneRefGroup>
<zoneAlts>
<zone applicRefId="appl-001">
```

```
<itemDescr>LOWER THIRD OF FUSELAGE (BELOW CABIN FLOOR) INCLUDING
RADOME TO FORWARD FACE OF REAR PRESSURE BULKHEAD NOSE CONE
STA650 TO FR95</itemDescr>
<zoneSide zoneSideValue="lr"/>
<boundaryFrom><boundary><quantity><quantityGroup
quantityGroupType="nominal">
<quantityValue>0</quantityValue></quantityGroup></quantity>
<quantity><quantityGroup quantityGroupType="nominal">
<quantityValue>650</quantityValue></quantityGroup></quantity></b
oundary>
</boundaryFrom>
<boundaryTo><boundary><quantity><quantityGroup
quantityGroupType="nominal">
<quantityValue>95</quantityValue></quantityGroup></quantity>
<quantity><quantityGroup quantityGroupType="nominal">
<quantityValue>0</quantityValue></quantityGroup></quantity></bou
ndary>
</boundaryTo>
<internalRef internalRefId="fig-0001"
internalRefTargetType="irtt01"/>
</zone>
</zoneAlts>
</zoneSpec>
<zoneSpec zoneType="subzone">
<zoneIdent zoneNumber="110"/>
<zoneRefGroup zoneRefType="belongsto"><zoneRef
zoneNumber="100"/></zoneRefGroup>
<zoneAlts>
<zone applicRefId="appl-001">
<itemDescr>Lower Deck Forward Cargo Compartment Right zoneSide -
limitRangeFrom lower Side of Pax floor limitRangeTo upper
zoneSide of cargo floor</itemDescr>
<boundaryFrom><boundary><quantity><quantityGroup
quantityGroupType="nominal">
<quantityValue>0</quantityValue></quantityGroup></quantity><quan
tity><quantityGroup quantityGroupType="nominal">
<quantityValue>650</quantityValue></quantityGroup></quantity></b
oundary>
</boundaryFrom>
<boundaryTo><boundary><quantity><quantityGroup
quantityGroupType="nominal">
<quantityValue>0</quantityValue></quantityGroup></quantity>
<quantity><quantityGroup quantityGroupType="nominal">
<quantityValue>0</quantityValue></quantityGroup></quantity></bou
ndary>
</boundaryTo>
<internalRef internalRefId="fig-0001"
internalRefTargetType="irtt01"/></zone>
</zoneAlts>
</zoneSpec>
</zoneRepository>
```

```
</commonRepository>
</content>
```

Chapter 3.9.5.2.11.5

Common information repository - Access points

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Chap 3.6	Information generation - Security and data restrictions
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Chap 3.9.6.1	Attributes - Project configurable values
Chap 4.13.1	Optimizing and reuse - Common information repository concept
Chap 4.13.3	Optimizing and reuse - Alternates concept

1 General

The access points Common Information Repository (CIR) data module is used to store information about access points and their functions. Refer to Chap 3.4.

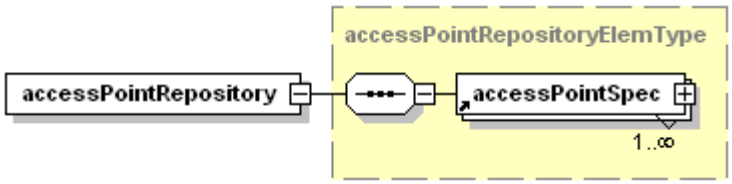
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Access points CIR data module content

2.1 Access point repository

Description: The element <accessPointRepository> provides a list of access points and their associated properties.

Markup element: <accessPointRepository>



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Fig 1 Element <accessPointRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <accessPointSpec>. Refer to Para 2.1.1.

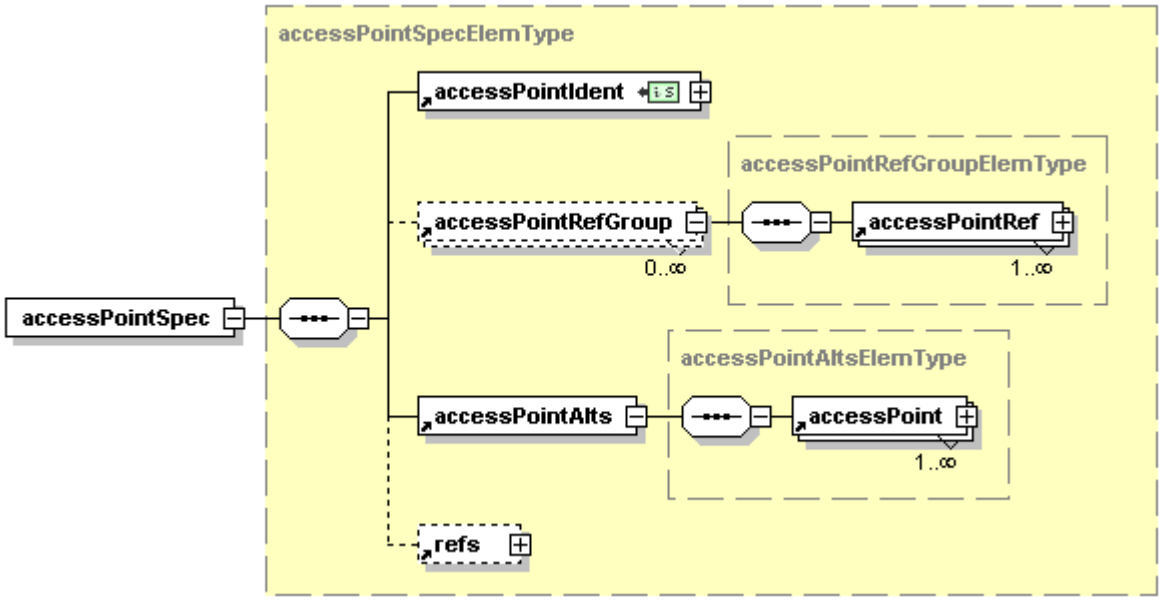
2.1.1 Access point specification

Description: The element <accessPointSpec> contains the associated properties for one access point.

Some properties of the access point can vary from one product instance to another. Such properties are managed under the access point alternates (element <accessPointAlts>), which can contain a reference to an applicability annotation. Refer to Chap 4.13.3 for details on the alternates concept.

For some properties appearing at both levels, the following rule must be applied: if the property is fulfilled in the alternate element, it supersedes the generic value stored in the parent element.

Markup element: <accessPointSpec>



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Fig 2 Element <accessPointSpec>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`accessPointIdent`>. Refer to Para 2.1.1.1.
- <`accessPointRefGroup`>. Refer to Para 2.1.1.2.
- <`accessPointAlts`>. Refer to Para 2.1.1.3.
- <`refs`>. References must be populated in accordance with Chap 3.9.5.2.1.2.

Markup example:

```
<accessPointSpec>
<accessPointIdent accessPointNumber="..."/>
<accessPointAlts>...</accessPointAlts>
</accessPointSpec>
```

2.1.1.1 Access point identifier

Description: The element <`accessPointIdent`>, contrary to the attribute `id`, semantically identifies the access point as a result of its attributes.

Markup element: <`accessPointIdent`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `accessPointNumber` (M). Refer to Chap 3.9.5.2.1.10.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<accessPointIdent accessPointNumber="121"/>
```

2.1.1.2 References to other access points

Description: The element <`accessPointRefGroup`> provides relationships and the types of relationships with other access points (eg, subaccess points).

The types of relationships depend on the configuration of the Product. As a result, this element can be found at both container and alternate levels.

Markup element: <`accessPointRefGroup`>. Refer to Fig 2.

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `accessPointRefType` (M), the type of the relationship between the two access points
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`accessPointRef`>, the references to the access points. Refer to Chap 3.9.5.2.1.10.

Business rule decision point BRDP-S1-00255 - Use of the attribute `accessPointRefType`:

- Decide which values (eg, subaccess points) to use for the attribute `accessPointRefType` and allocate suitable definitions to the values.

Markup example:

```
<accessPointRefGroup accessPointRefType="contains">
<accessPointRef .../>
</accessPointRefGroup>
```

2.1.1.3 Access point alternate group

Description: The element <accessPointAlts> is a group of access point alternates.

Markup element: <accessPointAlts>. Refer to Fig 2.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

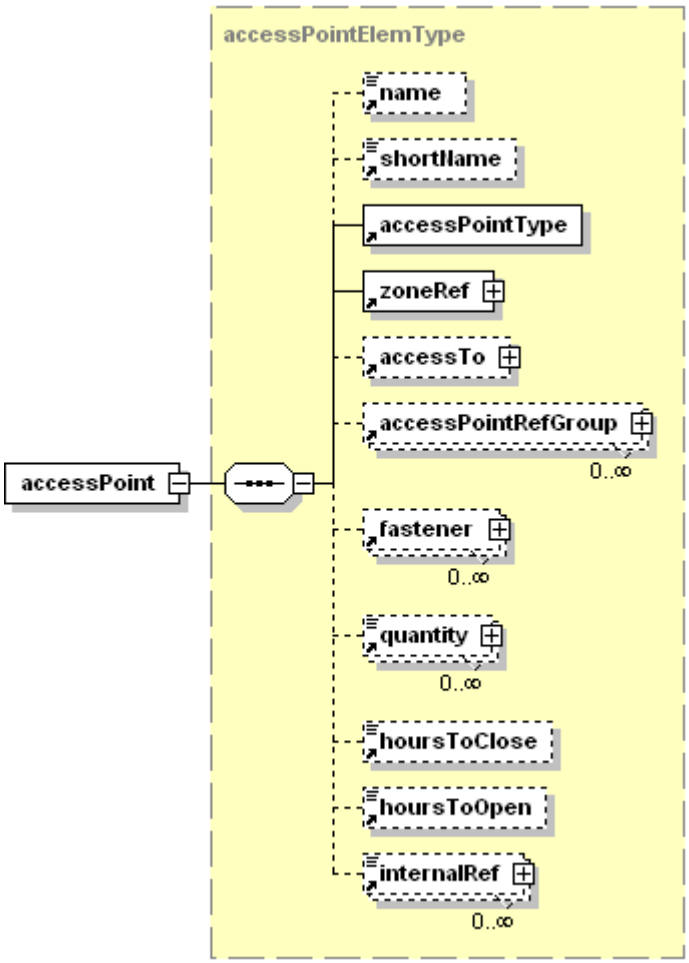
Child elements:

- <accessPoint>. Refer to Para 2.1.1.4.

2.1.1.4 Alternate access point

Description: The element <accessPoint> contains information that describes the access point and provides further information related to the access point based on the Product configuration.

Markup element: <accessPoint>



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Fig 3 Element <accessPoint>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `altNumber` (O), the alternate number to identify the alternate
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`name`>, the name of the access point. Refer to Chap 3.9.5.2.1.10.
- <`shortName`>, the abbreviated alternate name. Refer to Chap 3.9.5.2.1.10.
- <`accessPointType`>. Refer to Para 2.1.1.4.1.
- <`zoneRef`>. The zone where the access point is located. The target must be a zone container. Refer to Chap 3.9.5.2.1.10.

- <accessTo>. Refer to Para 2.1.1.4.2.
- <accessPointRefGroup>. Refer to Para 2.1.1.2.
- <fastener>. Refer to Para 2.1.1.4.4.
- <quantity>, the access point dimensions. Refer to Chap 3.9.5.2.1.10.
- <hoursToClose>. Refer to Para 2.1.1.4.7.
- <hoursToOpen>. Refer to Para 2.1.1.4.8.
- <internalRef>, reference to the illustration and/or multimedia file where the access point is illustrated. Refer to Chap 3.9.5.2.1.2.

Business rule decision point BRDP-S1-00256 - Use of the attribute `altNumber` in the access points CIR:

- Decide whether to use the attribute `altNumber`, which values to use and allocate suitable definitions to the values.

Markup example:

```
<accessPoint applicRefId="appl-001">
<accessPointType .../>
<zoneRef .../>
</accessPoint>
```

2.1.1.4.1 Access point type

Description: The element <accessPointType> is used to specify, through its attribute, whether the access point is a panel, a door, an electrical panel or any other type of access point.

Markup element: <accessPointType>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- accessPointTypeValue (M), the access point type value. Projects or organizations are allowed to define their own access point types. The attribute can have one of the following values:
  - "accpnl01" thru "accpnl99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

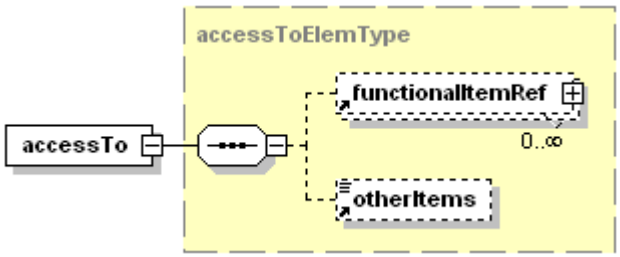
Markup example:

```
<accessPointType accessPointTypeValue="accpnl01"/>
```

2.1.1.4.2 Items reachable from the access point

Description: The element <accessTo> allows listing items that can be reached from the access point. Those items can be functional items or other items.

Markup element: <accessTo>



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Fig 4 Element <accessTo>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <functionalItemRef>, the references to the functional items. Refer to Chap 3.9.5.1.
- <otherItems>. Refer to Para 2.1.1.4.3.

2.1.1.4.3 Other items

Description: The element <otherItems> textually describes which items can be reached from the access point.

Markup element: <otherItems>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

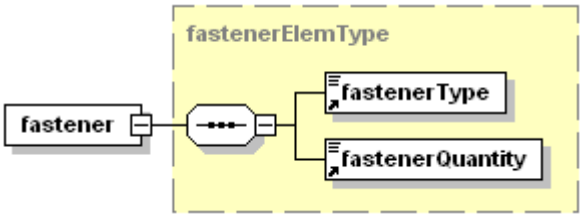
Markup example:

```
<otherItems>INTERNAL STRUCTURE, ELECTRICAL WIRING, CONNECTORS
PLATE</otherItems>
```

2.1.1.4.4 Fastener

Description: The element <fastener> is used to store access point fastener information.

Markup element: <fastener>



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Fig 5 Element <fastener>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- hingedFastenerFlag (O), a flag to indicate if the access point is hinged or not. The attribute can have one of the following values:
  - "1" - Yes, for hinged access points
  - "0" - No, for non-hinged access points
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <fastenerType>. Refer to Para 2.1.1.4.5.
- <fastenerQuantity>. Refer to Para 2.1.1.4.6.

Markup example:

```
<fastener hingedFastenerFlag="0">
<fastenerType>...</fastenerType>
<fastenerQuantity>...</fastenerQuantity>
</fastener>
```

2.1.1.4.5 Fastener type

Description: The element <fastenerType> contains the type of the fastener.

Markup element: <fastenerType>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<fastenerType>SF</fastenerType>
```

2.1.1.4.6 Fastener quantity

Description: The element <fastenerQuantity> contains the quantity of fasteners.

Markup element: <fastenerQuantity>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<fastenerQuantity>8</fastenerQuantity>
```

2.1.1.4.7 Elapsed time to close the access point

Description: The element <hoursToClose> contains the elapsed time necessary to close the access point, in hours.

Markup element: <hoursToClose>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<hoursToClose>0,2</hoursToClose>
```

2.1.1.4.8 Elapsed time to open the access point

Description: The element <hoursToOpen> contains the elapsed time necessary to open the access point, in hours.

Markup element: <hoursToOpen>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<hoursToOpen>0,2</hoursToOpen>
```

3 Example

```
<content>
<referencedApplicGroup>
<applic id="appl-001">
<displayText>
<simplePara>Version: A SN: 1-9</simplePara>
</displayText>
<evaluate andOr="and">
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValues="1~9"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="A"/>
</evaluate>
</applic>
<applic id="appl-002">
<displayText>
<simplePara>Version: A SN: 10-15</simplePara>
</displayText>
<evaluate andOr="and">
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValues="10~15"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="A"/>
</evaluate>
</applic>
</referencedApplicGroup>
```

```
<commonRepository>
<figure><title>Access panels - Figure 1</title>
<graphic infoEntityIdent="ICN-AE-A-00000000-Z-SF518-00000-A-01-
1" id="fig-0001"/>
</figure>
<accessPointRepository>
<accessPointSpec id="ap00">
<accessPointIdent accessPointNumber="123BF"></accessPointIdent>
<accessPointRefGroup accessPointRefType="contains">
<accessPointRef accessPointNumber="123B"/>
</accessPointRefGroup>
<accessPointAlts>
<accessPoint applicRefId="appl-001">
<name>Forward Cargo Panel</name>
<shortName>Panel</shortName>
<accessPointType
accessPointTypeValue="accpnl01"></accessPointType>
<zoneRef>
<name>Lower Deck Forward Cargo Compartment Right side</name>
</zoneRef>
<accessTo><functionalItemRef functionalItemNumber="4000-EM-1"
functionalItemType="fit01">
<name>INTERNAL STRUCTURE,
(ACCELEROMETERS)</name></functionalItemRef>
</accessTo>
<fastener><fastenerType>SF</fastenerType>
<fastenerQuantity>008</fastenerQuantity></fastener>
<fastener><fastenerType>SG</fastenerType>
<fastenerQuantity>002</fastenerQuantity></fastener>
<hoursToClose>0,3</hoursToClose>
<hoursToOpen>0,2</hoursToOpen>
</accessPoint>
<accessPoint applicRefId="appl-002">
<name>Forward Cargo Panel</name>
<shortName>Panel</shortName>
<accessPointType accessPointTypeValue="accpnl01"/>
<zoneRef>
<name>Lower Deck Forward Cargo Compartment Right side</name>
</zoneRef>
<accessTo><functionalItemRef functionalItemNumber="4000-EM-2"
functionalItemType="fit01">
<name>INTERNAL STRUCTURE, ELECTRICAL WIRING, CONNECTORS
PLATE</name></functionalItemRef>
</accessTo>
<fastener><fastenerType>SF</fastenerType>
<fastenerQuantity>008</fastenerQuantity></fastener>
<fastener><fastenerType>SG</fastenerType>
<fastenerQuantity>002</fastenerQuantity></fastener>
<hoursToOpen>0,2</hoursToOpen>
</accessPoint>
</accessPointAlts>
</accessPointSpec>
```

```
</accessPointRepository>
</commonRepository>
</content>
```

Chapter 3.9.5.2.11.6

Common information repository - Enterprise information

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Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.10	Common constructs - Text elements

Chap No./Document No.	Title
Chap 4.13.1	Optimizing and reuse - Common information repository concept

1 General

The enterprise information Common Information Repository (CIR) data module is used store information about an enterprise within the project. Refer to Chap 3.9.5.2.7.

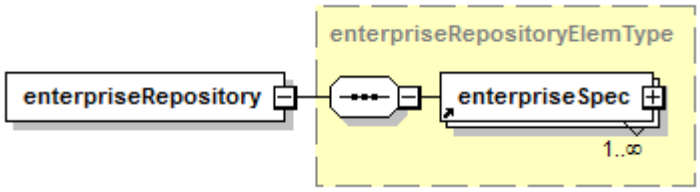
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Enterprise information CIR data module content

2.1 Enterprise list repository

Description: The element <enterpriseRepository> contains a list of enterprise descriptions.

Markup element: <enterpriseRepository>



ICN-1654N-S1000D0002-001-01

Fig 1 Element <enterpriseRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <enterpriseSpec>. Refer to Para 2.2.

Markup example:

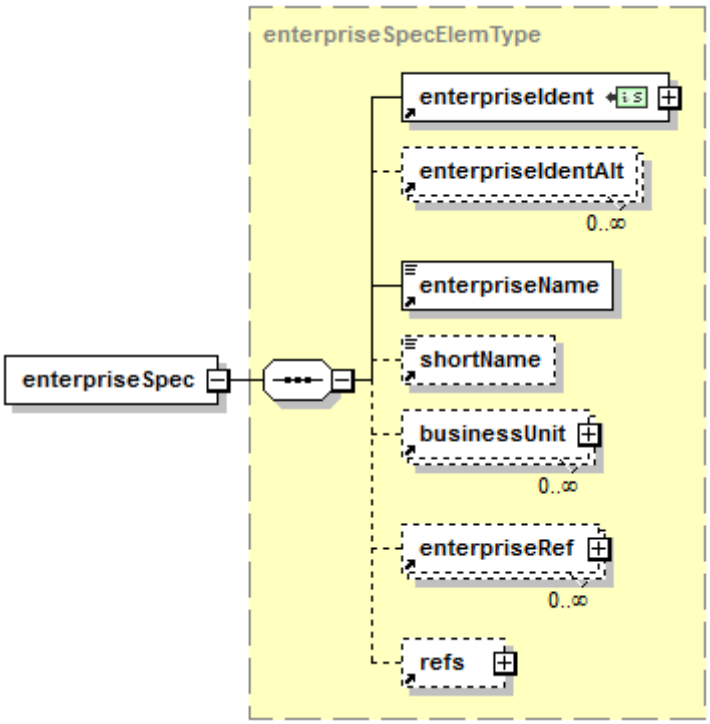
```
<enterpriseRepository>
<enterpriseSpec id="C001">
...
</enterpriseSpec>
</enterpriseRepository>
```

2.2 Enterprise specification

Description: The element <enterpriseSpec> contains the unique enterprise information for any enterprise that is involved in the development or supply of the Product. It contains

information about the enterprise such as manufacturer code, enterprise name and business unit.

Markup element: <enterpriseSpec>



ICN-1654N-S1000D0003-001-01

Fig 2 Element <enterpriseSpec>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <enterpriseIdent>. Refer to Para 2.3.
- <enterpriseIdentAlt>. Refer to Para 2.4.
- <enterpriseName>. Refer to Para 2.5.
- <shortName>, abbreviated alternate name. Refer to Chap 3.9.5.2.1.10.
- <businessUnit>. Refer to Para 2.6.
- <enterpriseRef>. Refer to Para 2.7.
- <refs>. References must be populated in accordance with Chap 3.9.5.2.1.2.

2.3 Enterprise identification

Description: The element <enterpriseIdent> identifies an enterprise, through its CAGE code.

Markup element: <enterpriseIdent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- manufacturerCodeValue (M), the CAGE code of the enterprise
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<enterpriseIdent manufacturerCodeValue="KZ444"/>
```

2.4 Alternate enterprise identification

Description: The element <enterpriseIdentAlt> provides an alternate method of identifying an enterprise where the enterprise does not have a CAGE code.

Markup element: <enterpriseIdentAlt>

Attributes:

- altCode (M), the enterprise identification code when no CAGE code is available
- altCodeType (M), the type of code being used

Child elements:

- None

Markup example:

```
<enterpriseIdentAlt altCode="1235" altCodeType="DUNS"/>
```

2.5 Enterprise name

Description: The element <enterpriseName> contains a text string identifying the name of the enterprise.

Markup element: <enterpriseName>

Attributes:

- None

Child elements:

- None

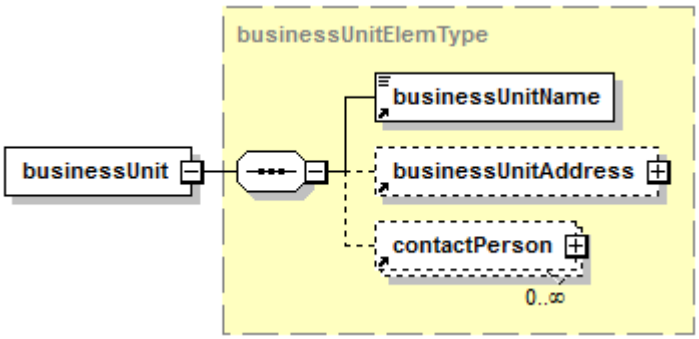
Markup example:

```
<enterpriseName>UTOPIA plc</enterpriseName>
```

2.6 Business unit

Description: The element <businessUnit> contains information about the business unit, including name, address and contacts.

Markup element: <businessUnit>



ICN-1654N-S1000D0004-001-01

Fig 3 Element <businessUnit>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <businessUnitName>. Refer to Para 2.6.1.
- <businessUnitAddress>. Refer to Para 2.6.2.
- <contactPerson>. Refer to Para 2.6.3.

Markup example:

```
<businessUnit>
<businessUnitName>Customers Services Business
Line</businessUnitName>
<businessUnitAddress>
...
</businessUnitAddress>
</businessUnit>
```

2.6.1 Business unit name

Description: The element <businessUnitName> contains a string identifying the name of the business unit.

Markup element: <businessUnitName>

Attributes:

– None

Child elements:

– None

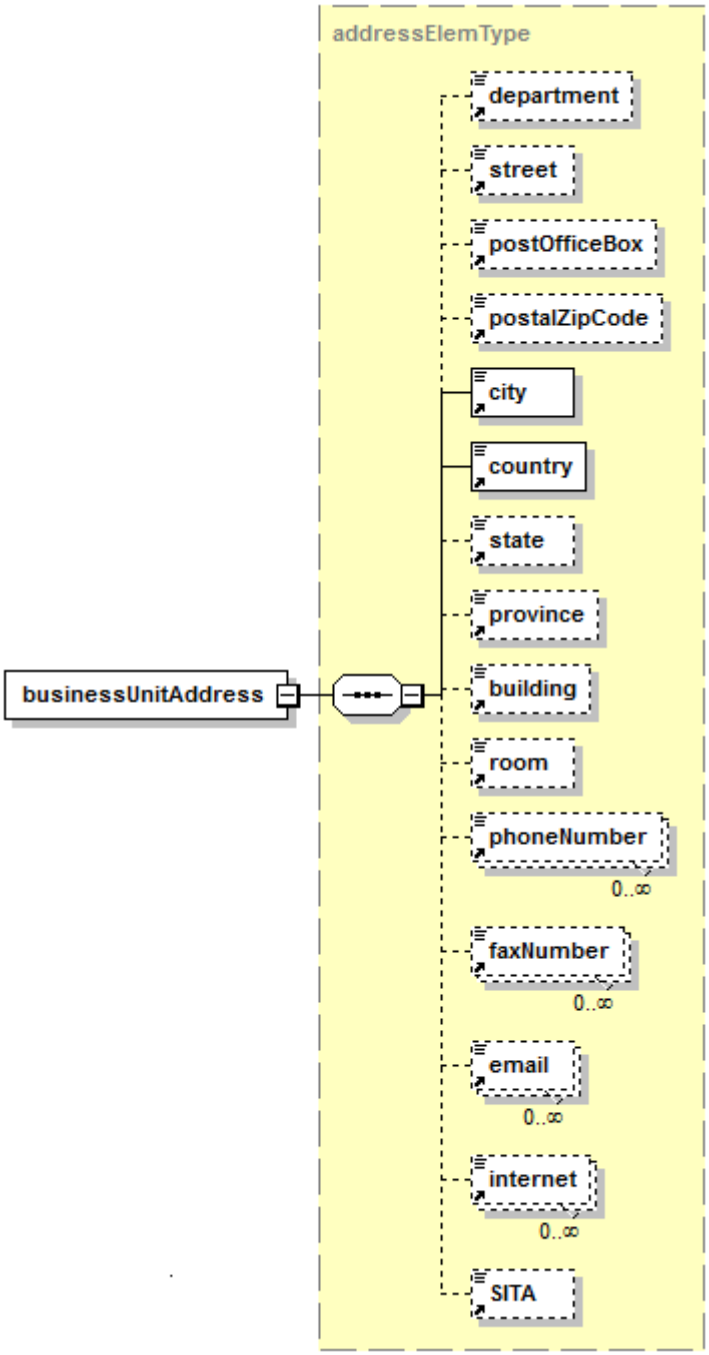
Markup example:

```
<businessUnitName>Customers Services Business
Line</businessUnitName>
```

2.6.2 Business unit address

Description: The element <businessUnitAddress> contains the information required to contact the business unit.

Markup element: <businessUnitAddress>



ICN-1654N-S1000D0005-001-01

Fig 4 Element <businessUnitAddress>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`department`>. Refer to Para 2.6.2.1.
- <`street`>. Refer to Para 2.6.2.2.
- <`postOfficeBox`>. Refer to Para 2.6.2.3.
- <`postalZipCode`>. Refer to Para 2.6.2.4.
- <`city`>. Refer to Para 2.6.2.5.
- <`country`>. Refer to Para 2.6.2.6.
- <`state`>. Refer to Para 2.6.2.7.
- <`province`>. Refer to Para 2.6.2.8.
- <`building`>. Refer to Para 2.6.2.9.
- <`room`>. Refer to Para 2.6.2.10.
- <`phoneNumber`>. Refer to Para 2.6.2.11.
- <`faxNumber`>. Refer to Para 2.6.2.12.
- <`email`>. Refer to Para 2.6.2.13.
- <`internet`>. Refer to Para 2.6.2.14.
- <`SITA`>. Refer to Para 2.6.2.15.

Markup example:

```
<businessUnitAddress>
<street>Heaven street</street>
<postalZipCode>99999</postalZipCode><city>Saint Vitus</city>
<country>UTOPIA</country>
<phoneNumber>111 222 333 444</phoneNumber>
<faxNumber>111 222 333 445</faxNumber>
<email>customers_services@utopia.com</email>
<email>info@utopia.com</email>
<internet>www.utopia.customers.services.online.com</internet>
<internet>www.utopia.online.com</internet>
</businessUnitAddress>
```

2.6.2.1 Department

Description: The element <`department`> contains the identification of the business department.

Markup element: <`department`>

Attributes:

- None

Child elements:

- None

Markup example:

```
<department>Happy support group</department>
```

2.6.2.2 Street

Description: The element <street> contains the street address of the business.

Markup element: <street>

Attributes:

– None

Child elements:

– None

Markup example:

```
<street>123 Happy Lane</street>
```

2.6.2.3 Post office box

Description: The element <postOfficeBox> contains the post office box of the business defined.

Markup element: <postOfficeBox>

Attributes:

– None

Child elements:

– None

Markup example:

```
<postOfficeBox>12345</postOfficeBox>
```

2.6.2.4 Postal zip code

Description: The element <postalZipCode> contains the zip code where the business is located.

Markup element: <postalZipCode>

Attributes:

– None

Child elements:

– None

Markup example:

```
<postalZipCode>99999</postalZipCode>
```

2.6.2.5 City

Description: The element <city> contains the name of the city where the business is located.

Markup element: <city>

Attributes:

– None

Child elements:

– None

Markup example:

```
<city>Happy Valley</city>
```

2.6.2.6 Country Code

Description: The element <country> contains the International Standards Organization (ISO) country code where the business is located.

Markup element: <country>

Attributes:

– None

Child elements:

– None

Markup example:

```
<country>UTOPIA</country>
```

2.6.2.7 State

Description: The element <state> contains the state where the business is located.

Markup element: <state>

Attributes:

– None

Child elements:

– None

Markup example:

```
<state>Euphoria</state>
```

2.6.2.8 Province

Description: The element <province> contains the province where the business is located.

Markup element: <province>

Attributes:

– None

Child elements:

– None

Markup example:

```
<province>Provincial</province>
```

2.6.2.9 Building identifier

Description: The element <building> contains the building number where the business is located.

Markup element: <building>

Attributes:

– None

Child elements:

– None

Markup example:

```
<building>11-22</building>
```

2.6.2.10 Room number

Description: The element <room> contains the room number in the building where the business is located.

Markup element: <room>

Attributes:

– None

Child elements:

– None

Markup example:

```
<room>99</room>
```

2.6.2.11 Phone numbers

Description: The element <phoneNumber> contains contact phone numbers for the business.

Markup element: <phoneNumber>

Attributes:

– `contactRole` (O), whether this is the phone number for a primary, secondary or alternate contact

Child elements:

– None

Markup example:

```
<phoneNumber contactRole="primary">111 222 333 444</phoneNumber>
```

2.6.2.12 Fax numbers

Description: The element <faxNumber> contains contact fax numbers for the business.

Markup element: <faxNumber>

Attributes:

– `contactRole` (O), whether this is the fax number for a primary, secondary or alternate contact

Child elements:

– None

Markup example:

```
<faxNumber>111 222 333 444</faxNumber>
```

2.6.2.13 Email addresses

Description: The element <email> contains contact email addresses for the business.

Markup element: <email>

Attributes:

– `contactRole` (O), whether this is the email address for a primary, secondary or alternate contact

Child elements:

– None

Markup example:

```
<email>customers_services@utopia.com</email>
```

2.6.2.14 Internet addresses

Description: The element <internet> contains internet addresses for the business.

Markup element: <internet>

Attributes:

– `contactRole` (O), whether this is the internet address for a primary, secondary or alternate contact

Child elements:

– None

Markup example:

```
<internet>www.utopia.customers.services.online.com</internet>
```

2.6.2.15 SITA address

Description: The element <SITA> contains the address supplied in the aviation industry by the Société Internationale de Télécommunications Aéronautiques (SITA).

Markup element: <SITA>

Attributes:

– None

Child elements:

– None

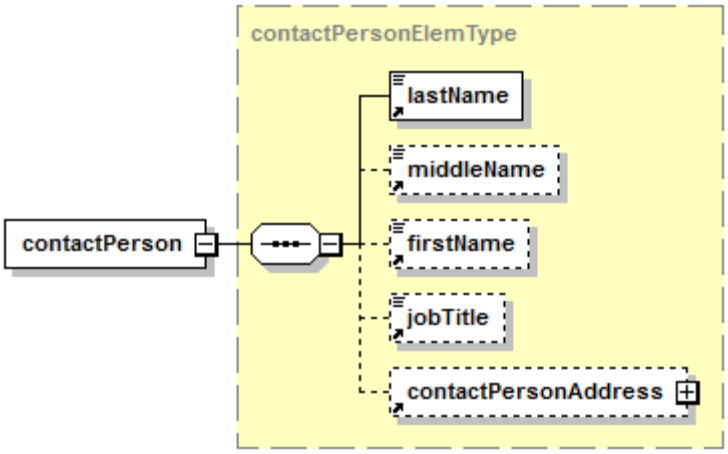
Markup example:

```
<SITA>111.222.333.444</SITA>
```

2.6.3 Contact persons

Description: The element <contactPerson> contains information related to individual contacts of a business unit.

Markup element: <contactPerson>



ICN-1654N-S1000D0006-001-01

Fig 5 Element <contactPerson>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- personPrefix (O), the title or prefix added to a person's name to signify veneration, an official position or a professional or academic qualification (eg, colonel, officer, lady, Mr., Mrs., Dr.)
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lastName>. Refer to Para 2.6.3.1.
- <middleName>. Refer to Para 2.6.3.2.
- <firstName>. Refer to Para 2.6.3.3.
- <jobTitle>. Refer to Para 2.6.3.4.
- <contactPersonAddress>. Refer to Para 2.6.3.5.

Markup example:

```
<contactPerson>
<lastName>Smiley</lastName>
</contactPerson>
```

2.6.3.1 Last name

Description: The element <lastName> contains the surname of the individual contact.

Markup element: <lastName>

Attributes:

– None

Child elements:

– None

Markup example:

```
<lastName>Smiley</lastName>
```

2.6.3.2 Middle name

Description: The element <middleName> contains the middle name of the individual contact.

Markup element: <middleName>

Attributes:

– None

Child elements:

– None

Markup example:

```
<middleName>Quincy</middleName>
```

2.6.3.3 First name

Description: The element <firstName> contains the first or given name of the individual contact.

Markup element: <firstName>

Attributes:

– None

Child elements:

– None

Markup example:

```
<firstName>Jonathon</firstName>
```

2.6.3.4 Job title

Description: The element <jobTitle> contains the job title of the individual contact.

Markup element: <jobTitle>

Attributes:

– None

Child elements:

– None

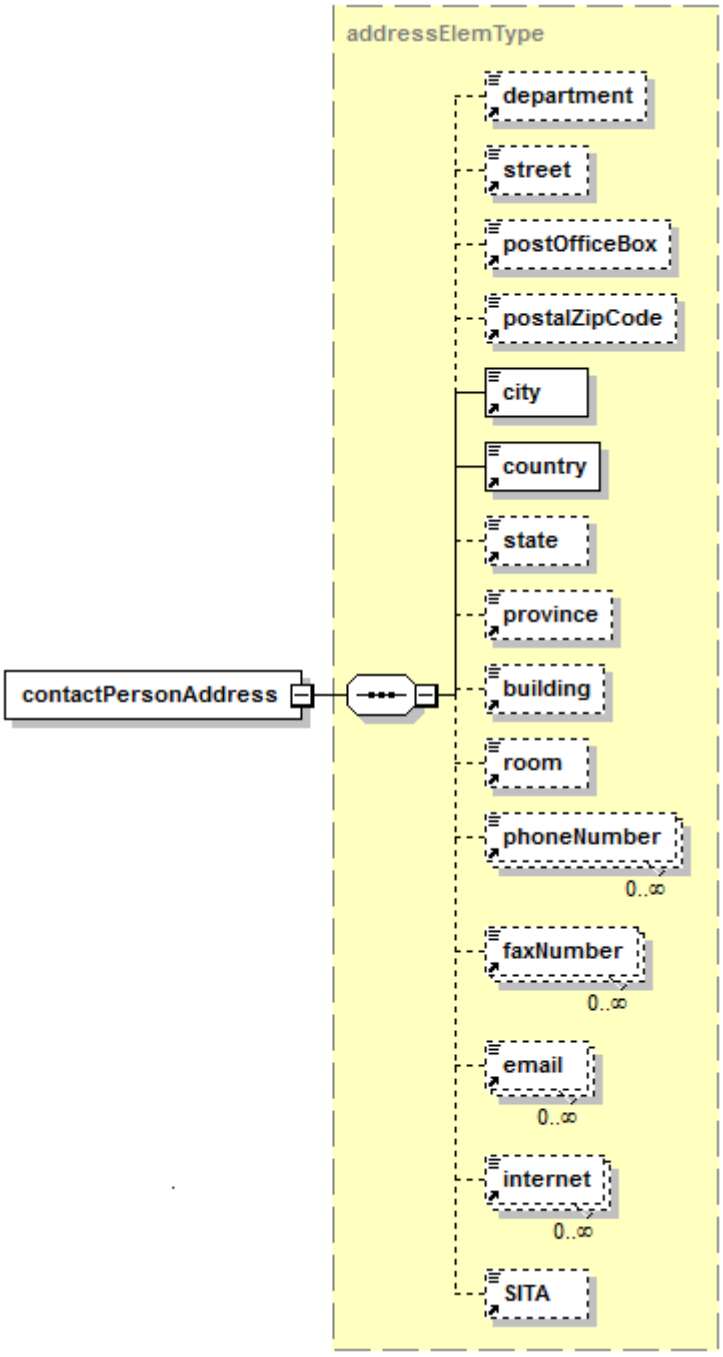
Markup example:

```
<jobTitle>Morale Booster</jobTitle>
```

2.6.3.5 Contact person address

Description: The element <contactPersonAddress> contains the information required to contact the contact person.

Markup element: <contactPersonAddress>



ICN-1654N-S1000D0007-001-01

Fig 6 Element <`contactPersonAddress`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`department`>. Refer to Para 2.6.2.1.
- <`street`>. Refer to Para 2.6.2.2.
- <`postOfficeBox`>. Refer to Para 2.6.2.3.
- <`postalZipCode`>. Refer to Para 2.6.2.4.
- <`city`>. Refer to Para 2.6.2.5.
- <`country`>. Refer to Para 2.6.2.6.
- <`state`>. Refer to Para 2.6.2.7.
- <`province`>. Refer to Para 2.6.2.8.
- <`building`>. Refer to Para 2.6.2.9.
- <`room`>. Refer to Para 2.6.2.10.
- <`phoneNumber`>. Refer to Para 2.6.2.11.
- <`faxNumber`>. Refer to Para 2.6.2.12.
- <`email`>. Refer to Para 2.6.2.13.
- <`internet`>. Refer to Para 2.6.2.14.
- <`SITA`>. Refer to Para 2.6.2.15.

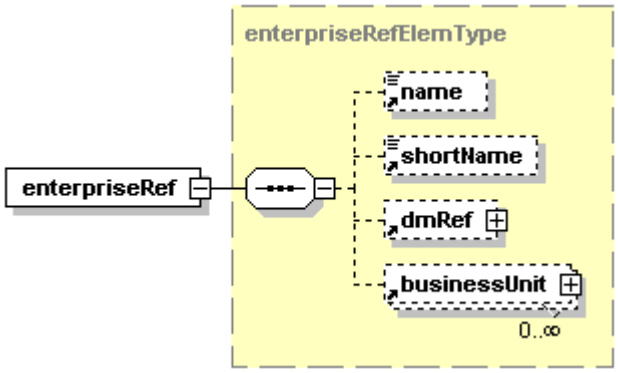
Markup example:

```
<contactPersonAddress>
<street>Heaven street</street>
<postalZipCode>99999</postalZipCode><city>Saint Vitus</city>
<country>UTOPIA</country>
<phoneNumber>111 222 333 444</phoneNumber>
<faxNumber>111 222 333 445</faxNumber>
<email>customers_services@utopia.com</email>
<email>info@utopia.com</email>
<internet>www.utopia.customers.services.online.com
</internet>
<internet>www.utopia.online.com</internet>
</contactPersonAddress>
```

2.7 Enterprise references

Description: The element <`enterpriseRef`> provides a method to reference other enterprises.

Markup element: <`enterpriseRef`>



ICN-B6865-S1000D0001-001-01

Fig 7 Element <enterpriseRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- enterpriseType (O), the type of enterprise (production site, distributor or manufacturer enterprise)
- enterpriseRefType (O), the type of enterprise reference
- manufacturerCodeValue (M), the CAGE code of the enterprise being referenced
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <name>, the name of the enterprise. Refer to Chap 3.9.5.2.1.10.
- <shortName>, abbreviated alternate name. Refer to Chap 3.9.5.2.1.10.
- <dmRef>. Data module references must be populated in accordance with Chap 3.9.5.2.1.2.
- <businessUnit>. Refer to Para 2.6.

Markup example:

```
<enterpriseRef enterpriseType="productSite"
manufacturerCodeValue="FAPE3" qualifiedSiteFlag="1"/>
```

3 Example

```
<commonRepository>
<enterpriseRepository>
<enterpriseSpec id="C001">
<enterpriseIdent manufacturerCodeValue="KZ444"/>
<enterpriseName>UTOPIA plc</enterpriseName>
<businessUnit>
<businessUnitName>Customers Services Business
Line</businessUnitName>
<businessUnitAddress>
```

```
<street>Heaven street</street>
<postalZipCode>99999</postalZipCode>
<city>Saint Vitus</city>
<country>UTOPIA</country>
<phoneNumber>111 222 333 444</phoneNumber>
<faxNumber>111 222 333 445</faxNumber>
<email>customers_services@utopia.com</email>
<email>info@utopia.com</email>
<internet>www.utopia.customers.services.online.com
</internet>
<internet>www.utopia.online.com</internet>
</businessUnitAddress>
</businessUnit>
</enterpriseSpec>
</enterpriseRepository>
</commonRepository>
```

Chapter 3.9.5.2.11.7

Common information repository - Supplies

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1 General

The supplies Common Information Repository (CIR) data module is used to capture and represent supply intrinsic properties and related information.

A supply has intrinsic properties which are always valid (eg, the specification of the supply, its manufacturer, a flash point). The supply identification can be used to uniquely identify the supply products (such as oils, greases, paints) by using the element <supplyRef>. Refer to Chap 3.9.5.2.1.9.

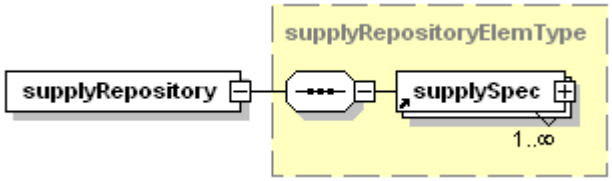
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Supplies CIR data module content

2.1 Supplies repository

Description: The element <supplyRepository> provides a list of supplies and their associated properties.

Markup element: <supplyRepository>



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Fig 1 Element <supplyRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

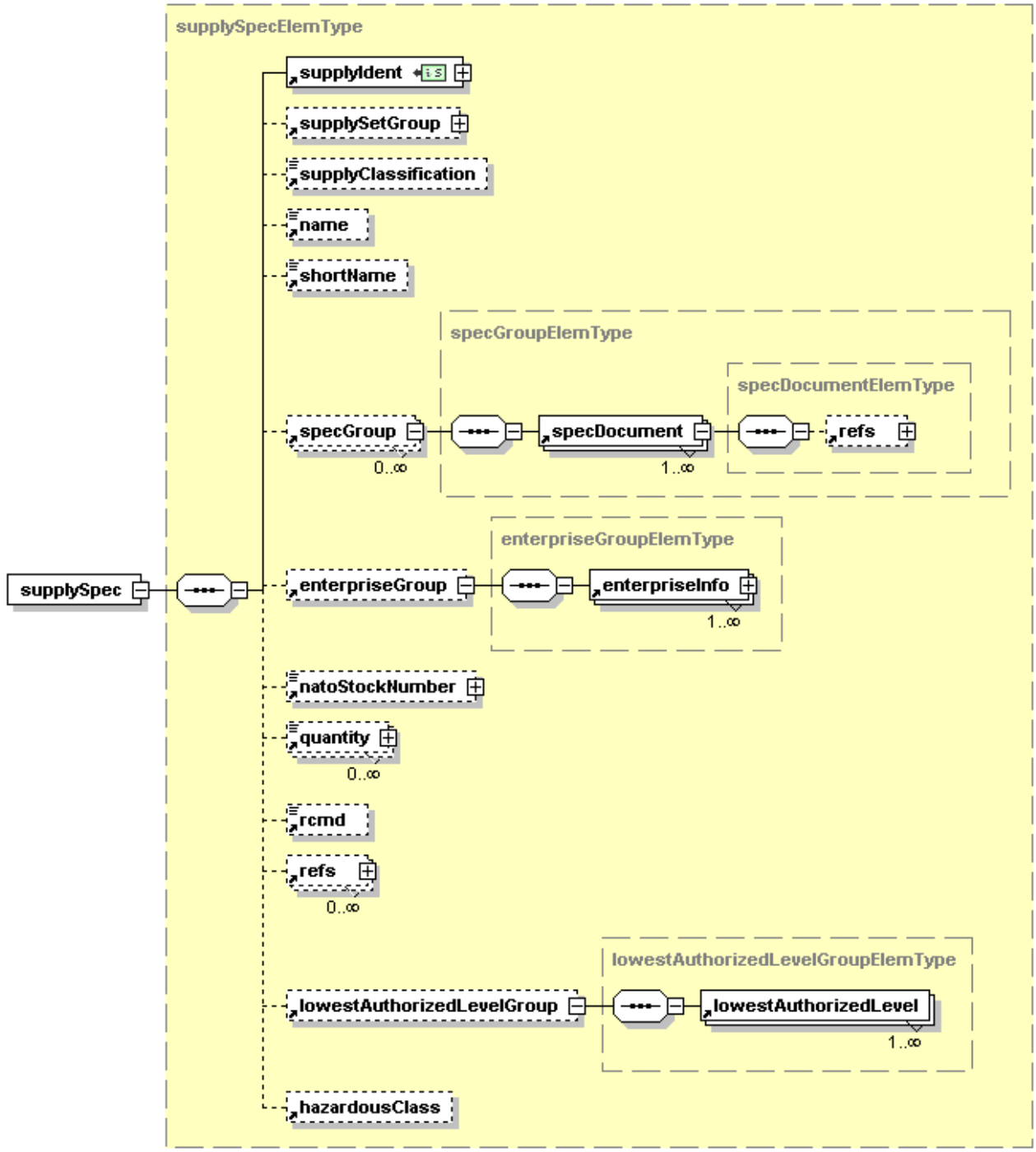
Child elements:

- <supplySpec>. Refer to Para 2.1.1.

2.1.1 Supply specification

Description: The element <supplySpec> contains the associated properties for one supply.

Markup element: <supplySpec>



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Fig 2 Element <supplySpec>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `manufacturedFlag` (O), a flag to indicate if the product is manufactured or no longer manufactured. The attribute can have one of the following values:

- "1" (D) - Yes, when the product is manufactured
- "0" - No, when the product is no longer manufactured

– obsoleteFlag (O), a flag to indicate that the supply is obsolete or not. The attribute can have one of the following values:

- "1" - Yes, for obsolete supplies
- "0" - No, for non-obsolete supplies

– specialLabelFlag (O), a flag to indicate that the supply product has a special labeling or not. The attribute can have one of the following values:

- "1" - Yes, for supplies with special labeling
- "0" - No, for supplies without special labeling

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <supplyIdent>. Refer to Para 2.1.1.1.
– <supplySetGroup>. Refer to Para 2.1.1.2.
– <supplyClassification>. Refer to Para 2.1.1.4.
– <name>, the name of the supply. Refer to Chap 3.9.5.2.1.10.
– <shortName>. abbreviated alternate name. Refer to Chap 3.9.5.2.1.10.
– <specGroup>. Refer to Para 2.1.1.5.
– <enterpriseGroup>. Refer to Para 2.1.1.6.
– <natoStockNumber>. the associated NATO Stock Number. Refer to Chap 3.9.5.2.7.
– <quantity>. the supply flash point(s). Refer to Chap 3.9.5.2.1.10.
– <rcmd>. Refer to Para 2.1.1.7.
– <refs>. References must be populated in accordance with Chap 3.9.5.2.1.2.
– <lowestAuthorizedLevelGroup>. Refer to Para 2.1.1.8.
– <hazardousClass>. identifies hazardous supplies. Refer to Chap 3.9.5.2.7.

2.1.1.1 Supply identifier

Description: The element <supplyIdent>, contrary to the attribute id, semantically identifies the supply as a result of its attributes.

Markup element: <supplyIdent>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– supplyNumber (M), the supply number. A unique label set by the project (eg, the supply trade name, a specification number).
– supplyNumberType (M), the type of supply identification. Projects or organizations are allowed to define their own supply number types. The attribute can have one of the following values:

- "sp01" thru "sp99". Refer to Chap 3.9.6.1.

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

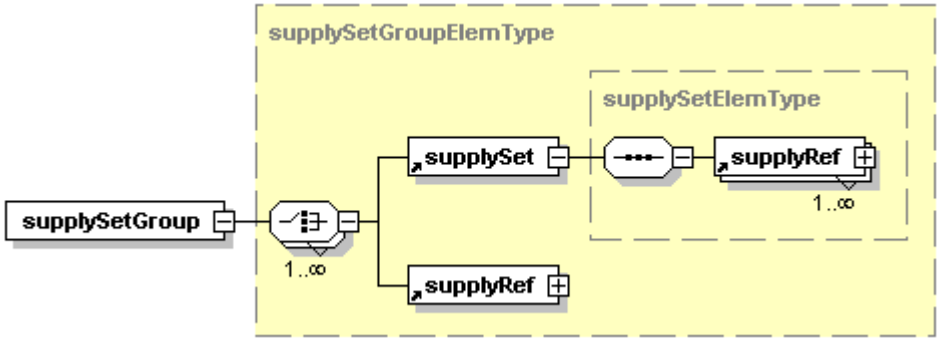
Markup example:

```
<supplyIdent supplyNumber="JET A1" supplyNumberType="sp01"/>
```

2.1.1.2 Supply set group

Description: The element <supplySetGroup> is constituted of supplies and/or sets of supplies. Each supply or set of supplies can be used equally.

Markup element: <supplySetGroup>



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Fig 3 Element <supplySetGroup>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <supplySet>, a set of supplies that must to be used together. Refer to Para 2.1.1.3.
– <supplyRef>, a supply. Refer to Chap 3.9.5.2.1.9.

2.1.1.3 Supply set

Description: The element <supplySet> identifies supplies that must be used together (eg, base and primer supply).

Markup element: <supplySet>. Refer to Fig 3.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <supplyRef>, the supplies in the set. Refer to Chap 3.9.5.2.1.9.

Markup example:

```
<supplySet>
<supplyRef supplyNumber="BSB-DUROFIX_FIXATIF_UW_SPECIAL"
supplyNumberType="sp01"/>
<supplyRef supplyNumber="BSB-DUROFIX_FIXATIF_UW"
supplyNumberType="sp01"/>
</supplySet>
```

2.1.1.4 Supply classification

Description: The element <supplyClassification> contains a classification related to the supply. For example, it can be used to provide a rating of the supply eco-efficiency.

Markup element: <supplyClassification>

Attributes:

- None

Child elements:

- None

Markup example:

```
<supplyClassification>eco-efficiency level
3</supplyClassification>
```

2.1.1.5 Specification list

Description: The element <specGroup> contains the specification that the supply meets.

Markup element: <specGroup>. Refer to Fig 2.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- vendorFlag (O), whether the list is defined by a supplier or by the manufacturer of the Product. The attribute can have one of the following values:

- "1" - Yes, the list is defined by a supplier
- "0" - No, the list is defined by the manufacturer of the Product

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <specDocument>. Refer to Para 2.1.1.5.1.

2.1.1.5.1 Specification document

Description: The element <specDocument> contains the identification information of a specification document with which the supply complies.

Markup element: <specDocument>. Refer to Fig 2.

Attributes:

– applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– manufacturerCodeValue, not used in the context of supplies
– countryIsoCode (O), the country of the specification owner
– specDocumentNumber (O), the identifier number of the specification
– specDocumentType (O), the type of the document, always a specification for supplies
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <refs>. References must be populated in accordance with Chap 3.9.5.2.1.2.

Markup example:

```
<specDocument countryIsoCode="FR" specDocumentNumber="ASNA3572"
specDocumentType="specification"/>
```

2.1.1.6 Enterprise list

Description: The element <enterpriseGroup> contains the supply product list of manufacturers, suppliers, etc.

Markup element: <enterpriseGroup>. Refer to Fig 2.

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

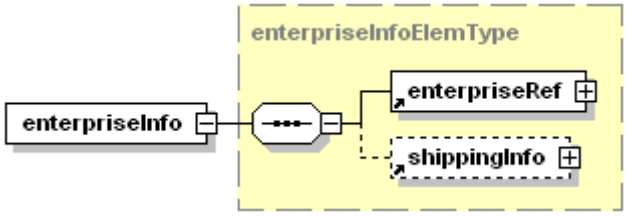
Child elements:

- <enterpriseInfo>. Refer to Para 2.1.1.6.1.

2.1.1.6.1 Enterprise information

Description: The element <enterpriseInfo> contains information about a supplier of the supply.

Markup element: <enterpriseInfo>



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Fig 4 Element <enterpriseInfo>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- locallySuppliedFlag (M), a flag to indicate if the supply can be locally purchased or not. The attribute can have one of the following values:
  - "1" - Yes, for locally purchased parts
  - "0" - No, for non-locally purchased parts
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <enterpriseRef>, the reference to an enterprise. Refer to Chap 3.9.5.2.11.6.
- <shippingInfo>. Refer to Para 2.1.1.6.2.

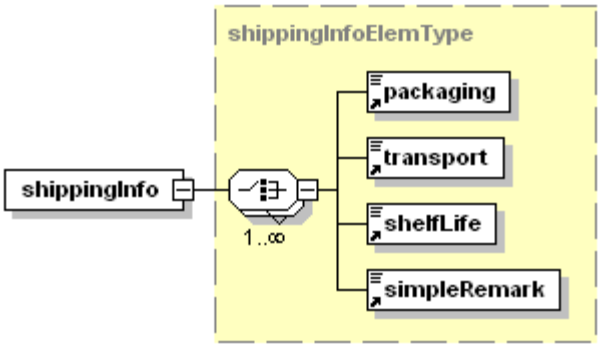
Markup example:

```
<enterpriseInfo locallySuppliedFlag="0">
<enterpriseRef manufacturerCodeValue="F8808"/>
</enterpriseInfo>
```

2.1.1.6.2 Shipping information

Description: The element <shippingInfo> contains the shipping information for the supply, if any. They are divided into four types of information.

Markup element: <shippingInfo>



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Fig 5 Element <shippingInfo>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

At least one of the child elements must be populated:

- <packaging>. Refer to Para 2.1.1.6.3.
- <transport>. Refer to Para 2.1.1.6.4.
- <shelfLife>. Refer to Para 2.1.1.6.5.
- <simpleRemark>. Refer to Para 2.1.1.6.6.

2.1.1.6.3 Packaging

Description: The element <packaging> contains information about the packaging of the supply.

Markup element: <packaging>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<packaging>1 AND 20 LITER (0.265 AND 5.3 GAL) CAN</packaging>
```

2.1.1.6.4 Transport

Description: The element <transport> contains information about the transport of the supply.

Markup element: <transport>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<transport>FLAMMABLE LIQUID</transport>
```

2.1.1.6.5 Shelf life

Description: The element <shelfLife> contains information about the shelf life of the supply.

Markup element: <shelfLife>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<shelfLife>APPROX 4 YEARS AT 20 DEG C (68 DEG F)</shelfLife>
```

2.1.1.6.6 General remark

Description: The element <simpleRemark> contains general remarks about the shipping information related to the supply.

Markup element: <simpleRemark>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<simpleRemark>FLAMMABLE,BUT DOES NOT REQUIRE A HAZARD
SYMBOL</simpleRemark>
```

2.1.1.7 Recommendation

Description: The element <`rcmd`> contains recommendations related to the supply.

Markup element: <`rcmd`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<rcmd>Polysulfide sealant with Asbestos</rcmd>
```

2.1.1.8 Lowest authorized maintenance level group

Description: The element <`lowestAuthorizedLevelGroup`> groups the different lowest authorized maintenance levels related to the supply.

Markup element: <`lowestAuthorizedLevelGroup`>. Refer to Fig 2.

Attributes:

- None

Child elements:

- <`lowestAuthorizedLevel`>. Refer to Para 2.1.1.9.

2.1.1.9 Lowest authorized maintenance level

Description: The element <lowestAuthorizedLevel> contains the minimum skill authorized to remove, replace, or use an item. The use of this element will facilitate supplying the bench stock applicable to the maintainer's skill level without having to go through an entire manual to determine what consumable supplies might be needed. It also alerts the clerk in the supply room of which supplies the maintainer is allowed to acquire for bench stock.

Markup element: <lowestAuthorizedLevel>

Attributes:

– lowestLevel (M), the lowest authorized level value. Projects or organizations are allowed to define their own lowest authorized levels. The attribute can have one of the following values:

- "la01" thru "la99". Refer to Chap 3.9.6.1.

Child elements:

– None

3 Examples

These examples show the combined use of the supplies CIR and the supply requirements CIR.

The following example illustrates the supplies CIR, for intrinsic properties. It defines two supplies and related properties.

```
<commonRepository>
<supplyRepository>
<supplySpec>
<supplyIdent supplyNumber="BSB-DUROFIX_FIXATIF_UW_SPECIAL"
supplyNumberType="sp01"/>
<specGroup vendorFlag="0">
<specDocument countryIsoCode="FR"
specDocumentNumber="IPDA 28-05"/>
</specGroup>
<enterpriseGroup>
<enterpriseInfo locallySuppliedFlag="0">
<enterpriseRef manufacturerCodeValue="F8808"/>
<shippingInfo>
<packaging>1 AND 20 LITER (0.265 AND 5.3 GAL) CAN</packaging>
<shelfLife>APPROX 4 YEARS AT 20 DEG C (68 DEG F)</shelfLife>
<transport>FLAMMABLE LIQUID</transport>
</shippingInfo>
</enterpriseInfo>
</enterpriseGroup>
</supplySpec>
<supplySpec>
<supplyIdent supplyNumber="BSB-DUROFIX_FIXATIF_UW"
supplyNumberType="sp01"/>
<specGroup vendorFlag="0">
<specDocument countryIsoCode="FR"
specDocumentNumber="ASNA3572"/>
</specGroup>
<enterpriseGroup>
```

```
<enterpriseInfo locallySuppliedFlag="0">
<enterpriseRef manufacturerCodeValue="F8808"/>
<shippingInfo>
<packaging>1 AND 20 LITER (0.265 AND 5.3 GAL) CAN</packaging>
<shelfLife>APPROX 4 YEARS AT 20 DEG C (68 DEG F)</shelfLife>
<transport>FLAMMABLE LIQUID</transport>
</shippingInfo>
</enterpriseInfo>
</enterpriseGroup>
</supplySpec>
</supplyRepository>
</commonRepository>
```

The following example illustrates the supply requirements CIR. Defined supplies (see above) are targeted through the use of the element <supplyRef> with attribute supplyNumber properly filled.

```
<commonRepository>
<supplyRqmtRepository>
<supplyRqmtSpec id="inv0105029-">
<supplyRqmtIdent materialCategory="05" supplyRqmtNumber="029"/>
<supplyRqmtAlts><supplyRqmt>
<supplyRqmtAltIdent materialCategory="05" supplyRqmtNumber="029"
vendorFlag="0"/>
<supplySetGroup>
<supplySet>
<supplyRef supplyNumber="BSB-DUROFIX_FIXATIF_UW_SPECIAL"
supplyNumberType="sp01"/>
<supplyRef supplyNumber="BSB-DUROFIX_FIXATIF_UW"
supplyNumberType="sp01"/>
</supplySet>
</supplySetGroup>
<name>FIXATIVE FOR PLACARD INSTALLATION</name>
<safetyCategory safetyCategoryValue="C"/>
<usage>IMMERSION OF BSB LABEL</usage>
</supplyRqmt></supplyRqmtAlts>
</supplyRqmtSpec>
</supplyRqmtRepository>
</commonRepository>
```

Chapter 3.9.5.2.11.8

Common information repository - Supplies, requirements

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Chap 3.9.6.1	Attributes - Project configurable values

Chap No./Document No.	Title
Chap 4.13.1	Optimizing and reuse - Common information repository concept

1 General

The supply requirements Common Information Repository (CIR) data module is used to capture and represent supply requirements and use conditions.

A supply requirement gives a definition of the requirement and includes, amongst other things, references to the supplies which fulfill the requirement. The supply requirements identification can be used to uniquely identify the supply requirements, for example in which case a supply or a group of supplies can be used, by using the element <supplyRqmtRef>. Refer to Chap 3.9.5.2.1.9.

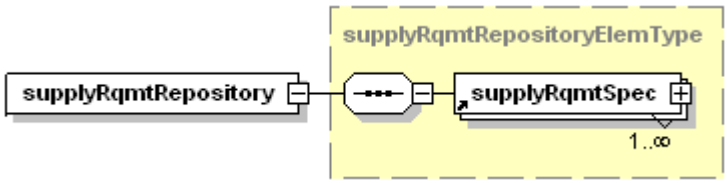
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Supply requirements CIR data module content

2.1 Supply requirement repository

Description: The element <supplyRqmtRepository> contains a list of supply requirements and their associated properties.

Markup element: <supplyRqmtRepository>



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Fig 1 Element <supplyRqmtRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

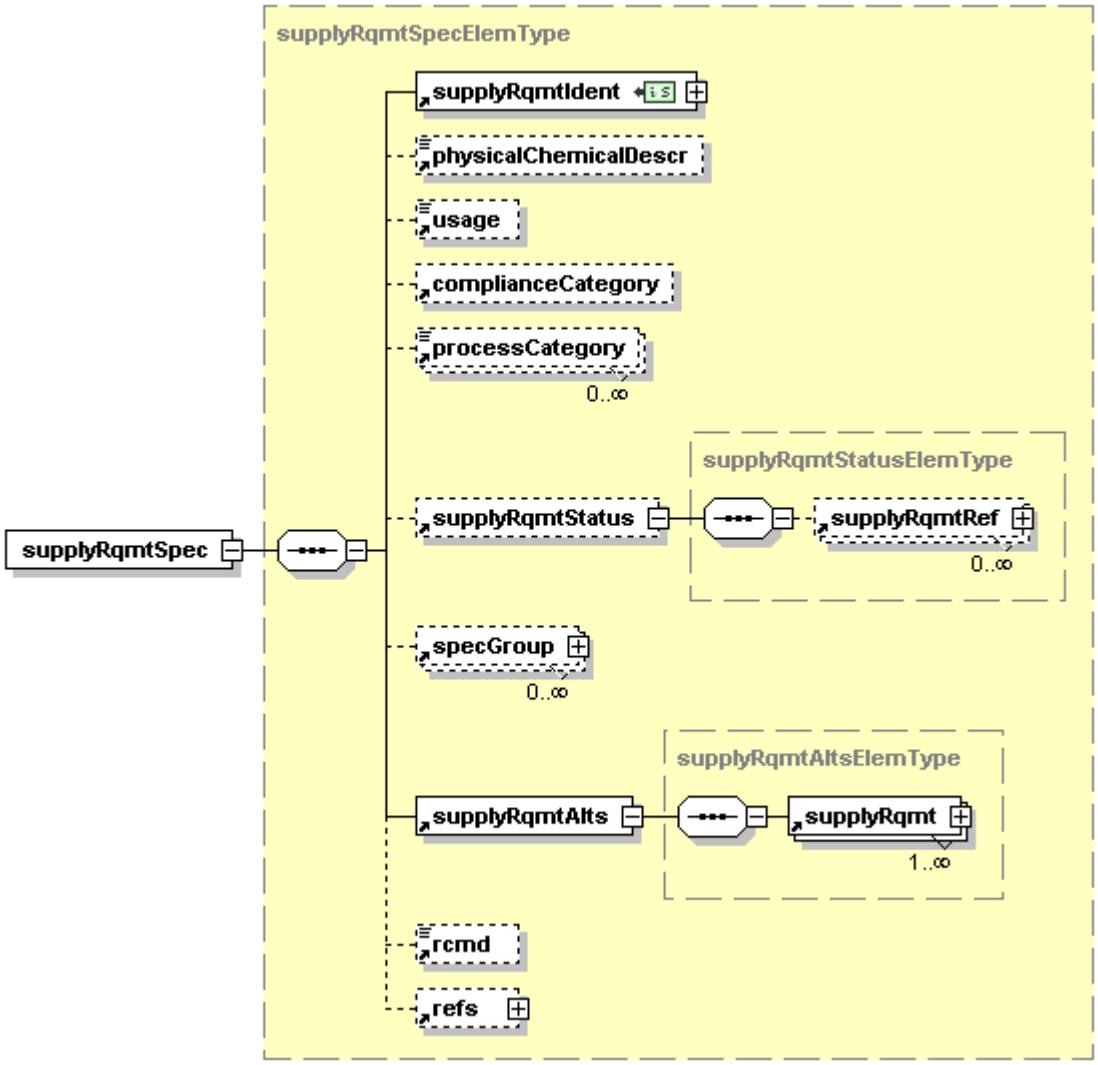
Child elements:

- <supplyRqmtSpec>. Refer to Para 2.1.1.

2.1.1 Supply requirement specification

Description: The element <supplyRqmtSpec> contains the associated properties of one supply requirement.

Markup element: <supplyRqmtSpec>



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Fig 2 Element <supplyRqmtSpec>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`supplyRqmtIdent`>. Refer to Para 2.1.1.1.
- <`physicalChemicalDescr`>. Refer to Para 2.1.1.2.
- <`usage`>. Refer to Para 2.1.1.3.
- <`complianceCategory`>. Refer to Para 2.1.1.4.

- <processCategory>. Refer to Para 2.1.1.5.
- <supplyRqmtStatus>. Refer to Para 2.1.1.6.
- <specGroup>, references to the applicable specifications. Refer to Chap 3.9.5.2.11.7.
- <supplyRqmtAlts>. Refer to Para 2.1.1.7.
- <rcmd>. Refer to Para 2.1.1.8.6.
- <refs>. References must be populated in accordance with Chap 3.9.5.2.1.2.

2.1.1.1 Supply requirement identifier

Description: The element <supplyRqmtIdent>, contrary to the attribute id, semantically identifies the supply requirement as a result of its attributes.

Markup element: <supplyRqmtIdent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- materialCategory (O), the nature of use of the supply requirement (eg, fuel, cleaning agent, lubricant)
- supplyRqmtNumber (M), the supply requirement number
- vendorFlag (O), whether the supply requirement is defined by a supplier or by the Product manufacturer. The attribute can have one of the following values:
  - "1" - Yes, the supply requirement is defined by a supplier
  - "0" - No, the supply requirement is defined by the Product manufacturer
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<supplyRqmtIdent materialCategory="09"
supplyRqmtNumber="09-001"/>
```

2.1.1.2 Physical and/or chemical description

Description: The element <physicalChemicalDescr> contains the physical and/or chemical product properties describing the supply requirement.

Markup element: <physicalChemicalDescr>

Attributes:

- None

Child elements:

- None

Markup example:

```
<physicalChemicalDescr>Manganese polysulphide sealant
overcoat</physicalChemicalDescr>
```

2.1.1.3 Usage

Description: The element <usage> contains the textual description of the supply requirement usage.

Markup element: <usage>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<usage>For fuel tank</usage>
```

2.1.1.4 Compliance category

Description: The element <complianceCategory> indicates whether the alternatives listed within the supply requirement are strictly limited to the ones listed or not, and to what extent the list of alternatives can be extended.

Markup element: <complianceCategory>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- complianceCategoryValue (O), represents the value of the compliance category. The attribute can have one of the following values:
  - "A" - The supply requirements do not allow selection of other products than the one listed below it. They are not open to external market.
  - "B" - The supply requirements allow selection of additional products thru through a proposed specification (eg, MIL, SAE). They are open to external market with a specification.
  - "C" - The supply requirements cover commonly available products that can be locally purchased. They are open to the external market without a specification.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<complianceCategory complianceCategoryValue="A"/>
```

2.1.1.5 Process category

Description: The element <processCategory> identifies the process category of the supply requirement. The process category is the technical or operational description of the processes of use (eg, roller application, brushing, spraying). For projects or organizations complying with REACH regulation, this element can contain the REACH process category value.

Markup element: <processCategory>

Attributes:

– None

Child elements:

– None

Markup example:

```
<processCategory>Roller application</processCategory>
```

2.1.1.6 Supply requirement status

Description: The element <supplyRqmtStatus> contains the supply requirement history. For instance, it indicates the supply requirement authorization status, if it has been superseded by another one, or split into two other supply requirements.

Markup element: <supplyRqmtStatus>. Refer to Fig 2.

Attributes:

– supplyRqmtStatusValue (O), the status of the supply requirement (eg, not authorized, superseded, split)

Child elements:

– <supplyRqmtRef>, enables referring to another supply requirement if the supply requirement has been superseded or split by another one. Refer to Chap 3.9.5.2.1.9.

Markup example:

```
<supplyRqmtStatus supplyRqmtStatusValue="split">
<supplyRqmtRef .../>
<supplyRqmtRef .../>
</supplyRqmtStatus>
```

2.1.1.7 Supply requirement alternative group

Description: The element <supplyRqmtAlts> contains a group of supply requirement alternatives.

Markup element: <supplyRqmtAlts>. Refer to Fig 2.

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

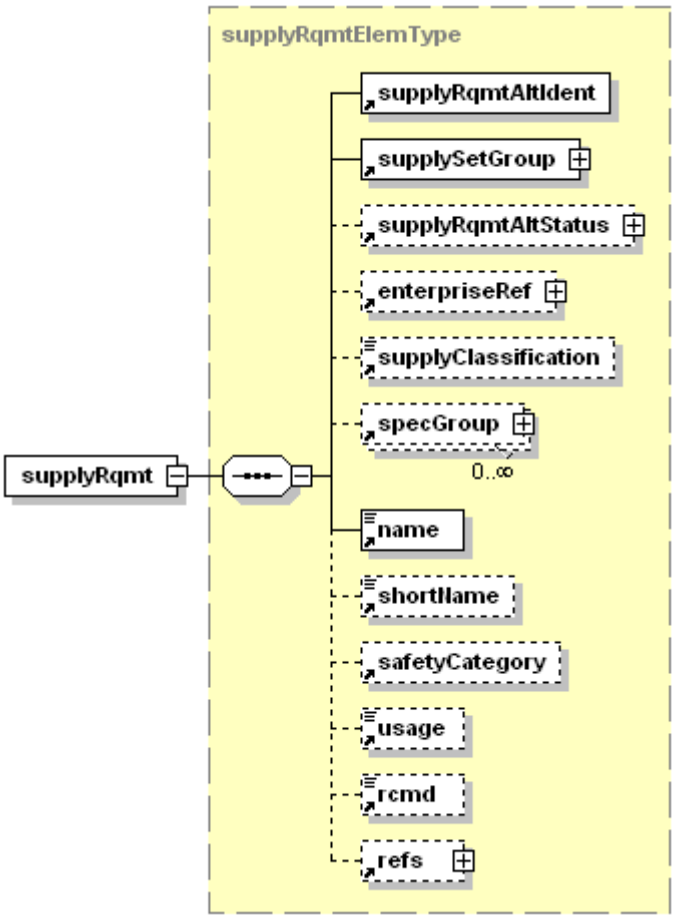
Child elements:

- <supplyRqmt>. Refer to Para 2.1.1.8.

2.1.1.8 Alternative of the supply requirement

Description: The element <supplyRqmt> represents one alternative of the supply requirement. Each alternative lists one or several supplies that fulfill the supply requirement.

Markup element: <supplyRqmt>



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Fig 3 Element <supplyRqmt>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- productCategory (O), the product category of the supply requirement alternative. Projects or organizations are allowed to define their own product categories. The attribute can have one of the following values:
  - "pcg01" thru "pcg99". Refer to Chap 3.9.6.1.
- supplyRqmtType (O), the type of the supply requirement alternative
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <supplyRqmtAltIdent>. Refer to Para 2.1.1.8.1.
- <supplySetGroup>, the references to the sets of supplies. Refer to Chap 3.9.5.2.11.7.
- <supplyRqmtAltStatus>. Refer to Para 2.1.1.8.2.
- <enterpriseRef>, the reference to an enterprise. Refer to Chap 3.9.5.2.11.6.
- <supplyClassification>, the classification related to the supply. Refer to Chap 3.9.5.2.11.7.
- <specGroup>, references to the applicable specifications. Refer to Chap 3.9.5.2.11.7.
- <name>, the name of the requirement. Refer to Chap 3.9.5.2.1.10.
- <shortName>, abbreviated alternate name. Refer to Chap 3.9.5.2.1.10.
- <safetyCategory>. Refer to Para 2.1.1.8.4.
- <usage>. Refer to Para 2.1.1.8.5.
- <rcmd>. Refer to Para 2.1.1.8.6.
- <refs>. References must be populated in accordance with Chap 3.9.5.2.1.2.

2.1.1.8.1 Supply requirement alternative identifier

Description: The element <supplyRqmtAltIdent>, contrary to the attribute id, semantically identifies the supply requirement as a result of its attributes.

Markup element: <supplyRqmtAltIdent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- materialCategory (O), the nature of use of the supply requirement alternative (eg, fuel, cleaning agent, lubricant)
- supplyRqmtNumber (M), the supply requirement alternative number
- vendorFlag (O), whether the supply requirement alternative is defined by a supplier. The attribute can have one of the following values:
  - "1" - Yes, for a supply requirement alternative defined by a supplier
  - "0" - No, for a supply requirement alternative defined by the Product manufacturer
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– None

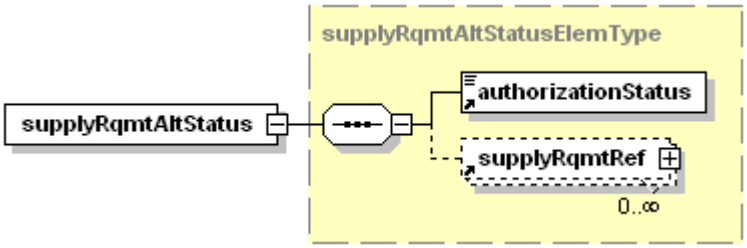
Markup example:

```
<supplyRqmtAltIdent materialCategory="09"
supplyRqmtNumber="09-001A"/>
```

2.1.1.8.2 Supply requirement alternative status

Description: The element <supplyRqmtAltStatus> tracks the supply requirement alternative history. For example, it indicates the supply requirement alternative authorization status and indicates if it has been superseded by another supply requirement or split into two other supply requirements.

Markup element: <supplyRqmtAltStatus>



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Fig 4 Element <supplyRqmtAltStatus>

Attributes:

– None

Child elements:

– <authorizationStatus>. Refer to Para 2.1.1.8.3.
– <supplyRqmtRef>, enables referring to another supply requirement if the supply requirement has been superseded or split by another one. Refer to Chap 3.9.5.2.1.9.

2.1.1.8.3 Authorization status

Description: The element <authorizationStatus> contains the authorization status of the supply requirement alternative.

Markup element: <authorizationStatus>

Attributes:

– authorizationStatusDate (O), the date from which the authorization status is valid

Child elements:

– None

Markup example:

```
<authorizationStatus authorizationStatusDate="20100801">REACH
banned</authorizationStatus>
```

2.1.1.8.4 Safety category

Description: The element <safetyCategory> contains the safety category of the supply listed in the supply requirement alternative.

Markup element: <safetyCategory>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- safetyCategoryValue (M), specifies the supply requirement safety category. The attribute can have one of the following values:
  - "A" - for supply requirement alternatives mandatory for safety reasons
  - "B" - for recommended supply requirement alternatives
  - "C" - for common supply requirement alternatives
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<safetyCategory safetyCategoryValue="A"/>
```

2.1.1.8.5 Usage

Description: The element <usage> contains the alternative textual description of the supply requirement usage.

Markup element: <usage>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<usage>IMMERSION OF BSB LABEL</usage>
```

2.1.1.8.6 Recommendation

Description: The element <rcmd> contains the recommendations linked to the supply requirement or the supply requirement alternative.

Markup element: <rcmd>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<rcmd>REFER TO THE ENGINE MANUFACTURERS DATA FOR APPROVED FUEL
ADDITIVES</rcmd>
```

3 Examples

These examples show the combined use of the supplies CIR and the supply requirements CIR.

The following example illustrates the supplies CIR, for intrinsic properties. It defines two supplies and related properties.

```
<commonRepository>
<supplyRepository>
<supplySpec>
<supplyIdent supplyNumber="BSB-DUROFIX_FIXATIF_UW_SPECIAL"
supplyNumberType="sp01"/>
<specGroup vendorFlag="0">
<specDocument countryIsoCode="FR"
specDocumentNumber="IPDA 28-05"/>
</specGroup>
<enterpriseGroup>
<enterpriseInfo locallySuppliedFlag="0">
<enterpriseRef manufacturerCodeValue="F8808"/>
<shippingInfo>
<packaging>1 AND 20 LITER (0.265 AND 5.3 GAL) CAN</packaging>
<shelfLife>APPROX 4 YEARS AT 20 DEG C (68 DEG F)</shelfLife>
<transport>FLAMMABLE LIQUID</transport>
</shippingInfo>
</enterpriseInfo>
</enterpriseGroup>
</supplySpec>
```

```
<supplySpec>
<supplyIdent supplyNumber="BSB-DUROFIX_FIXATIF_UW"
supplyNumberType="sp01"/>
<specGroup vendorFlag="0">
<specDocument countryIsoCode="FR"
specDocumentNumber="ASNA3572"/>
</specGroup>
<enterpriseGroup>
<enterpriseInfo locallySuppliedFlag="0">
<enterpriseRef manufacturerCodeValue="F8808"/>
<shippingInfo>
<packaging>1 AND 20 LITER (0.265 AND 5.3 GAL) CAN</packaging>
<shelfLife>APPROX 4 YEARS AT 20 DEG C (68 DEG F)</shelfLife>
<transport>FLAMMABLE LIQUID</transport>
</shippingInfo>
</enterpriseInfo>
</enterpriseGroup>
</supplySpec>
</supplyRepository>
</commonRepository>
```

The following example illustrates the supply requirements CIR. Defined supplies (see above) are targeted through the use of the element <supplyRef> with attribute supplyNumber properly filled.

```
<commonRepository>
<supplyRqmtRepository>
<supplyRqmtSpec id="inv0105029-">
<supplyRqmtIdent materialCategory="05" supplyRqmtNumber="029"/>
<supplyRqmtAlts><supplyRqmt>
<supplyRqmtAltIdent materialCategory="05" supplyRqmtNumber="029"
vendorFlag="0"/>
<supplySetGroup>
<supplySet>
<supplyRef supplyNumber="BSB-DUROFIX_FIXATIF_UW_SPECIAL"
supplyNumberType="sp01"/>
<supplyRef supplyNumber="BSB-DUROFIX_FIXATIF_UW"
supplyNumberType="sp01"/>
</supplySet>
</supplySetGroup>
<name>FIXATIVE FOR PLACARD INSTALLATION</name>
<safetyCategory safetyCategoryValue="C"/>
<usage>IMMERSION OF BSB LABEL</usage>
</supplyRqmt></supplyRqmtAlts>
</supplyRqmtSpec>
</supplyRqmtRepository>
</commonRepository>
```

Chapter 3.9.5.2.11.9

Common information repository - Tools

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Chap 4.13.3	Optimizing and reuse - Alternates concept
Chap 9.2.1	Terms, acronyms and subject index - Glossary of terms

1 General

The tools Common Information Repository (CIR) data module is used to capture and represent support equipment and their associated properties.

The support equipment identification can be used to uniquely identify any support equipment, including standard and special tools required to correctly accomplish a given action, task or procedure, using the element <toolRef>. Refer to Chap 3.9.5.2.1.9.

Note

Throughout this chapter, element and attribute names use the term “tool”, which in this chapter includes support equipment, which is defined in Chap 9.2.1.

Note

Refer to Para 3 for markup examples for the individual elements.

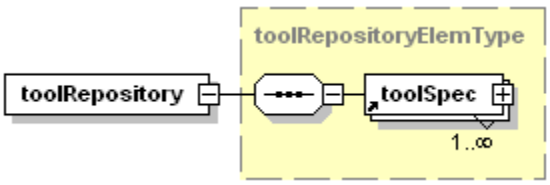
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Tools CIR data module content

2.1 Support equipment repository

Description: The element <toolRepository> contains a list of support equipment and their associated properties.

Markup element: <toolRepository>



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Fig 1 Element <toolRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <toolSpec>. Refer to Para 2.1.1.

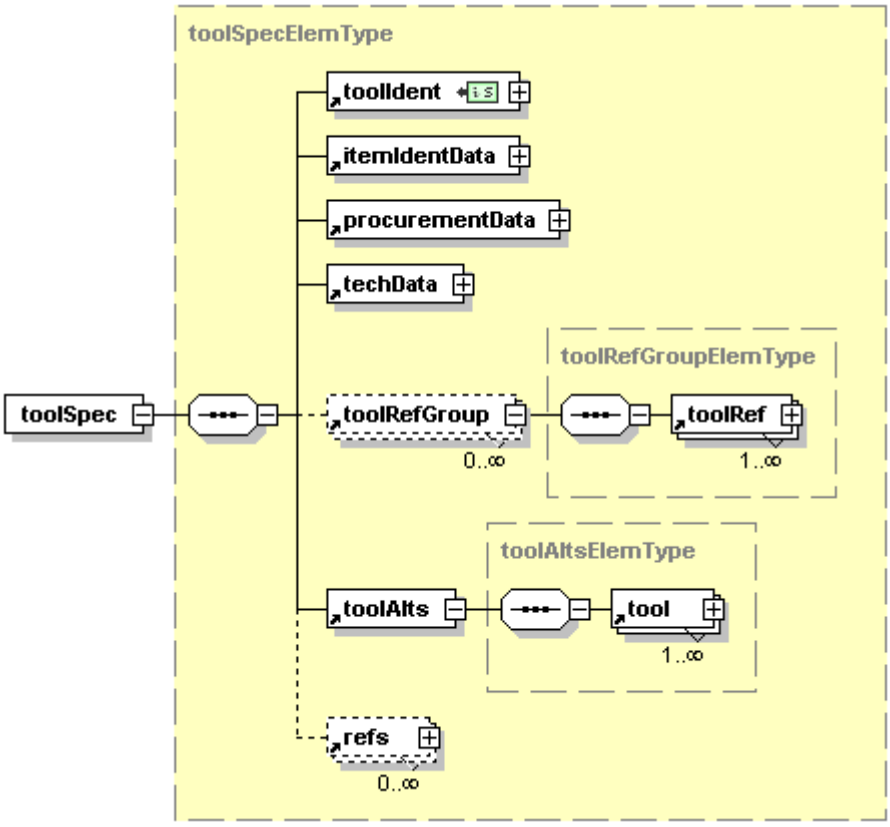
2.1.1 Support equipment specification

Description: The element <toolSpec> contains the associated properties for one piece of support equipment.

Some properties of the support equipment can vary from one product instance to another. Such properties are managed under the support equipment alternates (element <toolAlts>), which can contain a reference to an applicability annotation. Refer to Chap 4.13.3 for details on the alternates concept.

For some properties appearing at both levels (<toolSpec> and <tool>), the following rule must be applied: if the property is fulfilled in the alternate element, it supersedes the generic value stored in the parent element.

Markup element: <toolSpec>



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Fig 2 Element <toolSpec>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <toolIdent>. Refer to Para 2.1.1.1.
- <itemIdentData>, the full description of the support equipment. Refer to Chap 3.9.5.2.7.
- <procurementData>, how to procure the support equipment. Refer to Chap 3.9.5.2.7.
- <techData>, the technical properties of the support equipment. Refer to Chap 3.9.5.2.7.
- <toolRefGroup>. Refer to Para 2.1.1.2.
- <toolAlts>. Refer to Para 2.1.1.3.
- <refs>. References must be populated in accordance with Chap 3.9.5.2.1.2.

2.1.1.1 Support equipment identifier

Description: The element <toolIdent>, contrary to the attribute id, semantically identifies the support equipment as a result of its attributes.

Markup element: <toolIdent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- toolNumber (M), the support equipment part number used, together with the attribute manufacturerCodeValue, as the identifier of the support equipment, in the support equipment repository (implicit reference method).
- manufacturerCodeValue (M), the CAGE code of the support equipment manufacturer. As there is no standardized rule to assign a part number, the CAGE code of the support equipment manufacturer ensures the uniqueness of the support equipment identifier. Refer to Chap 3.9.5.2.1.10.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.1.1.2 References to other support equipment

Description: The element <toolRefGroup> provides relationships and the types of relationships with other support equipment.

Markup element: <toolRefGroup>. Refer to Fig 2.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- toolRefType (M), the type of the relationship with the child support equipment and tools (eg, symmetry, replacement relationship)
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <toolRef>, the references to the support equipment and tools. Refer to Chap 3.9.5.2.1.9.

Business rule decision point BRDP-S1-00260 - Use of the attribute toolRefType in the tools CIR:

- Decide which values to use for the attribute toolRefType and allocate suitable definitions to the values.

2.1.1.3 Support equipment alternate group

Description: The element <toolAlts> is a group of support equipment alternates.

Markup element: <toolAlts>. Refer to Fig 2.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

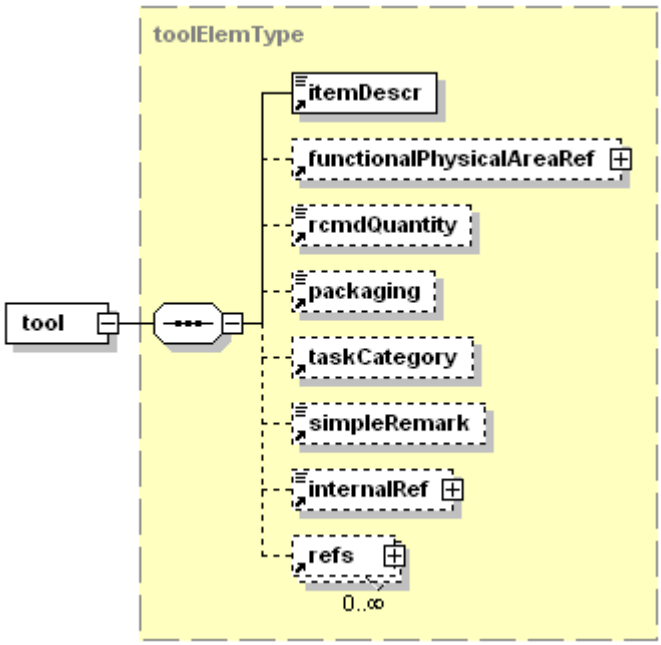
Child elements:

- <tool>. Refer to Para 2.1.1.4.

2.1.1.4 Alternate support equipment

Description: The element <tool> contains information that describes the support equipment and provides further information related to the support equipment based on the Product configuration.

Markup element: <tool>



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Fig 3 Element <tool>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `altNumber` (O), the alternate number to identify the alternate
- `deliveredSpecificationFlag` (O), whether a specification sheet is delivered with the support equipment. The attribute can have one of the following values:
  - "`1`" - Yes, a specification sheet is delivered
  - "`0`" - No, a specification sheet is not delivered
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`itemDescr`>, the description of the support equipment. Refer to Chap 3.9.5.2.11.4.
- <`functionalPhysicalAreaRef`>, a reference to a functional and/or physical area of the Product. Refer to Chap 3.9.5.2.11.10.
- <`rcmdQuantity`>. Refer to Para 2.1.1.4.1.
- <`packaging`>, information about the packaging of the support equipment. Refer to Chap 3.9.5.2.11.7.
- <`taskCategory`>. Refer to Para 2.1.1.4.2.
- <`simpleRemark`>, general remark (eg, about shipping the support equipment). Refer to Chap 3.9.5.2.11.7.

- <internalRef>, reference to the illustration or multimedia file where the support equipment is illustrated. Refer to Chap 3.9.5.2.1.2.
- <refs>. References must be populated in accordance with Chap 3.9.5.2.1.2.

Business rule decision point BRDP-S1-00261 - Use of the attribute altNumber in the tools CIR:

- Decide whether to use the attribute altNumber, which values to use and allocate suitable definitions to the values.

2.1.1.4.1 Recommended quantity

Description: The element <rcmdQuantity> contains the support equipment recommended quantity.

Markup element: <rcmdQuantity>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.1.1.4.2 Task code

Description: The element <taskCategory> specifies the usage of the support equipment (eg, servicing, maintenance, overhaul, repair).

Markup element: <taskCategory>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- taskCategoryCode (M), the support equipment task category value
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Business rule decision point BRDP-S1-00262 - Use of the attribute `taskCategoryCode` in the tools CIR:

- Decide which values (eg, servicing, maintenance, overhaul, repair) to use for the attribute `taskCategoryCode` and allocate suitable definitions to the values.

3 Example

```
<commonRepository>
<toolRepository>
<toolSpec>
<toolIdent toolNumber="PWC515916"
manufacturerCodeValue="0M197"/>
<itemIdentData>
<descrForPart>TUBE-GUIDE, BORESCOPE,POWER TURBINE</descrForPart>
<partKeyword>GUIDE</partKeyword></itemIdentData>
<procurementData>
<enterpriseRef manufacturerCodeValue="F0286"
enterpriseType="supplier"/>
</procurementData>
<techData>
<sparePartClass sparePartClassCode="1"/>
<partUsage partUsageCode="pu01"/>
</techData>
<toolRefGroup toolRefType="symmetric">
<toolRef toolNumber="PWC515918" manufacturerCodeValue="0M197"/>
</toolRefGroup>
<toolAlts>
<tool applicRefId="appl-001">
<itemDescr>This support equipment is used to move the borescope
during APU internal inspections of the Power
Turbine.</itemDescr>
<functionalPhysicalAreaRef systemCode="49" subSystemCode="2"/>
<rcmdQuantity>2</rcmdQuantity>
<taskCategory taskCategoryCode="maintenance"/>
</tool>
</toolAlts>
</toolSpec>
</toolRepository>
</commonRepository>
```

Chapter 3.9.5.2.11.10

Common information repository - Functional and/or physical areas

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Chap 4.3.5	Data module code - Disassembly code variant
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Chap No./Document No.	Title
Chap 8.2	SNS, information codes and learn codes - Maintained SNS

1 General

The functional and/or physical areas Common Information Repository (CIR) data module is used to store information about the functional and/or physical breakdown of the Product. Refer to Chap 4.3 and Chap 8.2.

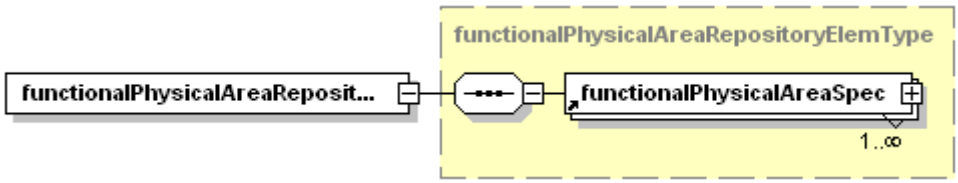
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Functional and/or physical areas CIR data module content

2.1 Functional and/or physical area repository

Description: The element <functionalPhysicalAreaRepository> contains a list of functional and/or physical areas and their associated properties.

Markup element: <functionalPhysicalAreaRepository>



ICN-S1000D-A-03090502-A-FAPE3-00094-A-001-01

Fig 1 Element <functionalPhysicalAreaRepository>

Attributes:

– None

Child elements:

– <functionalPhysicalAreaSpec>. Refer to Para 2.1.1.

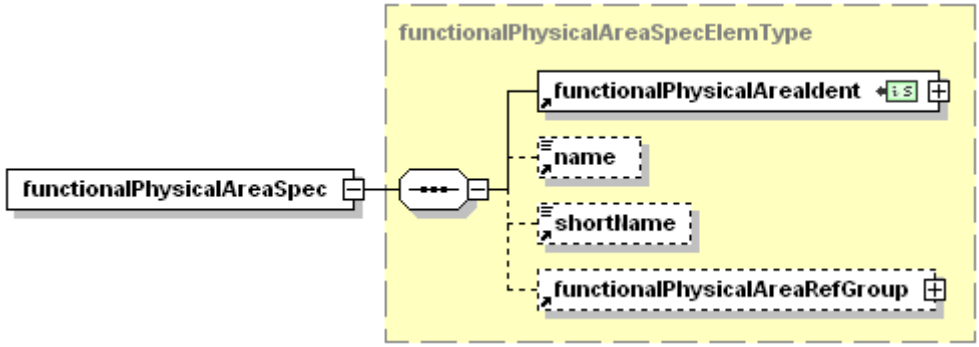
2.1.1 Functional and/or physical area specification

Description: The element <functionalPhysicalAreaSpec> contains the associated properties of one functional and/or physical area.

There are six types of functional and/or physical areas: the systems, the subsystems, the sub-subsystems, the assemblies, the disassemblies and the disassembly variants.

A given functional and/or physical area can have applicability and may not be valid for all instances of a Product.

Markup element: <functionalPhysicalAreaSpec>



ICN-S1000D-A-03090502-A-FAPE3-00095-A-001-01

Fig 2 Element <functionalPhysicalAreaSpec>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <functionalPhysicalAreaIdent>. Refer to Para 2.1.1.1.
- <name>, the name of the functional and/or physical area. Refer to Chap 3.9.5.2.1.10.
- <shortName>, the abbreviated alternate name. Refer to Chap 3.9.5.2.1.10.
- <functionalPhysicalAreaRefGroup>. Refer to Para 2.1.1.2.

2.1.1.1 Functional and/or physical area identifier

Description: The element <functionalPhysicalAreaIdent> semantically identifies the functional and/or physical area as a result of its attributes.

If values "0", "00" or "0000" are filled in the optional attributes subSystemCode, subSubSystemCode and assyCode, they are considered as significant values. In addition to the functional and/or physical area identifier, the system difference code can be specified for each functional and/or physical area.

Markup element: <functionalPhysicalAreaIdent>

Attributes:

- systemDiffCode (O), to indicate to which system difference code the functional and/or physical area pertains to. Refer to Chap 4.3.2.
- systemCode (M), the functional and/or physical area system code. Refer to Chap 4.3.3.
- subSystemCode (O), the functional and/or physical area subsystem code. Refer to Chap 4.3.3.
- subSubSystemCode (O), the functional and/or physical area sub-subsystem code. Refer to Chap 4.3.3.
- assyCode (O), the functional and/or physical area assembly code. Refer to Chap 4.3.3.

- `disassyCode` (O), the functional and/or physical area disassembly code. Refer to Chap 4.3.4.
- `disassyCodeVariant` (O), the functional and/or physical area disassembly code variant. Refer to Chap 4.3.5.

Child elements:

- None

Business rule decision point BRDP-S1-00263 - Use of the attribute `systemDiffCode` in the element <`functionalPhysicalAreaIdent`>:

- Decide whether to apply the system difference code in the functional and/or physical areas CIR data module.

Business rule decision point BRDP-S1-00264 - Use of the attributes `disassyCode` and `disassyCodeVariant` in the element <`functionalPhysicalAreaIdent`>:

- Decide whether to apply the disassembly code and disassembly variant code in the functional and/or physical areas CIR data module.

Markup examples:

The subsystem 21-1 must be populated:

```
<functionalPhysicalAreaIdent systemCode="21" subSystemCode="1"/>
```

The sub-subsystem 42-20 must be populated:

```
<functionalPhysicalAreaIdent systemCode="42" subSystemCode="2"
subSubSystemCode="0"/>
```

In case of project managing the disassembly in the functional and/or physical area repository, the disassembly 21-11-32-02 must be populated:

```
<functionalPhysicalAreaIdent systemCode="21" subSystemCode="1"
subSubSystemCode="1" assyCode="32" disassyCode="02"/>
```

In case of project managing several system difference codes, the system difference code value to which the functional area pertains to must to be indicated. The subsystem 21-1 in system difference code A must be populated:

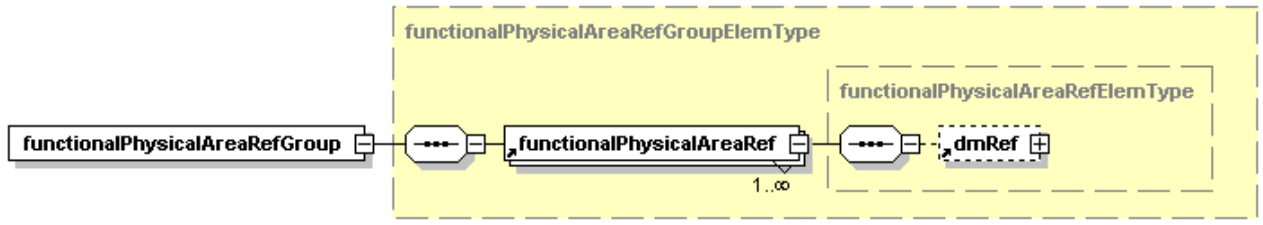
```
<functionalPhysicalAreaIdent systemDiffCode="A" systemCode="21"
subSystemCode="1"/>
```

2.1.1.2 References to other functional and/or physical areas

Description: The element <`functionalPhysicalAreaRefGroup`> reflects the functional and/or physical breakdown. If used, it must only contain the links from a functional and/or physical area to its direct child elements.

This means that a system can only refer to subsystems with the same system code values, a subsystem can only refer to sub-subsystems with the same system and subsystem code values, etc.

Markup element: <`functionalPhysicalAreaRefGroup`>



ICN-B6865-S1000D0013-001-01

Fig 3 Element <functionalPhysicalAreaRefGroup>

Attributes:

– None

Child elements:

– <functionalPhysicalAreaRef>. Refer to Para 2.1.1.3.

2.1.1.3 Functional and/or physical area

Description: The element <functionalPhysicalAreaRef> is used to mark up a functional and/or physical area (outside of its specification in the functional and/or physical areas CIR) and also allows referring to its specification in the functional and/or physical areas CIR.

Markup element: <functionalPhysicalAreaRef>. Refer to Fig 3.

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– systemDiffCode (O), the system difference code to which the functional and/or physical area pertains. Refer to Chap 4.3.2.
– systemCode (M), the functional and/or physical area system code. Refer to Chap 4.3.3.
– subSystemCode (O), the functional and/or physical area subsystem code. Refer to Chap 4.3.3.
– subSubSystemCode (O), the functional and/or physical area sub-subsystem code. Refer to Chap 4.3.3.
– assyCode (O), the functional and/or physical area assembly code. Refer to Chap 4.3.3.
– disassyCode (O), the functional and/or physical area disassembly code. Refer to Chap 4.3.4.
– disassyCodeVariant (O), the functional and/or physical area disassembly code variant. Refer to Chap 4.3.5.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <dmRef>. Data module references must be populated in accordance with Chap 3.9.5.2.1.2.

Markup example:

```
<functionalPhysicalAreaRef systemCode="21" subSystemCode="1"/>
```

3 Example

```
<content>
<referencedApplicGroup>
<applic id="appl-001">
<displayText>
<simplePara>A340-200, A340-500</simplePara>
</displayText>
<evaluate andOr="or">
<assert applicPropertyIdent="serie"
applicPropertyType="prodattr" applicPropertyValues="A340-200"/>
<assert applicPropertyIdent="serie"
applicPropertyType="prodattr" applicPropertyValues="A340-500"/>
</evaluate>
</applic>
<applic id="appl-002">
<displayText><simplePara>A340-500</simplePara></displayText>
<assert applicPropertyIdent="serie"
applicPropertyType="prodattr" applicPropertyValues="A340-500"/>
</applic>
</referencedApplicGroup>
<commonRepository>
<functionalPhysicalAreaRepository>
<functionalPhysicalAreaSpec applicRefId="appl-001">
<functionalPhysicalAreaIdent systemCode="21"/>
<name>Environmental control</name>
<functionalPhysicalAreaRefGroup>
<functionalPhysicalAreaRef systemCode="21" subSystemCode="1"/>
<functionalPhysicalAreaRef systemCode="21" subSystemCode="2"/>
</functionalPhysicalAreaRefGroup>
</functionalPhysicalAreaSpec>
<functionalPhysicalAreaSpec applicRefId="appl-001">
<functionalPhysicalAreaIdent systemCode="21" subSystemCode="1"/>
<name>Compression</name>
...
</functionalPhysicalAreaSpec>
<functionalPhysicalAreaSpec applicRefId="appl-002">
<functionalPhysicalAreaIdent systemCode="21" subSystemCode="2"/>
<name>Distribution</name>
...
</functionalPhysicalAreaSpec>
...
</functionalPhysicalAreaRepository>
</commonRepository>
</content>
```

Chapter 3.9.5.2.11.11

Common information repository - Controls and indicators

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Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.3	Data modules - Applicability
Chap 4.13.1	Optimizing and reuse - Common information repository concept
Chap 4.13.2	Optimizing and reuse - Incremental update of CIR data modules

1 General

The controls and indicators Common Information Repository (CIR) data module is used to capture and represent control and indicator information.

This information assists personnel in determining the location and function of the controls and indicators.

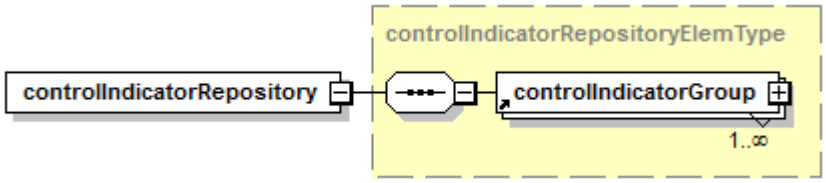
For more information on the CIR data module principles. Refer to Chap 4.13.1.

2 Controls and indicators CIR data module content

2.1 Controls and indicators repository

Description: The element <controlIndicatorRepository> contains control and indicator information.

Markup element: <controlIndicatorRepository>



ICN-S3627-S1000D0675-001-01

Fig 1 Element <controlIndicatorRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

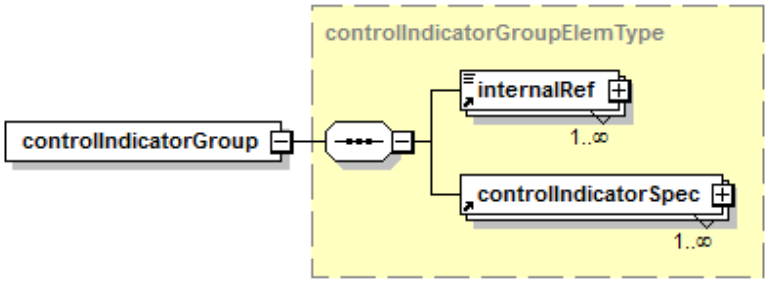
Child elements:

- <controlIndicatorGroup>. Refer to Para 2.1.1.

2.1.1 Control or indicator group

Description: The element <controlIndicatorGroup> contains a unique identification of controls and indicators, each grouped by equipment, assembly, or control panel.

Markup element: <controlIndicatorGroup>



ICN-S3627-S1000D0676-001-01

Fig 2 Element <controlIndicatorGroup>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`internalRef`>. Refer to Chap 3.9.5.2.1.2.
- <`controlIndicatorSpec`>. Refer to Para 2.1.1.1.

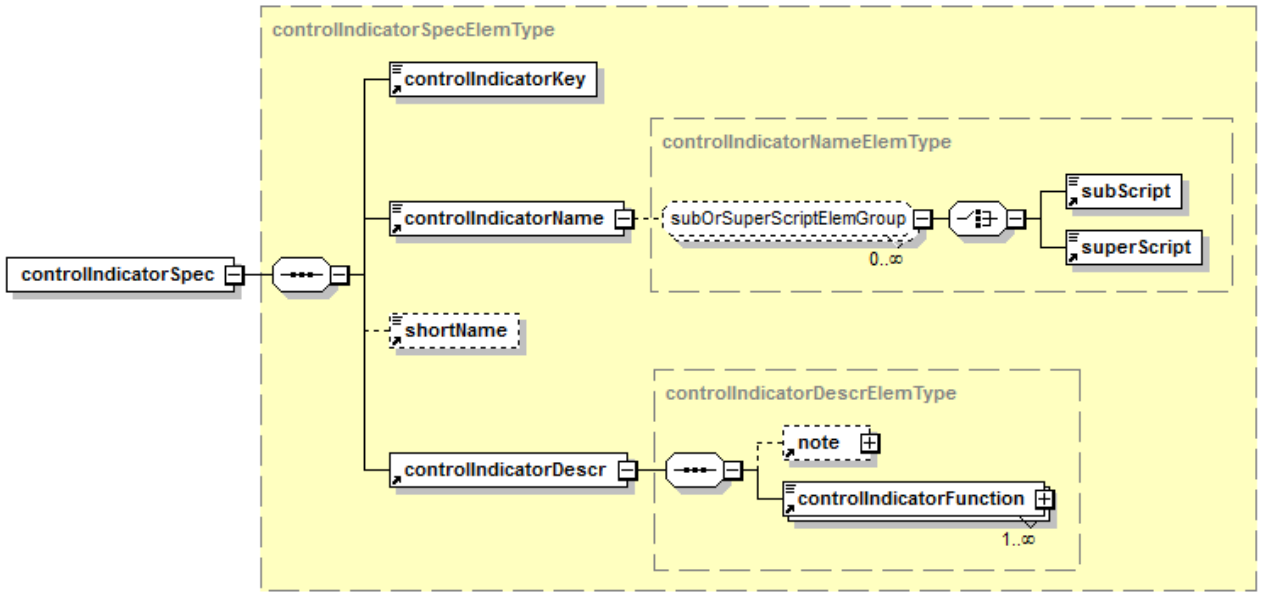
Markup example:

```
<controlIndicatorGroup>
<internalRef internalRefId="fig-0001"
internalRefTargetType="irtt01"/>
<controlIndicatorSpec>...</controlIndicatorSpec>
</controlIndicatorGroup>
```

2.1.1.1 Control and indicator information

Description: The element <`controlIndicatorSpec`> contains control and indicator information including illustration or index key, name, and description. This element is the target when a control or indicator is referenced from another data module, for example from a procedural data module, using the element <`controlIndicatorRef`>. Refer to Chap 3.9.5.2.1.10.

Markup element: <`controlIndicatorSpec`>



ICN-1G6E8-S1000D0001-002-01

Fig 3 Element <controlIndicatorSpec>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlIndicatorNumber (M), the identifier which can be used for implicit referencing within other data modules. Refer to Chap 4.13.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <controlIndicatorKey>. Refer to Para 2.1.1.1.1.
- <controlIndicatorName>. Refer to Para 2.1.1.1.2.
- <shortName>. Refer to Chap 3.9.5.2.1.10.
- <controlIndicatorDescr>. Refer to Para 2.1.1.1.3.

2.1.1.1.1 Control or indicator key

Description: The element <controlIndicatorKey> contains the illustration or index key of the control or indicator.

Markup element: <controlIndicatorKey>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<controlIndicatorKey>5</controlIndicatorKey>
```

2.1.1.1.2 *Control or indicator name*

Description: The element <controlIndicatorName> contains the name of the control or indicator.

Markup element: <controlIndicatorName>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<controlIndicatorName>Chrome Bell</controlIndicatorName>
```

2.1.1.1.3 *Control or indicator description*

Description: The element <controlIndicatorDescr> contains the information specific to a control or indicator.

Markup element: <controlIndicatorDescr>

Attributes:

- applicRefId (O), the applicability information. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

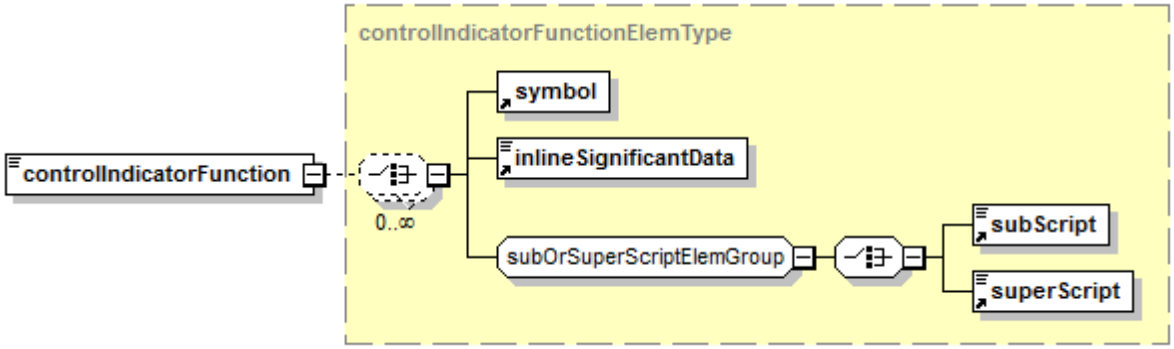
Child elements:

- <note>. Refer to Chap 3.9.3.
- <controlIndicatorFunction>. Refer to Para 2.1.1.1.4.

2.1.1.1.4 Control or indicator function

Description: The element <controlIndicatorFunction> contains one or more brief descriptions of the control or indicator function.

Markup element: <controlIndicatorFunction>



ICN-S3627-S1000D0678-001-01

Fig 4 Element <controlIndicatorFunction>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <symbol>. Refer to Chap 3.9.5.2.1.10.
- <inlineSignificantData>. Refer to Chap 3.9.5.2.1.10.
- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<controlIndicatorFunction>Push button to turn light
<inlineSignificantData
significantParaDataType="psd10">ON</inlineSignificantData> or
<inlineSignificantData
significantParaDataType="psd10">OFF</inlineSignificantData>.</co
ntrolIndicatorFunction>
```

3 Example

```
<commonRepository>
<figure id="fig-0001">
<title>Bike controls and indicators</title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-D000000-0-U8025-
00999-A-03-1"></graphic></figure>
<controlIndicatorRepository>
<controlIndicatorGroup>
<internalRef internalRefId="fig-0001"
internalRefTargetType="irtt01"/>
...
<controlIndicatorSpec controlIndicatorNumber="ci-0005">
<controlIndicatorKey>5</controlIndicatorKey>
<controlIndicatorName>Chrome bell</controlIndicatorName>
<controlIndicatorDescr>
<controlIndicatorFunction>Press to sound bell. Normally used to
signal a need for attention.</controlIndicatorFunction>
</controlIndicatorDescr>
</controlIndicatorSpec>
<controlIndicatorSpec controlIndicatorNumber="ci-0006">
<controlIndicatorKey>6</controlIndicatorKey>
<controlIndicatorName>Platform pedals</controlIndicatorName>
<controlIndicatorDescr>
<controlIndicatorFunction>Control the acceleration of the
bicycle.</controlIndicatorFunction>
</controlIndicatorDescr>
</controlIndicatorSpec>
<controlIndicatorSpec controlIndicatorNumber="ci-0007">
<controlIndicatorKey>7</controlIndicatorKey>
<controlIndicatorName>LED headlight</controlIndicatorName>
<controlIndicatorDescr>
<controlIndicatorFunction>Push button to turn light
<inlineSignificantData
significantParaDataType="psd10">ON</inlineSignificantData> or
<inlineSignificantData
significantParaDataType="psd10">OFF</inlineSignificantData>.</co
ntrolIndicatorFunction>
</controlIndicatorDescr>
</controlIndicatorSpec>
<controlIndicatorSpec controlIndicatorNumber="ci-0008">
<controlIndicatorKey>8</controlIndicatorKey>
<controlIndicatorName>LED taillight</controlIndicatorName>
<controlIndicatorDescr>
<controlIndicatorFunction>Lights illuminate automatically when
brakes are engaged.</controlIndicatorFunction>
</controlIndicatorDescr>
</controlIndicatorSpec>
</controlIndicatorGroup>
</controlIndicatorRepository>
</commonRepository>
```

Chapter 3.9.5.2.11.12

Common information repository - Applicability annotations

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Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.13	Common constructs - Externalization
Chap 3.9.5.3	Data modules - Applicability
Chap 4.13.1	Optimizing and reuse - Common information repository concept

1 General

The applicability annotations Common Information Repository (CIR) data module is used to store externalized applicability annotations for projects and organizations which need to externalize the applicability annotations from other data modules. The advantage of externalizing the applicability from other data modules is to simplify data module revisions.

The element <applicRef> is used in other data modules to refer to an applicability annotation stored in the applicability annotations CIR data module. Refer to Chap 3.9.5.2.1.13.

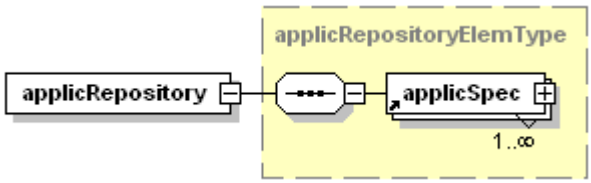
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Applicability annotations CIR data module content

2.1 Applicability annotations repository

Description: The element <applicRepository> contains a list of externalized applicability annotations used in the data modules.

Markup element: <applicRepository>



ICN-S1000D-A-03090502-A-FAPE3-00099-A-001-01

Fig 1 Element <applicRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

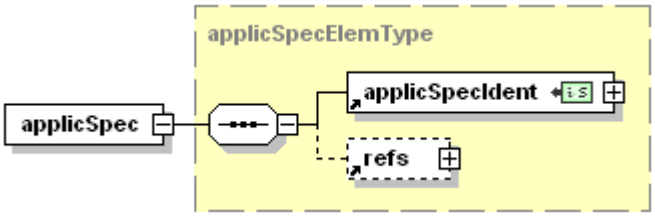
Child elements:

- <applicSpec>. Refer to Para 2.1.1.

2.1.1 Applicability annotation specification

Description: The element <applicSpec> represents one applicability annotation.

Markup element: <applicSpec>



ICN-S1000D-A-03090502-A-FAPE3-00100-A-001-01

Fig 2 Element <applicSpec>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- applicMapRefId (M), which refer to the referenced applicability annotation. Refer to Chap 3.9.5.3.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <applicSpecIdent>. Refer to Para 2.1.1.1.
- <refs>. Refer to Chap 3.9.5.2.1.2.

2.1.1.1 Applicability annotation identifier

Description: The element <applicSpecIdent> uniquely identifies the applicability annotation through its attribute applicIdentValue. This identifier must be used to refer from the data modules where the applicability annotation is externalized (element <applicRef>) to the externalized applicability annotation in the applicability annotations CIR data module.

Markup element: <applicSpecIdent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- applicIdentValue (M), the applicability annotation identifier
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<applicSpecIdent applicIdentValue="app-
S1000DLIGHTINGAAAD00000000AA056AA-0000"/>
```

3 Examples

The following examples illustrate two externalized applicability annotations stored in the applicability annotations CIR data module.

The first one is coming from DMC-S1000DLIGHTING-AAA-D00-00-00-00AA-056A-A and the second one from DMC-S1000DLIGHTING-AAA-D00-00-00-00AA-057A-A.

```
<content>
<referencedApplicGroup>
<applic id="appl-0001">
<displayText><simplePara>Mountain bicycle and (Mountain storm
Mk1 or Brook trekker Mk9)</simplePara></displayText>
```

```
...
</applic>
...
</referencedApplicGroup>
<commonRepository>
<applicRepository>
<applicSpec id="appsp-00001" applicMapRefId="appl-0001">
<applicSpecIdent applicIdentValue="app-
S1000DLIGHTINGAAAD00000000AA056AA-0000"/>
</applicSpec>
...
<applicSpec id="appsp-00006" applicMapRefId="appl-0001">
<applicSpecIdent applicIdentValue="app-
S1000DLIGHTINGAAAD00000000AA057AA-0000"/>
</applicSpec>
...
</applicRepository>
</commonRepository>
</content>
```

Chapter 3.9.5.2.11.13

Common information repository - Warnings

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Chap 3.9.5.2.1.11	Common information repository - Controls and indicators
Chap 3.9.5.2.1.13	Common constructs - Externalization
Chap 4.13.1	Optimizing and reuse - Common information repository concept

1 General

The warnings Common Information Repository (CIR) data module is used to collect and centralize in one place warnings used in several data modules. It is an alternative to the warning collection at data module level. Refer to Chap 3.9.3.

The element <warningRef>, child of the element <warningsAndCautionsRef>, is used in the other data modules to refer to a warning stored in the warnings CIR data module. Refer to Chap 3.9.5.2.1.13.

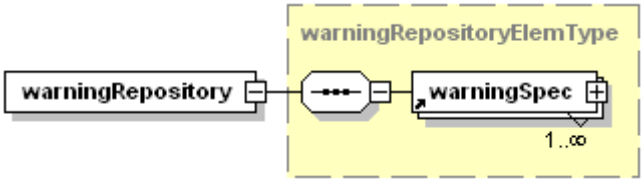
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Warnings CIR data module content

2.1 Warnings repository

Description: The element <warningRepository> contains a collection of warnings used in the data modules.

Markup element: <warningRepository>



ICN-S1000D-A-03090502-A-FAPE3-00102-A-001-01

Fig 1 Element <warningRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

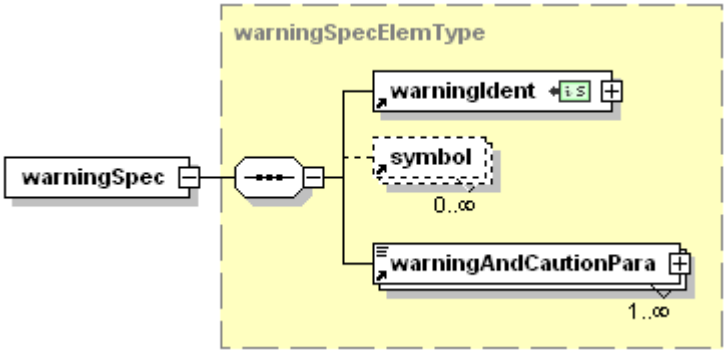
Child elements:

- <warningSpec>. Refer to Para 2.1.1.

2.1.1 Warning specification

Description: The element <warningSpec> represents one warning.

Markup element: <warningSpec>



ICN-S1000D-A-03090502-A-FAPE3-00103-A-001-01

Fig 2 Element <warningSpec>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <warningIdent>. Refer to Para 2.1.1.1.
- <symbol>. Refer to Chap 3.9.5.2.1.10.
- <warningAndCautionPara>. Refer to Chap 3.9.3.

2.1.1.1 Warning identifier

Description: The element <warningIdent> uniquely identifies the warning though its attribute warningIdentNumber. This identifier must be used to refer from the data modules where the warning is externalized (element <warningRef>) to the externalized warning in the warnings CIR data module.

Markup element: <warningIdent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- warningIdentNumber (M), the warning identifier
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<warningIdent warningIdentNumber="0-0204504-1"/>
```

3 Example

The following example illustrates two warnings stored in the warnings CIR data module.

```
<content>
<commonRepository>
<warningRepository>
<warningSpec id="warn-00001">
<warningIdent warningIdentNumber="0-0204504-1"/>
<warningAndCautionPara>Make sure that the bulb is cool before
you replace it.</warningAndCautionPara>
```

```
</warningSpec>
<warningSpec id="warn-00002">
<warningIdent warningIdentNumber="0008037-802"/>
<warningAndCautionPara>Make sure the light glass is not broken
before handling it</warningAndCautionPara>
</warningSpec>
...
</warningRepository>
</commonRepository>
</content>
```

Chapter 3.9.5.2.11.14

Common information repository - Cautions

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Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.2.1.11	Common constructs - Controlled content
Chap 3.9.5.2.1.13	Common constructs - Externalization
Chap 4.13.1	Optimizing and reuse - Common information repository concept

1 General

The cautions Common Information Repository (CIR) data module is used to collect and centralize in one place cautions used in several data modules. It is an alternative to the caution collection at data module level. Refer to Chap 3.9.3.

The element <cautionRef>, child of the element <warningsAndCautionsRef>, is used in the other data modules to refer to a caution stored in the cautions CIR data module. Refer to Chap 3.9.5.2.1.13.

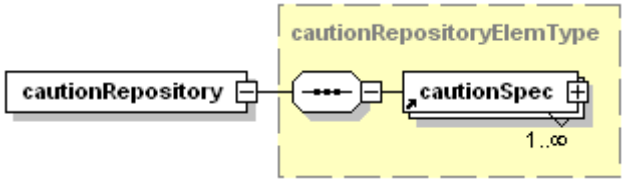
For more information on the CIR data module principles, refer to Chap 4.13.1.

2 Cautions CIR data module content

2.1 Cautions repository

Description: The element <cautionRepository> contains a collection of cautions used in the data modules.

Markup element: <cautionRepository>



ICN-S1000D-A-03090502-A-FAPE3-00105-A-001-01

Fig 1 Element <cautionRepository>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

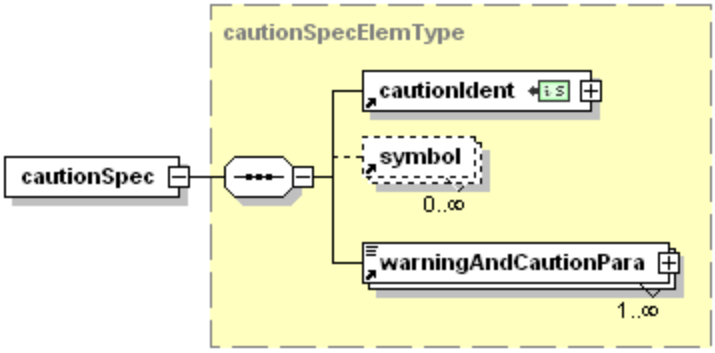
Child elements:

- <cautionSpec>. Refer to Para 2.1.1.

2.1.1 Caution specification

Description: The element <cautionSpec> represents one caution.

Markup element: <cautionSpec>



ICN-S1000D-A-03090502-A-FAPE3-00106-A-001-01

Fig 2 Element <cautionSpec>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <cautionIdent>. Refer to Para 2.1.1.1.
- <symbol>. Refer to Chap 3.9.5.2.1.10.
- <warningAndCautionPara>. Refer to Chap 3.9.3.

2.1.1.1 Caution identifier

Description: The element <cautionIdent> uniquely identifies the caution through its attribute cautionIdentNumber. This identifier must be used to refer from the data modules where the caution is externalized (element <cautionRef>) to the externalized caution in the cautions CIR data module.

Markup element: <cautionIdent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- cautionIdentNumber (M), the caution identifier
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<cautionIdent cautionIdentNumber="0-0204504-1"/>
```

3 Example

The following example illustrates two cautions stored in the cautions CIR data module.

```
<content>
<commonRepository>
<cautionRepository>
<cautionSpec id="caut-00001">
<cautionIdent cautionIdentNumber="0-0204504-1"/>
<warningAndCautionPara>Do not touch the glass of the
bulb.</warningAndCautionPara>
```

```
</cautionSpec>
<cautionSpec id="caut-00002">
<cautionIdent cautionIdentNumber="0008037-802"/>
<warningAndCautionPara>Make sure that the glass is clean before
installing it on the light.</warningAndCautionPara>
</cautionSpec>
...
</cautionRepository>
</commonRepository>
</content>
```

Chapter 3.9.5.2.12

Content section - Container data module

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Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 4.13.4	Optimizing and reuse - Container data module

1 General

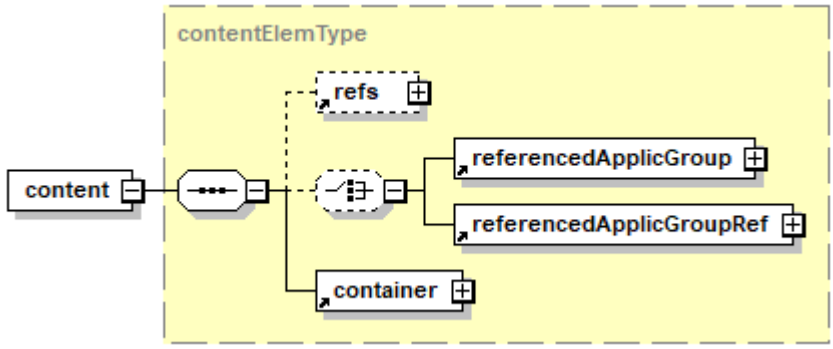
This chapter details the use of the container data module. The container data module provides a mechanism to associate several alternate data modules representing the same data. The general mechanism of the container data module is described in Chap 4.13.4.

2 Container data module content

2.1 Content

Description: The element <content> contains the content section of a container data module.

Markup element: <content>



ICN-B6865-S1000D0021-001-01

Fig 1 Element <content>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

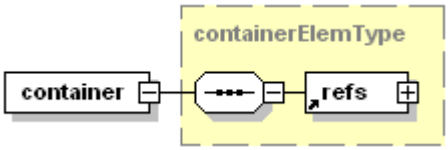
Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
- <container>. Refer to Para 2.2.

2.2 Container

Description: The element <container> contains the list of alternate data modules, which are in the container.

Markup element: <container>



ICN-S1000D-A-03090502-A-FAPE3-00109-A-001-01

Fig 2 Element <container>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <refs>, the references to alternate data modules. Refer to Chap 3.9.5.2.1.2.

3 Example

The following markup example illustrates a container data module referencing two alternate data modules.

```
<dmodule>
<identAndStatusSection>
<dmAddress>
<dmIdent>
<dmCode modelIdentCode="AJ" systemDiffCode="A"
systemCode="35" subSystemCode="1" subSubSystemCode="3"
assyCode="51" disassyCode="00" disassyCodeVariant="A"
infoCode="720" infoCodeVariant="A" itemLocationCode="A"/>
<language languageIsoCode="en" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</dmIdent>
<dmAddressItems>
<issueDate day="03" month="01" year="2006"/>
<dmTitle>
<techName>Crew</techName>
<infoName>Install procedure</infoName>
</dmTitle>
</dmAddressItems>
</dmAddress>
<dmStatus issueType="new">
<security securityClassification="01"/>
<responsiblePartnerCompany>
<enterpriseName>A</enterpriseName>
</responsiblePartnerCompany>
<originator enterpriseCode="XXX"/>
<applic>
<displayText><simplePara>All</simplePara></displayText>
</applic>
<brexDmRef>
<dmRef>
...
</dmRef>
</brexDmRef>
<qualityAssurance>
<unverified/>
</qualityAssurance>
</dmStatus>
</identAndStatusSection>
<content>
<container>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="AJ" systemDiffCode="A" systemCode="35"
subSystemCode="1" subSubSystemCode="3" assyCode="51"
disassyCode="00" disassyCodeVariant="B" infoCode="720"
infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
```

```
</dmRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="AJ" systemDiffCode="A" systemCode="35"
subSystemCode="1" subSubSystemCode="3" assyCode="51"
disassyCode="00" disassyCodeVariant="C" infoCode="720"
infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
</container>
</content>
</dmodule>
```

Chapter 3.9.5.2.13

Content section - Learning data module

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2.1	Content section - Common constructs
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.13.1	Learning data module - Learning plan information type
Chap 3.9.5.2.13.2	Content section - Learning overview information
Chap 3.9.5.2.13.3	Content section - Learning content information
Chap 3.9.5.2.13.4	Content section - Learning summary information
Chap 3.9.5.2.13.5	Content section - Learning assessment information
Chap 3.9.5.3	Data modules - Applicability
SCORM 2004	SCORM 2004 4th Edition

1 General

S1000D supports technical training information development through the use of the learning data module. The Schema for this data module structures technical learning content and configures it to the system being instructed in the lessons. It also maintains the use of standard S1000D XML structures. By maintaining the common S1000D structures, reuse between technical data and its supporting learning content is possible without the need for conversion from other formats.

1.1 Why use S1000D for technical training data?

The primary reason for using S1000D for technical training content is to ensure that the training content is current with other system documentation throughout the life cycle. S1000D improves life cycle configuration management. It is crucial for a data manager to know how a system design change effects supporting documentation, including training. There must be a common thread linked throughout the life cycle support data. That thread is supported by S1000D metadata. The use of S1000D provides a common set of metadata for all life cycle supportability content, thereby enabling queries and tools to help manage the content en masse. S1000D serves as a common digital data format for technical data and technical training content.

1.2 How S1000D supports training content structures and file naming

Five data structures have been designed to support the instructional design process. These structures have been modeled with course development, course content and course assessment in mind. The target instructional development audiences are the operational and technical training communities. Learning content designed to teach operational and maintenance procedures, system breakdown and repair can be supported with file names configured according to a meaningful data module code.

To support the various types of information concerned, the structures offered provide a wide variety of possibilities. Generally, projects must ensure that these possibilities are used in a sensible way to avoid creating unnecessary complex content structures.

The Sharable Content Object Reference Model (SCORM) primarily addresses how a learning content package module is constructed so that it operates in any SCORM-conformant Learning Management System (LMS). Naming conventions are left to individual learning development teams. S1000D standardize the naming conventions by providing data module coding structures that configures the learning content to the supported systems and assemblies.

1.3 How S1000D works with SCORM

SCORM is a United States Department of Defense specification developed by Advanced Distributed Learning (ADL). It has been adopted around the world. Its function is to ensure that an electronic learning content package module is interoperable with any SCORM-conformant LMS. An LMS tracks the learner's progress through a course.

SCORM is a model that references a collection of learning-oriented specifications that work to collect, describe, enable and distribute learning. SCORM does not specify course content or data formats. The technology is applicable to any learning subject matter and any data format. S1000D is a markup specification and fills SCORM data specification gap for technical learning content. S1000D can name, identify and structure technical learning content and offer configuration management support.

2 Learning information

2.1 Description

The learning Schema supports the development of technical learning objects. Object structures include support for needs analysis, learning objectives and interactive assessment. The intention is to support technical learning content in the life cycle logistics process.

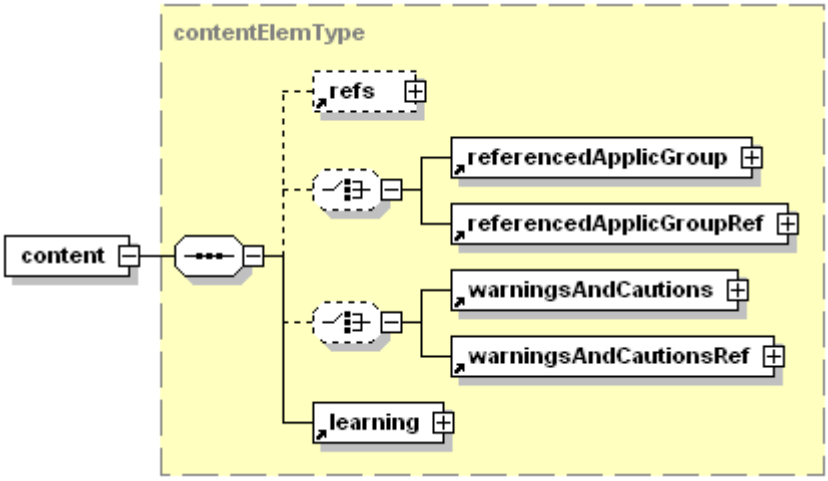
Note

The learning data module uses common constructs in addition to the markup unique to the learning schema. Refer to Chap 3.9.5.2.1.

2.2 Content

Description: The element <content> contains the content section of the learning data module.

Markup element: <content>



ICN-06RT9-000001-001-01

Fig 1 Element <content>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
- <warningsAndCautions>. Refer to Chap 3.9.3.
- <warningsAndCautionsRef>. Refer to Chap 3.9.3.
- <learning>. Refer to Para 2.3.

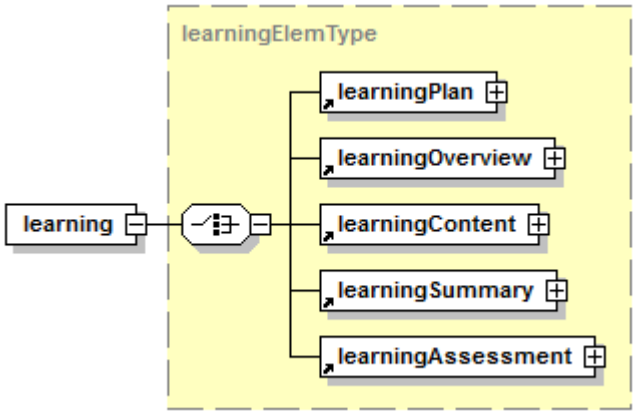
2.3 Learning content

Description: The element <learning> contains one of the five learning information types:

- learning plan
- learning overview
- learning content
- learning summary
- learning assessment

Separate data modules are needed for each learning information type.

Markup element: <learning>



ICN-06RT9-000016-001-01

Fig 2 Element <learning>

Attributes:

– None

Child elements:

– <learningPlan>, the learning planning information. Refer to Chap 3.9.5.2.13.1.
– <learningOverview>, the learning overview. Refer to Chap 3.9.5.2.13.2.
– <learningContent>, the learning content. Refer to Chap 3.9.5.2.13.3.
– <learningSummary>, the learning summary. Refer to Chap 3.9.5.2.13.4.
– <learningAssessment>, the learning assessment. Refer to Chap 3.9.5.2.13.5.

The substructures of the element <learning> include in several locations optional occurrences of element <title> in several locations. In order to achieve a readable and unambiguous presentation, given titles and generated titles must be provided in the output a sensible way.

Business rule decision point BRDP-S1-00561 - Use of titles in the Learning data module:

– In the substructures of the Learning data module, decide to what extent optional occurrences of the element <title> can be used and how given titles and generated titles must be presented to achieve a readable presentation of the information.

3 Example

Refer to Chap 3.9.5.2.13.1 thru Chap 3.9.5.2.13.5 for examples of markup of the child elements.

Chapter 3.9.5.2.13.1

Learning data module - Learning plan information type

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.5	Common constructs - Titles
Chap 3.9.5.2.2	Content section - Descriptive Information
Chap 3.9.7	Authoring - Human performance technology and training

1 General

The learning plan information model is the first branch in the learning schema. It contains content structures to support the capture and management of human performance system analysis data and requirements. For example, worker attributes, resources available, capacity to perform required maintenance tasks. It also contains content structures to capture training needs analysis data, such as learning objectives, trainee characteristics, assessment criteria, etc.

The learning plan branch supports the processes and requirements of Performance Analysis (PA) for Human Performance Technology (HPT) and Training Needs Analysis (TNA) for Instructional Systems Design (ISD). Structures included within the learning plan schema to support HPT PA include the following: Organizational analysis, gap analysis, organizational environment analysis, work environment analysis, performer analysis, cause analysis, and performance evaluation. Structures included to support ISD TNA include the following: Target

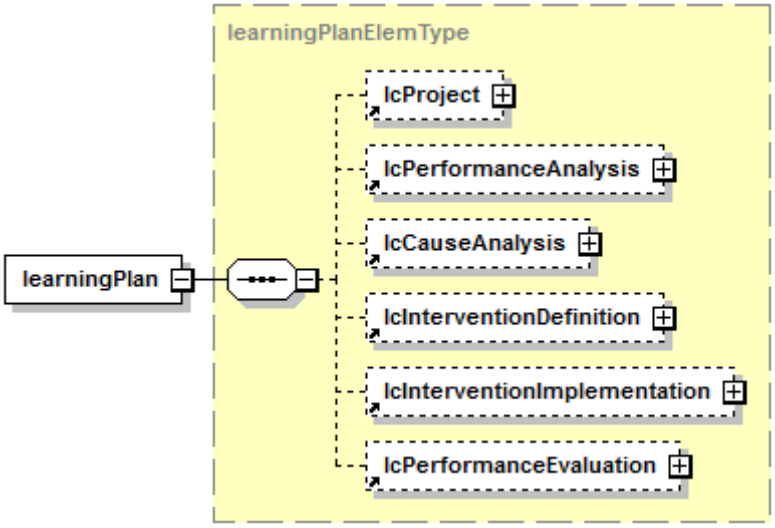
audience, prerequisites, required entry behaviors, training component (learning strategy, duration, required personnel, etc), assessment strategy, learning objective.

2 Learning plan content

Description: The element <learningPlan> captures the human performance system characteristics and requirements with a learning data module. It is also used to describe the requirements of interventions, including training interventions, intended to support the end user in performing tasks related to the maintenance or operation of the product. For example, a learning plan topic can describe the learning objectives of a technician training lesson about the proper disassembly of product. The learning plan structure is contained within the element <learning>.

Lesson plans are not traditionally viewed or utilized by learners. However, a lesson plan is the precursor and the foundation to instructional material. Kept together, lesson plans and the learning content developed from the plans form a complete instructional unit.

Markup element: <learningPlan>



ICN-1654N-S1000D0018-001-01

Fig 1 Element <learningPlan>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lcProject>. Refer to Para 2.1.
- <lcPerformanceAnalysis>. Refer to Para 2.2.
- <lcCauseAnalysis>. Refer to Para 2.3.
- <lcInterventionDefinition>. Refer to Para 2.4.

- <lcInterventionImplementation>. Refer to Para 2.5.
- <lcPerformanceEvaluation>. Refer to Para 2.6.

Business rule decision point BRDP-S1-00267 - Conducting a performance analysis:

- Decide whether to conduct a performance analysis to determine factors that can affect performance and gaps in job performance or a training needs analysis to determine training requirements.

Business rule decision point BRDP-S1-00268 - Developing learning objectives:

- Decide whether to develop learning objectives in accordance with task analysis items. Learning objectives ought to be developed in accordance with task analysis items that support system maintenance and operational procedures. Aligning learning objectives with task analysis items in the early content preplanning stages will foster reusable data and content alignment. Refer to Chap 3.9.7 for content preplanning discussions.

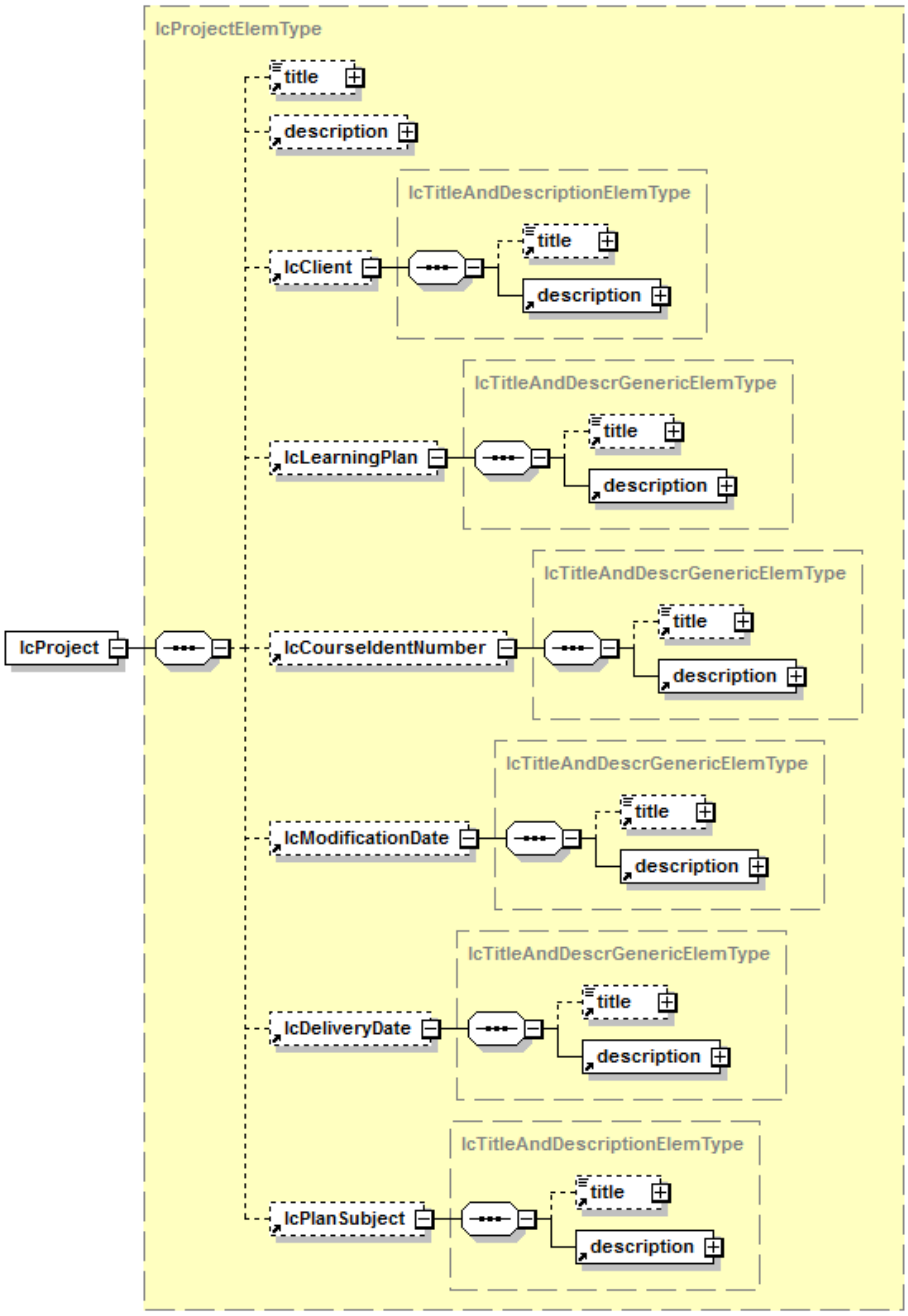
Business rule decision point BRDP-S1-00269 - Packaging lesson plans in SCORM content package modules:

- Decide whether to package lesson plans in SCORM content package modules.

2.1 Project

Description: The element <lcProject> contains the administrative information about the learning plan structure being developed from a performance analysis or training needs analysis.

Markup element: <lcProject>



ICN-1654N-S1000D0019-002-01

Fig 2 Element <`lcProject`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcClient>. Refer to Para 2.1.1.
- <lcLearningPlan>. Refer to Para 2.1.2.
- <lcCourseIdentNumber>. Refer to Para 2.1.3.
- <lcModificationDate>. Refer to Para 2.1.4.
- <lcDeliveryDate>. Refer to Para 2.1.5.
- <lcPlanSubject>. Refer to Para 2.1.6.

Markup example:

```
<lcProject>
<title>Basic bike awareness learning plan</title>
<description>
<para>This learning plan is sponsored by the National Bike
Courier Association(NBCA). It contains the requirements for a
training intervention intended to support men and women who
perform the bike courier job.</para>
</description>
<lcClient>
<title>National Bike Courier Association</title>
<description>
<para>The NBCA is a national professional society for bike
couriers.</para>
</description>
</lcClient>
<lcLearningPlan>
<title>Bike maintenance for couriers</title>
<description>
<para>This lesson plan describes the learning needs and
instructional requirements for teaching the parts of a bike and
bike maintenance procedures.</para>
</description>
</lcLearningPlan>
<lcCourseIdentNumber>
<title>Course identification number</title>
<description>
<para>N00174-05-D-0003</para>
</description>
</lcCourseIdentNumber>
<lcModificationDate>
<title>Modification date</title>
<description>
<para>N/A</para>
</description>
</lcModificationDate>
<lcDeliveryDate>
<title>Delivery date</title>
<description>
<para>20091228</para>
</description>
```

```
</lcDeliveryDate>
<lcPlanSubject>
<title>Learning plan subject matter</title>
<description>
<para>Major bike assembly, subassemblies and parts in the
context of and general maintenance procedures.</para>
</description>
</lcPlanSubject>
</lcProject>
```

2.1.1 Client

Description: The element <lcClient> contains the name of the organization sponsoring or requesting the development of the learning plan. It can also include a short description of the organization.

Markup element: <lcClient>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcClient>
<title>National Bike Courier Association</title>
<description>
<para>The NBCA is a national professional society for bike
couriers. The director of the NBCA has funded the development of
this learning plan.</para>
</description>
</lcClient>
```

2.1.2 Learning plan

Description: The element <lcLearningPlan> contains the title of the learning plan and a brief summary of its purpose or content.

Markup element: <lcLearningPlan>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcLearningPlan>
<title>Bike maintenance for couriers</title>
<description>
<para>This lesson plan describes the learning needs and
instructional requirements for teaching the parts of a bike and
bike maintenance procedures.</para>
</description>
</lcLearningPlan>
```

2.1.3 Course identification number

Description: The element <lcCourseIdentNumber> contains an alphanumeric alternate identifier to the project title.

Markup element: <lcCourseIdentNumber>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcCourseIdentNumber>
<title>Course identification number</title>
<description>
<para>N00174-05-D-0003</para>
</description>
</lcCourseIdentNumber>
```

2.1.4 Modification date

Description: The element <lcModificationDate> contains the date when the project modification is intended to be implemented.

Markup element: <lcModificationDate>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcModificationDate>
<title>Modification date</title>
<description>
<para>2010-06-22</para>
</description>
</lcModificationDate>
```

2.1.5 Delivery date

Description: The element <lcDeliveryDate> contains the date when the project delivery is intended to take place.

Markup element: <lcDeliveryDate>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcDeliveryDate>
<title>Delivery date</title>
<description>
<para>20091228</para>
</description>
</lcDeliveryDate>
```

2.1.6 Plan subject

Description: The element <lcPlanSubject> contains a description of the scope of requirements or topics covered within the learning plan.

Markup element: <lcPlanSubject>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

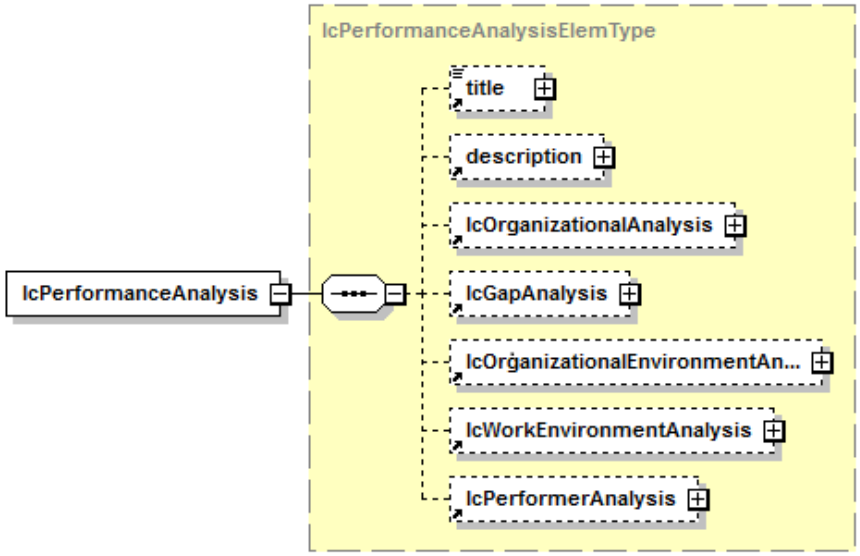
Markup example:

```
<lcPlanSubject>
<title>Periodic bike maintenance</title>
<description>
<para>The requirements documented in this learning plan are
intended for bike couriers who must perform regular maintenance
on their bikes.</para>
</description>
</lcPlanSubject>
```

2.2 Performance analysis

Description: The element <lcPerformanceAnalysis> contains the information and requirements resulting from an analysis of the affected human performance system or training needs of the product users. This is the second high-level container element in the element <learningPlan>.

Markup element: <lcPerformanceAnalysis>



ICN-1654N-S1000D0020-001-01

Fig 3 Element <lcPerformanceAnalysis>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcOrganizationalAnalysis>. Refer to Para 2.2.1.
- <lcGapAnalysis>. Refer to Para 2.2.2.
- <lcOrganizationalEnvironmentAnalysis>. Refer to Para 2.2.3.
- <lcWorkEnvironmentAnalysis>. Refer to Para 2.2.4.
- <lcPerformerAnalysis>. Refer to Para 2.2.5.

Business rule decision point BRDP-S1-00270 - Define life cycle need for performance analysis data:

- Define the life cycle need for analysis information and requirements resulting from a performance analysis for the client organization and human performance system affected by the product.

Business rule decision point BRDP-S1-00271 - Define life cycle need for training needs analysis data:

- Define the life cycle need for analysis information and requirements resulting from a training needs analysis for a training intervention.

Markup example:

```
<lcPerformanceAnalysis>
<title>Performance analysis</title>
<description>
<para>An analysis of the human performance system in which
Speedy Couriers bike couriers operate was conducted to determine
job performance requirements in relation to the S1000D Bike
product.</para>
</description>
<lcOrganizationalAnalysis>
<title>Organizational analysis</title>
<description>
<para>This organizational analysis was conducted to collect
information about the Speedy Couriers corporation to ensure
human performance technologists and instructional systems
designers align any performance interventions, including
training, with the character and expectations of the
corporation.</para>
</description>
<lcVisionStatement>
<description>
<para>We grow the local business economy by helping the
businesses of the city be more productive and successful.</para>
</description>
</lcVisionStatement>
<lcMissionStatement>
<description>
<para>Provide the city's businesses with the fastest, most
convenient and reliable courier services possible.</para>
</description>
</lcMissionStatement>
<lcValues>
<description>
<para>Promote the use of ecologically-friendly means of
transportation and respect the existence of wildlife, animals,
and humans when conducting business services.</para>
</description>
</lcValues>
<lcGoalStatement>
<description>
<para>To become the number-one, lowest-cost messenger service in
the city</para>
</description>
</lcGoalStatement>
<lcObjectiveStatement>
<description>
<para>Achieve 98% customer satisfaction rating on all bike
courier services.</para>
</description>
</lcObjectiveStatement>
</lcOrganizationalAnalysis>
<lcGapAnalysis>
```

```
<title>Gap analysis</title>
<description>
<para>Recently, there has been a rise in calls for "breakdown"
pickups, because the couriers do not know how to fix mechanical
failures. This problem leads to increased workload on other
carriers and late deliveries and pickups, which in turn leads to
unsatisfied customers.</para>
</description>
<lcGapItem>
<title>Gap item</title>
<description>
<para>Many couriers cannot correct mechanical problems with the
bike steering system within defined time parameters.</para>
</description>
</lcGapItem>
<lcGapItem>
<lcDesiredPerformanceStatement>
<description>
<para>Ability to maintain bike in full working order by having
the ability to troubleshoot breakdowns and perform repairs with
an average of 30 minutes from the time of breakdown</para>
</description>
</lcDesiredPerformanceStatement>
<lcActualPerformanceStatement>
<description>
<para>Ability to maintain bike in full working order is observed
with the existing abilities to troubleshoot breakdowns and
perform repairs. However, the average time to repair is 75
minutes from the time of breakdown.</para>
</description>
</lcActualPerformanceStatement>
<lcJtaItem>
<description>
<para>Disassemble bike's steering system.</para>
</description>
</lcJtaItem>
<lcGapStatement>
<description>
<para>Bike couriers, on average, are taking 45 minutes longer to
repair their bikes than required to ensure timely service to
customers.</para>
</description>
</lcGapStatement>
</lcGapItem>
</lcGapAnalysis>
<lcOrganizationalEnvironmentAnalysis>
<title>Analysis of Speedy Couriers' business environment</title>
<description>
<para>An organizational environment analysis was conducted to
capture information about factors that may inhibit Speedy
Couriers corporation in its ability to use the S1000D Bike to
meet its objectives within the business community. During the
```

```
analysis, it was learned that the corporation's couriers are
union workers. Union policy states that all general maintenance
and minor repairs shall be performed by couriers and that they
shall be compensated at a technician rate for such maintenance.
Therefore, it is desired by Speedy Courier corporation that all
procedures that fall within this part of the union policy be
written for couriers versus normal bike technicians.</para>
</description>
</lcOrganizationalEnvironmentAnalysis>
<lcWorkEnvironmentAnalysis>
<title>Analysis of courier's work environment at Speedy Courier,
Inc.</title>
<description>
<para>The work environment of Speedy Courier bike couriers is in
urban locations. The streets are paved, but due to its northern
locale, the streets are often damaged from ice and snow during
the winter months. Winter temperature range is -9 to 2 degrees
Celsius, spring is 4 to 20, summer is 22 to 27, and fall is 6 to
20. The couriers' bikes are subject to atmospheric conditions
such as sun, rain, sleet, snow, etc. For maintenace procedures
the couriers complete themselves, or that are performed by a
non-union technician, they will be performed at the garage area
provided by the corporation. In some cases, however, road hazard
maintenance will have to be performed in the field.
Specifically, this refers to tire tube replacements and chain
replacement.</para>
</description>
<lcManagerialSupport>
<description>
<para>Speedy Couriers has one general manager and four shift
managers with administrative duties related to dispatching
couriers. No managers have any advanced bike repair skills
beyond what the couriers possess. The shift managers are
responsible for ensuring couriers perform all required
preventive maintenance at the scheduled periodicity.</para>
</description>
</lcManagerialSupport>
<lcPhysicalAspectsOfSite>
<description>
<para>The maintenance location provided for couriers by the
corporation is a single garage bay measuring 20-feet deep by 16-
feet wide. Basic wrenches, pliers, screwdrivers, etc, are within
the work area. Lighting is in full working order. Various
moveable stools and benches are scattered throughout. No other
items are in the maintenance location.</para>
</description>
</lcPhysicalAspectsOfSite>
<lcSocialAspectsOfSite>
<description>
<para>Due to the need to keep couriers constantly dispatched,
there is often only one courier performing the required
maintenance at a given time. Couriers generally do not have time
```

```
or opportunity to interact or assist one another in the
maintenance location. Maintenance tasks are learned by the
couriers while on the job, often without assistance.</para>
</description>
</lcSocialAspectsOfSite>
<lcSpecialFactors>
<description>
<para>None identified.</para>
</description>
</lcSpecialFactors>
</lcWorkEnvironmentAnalysis>
<lcPerformerAnalysis>
<title>Performer analysis</title>
<description>
<para>This performer analysis examined the characteristics and
attributes of the primary bike maintenance technician, the
courier. The characteristics and attributes of a professional
bike technician are addressed under another performer
analysis.</para>
</description>
<lcJobTitle>
<description>
<para>Bike courier</para>
</description>
</lcJobTitle>
<lcJobCode>
<description>
<para>BT-1166</para>
</description>
</lcJobCode>
<lcEducationLevel>
<description>
<para>High school diploma, some college</para>
</description>
</lcEducationLevel>
<lcAge>
<description>
<para>18 to 21</para>
</description>
</lcAge>
<lcProfessionalBackground>
<description>
<para>The typical bike courier at Speedy Bike has limited or no
professional experience in any career field. The majority are
college students employed part-time by the bike courier
company.</para>
</description>
</lcProfessionalBackground>
<lcKnowledge>
<description>
<para>Based on a survey of Speedy Bike couriers, it was
concluded that the majority (90%) know the major common
```

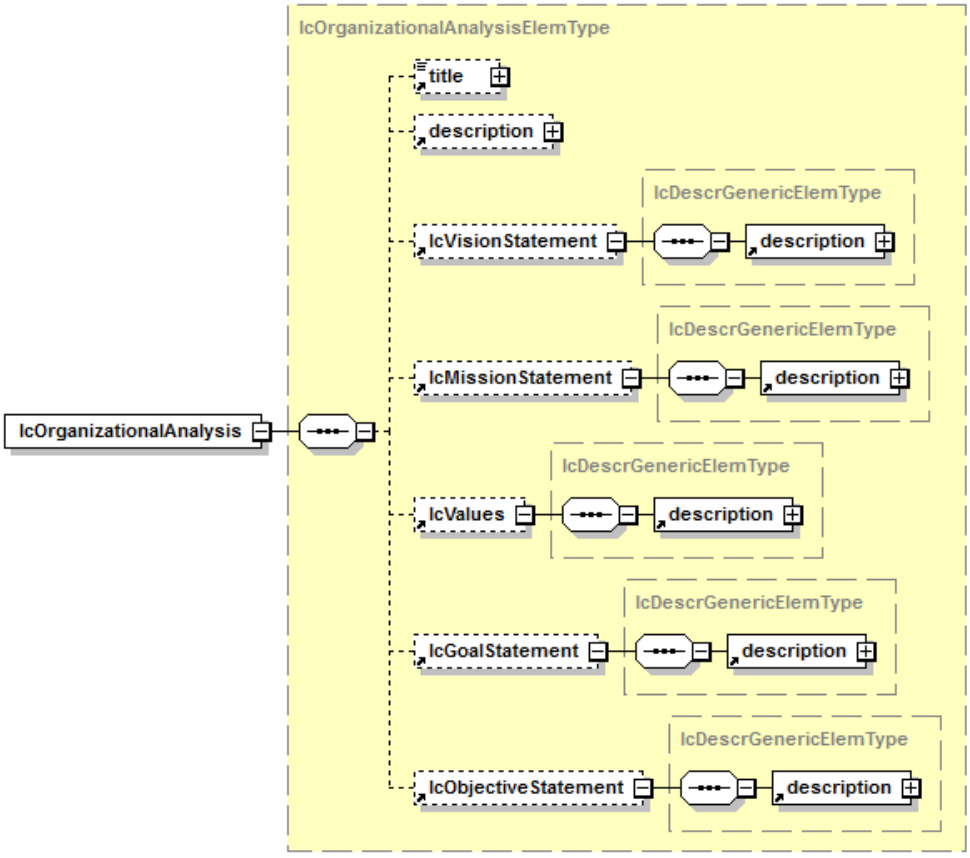
```
components and assemblies of a bike. This includes being able to
describe the basic mechanical functions and relationships
between those components and assemblies.</para>
</description>
</lcKnowledge>
<lcSkills>
<description>
<para>Prior to on-the-job experience, Speedy Bike couriers enter
the job with little to no experience with bike maintenance.
Chain tightening and wheel-tube replacement skills are possessed
by approximately 40% of the couriers. For the majority, skills
are mainly in bike operation.</para>
</description>
</lcSkills>
<lcAbilities>
<description>
<para>The bike couriers have the ablility to use basic hand
tools required to perform routine bike maintenance tasks.</para>
</description>
</lcAbilities>
<lcAttitude>
<description>
<para>The majority of the bike couriers are motivated by the pay
and tips received as part of the courier job. They are not
concerned with or aware of how they impact the success of the
business and local economy.</para>
</description>
</lcAttitude>

</lcPerformerAnalysis>
</lcPerformanceAnalysis>
```

2.2.1 Organizational analysis

Description: The element <lcOrganizationalAnalysis> contains the information about the client organization that will use the product of the S1000D project. It is used to collect and maintain information about the purpose and ethical boundaries of the organization and its aligning goals and objectives.

Markup element: <lcOrganizationalAnalysis>



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Fig 4 *Element* <`lcOrganizationalAnalysis`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>. Refer to Chap 3.9.5.2.1.5.
- <`description`>. Refer to Chap 3.9.5.2.2.
- <`lcVisionStatement`>. Refer to Para 2.2.1.1.
- <`lcMissionStatement`>. Refer to Para 2.2.1.2.
- <`lcValues`>. Refer to Para 2.2.1.3.
- <`lcGoalStatement`>. Refer to Para 2.2.1.4.
- <`lcObjectiveStatement`>. Refer to Para 2.2.1.5.

Markup example:

```
<lcOrganizationalAnalysis>
<title>Organizational analysis</title>
```

```
<description>
<para>This organizational analysis was conducted to collect
information about the Speedy Couriers corporation to ensure
human performance technologists and instructional systems
designers align any performance interventions, including
training, with the character and expectations of the
corporation.</para>
</description>
<lcVisionStatement>
<description>
<para>We grow the local business economy by helping the
businesses of the city be more productive and successful.</para>
</description>
</lcVisionStatement>
<lcMissionStatement>
<description>
<para>Provide the city's businesses with the fastest, most
convenient and reliable courier services possible.</para>
</description>
</lcMissionStatement>
<lcValues>
<description>
<para>Promote the use of ecologically-friendly means of
transportation and respect the existence of wildlife, animals,
and humans when conducting business services.</para>
</description>
</lcValues>
<lcGoalStatement>
<description>
<para>To become the number-one, lowest-cost messenger service in
the city</para>
</description>
</lcGoalStatement>
<lcObjectiveStatement>
<description>
<para>Achieve 98% customer satisfaction rating on all bike
courier services.</para>
</description>
</lcObjectiveStatement>
</lcOrganizationalAnalysis>
```

2.2.1.1 Vision statement

Description: The element <lcVisionStatement> contains the highest level vision statement describing the long-term end-state of the organization analyzed.

Markup element: <lcVisionStatement>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcVisionStatement>
<description>
<para>We grow the local business economy by helping businesses
of the city be more productive and successful.</para>
</description>
</lcVisionStatement>
```

2.2.1.2 Mission statement

Description: The element <lcMissionStatement> contains the high-level mission statement describing the mid-term end-state of an organization.

Markup element: <lcMissionStatement>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcMissionStatement>
<description>
<para>Provide the city's businesses with the fastest, most
convenient and reliable courier services possible.</para>
</description>
</lcMissionStatement>
```

2.2.1.3 Values

Description: The element <lcValues> contains a description of the client organization's ethical boundaries in achieving its vision and mission.

Markup element: <lcValues>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcValues>
<description>
<para>Promote the use of ecologically-friendly means of
transportation and respect the existence of wildlife, animals,
and humans when conducting business services.</para>
</description>
</lcValues>
```

2.2.1.4 Goal statement

Description: The element <lcGoalStatement> contains a description of what the client organization must ultimately achieve as the result of some initiative or acquisition.

Markup element: <lcGoalStatement>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcGoalStatement>
<description>
<para>To become the number-one, lowest-cost messenger service in
the city</para>
</description>
</lcGoalStatement>
```

2.2.1.5 Objective statement

Description: The element <lcObjectiveStatement> contains a specific, measurable statement that describes what an organization must do to achieve its goal.

Markup element: <lcObjectiveStatement>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

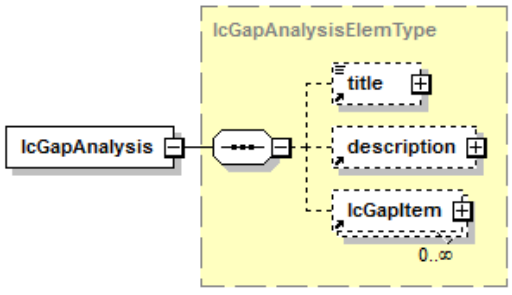
Markup example:

```
<lcObjectiveStatement>
<description>
<para>Achieve 98% customer satisfaction rating on all bike
courier services.</para>
</description>
</lcObjectiveStatement>
```

2.2.2 Gap analysis

Description: The element <lcGapAnalysis> contains the gap analysis information, which defines the delta between an organization's desired end state, as stated in its goal and objectives, and its current state.

Markup element: <lcGapAnalysis>



ICN-1654N-S1000D0042-001-01

Fig 5 Element <lcGapAnalysis>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>. Refer to Chap 3.9.5.2.1.5.
- <`description`>. Refer to Chap 3.9.5.2.2.
- <`lcGapItem`>. Refer to Para 2.2.2.1.

Markup example:

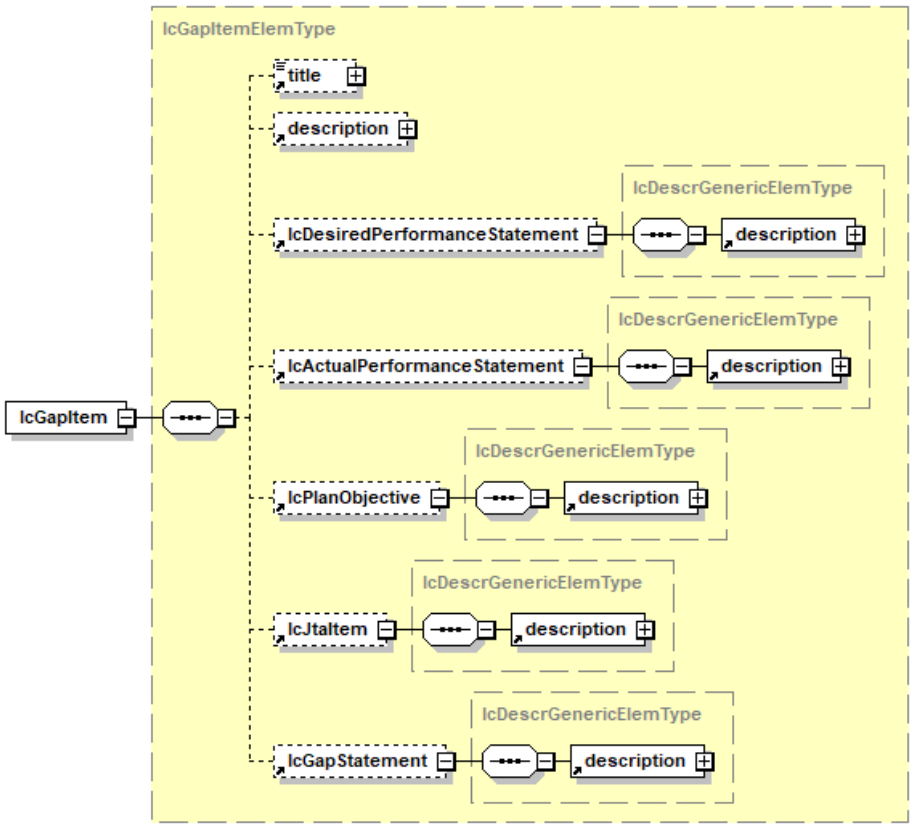
```
<lcGapAnalysis>
<title>Gap analysis</title>
<description>
<para>Recently, there has been a rise in calls for "breakdown"
pickups, because the couriers do not know how to fix mechanical
failures. This problem leads to increased workload on other
carriers and late deliveries and pickups, which in turn leads to
unsatisfied customers.</para>
</description>
<lcGapItem>
<title>Bike steering maintenance</title>
<description>
<para>Many couriers cannot correct mechanical problems with the
bike steering system within defined time parameters.</para>
</description>
</lcGapItem>
<lcGapItem>
<lcDesiredPerformanceStatement>
<description>
<para>Ability to maintain bike in full working order by having
the ability to troubleshoot breakdowns and perform repairs with
an average of 30 minutes from the time of breakdown</para>
</description>
</lcDesiredPerformanceStatement>
<lcActualPerformanceStatement>
<description>
<para>Ability to maintain bike in full working order is observed
with the existing abilities to troubleshoot breakdowns and
perform repairs. However, the average time to repair is 75
minutes from the time of breakdown.</para>
</description>
</lcActualPerformanceStatement>
<lcJtaItem>
<description>
<para>Disassemble bike's steering system.</para>
</description>
</lcJtaItem>
<lcGapStatement>
<description>
<para>Bike couriers, on average, are taking 45 minutes longer to
repair their bikes than required to ensure timely service to
customers.</para>
```

```
</description>
</lcGapStatement>
</lcGapItem>
</lcGapAnalysis>
```

2.2.2.1 Gap item

Description: The element <lcGapItem> contains the structure required to define the current versus actual performance metric and the delta between those points.

Markup element: <lcGapItem>



ICN-1654N-S1000D0022-003-01

Fig 6 Element <lcGapItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

- <lcDesiredPerformanceStatement>. Refer to Para 2.2.2.1.1.
- <lcActualPerformanceStatement>. Refer to Para 2.2.2.1.2.
- <lcPlanObjective>. Refer to Para 2.2.2.1.3.
- <lcJtaItem>. Refer to Para 2.2.2.1.4.
- <lcGapStatement>. Refer to Para 2.2.2.1.5.

Markup example:

```
<lcGapItem>
<title>Bike steering maintenance</title>
<description>
<para>Many couriers cannot correct mechanical problems with the
bike steering system within defined time parameters.</para>
</description>
</lcGapItem>
```

2.2.2.1.1 Desired performance statement

Description: The element <lcDesiredPerformanceStatement> contains a measurable statement of the desired performance outcome.

Markup element: <lcDesiredPerformanceStatement>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcDesiredPerformanceStatement>
<description>
<para>Ability to maintain bike in full working order by having
the ability to troubleshoot breakdowns and perform repairs
within an average of 30 minutes from the time of
breakdown</para>
</description>
</lcDesiredPerformanceStatement>
```

2.2.2.1.2 Actual performance statement

Description: The element <lcActualPerformanceStatement> contains a measurable statement of the actual or current performance outcome.

Markup element: <lcActualPerformanceStatement>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcActualPerformanceStatement>
<description>
<para>Ability to maintain bike in full working order is observed
with the existing abilities to troubleshoot breakdowns and
perform repairs. However, the average time to repair is 75
minutes from the time of breakdown.</para>
</description>
</lcActualPerformanceStatement>
```

2.2.2.1.3 Plan objective

Description: The element <lcPlanObjectve> contains descriptions of actions, behaviors, conditions and standards required of the learner in order to complete a course.

Markup element: <lcPlanObjective>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcPlanObjective>
<description>
<para>The student must earn a passing score on all assessments
in order to complete the course.</para>
</description>
</lcPlanObjective>
```

2.2.2.1.4 Job task analysis item

Description: The element <lcJtaItem> contains the description of job task analysis as related to a particular learning objective.

Markup element: <lcJtaItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcJtaItem>
<description>
<para>Disassemble bike steering system.</para>
</description>
</lcJtaItem>
```

2.2.2.1.5 Gap statement

Description: The element <lcGapStatement> contains a statement of the gap observed between the actual and desired states of performance.

Markup element: <lcGapStatement>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

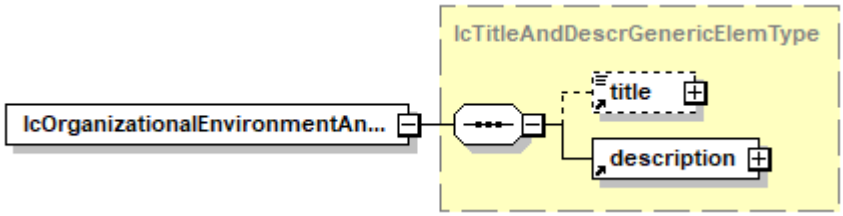
Markup example:

```
<lcGapStatement>
<description>
<para>Bike couriers, on average, are taking 45 minutes longer to
repair their bikes than required to ensure timely service to
customers.</para>
</description>
</lcGapStatement>
```

2.2.3 Organizational environment analysis

Description: The element <lcOrganizationalEnvironmentAnalysis> contains the information regarding internal and external factors that can influence an organization's ability to meet its vision, mission, goals, and objectives.

Markup element: <lcOrganizationalEnvironmentAnalysis>



ICN-1654N-S1000D0060-002-01

Fig 7 Element <lcOrganizationalEnvironmentAnalysis>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

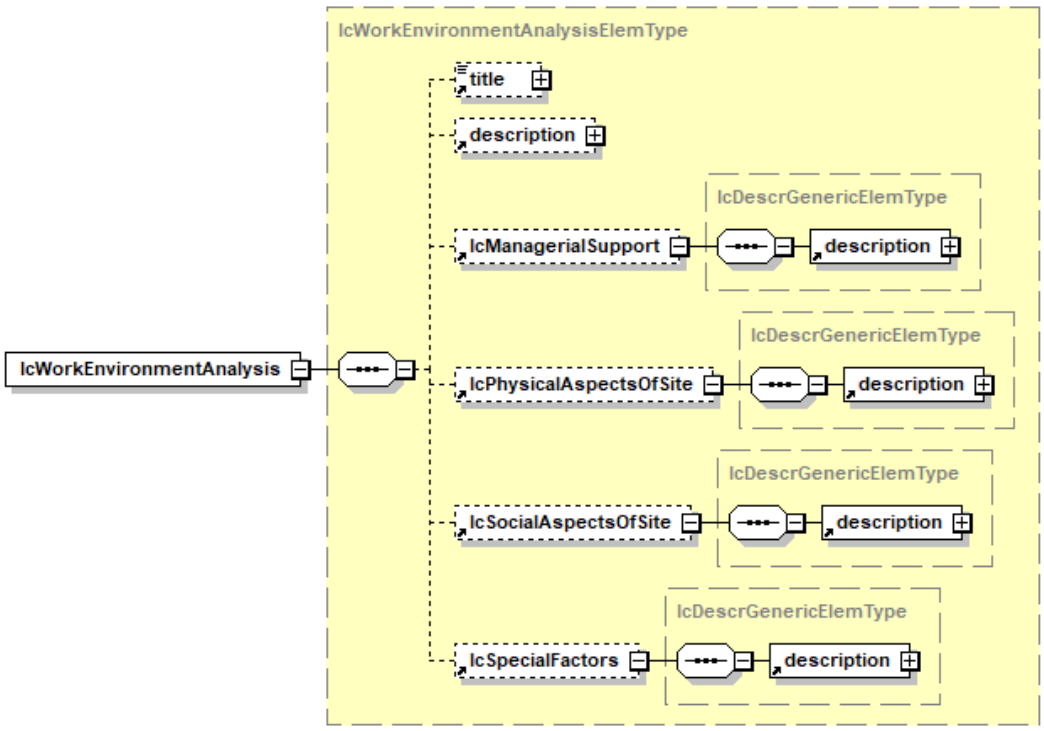
Markup example:

```
<lcOrganizationalEnvironmentAnalysis>
<title>Analysis of Speedy Couriers' business environment</title>
<description>
<para>An organizational environment analysis was conducted to
capture information about factors that may inhibit Speedy
Couriers corporation in its ability to use the S1000D Bike to
meet its objectives within the business community. During the
analysis, it was learned that the corporation's couriers are
union workers. Union policy states that all general maintenance
and minor repairs shall be performed by couriers and that they
shall be compensated at a technician rate for such maintenance.
Therefore, it is desired by Speedy Courier corporation that all
procedures that fall within this part of the union policy be
written for couriers versus normal bike technicians.</para>
</description>
</lcOrganizationalEnvironmentAnalysis>
```

2.2.4 Work environment analysis

Description: The element <lcWorkEnvironmentAnalysis> contains the information regarding factors in the workers' immediate environment that can influence the organization's ability to meet its vision, mission, goals, and objectives.

Markup element: <lcWorkEnvironmentAnalysis>



ICN-1654N-S1000D0023-003-01

Fig 8 Element <lcWorkEnvironmentAnalysis>`

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) andderivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcManagerialSupport>. Refer to Para 2.2.4.1.
- <lcPhysicalAspectsOfSite>. Refer to Para 2.2.4.2.
- <lcSocialAspectsOfSite>. Refer to Para 2.2.4.3.
- <lcSpecialFactors>. Refer to Para 2.2.4.4.

Markup example:

```
<lcWorkEnvironmentAnalysis>
<title>Analysis of courier's work environment at Speedy Courier,
Inc.</title>
<description>
<para>The work environment of Speedy Courier bike couriers is in
urban locations. The streets are paved, but due to its northern
locale, the streets are often damaged from ice and snow during
the winter months. Winter temperature range is -9 to 2 degrees
Celsius, spring is 4 to 20, summer is 22 to 27, and fall is 6 to
20. The couriers' bikes are subject to atmospheric conditions
such as sun, rain, sleet, snow, etc. For maintenace procedures
the couriers complete themselves, or that are performed by a
non-union technician, they will be performed at the garage area
provided by the corporation. In some cases, however, road hazard
maintenance will have to be performed in the field.
Specifically, this refers to tire tube replacements and chain
replacement.</para>
</description>
<lcManagerialSupport>
<description>
<para>Speedy Couriers has one general manager and four shift
managers with administrative duties related to dispatching
couriers. No managers have any advanced bike repair skills
beyond what the couriers possess. The shift managers are
responsible for ensuring couriers perform all required
preventive maintenance at the scheduled periodicity.</para>
</description>
</lcManagerialSupport>
<lcPhysicalAspectsOfSite>
<description>
<para>The maintenance location provided for couriers by the
corporation is a single garage bay measuring 20-feet deep by 16-
feet wide. Basic wrenches, pliers, screwdrivers, etc, are within
the work area. Lighting is in full working order. Various
moveable stools and benches are scattered throughout. No other
items are in the maintenance location.</para>
</description>
</lcPhysicalAspectsOfSite>
<lcSocialAspectsOfSite>
<description>
<para>Due to the need to keep couriers constantly dispatched,
there is often only one courier performing the required
maintenance at a given time. Couriers generally do not have time
or opportunity to interact or assist one another in the
maintenance location. Maintenance tasks are learned by the
couriers while on the job, often without assistance.</para>
</description>
</lcSocialAspectsOfSite>
<lcSpecialFactors>
<description>
<para>None Identified</para>
```

```
</description>
</lcSpecialFactors>
</lcWorkEnvironmentAnalysis>
```

2.2.4.1 Managerial support

Description: The element <lcManagerialSupport> contains the description of factors related to managerial or supervisory support structures in the workers' environment that can influence the organization's ability to meet its vision, mission, goals, and objectives.

Markup element: <lcManagerialSupport>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcManagerialSupport>
<description>
<para>Speedy Couriers has one general manager and four shift
managers with administrative duties related to dispatching
couriers. No managers have any advanced bike repair skills
beyond what the couriers possess. The shift managers are
responsible for ensuring couriers perform all required
preventive maintenance at the scheduled periodicity.</para>
</description>
</lcManagerialSupport>
```

2.2.4.2 Physical aspects of site

Description: The element <lcPhysicalAspectsOfSite> contains the description of tangible, overt characteristics or attributes of the workers' work locations that can influence an organization's ability to meet its vision, mission, goals, and objectives.

Markup element: <lcPhysicalAspectsOfSite>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcPhysicalAspectsOfSite>
<description>
<para>The maintenance location provided for couriers by the
corporation is a single garage bay measuring 20-feet deep by 16-
feet wide. Basic wrenches, pliers, screwdrivers, etc, are within
the work area. Lighting is in full working order. Various
moveable stools and benches are scattered throughout. No other
items are in the maintenance location.</para>
</description>
</lcPhysicalAspectsOfSite>
```

2.2.4.3 Social aspects of site

Description: The element <lcSocialAspectsOfSite> contains the description of social or cultural patterns, nuisances, or norms that influence whether or how efficiently workers perform and influence the organization's ability to meet its vision, mission, goals, and objectives.

Markup element: <lcSocialAspectsOfSite>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcSocialAspectsOfSite>
<description>
<para>Due to the need to keep couriers constantly dispatched,
there is often only one courier performing the required
maintenance at a given time. Couriers generally do not have time
or opportunity to interact or assist one another in the
maintenance location. Maintenance tasks are learned by the
couriers while on the job, often without assistance.</para>
</description>
</lcSocialAspectsOfSite>
```

2.2.4.4 Special factors

Description: The element <lcSpecialFactors> contains the description of any special factors observed at a work site that can affect the workers' performance and the organization's abilities to meet its vision, mission, goals, and objectives.

Markup element: <lcSpecialFactors>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

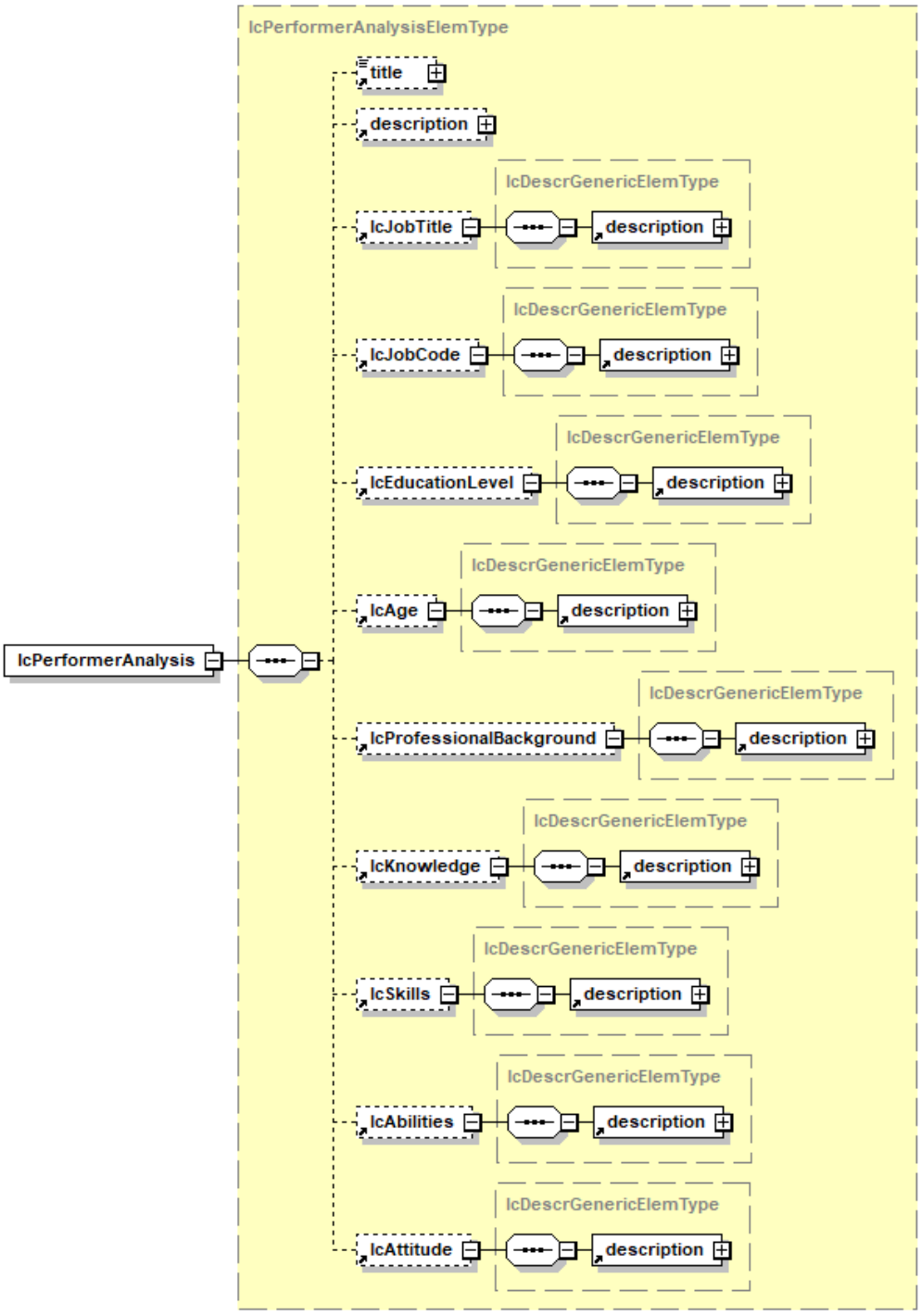
Markup example:

```
<lcSpecialFactors>
<description>
<para>None identified.</para>
</description>
</lcSpecialFactors>
```

2.2.5 Performer analysis

Description: The element <lcPerformerAnalysis> contains information regarding factors within an organization's workforce that can influence its abilities to meet its vision, mission, goals, and objectives.

Markup element: <lcPerformerAnalysis>



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Fig 9 Element <`lcPerformerAnalysis`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcJobTitle>. Refer to Para 2.2.5.1.
- <lcJobCode>. Refer to Para 2.2.5.2.
- <lcEducationLevel>. Refer to Para 2.2.5.3.
- <lcAge>. Refer to Para 2.2.5.4.
- <lcProfessionalBackground>. Refer to Para 2.2.5.5.
- <lcKnowledge>. Refer to Para 2.2.5.6.
- <lcSkills>. Refer to Para 2.2.5.7.
- <lcAbilities>. Refer to Para 2.2.5.8.
- <lcAttitude>. Refer to Para 2.2.5.9.

Markup example:

```
<lcPerformerAnalysis>
<title>Performer analysis</title>
<description>
<para>This performer analysis examined the characteristics and
attributes of the primary bike maintenance technician, the
courier. The characteristics and attributes of a professional
bike technician are addressed under another performer
analysis.</para>
</description>
<lcJobTitle>
<description>
<para>Bike courier</para>
</description>
</lcJobTitle>
<lcJobCode>
<description>
<para>BT-1166</para>
</description>
</lcJobCode>
<lcEducationLevel>
<description>
<para>High school diploma, some college</para>
</description>
</lcEducationLevel>
<lcAge>
<description>
<para>18 to 21</para>
</description>
</lcAge>
<lcProfessionalBackground>
<description>
<para>The typical bike courier at Speedy Bike has limited or no
professional experience in any career field. The majority are
```

```
college students employed part-time by the bike courier
company.</para>
</description>
</lcProfessionalBackground>
<lcKnowledge>
<description>
<para>Based on a survey of Speedy Bike couriers, it was
concluded that the majority (90%) know the major common
components and assemblies of a bike. This includes being able to
describe the basic mechanical functions and relationships
between those components and assemblies.</para>
</description>
</lcKnowledge>
<lcSkills>
<description>
<para>Prior to on-the-job experience, Speedy Bike couriers enter
the job with little to no experience with bike maintenance.
Chain tightening and wheel-tube replacement skills are possessed
by approximately 40% of the couriers. For the majority, skills
are mainly in bike operation.</para>
</description>
</lcSkills>
<lcAbilities>
<description>
<para>The bike couriers have the ablility to use basic hand
tools required to perform routine bike maintenance tasks.</para>
</description>
</lcAbilities>
<lcAttitude>
<description>
<para>The majority of the bike couriers are motivated by the pay
and tips received as part of the courier job. They are not
concerned with or aware of how they impact the success of the
business and local economy.</para>
</description>
</lcAttitude>
</lcPerformerAnalysis>
```

2.2.5.1 Job title

Description: The element <lcJobTitle> contains the job title of interest for a performer analysis.

Markup element: <lcJobTitle>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcJobTitle>
<description>
<para>Bicycle courier</para>
</description>
</lcJobTitle>
```

2.2.5.2 Job code

Description: The element <lcJobCode> contains the job code of interest for a performer analysis.

Markup element: <lcJobCode>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcJobCode>
<description>
<para>BT-1166</para>
</description>
</lcJobCode>
```

2.2.5.3 Education level

Description: The element <lcEducationLevel> contains the information about the educational level of the analyzed performers.

Markup element: <lcEducationLevel>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcEducationLevel>
<description>
<para>High school diploma, some college</para>
</description>
</lcEducationLevel>
```

2.2.5.4 Age

Description: The element <lcAge> contains the information about the age of the analyzed performers.

Markup element: <lcAge>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcAge>
<description>
<para>Adults aged 18 to 21</para>
</description>
</lcAge>
```

2.2.5.5 Professional background

Description: The element <lcProfessionalBackground> contains the information about the professional work experience of the analyzed performers.

Markup element: <lcProfessionalBackground>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcProfessionalBackground>
<description>
<para>The typical bike courier at Speedy Bike has limited or no
professional experience in any career field. The majority are
college students employed part-time by the bike courier
company.</para>
</description>
</lcProfessionalBackground>
```

2.2.5.6 Knowledge

Description: The element <lcKnowledge> contains a description of the learners' current knowledge related to tasks required of their job tasks.

Markup element: <lcKnowledge>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcKnowledge>
<description>
<para>Based on a survey of Speedy Bike couriers, it was
concluded that the majority (90%) know the major common
components and assemblies of a bike. This includes being able to
describe the basic mechanical functions and relationships
between those components and assemblies.</para>
</description>
</lcKnowledge>
```

2.2.5.7 Skills

Description: The element <lcSkills> contains a description of the learners' current skills related to tasks required of their job tasks.

Markup element: <lcSkills>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcSkills>
<description>
<para>Prior to on-the-job experience, Speedy Bike couriers enter
the job with little to no experience with bike maintenance.
Chain tightening and wheel-tube replacement skills are possessed
by approximately 40% of the couriers. For the majority, skills
are mainly in bike operation.</para>
</description>
</lcSkills>
```

2.2.5.8 Abilities

Description: The element <lcAbilities> contains a description of the learners' current abilities related to tasks required of their job tasks.

Markup element: <lcAbilities>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcAbilities>
<description>
<para>The bike couriers have the ablility to use basic hand
tools required to perform routine bike maintenance tasks.</para>
</description>
</lcAbilities>
```

2.2.5.9 Attitude

Description: The element <lcAttitude> contains a description of the learners' current attitudes related to tasks required of their job tasks or their organizations desired performance outcomes.

Markup element: <lcAttitude>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

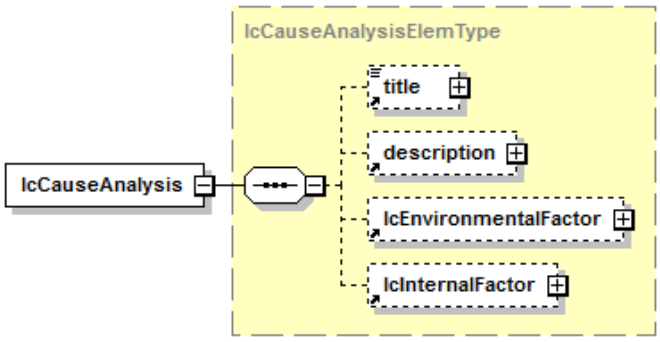
Markup example:

```
<lcAttitude>
<description>
<para>The majority of the bike couriers are motivated by the pay
and tips received as part of the courier job. They are not
concerned with or aware of how they impact the success of the
business and local economy.</para>
</description>
</lcAttitude>
```

2.3 Cause analysis

Description: The element <lcCauseAnalysis> contains the cause analysis information. This is the third high-level container element in the element <learningPlan>. It describes technical data regarding the root causes of a potential or observed human performance gap.

Markup element: <lcCauseAnalysis>



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Fig 10 Element <lcCauseAnalysis>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcEnvironmentalFactor>. Refer to Para 2.3.1.
- <lcInternalFactor>. Refer to Para 2.3.20.

Markup example:

```
<lcCauseAnalysis>
<title>Speedy Courier cause analysis</title>
<description>
<para>A causal factor tree analysis was conducted at Speedy
Couriers, Inc. to determine root causes of the couriers'
collective inability to make deliveries in accordance with the
company's defined requirement. This cause analysis was also used
to identify potential factors introduced by engineering changes
to the XYZ Bike used by Speedy Couriers, Inc., which may affect
(positively or negatively) the couriers' ability to meet the
requirement.</para>
</description>
<lcEnvironmentalFactor>
<title>Environmental factor</title>
<description>
<para>Causal factors external to the couriers were derived from
observations of the workplace, interviews with couriers,
supervisors, and the company's human resources director, and a
review of relevant company policies.</para>
</description>
```

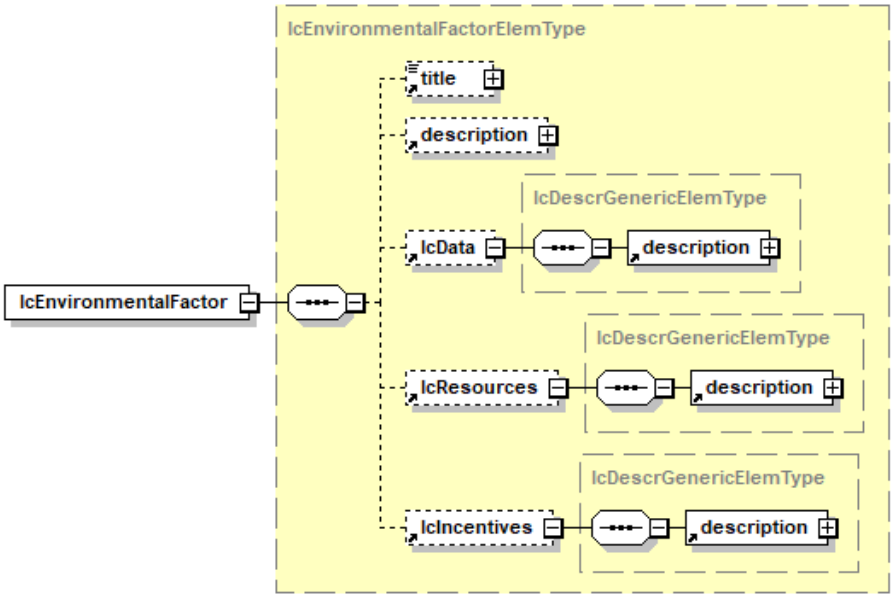
```
<lcData>
<description>
<para>Job sheets with basic, step-by-step procedures for routine
maintenance tasks are provided to all couriers with their
company-issued handbook. The maintenance procedures are not
illustrated and do not reference tools that should be used in
any given step.</para>
</description>
</lcData>
<lcResources>
<description>
<para>Couriers are provided the tools and parts required to
maintain and repair their bikes. However, those tools are only
available in the workshop location. There are no onboard tool
packs or emergency repair kits that couriers may carry in
transit.</para>
</description>
</lcResources>
<lcIncentives>
<description>
<para>The study revealed that there is currently a negative
incentive to troubleshoot and repair bike problems while on
courier duties. Since the company provides unlimited breakdown
service at no cost to the courier, there is no reason for
couriers to repair their own bikes.</para>
</description>
</lcIncentives>
</lcEnvironmentalFactor>
<lcInternalFactor>
<title>Internal factor</title>
<description>
<para>Causal factors internal to the couriers were derived from
interviews with the couriers.</para>
</description>
<lcKnowledge>
<description>
<para>While basic knowledge of concepts (eg, parts, components,
operation) related to most bikes was demonstrated by couriers,
only 15% had the procedural knowledge necessary to maintain and
repair bicycles.</para>
</description>
</lcKnowledge>
<lcCapacity>
<description>
<para>No significant causal factors were observed or uncovered
during this analysis.</para>
</description>
</lcCapacity>
<lcMotives>
<description>
<para>No significant causal factors were observed or uncovered
during this analysis.</para>
```

```
</description>
</lcMotives>
</lcInternalFactor>
</lcCauseAnalysis>
```

2.3.1 Environmental factor

Description: The element <lcEnvironmentalFactor> contains the information about causes of a potential or observed performance gap that is external to the human performer.

Markup element: <lcEnvironmentalFactor>



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Fig 11 Element <lcEnvironmentalFactor>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcData>. Refer to Para 2.3.1.1.
- <lcResources>. Refer to Para 2.3.1.2.
- <lcIncentives>. Refer to Para 2.3.1.3.

Markup example:

```
<lcEnvironmentalFactor>
<title>Environmental factor</title>
<description>
<para>Causal factors external to the couriers were derived from
observations of the workplace, interviews with couriers,
supervisors, and the company's human resources director, and a
review of relevant company policies.</para>
</description>
<lcData>
<description>
<para>Job sheets with basic, step-by-step procedures for routine
maintenance tasks are provided to all couriers with their
company-issued handbook. The maintenance procedures are not
illustrated and do not reference tools that should be used in
any given step.</para>
</description>
</lcData>
<lcResources>
<description>
<para>Couriers are provided the tools and parts required to
maintain and repair their bikes. However, those tools are only
available in the workshop location. There are no onboard tool
packs or emergency repair kits that couriers may carry in
transit.</para>
</description>
</lcResources>
<lcIncentives>
<description>
<para>The study revealed that there is currently a negative
incentive to troubleshoot and repair bike problems while on
courier duties. Since the company provides unlimited breakdown
service at no cost to the courier, there is no reason for
couriers to repair their own bikes.</para>
</description>
</lcIncentives>
</lcEnvironmentalFactor>
```

2.3.1.1 Data

Description: The element <lcData> contains the information about deficiencies in data that negatively impact the ability to perform a job, thus causing a potential or observed performance gap.

Markup element: <lcData>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcData>
<description>
<para>Job sheets with basic, step-by-step procedures for routine
maintenance tasks are provided to all couriers with their
company-issued handbook. The maintenance procedures are not
illustrated and do not reference tools that should be used in
any given step.</para>
</description>
</lcData>
```

2.3.1.2 Resources

Description: The element <lcResources> contains the information about deficiencies in resources that negatively impact the ability to perform a job, thus causing a potential or observed performance gap.

Markup element: <lcResources>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcResources>
<description>
<para>Couriers are provided the tools and parts required to
maintain and repair their bikes. However, those tools are only
available in the workshop location. There are no onboard tool
packs or emergency repair kits that couriers may carry in
transit.</para>
</description>
</lcResources>
```

2.3.1.3 Incentives

Description: The element <lcIncentives> contains the information about the policies, programs, or culture of an organization or work group that influences worker motivation and prioritization of work tasks, which can positively or negatively impact the ability to perform a job or can be the cause of a potential or observed performance gap.

Markup element: <lcIncentives>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

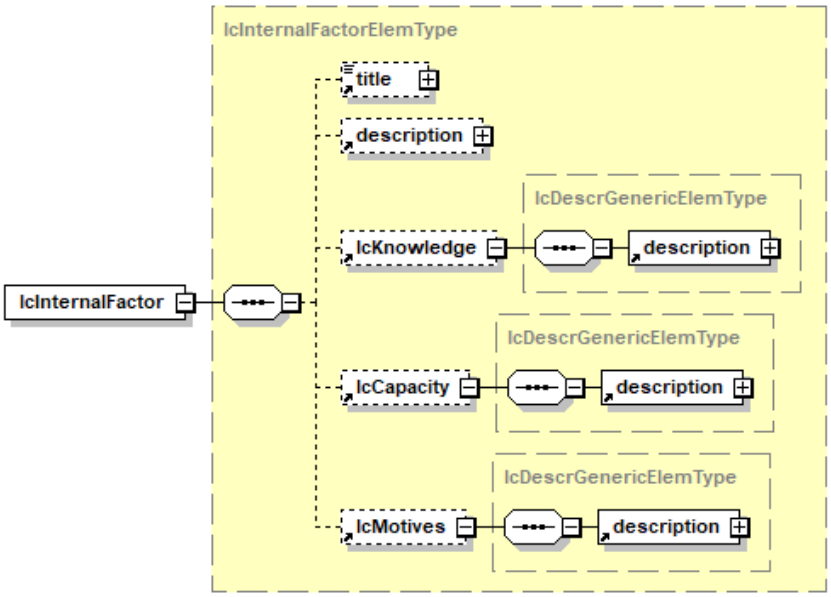
Markup example:

```
<lcIncentives>
<description>
<para>The study revealed that there is currently a negative
incentive to troubleshoot and repair bike problems while on
courier duties. Since the company provides unlimited breakdown
service at no cost to the courier, there is no reason for
couriers to repair their own bikes.</para>
</description>
</lcIncentives>
```

2.3.2 Internal factor

Description: The element <lcInternalFactor> contains the information about causes of a potential or observed performance gap that is directly attributable to the human performer.

Markup element: <lcInternalFactor>



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Fig 12 Element <lcInternalFactor>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcKnowledge>. Refer to Para 2.3.2.1.
- <lcCapacity>. Refer to Para 2.3.2.2.
- <lcMotives>. Refer to Para 2.3.2.3.

Markup example:

```
<lcInternalFactor>
<title>Internal factor</title>
<description>
<para>Causal factors internal to the couriers were derived from
interviews with the couriers.</para>
</description>
<lcKnowledge>
<description>
<para>While basic knowledge of concepts (eg, parts, components,
operation) related to most bikes was demonstrated by couriers,
only 15% the had the procedural knowledge necessary to maintain
```

```
and repair bicycles.</para>
</description>
</lcKnowledge>
<lcCapacity>
<description>
<para>No significant causal factors were observed or uncovered
during this analysis.</para>
</description>
</lcCapacity>
<lcMotives>
<description>
<para>No significant causal factors were observed or uncovered
during this analysis.</para>
</description>
</lcMotives>
</lcInternalFactor>
```

2.3.2.1 Knowledge

Description: The element <lcKnowledge> contains the information about deficiencies in the performers' knowledge that negatively impacts the ability to perform a job, thus causing a potential or observed performance gap.

Markup element: <lcKnowledge>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcKnowledge>
<description>
<para>Only a small percentage of the couriers had the necessary
knowledge needed to maintain and repair bicycles because for
many of the employees this is the first time using a bike for a
job.</para>
</description>
</lcKnowledge>
```

2.3.2.2 Capacity

Description: The element <lcCapacity> contains the information about deficiencies in the performers' capacity to perform a job that negatively impact the ability to be successful in completing the job, thus causing a potential or observed performance gap.

Markup element: <lcCapacity>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcCapacity>
<description>
<para>Bike couriers are not physically capable of carrying a
portable jack stand needed to perform steering alignment
repairs.</para>
</description>
</lcCapacity>
```

2.3.2.3 Motives

Description: The element <lcMotives> contains the information about the internal motivations of the workers, which can positively or negatively impact the ability to perform a job or can be the cause of a potential or observed performance gap.

Markup element: <lcMotives>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

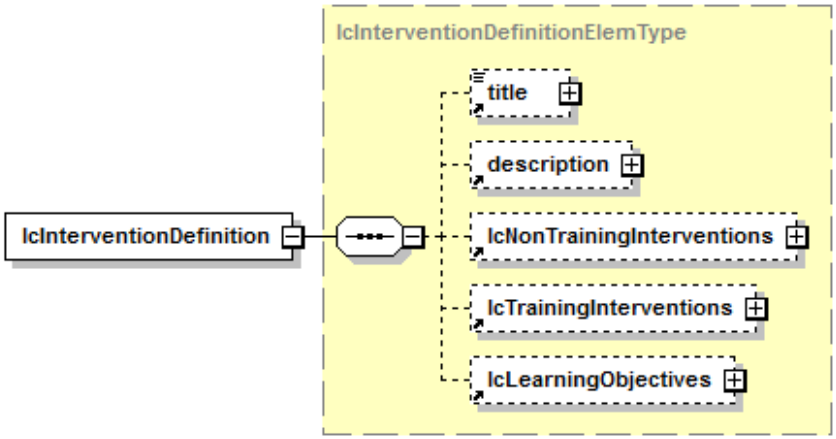
Markup example:

```
<lcMotives>
<description>
<para>The majority of bike couriers are performing the job for
pay to support their college tuition and living expenses.</para>
</description>
</lcMotives>
```

2.4 Intervention definition

Description: The element <lcInterventionDefinition> contains the data that defines the requirements or specifications for performance improvement types of intervention or for a training intervention to be designed and developed.

Markup element: <lcInterventionDefinition>



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Fig 13 Element <lcInterventionDefinition>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcNonTrainingInterventions>. Refer to Para 2.4.1.1.
- <lcTrainingInterventions>. Refer to Para 2.4.2.
- <lcLearningObjectives>. Refer to Para 2.4.3.

Markup example:

```
<lcInterventionDefinition>
<title>Intervention definition</title>
<description>
<para>The following information outlines the recommendations for
addressing the identified gap.</para>
</description>
<lcNonTrainingInterventions>
<title>Non-training interventions</title>
<description>
<para>The following information identifies various non-training
```

```
interventions intended to reduce the performance gaps of
couriers working at Speedy Courier, Inc. Final design
requirements and criteria of each non-training component shall
be defined at a later time.</para>
</description>
<lcPerformanceSupport>
<description>
<para>Bike couriers shall be provided a Quick fix guide that
outlines the five most common bike breakdowns. This guide
contains the processes to address each of the five breakdown
types.</para>
</description>
</lcPerformanceSupport>
<lcJobDesign>
<description>
<para>Two changes will be made to the courier job to better
align incentives with the company's goals. First, couriers will
not receive the commission for a delivery if the breakdown
service is used for a repair that could have been made "in the
field." Second, couriers will be placed under a tiered bonus
program that rewards calling in the breakdown service for
repairs listed in their Quick fix guide.</para>
</description>
</lcJobDesign>
<lcPersonalDevelopment>
<description>
<para>Bike couriers that are failing to meet the defined time
limit for any repair task listed in their manual will be
required to practice those tasks twice per week. They will be
assigned a mentor while performing the tasks. When they
demonstrate that they can perform the repairs within the time
limit, they will no longer be required to perform these task
rehearsals.</para>
</description>
</lcPersonalDevelopment>
<lcHumanResourceDevelopment>
<description>
<para>New hiring criteria and assessments shall be instituted to
evaluate courier applicants' existing skills in basic bike
repair and maintenance.</para>
</description>
</lcHumanResourceDevelopment>
<lcOrganizationalCommunication>
<description>
<para>A designated delegate in the third tier of bike couriers
will report courier maintenance statistics directly to the
Courier Manager on the last Friday of each month. The statistics
will be entered directly into the Courier Manager's Maintenance
Awareness (CMMA) tool.</para>
</description>
</lcOrganizationalCommunication>
<lcOrganizationalDesign>
```

```
<description>
<para>New hiring criteria and assessments shall be instituted to
evaluate courier applicants' existing skills in basic bike
repair and maintenance.</para>
</description>
</lcOrganizationalDesign>
</lcNonTrainingInterventions>
<lcTrainingInterventions>
<title>Training interventions</title>
<description>
<para>The following information outlines the training
recommendations for addressing the identified gap.</para>
</description>
<lcTargetAudience>
<title>Target audience</title>
<description>
<para>Skill levels for entry-level bike couriers can vary from
none to novice experience levels, which range from 0 to 1 year
in service. Couriers have typically learned the skills needed
through trial and error.</para>
</description>
<lcCurrentEntryBehaviors>
<description>
<para>The majority of couriers have high school educations and
have basic knowledge of tool use.</para>
</description>
</lcCurrentEntryBehaviors>
<lcAttitudeTowardContent>
<description>
<para>A survey revealed that 95% of the couriers are willing to
complete training as long as the stated incentives are
employed.</para>
</description>
</lcAttitudeTowardContent>
<lcLearningPreferences>
<description>
<para>Given the physical and customer-oriented nature of courier
work, the type of person attracted for such positions tends to
be of the more assertive type and the more emotionally
responsive. This type tends to prefer less-structured
activities, anecdotes and stories, interaction with others,
taking action, and moving as fast as possible (borderline
impatient).</para>
</description>
</lcLearningPreferences>
</lcTargetAudience>
<lcPrerequisites>
<title>Bike courier maintenance prerequisites</title>
<description>
<para>Basic bike repair hand tools: Purpose and use.</para>
</description>
</lcPrerequisites>
```

```
<lcRequiredEntryBehaviors>
<title>Required entry behaviors</title>
<description>
<para>Demonstrate proper use of basic hand tools and bike
jacks.</para>
</description>
</lcRequiredEntryBehaviors>
<lcTrainingComponent>
<title>Training component</title>
<description>
<para>The following information outlines the training
component.</para>
</description>
<lcTrainingType>
<description>
<para>An online computer-based course will be used in
conjunction with hands-on practices.</para>
</description>
</lcTrainingType>
<lcLearningStrategy>
<description>
<para>This training uses a blended approach to teaching bicycle
maintenance and repair.</para>
</description>
</lcLearningStrategy>
<lcDuration>
<lcTime>
<description>
<para>The computer-based courseware will take approximately 1,5
hours to complete. The practical exercises will take
approximately 2 hours to complete.</para>
</description>
</lcTime>
</lcDuration>
<lcRequiredFinances>
<description>
<para>All financial requirements will be covered by Speedy
Couriers, Inc.</para>
</description>
</lcRequiredFinances>
<lcRequiredPersonnel>
<description>
<para>The current bicycle repair technician will serve as a
facilitator during the practical exercise portion of the
training as well as the grader for the hands-on test at the end
of the training.</para>
</description>
</lcRequiredPersonnel>
<lcRequiredFacilities>
<description>
<para>The current bicycle repair area will be used for the
practical exercises and end of training hands-on test.</para>
```

```
</description>
</lcRequiredFacilities>
<lcRequiredEquipment>
<description>
<para>Couriers may take the computer portion of the training
using one of Speedy Courier's office computer workstations, or
they may take a CD of the training to be completed at home. The
current bicycle repair equipment will be used for the practical
exercises and end of training hands-on test.</para>
</description>
</lcRequiredEquipment>
<lcLocalCultureConsiderations>
<description>
<para>Most of the couriers take classes at the local community
college. Many view their jobs as a necessity and have poor
attitudes toward improving their performance.</para>
</description>
</lcLocalCultureConsiderations>
</lcTrainingComponent>
<lcAssessmentStrategy>
<title>Assessment Strategy</title>
<description>
<para>The following information outlines the assessment
strategies for the Basic bike awareness course.</para>
</description>
<lcAssessmentComponent>
<title>Computer-based assessment component</title>
<description>
<para>The following information outlines the assessment strategy
for the computer-based portion of the training.</para>
</description>
<lcMasteryScoreCriteria>
<description>
<para>80% mastery of all lesson tests</para>
</description>
</lcMasteryScoreCriteria>
<lcPerformanceRubric>
<description>
<para>QUESTION: Which part of the steering system supplies the
sideways swiveling action that allows the rider to steer the
bike?</para>
<para>ANSWER: Headset</para>
</description>
</lcPerformanceRubric>
<lcScoringMethod>
<description>
<para>The lesson tests are scored using computer programming
built into the training.</para>
</description>
</lcScoringMethod>
<lcMinimumPassThreshold>
<description>
```

```
<para>The minimum passing score for the assessment is
80%.</para>
</description>
</lcMinimumPassThreshold>
</lcAssessmentComponent>
</lcAssessmentStrategy>
<lcTechnicalRqmts>
<title>Technical Requirements</title>
<description>
<para>This section lists the technical requirements needed to
complete the instruction.</para>
</description>
<lcBrowsers>
<description>
<para>This courseware is created to run in the Internet Explorer
6.x Web browser.</para>
</description>
</lcBrowsers>
<lcLms>
<description>
<para>Lesson content packages will be tracked in the Sum total
LMS.</para>
</description>
</lcLms>
<lcNonLmsItEnvironment>
<description>
<para>The courseware does not require any special considerations
when it is running outside of an LMS.</para>
</description>
</lcNonLmsItEnvironment>
<lcPaperBasedMaterials>
<description>
<para>This courseware will use the Basic bike repair manual,
document number X45R56.</para>
</description>
</lcPaperBasedMaterials>
<lcClassroom>
<description>
<para>Instruction will be taken in the Learning Lab at Speedy
Courier's main office. The training is part of the employee's
first-day orientation and is required. No courier assignments
will be given until the employee completes the orientation and
the training.</para>
</description>
</lcClassroom>
<lcOjt>
<description>
<para>In addition to the performance practices and test that are
used in the curriculum, couriers will have access to the repair
facility in order to hone their skills and abilities in
repairing the bike.</para>
</description>
```

```
</lcOjt>
<lcAccessibility>
<description>
<para>This courseware meets W3C Web Accessibility Initiative
Guidelines Priority 1 checkpoints.</para>
</description>
</lcAccessibility>
<lcPlayers>
<description>
<para>The courseware will make use of the following players and
plug-ins: Adobe Flash player and Adobe Acrobat reader.</para>
</description>
</lcPlayers>
<lcGraphicStandards>
<description>
<para>Graphics utilized are JPEG and SWF files. SWF files may
contain 3D animation or interactivity. SWF files are being
utilized in lieu of CGM files to reach a broader audience
because they can be viewed utilizing the Adobe Flash
Player.</para>
</description>
</lcGraphicStandards>
<lcViewers>
<description>
<para>This course will use RealPlayer and Windows Media
player.</para>
</description>
</lcViewers>
<lcResolution>
<description>
<para>Although the courseware can be viewed using different
resolutions, it is best viewed in 1024x768 resolution.</para>
</description>
</lcResolution>
<lcFileSizeLimitations>
<description>
<para>This courseware keeps its file size to the bare minimum.
It tries to keep all files below 100k. If some files are larger
than the 100k, a pre-loader is attached.</para>
</description>
</lcFileSizeLimitations>
<lcDownloadTime>
<description>
<para>Download time will vary due to the users' computer
specifications.</para>
</description>
</lcDownloadTime>
<lcSecurity>
<description>
<para>Security level is unclassified.</para>
</description>
</lcSecurity>
```

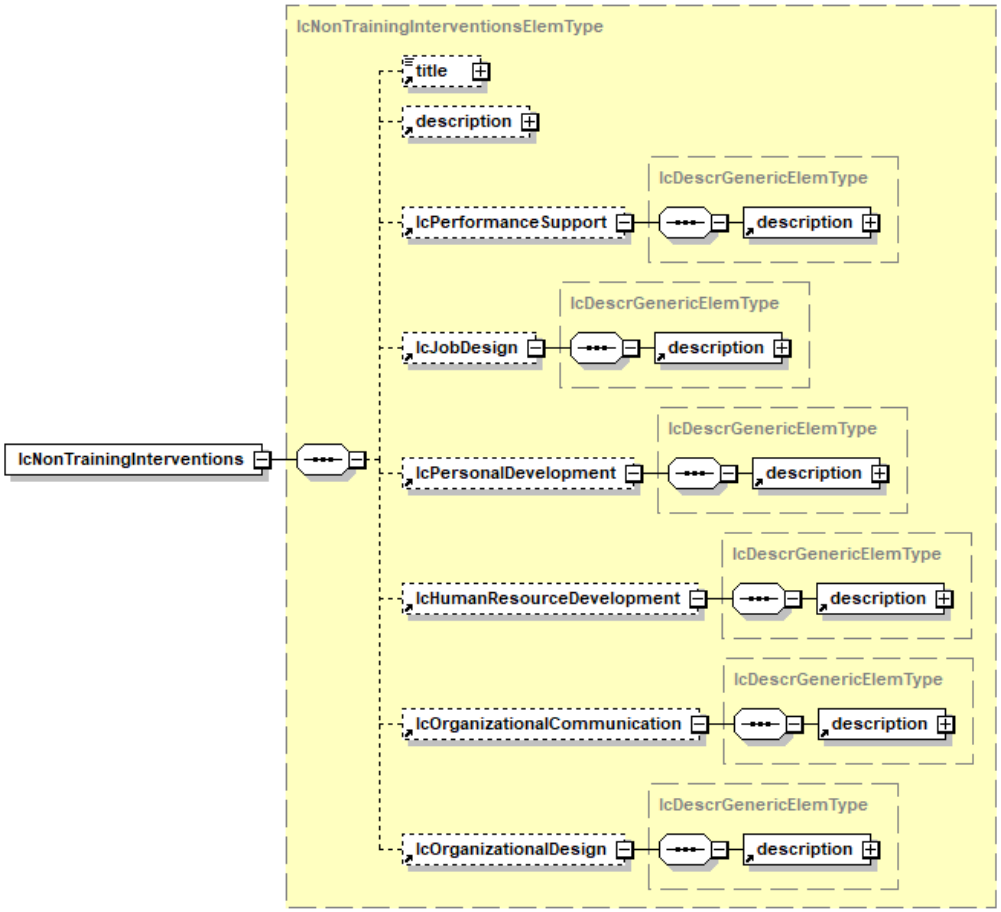
```
</lcTechnicalRqmts>
</lcTrainingInterventions>
<lcLearningObjectives>
<title>Learning Objectives</title>
<description>
<para>Objectives for the Basic bike awareness course</para>
</description>
<lcObjectiveItemGroup>
<title>Steering system lesson objectives</title>
<description>
<para>Objectives for the steering system lesson</para>
</description>
<lcObjectiveItem>
<title>Terminal objective</title>
<description>
<para>Perform steps to remove and install the parts of a bike's
steering system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>Module 3: Steering system</para>
</description>
</lcContentIdentifierName>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
<lcObjectiveItemGroup>
<title>Enabling objectives</title>
<description>
<para>Steering system module enabling objectives</para>
</description>
<lcObjectiveItem>
<title>Enabling objective for SCO 1</title>
<description>
<para>Identify the parts of a bike's steering system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>SCO 1 – Steering system description</para>
</description>
</lcContentIdentifierName>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
```

```
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
</lcObjectiveItem>
<lcObjectiveItem>
<title>Enabling objective for SCO 2</title>
<description>
<para>Describe the steps for installing and removing a bike's
steering system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>SCO 2 – Steering system installation and removal</para>
</description>
</lcContentIdentifierName>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
</lcObjectiveItem>
</lcObjectiveItemGroup>
</lcObjectiveItem>
</lcObjectiveItemGroup>
</lcLearningObjectives>
</lcInterventionDefinition>
```

2.4.1 Non-training interventions

Description: The element <lcNonTrainingInterventions> contains the data that defines the requirements or specifications for performance improvement types of intervention.

Markup element: <lcNonTrainingInterventions>



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Fig 14 Element <lcNonTrainingInterventions>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>. Refer to Chap 3.9.5.2.1.5.
- <`description`>. Refer to Chap 3.9.5.2.2.
- <`lcPerformanceSupport`>. Refer to Para 2.4.1.1.
- <`lcJobDesign`>. Refer to Para 2.4.1.2.
- <`lcPersonalDevelopment`>. Refer to Para 2.4.1.3.
- <`lcHumanResourceDevelopment`>. Refer to Para 2.4.1.4.
- <`lcOrganizationalCommunication`>. Refer to Para 2.4.1.5.
- <`lcOrganizationalDesign`>. Refer to Para 2.4.1.6.

Markup example:

```
<lcNonTrainingInterventions>
<title>Non-training interventions</title>
<description>
<para>The following information identifies various non-training
interventions intended to reduce the performance gaps of
couriers working at Speedy Courier, Inc. Final design
requirements and criteria of each non-training component shall
be defined at a later time.</para>
</description>
<lcPerformanceSupport>
<description>
<para>Bike couriers shall be provided a Quick fix guide that
outlines the five most common bike breakdowns. This guide
contains the processes to address each of the five breakdown
types.</para>
</description>
</lcPerformanceSupport>
<lcJobDesign>
<description>
<para>Two changes will be made to the courier job to better
align incentives with the company's goals. First, couriers will
not receive the commission for a delivery if the breakdown
service is used for a repair that could have been made "in the
field." Second, couriers will be placed under a tiered bonus
program that rewards calling in the breakdown service for
repairs listed in their Quick fix guide.</para>
</description>
</lcJobDesign>
<lcPersonalDevelopment>
<description>
<para>Bike couriers that are failing to meet the defined time
limit for any repair task listed in their manual will be
required to practice those tasks twice per week. They will be
assigned a mentor while performing the tasks. When they
demonstrate that they can perform the repairs within the time
limit, they will no longer be required to perform these task
rehearsals.</para>
</description>
</lcPersonalDevelopment>
<lcHumanResourceDevelopment>
<description>
<para>New hiring criteria and assessments shall be instituted to
evaluate courier applicants' existing skills in basic bike
repair and maintenance.</para>
</description>
</lcHumanResourceDevelopment>
<lcOrganizationalCommunication>
<description>
<para>A designated delegate in the third tier of bike couriers
will report courier maintenance statistics directly to the
Courier Manager on the last Friday of each month. The statistics
```

```
will be entered directly into the Courier Manager's Maintenance
Awareness (CMMA) tool.</para>
</description>
</lcOrganizationalCommunication>
<lcOrganizationalDesign>
<description>
<para>Couriers will be structured into three tiers. The base
tier will be new hires with no experience. The second tier will
be couriers with 1-3 years of experience. The third tier will be
couriers with 4+ years of experience, and will include
supervisory-level couriers.</para>
</description>
</lcOrganizationalDesign>
</lcNonTrainingInterventions>
```

2.4.1.1 Performance support

Description: The element <lcPerformanceSupport> contains the technical data that describes the purpose, requirements, or specifications of an intervention to be used on the job that will improve worker performance.

Markup element: <lcPerformanceSupport>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcPerformanceSupport>
<description>
<para>Bike couriers shall be provided a Quick fix guide that
outlines the five most common bike breakdowns. This guide
contains the processes to address each of the five breakdown
types.</para>
</description>
</lcPerformanceSupport>
```

2.4.1.2 Job design

Description: The element <lcJobDesign> contains the technical data that describes new or altered job requirements, specifications, responsibilities, processes, etc, that will improve performance of the job by the responsible workers.

Markup element: <lcJobDesign>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcJobDesign>
<description>
<para>Two changes will be made to the courier job to better
align incentives with the company's goals. First, couriers will
not receive the commission for a delivery if the breakdown
service is used for a repair that could have been made "in the
field." Second, couriers will be placed under a tiered bonus
program that rewards calling in the breakdown service for
repairs listed in their Quick fix guide.</para>
</description>
</lcJobDesign>
```

2.4.1.3 Personal development

Description: The element <lcPersonalDevelopment> contains the technical data that describes activities, actions, etc, to be taken by individuals to improve performance of job tasks.

Markup element: <lcPersonalDevelopment>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcPersonalDevelopment>
<description>
<para>Bike couriers that are failing to meet the defined time
limit for any repair task listed in their manual will be
```

```
required to practice those tasks twice per week. They will be
assigned a mentor while performing the tasks. When they
demonstrate that they can perform the repairs within the time
limit, they will no longer be required to perform these task
rehearsals.</para>
</description>
</lcPersonalDevelopment>
```

2.4.1.4 Human resource development

Description: The element <lcHumanResourceDevelopment> contains the technical data that describes a human resource type of intervention that will target the creation or modification of personnel selection processes.

Markup element: <lcHumanResourceDevelopment>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcHumanResourceDevelopment>
<description>
<para>New hiring criteria and assessments shall be instituted to
evaluate courier applicants' existing skills in basic bike
repair and maintenance.</para>
</description>
</lcHumanResourceDevelopment>
```

2.4.1.5 Organizational communication

Description: The element <lcOrganizationalCommunication> contains the technical data that describes an intervention that alters the pattern, means of, and protocol for communicating within and across an organization's levels and departments.

Markup element: <lcOrganizationalCommunication>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcOrganizationalCommunication>
<description>
<para>A designated delegate in the third tier of bike couriers
will report courier maintenance statistics directly to the
Courier Manager on the last Friday of each month. The statistics
will be entered directly into the Courier Manager's Maintenance
Awareness (CMMA) tool.</para>
</description>
</lcOrganizationalCommunication>
```

2.4.1.6 Organizational design

Description: The element <lcOrganizationalDesign> contains the technical data that describes a performance intervention designed to improve or align an organization's structure so that business objectives can be successfully met by its workers.

Markup element: <lcOrganizationalDesign>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

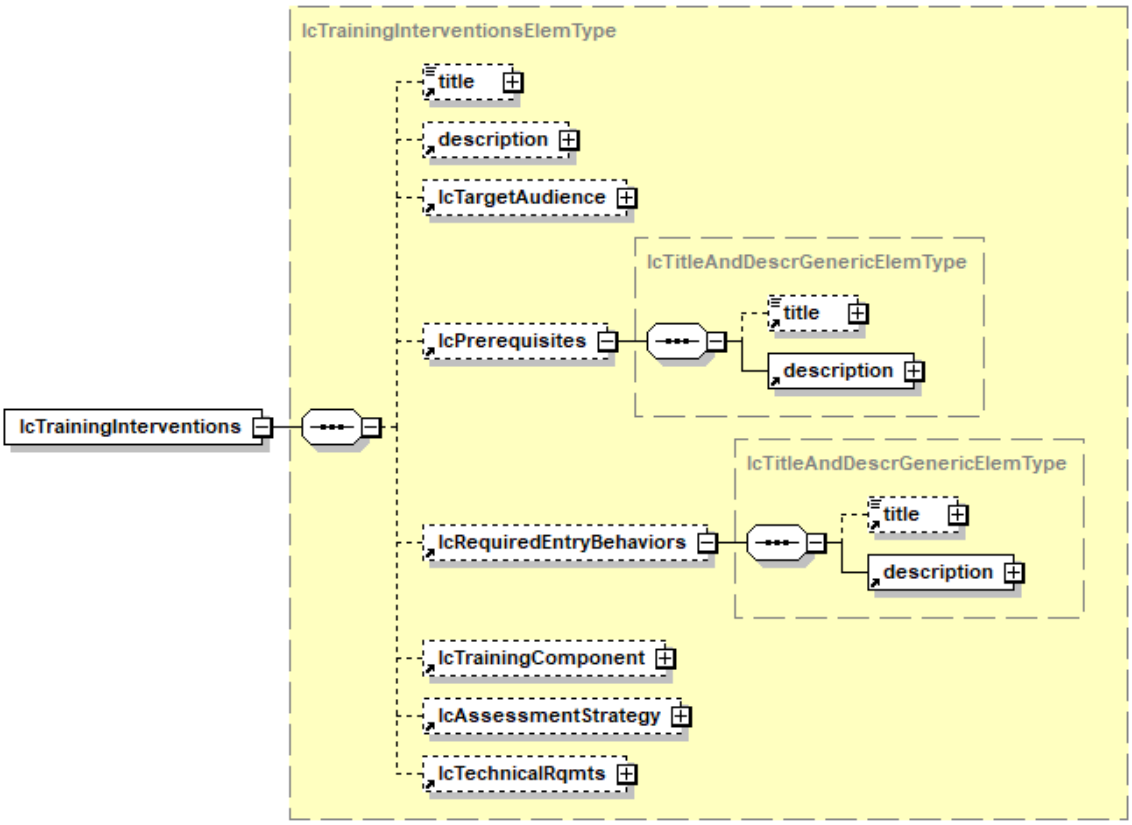
Markup example:

```
<lcOrganizationalDesign>
<description>
<para>Couriers will be structured into three tiers. The base
tier will be new hires with no experience. The second tier will
be couriers with 1-3 years of experience. The third tier will be
couriers with 4+ years of experience, and will include
supervisory-level couriers.</para>
</description>
</lcOrganizationalDesign>
```

2.4.2 Training intervention

Description: The element <lcTrainingInterventions> contains the data that defines the specifications and requirements for the design and development of the courseware.

Markup element: <lcTrainingInterventions>



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Fig 15 Element <lcTrainingInterventions>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcTargetAudience>. Refer to Para 2.4.2.1.
- <lcPrerequisites>. Refer to Para 2.4.2.1.2.
- <lcRequiredEntryBehaviors>. Refer to Para 2.4.2.3.
- <lcTrainingComponent>. Refer to Para 2.4.2.4.

- <lcAssessmentStrategy>. Refer to Para 2.4.2.5.
- <lcTechnicalRqmts>. Refer to Para 2.4.2.6.

Markup example:

```
<lcTrainingInterventions>
<title>Training interventions</title>
<description>
<para>The following information outlines the training
recommendations for addressing the identified gap.</para>
</description>
<lcTargetAudience>
<title>Target audience</title>
<description>
<para>Skill levels for entry-level bike couriers can vary from
none to novice experience levels, which range from 0 to 1 year
in service. Couriers have typically learned the skills needed
through trial and error.</para>
</description>
<lcCurrentEntryBehaviors>
<description>
<para>The majority of couriers have high school educations and
have basic knowledge of tool use.</para>
</description>
</lcCurrentEntryBehaviors>
<lcAttitudeTowardContent>
<description>
<para>A survey revealed that 95% of the couriers are willing to
complete training as long as the stated incentives are
employed.</para>
</description>
</lcAttitudeTowardContent>
<lcLearningPreferences>
<description>
<para>Given the physical and customer-oriented nature of courier
work, the type of person attracted for such positions tends to
be of the more assertive type and more emotionally responsive.
This type tends to prefer less-structured activities, anecdotes
and stories, interaction with others, taking action, and moving
as fast as possible (borderline impatient).</para>
</description>
</lcLearningPreferences>
</lcTargetAudience>
<lcPrerequisites>
<title>Bike courier maintenance prerequisites</title>
<description>
<para>Basic bike repair hand tools: Purpose and use.</para>
</description>
</lcPrerequisites>
<lcRequiredEntryBehaviors>
<title>Required entry behaviors</title>
<description>
<para>Demonstrate proper use of basic hand tools and bike
```

```
jacks.</para>
</description>
</lcRequiredEntryBehaviors>
<lcTrainingComponent>
<title>Training component</title>
<description>
<para>The following information outlines the training
component.</para>
</description>
<lcTrainingType>
<description>
<para>An online computer-based course will be used in
conjunction with hands-on practices.</para>
</description>
</lcTrainingType>
<lcLearningStrategy>
<description>
<para>This training uses a blended approach to teaching bicycle
maintenance and repair.</para>
</description>
</lcLearningStrategy>
<lcDuration>
<lcTime>
<description>
<para>The computer-based courseware will take approximately 1,5
hours to complete. The practical exercises will take
approximately 2 hours to complete.</para>
</description>
</lcTime>
</lcDuration>
<lcRequiredFinances>
<description>
<para>All financial requirements will be covered by Speedy
Couriers, Inc.</para>
</description>
</lcRequiredFinances>
<lcRequiredPersonnel>
<description>
<para>The current bicycle repair technician will serve as a
facilitator during the practical exercise portion of the
training as well as the grader for the hands-on test at the end
of the training.</para>
</description>
</lcRequiredPersonnel>
<lcRequiredFacilities>
<description>
<para>The current bicycle repair area will be used for the
practical exercises and end of training hands-on test.</para>
</description>
</lcRequiredFacilities>
<lcRequiredEquipment>
<description>
```

```
<para>Couriers may take the computer portion of the training
using one of Speedy Courier's office computer workstations or
they may take a CD of the training to be completed at home. The
current bicycle repair equipment will be used for the practical
exercises and end of training hands-on test.</para>
</description>
</lcRequiredEquipment>
<lcLocalCultureConsiderations>
<description>
<para>Most of the couriers take classes at the local community
college. Many view their jobs as a necessity and have poor
attitudes toward improving their performance.</para>
</description>
</lcLocalCultureConsiderations>
</lcTrainingComponent>
<lcAssessmentStrategy>
<title>Assessment strategy</title>
<description>
<para>The following information outlines the assessment
strategies for the Basic bike awareness course.</para>
</description>
<lcAssessmentComponent>
<title>Computer-based assessment component</title>
<description>
<para>The following information outlines the assessment strategy
for the computer-based portion of the training.</para>
</description>
<lcMasteryScoreCriteria>
<description>
<para>80% mastery of all lesson tests</para>
</description>
</lcMasteryScoreCriteria>
<lcPerformanceRubric>
<description>
<para>QUESTION: Which part of the steering system supplies the
sideways swiveling action that allows the rider to steer the
bike?</para>
<para>ANSWER: Headset</para>
</description>
</lcPerformanceRubric>
<lcScoringMethod>
<description>
<para>The lesson tests are scored using computer programming
built into the training.</para>
</description>
</lcScoringMethod>
<lcMinimumPassThreshold>
<description>
<para>The minimum passing score for the assessment is
80%.</para>
</description>
</lcMinimumPassThreshold>
```

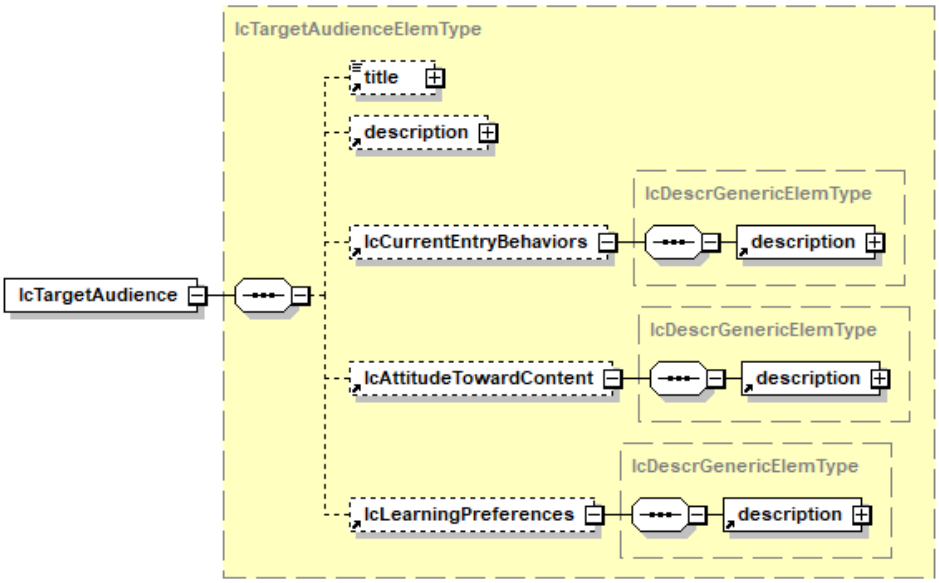
```
</lcAssessmentComponent>
</lcAssessmentStrategy>
<lcTechnicalRqmts>
<title>Technical requirements</title>
<description>
<para>This section lists the technical requirements needed to
complete the instruction.</para>
</description>
<lcBrowsers>
<description>
<para>This courseware is created to run in the Internet Explorer
6.x Web browser.</para>
</description>
</lcBrowsers>
<lcLms>
<description>
<para>Lesson content packages will be tracked in the Sum Total
LMS.</para>
</description>
</lcLms>
<lcNonLmsItEnvironment>
<description>
<para>The courseware does not require any special considerations
when it is running outside of an LMS.</para>
</description>
</lcNonLmsItEnvironment>
<lcPaperBasedMaterials>
<description>
<para>This courseware will use the Basic bike repair manual,
document number X45R56.</para>
</description>
</lcPaperBasedMaterials>
<lcClassroom>
<description>
<para>Instruction will be taken in the Learning Lab at Speedy
Courier's main office. The training is part of the employee's
first-day orientation and is required. No courier assignments
will be given until the employee completes the orientation and
the training.</para>
</description>
</lcClassroom>
<lcOjt>
<description>
<para>In addition to the performance practices and test that are
used in the curriculum, couriers will have access to the repair
facility in order to hone their skills and abilities in
repairing the bike.</para>
</description>
</lcOjt>
<lcAccessibility>
<description>
<para>This courseware meets W3C Web Accessibility Initiative
```

```
Guidelines Priority 1 checkpoints.</para>
</description>
</lcAccessibility>
<lcPlayers>
<description>
<para>The courseware will make use of the following players and
plug-ins: Adobe Flash player and Adobe Acrobat reader.</para>
</description>
</lcPlayers>
<lcGraphicStandards>
<description>
<para>Graphics utilized are JPEG and SWF files. SWF files may
contain 3D animation or interactivity. SWF files are being
utilized in lieu of CGM files to reach a broader audience
because they can be viewed utilizing the Adobe Flash
player.</para>
</description>
</lcGraphicStandards>
<lcViewers>
<description>
<para>This course will use RealPlayer and Windows Media
player.</para>
</description>
</lcViewers>
<lcResolution>
<description>
<para>Although the courseware can be viewed using different
resolutions, it is best viewed in 1024x768 resolution.</para>
</description>
</lcResolution>
<lcFileSizeLimitations>
<description>
<para>This courseware keeps it file size to the bare minimum. It
tries to keep all files below 100k. If some files are larger
than the 100k, a pre-loader is attached.</para>
</description>
</lcFileSizeLimitations>
<lcDownloadTime>
<description>
<para>Download time will vary due to the users' computer
specifications.</para>
</description>
</lcDownloadTime>
<lcSecurity>
<description>
<para>Security level is unclassified.</para>
</description>
</lcSecurity>
</lcTechnicalRqmts>
</lcTrainingInterventions>
```

2.4.2.1 Target audience

Description: The element <lcTargetAudience> contains the data that defines the student characteristics for a training intervention.

Markup element: <lcTargetAudience>



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Fig 16 Element <lcTargetAudience>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcCurrentEntryBehaviors>. Refer to Para 2.4.2.1.1.
- <lcAttitudeTowardContent>. Refer to Para 2.4.2.1.2.
- <lcLearningPreferences>. Refer to Para 2.4.2.1.3.

Markup example:

```
<lcTargetAudience>
<title>Target audience</title>
<description>
<para>Skill levels for entry-level bike couriers can vary from
none to novice experience levels, which range from 0 to 1 year
in service. Couriers have typically learned the skills needed
through trial and error.</para>
```

```
</description>
<lcCurrentEntryBehaviors>
<description>
<para>The majority of couriers have high school educations and
have basic knowledge of tool use.</para>
</description>
</lcCurrentEntryBehaviors>
<lcAttitudeTowardContent>
<description>
<para>A survey revealed that 95% of the couriers are willing to
complete training as long as the stated incentives are
employed.</para>
</description>
</lcAttitudeTowardContent>
<lcLearningPreferences>
<description>
<para>Given the physical and customer-oriented nature of courier
work, the type of person attracted for such positions tends to
be of the more assertive type and more emotionally responsive.
This type tends to prefer less-structured activities, anecdotes
and stories, interaction with others, taking action, and moving
as fast as possible (borderline impatient).</para>
</description>
</lcLearningPreferences>
</lcTargetAudience>
```

2.4.2.1.1 Current entry behaviors

Description: The element <lcCurrentEntryBehaviors> contains the known existing knowledge, skills, or abilities of the target audience in relation to the required training.

Markup element: <lcCurrentEntryBehaviors>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcCurrentEntryBehaviors>
<description>
<para>The majority of couriers have high school educations and
have basic knowledge of tool use.</para>
</description>
</lcCurrentEntryBehaviors>
```

2.4.2.1.2 Attitude toward content

Description: The element <lcAttitudeTowardContent> contains the known attitudes of the target audience in relation to the required training.

Markup element: <lcAttitudeTowardContent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcAttitudeTowardContent>
<description>
<para>A survey revealed that 95% of the couriers are willing to
complete training as long as the stated incentives are
employed.</para>
</description>
</lcAttitudeTowardContent>
```

2.4.2.1.3 Learning preferences

Description: The element <lcLearningPreferences> contains the information about the target audience's methods or modes of learning for the training topic in question.

Markup element: <lcLearningPreferences>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcLearningPreferences>
<description>
<para>Given the physical and customer-oriented nature of courier
```

```
work, the type of person attracted for such positions tends to
be of the more assertive type and more emotionally responsive.
This type tends to prefer less-structured activities, anecdotes
and stories, interaction with others, taking action, and moving
as fast as possible (borderline impatient).</para>
</description>
</lcLearningPreferences>
```

2.4.2.2 Prerequisites

Description: The element <lcPrerequisites> contains a requirement that must be completed prior to the target training.

Markup element: <lcPrerequisites>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcPrerequisites>
<title>Bike courier maintenance Prerequisites</title>
<description>
<para>Basic bike repair hand tools: Purpose and use.</para>
</description>
</lcPrerequisites>
```

2.4.2.3 Required entry behaviors

Description: The element <lcRequiredEntryBehaviors> contains a task that must be demonstrated by the target audience in order to take the training.

Markup element: <lcRequiredEntryBehaviors>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

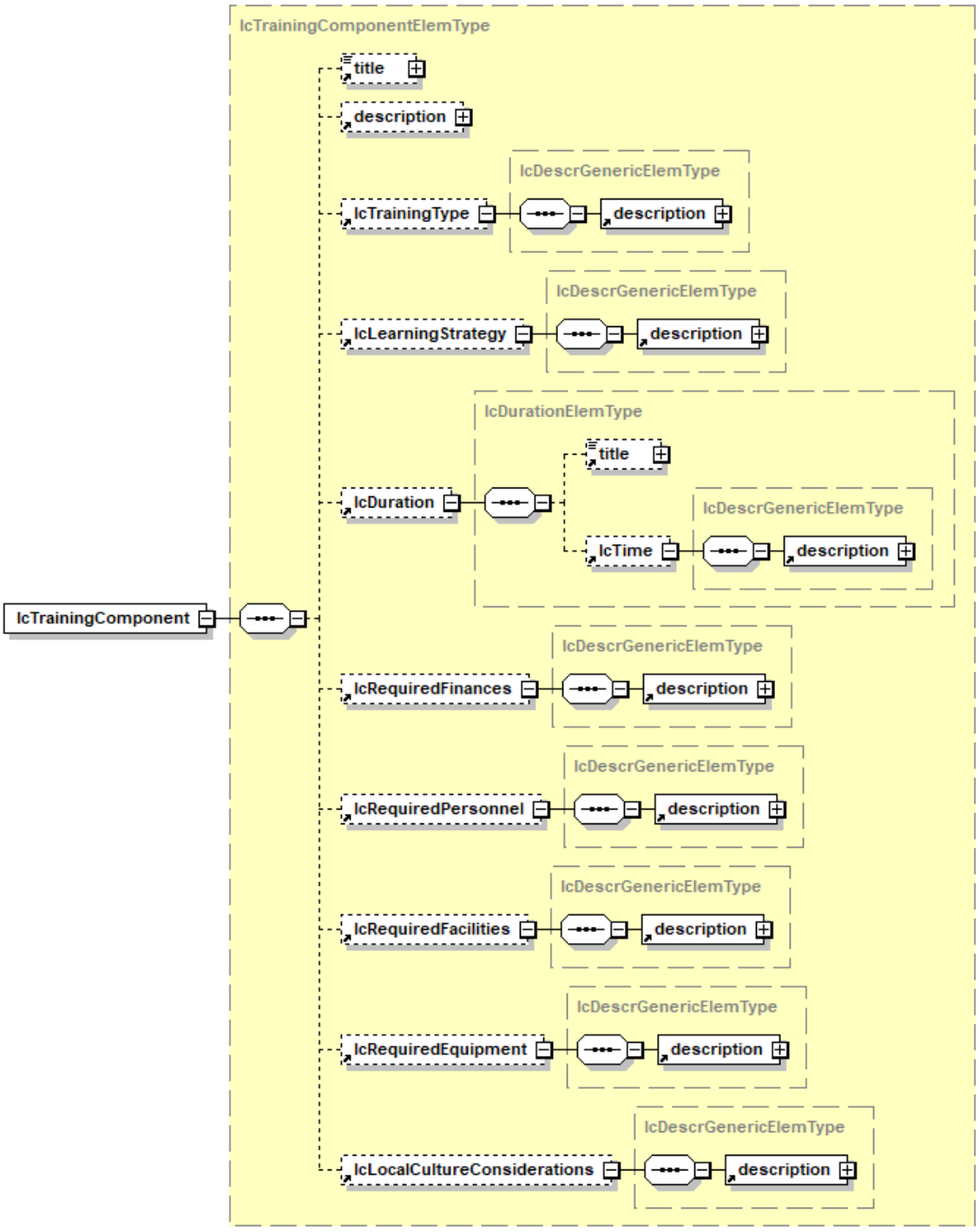
Markup example:

```
<lcRequiredEntryBehaviors>
<title>Required entry behaviors</title>
<description>
<para>Demonstrate proper use of basic hand tools and bike
jacks.</para>
</description>
</lcRequiredEntryBehaviors>
```

2.4.2.4 Training component

Description: The element <lcTrainingComponent> contains the data that describes the requirements for the support and logistics of the training intervention.

Markup element: <lcTrainingComponent>



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Fig 17 Element <`lcTrainingComponent`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>. Refer to Chap 3.9.5.2.1.5.
- <`description`>. Refer to Chap 3.9.5.2.2.
- <`lcTrainingType`>. Refer to Para 2.4.2.4.1.
- <`lcLearningStrategy`>. Refer to Para 2.4.2.4.2.
- <`lcDuration`>. Refer to Para 2.4.2.4.3.
- <`lcRequiredFinances`>. Refer to Para 2.4.2.4.5.
- <`lcRequiredPersonnel`>. Refer to Para 2.4.2.4.6.
- <`lcRequiredFacilities`>. Refer to Para 2.4.2.4.7.
- <`lcRequiredEquipment`>. Refer to Para 2.4.2.4.8.
- <`lcLocalCultureConsiderations`>. Refer to Para 2.4.2.4.9.

Markup example:

```
<lcTrainingComponent>
<title>Training component</title>
<description>
<para>The following information outlines the training
component.</para>
</description>
<lcTrainingType>
<description>
<para>An online computer-based course will be used in
conjunction with hands-on practices.</para>
</description>
</lcTrainingType>
<lcLearningStrategy>
<description>
<para>This training uses a blended approach to teaching bicycle
maintenance and repair.</para>
</description>
</lcLearningStrategy>
<lcDuration>
<lcTime>
<description>
<para>The computer-based courseware will take approximately 1,5
hours to complete. The practical exercises will take
approximately 2 hours to complete.</para>
</description>
</lcTime>
</lcDuration>
<lcRequiredFinances>
<description>
<para>All financial requirements will be covered by Speedy
Couriers, Inc.</para>
</description>
</lcRequiredFinances>
<lcRequiredPersonnel>
```

```
<description>
<para>The current bicycle repair technician will serve as a
facilitator during the practical exercise portion of the
training as well as the grader for the hands-on test at the end
of the training.</para>
</description>
</lcRequiredPersonnel>
<lcRequiredFacilities>
<description>
<para>The current bicycle repair area will be used for the
practical exercises and end of training hands-on test.</para>
</description>
</lcRequiredFacilities>
<lcRequiredEquipment>
<description>
<para>Couriers may take the computer portion of the training
using one of Speedy Courier's office computer workstations or
they may take a CD of the training to be completed at home. The
current bicycle repair equipment will be used for the practical
exercises and end of training hands-on test.</para>
</description>
</lcRequiredEquipment>
<lcLocalCultureConsiderations>
<description>
<para>Most of the couriers take classes at the local community
college. Many view their jobs as a necessity and have poor
attitudes toward improving their performance.</para>
</description>
</lcLocalCultureConsiderations>
</lcTrainingComponent>
```

2.4.2.4.1 Training type

Description: The element <lcTrainingType> contains the category of instruction that will occur.

Markup element: <lcTrainingType>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcTrainingType>
<description>
<para>An online computer-based course will be used in
conjunction with hands-on practices.</para>
</description>
</lcTrainingType>
```

2.4.2.4.2 Learning strategy

Description: The element <lcLearningStrategy> contains the selected learning strategy for a training component.

Markup element: <lcLearningStrategy>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcLearningStrategy>
<description>
<para>This training uses a blended approach to teaching bicycle
maintenance and repair.</para>
</description>
</lcLearningStrategy>
```

2.4.2.4.3 Duration

Description: The element <lcDuration> contains the expected amount of time required for the learner to complete the training component.

Markup element: <lcDuration>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <lcTime>. Refer to Para 2.4.2.4.4.

Markup example:

```
<lcDuration>
<lcTime>
<description>
<para>The computer-based courseware will take approximately 1,5
hours to complete. The practical exercises will take
approximately 2 hours to complete.</para>
</description>
</lcTime>
</lcDuration>
```

2.4.2.4.4 Time

Description: The element <lcTime> contains the time expected to complete an activity.

Markup element: <lcTime>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcTime>
<description>
<para>It should take no more than 1 hour and 30 minutes to
complete this course.</para>
</description>
</lcTime>
```

2.4.2.4.5 Required finances

Description: The element <lcRequiredFinances> contains the funding or cost requirements for a training component.

Markup element: <lcRequiredFinances>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcRequiredFinances>
<description>
<para>All financial requirements will be covered by Speedy
Couriers, Inc.</para>
</description>
</lcRequiredFinances>
```

2.4.2.4.6 Required personnel

Description: The element <lcRequiredPersonnel> contains the personnel required to support or implement a training component.

Markup element: <lcRequiredPersonnel>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcRequiredPersonnel>
<description>
<para>The current bicycle repair technician will serve as a
facilitator during the practical exercise portion of the
training as well as the grader for the hands-on test at the end
of the training.</para>
</description>
</lcRequiredPersonnel>
```

2.4.2.4.7 Required facilities

Description: The element <lcRequiredFacilities> contains the facilities required to support or implement a training component.

Markup element: <lcRequiredFacilities>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcRequiredFacilities>
<description>
<para>The current bicycle repair area will be used for the
practical exercises and end of training hands-on test.</para>
</description>
</lcRequiredFacilities>
```

2.4.2.4.8 Required equipment

Description: The element <lcRequiredEquipment> contains the supplies and tools required to support or implement a training component.

Markup element: <lcRequiredEquipment>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcRequiredEquipment>
<description>
<para>Couriers may take the computer portion of the training
using one of Speedy Courier's office computer workstations or
they may take a CD of the training to be completed at home. The
current bicycle repair equipment will be used for the practical
exercises and end of training hands-on test.</para>
</description>
</lcRequiredEquipment>
```

2.4.2.4.9 Local culture considerations

Description: The element <lcLocalCultureConsiderations> contains any special local customs or cultural nuances to be considered in the implementation or delivery of a training component.

Markup element: <lcLocalCultureConsiderations>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

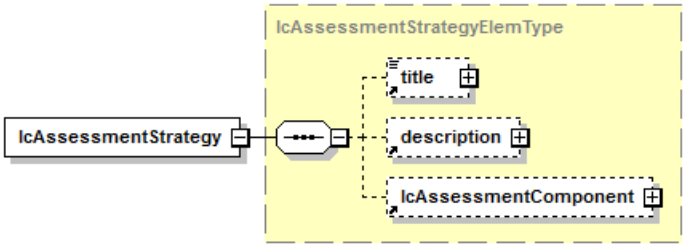
Markup example:

```
<lcLocalCultureConsiderations>
<description>
<para>Most of the couriers take classes at the local community
college. Many view their jobs as a necessity and have poor
attitudes toward improving their performance.</para>
</description>
</lcLocalCultureConsiderations>
```

2.4.2.5 Assessment strategy

Description: The element <lcAssessmentStrategy> contains the requirements of the plan for assessing learners' achievements in relation to the objective.

Markup element: <lcAssessmentStrategy>



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Fig 18 Element <lcAssessmentStrategy>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcAssessmentComponent>. Refer to Para 2.4.2.5.2.

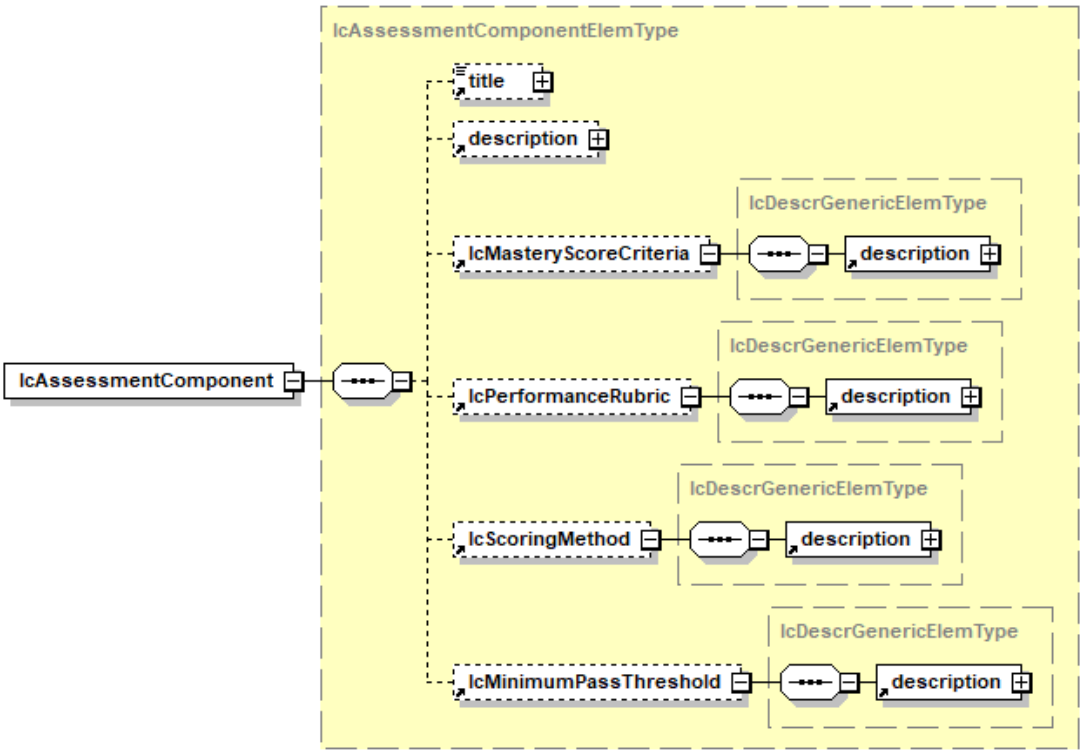
Markup example:

```
<lcAssessmentStrategy>
<title>Assessment strategy</title>
<description>
<para>The following information outlines the assessment
strategies for the Basic bike awareness course.</para>
</description>
<lcAssessmentComponent>
<title>Computer-based assessment component</title>
<description>
<para>The following information outlines the assessment strategy
for the computer-based portion of the training.</para>
</description>
<lcMasteryScoreCriteria>
<description>
<para>80% mastery of all lesson tests</para>
</description>
</lcMasteryScoreCriteria>
<lcPerformanceRubric>
<description>
<para>QUESTION: Which part of the steering system supplies the
sideways swiveling action that allows the rider to steer the
bike?</para>
<para>ANSWER: Headset</para>
</description>
</lcPerformanceRubric>
<lcScoringMethod>
<description>
<para>The lesson tests are scored using computer programming
built into the training.</para>
</description>
</lcScoringMethod>
<lcMinimumPassThreshold>
<description>
<para>The minimum passing score for the assessment is
80%.</para>
</description>
</lcMinimumPassThreshold>
</lcAssessmentComponent>
</lcAssessmentStrategy>
```

2.4.2.5.1 Assessment component

Description: The element <lcAssessmentComponent> contains the specifications of the learner evaluation requirement for a training component.

Markup element: <lcAssessmentComponent>



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Fig 19 Element <lcAssessmentComponent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcMasteryScoreCriteria>. Refer to Para 2.4.2.5.2.
- <lcPerformanceRubric>. Refer to Para 2.4.2.5.3.
- <lcScoringMethod>. Refer to Para 2.4.2.5.4.
- <lcMinimumPassThreshold>. Refer to Para 2.4.2.5.5.

Markup example:

```
<lcAssessmentComponent>
<title>Computer-based assessment component</title>
<description>
<para>The following information outlines the assessment strategy
for the computer-based portion of the training.</para>
</description>
<lcMasteryScoreCriteria>
<description>
<para>80% mastery of all lesson tests</para>
</description>
</lcMasteryScoreCriteria>
<lcPerformanceRubric>
<description>
<para>QUESTION: Which part of the steering system supplies the
sideways swiveling action that allows the rider to steer the
bike?</para>
<para>ANSWER: Headset</para>
</description>
</lcPerformanceRubric>
<lcScoringMethod>
<description>
<para>The lesson tests are scored using computer programming
built into the training.</para>
</description>
</lcScoringMethod>
<lcMinimumPassThreshold>
<description>
<para>The minimum passing score for the assessment is
80%.</para>
</description>
</lcMinimumPassThreshold>
</lcAssessmentComponent>
```

2.4.2.5.2 Mastery score criteria

Description: The element <lcMasteryScoreCriteria> contains the score or grade that is the minimum expected in order for the assessment to be considered successfully completed.

Markup element: <lcMasteryScoreCriteria>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcMasteryScoreCriteria>
<description>
<para>80% mastery of all lesson tests</para>
</description>
</lcMasteryScoreCriteria>
```

2.4.2.5.3 Performance rubric

Description: The element <lcPerformanceRubric> contains information for the answer key used to evaluate the assessment.

Markup element: <lcPerformanceRubric>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcPerformanceRubric>
<description>
<para>QUESTION: Which part of the steering system supplies the
sideways swiveling action that allows the rider to steer the
bike?</para>
<para>ANSWER: Headset</para>
</description>
</lcPerformanceRubric>
```

2.4.2.5.4 Scoring method

Description: The element <lcScoringMethod> gives a description of how the assessment is graded.

Markup element: <lcScoringMethod>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcScoringMethod>
<description>
<para>The lesson tests are scored using computer programming
built into the training.</para>
</description>
</lcScoringMethod>
```

2.4.2.5.5 Minimum pass threshold

Description: The element <lcMinimumPassThreshold> gives the minimum score required of the learner to successfully complete the assessment component.

Markup element: <lcMinimumPassThreshold>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

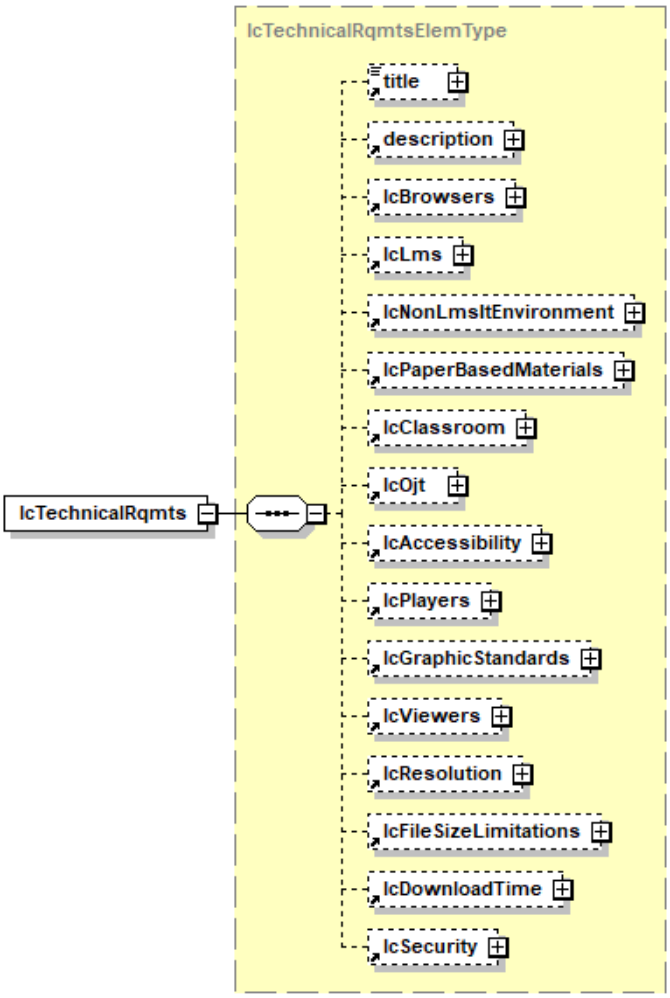
Markup example:

```
<lcMinimumPassThreshold>
<description>
<para>The minimum passing score for the assessment is
80%.</para>
</description>
</lcMinimumPassThreshold>
```

2.4.2.6 Technical requirements

Description: The element <lcTechnicalRqmts> contains the technical requirements for how the learning content is delivered and how those requirements are supported by the instructional design.

Markup element: <lcTechnicalRqmts>



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Fig 20 Element <lcTechnicalRqmts>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcBrowsers>. Refer to Para 2.4.2.6.1.
- <lcLms>. Refer to Para 2.4.2.6.2.
- <lcNonLmsItEnvironment>. Refer to Para 2.4.2.6.3.
- <lcPaperBasedMaterials>. Refer to Para 2.4.2.6.4.

- <lcClassroom>. Refer to Para 2.4.2.6.5.
- <lcOjt>. Refer to Para 2.4.2.6.6.
- <lcAccessibility>. Refer to Para 2.4.2.6.7.
- <lcPlayers>. Refer to Para 2.4.2.6.8.
- <lcGraphicStandards>. Refer to Para 2.4.2.6.9.
- <lcViewers>. Refer to Para 2.4.2.6.10.
- <lcResolution>. Refer to Para 2.4.2.6.11.
- <lcFileSizeLimitations>. Refer to Para 2.4.2.6.12.
- <lcDownloadTime>. Refer to Para 2.4.2.6.13.
- <lcSecurity>. Refer to Para 2.4.2.6.14.

Markup example:

```
<lcTechnicalRqmts>
<title>Technical requirements</title>
<description>
<para>This section lists the technical requirements needed to
complete the instruction.</para>
</description>
<lcBrowsers>
<description>
<para>This courseware is created to run in the Internet Explorer
6.x Web browser.</para>
</description>
</lcBrowsers>
<lcLms>
<description>
<para>Lesson content packages will be tracked in the Sum Total
LMS.</para>
</description>
</lcLms>
<lcNonLmsItEnvironment>
<description>
<para>The courseware does not require any special considerations
when it is running outside of an LMS.</para>
</description>
</lcNonLmsItEnvironment>
<lcPaperBasedMaterials>
<description>
<para>This courseware will use the Basic bike repair manual,
document number X45R56.</para>
</description>
</lcPaperBasedMaterials>
<lcClassroom>
<description>
<para>Instruction will be taken in the Learning Lab at Speedy
Courier's main office. The training is part of the employee's
first-day orientation and is required. No courier assignments
will be given until the employee completes the orientation and
the training.</para>
</description>
</lcClassroom>
```

```
<lcOjt>
<description>
<para>In addition to the performance practices and test that are
used in the curriculum, couriers will have access to the repair
facilitiy in order to hone their skills and abilities in
repairing the bike.</para>
</description>
</lcOjt>
<lcAccessibility>
<description>
<para>This courseware meets W3C Web Accessibility Initiative
Guidelines Priority 1 checkpoints.</para>
</description>
</lcAccessibility>
<lcPlayers>
<description>
<para>The courseware will make use of the following players and
plug-ins: Adobe Flash player and Adobe Acrobat reader.</para>
</description>
</lcPlayers>
<lcGraphicStandards>
<description>
<para>Graphics utilized are JPEG and SWF files. SWF files may
contain 3D animation or interactivity. SWF files are being
utilized in lieu of CGM files to reach a broader audience
because they can be viewed utilizing the Adobe Flash
player.</para>
</description>
</lcGraphicStandards>
<lcViewers>
<description>
<para>This course will use RealPlayer and Windows Media
player.</para>
</description>
</lcViewers>
<lcResolution>
<description>
<para>Although the courseware can be viewed using different
resolutions, it is best viewed in 1024x768 resolution.</para>
</description>
</lcResolution>
<lcFileSizeLimitations>
<description>
<para>This courseware keeps it file size to the bare minimum. It
tries to keep all files below 100k. If some files are larger
than the 100k, a pre-loader is attached.</para>
</description>
</lcFileSizeLimitations>
<lcDownloadTime>
<description>
<para>Download time will vary due to the users computer
specifications.</para>
```

```
</description>
</lcDownloadTime>
<lcSecurity>
<description>
<para>Security level is unclassified.</para>
</description>
</lcSecurity>
</lcTechnicalRqmts>
```

2.4.2.6.1 Browsers

Description: The element <lcBrowsers> gives the Internet browsers suitable for viewing the training material.

Markup element: <lcBrowsers>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcBrowsers>
<description>
<para>This courseware is created to run in the Internet Explorer
6.x web browser.</para>
</description>
</lcBrowsers>
```

2.4.2.6.2 LMS

Description: The element <lcLms> contains the Learning Management System (LMS) name and version number.

Markup element: <lcLms>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcLms>
<description>
<para>Lesson content packages will be tracked in the Sum Total
LMS.</para>
</description>
</lcLms>
```

2.4.2.6.3 Non-LMS environment

Description: The element <lcNonLmsItEnvironment> contains any technical requirements when SCORM and an LMS are not required.

Markup element: <lcNonLmsItEnvironment>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcNonLmsItEnvironment>
<description>
<para>The courseware does not require any special considerations
when it is running outside of an LMS.</para>
</description>
</lcNonLmsItEnvironment>
```

2.4.2.6.4 Paper-based materials

Description: The element <lcPaperBasedMaterials> contains the requirements for the training components delivered via paper-based formats.

Markup element: <lcPaperBasedMaterials>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcPaperBasedMaterials>
<description>
<para>This courseware will use the Basic bike repair manual,
document number X45R56.</para>
</description>
</lcPaperBasedMaterials>
```

2.4.2.6.5 Classroom

Description: The element <lcClassroom> contains the technical aspects of the course to take place in a classroom.

Markup element: <lcClassroom>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcClassroom>
<description>
<para>Instruction will be taken in the Learning Lab at Speedy
Courier's main office. The training is part of the employee's
first-day orientation and is required. No courier assignments
will be given until the employee completes the orientation and
the training.</para>
</description>
</lcClassroom>
```

2.4.2.6.6 On-the-job training

Description: The element <lcOjt> contains a description of the technical aspects of the course taking place in the work environment.

Markup element: <lcOjt>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcOjt>
<description>
<para>In addition to the performance practices and test that are
used in the curriculum, couriers will have access to the repair
facilitiy in order to hone their skills and abilities in
repairing the bike.</para>
</description>
</lcOjt>
```

2.4.2.6.7 Accessibility

Description: The element <lcAccessibility> contains the accessibility level for persons with disabilities.

Markup element: <lcAccessibility>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcAccessibility>
<description>
<para>This courseware meets W3C Web Accessibility Initiative
Guidelines Priority 1 checkpoints.</para>
</description>
</lcAccessibility>
```

2.4.2.6.8 Players

Description: The element <lcPlayers> contains a description of the tools used for time-sequenced display at runtime.

Markup element: <lcPlayers>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcPlayers>
<description>
<para>The courseware will make use of the following players and
plug-ins: Adobe Flash player and Adobe Acrobat reader.</para>
</description>
</lcPlayers>
```

2.4.2.6.9 Graphic standards

Description: The element <lcGraphicStandards> contains a description of the standards and system requirements for displaying graphics, 3D animations from Computer Aided Drawing (CAD), navigation through virtual spaces, etc.

Markup element: <lcGraphicStandards>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcGraphicStandards>
<description>
<para>Graphics utilized are JPEG and SWF files. SWF files may
contain 3D animation or interactivity. SWF files are being
```

```
utilized in lieu of CGM files to reach a broader audience
because they can be viewed utilizing the Adobe Flash
player.</para>
</description>
</lcGraphicStandards>
```

2.4.2.6.10 Viewers

Description: The element <lcViewers> contains a description of the viewers used for time-sequenced display at runtime.

Markup element: <lcViewers>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcViewers>
<description>
<para>This course will use RealPlayer and Windows Media
player.</para>
</description>
</lcViewers>
```

2.4.2.6.11 Resolution

Description: The element <lcResolution> contains a description of the required computer screen resolution for delivered instruction.

Markup element: <lcResolution>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcResolution>
<description>
<para>Although the courseware can be viewed using different
resolutions, it is best viewed in 1024x768 resolution.</para>
</description>
</lcResolution>
```

2.4.2.6.12 File size limitations

Description: The element <lcFileSizeLimitations> contains a description of the file size limitations in the client's delivery environment.

Markup element: <lcFileSizeLimitations>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcFileSizeLimitations>
<description>
<para>This courseware keeps it file size to the bare minimum. It
tries to keep all files below 100k. If some files are larger
than the 100k, a pre-loader is attached.</para>
</description>
</lcFileSizeLimitations>
```

2.4.2.6.13 Download time

Description: The element <lcDownloadTime> contains a description of the maximum time allowed for download time in the client's delivery environment.

Markup element: <lcDownloadTime>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcDownloadTime>
<description>
<para>Download time will vary due to the users' computer
specifications.</para>
</description>
</lcDownloadTime>
```

2.4.2.6.14 Security

Description: The element <lcSecurity> contains a description of the security requirements in the delivered instruction.

Markup element: <lcSecurity>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcSecurity>
<description>
<para>Security level is unclassified.</para>
</description>
</lcSecurity>
```

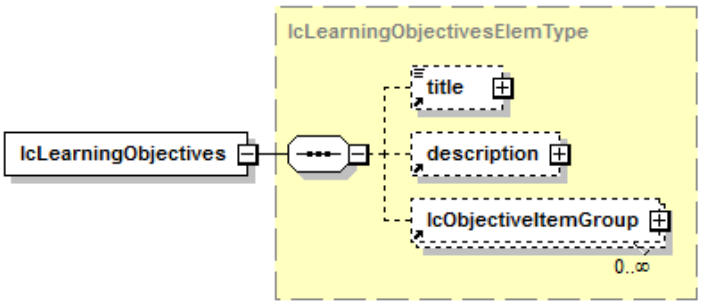
2.4.3 Learning objectives

Description: The element <lcLearningObjectives> contains the learning objectives data. Learning objectives state the actions, conditions, behaviors, and standards expected of the learner by the end of a training event.

Referencing content data from learning objectives: Learning objectives can be linked to the content items supporting them. Referencing is achieved through the use of the element <dmRef> within an element <lcObjectiveItem>. Refer to Para 2.4.3.1.1.

References can be made for entire content data modules, or identifiable portions of content data modules, according to the rules of use of the element <dmRef> found in Chap 3.9.5.2.1.2.

Markup element: <lcLearningObjectives>



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Fig 21 Element <lcLearningObjectives>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcObjectiveItemGroup>. Refer to Para 2.4.3.1.

Markup example:

```
<lcLearningObjectives>
<title>Learning Objectives</title>
<description>
<para>Objectives for the Basic bike awareness course</para>
</description>
<lcObjectiveItemGroup>
<title>Steering system lesson objectives</title>
<description>
<para>Objectives for the steering system lesson</para>
</description>
<lcObjectiveItem>
<title>Terminal objective</title>
<description>
<para>Perform steps to remove and install the parts of a bike's
steering system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>Module 3: Steering system</para>
</description>
</lcContentIdentifierName>
<dmRef>
```

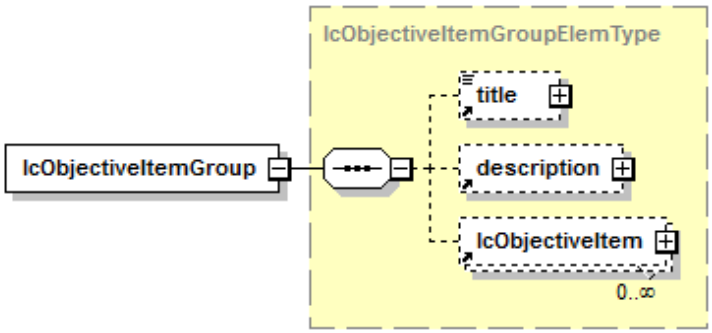
```
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/><language
countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
<lcObjectiveItemGroup>
<title>Enabling objectives</title>
<description>
<para>Steering system module enabling objectives</para>
</description>
<lcObjectiveItem id="lo-001">
<title>Enabling objective for SCO 1</title>
<description>
<para id="para-001">Identify the parts of a bike's steering
system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>SCO 1 – Steering system description</para>
</description>
</lcContentIdentifierName>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
</lcObjectiveItem>
<lcObjectiveItem id="lo-002">
<title>Enabling objective</title>
<description>
<para id="para-0002">Describe the steps for installing and
removing a bike's steering system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>SCO 2 – Steering system installation and removal</para>
</description>
</lcContentIdentifierName>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
```

```
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
</lcObjectiveItem>
</lcObjectiveItemGroup>
</lcObjectiveItem>
</lcObjectiveItemGroup>
</lcLearningObjectives>
```

2.4.3.1 Objective items group

Description: The element <lcObjectiveItemGroup> contains the objective item elements.

Markup element: <lcObjectiveItemGroup>



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Fig 22 Element <lcObjectiveItemGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcObjectiveItem>. Refer to Para 2.4.3.1.1.

Markup example:

```
<lcObjectiveItemGroup>
<title>Enabling objectives</title>
```

```
<description>
<para>Steering system module enabling Objectives</para>
</description>
<lcObjectiveItem>
<title>Enabling objective for SCO 1</title>
<description>
<para>Identify the parts of a bike's steering system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>SCO 1 – steering system description</para>
</description>
</lcContentIdentifierName>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
</lcObjectiveItem>
<lcObjectiveItem>
<title>Enabling objective for SCO 2</title>
<description>
<para>Describe the steps for installing and removing a bike's
steering system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>SCO 2 – Steering system installation and removal</para>
</description>
</lcContentIdentifierName>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
</lcObjectiveItem>
</lcObjectiveItemGroup>
```

2.4.3.1.1 Objective item

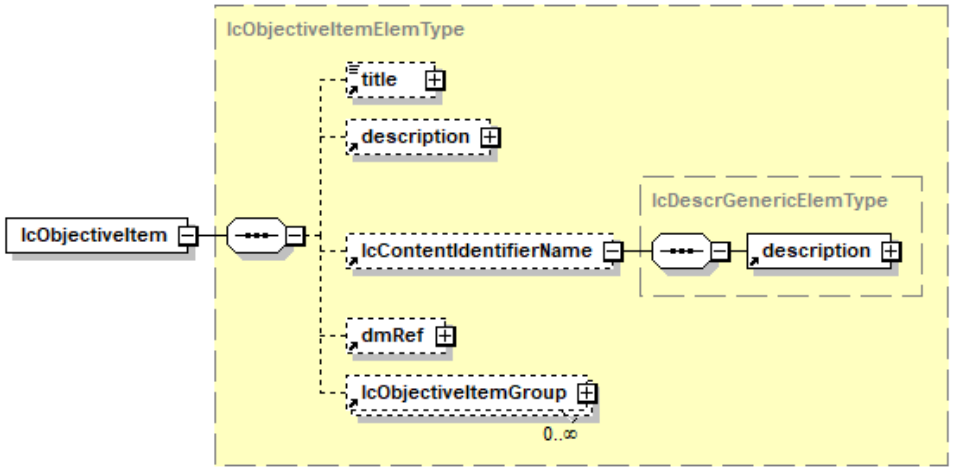
Description: The element <lcObjectiveItem> contains the objective item content. The element <lcObjectiveItemGroup> can be nested within the element

<lcObjectiveItem> to allow for capture of objectives according to a particular course structure.

Note

The child element <dmRef> can be used to establish references between learning objectives, assessments, technical data, and the learning content supporting them. Associating learning objectives and content allows courseware designers and evaluators opportunities to ensure that the learning materials meet explicit goals and expectations. Referencing allows more direct evaluation of the effectiveness of the design and presentation of learning materials according to their stated purposes. Maintenance of the learning content is made more efficient by the ability to directly locate the content items supporting objectives within the course structure. In addition, content referencing allows developers the opportunity to build navigational systems designed around the clear statement of learning objectives with hyperlinks to the content items they represent.

Markup element: <lcObjectiveItem>



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Fig 23 Element <lcObjectiveItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcContentIdentifierName>. Refer to Para 2.4.3.1.2.
- <dmRef>, the reference to content supported by an objective item is identified by the element <dmRef>. Use of the element <dmRef> will support XML data linking among learning objectives and their related content within learning materials. The element <dmRef> is used in accordance with the rules in Chap 3.9.5.2.1.2.

– <lcObjectiveItemGroup>. Refer to Para 2.4.3.1.

Markup example:

```
<lcObjectiveItem>
<title>Enabling objective for SCO 2</title>
<description>
<para>Describe the steps for installing and removing a bike's
steering system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>SCO 2 – Steering system installation and removal</para>
</description>
</lcContentIdentifierName>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
</lcObjectiveItem>
```

2.4.3.1.2 Content identifier name

Description: The element <lcContentIdentifierName> contains the common name of the objective item. The content identifier can be any name an organization chooses to assign to a learning objective. Examples include "enabling objective" and "terminal objective".

Markup element: <lcContentIdentifierName>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <description>. Refer to Chap 3.9.5.2.2.

Markup example:

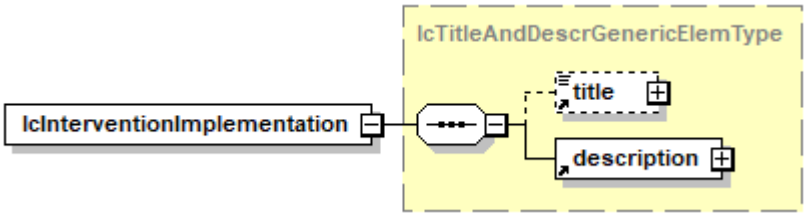
```
<lcContentIdentifierName>
<description>
<para>SCO 2 – Steering system installation and removal</para>
```

```
</description>
</lcContentIdentifierName>
```

2.5 Intervention implementation

Description: The element <lcInterventionImplementation> contains the technical data regarding requirements for successful release and use of an intervention among the target population.

Markup element: <lcInterventionImplementation>



ICN-1654N-S1000D0061-002-01

Fig 24 Element <lcInterventionImplementation>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

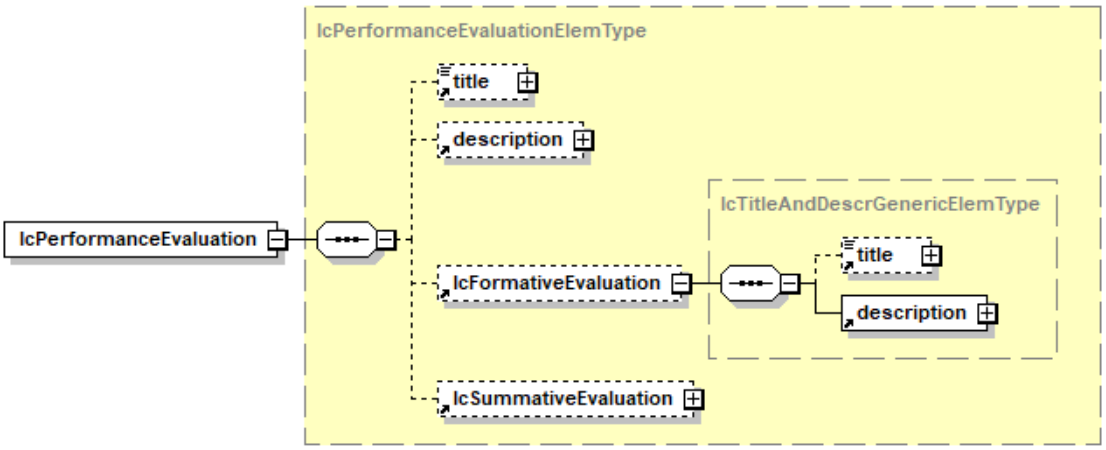
Markup example:

```
<lcInterventionImplementation>
<title>Intervention implementation</title>
<description>
<para>The implementation of this intervention will be composed
of the creation and institution of a computer-based training
program that works in conjunction with hands-on practical
exercises.</para>
</description>
</lcInterventionImplementation>
```

2.6 Performance evaluation

Description: The element <lcPerformanceEvaluation> contains the technical data regarding the requirements for an evaluation instrument or plan that will determine the success of an intervention.

Markup element: <lcPerformanceEvaluation>



ICN-1654N-S1000D0036-003-01

Fig 25 Element <lcPerformanceEvaluation>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>. Refer to Chap 3.9.5.2.1.5.
- <`description`>. Refer to Chap 3.9.5.2.2.
- <`lcFormativeEvaluation`>. Refer to Para 2.6.1.
- <`lcSummativeEvaluation`>. Refer to Para 2.6.2.

Markup example:

```
<lcPerformanceEvaluation>
<title>Performance evaluation</title>
<description>
<para>The following information outlines the Performance
evaluation.</para>
</description>
<lcFormativeEvaluation>
<title>Formative evaluation</title>
<description>
<para>Formative evaluation for this course is provided in the
form of checks on learning that are spread out thoughout the
lessons. In addition, the core lessons have quizzes that assess
the content.</para>
</description>
</lcFormativeEvaluation>
<lcSummativeEvaluation>
<title>Summative evaluation</title>
```

```
<description>
<para>The summative evaluation will be conducted at two time
frames: first, immediately after the training takes place, and
second, 6 months after the training was conducted.</para>
</description>
<lcImmediatePerformanceCompetence>
<description>
<para>The immediate performance change will be evaluated during
the hands-on assessment conducted at the end of the training.
This assessment will determine if the training had the desired
immediate effect.</para>
</description>
</lcImmediatePerformanceCompetence>
<lcJobTransfer>
<description>
<para>At a time of 6 months after the course is provided to the
couriers, a survey will be taken to determine if the training
allowed the couriers to conduct their own repairs and reduce the
number of breakdown pickups by the company.</para>
</description>
</lcJobTransfer>
<lcOrganizationalImpact>
<description>
<para>At a time of 6 months after the start of the training
program, Speedy Couriers will evaluate the data in order to
determine if breakdown service has decreased and on-time
delivery has increased.</para>
</description>
</lcOrganizationalImpact>
</lcSummativeEvaluation>
</lcPerformanceEvaluation>
```

2.6.1 Formative evaluation

Description: The element <lcFormativeEvaluation> contains the requirements of ongoing feedback on performance in order to provide evaluative information useful in improving the training.

Markup element: <lcFormativeEvaluation>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

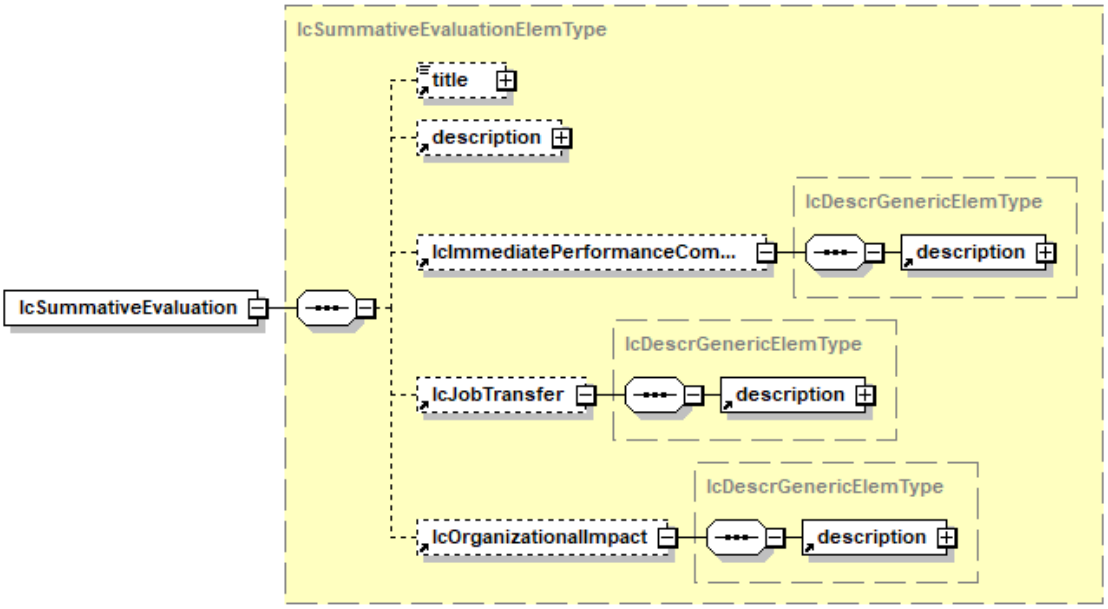
Markup example:

```
<lcFormativeEvaluation>
<title>Formative evaluation</title>
<description>
<para>Formative evaluation for this course is provided in the
form of checks on learning that are spread out thoughout the
lessons. In addition, the core lessons have quizzes that assess
the content.</para>
</description>
</lcFormativeEvaluation>
```

2.6.2 Summative evaluation

Description: The element <lcSummativeEvaluation> defines the criteria for identifying larger patterns and trends in performance and judging these findings against the objectives for the training.

Markup element: <lcSummativeEvaluation>



ICN-1654N-S1000D0037-003-01

Fig 26 Element <lcSummativeEvaluation>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.

- <description>. Refer to Chap 3.9.5.2.2.
- <lcImmediatePerformanceCompetence>. Refer to Para 2.6.2.1.
- <lcJobTransfer>. Refer to Para 2.6.2.2.
- <lcOrganizationalImpact>. Refer to Para 2.6.2.3.

Markup example:

```
<lcSummativeEvaluation>
<title>Summative evaluation</title>
<description>
<para>The summative evaluation will be conducted at two time
frames: first, immediately after the training takes place, and
second, 6 months after the training was conducted.</para>
</description>
<lcImmediatePerformanceCompetence>
<description>
<para>The immediate performance change will be evaluated during
the hands-on assessment conducted at the end of the training.
This assessment will determine if the training had the desired
immediate effect.</para>
</description>
</lcImmediatePerformanceCompetence>
<lcJobTransfer>
<description>
<para>At a time of 6 months after the course is provided to the
couriers, a survey will be taken to determine if the training
allowed the couriers to conduct their own repairs and reduce the
number of breakdown pickups by the company.</para>
</description>
</lcJobTransfer>
<lcOrganizationalImpact>
<description>
<para>At a time of 6 months after the start of the training
program, Speedy Couriers will evaluate the data in order to
determine if breakdown service has decreased and on-time
delivery has increased.</para>
</description>
</lcOrganizationalImpact>
</lcSummativeEvaluation>
```

2.6.2.1 Immediate performance competence

Description: The element <lcImmediatePerformanceCompetence> contains the requirements for an evaluation instrument or plan that determines whether an intervention resulted in the desired immediate effect on human performance.

Markup element: <lcImmediatePerformanceCompetence>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcImmediatePerformanceCompetence>
<description>
<para>The immediate performance change will be evaluated during
the hands-on assessment conducted at the end of the training.
This assessment will determine if the training had the desired
immediate effect.</para>
</description>
</lcImmediatePerformanceCompetence>
```

2.6.2.2 Job transfer

Description: The element <lcJobTransfer> contains the requirements for an evaluation instrument or plan that determines whether an intervention resulted in the desired effect on performance in the work environment.

Markup element: <lcJobTransfer>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcJobTransfer>
<description>
<para>At a time of 6 months after the course is provided to the
couriers, a survey will be taken to determine if the training
allowed the couriers to conduct their own repairs and reduce the
number of breakdown pickups by the company.</para>
</description>
</lcJobTransfer>
```

2.6.2.3 Organizational impact

Description: The element <lcOrganizationalImpact> contains the requirements for an evaluation instrument or plan that determines whether an intervention resulted in the desired effect on overall performance of the organization.

Markup element: <lcOrganizationalImpact>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcOrganizationalImpact>
<description>
<para>At a time of 6 months after the start of the training
program, Speedy Couriers will evaluate the data in order to
determine if breakdown service has decreased and on-time
delivery has increased.</para>
</description>
</lcOrganizationalImpact>
```

3 Markup example

Below is a complete markup example for the element <lcLearningPlan>. It describes the learning data modules that were created for the Bike sample.

```
<?xml version="1.0" encoding="utf-8"?>
<dmodule xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="http://www.s1000d.org/S1000D_4-
2/flat_schema/learning.xsd">
<rdf:Description>
<dc:creator>U8025</dc:creator>
<dc:title>Bicycle - Performance support</dc:title>
<dc:subject>Bicycle - Performance support</dc:subject>
<dc:publisher>06RT9</dc:publisher>
<dc:contributor>06RT9</dc:contributor>
<dc:date>2009-08-22</dc:date>
<dc:type>text</dc:type>
<dc:format>text/xml</dc:format>
<dc:identifier>S1000DBIKE-AAA-D00-00-00-00AA-932A-T-H31A_001-
00</dc:identifier>
<dc:language>en-US</dc:language>
<dc:rights>01_cc51</dc:rights>
</rdf:Description>
<identAndStatusSection>
```

```
<dmAddress>
<dmIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="932" infoCodeVariant="A" itemLocationCode="T"
learnCode="H31" learnEventCode="A"/>
<language countryIsoCode="US" languageIsoCode="en"/>
<issueInfo issueNumber="007" inWork="00"/>
</dmIdent>
<dmAddressItems>
<issueDate year="2009" month="07" day="22"/>
<dmTitle>
<techName>Bicycle</techName>
<infoName>Performance support intervention</infoName>
</dmTitle>
</dmAddressItems>
</dmAddress>
<dmStatus>
<security securityClassification="01"></security>
<responsiblePartnerCompany
enterpriseCode="06RT9"></responsiblePartnerCompany>
<originator></originator>
<applic>
<displayText></displayText>
</applic>
<brexDmRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="A"
infoCode="022" subSystemCode="0" infoCodeVariant="A"
disassyCodeVariant="A" subSubSystemCode="0" itemLocationCode="D"
assyCode="00" systemCode="00" disassyCode="00"></dmCode>
</dmRefIdent>
</dmRef>
</brexDmRef>
<qualityAssurance>
<unverified></unverified>
</qualityAssurance>
</dmStatus>
</identAndStatusSection>
<content>
<learning>
<learningPlan>
<lcProject>
<title>Basic bike awareness</title>
<description>
<para>This learning is sponsored by the National Bike Courier
Association (NBCA).</para>
</description>
<lcClient>
<title>National Bike Courier Association</title>
```

```
<description>
<para>The NBCA's mission statement is to promote unity and
solidarity within the messenger community and to raise the
status of our profession.</para>
</description>
</lcClient>
<lcLearningPlan>
<title>Getting to know your bike</title>
<description>
<para>This lesson plan describes the learning needs and
instructional strategies for teaching the parts of a bike and
bike maintenance.</para>
</description>
</lcLearningPlan>
<lcCourseIdentNumber>
<title>Course identification number</title>
<description>
<para>N00174-05-D-0003</para>
</description>
</lcCourseIdentNumber>
<lcModificationDate>
<title>Modification date</title>
<description>
<para>N/A</para>
</description>
</lcModificationDate>
<lcDeliveryDate>
<title>Delivery date</title>
<description>
<para>20091228</para>
</description>
</lcDeliveryDate>
<lcPlanSubject>
<title>Learning plan subject matter</title>
<description>
<para>Bike description and general maintenance</para>
</description>
</lcPlanSubject>
</lcProject>
<lcPerformanceAnalysis>
<title>Performance analysis</title>
<description>
<para>A study was conducted at Speedy Couriers using a
proformance analysis model for goals-driven measurements.</para>
</description>
<lcOrganizationalAnalysis>
<title>Organizational analysis</title>
<description>
<para>The following information describes the organizational
elements of the performance analysis</para>
</description>
<lcVisionStatement>
```

```
<description>
<para>We help the businesses of the city be more productive and
successful by providing the fastest, most convenient courier
services: From your door to theirs in less time.</para>
</description>
</lcVisionStatement>
<lcMissionStatement>
<description>
<para>To become the number one messenger service in the city by
consistently providing fast, convenient service at a competitive
price with 98% customer satisfaction</para>
</description>
</lcMissionStatement>
<lcValues>
<description>
<para>Couriers should be goal oriented. They must exhibit the
desire to meet the organization's expectations by completing
their job tasks as assigned. The company believes this can be
accomplished more effectively if couriers take and pass the Bike
course.</para>
</description>
</lcValues>
<lcGoalStatement>
<description>
<para>Provide training so that couriers can maintain their own
bikes and avoid breakdowns. This allows the couriers the ability
to make more pickups and deliveries.</para>
</description>
</lcGoalStatement>
<lcObjectiveStatement>
<description>
<para>Managers at Speedy Couriers, Inc. have concerns regarding
their new couriers' abilities to maintain their bikes. Because
couriers supply their own bikes, the company has no idea of each
bike's condition. In order for couriers to do their jobs
effectively, their bikes must be in good working order.</para>
</description>
</lcObjectiveStatement>
</lcOrganizationalAnalysis>
<lcGapAnalysis>
<title>Gap analysis</title>
<description>
<para>Recently, there has been a rise in calls for "breakdown"
pickups, because the couriers do not know how to fix mechanical
failures. This problem leads to increased workload on other
carriers and late deliveries and pickups, which in turn leads to
unsatisfied customers.</para>
</description>
<lcGapItem>
<title>Gap item</title>
<description>
<para>Many couriers do not know how to correct mechanical
```

```
problems with the bike steering system.</para>
</description>
</lcGapItem>
<lcGapItem>
<lcDesiredPerformanceStatement>
<description>
<para>Maintain bike in good working order. Troubleshoot
breakdowns in a timely manner. Conduct repairs at the time of
breakdown.</para>
</description>
</lcDesiredPerformanceStatement>
<lcActualPerformanceStatement>
<description>
<para>Unable to maintain bike in good working order. Cannot
troubleshoot breakdowns in a timely manner. Not able to conduct
repairs at the time of breakdown.</para>
</description>
</lcActualPerformanceStatement>
<lcJtaItem>
<description>
<para>Identify the parts of a bike's steering system.</para>
</description>
</lcJtaItem>
<lcGapStatement>
<description>
<para>Bike couriers do not have the knowledge or skills needed
to maintain a bicycle or the ability to troubleshoot and address
problems when they occur.</para>
</description>
</lcGapStatement>
</lcGapItem>
</lcGapAnalysis>
<lcOrganizationalEnvironmentAnalysis>
<title>Organizational environment analysis</title>
<description>
<para>An organizational analysis was conducted on Speedy
Couriers. This appraisal was aimed at identifying areas of
inefficiency and opportunities for streamlining and
reorganization.</para>
</description>
</lcOrganizationalEnvironmentAnalysis>
<lcWorkEnvironmentAnalysis>
<title>Work environment analysis</title>
<description>
<para>The environment in which bike couriers work is typically
outside, where the courier and his or her bike are subject to
atmospheric conditions such as sun, rain, sleet, snow, etc. Bike
maintenance will most likely be performed inside the courier's
dwelling or in a garage.</para>
</description>
<lcManagerialSupport>
<description>
```

```
<para>Speedy Couriers has one general manager and four shift
managers. The managers work in conjunction with each
other.</para>
</description>
</lcManagerialSupport>
<lcPhysicalAspectsOfSite>
<description>
<para>The physical site survey revealed that the interior layout
of the Speedy Couriers facility provided ample room and features
to accommodate the number of couriers employed as well as any
maintenance or repair that is required.</para>
</description>
</lcPhysicalAspectsOfSite>
<lcSocialAspectsOfSite>
<description>
<para>It was revealed during the survey of the social aspects of
Speedy Couriers that there was very little social interaction
due to the nature of the work as well as the high turn over
rate.</para>
</description>
</lcSocialAspectsOfSite>
<lcSpecialFactors>
<description>
<para>None identified.</para>
</description>
</lcSpecialFactors>
</lcWorkEnvironmentAnalysis>
<lcPerformerAnalysis>
<title>Performer analysis</title>
<description>
<para>Skill levels for entry-level bike couriers can vary from
none to novice experience levels, which range from 0 to 1 year
in service. Couriers have typically learned the skills needed
through trial and error.</para>
</description>
<lcJobTitle>
<description>
<para>Bicycle Courier</para>
</description>
</lcJobTitle>
<lcJobCode>
<description>
<para>BT-1166</para>
</description>
</lcJobCode>
<lcEducationLevel>
<description>
<para>High school diploma, some college</para>
</description>
</lcEducationLevel>
<lcAge>
<description>
```

```
<para>Adults aged 18 to 21</para>
</description>
</lcAge>
<lcProfessionalBackground>
<description>
<para>The target audience for this course includes bike couriers
who are responsible for maintaining their own bicycles.</para>
</description>
</lcProfessionalBackground>
<lcKnowledge>
<description>
<para>General bike functions, simple maintenance</para>
</description>
</lcKnowledge>
<lcSkills>
<description>
<para>The audience has little to no experience with bike
maintenance. Skills are mainly in bike operation.</para>
</description>
</lcSkills>
<lcAbilities>
<description>
<para>The bike couriers have the ablility to use basic tools to
perform simple tasks.</para>
</description>
</lcAbilities>
<lcAttitude>
<description>
<para>Bike couriers must ensure that their bikes are in safe
working order for them to perform their jobs effectively.</para>
</description>
</lcAttitude>
</lcPerformerAnalysis>
</lcPerformanceAnalysis>
<lcCauseAnalysis>
<title>Cause analysis</title>
<description>
<para>A causal factor tree analysis was conducted on Speedy
Couriers, Inc.</para>
</description>
<lcEnvironmentalFactor>
<title>Environmental factor</title>
<description>
<para>The environmental factors were derived from examining the
workplace, resources, and any company incentives that may have
an impact on the gap.</para>
</description>
<lcData>
<description>
<para>Job sheets with basic step-by-step procedures for routine
maintenance tasks are provided to all couriers with their
company-issued handbook. The maintenance procedures are not
```

```
illustrated and do not reference tools that should be used in
any given step.</para>
</description>
</lcData>
<lcResources>
<description>
<para>Couriers are provided all of the resources needed to
maintain and repair their bikes.</para>
</description>
</lcResources>
<lcIncentives>
<description>
<para>The study revealed that there is currently a negative
incentive to troubleshoot and repair bike problems while on
courier duties. Since the company provides unlimited breakdown
service, there is no reason for couriers to repair their own
bikes.</para>
</description>
</lcIncentives>
</lcEnvironmentalFactor>
<lcInternalFactor>
<title>Internal factor</title>
<description>
<para>The internal factors were derived from interviews with the
couriers.</para>
</description>
<lcKnowledge>
<description>
<para>Only a small percentage of the couriers had the necessary
knowledge needed to maintain and repair bicycles.</para>
</description>
</lcKnowledge>
<lcCapacity>
<description>
<para>All of the couriers possessed the capacity to learn the
skills needed to maintain and repair bicycles.</para>
</description>
</lcCapacity>
<lcMotives>
<description>
<para>No significant causal factors were observed or uncovered
during this analysis.</para>
</description>
</lcMotives>
</lcInternalFactor>
</lcCauseAnalysis>
<lcInterventionDefinition>
<title>Intervention definition</title>
<description>
<para>The following information outlines the recommendations for
addressing the identified gap.</para>
</description>
```

```
<lcNonTrainingInterventions>
<title>Non-training interventions</title>
<description>
<para>The following information outlines the non-training
recommendations for addressing the identified gap.</para>
</description>
<lcPerformanceSupport>
<description>
<para>Bike couriers will be provided a Quick fix guide that
outlines the five most common bike breakdowns. This guide
contains the processes to address each of the five breakdown
types.</para>
</description>
</lcPerformanceSupport>
<lcJobDesign>
<description>
<para>Two changes will be made regarding courier
responsibilities. First, couriers will not receive the
commission for a delivery if the breakdown service is used and
the repair could have been made without pickup. Second, bonuses
will be provided to couriers that do not use the breakdown
service.</para>
</description>
</lcJobDesign>
<lcPersonalDevelopment>
<description>
<para>Bike couriers that are failing to meet the defined time
limit for any repair task listed in their manual will be
required to practice those tasks twice per week. They will be
assigned a mentor while performing the tasks. When they
demonstrate that they can perform the repairs within the time
limit, they will no longer be required to perform these task
rehearsals.</para>
</description>
</lcPersonalDevelopment>
<lcHumanResourceDevelopment>
<description>
<para>Current employees will be required to successfully
complete the courseware within 30 calendar days of
implementation. All subsequent hires will be required to
complete the courseware within 30 calendar days of hire
date.</para>
</description>
</lcHumanResourceDevelopment>
<lcOrganizationalCommunication>
<description>
<para>A designated delegate in the third tier of bike couriers
will report courier maintenance statistics directly to the
Courier Manager on the last Friday of each month. The statistics
will be entered directly into the Courier Manager's Maintenance
Awareness (CMMA) tool.</para>
</description>
```

```
</lcOrganizationalCommunication>
<lcOrganizationalDesign>
<description>
<para>All managers will be required to complete the same
courseware training as the couriers.</para>
</description>
</lcOrganizationalDesign>
</lcNonTrainingInterventions>
<lcTrainingInterventions>
<title>Training interventions</title>
<description>
<para>The following information outlines the training
recommendations for addressing the identified gap.</para>
</description>
<lcTargetAudience>
<title>Target audience</title>
<description>
<para>Skill levels for entry-level bike couriers can vary from
none to novice experience levels, which range from 0 to 1 year
in service. Couriers have typically learned the skills needed
through trial and error.</para>
</description>
<lcCurrentEntryBehaviors>
<description>
<para>The majority of couriers have high school educations and
have basic knowledge of tool use.</para>
</description>
</lcCurrentEntryBehaviors>
<lcAttitudeTowardContent>
<description>
<para>A survey revealed that 95% of the couriers are willing to
complete training as long as the stated incentives are
employed.</para>
</description>
</lcAttitudeTowardContent>
<lcLearningPreferences>
<description>
<para>Given the physical and customer-oriented nature of courier
work, the type of person attracted for such positions tends to
be of the more assertive type and more emotionally responsive.
This type tends to prefer less-structured activities, anecdotes
and stories, interaction with others, taking action, and moving
as fast as possible (borderline impatient).</para>
</description>
</lcLearningPreferences>
</lcTargetAudience>
<lcPrerequisites>
<title>Bike courier maintenance prerequisites</title>
<description>
<para>Basic bike repair hand tools: Purpose and use.</para>
</description>
</lcPrerequisites>
```

```
<lcRequiredEntryBehaviors>
<title>Required entry behaviors</title>
<description>
<para>Demonstrate proper use of basic hand tools and bike
jacks.</para>
</description>
</lcRequiredEntryBehaviors>
<lcTrainingComponent>
<title>Training component</title>
<description>
<para>The following information outlines the training
component.</para>
</description>
<lcTrainingType>
<description>
<para>An online computer-based course will be used in
conjunction with hands-on practices.</para>
</description>
</lcTrainingType>
<lcLearningStrategy>
<description>
<para>This training uses a blended approach to teaching bicycle
maintenance and repair.</para>
</description>
</lcLearningStrategy>
<lcDuration>
<lcTime>
<description>
<para>The computer-based courseware will take approximately 1,5
hours to complete. The practical exercises will take
approximately 2 hours to complete.</para>
</description>
</lcTime>
</lcDuration>
<lcRequiredFinances>
<description>
<para>All financial requirements will be covered by Speedy
Couriers, Inc.</para>
</description>
</lcRequiredFinances>
<lcRequiredPersonnel>
<description>
<para>The current bicycle repair technician will serve as a
facilitator during the practical exercise portion of the
training as well as the grader for the hands-on test at the end
of the training.</para>
</description>
</lcRequiredPersonnel>
<lcRequiredFacilities>
<description>
<para>The current bicycle repair area will be used for the
practical exercises and end of training hands-on test.</para>
```

```
</description>
</lcRequiredFacilities>
<lcRequiredEquipment>
<description>
<para>Couriers may take the computer portion of the training
using one of Speedy Courier's office computer workstations or
they may take a CD of the training to be completed at home. The
current bicycle repair equipment will be used for the practical
exercises and end of training hands-on test.</para>
</description>
</lcRequiredEquipment>
<lcLocalCultureConsiderations>
<description>
<para>Most of the couriers take classes at the local community
college. Many view their jobs as a necessity and have poor
attitudes toward improving their performance.</para>
</description>
</lcLocalCultureConsiderations>
</lcTrainingComponent>
<lcAssessmentStrategy>
<title>Assessment Strategy</title>
<description>
<para>The following information outlines the assessment
strategies for the Basic bike awareness course.</para>
</description>
<lcAssessmentComponent>
<title>Computer-based assessment component</title>
<description>
<para>The following information outlines the assessment strategy
for the computer-based portion of the training.</para>
</description>
<lcMasteryScoreCriteria>
<description>
<para>80% mastery of all lesson tests</para>
</description>
</lcMasteryScoreCriteria>
<lcPerformanceRubric>
<description>
<para>QUESTION: Which part of the steering system supplies the
sideways swiveling action that allows the rider to steer the
bike?</para>
<para>ANSWER: Headset</para>
</description>
</lcPerformanceRubric>
<lcScoringMethod>
<description>
<para>The lesson tests are scored using computer programming
built into the training.</para>
</description>
</lcScoringMethod>
<lcMinimumPassThreshold>
<description>
```

```
<para>The minimum passing score for the assessment is
80%.</para>
</description>
</lcMinimumPassThreshold>
</lcAssessmentComponent>
</lcAssessmentStrategy>
<lcTechnicalRqmts>
<title>Technical requirements</title>
<description>
<para>This section lists the technical requirements needed to
complete the instruction.</para>
</description>
<lcBrowsers>
<description>
<para>This courseware is created to run in the Internet Explorer
6.x Web browser.</para>
</description>
</lcBrowsers>
<lcLms>
<description>
<para>Lesson content packages will be tracked in the Sum total
LMS.</para>
</description>
</lcLms>
<lcNonLmsItEnvironment>
<description>
<para>The courseware does not require any special considerations
when it is running outside of an LMS.</para>
</description>
</lcNonLmsItEnvironment>
<lcPaperBasedMaterials>
<description>
<para>This courseware will use the Basic bike repair manual,
document number X45R56.</para>
</description>
</lcPaperBasedMaterials>
<lcClassroom>
<description>
<para>Instruction will be taken in the Learning Lab at Speedy
Courier's main office. The training is part of the employee's
first-day orientation and is required. No courier assignments
will be given until the employee completes the orientation and
the training.</para>
</description>
</lcClassroom>
<lcOjt>
<description>
<para>In addition to the performance practices and test that are
used in the curriculum, couriers will have access to the repair
facilitiy in order to hone their skills and abilities in
repairing the bike.</para>
</description>
```

```
</lcOjt>
<lcAccessibility>
<description>
<para>This courseware meets W3C Web Accessibility Initiative
Guidelines Priority 1 checkpoints.</para>
</description>
</lcAccessibility>
<lcPlayers>
<description>
<para>The courseware will make use of the following players and
plug-ins: Adobe Flash player and Adobe Acrobat reader.</para>
</description>
</lcPlayers>
<lcGraphicStandards>
<description>
<para>Graphics utilized are JPEG and SWF files. SWF files may
contain 3D animation or interactivity. SWF files are being
utilized in lieu of CGM files to reach a broader audience
because they can be viewed utilizing the Adobe Flash
player.</para>
</description>
</lcGraphicStandards>
<lcViewers>
<description>
<para>This course will use RealPlayer and Windows Media
player.</para>
</description>
</lcViewers>
<lcResolution>
<description>
<para>Although the courseware can be viewed using different
resolutions, it is best viewed in 1024x768 resolution.</para>
</description>
</lcResolution>
<lcFileSizeLimitations>
<description>
<para>This courseware keeps it file size to the bare minimum. It
tries to keep all files below 100k. If some files are larger
than the 100k, a pre-loader is attached.</para>
</description>
</lcFileSizeLimitations>
<lcDownloadTime>
<description>
<para>Download time will vary due to the users' computer
specifications.</para>
</description>
</lcDownloadTime>
<lcSecurity>
<description>
<para>Security level is unclassified.</para>
</description>
</lcSecurity>
```

```
</lcTechnicalRqmts>
</lcTrainingInterventions>
<lcLearningObjectives>
<title>Learning Objectives</title>
<description>
<para>Objectives for the Basic bike awareness course</para>
</description>
<lcObjectiveItemGroup>
<title>Steering system lesson objectives</title>
<description>
<para>Objectives for the steering system lesson</para>
</description>
<lcObjectiveItem>
<title>Terminal objective</title>
<description>
<para>Perform steps to remove and install the parts of a bike's
steering system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>Module 3: Steering system</para>
</description>
</lcContentIdentifierName>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
<lcObjectiveItemGroup>
<title>Enabling objectives</title>
<description>
<para>Steering system module enabling objectives</para>
</description>
<lcObjectiveItem>
<title>Enabling objective for SCO 1</title>
<description>
  <para>Identify the parts of a bike's steering system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>SCO 1 – Steering system description</para>
</description>
</lcContentIdentifierName>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
```

```
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
</lcObjectiveItem>
<lcObjectiveItem>
<title>Enabling objective for SCO 2</title>
<description>
<para>Describe the steps for installing and removing a bike's
steering system.</para>
</description>
<lcContentIdentifierName>
<description>
<para>SCO 2 – Steering system installation and removal</para>
</description>
</lcContentIdentifierName>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="100" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
</lcObjectiveItem>
</lcObjectiveItemGroup>
</lcObjectiveItem>
</lcObjectiveItemGroup>
</lcLearningObjectives>
</lcInterventionDefinition>
<lcInterventionImplementation>
<title>Intervention implementation</title>
<description>
<para>The implementation of this intervention will be composed
of the creation and institution of a computer-based training
program that works in conjunction with hands-on practical
exercises.</para>
</description>
</lcInterventionImplementation>
<lcPerformanceEvaluation>
<title>Performance evaluation</title>
<description>
<para>The following information outlines the Performance
evaluation.</para>
</description>
```

```
<lcFormativeEvaluation>
<title>Formative evaluation</title>
<description>
<para>Formative evaluation for this course is provided in the
form of checks on learning that are spread out thoughout the
lessons. In addition, the core lessons have quizzes that assess
the content.</para>
</description>
</lcFormativeEvaluation>
<lcSummativeEvaluation>
<title>Summative evaluation</title>
<description>
<para>The summative evaluation will be conducted at two time
frames: first, immediately after the training takes place, and
second, 6 months after the training was
conducted.</para></description>
<lcImmediatePerformanceCompetence>
<description>
<para>The immediate performance change will be evaluated during
the hands-on assessment conducted at the end of the training.
This assessment will determine if the training had the desired
immediate effect.</para>
</description>
</lcImmediatePerformanceCompetence>
<lcJobTransfer>
<description>
<para>At a time of 6 months after the course is provided to the
couriers, a survey will be taken to determine if the training
allowed the couriers to conduct their own repairs and reduce the
number of breakdown pickups by the company.</para>
</description>
</lcJobTransfer>
<lcOrganizationalImpact>
<description>
<para>At a time of 6 months after the start of the training
program, Speedy Couriers will evaluate the data in order to
determine if breakdown service has decreased and on-time
delivery has increased.</para>
</description>
</lcOrganizationalImpact>
</lcSummativeEvaluation>
</lcPerformanceEvaluation>
</learningPlan>
</learning>
</content>
</dmodule>
```

Chapter 3.9.5.2.13.2

Content section - Learning overview information

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Chap 3.9.5.2.1	Content section - Common constructs
Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.5	Common constructs - Titles
Chap 3.9.5.2.2	Content section - Descriptive information

1 General

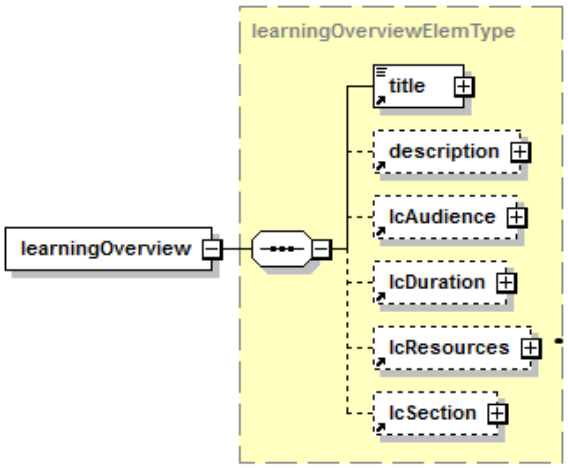
The learning overview information model is the second branch in the learning schema. It contains an overview of the learning content.

2 Learning overview content

2.1 Learning overview

Description: The element <learningOverview> contains the introductory learning content information. It includes information helpful to the learner, such as prerequisites, duration, intended audience, and can include information and strategies that seek to gain attention and stimulate recall of prior learning.

Markup element: <learningOverview>



ICN-1654N-S1000D0038-001-01

Fig 1 Element <learningOverview>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), derivativeClassificationRefId (O) and caveat (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcAudience>. Refer to Para 2.2.
- <lcDuration>. Refer to Para 2.3.
- <lcResources>. Refer to Para 2.4.
- <lcSection>. Refer to Para 2.5.

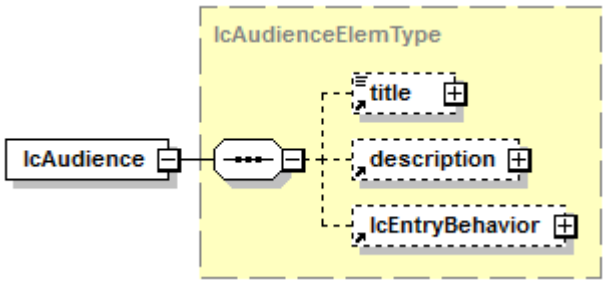
Markup example:

```
<learningOverview>
<title>Steering system sverview</title>
<description>
<!-- the following dmRef points to an objective item found in
the learn plan for this lesson. -->
<para>
In order for a rider to keep his or her bike moving in a given
direction, he or she must steer the bike. A bike's steering
system offers input, which helps the bike and rider to remain
upright. Additionally, the rider's balance affects the bike's
steering. If the rider's center of gravity sways more to the
left or right of the wheels, the bike will lean. This lean
causes the handlebar to turn in the direction of the lean,
pulling the bike in that direction. In order to rebalance, the
rider uses inertia and the steering system.
</para>
<para>
Objective: Given a photograph of a bike's steering system, you
will be able to identify each part with 80 percent accuracy.
<dmRef referredFragment="lo-001">
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="932" infoCodeVariant="A" itemLocationCode="T"
learnCode="H31" learnEventCode="A"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
</para>
</description>
</learningOverview>
```

2.2 Audience

Description: The element <lcAudience> contains the intended learner's profile taking the instruction.

Markup element: <lcAudience>



ICN-1654N-S1000D0039-002-01

Fig 2 Element <lcAudience>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `derivativeClassificationRefId` (O) and `caveat` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>. Refer to Chap 3.9.5.2.1.5.
- <`description`>. Refer to Chap 3.9.5.2.2.
- <`lcEntryBehavior`>. Refer to Para 2.2.1.

2.2.1 Entry behavior

Description: The element <`lcEntryBehavior`> contains the current skill level or activities of the learners in relation to the training purpose.

Markup element: <`lcEntryBehavior`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `derivativeClassificationRefId` (O) and `caveat` (O), the security and restrictive marking. Refer to Chap 3.6.

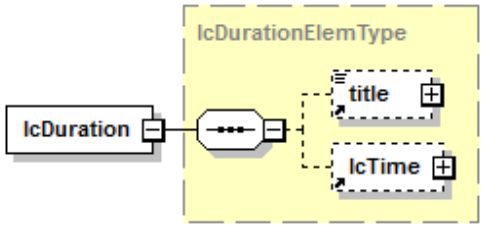
Child elements:

- <`description`>. Refer to Chap 3.9.5.2.2.

2.3 Duration

Description: The element <`lcDuration`> contains the estimated duration of the learning activity.

Markup element: <`lcDuration`>



ICN-1654N-S1000D0046-001-01

Fig 3 Element <`lcDuration`>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O) ,the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), derivativeClassificationRefId (O) and caveat (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <lcTime>. Refer to Para 2.3.1.

Markup example:

```
<lcDuration>
<title>Duration</title>
<lcTime>
<description>
<para>It should take no more than 1 hour and 30 minutes to
complete this course.</para>
</description>
</lcTime>
</lcDuration>
```

2.3.1 Time

Description: The element <lcTime> contains the time expected to complete an activity.

Markup element: <lcTime>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), derivativeClassificationRefId (O) and caveat (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcTime>
<description>
<para>It should take no more than 1 hour and 30 minutes to
complete this course.</para>
</description>
</lcTime>
```

2.4 Resources

Description: The element <lcResources> contains a list of related resources and information about them, such as related articles or samples on the Web.

Markup element: <lcResources>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), derivativeClassificationRefId (O) and caveat (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcResources>
<description>
<para>Bike technical data </para>
</description>
</lcResources>
```

2.5 Section

Description: The element <lcSection> contains a generic element to contain optional learning overview content.

Markup element: <lcSection>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), derivativeClassificationRefId (O) and caveat (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcSection>
<description>
<figure>
<title/>
```

```
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-D000000-A-06RT9-
00149-A-001-01"/>
</figure>
</description>
</lcSection>
```

3 Examples

Below is a markup example for <learningOverview>. It describes a short lesson that is a part of the bike learning example.

```
<learning>
<learningOverview>
<title>Overview: Getting to know your bike</title>
<lcAudience>
<description>
<para>The intended audience are bike couriers.</para>
</description>
<lcEntryBehavior>
<description>
<para>Newly hired bike couriers do not necessarily have the
skills required to maintain their bikes. Currently employed
couriers may require refresher training on bike
maintenance.</para>
</description>
</lcEntryBehavior>
</lcAudience>
<lcDuration>
<title>Duration</title>
<lcTime>
<description>
<para>It should take no more than 1 hour and 30 minutes to
complete this course.</para>
</description>
</lcTime>
</lcDuration>
<lcResources>
<description>
<para>Bike technical data</para>
</description>
</lcResources>
<lcSection>
<description>
<figure>
<title/>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-D000000-A-06RT9-
00149-A-001-01"/>
</figure>
</description>
</lcSection>
</learningOverview>
</learning>
```

Chapter 3.9.5.2.13.3

Content section - Learning content information

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Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.5	Common constructs - Titles
Chap 3.9.5.2.2	Content section - Descriptive information

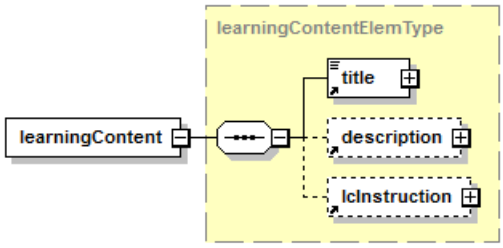
1 General

The learning content information model contains the bulk of the learning materials. The learning content structure includes learning activities and language that form the learning materials. It holds the most potential for the appropriate reuse of technical data where content supplements are useful.

2 Learning content

Description: A learning content data module comprises a set of data about a single terminal learning objective supported by zero or more enabling learning objectives. It contains the learning content itself, and enables direct use of content. It supports specific objectives declared in the learning plan topic type.

Markup element: <learningContent>



ICN-1654N-S1000D0040-001-01

Fig 1 Element <learningContent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcInstruction>. Refer to Para 2.1.

2.1 Instruction

Description: The element <lcInstruction> describes the specifics of a learning activity.

Markup element: <lcInstruction>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.

3 Examples

Below is a complete markup example for <learningContent>. It describes the steps for removing the bicycle front wheel.

```
<learning>
<learningContent>
<title>Front wheel Removal</title>
<description>
<para>The content of this data model describes the steps for
removing the bicycle front wheel.</para>
</description>
<lcInstruction>
<description>
<figure>
<title></title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA00000-A-06RT9-
00094-A-001-01" />
</figure>
<levelledPara id="para-000">
<levelledPara id="para-001">
<para>To remove your bike's front wheel, place the bike on a
stand. If you do not have a stand, you can still remove the
tire. It will just take a little coordination on your
part.</para>
<para>Begin by either deflating the front tire slightly or
disconnecting the front brakes. This is done so the wheel can
come out easily and not get stuck at the brake pads.</para>
<figure>
<title></title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA00000-A-06RT9-
00106-A-001-01" />
</figure>
</levelledPara>
<levelledPara id="para-002">
<para>If your bike has a quick-release lever, push the lever
outward and turn it in a counterclockwise motion for several
revolutions.</para>
<figure>
<title></title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA00000-A-06RT9-
00107-A-001-01" />
</figure>
</levelledPara>
<levelledPara id="para-003">
<para>If your bike does not have a quick-release lever, you will
need a wrench to loosen the nuts on either side of the
hub.</para>
<figure>
<title></title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA00000-A-06RT9-
00108-A-001-01" />
</figure>
</levelledPara>
<levelledPara id="para-004">
<para>Remove the wheel.</para>
<figure>
```

```
<title></title>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-DA00000-A-06RT9-
00109-A-001-01" />
</figure>
</levelledPara>
</levelledPara>
<para>
<emphasis>Use the arrows to view the slide show.</emphasis>
</para>
</description>
</lcInstruction>
</learningContent>
</learning>
```

Chapter 3.9.5.2.13.4

Content section - Learning summary information

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.5	Common constructs - Titles
Chap 3.9.5.2.2	Content section - Descriptive information
Chap 3.9.5.2.13.2	Content section - Learning overview information

1 General

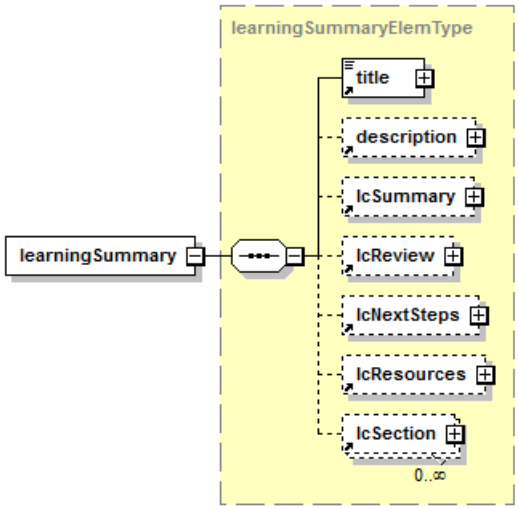
The learning summary information model summarizes the learning content. The learning summary structure reviews learning objectives, learning activities, and language that form the learning materials. It can also discuss lesson assessments and future learning requirements. The learning summary data module can be used any time a summation is required.

2 Learning summary content

2.1 Learning summary

Description: The element <learningSummary> recaps and provides context for the achievement or accomplishment of learning objectives, provides guidance to reinforce learning and long-term memory, and can pose questions to enhance encoding and verification of the learning content.

Markup element: <learningSummary>



ICN-1654N-S1000D0041-001-01

Fig 1 Element <learningSummary>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <description>. Refer to Chap 3.9.5.2.2.
- <lcSummary>. Refer to Para 2.2.
- <lcReview>. Refer to Para 2.3.
- <lcNextSteps>. Refer to Para 2.4.
- <lcResources>. Refer to Chap 3.9.5.2.13.2.
- <lcSection>. Refer to Chap 3.9.5.2.13.2.

2.2 Summary

Description: The element <lcSummary> provides a textual summary that describes the main learning goals and lessons learned.

Markup element: <lcSummary>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`description`>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcSummary>
<description>
<para>
Damage to any of a bike's steering system components could
render the system inoperable. Therefore, you should know how to
remove and install each piece. The handlebar, stem, and headset
all play a vital role in steering. This topic provided the
information you will need to remove and install the components
of a bike's steering system.
</para>
<!-- the following dmRef points to an objective item listed
lcObjectives section of the learn plan for this lesson. -->
<para>
Now that you have completed this topic, you should be able to
describe the procedures for installing and removing a bike's
steering system.
</para>
<para>
<dmRef referredFragment="lo-002">
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="932" infoCodeVariant="A" itemLocationCode="T"
learnCode="H31" learnEventCode="A"/>
<issueInfo issueNumber="001" inWork="01"/>
<language countryIsoCode="US" languageIsoCode="en"/>
</dmRefIdent>
</dmRef>
</para>
</description>
</lcSummary>
```

2.3 Review

Description: The element <`lcReview`> provides a review of the main points.

Markup element: <`lcReview`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`description`>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcReview>
<description>
<para>This lesson provided general bicycle care and maintenance
information. </para>
</description>
</lcReview>
```

2.4 Next steps

Description: The element <`lcNextSteps`> describes the next steps to reinforce the knowledge learned.

Markup element: <`lcNextSteps`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`description`>. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcNextSteps>
<description>
<para>Now that you have completed this topic, you can take the
related assessment.</para>
</description>
</lcNextSteps>
```

3 Example

Below is a complete markup example for <learningSummary>. It describes a short lesson summary on performing regular cleaning of the bike.

```
<learning>
<learningSummary>
<title>Summary</title>
<lcSummary>
<description>
<figure>
<title/>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-D000000-A-06RT9-
00150-A-001-01"/>
</figure>
<para>Regular cleaning and testing of your bike's systems are
part of keeping your bike maintained. Over time, your bike's
moving parts become susceptible to dirt and grime and will
eventually fail to operate correctly if they are not maintained.
Because the bike has so many moving parts, it is important that
you know how to keep the bike clean and lubricated.</para>
<para>It is also important to know how to patch an inner tube
puncture. As you are riding, you never know what you might run
over. A nail or a tack can cause quite a bit of
aggravation.</para>
</description>
</lcSummary>
<lcReview>
<description>
<para>This lesson provided general bicycle care and maintenance
information. </para>
</description>
</lcReview>
<lcNextSteps>
<description>
<para>Now that you have completed this topic, you can take the
related assessment.</para>
</description>
</lcNextSteps>
<lcResources>
<description>
<para>Bike technical data </para>
</description>
</lcResources>
<lcSection>
<description>
<para>Now that you have completed this topic, you should be able
to perform some general maintenance on your bike.</para>
</description>
</lcSection>
</learningSummary>
</learning>
```

Chapter 3.9.5.2.13.5

Content section - Learning assessment information

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Chap 3.9.5.2.1.8	Common constructs - Hotspots
Chap 3.9.5.2.2	Content section - Descriptive information
Chap 3.9.5.2.13.1	Content section - Learning plan information type

1 General

The learning assessment information model allows for one or more questions to be presented to the user. These questions are meant to test the student's learning. Each assessment question is regarded as an independent interaction.

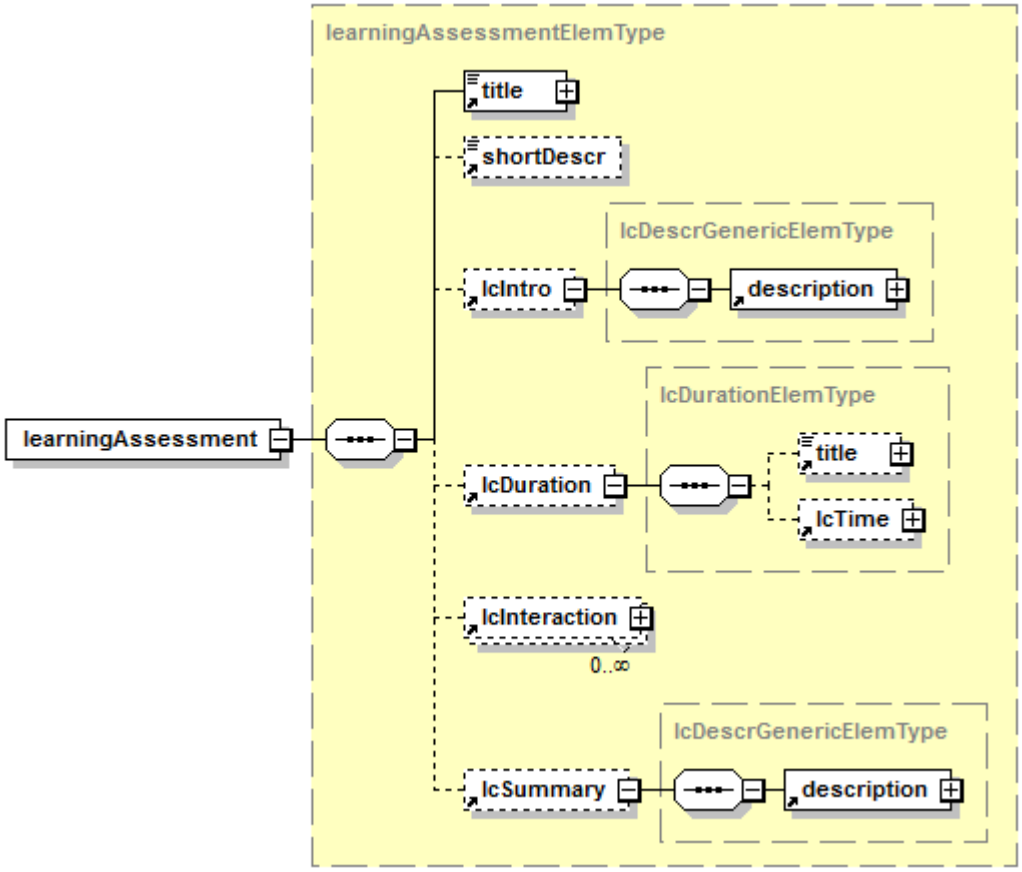
2 Learning assessment

Description: The element <learningAssessment> contains the learning assessment. It presents interactions that measure a learner's progress, encourage recollection, and stimulate reinforcement of the learning content. It can be presented before the content as a pre-assessment or at the end of the content as a post-assessment. The format of each interactive assessment question can be structured as one of the following question types: true/false, single select, multiple select, completion, sequencing, matching, drag-and-drop, or hotspot. A single learning assessment can contain one or more individual "interactions", each of which contains a "question type". The interactions use a subset of the Instructional management system question-test interoperability specification.

Note

The true/false, single-select, and multiple-select structures use the same content model, the element <lcQuestionOptionGroup>. There is one occurrence of the element <lcQuestionOptionGroup> for each assessment question.

Markup element: <learningAssessment>



ICN-S3627-S1000D0642-002-01

Fig 1 Element <learningAssessment>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>, the title of the learning assessment information. Refer to Chap 3.9.5.2.1.5.
- <`shortDescr`>. Refer to Para 2.1.
- <`lcIntro`>. Refer to Para 2.2.
- <`lcDuration`>. Refer to Para 2.3.
- <`lcInteraction`>. Refer to Para 2.4.
- <`lcSummary`>. Refer to Para 2.5.

2.1 Short description

Description: The element <`shortDescr`> contains a short description of the learning assessment portion of the course or lesson.

Markup element: <shortDescr>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

2.2 Introduction

Description: The element <lcIntro> contains a detailed introduction and description of the assessment by use of the element <description>. It is used when the element <shortDescr> is not adequate to fully describe the content.

Markup element: <lcIntro>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>. Refer to Chap 3.9.5.2.2.

2.3 Duration

Description: The element <lcDuration> contains an estimated duration of the assessment by use of the element <description>.

Markup element: <lcDuration>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

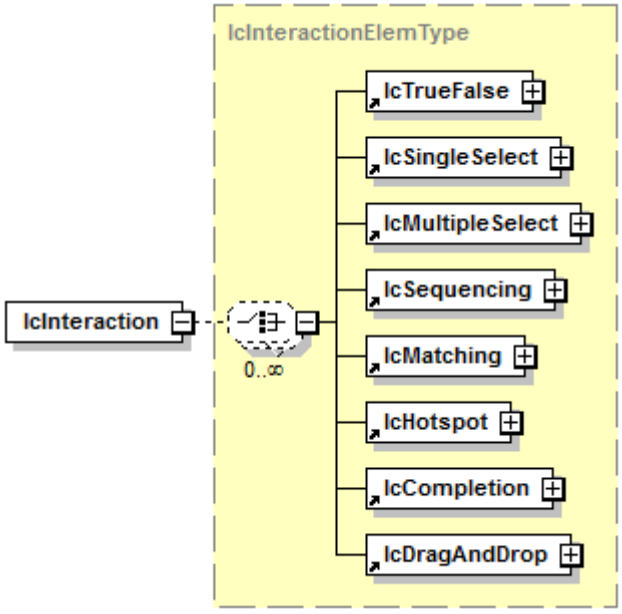
Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <lcTime>. Refer to Chap 3.9.5.2.13.1.

2.4 Interaction

Description: The element <lcInteraction> contains the assessment questions and a selection of possible answers.

Markup element: <lcInteraction>



ICN-S3627-S1000D0643-001-01

Fig 2 Element <lcInteraction>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- shuffle (O,) used to reorder the sequence of interactions within the assessment. The attribute can have one of the following values:
  - "0" - No shuffle
  - "1" - Shuffle

  The attribute shuffle can be used to randomly redistribute the order of entire groups of assessment interactions or answer options as well individual assessment items within a group.
- weightingFactor (O), the factor customizing the score value of an interaction item. The attribute weightingFactor accepts numeric values to indicate the relative importance of an interaction item within an assessment scheme.

  For example, when the importance of an assessment question is critical to the subject matter (such as a question concerning safety procedures), an interaction attribute weightingFactor can be assigned a numeric value calculated to trigger a fail threshold for a single incorrect response.

- `attempts` (O), the number of allowed attempts on an assessment. This attribute accepts numeric values.

  The attribute `attempts` provides assessment designers the flexibility to develop assessments that allow assessment takers multiple attempts at individual assessment interactions. This technique is often used by designers when assessments are intended to reinforce acquired knowledge rather than test and score mastery of the subject matter.

- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Note

The attributes `shuffle`, `weightingFactor` and `attempts` are used to customize interactions according to the learning goals of the assessment. Assessment designers can decide to use these attributes to customize individual assessment items within a sequence of assessment questions, or they can be used to customize any individual assessment question.

Child elements:

- <`lcTrueFalse`>, the true/false assessment interaction items. Refer to Para 2.4.1.
- <`lcSingleSelect`>, the single-select assessment interaction items. Refer to Para 2.4.2.
- <`lcMultipleSelect`>, the multiple-select assessment interaction items. Refer to Para 2.4.3.
- <`lcSequencing`>, the sequencing assessment interaction items. Refer to Para 2.4.4.
- <`lcMatching`>, the matching assessment interaction type. Refer to Para 2.4.5.
- <`lcHotspot`>, the assessment items using embedded interactive hotspots. Refer to Para 2.4.6.
- <`lcCompletion`>, the fill-in-the-blank type interaction items. Refer to Para 2.4.7.
- <`lcDragAndDrop`>, the assessment items relying on user drag-and-drop interactivity. Refer to Para 2.4.8.

Business rule decision point BRDP-S1-00273 - Use of the attribute `weightingFactor`:

- Decide whether to assign weighted values to individual interactions.

Business rule decision point BRDP-S1-00274 - Use of the attribute `attempts`:

- Decide whether to allow multiple response attempts for interaction items.

Markup example:

```
<lcInteraction shuffle="1" weightingFactor="25" attempts="2">
<lcTrueFalse>
<title />
<lcQuestion>
<description>
<para>Select your answer, and then click NEXT.</para>
<para>All bike tires require an inner tube?</para>
</description>
</lcQuestion>
<lcAnswerOptionGroup>
```

```
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>True</para>
</description>
</lcAnswerOptionContent>
</lcAnswerOption>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>False</para>
</description>
</lcAnswerOptionContent>
<lcCorrectResponse lcName="lcCorrectResponse"/>
</lcAnswerOption>
</lcAnswerOptionGroup>
<lcFeedbackItemGroup>...</lcFeedbackItemGroup>
</lcTrueFalse>
</lcInteraction>
```

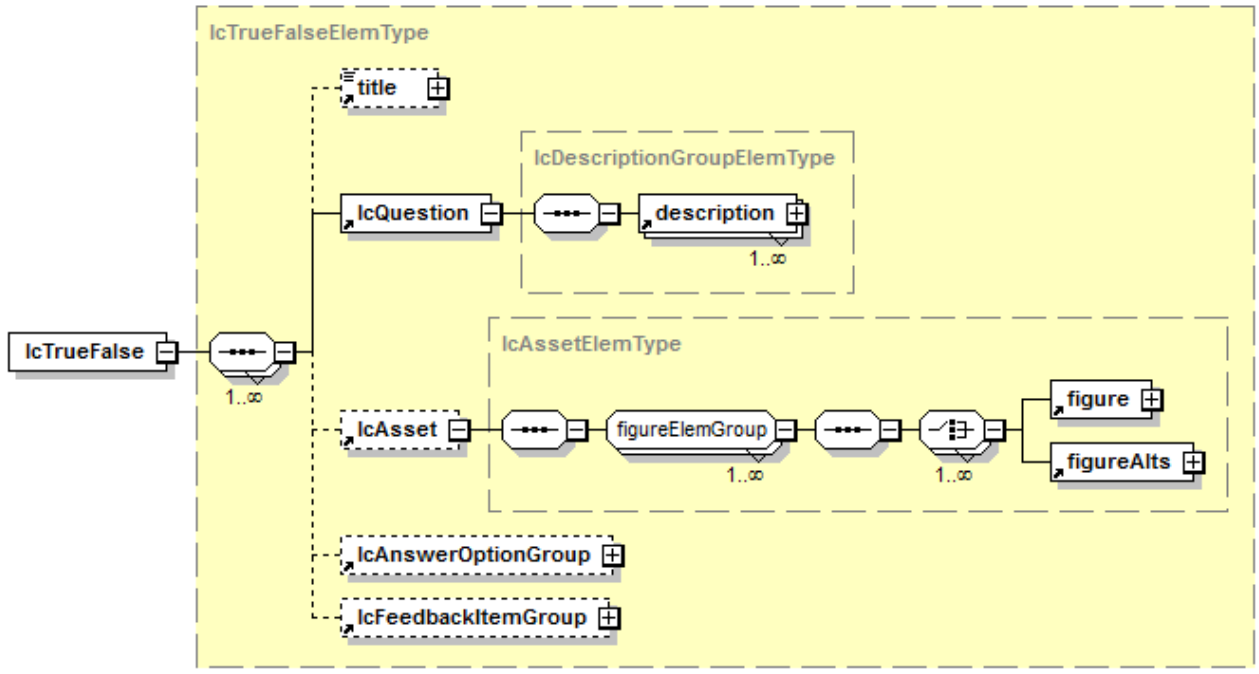
2.4.1 True/false

Description: The element <lcTrueFalse> contains the markup for true/false assessment interaction items. The true/false interaction presents the learner with two choices, one correct, the other incorrect, and is often presented as true/false or yes/no responses.

Note

The element <lcTrueFalse> contains the same content model as the element <lcSingleSelect> and the element <lcMultipleSelect>. However, the true/false interaction contains only two <answerOption> elements within the child <answerOptionGroup> element: one answer option for the "true" answer option and one for the "false" answer option.

Markup element: <lcTrueFalse>



ICN-S3627-S1000D0644-001-01

Fig 3 Element <lcTrueFalse>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>, the title of learning assessment information. Refer to Chap 3.9.5.2.1.5.
- <`lcQuestion`>. Refer to Para 2.4.1.1.
- <`lcAsset`>. Refer to Para 2.4.1.2
- <`lcAnswerOptionGroup`>. Refer to Para 2.4.1.3.
- <`lcFeedbackItemGroup`>. Refer to Para 2.4.1.4.

Markup example:

```
<lcTrueFalse>
<title />
<lcQuestion>
<description>
<para>Select your answer, and then click NEXT.</para>
<para>All bike tires require an inner tube?</para>
</description>
</lcQuestion>
<lcAnswerOptionGroup>
<lcAnswerOption>
```

```
<lcAnswerOptionContent>
<description>
<para>True</para>
</description>
</lcAnswerOptionContent>
</lcAnswerOption>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>False</para>
</description>
</lcAnswerOptionContent>
<lcCorrectResponse lcName="lcCorrectResponse"/>
</lcAnswerOption>
</lcAnswerOptionGroup>
<lcFeedbackItemGroup>...</lcFeedbackItemGroup>
</lcTrueFalse>
```

2.4.1.1 Question

Description: The element <lcQuestion> contains the stem for an assessment interaction.

Markup element: <lcQuestion>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>, the description of the element in which it is contained. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcQuestion>
<description>
<para>Select your answer, and then click CHECK.</para>
<para>The stem attaches the _________ to the ________.</para>
</description>
</lcQuestion>
```

2.4.1.2 Asset

Description: The element <lcAsset> contains images and other graphic assets to support an assessment interaction.

Markup element: <lcAsset>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.

2.4.1.3 Answer option group

Description: The element <lcAnswerOptionGroup> contains answer options for true/false, single-select, completion, or multiple-select assessment interactions.

Markup element: <lcAnswerOptionGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lcAnswerOption>. Refer to Para 2.4.1.3.1.

Markup example:

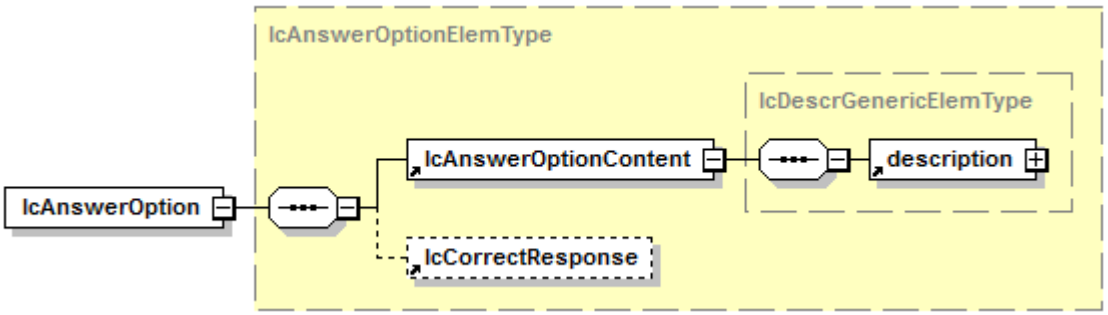
```
<lcAnswerOptionGroup>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Spokes</para>
</description>
</lcAnswerOptionContent>
</lcAnswerOption>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Control cables</para>
</description>
</lcAnswerOptionContent>
<lcCorrectResponse lcName="lcCorrectResponse"/>
</lcAnswerOption>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Chain</para>
```

```
</description>
</lcAnswerOptionContent>
<lcCorrectResponse lcName="lcCorrectResponse"/>
</lcAnswerOption>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Wheel rims</para>
</description>
</lcAnswerOptionContent>
</lcAnswerOption>
</lcAnswerOptionGroup>
```

2.4.1.3.1 Answer option

Description: The element <lcAnswerOption> contains a single answer option for true/false, single-select, completion, or multiple-select assessment interactions.

Markup element: <lcAnswerOption>



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Fig 4 Element <lcAnswerOption>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lcAnswerOptionContent>. Refer to Para 2.4.1.3.2.
- <lcCorrectResponse>. Refer to Para 2.4.1.3.3.

Markup example:

```
<lcAnswerOption id="ao_001" shuffle="1">
<lcAnswerOptionContent>
<description>
<para>headset/fork</para>
</description>
```

```
</lcAnswerOptionContent>
</lcAnswerOption>
```

2.4.1.3.2 Answer option content

Description: The element <lcAnswerOptionContent> contains the content for an answer option to a question and can indicate that the answer option is correct or incorrect.

Markup element: <lcAnswerOptionContent>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>, the description of the element in which it is contained. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcAnswerOptionContent>
<description>
<para>frame/handlebar</para>
</description>
</lcAnswerOptionContent>
```

2.4.1.3.3 Correct response

Description: The (empty) element <lcCorrectResponse> contains a correct occurrence of the element <lcOptionContent> response in the element <lcAnswerOption>.

Markup element: <lcCorrectResponse>

Attributes:

- lcName (O), the indication of the assessment type. The default value is "lcCorrectResponse" in the context of use of the element <lcCorrectResponse>.
- lcValue (O), the value of the correct response

Child elements:

- None

Markup example:

```
<lcAnswerOption id="ao_003" shuffle="1">
<lcAnswerOptionContent>
<description>
<para>handlebar/headset</para>
</description>
</lcAnswerOptionContent>
```

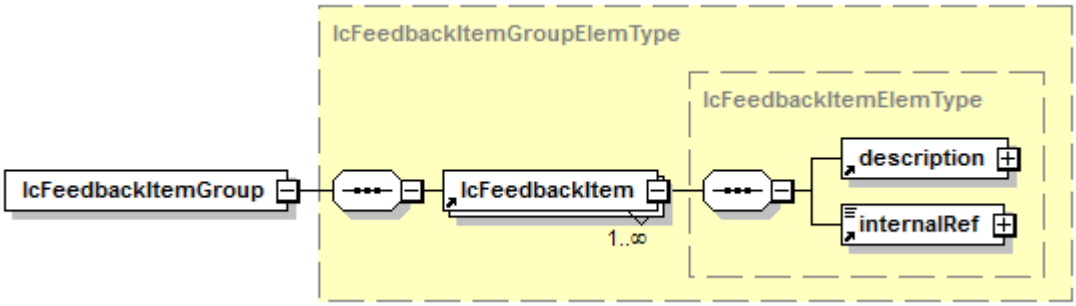
```
<lcCorrectResponse lcName="lcCorrectResponse"/>
</lcAnswerOption>
```

2.4.1.4 Feedback item group

Description: The element <lcFeedbackItemGroup> contains the content for supplying dynamic feedback to user assessment item responses.

The element <lcFeedbackItemGroup> supports linking of performance-based feedback through the use of internal referencing. Assessment designers can use the element <internalRef> as a child of the element <lcFeedBackItem> to establish relationships among answer options and associated feedback content. This allows for the development of robust and flexible assessment interactions capable of providing feedback to users in response to multiple interaction performance results. As the markup example demonstrates, feedback can be developed to support the answer status as it applies to individual question responses. Feedback content can be logically associated with the current number of allowable user response attempts as well as the correct or incorrect status of the response.

Markup element: <lcFeedbackItemGroup>



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Fig 5 Element <lcFeedbackItemGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lcFeedBackItem>. Refer to Para 2.4.1.4.1.

Markup example:

```
<lcFeedbackItemGroup>
<lcFeedbackItem attemptMatch="1"
feedbackStatus="fbCorrect"><description>
<para>Correct!</para>
</description>
<internalRef internalRefId="ao_003">
</internalRef>
```

```
</lcFeedbackItem>
<lcFeedbackItem attemptMatch="2"
feedbackStatus="fbCorrect"><description>
<para>You got it right this time. Good work!</para>
</description>
<internalRef internalRefId="ao_003">
</internalRef>
</lcFeedbackItem>
<lcFeedbackItem attemptMatch="1" feedbackStatus="fbIncorrect">
<description>
<para>The answer <emphasis>"headset/fork"</emphasis> is
incorrect. Try again!</para>
</description>
<internalRef internalRefId="ao_001">
</internalRef>
</lcFeedbackItem>
<lcFeedbackItem attemptMatch="1" feedbackStatus="fbIncorrect">
<description>
<para>
The answer <emphasis>"fork/handlebar"</emphasis> is incorrect.
Try again!
</para>
</description>
<internalRef internalRefId="ao_002">
</internalRef>
</lcFeedbackItem>
<lcFeedbackItem>
<description>
<para>Correct!</para>
</description>
<internalRef internalRefId="ao_003">
</internalRef>
</lcFeedbackItem>
<lcFeedbackItem attemptMatch="1" feedbackStatus="fbIncorrect">
<description>
<para>
The answer <emphasis>"frame/handlebar"</emphasis> is incorrect.
Try again!
</para>
</description>
<internalRef internalRefId="ao_004">
</internalRef>
</lcFeedbackItem>
<lcFeedbackItem attemptMatch="2" feedbackStatus="fbIncorrect">
<description>
<para>
The answer <emphasis>"headset/fork"</emphasis> is incorrect. The
correct answer is handlebar/headset.
</para>
</description>
<internalRef internalRefId="ao_001">
</internalRef>
</lcFeedbackItem>
```

```
<lcFeedbackItem attemptMatch="2" feedbackStatus="fbIncorrect">
<description>
<para>
The answer <emphasis>"fork/handlebar"</emphasis> is incorrect.
The correct answer is handlebar/headset.
</para>
</description>
<internalRef internalRefId="ao_002">
</internalRef>
</lcFeedbackItem>
<lcFeedbackItem attemptMatch="2" feedbackStatus="fbIncorrect">
<description>
<para>
The answer <emphasis>"frame/handlebar"</emphasis> is incorrect.
The correct answer is handlebar/headset.
</para>
</description>
<internalRef internalRefId="ao_004">
</internalRef>
</lcFeedbackItem>
</lcFeedbackItemGroup>
```

2.4.1.4.1 Feedback item

Description: The element <lcFeedbackItem> contains the interaction performance information. Feedback information is displayed to assessment takers as the result of response attempts. Individual feedback items can be custom tailored to support complex, performance-based feedback scenarios for a range of user assessment interaction responses.

Linking of the feedback responses to the answer matching answer options is accomplished through the element <internalRef>. As the markup example illustrates, feedback items can be linked to specific answer options to indicate correct and incorrect responses as well as to reflect feedback based on the number of the interaction attempts.

Markup element: <lcFeedbackItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- attemptMatch (O), the number of response attempts allowed for interactions.
- feedbackStatus (O), the type of feedback to be displayed for a response attempt. The type of feedback is conditional to the response status of the answer option. The attribute can have one of the following values:
  - "fbCorrect" - the feedback content of the <lcFeedbackItem> element will match a correct response
  - "fbIncorrect" - the feedback content of the <lcFeedbackItem> element will match an incorrect response
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>, the description for the element in which it is contained. Refer to Chap 3.9.5.2.2.
- <internalRef>, the cross-reference from one point in a data module to another point in the same data module. This is achieved by linking the attribute internalRefId to the target attribute id. Refer to Para 2.4.1.4.2 and Chap 3.9.5.2.1.2.

Markup example:

```
<lcFeedbackItem attemptMatch="1" feedbackStatus="fbCorrect">
<description>
<para>Correct!</para>
</description>
<internalRef internalRefId="ao_003">
</internalRef>
</lcFeedbackItem>
```

2.4.1.4.2 Internal reference

Description: The element <internalRef> is used to mark up a cross-reference from one point in a data module to another point in the same data module. This is achieved by linking the attribute internalRefId to the target attribute id. Refer to Chap 3.9.5.2.1.2.

The element <internalRef> is used within the feedback group structure to link feedback items to their paired answer options. Linking is accomplished by setting the value of the attribute internalRefId to the matching value of the attribute id of the element <answerOption>.

Markup example:

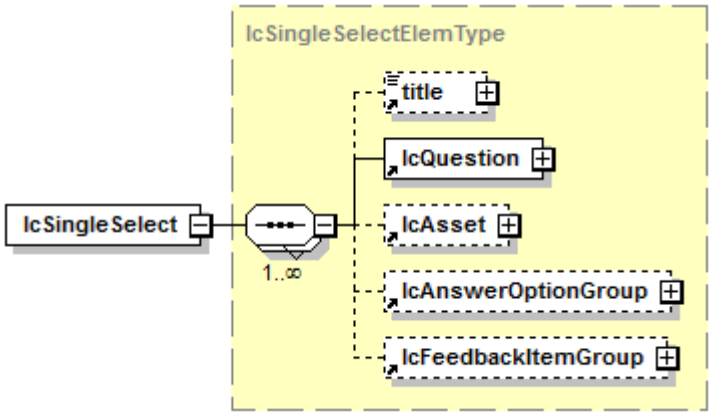
```
<lcTrueFalse>
<title />
<lcQuestion>
<description>
<para>Select your answer, and then click NEXT.</para>
<para>All bike tires require an inner tube?</para>
</description>
</lcQuestion>
<lcAnswerOptionGroup>
<lcAnswerOption id="ao_001" shuffle="1">
<lcAnswerOptionContent>
<description>
<para>headset/fork</para>
</description>
</lcAnswerOptionContent>
</lcAnswerOption>
</lcAnswerOptionGroup>
<lcFeedbackItemGroup>
<lcFeedbackItem attemptMatch="1" feedbackStatus="fbIncorrect">
<description>
<para>The answer <emphasis>"headset/fork"</emphasis> is
incorrect. Try again!</para>
</description>
<internalRef internalRefId="ao_001">
</internalRef>
```

```
</lcFeedbackItem>
</lcFeedbackItemGroup>
</lcTrueFalse>
```

2.4.2 Single select

Description: A single-select interaction presents the assessment taker with a question and three or more possible answers, only one of which is correct.

Markup element: <lcSingleSelect>



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Fig 6 Element <lcSingleSelect>

Note

The element <lcSingleSelect> contains the same content model as the element <lcTrueFalse> and the element <lcMultipleSelect>. Enter two or more elements <lcAnswerOptionGroup> for each possible correct answer.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- lcName (O), the assessment type. The default value is "lcSingleSelect" in the context of use of the element <lcSingleSelect>.
- lcValue (O), the value of the correct response
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>, the title of learning assessment information. Refer to Chap 3.9.5.2.1.5.
- <lcQuestion>. Refer to Para 2.4.1.1.
- <lcAsset>. Refer to Para 2.4.1.2.
- <lcAnswerOptionGroup>. Refer to Para 2.4.1.3.
- <lcFeedbackItemGroup>. Refer to Para 2.4.1.4.

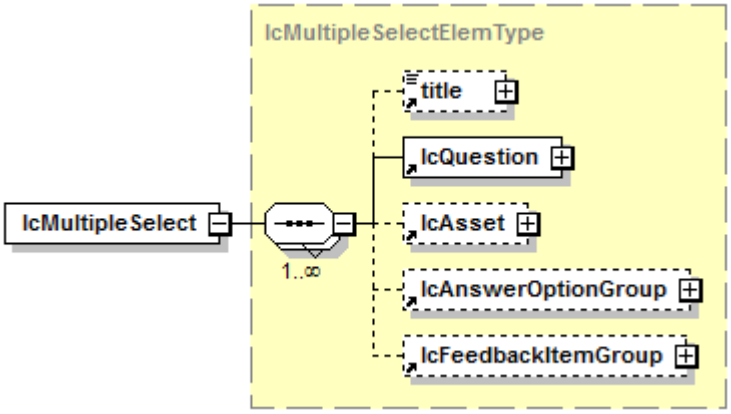
Markup example:

```
<lcSingleSelect>
<title/>
<lcQuestion>
<description>
<para>Select your answer, and then click NEXT.</para>
<para>What is the function of the valve attached to a bike's
inner tube?</para>
</description>
</lcQuestion>
<lcAnswerOptionGroup>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Holds the inner tube in place</para>
</description>
</lcAnswerOptionContent>
</lcAnswerOption>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Indicates the correct direction of rotation</para>
</description>
</lcAnswerOptionContent>
</lcAnswerOption>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Allows inflation of the tube and tire to the correct
pressure</para>
</description>
</lcAnswerOptionContent>
<lcCorrectResponse lcName="lcCorrectResponse"/>
</lcAnswerOption>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Protects the tube from damage</para>
</description>
</lcAnswerOptionContent>
</lcAnswerOption>
</lcAnswerOptionGroup>
<lcFeedbackItemGroup>...</lcFeedbackItemGroup>
</lcSingleSelect>
```

2.4.3 Multiple select

Description: The element <lcMultipleSelect> contains a multiple-select interaction presents the assessment taker with a question and three or more possible answers, where two or more answers are correct.

Markup element: <lcMultipleSelect>



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Fig 7 Element <lcMultipleSelect>

Note

The element <lcMultipleSelect> contains the same content model as the element <lcTrueFalse> and the element <lcSingleSelect>. Enter three or more elements <lcAnswerOptionGroup> for each possible correct answer.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- lcName (O), the indication of the assessment type. The default value is "lcMultipleSelect" in the context of use of the element <lcMultipleSelect>.
- lcValue (O), the value of the correct response
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>, the title of learning assessment information. Refer to Chap 3.9.5.2.1.5.
- <lcQuestion>. Refer to Para 2.4.1.1.
- <lcAsset>. Refer to Para 2.4.1.2.
- <lcAnswerOptionGroup>. Refer to Para 2.4.1.3.
- <lcFeedbackItemGroup>. Refer to Para 2.4.1.4.

Markup example:

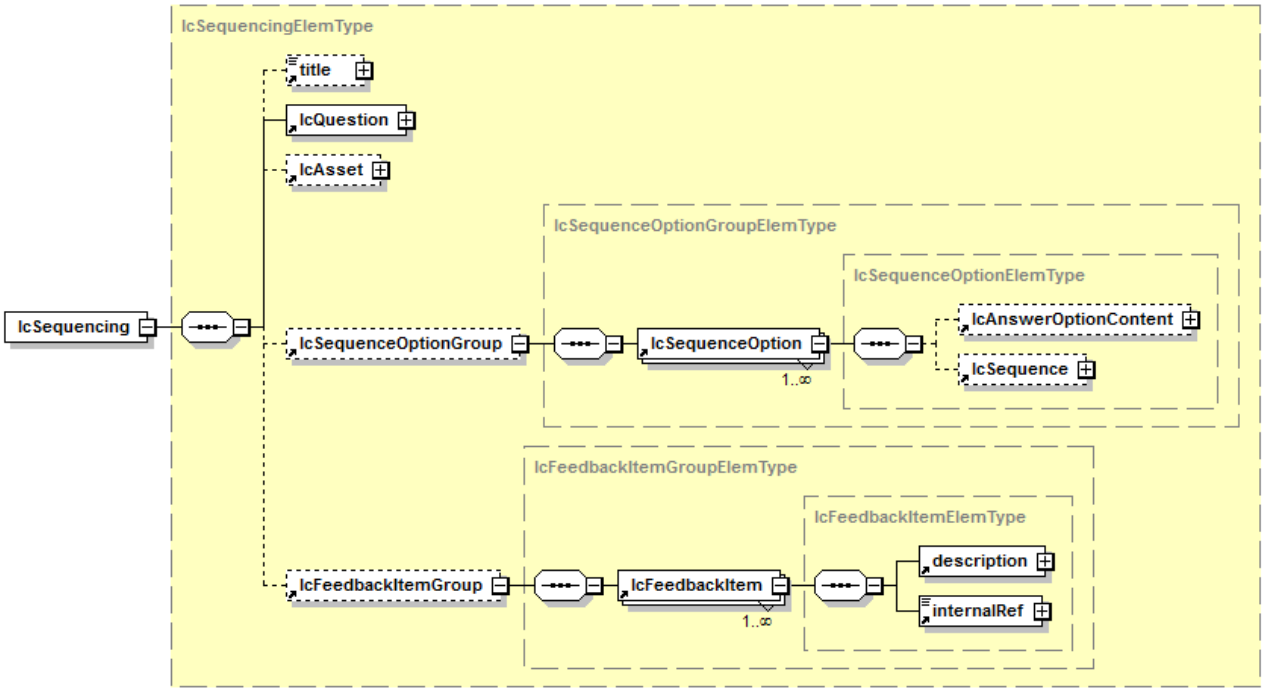
```
<lcMultipleSelect>
<title/>
<lcQuestion>
<description>
<para>Select all answers that apply, and then click NEXT.</para>
<para>Hard-to-clean areas on your bike include:</para>
</description>
</lcQuestion>
```

```
<lcAnswerOptionGroup>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Shift levers</para>
</description>
</lcAnswerOptionContent>
<lcCorrectResponse lcName="lcCorrectResponse"/>
</lcAnswerOption>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Spokes</para>
</description>
</lcAnswerOptionContent>
</lcAnswerOption>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Brakes</para>
</description>
</lcAnswerOptionContent>
<lcCorrectResponse lcName="lcCorrectResponse"/>
</lcAnswerOption>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>Stem</para>
</description>
</lcAnswerOptionContent>
</lcAnswerOption>
</lcAnswerOptionGroup>
</lcMultipleSelect>
```

2.4.4 Sequencing

Description: The element <lcSequencing> contains the container for sequence interaction type content. The sequence interaction presents the assessment taker with a list of items or actions that must be put into a correct sequential order.

Markup element: <lcSequencing>



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Fig 8 Element <lcSequencing>

Note

The element <lcSequencing> contains the same basic content model as the element <lcTrueFalse>, the element <lcSingleSelect>, and the element <lcMultipleSelect> except that the element <lcSequenceOptionGroup> replaces the element <lcAnswerOptionGroup>.

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- lcName (O), the indication of the assessment type. The default value is "lcSequencing" in the context of use of the element <lcSequencing>.
- lcValue (O), the value giving the sequence order of the element <lcSequencing>
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>, the title of the learning assessment information. Refer to Chap 3.9.5.2.1.5.
- <lcQuestion>. Refer to Para 2.4.1.1.
- <lcAsset>. Refer to Para 2.4.1.2.
- <lcSequenceOptionGroup>. Refer to Para 2.4.4.1.
- <lcFeedbackItemGroup>. Refer to Para 2.4.1.4.

Markup example:

```
<lcSequencing>
<!--PROGRAMMERS NOTE: Randomize the display order of sequence
options - lcValue attribute indicates correct order after user
sequencing-->
<title></title>
<lcQuestion id="ques-001">
<description>
<para>Place the steps for finding and repairing a puncture in
the correct order. First, select a step. Then use the up and
down arrows to move the step to the correct position. Repeat for
each step, and then click NEXT.</para>
</description>
</lcQuestion>
<lcSequenceOptionGroup>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Remove the wheel.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="1"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Unseat the tire.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="2"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Examine tube for leak.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="3"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Mark puncture.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="4"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Sand patch application area.</para>
</description>
</lcAnswerOptionContent>
```

```
<lcSequence lcName="lcSequence" lcValue="5"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>
Apply the glue.
</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="6"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Reinstall the tube.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="7"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Reinstall the tire.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="8"/>
</lcSequenceOption>
</lcSequenceOptionGroup>
</lcSequencing>
```

2.4.4.1 Sequence option group

Description: The element <lcSequenceOptionGroup> contains the options for an assessment sequence interaction.

Markup element: <lcSequenceOptionGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lcSequenceOption>. Refer to Para 2.4.4.2.

Markup example:

```
<lcSequenceOptionGroup>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Remove the wheel.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="1"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Unseat the tire.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="2"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Examine tube for leak.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="3"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Mark puncture.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="4"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Sand patch application area.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="5"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>
Apply the glue.
</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="6"/>
</lcSequenceOption>
<lcSequenceOption>
```

```
<lcAnswerOptionContent>
<description>
<para>Reinstall the tube.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="7"/>
</lcSequenceOption>
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Reinstall the tire.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="8"/>
</lcSequenceOption>
</lcSequenceOptionGroup>
```

2.4.4.2 Sequence option

Description: The element <lcSequenceOption> contains a group of answer items to be sequenced within an assessment interaction.

Markup element: <lcSequenceOption>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lcAnswerOptionContent>. Refer to Para 2.4.1.3.2.
- <lcSequence>. Refer to Para 2.4.4.2.1.

Markup example:

```
<lcSequenceOption>
<lcAnswerOptionContent>
<description>
<para>Reinstall the tube.</para>
</description>
</lcAnswerOptionContent>
<lcSequence lcName="lcSequence" lcValue="1"/>
</lcSequenceOption>
```

2.4.4.2.1 Sequence

Description: The element <lcSequence> contains the position of a sequence option in a sequence in an assessment interaction.

Markup element: <lcSequence>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `lcName` (O), the indication of the assessment type. The default value is "`lcSequence`" in the context of use of the element <`lcSequence`>.
- `lcValue` (O), the value giving the sequence order of the element <`lcSequenceOption`>
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

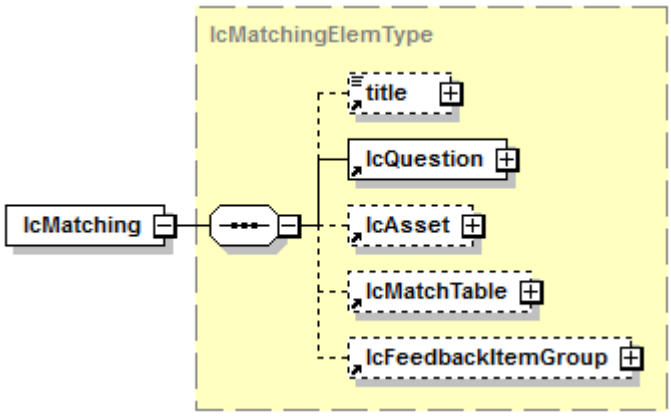
Markup example:

```
<lcSequence lcName="lcSequence" lcValue="7"/>
```

2.4.5 Matching

Description: The element <`lcMatching`> contains the answer items and their corresponding matching responses in the form of a match table. The matching interaction type provides the answer key information via the match table structure. The matching interaction asks the assessment taker to link two related items together from a list of multiple options.

Markup element: <`lcMatching`>



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Fig 9 Element <`lcMatching`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>, the title of the learning assessment information. Refer to Chap 3.9.5.2.1.5.
- <`lcQuestion`>. Refer to Para 2.4.1.1.
- <`lcAsset`>. Refer to Para 2.4.1.2.
- <`lcMatchTable`>. Refer to Para 2.4.5.1.
- <`lcFeedbackItemGroup`>. Refer to Para 2.4.1.4.

Markup example:

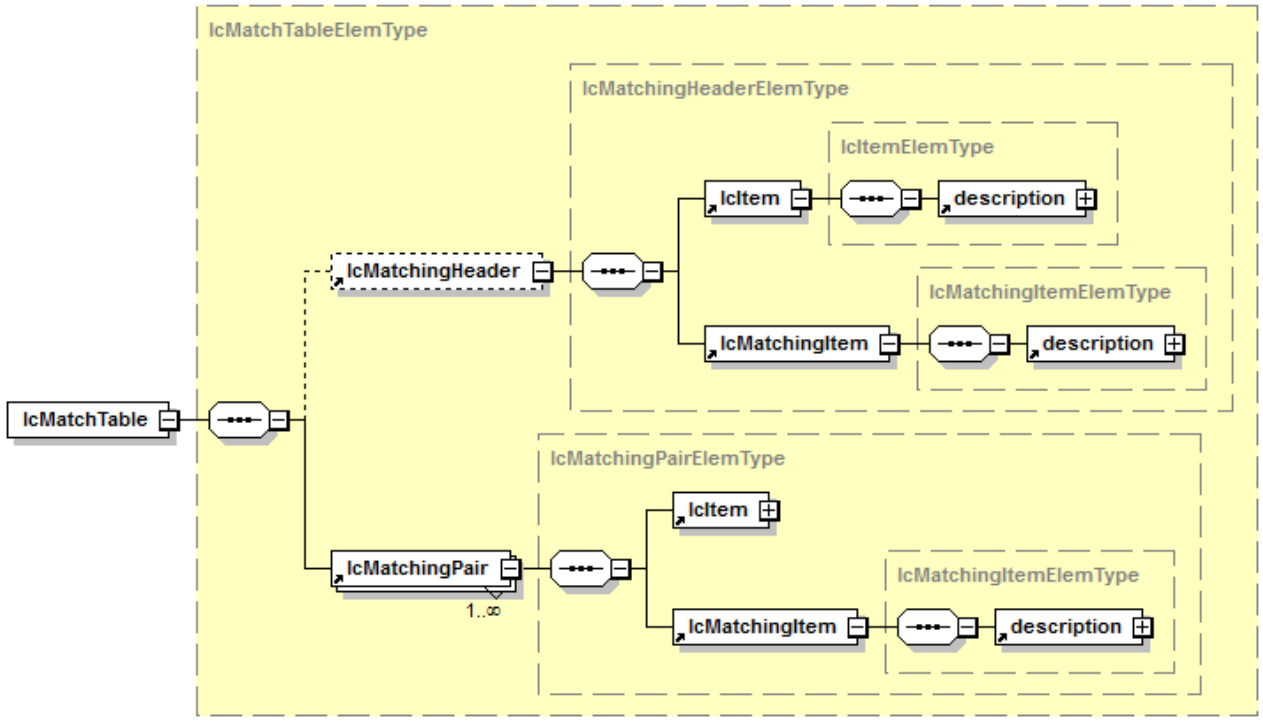
```
<lcMatching id="matching">
<title></title>
<lcQuestion>
<description>
<para>Use the drop-down menus to answer the questions, and then
click CHECK.</para>
</description>
</lcQuestion>
<lcMatchTable>
<lcMatchingHeader>
<lcItem>
<description>
<para>Question</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Answer Menu</para>
</description>
</lcMatchingItem>
</lcMatchingHeader>
<lcMatchingPair>
<lcItem>
<description>
<para>Which part of the hub assembly allows wheel components
 to rotate freely around the axle?</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Bearings</para>
</description>
</lcMatchingItem>
</lcMatchingPair>
<lcMatchingPair>
<lcItem>
<description>
<para>To which part of the assembly are the spokes
attached?</para>
</description>
```

```
</lcItem>
<lcMatchingItem>
<description>
<para>Hub shell</para>
</description>
</lcMatchingItem>
</lcMatchingPair>
<lcMatchingPair>
<lcItem>
<description>
<para>Which part of the hub assembly is attached to the
dropouts?</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Axle</para>
</description>
</lcMatchingItem>
</lcMatchingPair>
</lcMatchTable>
</lcMatching>
```

2.4.5.1 Match table

Description: The element <lcMatchTable> contains a data table structure for the matching item and corresponding response items in a matching type assessment interaction. The element <lcMatchTable> identifies matching pairs of items and their corresponding responses. The element <lcMatchTable> defines matching response pairs through child elements <lcItem> and <lcMatchingItem>.

Markup element: <lcMatchTable>



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Fig 10 Element <lcMatchTable>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`lcMatchingHeader`>. Refer to Para 2.4.5.1.1.
- <`lcMatchingPair`>. Refer to Para 2.4.5.1.4.

Markup example:

```
<lcMatchTable>
<lcMatchingHeader>
<lcItem>
<description>
<para>Question</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Answer Menu</para>
</description>
```

```
</lcMatchingItem>
</lcMatchingHeader>
<lcMatchingPair>
<lcItem>
<description>
<para>Which part of the hub assembly allows wheel components
  to rotate freely around the axle?</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Bearings</para>
</description>
</lcMatchingItem>
</lcMatchingPair>
<lcMatchingPair>
<lcItem>
<description>
<para>To which part of the assembly are the spokes
attached?</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Hub shell</para>
</description>
</lcMatchingItem>
</lcMatchingPair>
<lcMatchingPair>
<lcItem>
<description>
<para>Which part of the hub assembly is attached to the
dropouts?</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Axle</para>
</description>
</lcMatchingItem>
</lcMatchingPair>
</lcMatchTable>
```

2.4.5.1.1 Matching header

Description: The element <lcMatchingHeader> contains the column headings for items to be matched in a match table.

Markup element: <lcMatchingHeader>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lcItem>. Refer to Para 2.4.5.1.2.
- <lcMatchingItem>. Refer to Para 2.4.5.1.3.

Markup example:

```
<lcMatchingHeader>
<lcItem>
<description>
<para>Question</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Answer Menu</para>
</description>
</lcMatchingItem>
</lcMatchingHeader>
```

2.4.5.1.2 Item

Description: The element <lcItem> contains content for an item that corresponds to an element <lcMatchingItem> response located within an element <lcMatchTable>.

Markup element: <lcItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>, the description of the element in which it is contained. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcItem>
<description>
<para>Which part of the hub assembly is attached to the
dropouts?</para>
</description>
</lcItem>
```

2.4.5.1.3 Matching item

Description: The element <lcMatchingItem> contains content for the corresponding <lcItem> that comprises a matching pair of assessment items in a matching interaction.

Markup element: <lcMatchingItem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>, the description of the element in which it is contained. Refer to Chap 3.9.5.2.2.

Markup example:

```
<lcMatchingItem>
<description>
<para>Axle</para>
</description>
</lcMatchingItem>
```

2.4.5.1.4 Matching pair

Description: The element <lcMatchingPair> contains a table row with the pair of items that comprise a correct match of corresponding <lcItem> and <lcMatchingItems> elements within a matching type interaction.

Markup element: <lcMatchingPair>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <lcItem>. Refer to Para 2.4.5.1.2.
- <lcMatchingItem>. Refer to Para 2.4.5.1.3.

Markup example:

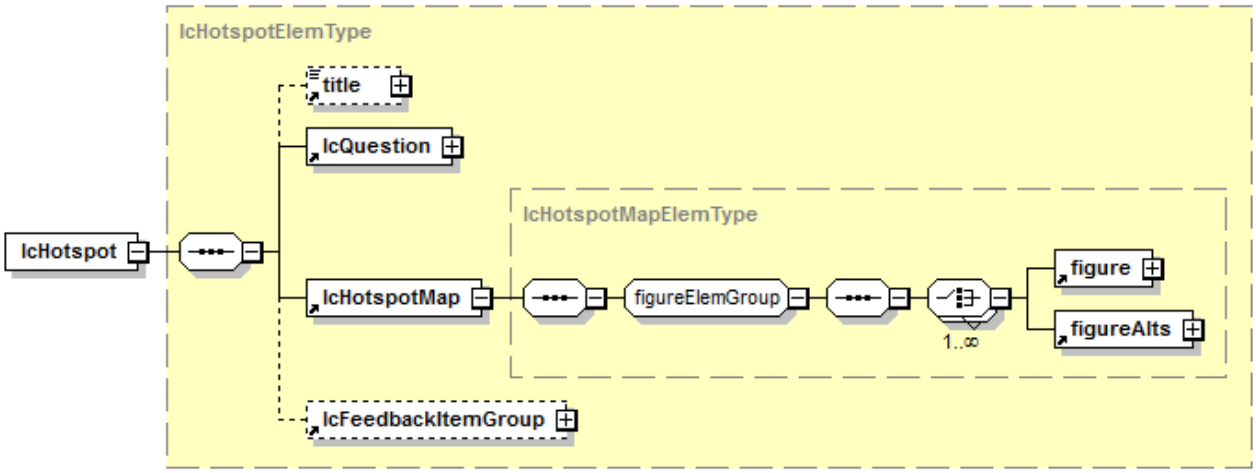
```
<lcMatchingPair>
<lcItem>
<description>
```

```
<para>Which part of the hub assembly is attached to the
dropouts?</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Axle</para>
</description>
</lcMatchingItem>
</lcMatchingPair>
```

2.4.6 Hotspot

Description: The element <lcHotspot> contains a container for hotspot interaction markup. The hotspot interaction asks the assessment taker to click on a region of the screen to indicate a choice. The hotspot assessment interaction uses coordinate mapping structures to define and locate interactive regions located within the viewing computer screen.

Markup element: <lcHotspot>



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Fig 11 Element <lcHotspot>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>, the title of the learning assessment information. Refer to Chap 3.9.5.2.1.5.
- <lcQuestion>. Refer to Para 2.4.1.1.
- <lcHotspotMap>. Refer to Para 2.4.6.1.
- <lcFeedbackItemGroup>. Refer to Para 2.4.1.4.

Markup example:

```
<lcHotspot id="hotspotsAssessment001">
<title></title>
<lcQuestion>
<description>
<para>Identify the headset by clicking it in the image.</para>
</description>
</lcQuestion>
<lcHotspotMap>
<figure>
<title/>
<graphic id="hsa-001" infoEntityIdent="ICN-S1000DBIKE-AAA-
DA20000-A-06RT9-00029-A-001-01" reproductionHeight="400pt"
reproductionWidth="400pt">
<hotspot id="hotspot001"
objectCoordinates="150,90,180,90,150,170,180,170">
<lcCorrectResponse lcName="hotspot001"/>
</hotspot>
<hotspot id="hotspot002"
objectCoordinates="200,180,230,180,200,380,230,380">
</hotspot>
<hotspot id="hotspot003"
objectCoordinates="120,50,190,50,120,100,190,100">
</hotspot>
</graphic>
</figure>
</lcHotspotMap>
</lcHotspot>
```

2.4.6.1 Hotspot map

Description: The element <lcHotspotMap> designates an action area or interactive region over a media object, allowing assessment takers to click in that region. The user's clicked selection is scored as a correct or an incorrect response to an interaction question. The interactive, or "hot", region is defined within the element <lcHotspotMap> as a series of "x" and "y" Cartesian coordinates assigned as values of the attribute objectCoordinate attributes of the element <hotspot> element. Refer to Chap 3.9.5.2.1.8.

Markup element: <lcHotspotMap>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <figure>. Refer to Chap 3.9.5.2.1.7.

– <figureAlts>. Refer to Chap 3.9.5.2.1.7.

Markup example

```
<lcHotspotMap>
<figure>
<title/>
<graphic id="hsa-001" infoEntityIdent="ICN-S1000DBIKE-AAA-
DA20000-A-06RT9-00029-A-001-01" reproductionHeight="400pt"
reproductionWidth="400pt">
<hotspot id="hotspot001"
objectCoordinates="150,90,180,90,150,170,180,170">
<lcCorrectResponse lcName="hotspot001"/>
</hotspot>
<hotspot id="hotspot002"
objectCoordinates="200,180,230,180,200,380,230,380">
</hotspot>
<hotspot id="hotspot003"
objectCoordinates="120,50,190,50,120,100,190,100">
</hotspot>
</graphic>
</figure>
</lcHotspotMap>
```

2.4.7 Completion

Description: The element <lcCompletion> contains the completion type interactions. The completion interaction asks the assessment taker to supply missing information to complete an assessment item. The completion type assessment item is also commonly known as the "fill-in-the-blank" question type.

Markup element: <lcCompletion>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- lcName (O), the indication of the assessment type. The default value is "lcCompletion" in the context of use of the element <lcCompletion>.
- lcValue (O), the value giving the sequence order of the element <lcCompletion>
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>, the title of the learning assessment information. Refer to Chap 3.9.5.2.1.5.
- <lcQuestion>. Refer to Para 2.4.1.1.
- <lcAsset>. Refer to Para 2.4.1.2.
- <lcAnswerOptionGroup>. Refer to Para 2.4.1.3.
- <lcFeedbackItemGroup>. Refer to Para 2.4.1.4.

Markup example:

```
<lcCompletion>
<lcQuestion>
<description>
<para>Type the answer that best completes the statement in the
text box, and then click CHECK.</para>
<para>The stem attaches the_____ to the
handlebar.</para>
</description>
</lcQuestion>
<lcAnswerOptionGroup>
<lcAnswerOption>
<lcAnswerOptionContent>
<description>
<para>headset</para>
</description>
</lcAnswerOptionContent>
<lcCorrectResponse />
</lcAnswerOption>
</lcAnswerOptionGroup>
</lcCompletion>
```

2.4.8 Drag and drop

Description: The element <lcDragAndDrop> contains the drag-and-drop assessment interactions. The drag-and-drop interaction asks the assessment taker to drag related items using the mouse and drop them on designated embedded targets. The response is evaluated according to the match table content model.

Note

Like the element <lcHotspot> interaction, the <lcDragAndDrop> interaction relies on the <lcMatchTable> element to organize matching answer items. The <lcDragAndDrop> element is designed to indicate the need for users to complete the interaction by performing mouse selection and dragging of viewable objects to designated interactive drop targets. The drag-and-drop interaction uses matched pairs of <lcItem> and <lcMatchingItem> elements located within the <lcMatchTable> element. The item and matching item pairs provide the mechanisms for determining correct and incorrect answer attempts.

Markup element: <lcDragAndDrop>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>, the title of the learning assessment information. Refer to Chap 3.9.5.2.1.5.

- <lcQuestion>. Refer to Para 2.4.1.1.
- <lcAsset>. Refer to Para 2.4.1.2.
- <lcMatchTable>. Refer to Para 2.4.5.1.
- <lcFeedbackItemGroup>. Refer to Para 2.4.1.4.

Markup example:

```
<lcDragAndDrop>
<title></title>
<lcQuestion>
<description>
<para>Drag the answer options to the matching questions, and
then click CHECK.</para>
</description>
</lcQuestion>
<lcMatchTable>
<lcMatchingPair>
<lcItem>
<description>
<para>Which part of the hub assembly allows wheel components to
rotate freely around the axle?</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Bearings</para>
</description>
</lcMatchingItem>
</lcMatchingPair>
<lcMatchingPair>
<lcItem>
<description>
<para>To which part of the assembly are the spokes
attached?</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Hub shell</para>
</description>
</lcMatchingItem>
</lcMatchingPair>
<lcMatchingPair>
<lcItem>
<description>
<para>Which part of the hub assembly is attached to the
dropouts?</para>
</description>
</lcItem>
<lcMatchingItem>
<description>
<para>Axle</para>
</description>
</lcMatchingItem>
```

```
</lcMatchingPair>
</lcMatchTable>
</lcDragAndDrop>
```

2.5 Summary

Description: The element <lcSummary> contains a summary of the learning assessment.

Markup element: <lcSummary>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <description>, the description of the element in which it is contained. Refer to Chap 3.9.5.2.2.

Chapter 3.9.5.2.14

Content section - Maintenance checklists and inspections

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1 General

The schedule Schema is used to capture and represent maintenance planning information but includes key elements to provide additional functionality. It provides the ability to reduce failure by providing a list of operations or checks to be performed for maintaining the Product. The schema can be used for checklist and inspection information such as scheduled inspection and maintenance conditions necessary to keep the equipment in serviceable condition. It includes a special category to identify in what instances the equipment is not ready or usable.

2 Checklist information

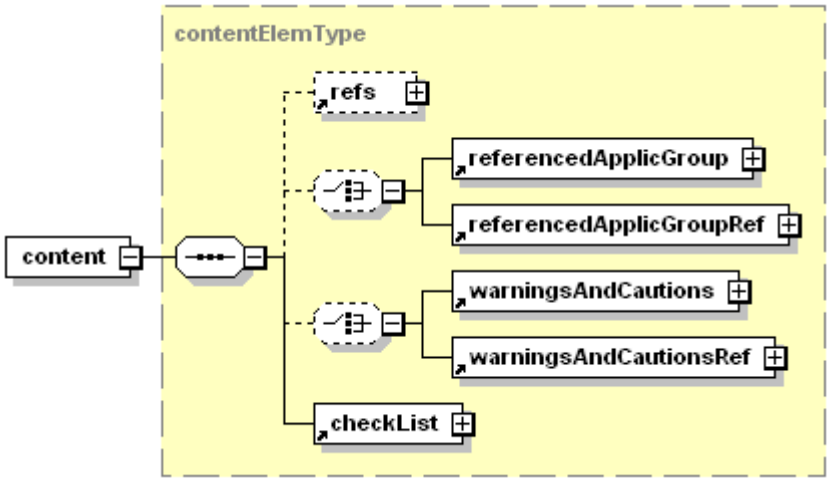
2.1 Schema basic rules

This Schema can be used when the maintenance data contains procedural tasks that must be presented with the maintenance data. These procedural tasks are not a full procedure like those contained in a procedural data module.

2.2 Content

Description: The checklist and maintenance planning Schema is robust enough that it can accommodate many forms of maintenance checklist data. It can be used for items such as Preventive Maintenance Checks and Services (PMCS) table, checking unpacked equipment conditions, preventive maintenance inspection form, and criteria for special inspections to name a few. The paragraphs that follow describe the elements in detail and include markup examples.

Markup element: <content>



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Fig 1 Major elements in maintenance checklist and inspection content

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

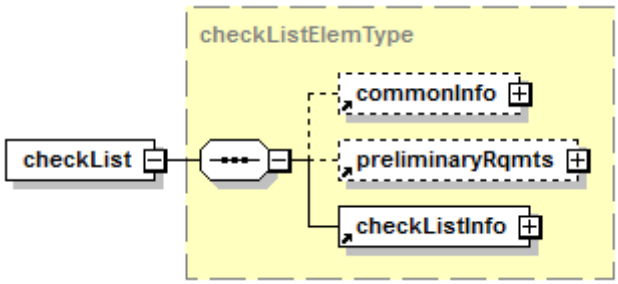
Child elements:

- <`refs`>. Refer to Chap 3.9.5.2.1.2.
- <`referencedApplicGroup`>. Refer to Chap 3.9.5.3.
- <`referencedApplicGroupRef`>. Refer to Chap 3.9.5.3.
- <`warningsAndCautions`>. Refer to Chap 3.9.3.
- <`warningsAndCautionsRef`>. Refer to Chap 3.9.3.
- <`checkList`>. Refer to Para 2.3.

2.3 Checklist and maintenance planning information

Description: The element <`checkList`> contains the checklist information. For each category identified, an organization or project can establish business rules for which elements to use and/or how to markup checklists for each category type.

Markup element: <`checkList`>



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Fig 2 Element <`checklist`>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `checkListType` (O), the type of checklist
- `checkListCategory` (O), the type of checklist. The attribute can have one of the following values:
  - "`clc01`" thru "`clc99`". Refer to Chap 3.9.6.1.
- `worthinessLimit` (O), indicates if the task is mandatory or recommended. Refer to Chap 3.9.5.2.5.
- `reducedMaint` (O), indicates reduced maintenance information. Refer to Chap 3.9.5.2.5.
- `skillLevelCode` (O), the skill level required to complete the task. Refer to Chap 3.9.5.2.5.
- `skillType` (O), the category of skill for the task. Refer to Chap 3.9.5.2.5.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), and `caveat` (O), and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

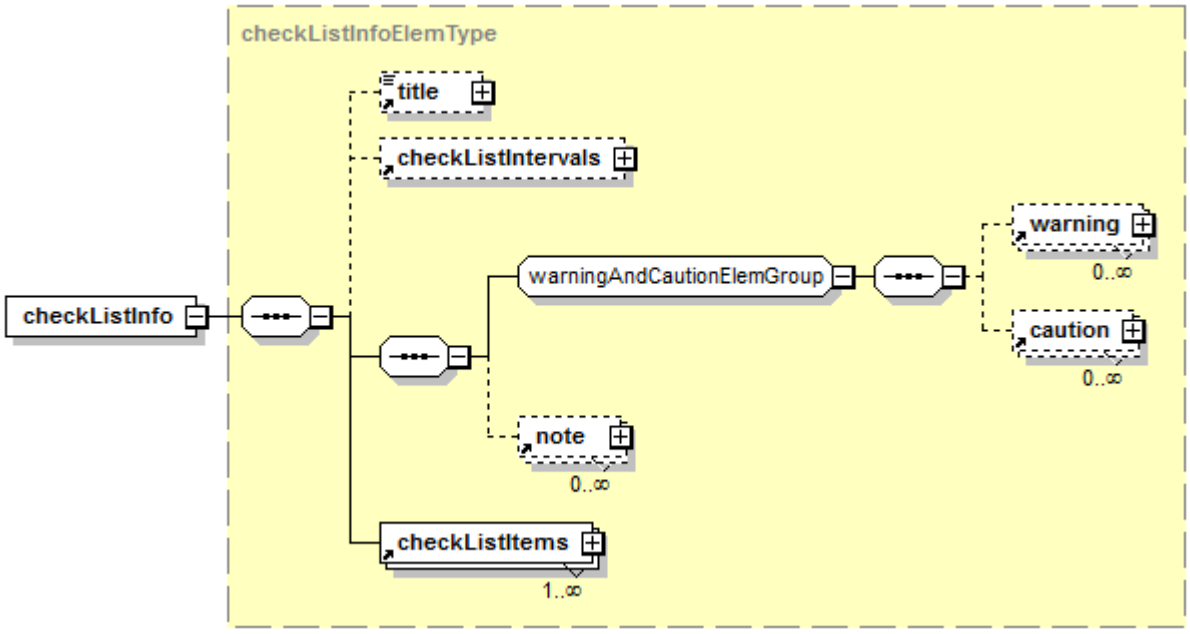
Child elements:

- <`commonInfo`>. Refer to Chap 3.9.5.2.1.12.
- <`preliminaryRqmts`>. Refer to Chap 3.9.5.2.1.9.
- <`checkListInfo`>, contains checklist items. Refer to Para 2.3.1.

2.3.1 Checklist information

Description: The element <`checkListInfo`> contains information necessary to group the items that create the checklist data.

Markup element: <`checkListInfo`>



ICN-S3627-S1000D0630-001-01

Fig 3 Element <checkListInfo>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `worthinessLimit` (O), indicates if the task is mandatory or recommended. Refer to Chap 3.9.5.2.5.
- `reducedMaint` (O), gives the reduced maintenance information. Refer to Chap 3.9.5.2.5.
- `skillLevelCode` (O), the skill level required to complete the task. Refer to Chap 3.9.5.2.5.
- `skillType` (O), the category of skill for the task. Refer to Chap 3.9.5.2.5.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), and `caveat` (O), and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`title`>, the title for the element <`checkListInfo`>. Refer to Chap 3.9.5.2.1.5.
- <`checkListIntervals`>, the maintenance intervals. Refer to Para 2.3.1.1.
- <`warning`>. Refer to Chap 3.9.3.
- <`caution`>. Refer to Chap 3.9.3.
- <`note`>. Refer to Chap 3.9.3.
- <`checkListItems`>, the items pertinent to the checklist. Refer to Para 2.3.1.2.

2.3.1.1 Checklist intervals

Description: The element <checkListIntervals> contains the various maintenance intervals used in an inspection or checklist. These intervals can be used to capture information for use with maintenance interval columns. For example, a table might have a column for 500 hours and a column for 1000 hours. These columns would then have a check mark in the appropriate task row to indicate when the maintenance should be performed.

Markup element: <checkListIntervals>

Attributes:

– None

Child elements:

– <checkListInterval>, used to capture the individual intervals corresponding to the checklist

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

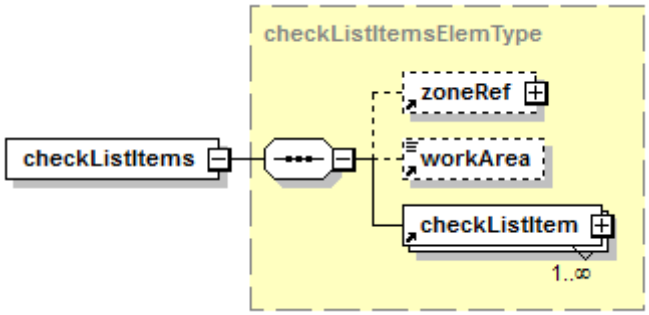
Markup example:

```
<checkListIntervals>
<checkListInterval id="cl01">500 h</checkListInterval>
<checkListInterval id="cl02">1000 h</checkListInterval>
</checkListIntervals>
```

2.3.1.2 Checklist items

Description: The element <checkListItems> contains one or more individual checklist items (<checkListItem>).

Markup element: <checkListItems>



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Fig 4 Element <checkListItems>

Attributes:

– None

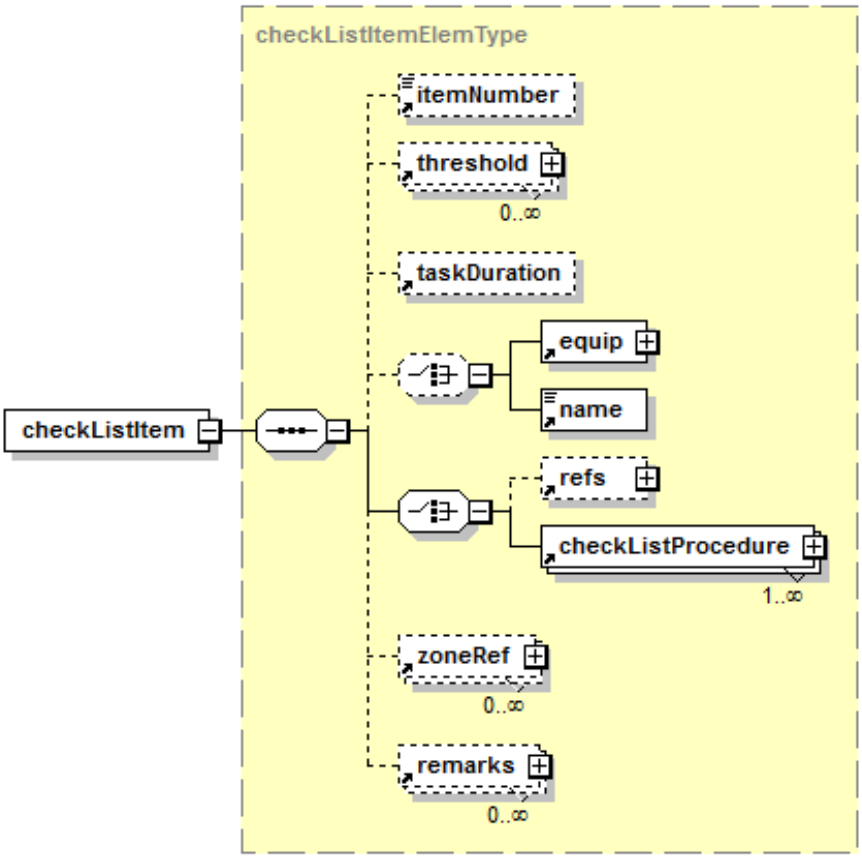
Child elements:

– <zoneRef>, the reference to the zone. Refer to Chap 3.9.5.2.1.10.
– <workArea>, the descriptive identifier of the area where work is accomplished that cannot be deduced from the names of the collection of zones. Refer to Chap 3.9.5.2.1.9.
– <checkListItem>, the individual items. Refer to Para 2.3.1.3.

2.3.1.3 Checklist item

Description: The element contains a number of elements used to capture individual items specific for an inspection or maintenance check. The element <checkListItem> presents an optional item number, followed by an optional threshold.

Markup element: <checkListItem>



ICN-S3627-S1000D0632-001-01

Fig 5 Element <checkListItem>

Attributes:

– None

Child elements:

– <itemNumber>. Refer to Para 2.3.1.3.1.
– <threshold>, the threshold limits. Refer to Chap 3.9.5.2.5.
– <taskDuration>, the elapsed time necessary to achieve the maintenance action. Refer to Chap 3.9.5.2.1.9.
– <equip>, the identifier for the equipment. Refer to Chap 3.9.5.2.5.
– <name>, the name of the equipment. Refer to Chap 3.9.5.2.1.10.
– <refs>. Refer to Chap 3.9.5.2.1.2.
– <checkListProcedure>, contains an individual procedure pertinent to the checklist. Refer to Para 2.3.1.3.2.
– <zoneRef>. Refer to Chap 3.9.5.2.1.10.
– <remarks>. Refer to Chap 3.9.5.1.

Markup example:

```
<checkListItem>
<itemNumber>8</itemNumber>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th51">
<thresholdValue>After</thresholdValue>
</threshold>
</checkListItem>
```

2.3.1.3.1 Item number

Description: The element <itemNumber> is assigned to the checklist item for reference purposes. It is used to identify the line item or the row number for data presented in tabular format.

Markup element: <itemNumber>

Attributes:

– None

Child elements:

– None

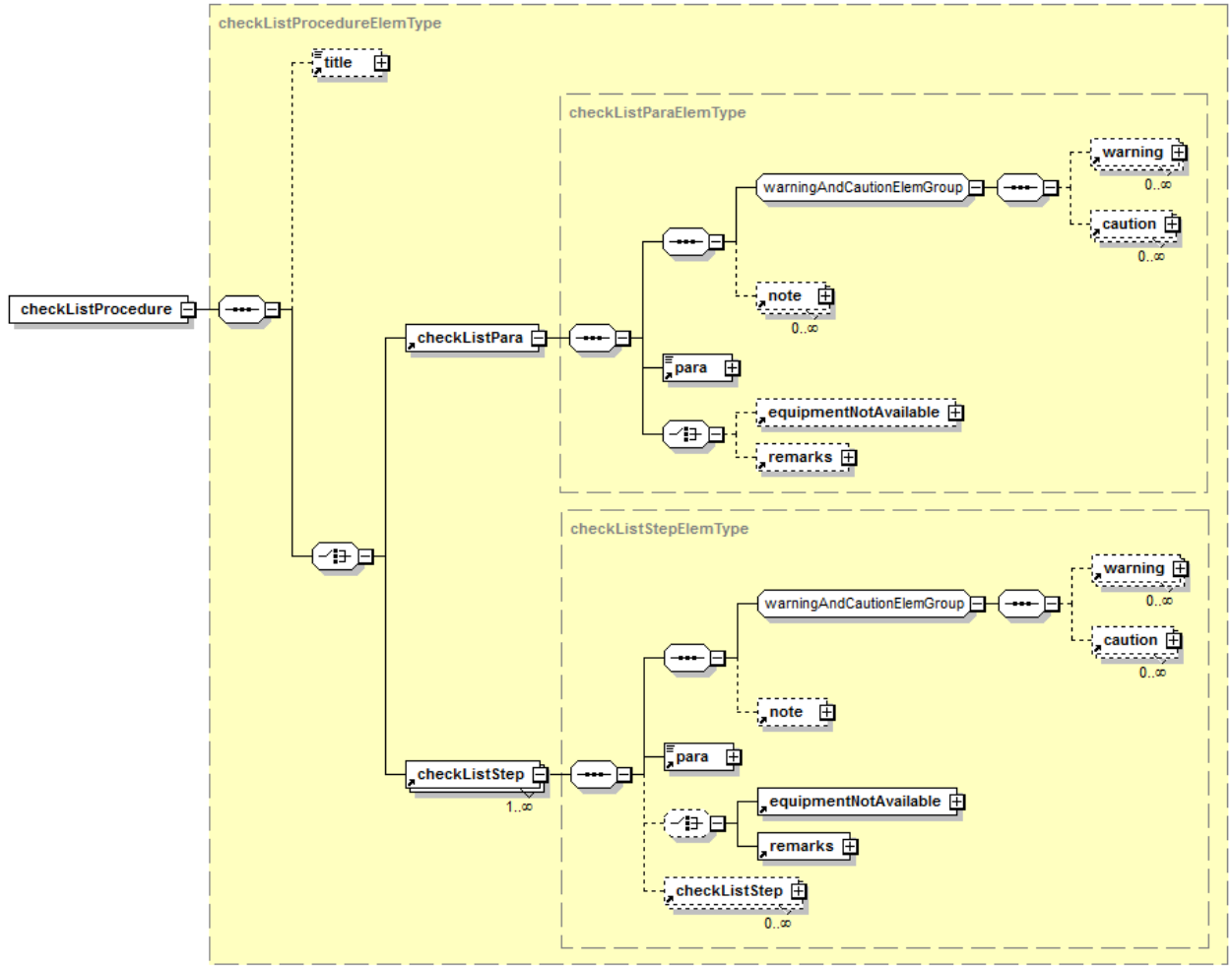
Markup example:

```
<itemNumber>8</itemNumber>
```

2.3.1.3.2 Checklist procedure

Description: The element <checkListProcedure> contains a brief description of each check to be performed as well as any information required to accomplish a check or service. This element contains either paragraph text or a series of checklist steps.

Markup element: <checkListProcedure>



ICN-S3627-S1000D0633-001-01

Fig 6 Element <checkListProcedure>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `independentCheck` (O), the procedure must be checked by for example a supervisor with a given qualification.
- `skillLevelCode` (O), the skill level required to complete the task. Refer to Chap 3.9.5.2.5.
- `itemCharacteristic` (O), used to indicate characteristics of the item that is the subject of a given procedural step. The attribute can have one or more of the following values:
  - "`ic01`" thru "`ic99`". Refer to Chap 3.9.6.1.
- `crewMemberType` (O), the crew member type that will perform the procedure. The attribute can have one of the following values:
  - "`cm01`" thru "`cm99`". Refer to Chap 3.9.6.1.

- safeFlight (O), indicates if the equipment is safe for flight. The attribute can have one of the following values:
  - "0" - No, the equipment is not safe for flight
  - "1" - Yes, the equipment is safe for flight
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), and caveat (O), and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>, the title for the element <checkListProcedure>. Refer to Chap 3.9.5.2.1.5.
- <checkListPara>, checklist paragraph. Refer to Para 2.3.1.3.3.
- <checkListStep>, checklist step. Refer to Para 2.3.1.3.5.

Markup example:

```
<checkListProcedure>
<checkListPara>
<para>Aircraft forms and records for recorded
discrepancies</para>
</checkListPara>
</checkListProcedure>
```

2.3.1.3.3 Checklist paragraph

Description: The element <checkListPara> contains the statement necessary to indicate which check should be performed, when only one statement is needed.

Markup element: <checkListPara>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- warningRefs (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- cautionRefs (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- independentCheck (O), the paragraph must be checked by for example a supervisor with a given qualification.
- skillLevelCode (O), the skill level required to complete the task. Refer to Chap 3.9.5.2.5. This attribute can have one of the following values:
  - "sk01" thru "sk99". Refer to Chap 3.9.6.1.

- itemCharacteristic (O), used to indicate characteristics of the item that is the subject of a given procedural step. If used, this attribute can have one or more of the following values:
  - "ic01" thru "ic99". Refer to Chap 3.9.6.1.
- crewMemberType (O). Refer to Para 2.3.1.3.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), and caveat (O), and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <warning>. Refer to Chap 3.9.3.
- <caution>. Refer to Chap 3.9.3.
- <note>. Refer to Chap 3.9.3.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <equipmentNotAvailable>, defines the condition of equipment. Refer to Para 2.3.1.3.4.
- <remarks>. Refer to Chap 3.9.5.1.

2.3.1.3.4 Equipment not available

Description: The element <equipmentNotAvailable> contains the condition of the equipment (shortages, malfunctions, etc) that makes equipment not ready or not available for use. This element is aligned with the checklist item or paragraph for which the equipment not ready/available is applicable. This element includes a required element <para>.

Markup element: <equipmentNotAvailable>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <para>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<equipmentNotAvailable>
<para>Front hull plug missing</para>
</equipmentNotAvailable>
```

2.3.1.3.5 Checklist step

Description: The element <checkListStep> contains the statements

Markup element: <checkListStep>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- warningRefs (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- cautionRefs (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- independentCheck (O), the step must be checked for example by a supervisor with a given qualification
- skillLevelCode (O), the skill level required for complete procedure. Refer to Chap 3.9.5.1. This attribute can have one of the following values:
  - "sk01" thru "sk99". Refer to Chap 3.9.6.1.
- itemCharacteristic (O), used to indicate characteristics of the item that is the subject of a given procedural step. If used, this attribute can have one or more of the following values:
  - "ic01" thru "ic99". Refer to Chap 3.9.6.1.
- keepWithNext (O), the indication whether a step is presented together with the next step, if possible. This attribute is intended for use only when absolutely necessary in a situation where for example scrolling is not practical for the user or the viewing device does not allow scrolling. This attribute can have one of the following values:
  - "0" (D) - No
  - "1" - Yes, the step is kept with the next sibling step (if one exists) and therefore, all children of the element for which the attribute is set should be kept together as well (if possible). This attribute has no meaning when placed on a final step.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), and caveat (O), and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <warning>. Refer to Chap 3.9.3.
- <caution>. Refer to Chap 3.9.3.
- <note>. Refer to Chap 3.9.3.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <equipmentNotAvailable>, the condition of equipment. Refer to Para 2.3.1.3.4.
- <remarks>. Refer to Chap 3.9.5.1.
- <checkListStep>

Business rule decision point BRDP-S1-00279 - Define maximum number of steps levels in <checkListProcedure>:

- Projects must decide the maximum number of step levels allowed.

3 Examples

This section includes markup examples to demonstrate how the checklist data module can be used to accommodate a variety of maintenance checklist and inspection forms. The examples include only a sampling of the items that can be marked up.

3.1 Example 1 - Preventive maintenance inspection form

The first of these examples is a preventive maintenance inspection form. Using the checklist data module, an inspection form can be marked up to identify which items must be inspected for several intervals such as Daily, Intermediate and Periodic. The following markup example demonstrates the use of the element <checkList> for this particular type of data. A sample display is included at the end for review purposes only. This does not dictate what it should look like. It is only included here to support the markup structure.

```
<checkList checkListCategory="clc01">
<checkListInfo>
<checkListIntervals>
<checkListInterval id="th51">D</checkListInterval>
<checkListInterval id="th52">I</checkListInterval>
<checkListInterval id="th53">P</checkListInterval>
</checkListIntervals>
<checkListItems>
<workArea>NOSE
AREA</workArea><checkListItem><itemNumber>1.1</itemNumber>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th51">
<thresholdValue>X</thresholdValue></threshold>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th52">
<thresholdValue>X</thresholdValue></threshold>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th53">
<thresholdValue>X</thresholdValue></threshold>
<checkListProcedure>
<checkListPara><para>Aircraft forms and records for recorded
discrepancies</para></checkListPara>
</checkListProcedure>
</checkListItem>
<!-- ... -->
<checkListItem>
<itemNumber>1.4</itemNumber>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th51">
<thresholdValue>X</thresholdValue></threshold>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th52">
<thresholdValue>X</thresholdValue></threshold>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th53">
<thresholdValue>X</thresholdValue></threshold>
<checkListProcedure>
<checkListPara><para>Pilot lube and static ports for
obstructions and cleanliness.</para></checkListPara>
</checkListProcedure>
</checkListItem>
<checkListItem>
<itemNumber>1.4.1</itemNumber>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th51">
```

```
<thresholdValue></thresholdValue></threshold>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th52">
<thresholdValue></thresholdValue></threshold>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th53">
<thresholdValue>X</thresholdValue></threshold>
<checkListProcedure>
<checkListPara><para>Disconnect pilot/static lines from
instrument ports. Remove drain caps from moisture traps.</para>
</checkListPara>
</checkListProcedure>
</checkListItem>
<checkListItem>
<itemNumber>1.4.2</itemNumber>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th51">
<thresholdValue></thresholdValue></threshold>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th52">
<thresholdValue></thresholdValue></threshold>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th53">
<thresholdValue>X</thresholdValue></threshold>
<checkListProcedure>
<checkListPara><para>Purge pilot/static system with clean air
pressure (10-60 PSI). Reconnect lines and caps and inspect
system for leaks utilizing instrument test set.</para>
</checkListPara>
</checkListProcedure>
</checkListItem>
<checkListItem>
<itemNumber>1.5</itemNumber>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th51">
<thresholdValue>X</thresholdValue></threshold>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th52">
<thresholdValue>X</thresholdValue></threshold>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th53">
<thresholdValue>X</thresholdValue></threshold>
<checkListProcedure>
<checkListPara><para>Windshields and windows for cleanliness,
scratches, and cracks.</para></checkListPara>
</checkListProcedure>
</checkListItem>
</checkListItems>
</checkListInfo>
</checkList>
```

INSPECTION TOTAL WORK TIME

D _____

I _____

P _____

Seq. No.	Item and Procedure	D	I	P	W/T
	NOSE AREA				
1.1	Aircraft forms and records for recorded discrepancies (TM 38-750)	X	X	X	
1.2	Nose section exterior for damage.	X	X	X	
1.3	Nose compartment interior for cleanliness, equipment for damage and loose connections, and door for secure latching.	X	X	X	
1.4	Pilot lube and static ports for obstructions and cleanliness.	X	X	X	
1.4.1	Disconnect pilot/static lines from instrument ports. Remove drain caps from moisture traps.			X	
1.4.2	Purge pilot/static system with clean dry air pressure (10-60 PSI). Reconnect lines and caps and inspect system for leaks utilizing instrument test set.			X	
1.5	Windshields and windows for cleanliness, scratches, and cracks	X	X	X	
1.6	Test FAT gage (TM 55-1500-204-25/1).			X	

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Fig 7 Preventive maintenance inspection form

3.2 Example 2 - PMCS data

This example demonstrates how to markup PMCS data. Using the checklist data module, PMCS data can be marked up and published in various formats for use by the maintainer. The following markup example demonstrates the use of the <checkList> element for this particular type of data. A sample display is included at the end for review purposes only. This does not dictate how the data should be presented. It is only serves to help interpret the markup structure.

```
<checkList checkListCategory="clc02">
<checkListInfo>
<checkListItems>
<checkListItem>
<itemNumber>7</itemNumber>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th02">
<thresholdValue>Before</thresholdValue>
</threshold>
```

```
<equip>
<name>Internal Fire Extinguishers</name>
<catalogSeqNumberRef itemSeqNumberValue="1" figureNumber="01"
item="001"/>
</equip>
<checkListProcedure crewMemberType="cm52">
<checkListStep>
<para>Check engine compartment fire extinguisher.</para>
<checkListStep>
<para>Check wire or lead seals on engine compartment fire
extinguisher.</para>
<equipmentNotAvailable>
<para>Wire or lead seals on engine compartment fire extinguisher
are missing broken or improperly laced.</para>
</equipmentNotAvailable>
</checkListStep>
<checkListStep>
<note>
<notePara>If engine compartment fire extinguisher is in yellow
zone, notify unit maintenance after mission is
completed.</notePara>
</note>
<para>Check that pressure gage on engine compartment fire
extinguisher is in green or yellow zone. </para>
<equipmentNotAvailable>
<para>Pressure gage on engine compartment fire extinguisher
reads in red zone. </para>
</equipmentNotAvailable>
</checkListStep>
</checkListStep>
</checkListProcedure>
</checkListItem>
<checkListItem>
<itemNumber>8</itemNumber>
<threshold thresholdType="interval"
thresholdUnitOfMeasure="th51">
<thresholdValue>After</thresholdValue>
</threshold>
<checkListProcedure>
<checkListPara>
<para></para>
</checkListPara>
</checkListProcedure>
</checkListItem>
</checkListItems>
</checkListInfo>
</checkList>
```

Preventive maintenance checks and services for Model M2A3/M3A3, Before - Continue

Item No.	Interval	Item to be checked or serviced	Procedure	Equipment not ready/Available if:
			WARNING Hydraulic fluid is poisonous and can be absorbed through your skin. Never service hydraulic system when fluid is hot or under pressure. Avoid skin contact. Wash hands with soap immediately after servicing, and wash off any fluid which comes in contact with skin. If fluid gets into eyes, wash eyes immediately and get medical help. b. Check ramp hydraulic power unit. 1. Lower ramp. 2. Remove ramp hydraulic power unit cover and check sight glass. If fluid level is below ADD mark, add FRH (MIL-H-46170) as needed. Never fill over halfway between ADD and FULL with ramp down. Ramp hydraulic power unit will be overfilled with ramp up. 3. Install ramp hydraulic power unit cover. 4. Raise ramp.	
6	Before	Hull drain plugs	Driver a. Check for open or missing front hull drain plug and that bridge plates are fully seated.	Front hull drain plug is missing or bridge plates will not seat.
7	Before	Internal fire extinguisher	Driver a. Check engine compartment fire extinguisher 5. Check wire or lead seals on engine compartment fire extinguisher. 6. Check that pressure gage on engine compartment fire extinguisher is in green or yellow zone. **Note** If engine compartment fire extinguisher is in yellow zone, notify unit maintenance after mission is completed	Wire or lead seals on engine compartment fire extinguisher are missing, broken or improperly laced. Pressure gage on engine compartment fire extinguisher reads in red zone.

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Fig 8 Preventive maintenance checks and services

Chapter 3.9.5.2.15

Content section - Service bulletin data module

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References

Table 1 References

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Chap 3.6	Information generation - Security and data restrictions
Chap 3.9.3	Authoring - Warnings, cautions and notes
Chap 3.9.5.1	Data modules - Identification and status section

Chap No./Document No.	Title
Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
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Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.6.1	Attributes - Project configurable values
Chap 5.2.1.16	Common information sets - Service bulletins

1 General

The service bulletin Schema is used to capture and represent service bulletin information. Refer to Chap 5.2.1.16 for Service bulletin information set.

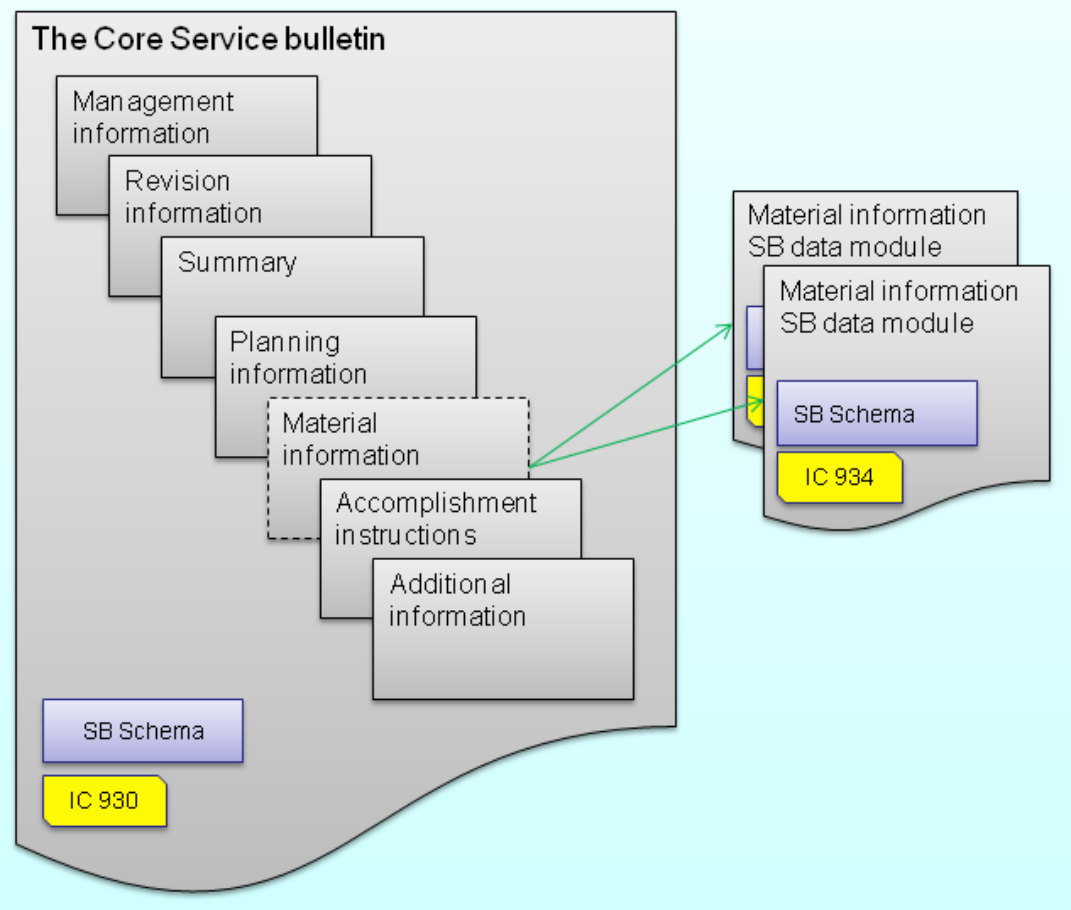
2 Service bulletin information

2.1 Schema basic rules

The Service bulletin Schema can contain either:

- the main topics of the core service bulletin data module (with IC 930)
- only the material information associated to a core service bulletin data module (with IC 934)

The following figure gives the two usages of the Service bulletin Schema.



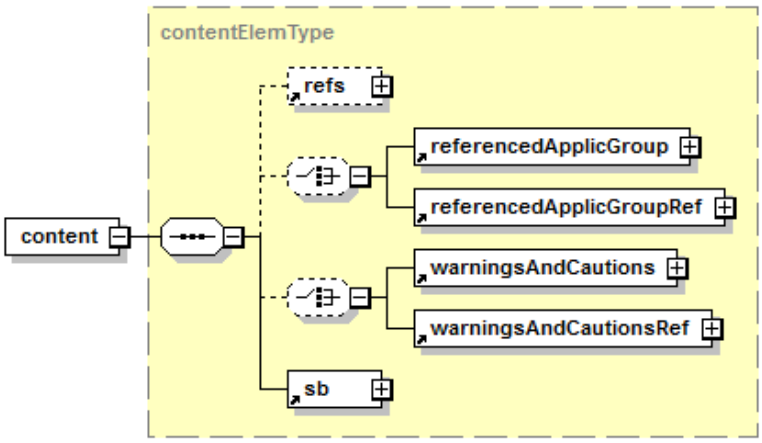
ICN-S1000D-A-03090502-B-FAPE3-00001-A-001-01

Fig 1 The two usages of the Service bulletin Schema

2.2 Content

Description: The element <content> contains the content section of the Service bulletin data module.

Markup element: <content>



ICN-FAPE3-S1000D0001-A-001-01

Fig 2 Element <content>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

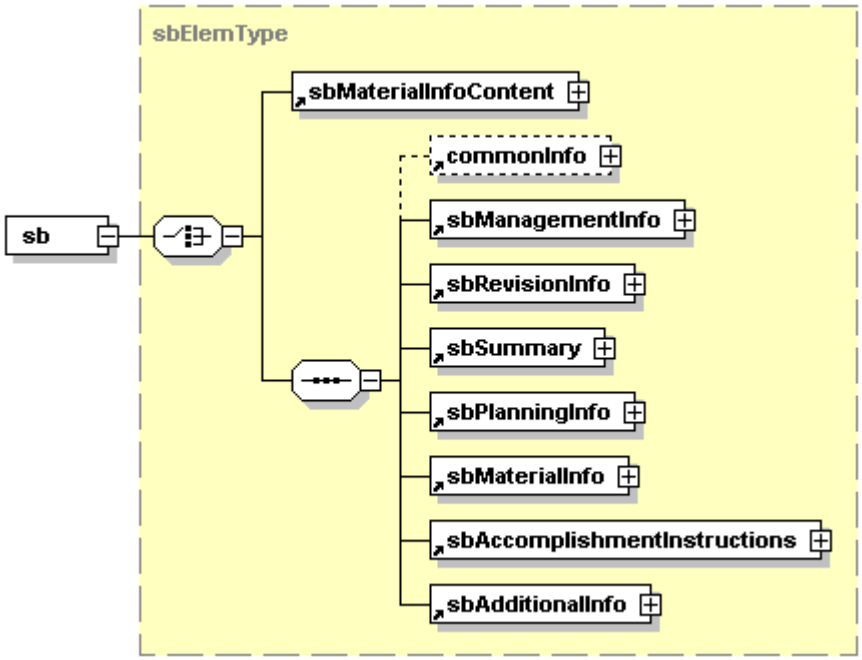
Child elements:

- <`refs`>. Refer to Chap 3.9.5.2.1.2.
- <`referencedApplicGroup`>. Refer to Chap 3.9.5.3.
- <`referencedApplicGroupRef`>. Refer to Chap 3.9.5.3.
- <`warningsAndCautions`>. Refer to Chap 3.9.3.
- <`warningsAndCautionsRef`>. Refer to Chap 3.9.3.
- <`sb`>. Refer to Para 2.3.

2.3 Service bulletin

Description: The element <`sb`> contains the main topics of a full core Service bulletin or a single material information main topic.

Markup element: <`sb`>



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Fig 3 Element <`sb`>

Attributes:

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `warningRefs` (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- `cautionRefs` (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <sbMaterialInfoContent>, used if the data module contains only material information. Refer to Para 2.3.1.
- <commonInfo>. Refer to Chap 3.9.5.2.1.12.
- <sbManagementInfo>. Refer to Para 2.3.2.
- <sbRevisionInfo>. Refer to Para 2.3.3.
- <sbSummary>. Refer to Para 2.3.4.
- <sbPlanningInfo>. Refer to Para 2.3.5.
- <sbMaterialInfo>. Refer to Para 2.3.6.
- <sbAccomplishmentInstructions>. Refer to Para 2.3.7.
- <sbAdditionalInfo>. Refer to Para 2.3.8.

2.3.1 Service bulletin material information

This main topic is dedicated to Service bulletin material information. Refer to Chap 3.9.5.2.15.2.

Note

When one or more data modules are dedicated for material information using the element <sbMaterialInfoContent> directly within the element <sb> they must have the IC 934. Refer to default BREX rule BREX-S1-00094. In addition, the Service bulletin core data module must contain references (using the element <refs> in the element <sbMaterialInfo>) to the data modules dedicated for material information.

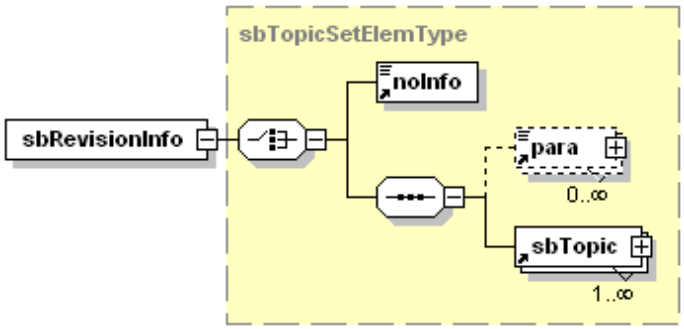
2.3.2 Service bulletin management information

This main topic is dedicated to Service bulletin management information. Refer to Chap 3.9.5.2.15.1.

2.3.3 Service bulletin revision information

Description: The element <sbRevisionInfo> contains the information regarding the reason of the issuance of the current revision of the Service bulletin. It also summarizes the history of previous Service bulletin issues. It is made of topics of descriptive content.

Markup element: <sbRevisionInfo>



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Fig 4 Element <sbRevisionInfo>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`noInfo`>. Refer to Para 2.3.3.1.
- <`para`>. Refer to Chap 3.9.5.2.1.10.
- <`sbTopic`>. Refer to Para 2.3.3.2 and default BREX rule BREX-S1-00095.

Note

The attribute `sbTopicType` of element <`sbTopic`> must be populated in accordance with the main topic where the element <`sbTopic`> is used. In the element <`sbRevisionInfo`> the element <`sbTopic`> has a default value of "`sbtt01`" for the attribute `sbTopicType`. The value "`sbtt01`" is allowed only in this context. Revision information can contain topics with values that can include but are not limited to "`sbtt21`", "`sbtt22`", "`sbtt23`" and "`sbtt24`".

Markup examples:

Revision main topic without information

```
<sbRevisionInfo>
<noInfo>No revision information available</noInfo>
</sbRevisionInfo>
```

Revision main topic with revision information

```
<sbRevisionInfo>
<sbTopic sbTopicType="sbtt21">
<title>Additional Work</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt22">
<title>Reason</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt23">
<title>Revision history</title>
<sbTopicContent>
<para>This document is the first issue of the Service
bulletin</para>
</sbTopicContent>
</sbTopic>
```

```
<sbTopic sbTopicType="sbtt24">
<title>Revision sequence</title>
<sbTopicContent>
<para>Original issue date: April 14th,2010
</para>
</sbTopicContent>
</sbTopic>
</sbRevisionInfo>
```

Note

For allowed list of topic types refer to Para 2.3.3.2.

2.3.3.1 No information

Description: The element <noInfo> contains the marker for no information available in main topics, topics or material in a Service bulletin. Text is allowed to clarify the context where the element <noInfo> is used.

Markup element: <noInfo>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

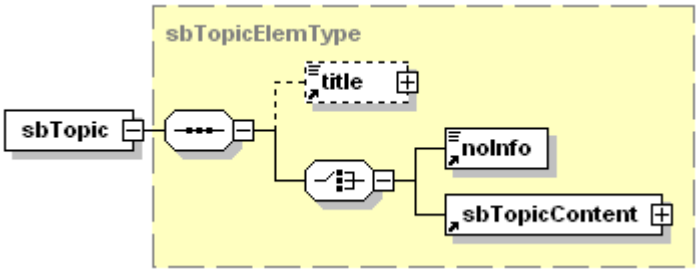
Child elements:

- None

2.3.3.2 Service bulletin topic

Description: The element <sbTopic> contains the necessary information for descriptive Service bulletin main topics (revision information, summary, planning information and additional information).

Markup element: <sbTopic>



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Fig 5 Element <sbTopic>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- sbTopicType (M), the topic type. Identifies the different topic types delivered within a Service bulletin. Attribute sbTopicType must be populated in accordance with the main

topic where the element <sbTopic> is used. The attribute can have one of the following values:

- "sbtt01" thru "sbtt99". Refer to Chap 3.9.6.1 and default BREX rules BREX-S1-00095, BREX-S1-00096, BREX-S1-00097 and BREX-S1-00098.

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <title>. Refer to Chap 3.9.5.2.1.5.
– <noInfo>. Refer to Para 2.3.3.1.
– <sbTopicContent>. Refer to Para 2.3.3.2.1.

Business rule decision point BRDP-S1-00280 - Use of the attribute sbTopicType in the element <sbTopic> within the element <sbRevisionInfo>:

– Decide which topic types are mandatory, which are optional, and on the sequence in which the corresponding element <sbTopic> must be given in the element <sbRevisionInfo>. Refer to Chap 3.9.6.1.

2.3.3.2.1 Service bulletin topic content

Description: The element <sbTopicContent> contains the descriptive content of a Service bulletin topic.

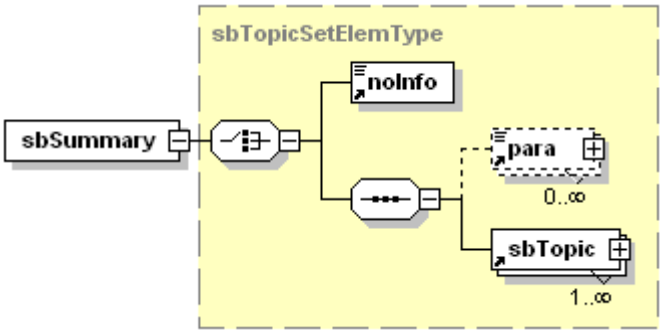
Markup element: <sbTopicContent>

The element <sbTopicContent> contains the same attributes and elements as the element <description>. Refer to Chap 3.9.5.2.2.

2.3.4 Service bulletin summary

Description: The element <sbSummary> contains the summary of the Service bulletin to give an overview of the purpose and content of the Service bulletin. It is made of topics of descriptive content.

Markup element: <sbSummary>



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Fig 6 Element <sbSummary>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`noInfo`>. Refer to Para 2.3.3.1.
- <`para`>. Refer to Chap 3.9.5.2.1.10.
- <`sbTopic`>. Refer to Para 2.3.3.2 and default BREX rule BREX-S1-00096.

Note

The attribute `sbTopicType` of element <`sbTopic`> must be populated in accordance with the main topic where it is used. In the element <`sbSummary`> the element <`sbTopic`> has a default value of "`sbtt02`" for the attribute `sbTopicType`. The value "`sbtt02`" is allowed only in this context. Summary can contain topics with values that can include but are not limited to "`sbtt05`" thru "`sbtt09`", "`sbtt11`" and "`sbtt17`" thru "`sbtt20`".

Business rule decision point BRDP-S1-00281 - Use of the attribute `sbTopicType` in element <`sbTopic`> within the element the element <`sbSummary`>:

- Decide which topic types are mandatory, which are optional, and on the sequence in which the corresponding element <`sbTopic`> must be given in the element <`sbSummary`>. Refer to Chap 3.9.6.1.

Markup example:

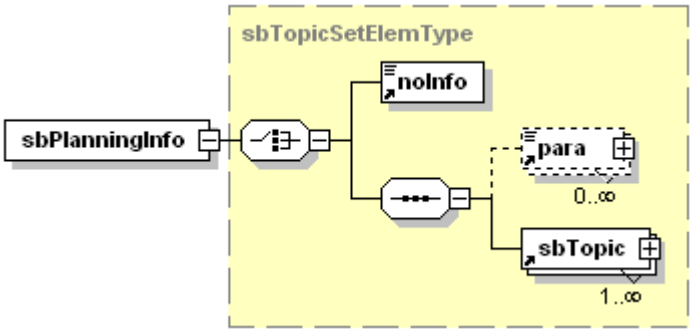
```
<sbSummary>
<sbTopic sbTopicType="sbtt07">
<title>Reason</title>
<sbTopicContent>
<para>A lot of customers asked for the improvement of the front
hanging in order to use the bike in more severe
conditions.</para>
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt08">
<title>Description</title>
<sbTopicContent>
<para>Replacement of the fork</para>
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt19">
<title>General evaluation</title>
<sbTopicContent>
...
</sbTopicContent>
```

```
</sbTopic>
</sbSummary>
```

2.3.5 Service bulletin planning information

Description: The element <sbPlanningInfo> contains the information required to determine if the Service bulletin should be applied and to plan its accomplishment. It is made of topics of descriptive content.

Markup element: <sbPlanningInfo>



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Fig 7 Element <sbPlanningInfo>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <noInfo>. Refer to Para 2.3.3.1.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <sbTopic>. Refer to Para 2.3.3.2 and default BREX rule BREX-S1-00097.

Note

The attribute sbTopicType of element <sbTopic> must be populated in accordance with the main topic where it is used. In the element <sbPlanningInfo> the element <sbTopic> has a default value of "sbtt03" for the attribute sbTopicType. The value "sbtt03" is allowed only in this context. Planning information can contain topics with values that can include but are not limited to "sbtt05" thru "sbtt17".

Business rule decision point BRDP-S1-00282 - Use of the attribute sbTopicType in the element <sbTopic> within the element the element <sbPlanningInfo>:

- Decide which topic types are mandatory, which are optional, and on the sequence in which the corresponding element <sbTopic> must be given in the element <sbPlanningInfo>. Refer to Chap 3.9.6.1.

Markup example:

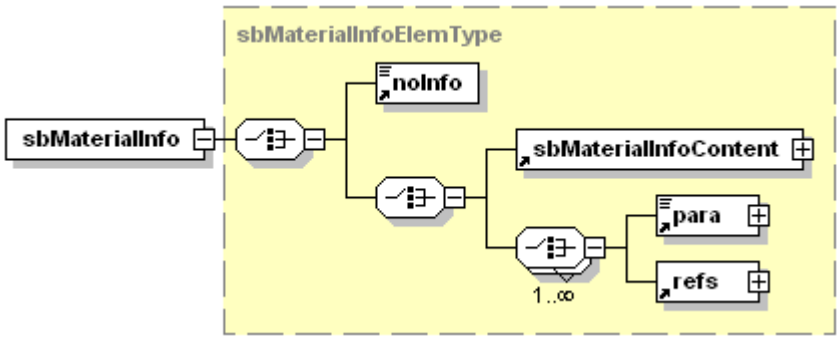
```
<sbPlanningInfo>
<sbTopic sbTopicType="sbtt05">
<title>Applicability</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt06">
<title>Concurrent Requirements</title>
<noInfo/>
</sbTopic>
<sbTopic sbTopicType="sbtt07">
<title>Reason</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt08">
<title>Description</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt09">
<title>Compliance</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt10">
<title>Approval</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt11">
<title>Manpower</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt12">
<title>Weight and balance</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt13">
<title>Electrical load data</title>
<sbTopicContent>
...
```

```
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt14">
<title>Software accomplishment summary</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
<sbTopic sbTopicType="sbtt15">
<title>Referenced Documentation</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
...</sbPlanningInfo>
```

2.3.6 Service bulletin material information

Description: The element <sbMaterialInfo> contains information related to material set or individual material involved in Service bulletin accomplishment. It contains one or more references to data modules dedicated to material when material information is not delivered within the core Service bulletin data module.

Markup element: <sbMaterialInfo>



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Fig 8 Element <sbMaterialInfo>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <noInfo>. Refer to Para 2.3.3.1.
- <sbMaterialInfoContent>, the material information needed during Service bulletin accomplishment, when material information is delivered within the Service bulletin core data module. Refer to Chap 3.9.5.2.15.2.

- <para>. Refer to Chap 3.9.5.2.1.10.
- <refs>, the references to material dedicated data modules with IC 934 when material information is externalized from Service bulletin core data module. Refer to Chap 3.9.5.2.1.2.

Markup example:

Material information main topic referencing an external Service bulletin data module dedicated to material.

```
<sbMaterialInfo>
<para>To get the required material, refer to</para>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="01" disassyCode="00" disassyCodeVariant="AA"
infoCode="934" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
</sbMaterialInfo>
```

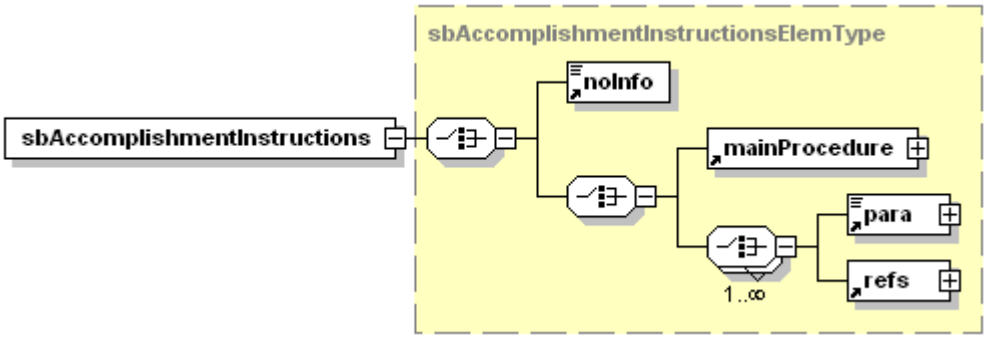
Material information main topic included in the core Service bulletin data module.

```
<sbMaterialInfo>
<sbMaterialInfoContent>
<sbMaterialSetList>
...
</sbMaterialSetList>
<sbSupportEquipsList>
...
</sbSupportEquipsList>
<sbSuppliesList>
...
</sbSuppliesList>
<sbSparesList>
...
</sbSparesList>
<sbRemovedSparesList>
...
</sbRemovedSparesList>
</sbMaterialInfoContent>
</sbMaterialInfo>
```

2.3.7 Service bulletin accomplishment instructions

Description: The element <sbAccomplishmentInstructions> contains references to procedural data modules supporting the description of step-by-step instructions. For very simple Service bulletin, it contains the detailed step-by-step instructions to do the work.

Markup element: <sbAccomplishmentInstructions>



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Fig 9 Element <sbAccomplishmentInstructions>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`noInfo`>. Refer to Para 2.3.3.1.
- <`mainProcedure`>, the detailed instruction for simple Service bulletin. Refer to Chap 3.9.5.2.3.

  Note

  The element <`mainProcedure`> in the Service bulletin data module is similar to the same element found in procedural data modules. However, it contains the element <`para`>, which throughout the Service bulletin data module uses the same `textElementGroup` as in the descriptive data module. Refer to Chap 3.9.5.2.1.10.

- <`para`>. Refer to Chap 3.9.5.2.1.10.
- <`refs`>, the references to procedural data modules supporting step-by-step instructions. Refer to Chap 3.9.5.2.1.2.

Markup example:

Accomplishment instructions main topic referencing an external procedural data module dedicated to step-by-step instruction.

```
<sbAccomplishmentInstructions>
<para>To accomplish the step-by-step instructions, refer
to</para>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="01" disassyCode="00" disassyCodeVariant="AA"
```

```
infoCode="933" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
</sbAccomplishmentInstructions>
```

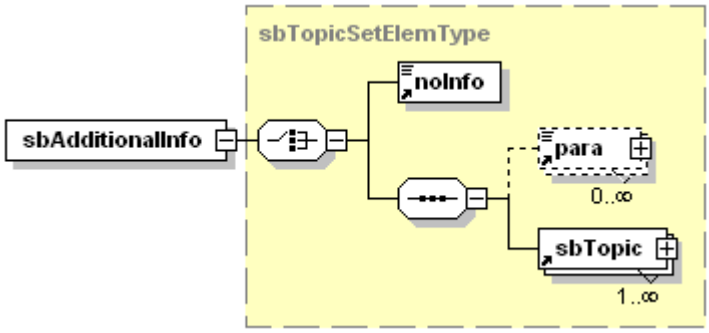
Accomplishment instructions with simple step-by-step instructions included within a core Service bulletin data module.

```
<sbAccomplishmentInstructions>
<mainProcedure>...</mainProcedure>
</sbAccomplishmentInstructions>
```

2.3.8 Service bulletin additional information

Description: The element <sbAdditionalInfo> contains the additional information to support the procedures or instructions that are in the Service bulletin. It is made of topics of descriptive content.

Markup element: <sbAdditionalInfo>



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Fig 10 Element <sbAdditionalInfo>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <noInfo>. Refer to Para 2.3.3.1.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <sbTopic>. Refer to Para 2.3.3.2 and default BREX rule BREX-S1-00098.

Note

The attribute sbTopicType of element <sbTopic> must be populated in accordance with the main topic where it is used. In the element <sbAdditionalInfo> the element <sbTopic> has a default value of

"sbtt04" for the attribute sbTopicType. The value "sbtt04" is allowed only in this context. Additional information can contain topics with other values.

Business rule decision point BRDP-S1-00283 - Use of the attribute sbTopicType in the element <sbTopic> wthin the element <sbAdditionalInfo>:

– Decide which topic types are mandatory, which are optional, and on the sequence in which the corresponding element <sbTopic> must be given in the element <sbAdditionalInfo>. Refer to Chap 3.9.6.1.

Markup example:

```
<sbAdditionalInfo>
<sbTopic sbTopicType="sbtt04">
<title>Additional information linked to the saw tool used in the
Service bulletin</title>
<sbTopicContent>
...
</sbTopicContent>
</sbTopic>
</sbAdditionalInfo>
```

Chapter 3.9.5.2.15.1

Service bulletin data module - Management information

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1 General

The Service bulletin management information main topic summarizes major Service bulletin characteristic or properties in a structured and retrievable form.

It is included within the core Service bulletin data module using the element <sbManagementInfo> accessible in the element <sb>. Refer to Chap 3.9.5.2.15.

2 Service bulletin management information

Description: The element <sbManagementInfo> contains the metadata related to the Service bulletin management. It contains information that can be easily retrieved by IT tool and useful for user in order to help him to decide if and when to apply the Service bulletin.

Markup element: <sbManagementInfo>



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Fig 1 Element <sbManagementInfo>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`commonInfo`>. Refer to Chap 3.9.5.2.1.12.
- <`sbCompliance`>. Refer to Para 2.1.
- <`sbTaskType`>. Refer to Para 2.2.
- <`sbProductModificationList`>. Refer to Para 2.3.
- <`sbImpactList`>. Refer to Para 2.4.
- <`sbConcurrentSbList`>. Refer to Para 2.5.
- <`sbAccomplishmentLimit`>. Refer to Para 2.6.
- <`sbTimeAssessment`>. Refer to Para 2.7.

- <sbOriginalIssueDate>. Refer to Para 2.8.
- <sbApproval>. Refer to Para 2.9.
- <sbApprovedDm>. Refer to Para 2.10.
- <sbReplacementSb>. Refer to Para 2.11.
- <genericPropertyGroup>. Refer to Para 2.12.

Markup example:

```
<sbManagementInfo>
<sbCompliance sbComplianceCategory="sbcc03"/>
<sbTaskType sbTaskCategory="sbtc01"/>
<sbOriginalIssueDate>
<issueDate year="2010" month="04" day="07"/>
</sbOriginalIssueDate>
</sbManagementInfo>
```

2.1 Compliance category

Description: The element <sbCompliance> contains the Service bulletin compliance category.

Markup element: <sbCompliance>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- sbComplianceCategory (M), the compliance category of the Service bulletin. The attribute can have one of the following values:
  - "sbcc01" thru "sbcc99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<sbCompliance sbComplianceCategory="sbcc04"/>
```

Note

sbComplianceCategory="sbcc04" is defined as "Optional".

2.2 Service bulletin task type

Description: The element <sbTaskType> gives the main type of activity the Service bulletin describes.

Markup element: <sbTaskType>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- `sbTaskCategory` (M), the task type category of the Service bulletin. The attribute can have one of the following values:
  - "`sbtc01`" thru "`sbtc99`". Refer to Chap 3.9.6.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<sbTaskType sbTaskCategory="sbtc01"/>
```

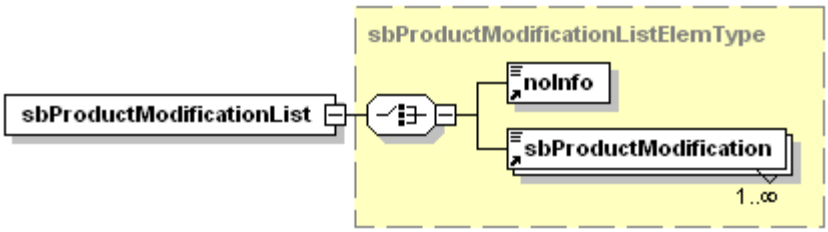
Note

`sbTaskCategory`="`sbtc01`" is defined as "modification".

2.3 List of product modifications

Description: The element <`sbProductModificationList`> contains the list of the manufacturer's internal tracking numbers for product changes that are being described in the Service bulletin.

Markup element: <`sbProductModificationList`>



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Fig 2 Element <`sbProductModificationList`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`noInfo`>. Refer to Chap 3.9.5.2.15.
- <`sbProductModification`>. Refer to Para 2.3.1.

Markup example:

```
<sbProductModificationList>
<sbProductModification applicRefId="app-0002"
sbModificationIdent="A2001"
sbModificationClassification="major">Installation of telescopic
fork with 140mm clearance</sbProductModification>
<sbProductModification applicRefId="app-0003"
sbModificationIdent="A2002"
```

```
sbModificationClassification="major">Installation of telescopic
fork with 100mm clearance</sbProductModification>
</sbProductModificationList>
```

2.3.1 Product modification

Description: The element <sbProductModification> contains the identifier of a "design change" defined by the manufacturer of the product and installed by the Service bulletin. The description of the design change can also be given.

Markup element: <sbProductModification>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- sbModificationIdent (O), the design change or modification identifier
- sbModificationClassification (O), the classification of the modification. The attribute can have one of the following values:
  - "minor" - a change classified as minor
  - "major" - a change classified as major

  Note

  A "minor" change is one that has no appreciable effect on mass, balance, structural strength, reliability, operational characteristics, noise, fuel venting, exhaust emission or other characteristics affecting the operation of the product classified as minor. All changes other than "minor" are "major" changes.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

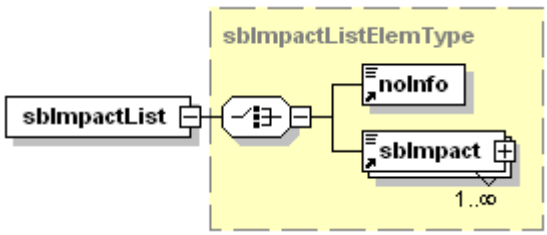
Child elements:

- None

2.4 Impacts list

Description: The element <sbImpactList> contains a list of impacts of accomplishment of the Service bulletin on the product.

Markup element: <sbImpactList>



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Fig 3 Element <sbImpactList>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`noInfo`>. Refer to Chap 3.9.5.2.15.
- <`sbImpact`>. Refer to Para 2.4.1.

Markup example:

```
<sbImpactList>
<sbImpact applicRefId="app-0002" sbImpactType="sbit01">
<quantity quantityType="qty08">
<quantityGroup>
<quantityValue quantityUnitOfMeasure="kg">+0.5</quantityValue>
<quantityValue quantityUnitOfMeasure="lbm">+1.1</quantityValue>
</quantityGroup>
</quantity>
</sbImpact>
<sbImpact applicRefId="app-0003" sbImpactType="sbit01">
<quantity quantityType="qty08">
<quantityGroup>
<quantityValue quantityUnitOfMeasure="kg">+0.8</quantityValue>
<quantityValue quantityUnitOfMeasure="lbm">+1.7</quantityValue>
</quantityGroup>
</quantity>
</sbImpact>
</sbImpactList>
```

Note

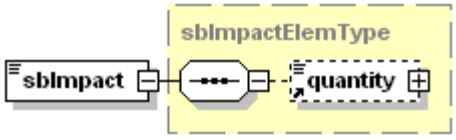
`sbImpactType`="`sbit01`" is defined as "Weight".

`quantityType`="`qty08`" is defined as "Mass".

2.4.1 Service bulletin impact

Description: The element <`sbImpact`> contains the description and quantifies an impact of the Service bulletin on a specific product characteristic. The presence of the element <`sbImpact`> with an attribute `sbImpactType` means that the Service bulletin has a significant impact on the product, for instance impact on the product weight.

Markup element: <`sbImpact`>



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Fig 4 Element <`sbImpact`>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `sbImpactType` (M), the type of the impact. The attribute can have one of the following values:
  - "`sbit01`" thru "`sbit99`". Refer to Chap 3.9.6.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

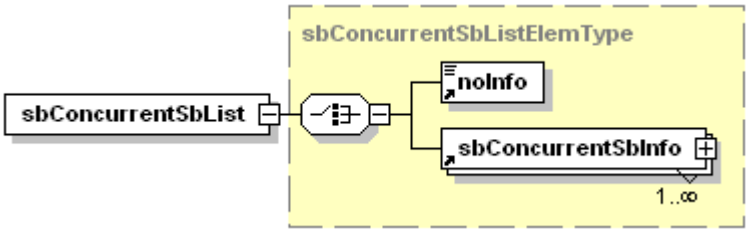
Child elements:

- <`quantity`>. the physical value of the impact. The child element <`quantityValue`> contains a numeric value and can contain a "+" or "-" sign as a textual content to indicate the positive or negative impact of a given type. Refer to Chap 3.9.5.2.1.10.

2.5 List of concurrent Service bulletins

Description: The element <`sbConcurrentSbList`> contains the list of Service bulletins (and associated product modification) that must be accomplished before or simultaneously with the current one and a list of Service bulletins (and associated product modification) that must not be accomplished before the current one, based on applicability.

Markup element: <`sbConcurrentSbList`>



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Fig 5 Element <`sbConcurrentSbList`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

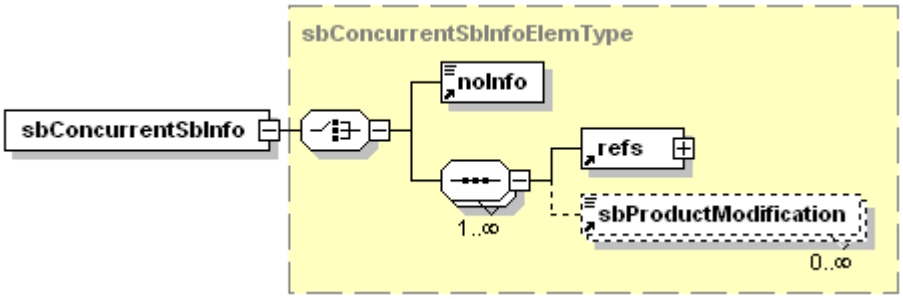
Child elements:

- <`noInfo`>. Refer to Chap 3.9.5.2.15.
- <`sbConcurrentSbInfo`>. Refer to Para 2.5.1.

2.5.1 Concurrent Service bulletin information

Description: The element <sbConcurrentSbInfo> contains the information about the Service bulletin and product modification that must be accomplished (or not) before or simultaneously with the current one.

Markup element: <sbConcurrentSbInfo>



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Fig 6 Element <sbConcurrentSbInfo>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- sbConcurrentStatus (M), indicates when and if the list of referenced Service bulletin must be accomplished with current Service bulletin. The attribute can have one of the following values:
  - "previousOrParallel" - the referenced Service bulletin must be done before or simultaneously with the current one
  - "previous" - the referenced Service bulletin must be done before the current one
  - "notPrevious" - the referenced Service bulletin must not have been done before the current one
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <noInfo>. Refer to Chap 3.9.5.2.15.
- <refs>. the reference to the concurrent Service bulletin. Refer to Chap 3.9.5.2.1.2.
- <sbProductModification>. any optional product modification reference. Refer to Para 2.3.1.

Markup example:

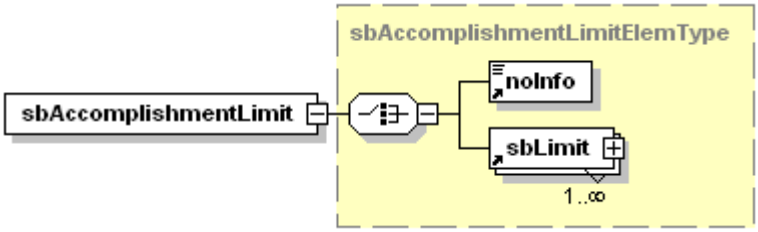
```
<sbConcurrentSbInfo applicRefId="app-0001"
sbConcurrentStatus="previous">
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="02" disassyCode="00" disassyCodeVariant="AA"
```

```
infoCode="930" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
</sbConcurrentSbInfo>
```

2.6 Accomplishment limit

Description: The element <sbAccomplishmentLimit> contains information on accomplishment time limit recommendation for the Service bulletin.

Markup element: <sbAccomplishmentLimit>



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Fig 7 Element <sbAccomplishmentLimit>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

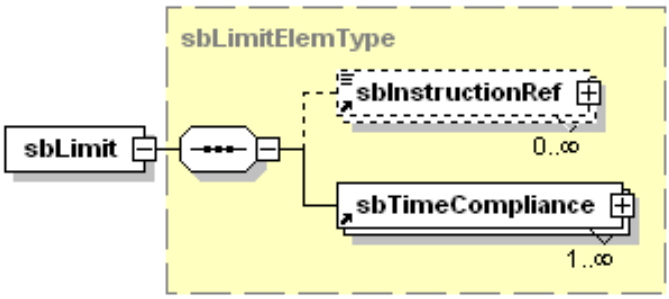
Child elements:

- <noInfo>. Refer to Chap 3.9.5.2.15.
- <sbLimit>. Refer to Para 2.6.1.

2.6.1 Service bulletin limit

Description: The element <sbLimit> contains necessary information related to interval, threshold, and time limit to take into account when scheduling the Service bulletin accomplishment, based on applicability.

Markup element: <sbLimit>



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Fig 8 Element <sbLimit>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <sbInstructionRef>. Refer to Para 2.6.1.1.
- <sbTimeCompliance>. Refer to Para 2.6.1.2.

Markup example:

```
<sbLimit applicRefId="app-0001">
<sbInstructionRef>
<refs>...
</refs>
</sbInstructionRef>
<sbTimeCompliance sbTimeComplianceType="sbtct01">
<limit limitTypeValue="po">
<threshold thresholdUnitOfMeasure="th02">
<thresholdValue>1000</thresholdValue>
</threshold>
</limit>
</sbTimeCompliance>
<sbTimeCompliance sbTimeComplianceType="sbtct02">
<limit limitTypeValue="po">
<threshold thresholdUnitOfMeasure="th03">
<thresholdValue>3</thresholdValue>
</threshold>
<remarks><simplePara>After issuance of the Service
bulletin</simplePara></remarks>
</limit>
</sbTimeCompliance>
</sbLimit>
```

Note

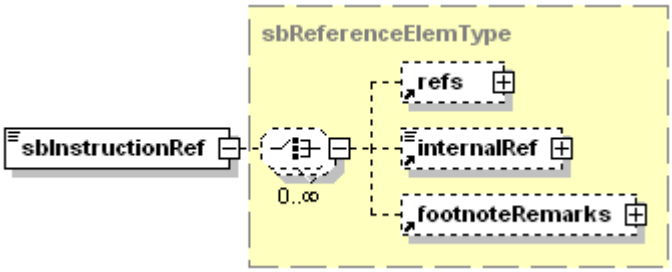
sbTimeComplianceType="sbtc01" is defined as "Basic limit".

sbTimeComplianceType="sbtc02" is defined as "Grace period".

2.6.1.1 Instruction reference

Description: The element <sbInstructionRef> contains the work to be performed as a first step of the Service bulletin by referring to either an external procedure or an internal instruction in accomplishment instruction.

Markup element: <sbInstructionRef>



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Fig 9 Element <sbInstructionRef>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

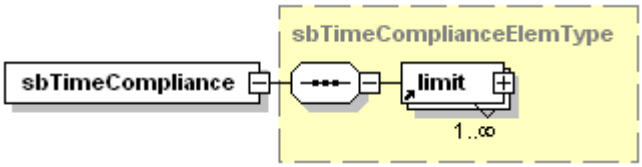
Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <internalRef>. Refer to Chap 3.9.5.2.1.2.
- <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

2.6.1.2 Time compliance

Description: The element <sbTimeCompliance> contains the limit to accomplish the Service bulletin (basic limit, grace period, repetitive interval).

Markup element: <sbTimeCompliance>



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Fig 10 Element <sbTimeCompliance>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- sbTimeComplianceType (M), the type of compliance time. The attribute can have one of the following values:
  - "sbtct01" thru "sbtct99". Refer to Chap 3.9.6.1.

- When used with the basic limit type "sbtct01", the element <sbTimeCompliance> contains the threshold or trigger not to exceed for the accomplishment of the Service bulletin. The element <limit> defined in scheduled maintenance context is used to provide this information. The attribute limitTypeValue set to "po" must be used to indicate that the work has to be done once. Refer to default BREX rule BREX-S1-00099.
- When used with the grace period type "sbtct02", the element <sbTimeCompliance> contains an additional limit relative to the issuance of the Service bulletin. That is necessary when the basic limit is too short regarding the in-service life of the product at the issuance of the Service bulletin. This additional limit gives the customer enough time to organize the Service bulletin embodiment. The attribute limitTypeValue set to "po" must be used to indicate that the work has to be done once. Refer to default BREX rule BREX-S1-00100. The element <sbTimeCompliance> with attribute sbTimeComplianceType set to "sbtct01" and "sbtct02" must be taken into account whichever comes later.
- When used with the repetitive interval type "sbtct03", the element <sbTimeCompliance> contains the repetitive interval not to exceed to repeat accomplishment of the Service bulletin. The element <sbTimeCompliance> contains the element <limit> whose attribute limitTypeValue="pe" must be used to express a periodic accomplishment. Refer to default BREX rule BREX-S1-00101.

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– <limit>. Contains the information required to determine when a Service bulletin must be performed. Refer to Chap 3.9.5.2.5.

Markup examples:

Basic limit type

```
<sbTimeCompliance sbTimeComplianceType="sbtct01">
<limit limitTypeValue="po">
<threshold thresholdUnitOfMeasure="th02">
<thresholdValue>1000</thresholdValue>
</threshold>
</limit>
</sbTimeCompliance>
```

Grace period type

```
<sbTimeCompliance sbTimeComplianceType="sbtct02">
<limit limitTypeValue="po">
<threshold thresholdUnitOfMeasure="th03">
<thresholdValue>3</thresholdValue>
</threshold>
<remarks><simplePara>After issuance of the Service
bulletin</simplePara></remarks>
</limit>
</sbTimeCompliance>
```

Repetitive interval type

```
<sbTimeCompliance sbTimeComplianceType="sbtct03">
<limit limitTypeValue="pe">
<threshold thresholdUnitOfMeasure="th02">
<thresholdValue>200</thresholdValue>
</threshold>
</limit>
</sbTimeCompliance>
```

Note

sbTimeComplianceType="sbtct01" is defined as "Basic limit".

sbTimeComplianceType="sbtct02" is defined as "Grace period".

sbTimeComplianceType="sbtct03" is defined as "Repetitive interval".

limitTypeValue="po" is defined as "Perform once".

limitTypeValue="pe" is defined as "Perform periodically".

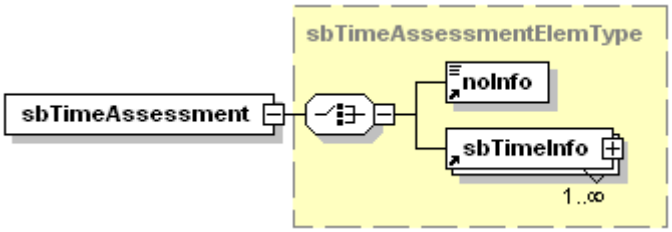
thresholdUnitOfMeasure="th02" is defined as "Flight cycles".

thresholdUnitOfMeasure="th03" is defined as "Months".

2.7 Time assessment

Description: The element <sbTimeAssessment> contains the time information (duration, elapsed time) necessary to perform the Service bulletin. Time information is related to the different product configurations described in within the Service bulletin.

Markup element: <sbTimeAssessment>



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Fig 11 Element <sbTimeAssessment>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

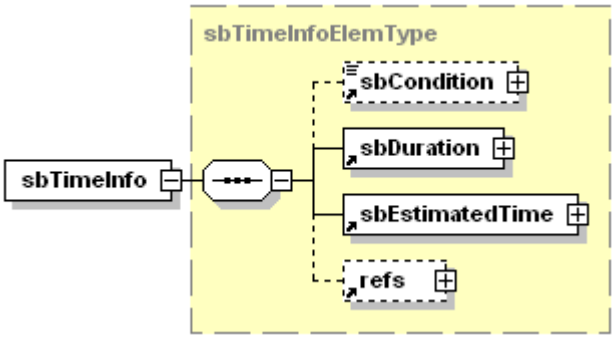
Child elements:

- <noInfo>. Refer to Chap 3.9.5.2.15.
- <sbTimeInfo>. Refer to Para 2.7.1.

2.7.1 Time information

Description: The element <sbTimeInfo> contains the time information like duration and elapsed time, based on applicability and task to perform.

Markup element: <sbTimeInfo>



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Fig 12 Element <sbTimeInfo>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- sbAggregationLevelFlag (O), indicates whether the duration and workload represent the sum up of duration and workload of all referenced procedure from the current Service bulletin. The attribute can have one of the following values:
  - "1" - Yes, the duration and workload represent the sum up of duration and workload of all referenced procedure from the current Service bulletin
  - "0" - No, the duration and workload do not represent the sum up of duration and workload of all referenced procedure from the current Service bulletin
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <sbCondition>. the reference to different options to complete the Service bulletin. Refer to Para 2.7.1.1.
- <sbDuration>. Refer to Para 2.7.1.2.
- <sbEstimatedTime>. Refer to Para 2.7.1.3.
- <refs>. Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<sbTimeInfo applicRefId="app-0003" sbAggregationLevelFlag="1">
<sbCondition>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="01" disassyCode="00" disassyCodeVariant="AA"
infoCode="933" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
```

```
</refs>
</sbCondition>
<sbDuration>
<quantity quantityType="qty04">
<quantityGroup>
<quantityValue quantityUnitOfMeasure="h">3,0</quantityValue>
</quantityGroup>
</quantity>
</sbDuration>
<sbEstimatedTime>
<quantity quantityType="qty04">
<quantityGroup>
<quantityValue quantityUnitOfMeasure="h">5,0</quantityValue>
</quantityGroup>
</quantity>
</sbEstimatedTime>
</sbTimeInfo>
```

Note

In the example here above, if the task set (IC 933) referenced in the element <sbCondition> requires two people who work together simultaneously for two hours followed by another person who works alone for one hour to complete the task set, the element <sbDuration> would contain 3,0 h (hours) and the element <sbEstimatedTime> would contain 5,0 h (man-hours).

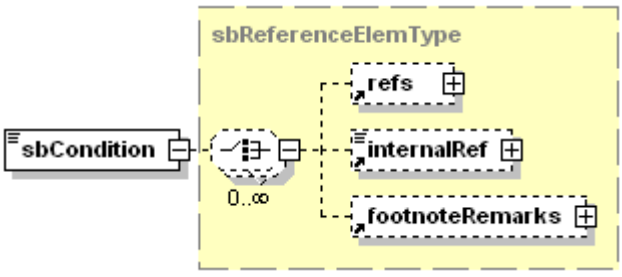
The attribute sbAggregationLevelFlag set to "1" indicates that duration and estimated time of any referenced procedure are included in these figures.

quantityType="qty04" is defined as "Time".

2.7.1.1 Condition

Description: The element <sbCondition> contains the different options to complete the Service bulletin and return to service by referring to procedures or task set.

Markup element: <sbCondition>



ICN-S1000D-A-03090502-B-FAPE3-00028-A-001-01

Fig 13 Element <sbCondition>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <internalRef>. Refer to Chap 3.9.5.2.1.2.
- <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

Markup example:

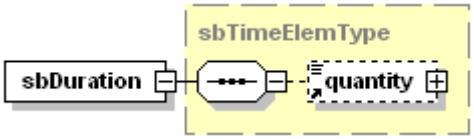
```
<sbCondition>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="01" disassyCode="00" disassyCodeVariant="AA"
infoCode="933" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</refs>
</sbCondition>
```

2.7.1.2 Duration

Description: The element <sbDuration> contains the elapsed time for performing the actions specified to complete the whole Service bulletin or to complete a Service bulletin task set.

The duration must be given in hours or days with maximum two decimals (eg, 2,45 h or 1,5 d).

Markup element: <sbDuration>



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Fig 14 Element <sbDuration>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <quantity>. Refer to Chap 3.9.5.2.1.10.

The attribute quantityUnitOfMeasure of the element <quantityValue> or the element <quantityGroup> must be filled with the values "h" for hours or "d" for days. Refer to default BREX rule BREX-S1-00102.

Markup example:

```
<sbDuration>
<quantity quantityType="qty04">
<quantityGroup>
<quantityValue quantityUnitOfMeasure="h">1,5</quantityValue>
</quantityGroup></quantity>
</sbDuration>
```

Note

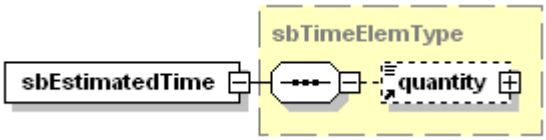
quantityType="qty04" is defined as "Time".

2.7.1.3 Estimated time

Description: The element <sbEstimatedTime> contains the estimated aggregated time to complete the whole Service bulletin or to complete a task set. Refer to <estimatedTime>, Chap 3.9.5.2.1.9.

The estimated time must be given in man-hours with maximum two decimals (eg, 14,55 h).

Markup element: <sbEstimatedTime>



ICN-S1000D-A-03090502-B-FAPE3-00030-A-001-01

Fig 15 Element <sbEstimatedTime>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <quantity>. Refer to Chap 3.9.5.2.1.10.

  The attribute quantityUnitOfMeasure of the element <quantityValue> or the element <quantityGroup> must be filled with the values "h" for (man-)hours. Refer to default BREX rule BREX-S1-00103.

Markup example:

```
<sbEstimatedTime>
<quantity quantityType="qty04">
<quantityGroup>
<quantityValue quantityUnitOfMeasure="h">1,5</quantityValue>
```

```
</quantityGroup>
</quantity>
</sbEstimatedTime>
```

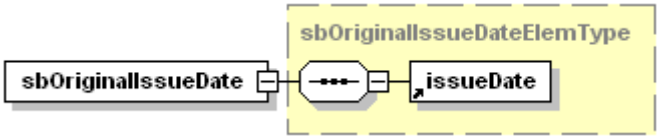
Note

quantityType="qty04" is defined as "Time".

2.8 Original issue date

Description: The element <sbOriginalIssueDate> contains the first issue date of the Service bulletin.

Markup element: <sbOriginalIssueDate>



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Fig 16 Element <sbOriginalIssueDate>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <issueDate>. the first issue date of the Service bulletin. Refer to Chap 3.9.5.1.

Markup example:

```
<sbOriginalIssueDate>
<issueDate year="2011" month="03" day="31"/>
</sbOriginalIssueDate>
```

2.9 Service bulletin approval

Description: The element <sbApproval> contains the approval identifier given by manufacturer approval authorities (eg, EASA, FAA).

Markup element: <sbApproval>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- sbApprovalIdent (M), the approval identifier given by manufacturer approval authorities
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

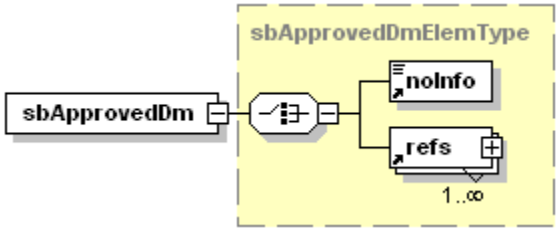
Markup example:

```
<sbApproval sbApprovalIdent="EASA.21J.031"/>
```

2.10 Service bulletin approved data modules

Description: The element <sbApprovedDm> contains the list of data modules approved in the frame of the current Service bulletin.

Markup element: <sbApprovedDm>



ICN-S1000D-A-03090502-B-FAPE3-00032-A-001-01

Fig 17 Element <sbApprovedDm>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– <noInfo>. Refer to Chap 3.9.5.2.15.
– <refs>. the references to approved data modules. Refer to Chap 3.9.5.2.1.2.

Markup example:

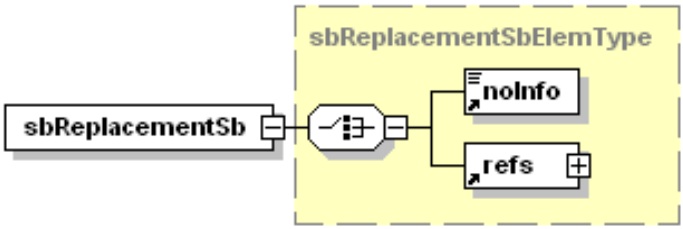
```
<sbApprovedDm>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="01" disassyCode="00" disassyCodeVariant="AA"
infoCode="933" infoCodeVariant="A" itemLocationCode="A"/>
<issueInfo issueNumber="001" inWork="00"/>
</dmRefIdent>
</dmRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="3" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="520" infoCodeVariant="A" itemLocationCode="A"/>
```

```
</dmRefIdent>
</dmRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="01" disassyCode="00" disassyCodeVariant="AB"
infoCode="720" infoCodeVariant="A" itemLocationCode="A"/>
<issueInfo issueNumber="001" inWork="00"/>
</dmRefIdent>
</dmRef>
...
</refs>
</sbApprovedDm>
```

2.11 Service bulletin replacement

Description: The element <sbReplacementSb> contains the information about the Service bulletin that can replace the current one.

Markup element: <sbReplacementSb>



ICN-S1000D-A-03090502-B-FAPE3-00033-A-001-01

Fig 18 Element <sbReplacementSb>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <noInfo>. Refer to Chap 3.9.5.2.15.
- <refs>. the references to a replacement Service bulletin. Refer to Chap 3.9.5.2.1.2.

Markup example:

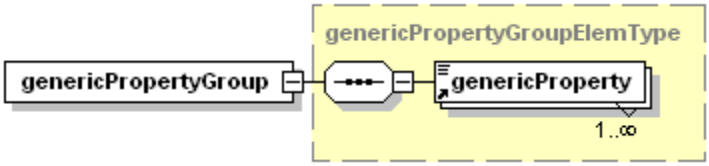
```
<sbReplacementSb>
<refs>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="02" disassyCode="00" disassyCodeVariant="AA"
infoCode="930" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
```

```
</dmRef>
</refs>
</sbReplacementSb>
```

2.12 Generic property group

Description: The element <genericPropertyGroup> contains list of properties associated to the product or part of the product that are interesting to provide to the end user.

Markup element: <genericPropertyGroup>



ICN-S1000D-A-03090502-B-FAPE3-00034-A-001-01

Fig 19 Element <genericPropertyGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <genericProperty>. a single property of the product or part of the product. Refer to Para 2.12.1.

2.12.1 Generic property

Description: The element <genericProperty> contains a single property associated to the product.

Markup element: <genericProperty>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- genericPropertyType (M), the type of the property. The attribute can have on of the following values:
  - "gpt01" thru "gpt99". Refer to Chap 3.9.6.1.

  The use of the different values allowed for the attribute genericPropertyType depends on the context where the element <genericPropertyGroup> is present.
- genericPropertyFlag (O), indicates whether the generic property is applicable. The attribute can have one of the following values:
  - "1" - True, the generic property is applicable.

- "0" - False, the generic property is not applicable.

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

Markup example:

```
<genericPropertyGroup>
<genericProperty genericPropertyType="gpt01"
genericPropertyFlag="1"/>
<genericProperty genericPropertyType="gpt04"
genericPropertyFlag="1"/>
<genericProperty genericPropertyType="gpt06"
genericPropertyFlag="1"/>
</genericPropertyGroup>
```

Note

genericPropertyType="gpt01" is defined as "Passenger comfort affected".

genericPropertyType="gpt04" is defined as "Structural life extension".

genericPropertyType="gpt06" is defined as "Product operation affected".

Chapter 3.9.5.2.15.2

Service bulletin data module - Material information

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Chap 3.9.6.1	Attributes - Project configurable values

1 General

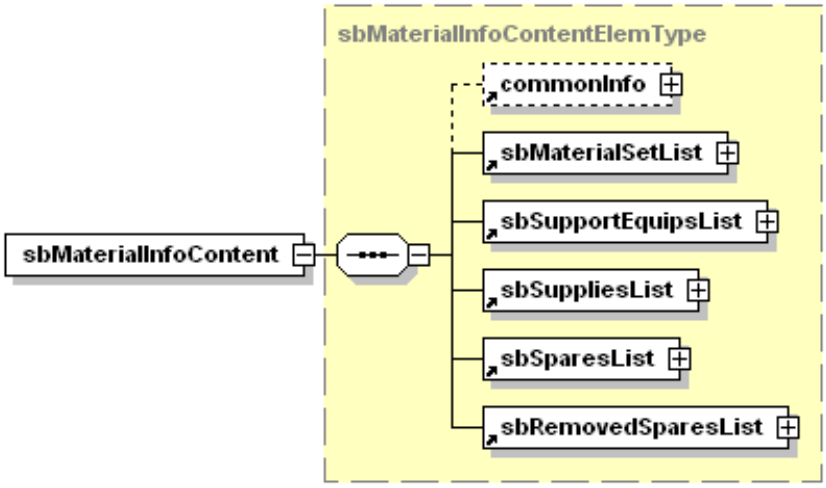
The service bulletin material information can be either:

- included within the core service bulletin data module using the element <sbMaterialInfoContent>, child of <sbMaterialInfo>. Refer to Chap 3.9.5.2.15. Refer to Para 2 for the content model description.
- a separate data module using the element <sbMaterialInfoContent> from the element <sb> of the Service bulletin Schema. Refer to Para 2.

2 Service bulletin material information content

Description: The element <sbMaterialInfoContent> contains any information related to material involved in Service bulletin accomplishment.

Markup element: <sbMaterialInfoContent>



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Fig 1 Element <sbMaterialInfoContent>

Attributes:

- None

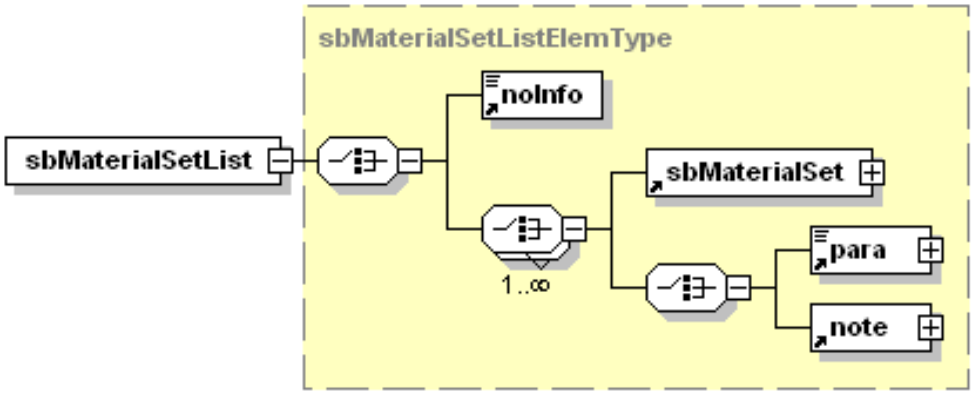
Child elements:

- <commonInfo>. Refer to Chap 3.9.5.2.1.12.
- <sbMaterialSetList>. Refer to Para 2.1.
- <sbSupportEquipsList>. Refer to Para 2.2.
- <sbSuppliesList>. Refer to Para 2.3.
- <sbSparesList>. Refer to Para 2.4.
- <sbRemovedSparesList>. Refer to Para 2.5.

2.1 List of material sets

Description: The element <sbMaterialSetList> contains the list of material (set, individual or external) involved in the Service bulletin. This topic provides a single place where to define the full list of references to material applicable to a set of Products.

Markup element: <sbMaterialSetList>



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Fig 2 Element <sbMaterialSetList>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

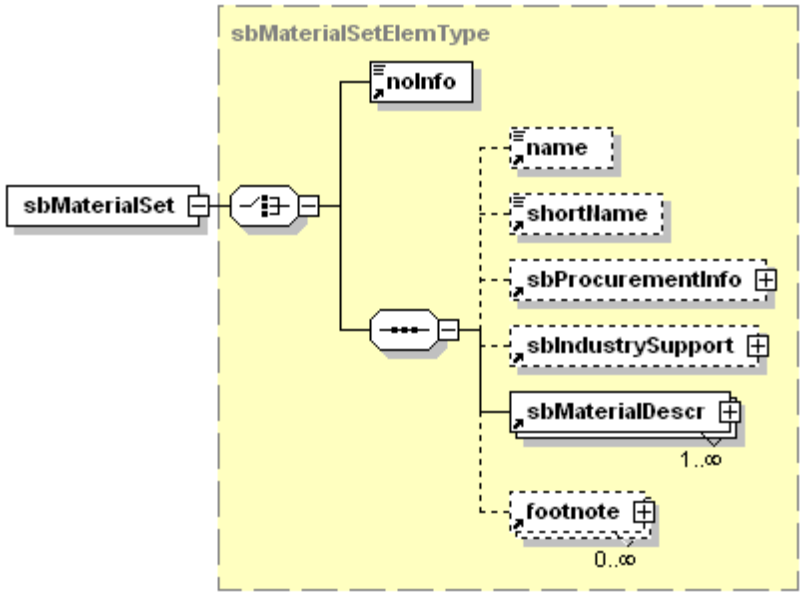
Child elements:

- <noInfo>. Refer to Chap 3.9.5.2.15.
- <sbMaterialSet>. Refer to Para 2.1.1.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <note>. Refer to Chap 3.9.3.

2.1.1 Material set

Description: The element <sbMaterialSet> lists the references and quantity to any kind of set of material applicable to a set of Productsand involved in Service bulletin accomplishment.

Markup element: <sbMaterialSet>



ICN-S1000D-A-03090502-B-FAPE3-00040-A-001-01

Fig 3 Element <sbMaterialSet>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `sbMaterialType` (O), the type of material used in the Service bulletin. The attribute can have one of the following values:
  - "`sbmt01`" thru "`sbmt99`". Refer to Chap 3.9.6.1.
- `sbMaterialIdent` (O), the identifier of the set of material set references
- `sbMaterialIssue` (O), the issue of the set of material set references
- `sbProcurableFlag` (O), whether the set of material is procurable. The attribute can have one of the following values:
  - "`0`" - No, the set of material or individual material is not procurable.
  - "`1`" - Yes, the set of material or individual material is procurable.
- `sbSupplierValue` (O), the supplier of set or individual set. The attribute can have one of the following values:
  - "`manufacturer`" - the set of material or individual material is provided by the responsible partner company of the Service bulletin
  - "`supplier`" - the set of material or individual material is provided by a supplier different from the responsible partner company of the Service bulletin
  - "`any`" - the set of material or individual material can be provided by any suppliers
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <noInfo>. Refer to Chap 3.9.5.2.15.
- <name>. Refer to Chap 3.9.5.2.1.10.
- <shortName>. Refer to Chap 3.9.5.2.1.10.
- <sbProcurementInfo>. Refer to Para 2.1.1.1.
- <sbIndustrySupport>. Refer to Para 2.1.1.2.
- <sbMaterialDescr>. Refer to Para 2.1.1.3.
- <footnote>. Refer to Chap 3.9.5.2.1.10.

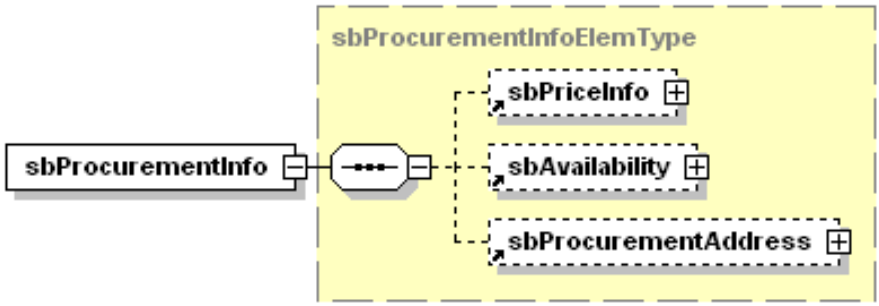
Markup example:

```
<sbMaterialSet>
<sbMaterialDescr>
<sbMaterialSetRef>
<internalRef internalRefId="mat-0001"
internalRefTargetType="irtt15"/>
</sbMaterialSetRef>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</sbMaterialDescr>
<sbMaterialDescr>
<sbMaterialSetRef>
<internalRef internalRefId="mat-0002"
internalRefTargetType="irtt15">Supply</internalRef>
</sbMaterialSetRef>
</sbMaterialDescr>
<sbMaterialDescr>
<sbMaterialSetRef>
<internalRef internalRefId="mat-0003"
internalRefTargetType="irtt15"/>
</sbMaterialSetRef>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</sbMaterialDescr>
<sbMaterialDescr>
<sbMaterialSetRef>
<internalRef internalRefId="mat-0005"
internalRefTargetType="irtt15">Removed spare set</internalRef>
</sbMaterialSetRef>
</sbMaterialDescr>
<sbMaterialDescr>
<sbMaterialSetRef>
<internalRef internalRefId="mat-0007"
internalRefTargetType="irtt15">Modified spare</internalRef>
</sbMaterialSetRef>
</sbMaterialDescr>
</sbMaterialSet>
```

2.1.1.1 Procurement information

Description: The element <sbProcurementInfo> contains information about price, availability and procurement address of the element it is attached to.

Markup element: <sbProcurementInfo>



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Fig 4 Element <sbProcurementInfo>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <sbPriceInfo>. Refer to Para 2.1.1.1.1.
- <sbAvailability>. Refer to Para 2.1.1.1.2.
- <sbProcurementAddress>. Refer to Para 2.1.1.1.3.

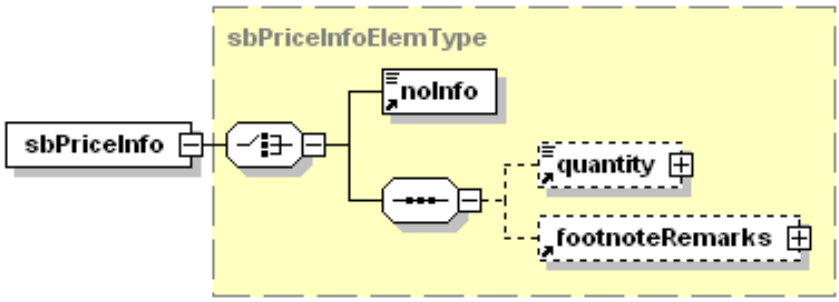
Business rule decision point BRDP-S1-00287 - Use of the element <sbProcurementInfo> in the element <sbMaterialSet>, the element <sbSupportEquipSet>, the element <sbIndividualSupportEquip>, the element <sbSupplySet>, the element: <sbIndividualSupply>, the element <sbSpareSet> and the element <sbIndividualSpare>:

- Decide whether the use of the element <sbProcurementInfo> is allowed within
  - the element <sbMaterialSet>
  - the definitions of individual material sets (ie, <sbSupportEquipSet>, <sbSupplySet> and <sbSpareSet>)
  - the definitions of individual spares, supplies and support equipment (ie, <sbIndividualSupportEquip>,<sbIndividualSupply> and <sbIndividualSpare>)

2.1.1.1.1 Price information

Description: The element <sbPriceInfo> contains the cost of the material set or individual material.

Markup element: <sbPriceInfo>



ICN-S1000D-A-03090502-B-FAPE3-00042-A-001-01

Fig 5 Element <sbPriceInfo>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`noInfo`>. Refer to Chap 3.9.5.2.15.
- <`quantity`>, the price of material expressed with currency. Refer to Chap 3.9.5.2.1.10.
- <`footnoteRemarks`>. Refer to Chap 3.9.5.2.1.9.

Markup example:

```
<sbPriceInfo>
<quantity quantityType="qty02"
quantityTypeSpecifics="USD">150</quantity>
</sbPriceInfo>
```

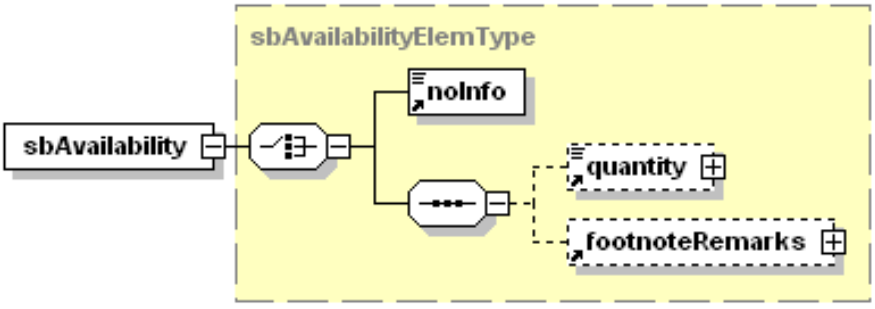
Note

`quantityType`="`qty02`" is defined as "Price".

2.1.1.1.2 Availability

Description: The element <`sbAvailability`> contains the lead time necessary to get the material set or individual material.

Markup element: <`sbAvailability`>



ICN-S1000D-A-03090502-B-FAPE3-00043-A-001-01

Fig 6 Element <sbAvailability>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

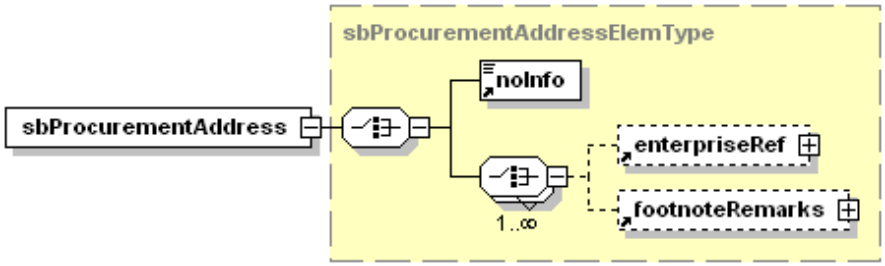
Child elements:

- <`noInfo`>. Refer to Chap 3.9.5.2.15.
- <`quantity`>, the number of days or months to get the material. Refer to Chap 3.9.5.2.1.10.
- <`footnoteRemarks`>. Refer to Chap 3.9.5.2.1.9.

2.1.1.1.3 Procurement addresses

Description: The element <`sbProcurementAddress`> contains information where to procure the material.

Markup element: <`sbProcurementAddress`>



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Fig 7 Element <`sbProcurementAddress`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

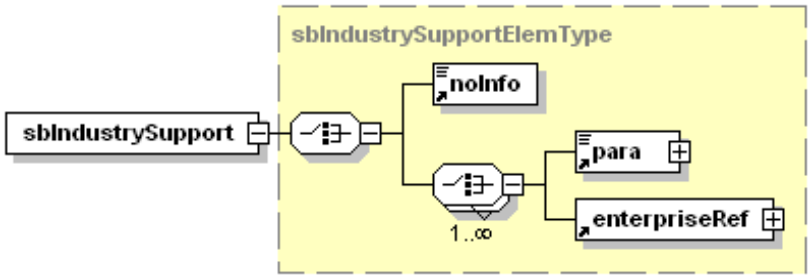
Child elements:

- <`noInfo`>. Refer to Chap 3.9.5.2.15.
- <`enterpriseRef`>, the address where to procure the material or reference to the enterprise information CIR. Refer to Chap 3.9.5.2.11.6.
- <`footnoteRemarks`>. Refer to Chap 3.9.5.2.1.9.

2.1.1.2 Industry support

Description: The element <`sbIndustrySupport`> contains the information about any special assistance provided by the Service bulletin manufacturer (ie, information about a product retrofit campaign).

Markup element: <`sbIndustrySupport`>



ICN-S1000D-A-03090502-B-FAPE3-00046-A-001-01

Fig 8 Element <sbIndustrySupport>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <noInfo>. Refer to Chap 3.9.5.2.15.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <enterpriseRef>, the address where to procure the material or reference to the enterprise information CIR. Refer to Chap 3.9.5.2.11.6.

Business rule decision point BRDP-S1-00288 - Use of the element <sbIndustrySupport> in the element <sbMaterialSet>, the element <sbSupportEquipSet>, the element <sbIndividualSupportEquip>, the element <sbSupplySet>, the element <sbIndividualSupply>, the element <sbSpareSet>, the element <sbIndividualSpare>, the element <sbRemovedSpareSet>, the element <sbIndividualRemovedSpare>:

- Decide whether the use of the element <sbIndustrySupport> is allowed within
  - the element <sbMaterialSet>
  - the definitions of individual material sets (ie, <sbSupportEquipSet>, <sbSupplySet> , <sbSpareSet> and <sbRemovedSpareSet>)
  - the definitions of individual spares, supplies, support equipment and removed spares (ie, <sbIndividualSupportEquip>, <sbIndividualSupply>, <sbIndividualSpare> and <sbIndividualRemovedSpare>)

Markup example:

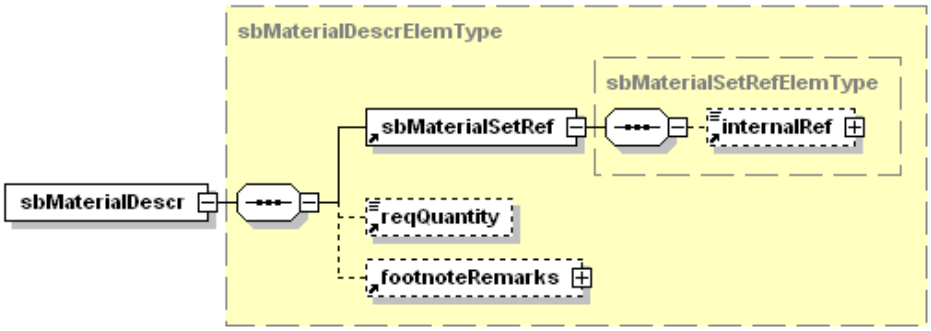
```
<sbIndustrySupport>
<para>Technical support can be requested at:</para>
<enterpriseRef manufacturerCodeValue="KZ666">
<name>World-Bike</name>
```

```
<businessUnit>
<businessUnitName>Customer support</businessUnitName>
<businessUnitAddress>
<street>100, Bike Street</street>
<city>London</city>
<country>UK</country>
</businessUnitAddress>
</businessUnit>
</enterpriseRef>
</sbIndustrySupport>
```

2.1.1.3 Material description

Description: The element <sbMaterialDescr> contains the reference to a material set or to an individual material or to an external material set necessary to accomplish the Service bulletin for a given applicability.

Markup element: <sbMaterialDescr>



ICN-S1000D-A-03090502-B-FAPE3-00047-A-001-01

Fig 9 Element <sbMaterialDescr>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <sbMaterialSetRef>. Refer to Para 2.1.1.3.1.
- <reqQuantity>, the required quantity of the referenced material set in the current set of references. Refer to Chap 3.9.5.2.1.9.
- <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

Markup example:

```
<sbMaterialDescr>
<sbMaterialSetRef>
<internalRef internalRefId="mat-0003"
internalRefTargetType="irtt15"/>
</sbMaterialSetRef>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</sbMaterialDescr>
```

Note

`internalRefTargetType`="`irtt15`" is defined as " Service bulletin material set, support equipment set, supply set, spare set or removed spare set (including individual and external material)".

2.1.1.3.1 Material set reference

Description: The element <`sbMaterialSetRef`> contains a reference to the definition of a material set. The reference can be made of any type of material set.

Markup element: <`sbMaterialSetRef`>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `sbMaterialType` (O), the type of the referenced material set in the Service bulletin. The attribute can have one of the following values:
  - "`sbmt01`" thru "`sbmt99`". Refer to Chap 3.9.6.1.
- `sbMaterialIdent` (O), the identifier of the referenced material set
- `sbMaterialIssue` (O), the issue of the referenced material set
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`internalRef`>, the cross-reference to the set of material. Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<sbMaterialSetRef><internalRef internalRefId="mat-0004"
internalRefTargetType="irtt15"/>
</sbMaterialSetRef>
```

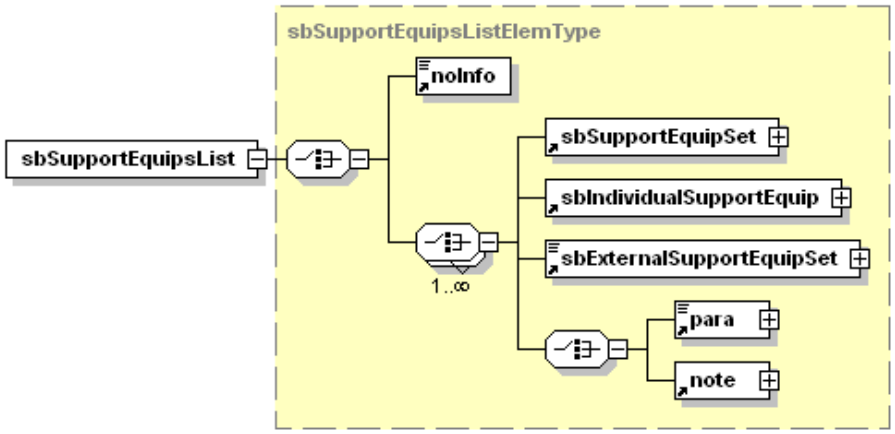
Note

`internalRefTargetType`="`irtt15`" is defined as " Service bulletin material set, support equipment set, supply set, spare set or removed spare set (including individual and external material)".

2.2 List of support equipment

Description: The element <sbSupportEquipsList> contains the list of support equipment (set, individual, external) involved in the Service bulletin.

Markup element: <sbSupportEquipsList>



ICN-S1000D-A-03090502-B-FAPE3-00048-A-001-01

Fig 10 Element <sbSupportEquipsList>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

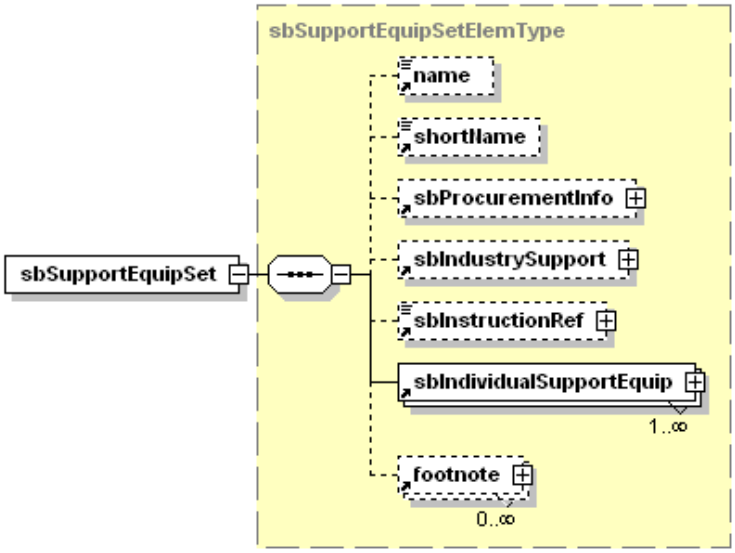
Child elements:

- <noInfo>. Refer to Chap 3.9.5.2.15.
- <sbSupportEquipSet>. Refer to Para 2.2.1.
- <sbIndividualSupportEquip>. Refer to Para 2.2.2.
- <sbExternalSupportEquipSet>. Refer to Para 2.2.3.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <note>. Refer to Chap 3.9.3.

2.2.1 Support equipment set

Description: The element <sbSupportEquipSet> contains the information about support equipment grouped by set and involved in the Service bulletin.

Markup element: <sbSupportEquipSet>



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Fig 11 Element <sbSupportEquipSet>

Attributes:

– The attributes and business rules are the same as for the element <sbMaterialSet>. Refer to Para 2.1.1.

Child elements:

– <name>. Refer to Chap 3.9.5.2.1.10.
– <shortName>. Refer to Chap 3.9.5.2.1.10.
– <sbProcurementInfo>. Refer to Para 2.1.1.1.
– <sbIndustrySupport>. Refer to Para 2.1.1.2.
– <sbInstructionRef>. Refer to Chap 3.9.5.2.15.1.
– <sbIndividualSupportEquip>. Refer to Para 2.2.2.
– <footnote>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<sbSupportEquipSet id="mat-0001" sbMaterialType="sbmt01"
sbMaterialIdent="BSK-TLST-200" sbMaterialIssue="001"
sbProcurableFlag="1" sbSupplierValue="manufacturer">
<name>Saw tool set</name>
<sbProcurementInfo>
...
</sbProcurementInfo>
<sbIndustrySupport>
...
</sbIndustrySupport>
<sbIndividualSupportEquip sbMaterialType="sbmt01">
...
</sbIndividualSupportEquip>
<sbIndividualSupportEquip sbMaterialType="sbmt01">
...
</sbIndividualSupportEquip>
</sbSupportEquipSet>
```

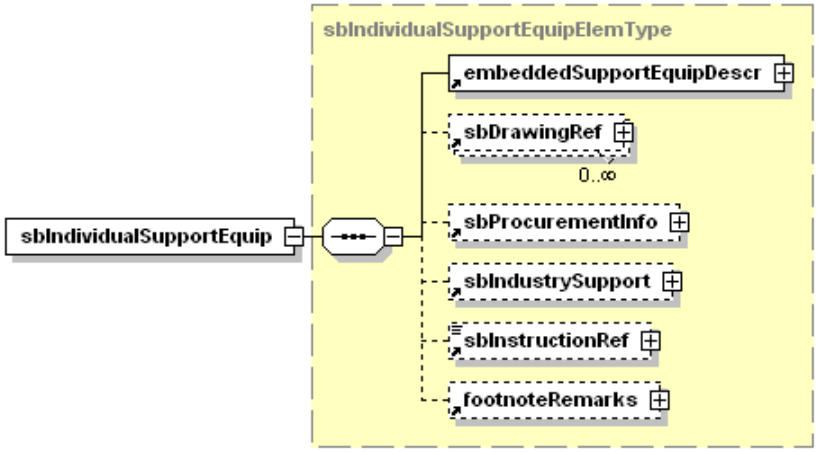
Note

sbMaterialType="sbmt01" is defined as "Set of material or individual material specific to the Service bulletin".

2.2.2 Individual support equipment

Description: The element <sbIndividualSupportEquip> contains the information about individual support equipment involved in the Service bulletin.

Markup element: <sbIndividualSupportEquip>



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Fig 12 Element <sbIndividualSupportEquip>

Attributes:

- The attributes and business rules are the same as for the element <sbMaterialSet>. Refer to Para 2.1.1.

Child elements:

- <embeddedSupportEquipDescr>. Description of the support equipment. Refer to Chap 3.9.5.2.1.9.
- <sbDrawingRef>. Refer to Para 2.2.2.1.
- <sbProcurementInfo>. Refer to Para 2.1.1.1.
- <sbIndustrySupport>. Refer to Para 2.1.1.2.
- <sbInstructionRef>. Refer to Chap 3.9.5.2.15.1.
- <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

Markup example:

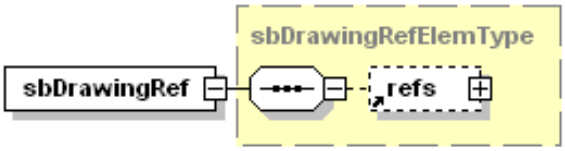
```
<sbIndividualSupportEquip sbMaterialType="sbmt01">
<embeddedSupportEquipDescr>
<name>Saw tool</name>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>BSK-TW-100</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
```

```
</embeddedSupportEquipDescr>
</sbIndividualSupportEquip>
```

2.2.2.1 Drawing reference

Description: The element <sbDrawingRef> contains the reference to a drawing not being part of the Service bulletin data module.

Markup element: <sbDrawingRef>



ICN-S1000D-A-03090502-B-FAPE3-00051-A-001-01

Fig 13 Element <sbDrawingRef>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- sbItem (O), identifies the item in the drawing

Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.

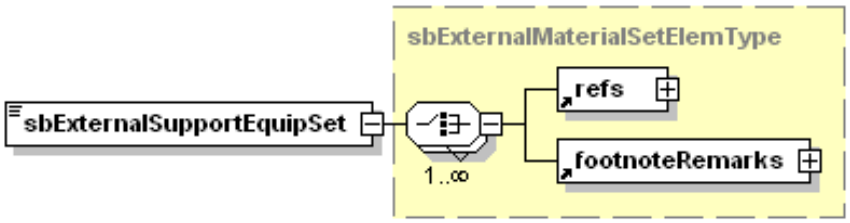
Markup example:

```
<sbDrawingRef sbItem="01">
<refs><externalPubRef>...</externalPubRef></refs>
</sbDrawingRef>
```

2.2.3 External support equipment set

Description: The element <sbExternalSupportEquipSet> contains references to external documentation referencing support equipment that are necessary for the Service bulletin accomplishment.

Markup element: <sbExternalSupportEquipSet>



ICN-S1000D-A-03090502-B-FAPE3-00052-A-002-01

Fig 14 Element <sbExternalSupportEquipSet>

Attributes:

– The attributes and business rules are the same as for the element <sbMaterialSet>. Refer to Para 2.1.1.

Child elements:

– <refs>. Refer to Chap 3.9.5.2.1.2.
– <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

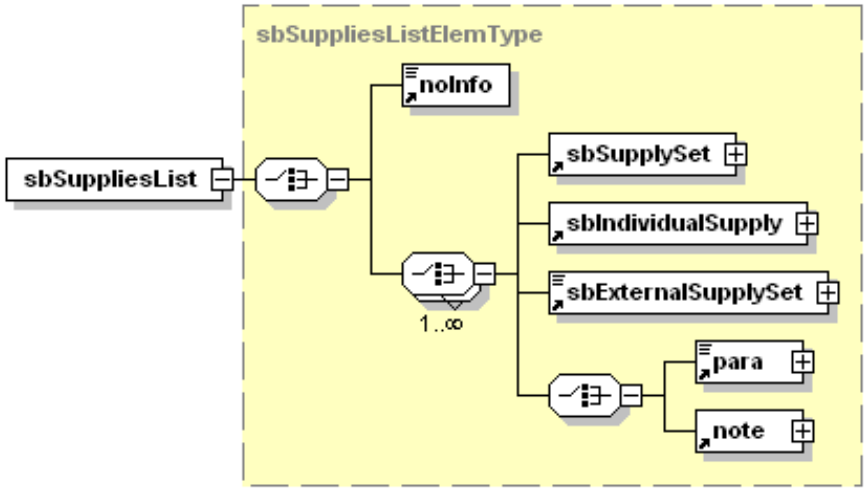
Markup example:

```
<sbExternalSupportEquipSet sbMaterialIdent="mat-0010">
<refs><dmRef>...</dmRef></refs>
</sbExternalSupportEquipSet>
```

2.3 List of supplies

Description: The element <sbSuppliesList> contains the list of supplies (set of supplies, individual supplies or from external documentation supplies) involved in the Service bulletin.

Markup element: <sbSuppliesList>



ICN-S1000D-A-03090502-B-FAPE3-00053-A-001-01

Fig 15 Element <sbSuppliesList>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

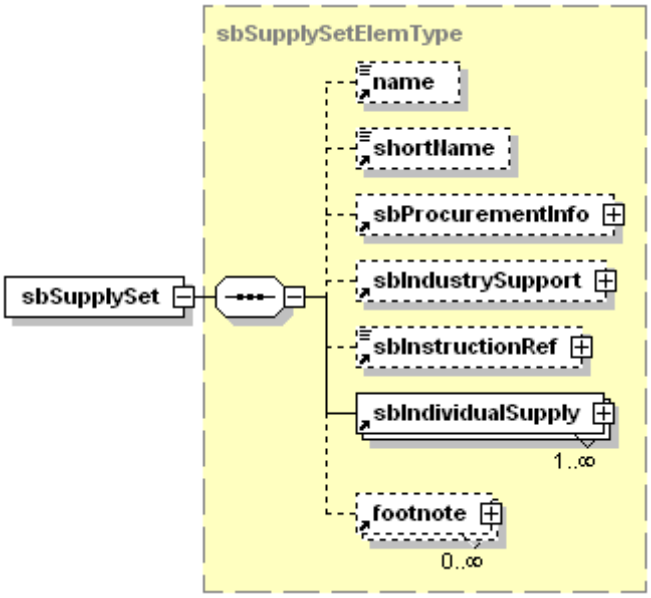
– <noInfo>. Refer to Chap 3.9.5.2.15.
– <sbSupplySet>. Refer to Para 2.3.1.
– <sbIndividualSupply>. Refer to Para 2.3.2.
– <sbExternalSupplySet>. Refer to Para 2.3.3.

- <para>. Refer to Chap 3.9.5.2.1.10.
- <note>. Refer to Chap 3.9.3.

2.3.1 Supply set

Description: The element <sbSupplySet> contains the information about supplies grouped by set and involved in the Service bulletin.

Markup element: <sbSupplySet>



ICN-S1000D-A-03090502-B-FAPE3-00054-A-001-01

Fig 16 Element <sbSupplySet>

Attributes:

- The attributes and business rules are the same as for the element <sbMaterialSet>. Refer to Para 2.1.1.

Child elements:

- <name>. Refer to Chap 3.9.5.2.1.10.
- <shortName>. Refer to Chap 3.9.5.2.1.10.
- <sbProcurementInfo>. Refer to Para 2.1.1.1.
- <sbIndustrySupport>. Refer to Para 2.1.1.2.
- <sbInstructionRef>. Refer to Chap 3.9.5.2.15.1.
- <sbIndividualSupply>. Refer to Para 2.3.2.
- <footnote>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<sbSupplySet id="mat-0018" sbMaterialType="sbmt01"
sbMaterialIdent="BSK-SPST-100" sbMaterialIssue="001"
sbProcurableFlag="1" sbSupplierValue="any">
<name>Clean up set</name>
<sbProcurementInfo>
...
</sbProcurementInfo>
```

```
<sbIndustrySupport>
...
</sbIndustrySupport>
<sbIndividualSupply sbMaterialType="sbmt01">
...
</sbIndividualSupply>
</sbSupplySet>
```

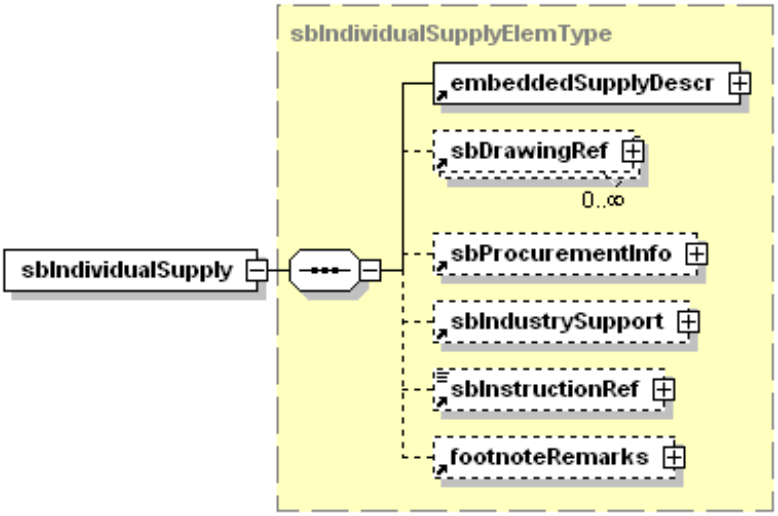
Note

sbMaterialType="sbmt01" is defined as "Set of material or individual material specific to the Service bulletin".

2.3.2 Individual supply

Description: The element <sbIndividualSupply> contains the information about individual supply involved in the Service bulletin. The supply is not present within a set of supplies.

Markup element: <sbIndividualSupply>



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Fig 17 Element <sbIndividualSupply>

Attributes:

– The attributes and business rules are the same as for the element <sbMaterialSet>. Refer to Para 2.1.1.

Child elements:

– <embeddedSupplyDescr>. Refer to Chap 3.9.5.2.1.9.
– <sbDrawingRef>. Refer to Para 2.2.2.1.
– <sbProcurementInfo>. Refer to Para 2.1.1.1.
– <sbIndustrySupport>. Refer to Para 2.1.1.2.
– <sbInstructionRef>. Refer to Chap 3.9.5.2.15.1.
– <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

Markup example:

```
<sbIndividualSupply id="mat-0002" sbMaterialType="sbmt02"
sbProcurableFlag="1" sbSupplierValue="any">
<embeddedSupplyDescr>
<name>General grease</name>
<identNumber>
<manufacturerCode>KZ222</manufacturerCode>
<partAndSerialNumber>
<partNumber>LL-005</partNumber>
</partAndSerialNumber>
</identNumber>
<reqQuantity>As required</reqQuantity>
</embeddedSupplyDescr>
</sbIndividualSupply>
```

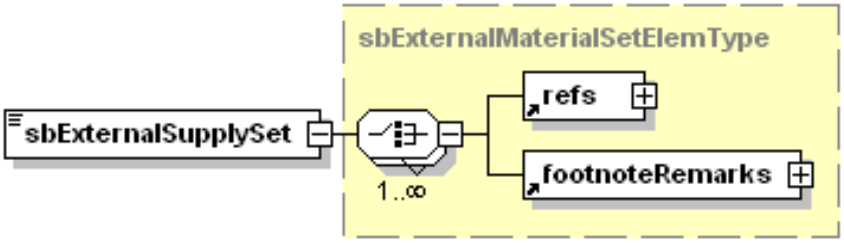
Note

sbMaterialType="sbmt02" is defined as "Set of material or individual material not specially built for the Service bulletin".

2.3.3 External supply set

Description: The element <sbExternalSupplySet> contains references to external documentation referencing supplies that are necessary for the Service bulletin accomplishment.

Markup element: <sbExternalSupplySet>



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Fig 18 Element <sbExternalSupplySet>

Attributes:

- The attributes and business rules are the same as for the element <sbMaterialSet>. Refer to Para 2.1.1.

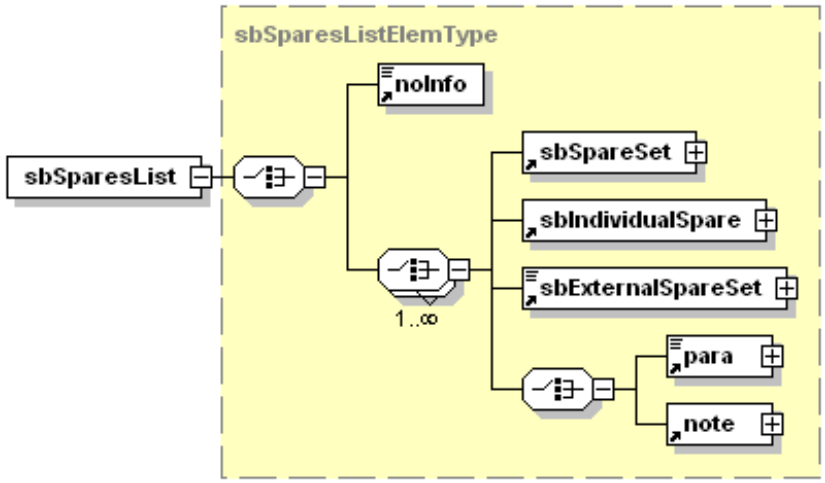
Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

2.4 List of spares

Description: The element <sbSparesList> contains the list of spares (set, individual, external) involved in the Service bulletin.

Markup element: <sbSparesList>



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Fig 19 Element <sbSparesList>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

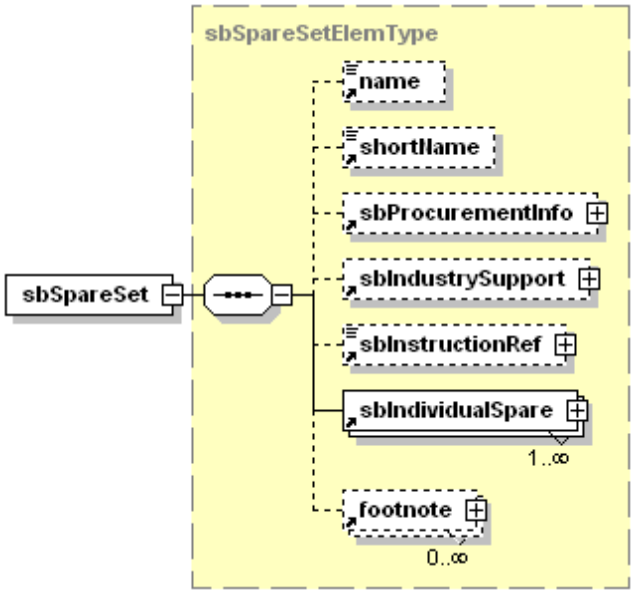
Child elements:

- <noInfo>. Refer to Chap 3.9.5.2.15.
- <sbSpareSet>. Refer to Para 2.4.1.
- <sbIndividualSpare>. Refer to Para 2.4.2.
- <sbExternalSpareSet>. Refer to Para 2.4.3.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <note>. Refer to Chap 3.9.3.

2.4.1 Spare set

Description: The element <sbSpareSet> contains the information about spares grouped by set and involved in the Service bulletin.

Markup element: <sbSpareSet>



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Fig 20 Element <sbSpareSet>

Attributes:

– The attributes and business rules are the same as for the element <sbMaterialSet>. Refer to Para 2.1.1.

Child elements:

– <name>. Refer to Chap 3.9.5.2.1.10.
– <shortName>. Refer to Chap 3.9.5.2.1.10.
– <sbProcurementInfo>. Refer to Para 2.1.1.1.
– <sbIndustrySupport>. Refer to Para 2.1.1.2.
– <sbInstructionRef>. Refer to Chap 3.9.5.2.15.1.
– <sbIndividualSpare>. Refer to Para 2.4.2.
– <footnote>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<sbSpareSet id="mat-0003" sbMaterialType="sbmt01"
sbMaterialIdent="SPA-1000-1" sbMaterialIssue="001"
sbProcurableFlag="1" sbSupplierValue="manufacturer">
<name>Fork set</name>
<sbProcurementInfo>
...
</sbProcurementInfo>
<sbIndividualSpare sbMaterialType="sbmt02">
...
</sbIndividualSpare>
<sbIndividualSpare sbMaterialType="sbmt02">
...
</sbIndividualSpare>
</sbSpareSet>
```

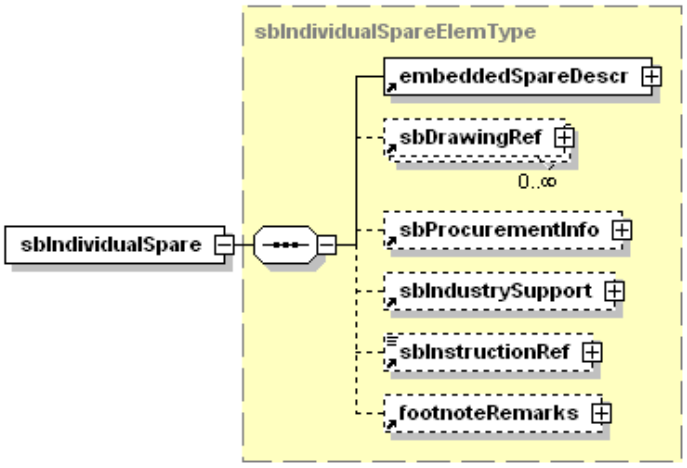
Note

- sbMaterialType="sbmt01" is defined as "Set of material or individual material specific to the Service bulletin"
- sbMaterialType="sbmt02" is defined as "Set of material or individual material not specially built for the Service bulletin"

2.4.2 Individual spare

Description: The element <sbIndividualSpare> contains the information about individual spare involved in the Service bulletin. The spare is not present within a set of spares.

Markup element: <sbIndividualSpare>



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Fig 21 Element <sbIndividualSpare>

Attributes:

- The attributes and business rules are the same as for the element <sbMaterialSet>. Refer to Para 2.1.1.

Child elements:

- <embeddedSpareDescr>. Refer to Chap 3.9.5.2.1.9.
- <sbDrawingRef>. Refer to Para 2.2.2.1.
- <sbProcurementInfo>. Refer to Para 2.1.1.1.
- <sbIndustrySupport>. Refer to Para 2.1.1.2.
- <sbInstructionRef>. Refer to Chap 3.9.5.2.15.1.
- <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

Markup example:

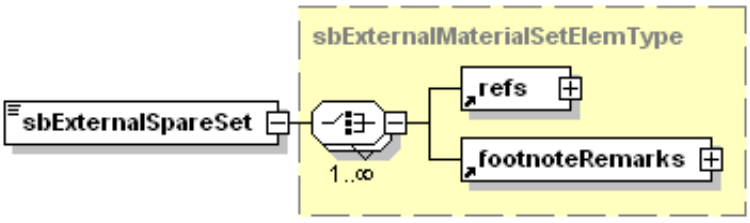
```
<sbIndividualSpare id="mat-0004" sbMaterialType="sbmt01"
sbMaterialIdent="FK-TEL1002" sbMaterialIssue="001"
sbProcurableFlag="1" sbSupplierValue="manufacturer">
<embeddedSpareDescr>
<name>Fork</name>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>FK-TEL1002</partNumber>
```

```
</partAndSerialNumber>
</identNumber>
<reqQuantity unitOfMeasure="EA">1</reqQuantity>
</embeddedSpareDescr>
<sbProcurementInfo>
<sbPriceInfo>
<quantity quantityType="qty02"
quantityTypeSpecifics="USD">100</quantity>
</sbPriceInfo>
<sbAvailability>
<quantity>
<quantityGroup>
<quantityValue quantityUnitOfMeasure="d">3</quantityValue>
</quantityGroup>
</quantity>
<footnoteRemarks>
<simplePara>After purchase order reception</simplePara>
</footnoteRemarks>
</sbAvailability>
<sbProcurementAddress>
<enterpriseRef manufacturerCodeValue="KZ666">
<name>World-Bike</name>
<businessUnit>
<businessUnitName>Customer support</businessUnitName>
<businessUnitAddress>
<street>100, Bike Street</street>
<city>London</city>
<country>UK</country>
</businessUnitAddress>
</businessUnit>
</enterpriseRef>
</sbProcurementAddress>
</sbProcurementInfo>
</sbIndividualSpare>
```

2.4.3 External spare

Description: The element <sbExternalSpareSet> contains references to external documentation referencing spares that are necessary for the Service bulletin accomplishment.

Markup element: <sbExternalSpareSet>



ICN-S1000D-A-03090502-B-FAPE3-00060-A-001-01

Fig 22 Element <sbExternalSpareSet>

Attributes:

– The attributes and business rules are the same as for the element <sbMaterialSet>. Refer to Para 2.1.1.

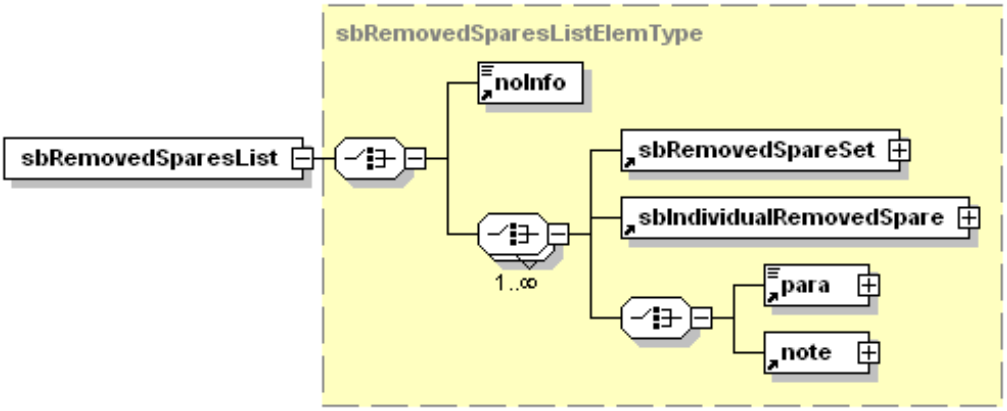
Child elements:

– <refs>. Refer to Chap 3.9.5.2.1.2.
– <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

2.5 List of removed spares

Description: The element <sbRemovedSparesList> contains the list of removed spares (set, individual) used in the Service bulletin.

Markup element: <sbRemovedSparesList>



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Fig 23 Element <sbRemovedSparesList>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

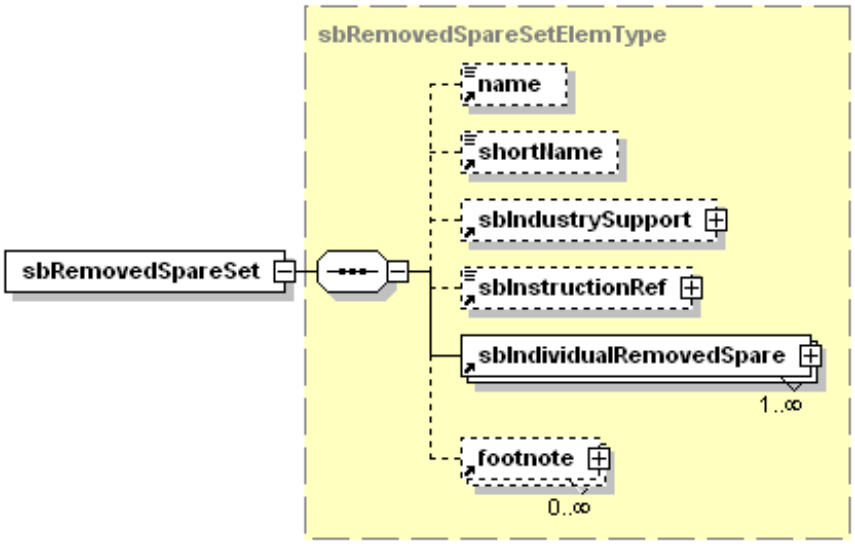
Child elements:

– <noInfo>. Refer to Chap 3.9.5.2.15.
– <sbRemovedSpareSet>. Refer to Para 2.5.1.
– <sbIndividualRemovedSpare>. Refer to Para 2.5.2.
– <para>. Refer to Chap 3.9.5.2.1.10.
– <note>. Refer to Chap 3.9.3.

2.5.1 Removed spare set

Description: The element <sbRemovedSpareSet> contains the information about removed spares grouped by set and used in the Service bulletin.

Markup element: <sbRemovedSpareSet>



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Fig 24 Element <sbRemovedSpareSet>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- sbMaterialType (O), the type of removed or modified material used in the Service bulletin. The attribute can have one of the following values:
  - "sbmt01" thru "sbmt99". Refer to Chap 3.9.6.1.
- sbMaterialIdent (O), the identifier of the material set
- sbMaterialIssue (O), the issue of the material set
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

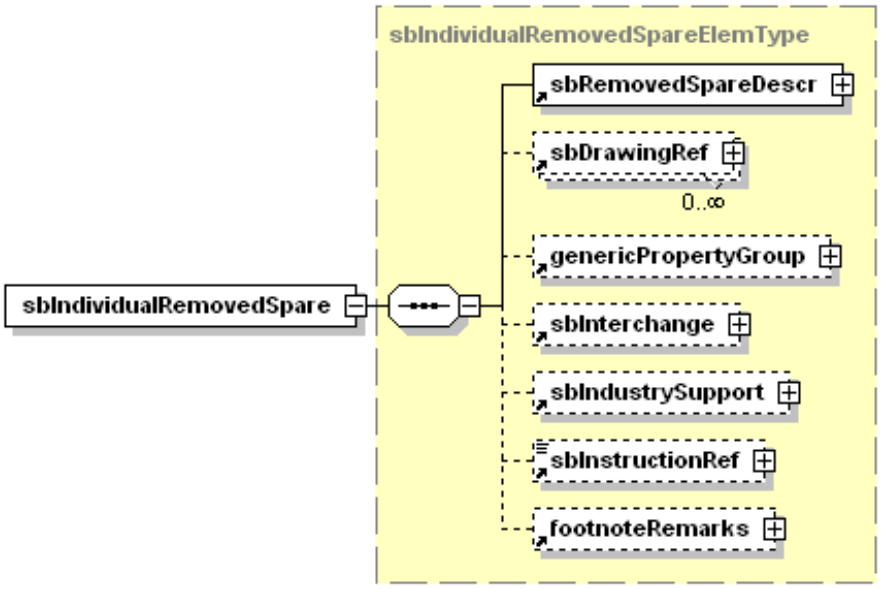
Child elements:

- <name>. Refer to Chap 3.9.5.2.1.10.
- <shortName>. Refer to Chap 3.9.5.2.1.10.
- <sbIndustrySupport>. Refer to Para 2.1.1.2.
- <sbInstructionRef>. Refer to Chap 3.9.5.2.15.1.
- <sbIndividualRemovedSpare>. Refer to Para 2.5.2.
- <footnote>. Refer to Chap 3.9.5.2.1.10.

2.5.2 Individual removed spare

Description: The element <sbIndividualRemovedSpare> contains the information about individual removed spare used in the Service bulletin. The removed spare is not present within a set of removed spares.

Markup element: <sbIndividualRemovedSpare>



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Fig 25 Element <sbIndividualRemovedSpare>

Attributes:

– The attributes and business rules are the same as for the element <sbRemovedSpareSet>. Refer to Para 2.5.1.

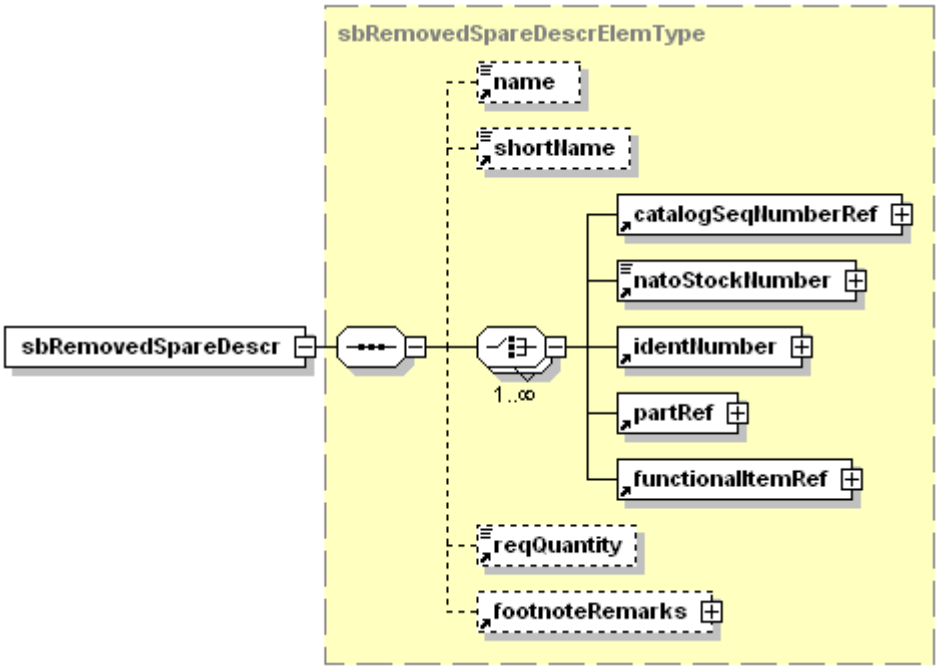
Child elements:

– <sbRemovedSpareDescr>. Refer to Para 2.5.2.1.
– <sbDrawingRef>. Refer to Para 2.2.2.1.
– <genericPropertyGroup>, contains <genericProperty> elements whose predefined values of the attribute genericPropertyType in this context are "gpt10" and "gpt11". Refer to Chap 3.9.5.2.15.1.
– <sbInterchange>. Refer to Para 2.5.2.2.
– <sbIndustrySupport>. Refer to Para 2.1.1.2.
– <sbInstructionRef>. Refer to Chap 3.9.5.2.15.1.
– <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

2.5.2.1 Removed spare description

Description: The element <sbRemovedSpareDescr> contains the description of the removed spare.

Markup element: <sbRemovedSpareDescr>



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Fig 26 Element <sbRemovedSpareDescr>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `materialUsage` (O), the qualification of the removed part. The attribute can have one of the following values:

  - "`mu01`" thru "`mu99`". Refer to Chap 3.9.6.1 and default BREX rule BREX-S1-00104.

  The values "`mu01`" (Discarded), "`mu02`" (Retained) and "`mu06`" (Modified to) can be used in this context.

- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`name`>. Refer to Chap 3.9.5.2.1.10.
- <`shortName`>. Refer to Chap 3.9.5.2.1.10.
- The identification by one or more of the elements <`catalogSeqNumberRef`> (refer to Chap 3.9.5.2.7), <`natoStockNumber`> (refer to Chap 3.9.5.2.7), <`identNumber`> (refer to Chap 3.9.5.2.1.9), <`partRef`> (refer to Chap 3.9.5.2.1.10) and <`functionalItemRef`> (refer to Chap 3.9.5.1).
- <`reqQuantity`>. Refer to Chap 3.9.5.2.1.9.

– <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

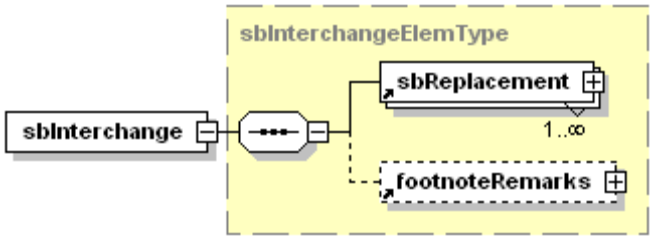
Markup example:

```
<sbRemovedSpareDescr>
<name>Fork</name>
<identNumber>
<manufacturerCode>KZ666</manufacturerCode>
<partAndSerialNumber>
<partNumber>FK-1000</partNumber>
</partAndSerialNumber>
</identNumber>
</sbRemovedSpareDescr>
```

2.5.2.2 Interchangeability

Description: The element <sbInterchange> contains the information related to the new spare that replace the old one if applicable.

Markup element: <sbInterchange>



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Fig 27 Element <sbInterchange>

Attributes:

– applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

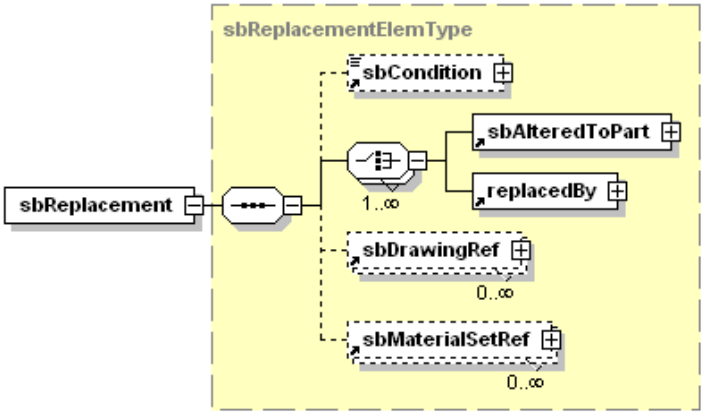
Child elements:

– <sbReplacement>. Refer to Para 2.5.2.2.1.
– <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.

2.5.2.2.1 Replacement part

Description: The element <sbReplacement> contains the information related to the replacement condition of the newly installed spare versus the removed spare.

Markup element: <sbReplacement>



ICN-S1000D-A-03090502-B-FAPE3-00066-A-001-01

Fig 28 Element <sbReplacement>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `sbReplacementType` (O), the specific condition applicable to the interchangeability condition. The attribute can have one of the following values:
  - "`nominal`" - no specific condition for its application
  - "`conditional`" - a specific condition is applicable to the interchangeability condition which is expressed in the element <`sbCondition`>. Refer to Chap 3.9.5.2.15.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`sbCondition`>, any specific condition applicable to current interchangeability instructions. Refer to Chap 3.9.5.2.15.1.
- <`sbAlteredToPart`>, the replacing part in case of modification of an existing one. Refer to Para 2.5.2.2.2.
- <`replacedBy`>, the replacing part in case of exchange of part. Refer to Chap 3.9.5.2.7.
- <`sbDrawingRef`>, the reference to the drawing of the replacing part. Refer to Para 2.2.2.1.
- <`sbMaterialSetRef`>, the reference to the material set containing the replacing part. Refer to Para 2.1.1.3.1.

Markup examples:

Example with replacement of part

```
<sbReplacement>
<replacedBy replacementCode="oneway">
```

```
<partRef manufacturerCodeValue="KZ666" partNumberValue="FK-
TEL1001"/>
</replacedBy>
</sbReplacement>
```

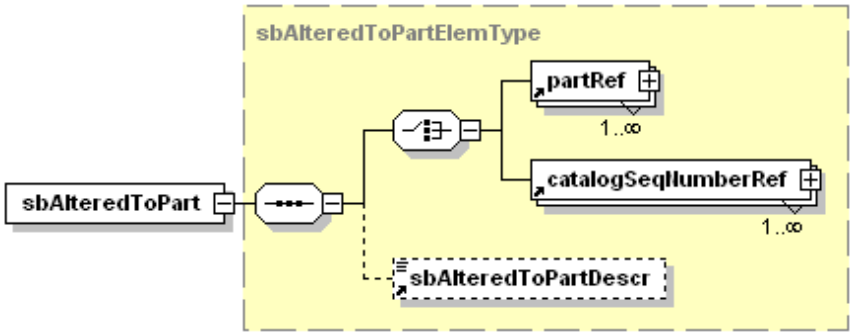
Example with modification of part

```
<sbReplacement>
<sbAlteredToPart>
<partRef manufacturerCodeValue="KZ666" partNumberValue="BSK-AXS-
2001"/>
</sbAlteredToPart>
</sbReplacement>
```

2.5.2.2.2 Altered to part

Description: The element <sbAlteredToPart> contains the new part number given to the modified part when re-installed on the product after modification.

Markup element: <sbAlteredToPart>



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Fig 29 Element <sbAlteredToPart>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <partRef>, the reference to the replacing part. Refer to Chap 3.9.5.2.1.10.
- <catalogSeqNumberRef>, the identification of the replacing part in the IPD data module. Refer to Chap 3.9.5.2.7.
- <sbAlteredToPartDescr>. Refer to Para 2.5.2.2.3.

Markup example:

```
<sbAlteredToPart>
<partRef manufacturerCodeValue="KZ666" partNumberValue="BSK-AXS-
2001"/>
```

```
<sbAlteredToPartDescr>Mountain bike wheel
axis</sbAlteredToPartDescr>
</sbAlteredToPart>
```

2.5.2.2.3 Altered to part description

Description: The element <sbAlteredToPartDescr> contains the description of the new part which is modified then re-installed on the product.

Markup element: <sbAlteredToPartDescr>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Chapter 3.9.5.2.16

Content section - Front matter

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Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
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Chap 6.2.1	Page-oriented publications - Page layout, paper publications, headers and footers
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1 General

Front matter information can be captured and represented by using different Schemas. In general, all Front matter data modules can use the descriptive Schema except for ACT, CCT and PCT which have their own Schemas.

The Front matter Schema described in this chapter can be used to minimize manual authoring and in most cases support auto-generation of the Front matter data modules.

This Schema is used to capture and represent the following Front matter information:

- Title page - TITLE
- Table of contents - TOC
- List of effective pages - LOEP
- List of effective data modules - LOEDM
- Highlights - HIGH

The Schema also supports the capturing and representation of publication list data modules for the List of applicable publications. Refer to Chap 5.2.1.20.

Note

All other Front matter data module types than those given above must use the descriptive Schema.

Note

In future issues of the specification the remaining Front matter data module types (refer to Chap 3.9.4) will be included in the Front matter Schema.

The Front matter Schema has an Identification and status section and a Content section. The Identification and status section is used for managing the Front matter data module itself and is thus not used for presentation except for the headers and footers. The Content section consists of a set of branches for the different types of Front matter.

Note

The date in the footer is derived from the front matter data module element <issueDate> given in the element <identAndStatusSection>. Rules for data module issue dates are given in Chap 3.9.5.1.

The Schema is designed to derive basic information, such as issue information (refer to Para 2.3.1.4) and Table of contents entries (refer to Para 2.3.2.3.2) from a source publication module.

The Front matter data modules are primarily designed to be used as customized modules, but the Schema allows treating them as master Front matter data modules by using applicability.

Note

A publication often comprises data modules and publication modules using different ACT, CCT and PCT, and also has different project rules for applicability which must be carefully managed.

The Front matter Schema also allows change marking. To avoid confusion and unnecessary change marking, it is recommended that care be taken when applying change marking. For example, change marking the introductory paragraph using the element <reducedPara> in a Table of contents data module when it is reworded or when the issue number is changed. Refer to Chap 3.9.4.

The rules and guidance for S1000D standard page-oriented presentation of Front matter data modules are given in Chap 6.2.3.1 together with several examples of Front matter data modules.

2 Front matter information

2.1 Schema basic rules

The Front matter Schema defines a dedicated structure for the content of Front matter data modules.

This Schema can be used for all types of Front matter (eg, TITLE, TOC and LOEDM). It can also be used for publication lists data modules for the List of applicable publications.

Note

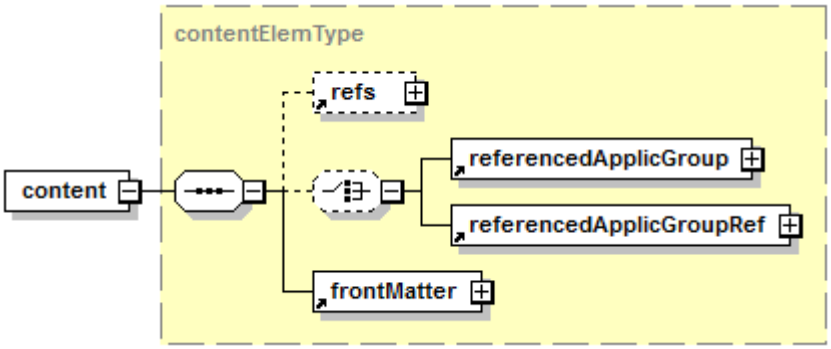
The title to be presented on the front matter data modules, except for TITLE, is derived from the elements <infoName> and <infoNameVariant>. Any content of the mandatory element <techName> is suppressed. Refer to the general rules in Chap 6.2.3.1.

The attribute controlAuthorityRefs must not be used. Refer to default BREX rule BREX-S1-00271.

2.2 Content

Description: The element <content> contains the Content section of a Front matter data module.

Markup element: <content>



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Fig 1 Major elements in Front matter content

Attributes:

- id (O), the identifier of the element <content>. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

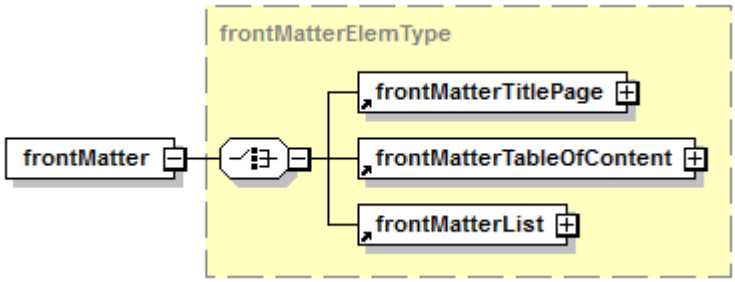
Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
- <frontMatter>. Refer to Para 2.3.

2.3 Front matter

Description: The Front matter Schema contains three branches supporting the following Front matter types:

- Title page. Refer to Para 2.3.1.
- Table of contents. Refer to Para 2.3.2.
- Highlights and various Front matter lists. Refer to Para 2.3.3.



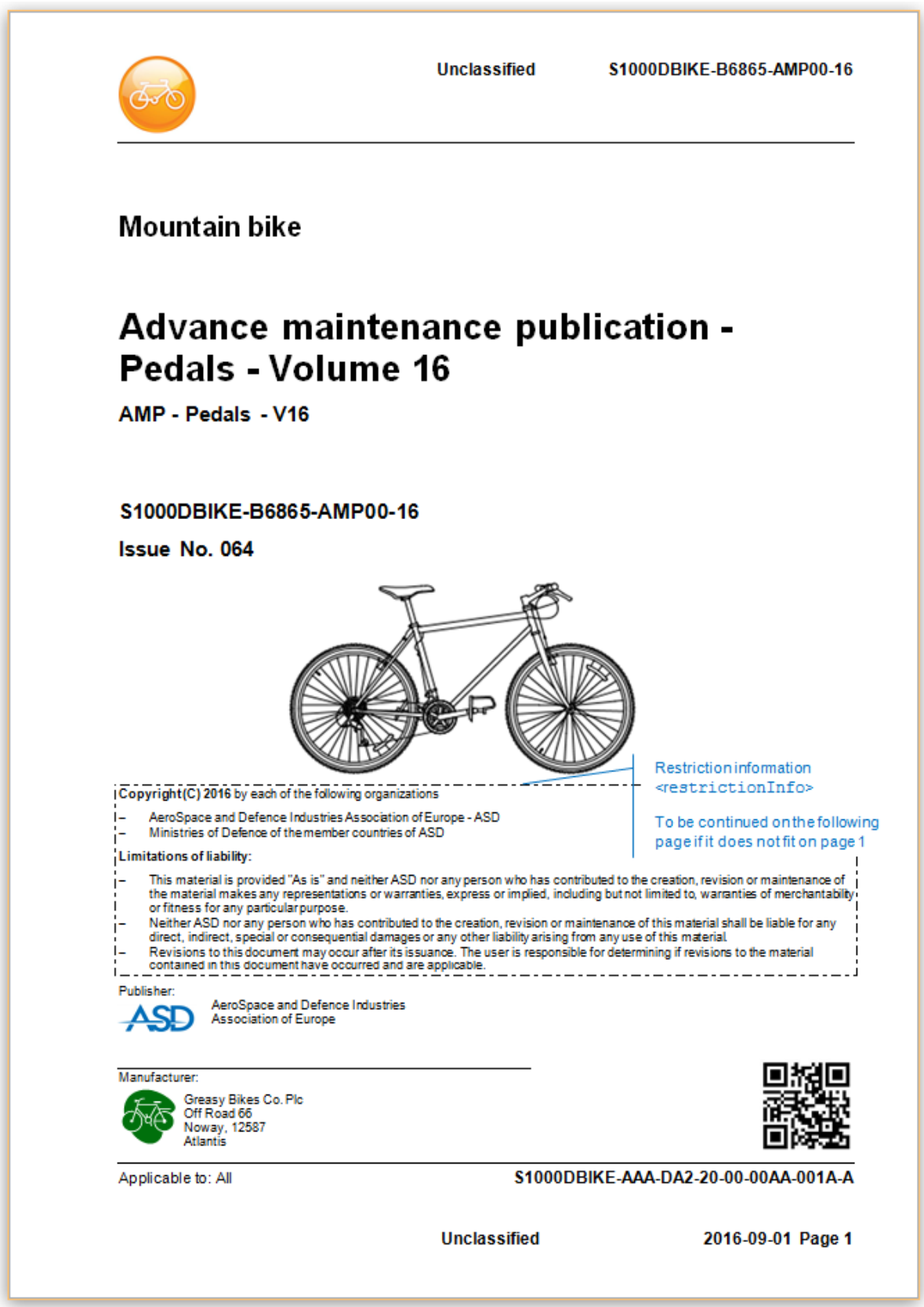
ICN-S3627-S1000D0557-002-01

Fig 2 The three Front matter branches

2.3.1 Title page

Description: The element <frontMatterTitlePage> contains the title page information.

Rules for presentation of title pages in accordance with the S1000D standard page-oriented presentation is given in Chap 6.2.3.1.



Unclassified S1000DBIKE-B6865-AMP00-16

Mountain bike

Advance maintenance publication - Pedals - Volume 16

AMP - Pedals - V16

S1000DBIKE-B6865-AMP00-16

Issue No. 064

Restriction information
<restrictionInfo>

To be continued on the following page if it does not fit on page 1

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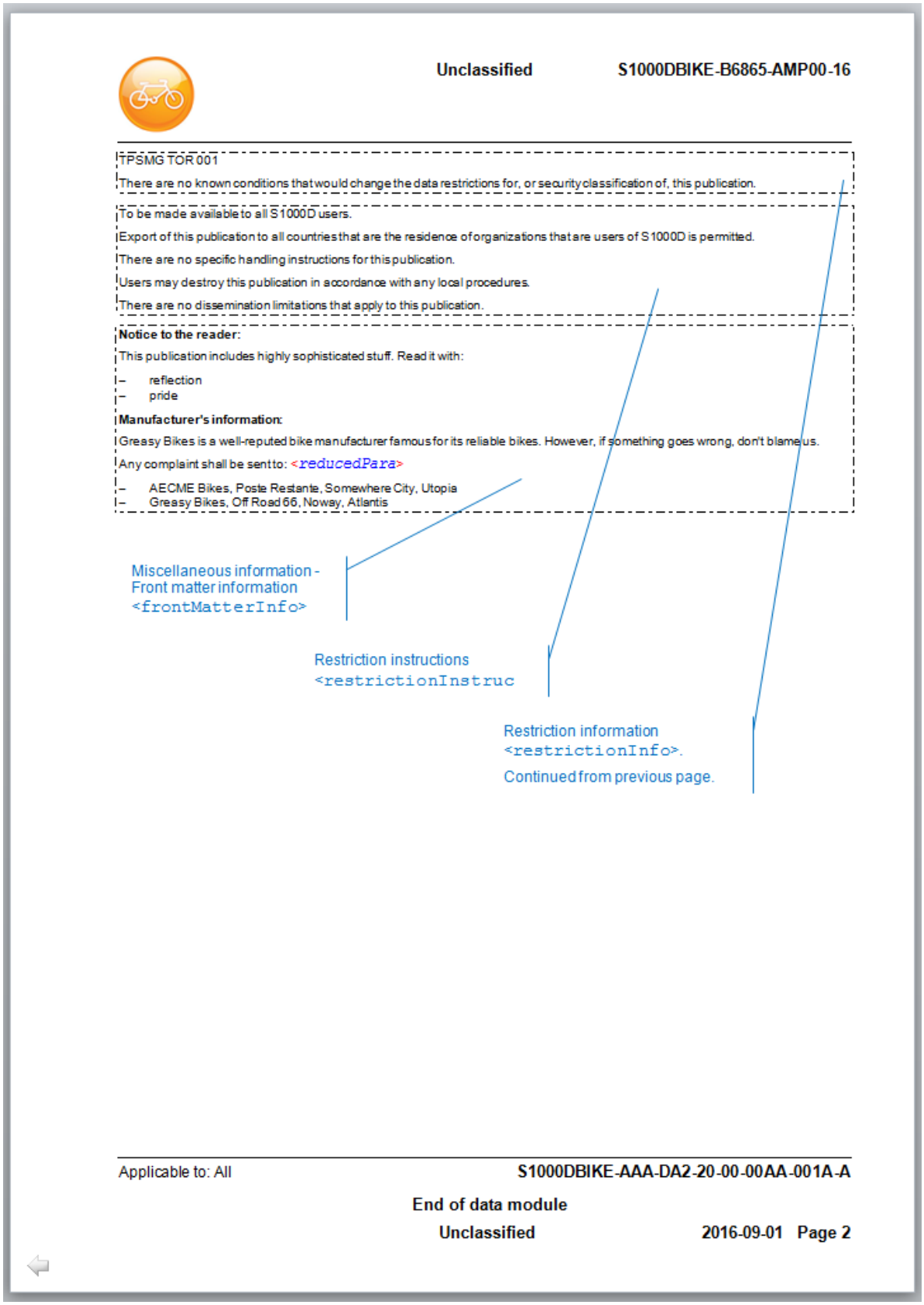
Manufacturer:
Greasy Bikes Co. Plc
Off Road 66
Noway, 12587
Atlantis

Applicable to: All S1000DBIKE-AAA-DA2-20-00-00AA-001A-A

Unclassified 2016-09-01 Page 1

ICN-S3627-S1000D0604-003-01

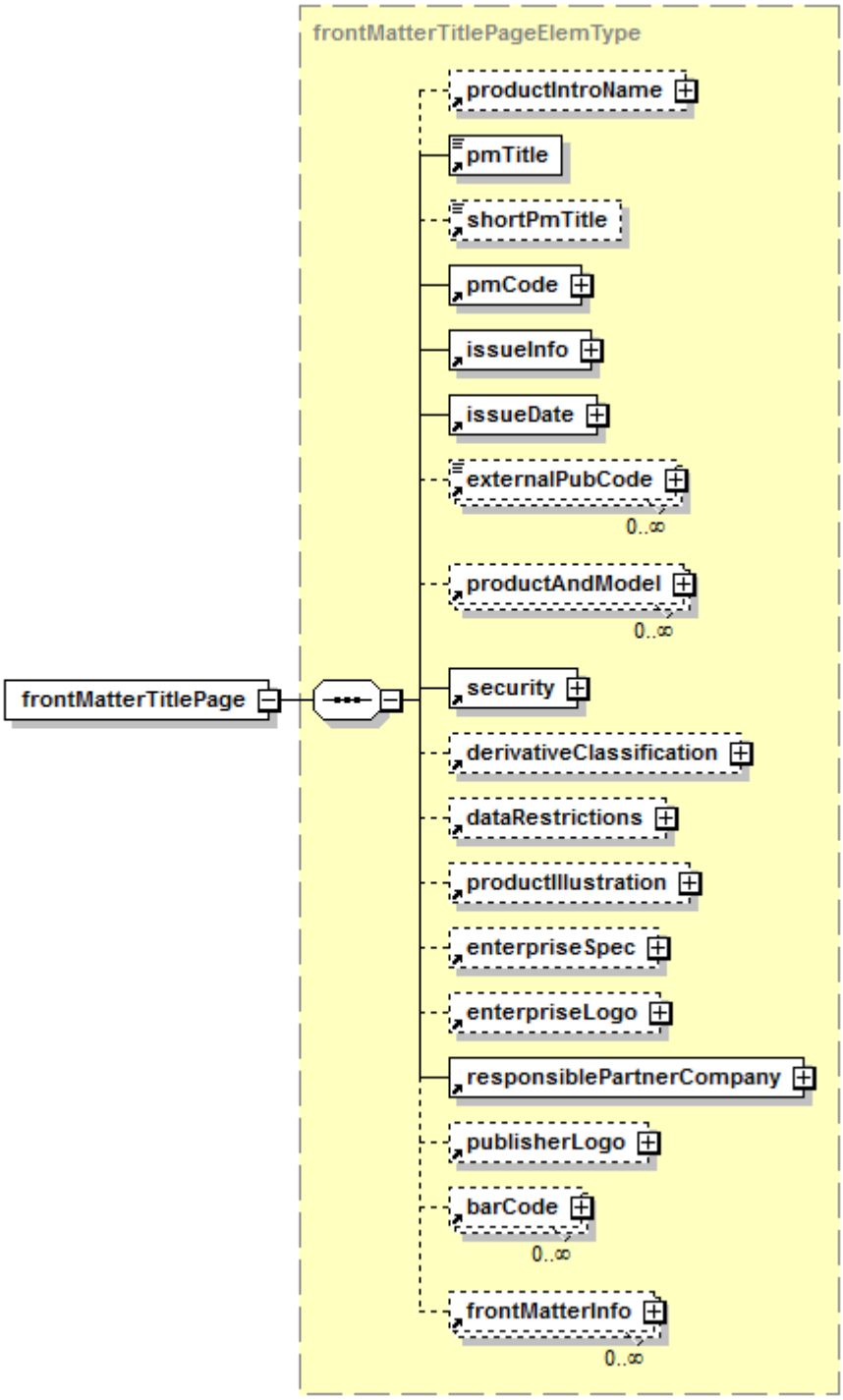
Fig 3 Title page, page 1 - S1000D standard page-oriented presentation, example



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Fig 4 Title page, page 2 - S1000D standard page-oriented presentation, example

Markup element: <frontMatterTitlePage>



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Fig 5 Element <frontMatterTitlePage>

Attributes:

– None

Child elements:

- <productIntroName>. Refer to Para 2.3.1.1.
- <pmTitle>. Refer to Para 2.3.1.2.
- <shortPmTitle>. Refer to Para 2.3.1.2.
- <pmCode>. Refer to Para 2.3.1.3.
- <issueInfo>. Refer to Para 2.3.1.4.
- <issueDate>. Refer to Para 2.3.1.4.
- <externalPubCode>. Refer to Para 2.3.1.5.
- <productAndModel>. Refer to Para 2.3.1.6.
- <security>. Refer to Para 2.3.1.7.
- <derivativeClassification>. Refer to Para 2.3.1.8.
- <dataRestrictions>. Refer to Para 2.3.1.9.
- <productIllustration>. Refer to Para 2.3.1.10.
- <enterpriseSpec>. Refer to Para 2.3.1.11.
- <enterpriseLogo>. Refer to Para 2.3.1.12.
- <responsiblePartnerCompany>. Refer to Para 2.3.1.13.
- <publisherLogo>. Refer to Para 2.3.1.14.
- <barcode>. Refer to Para 2.3.1.15.
- <frontMatterInfo>. Refer to Para 2.3.1.16.

2.3.1.1 Product name

Description: The element <productIntroName> contains the name of the product or project documented in the publication or any commercial name to be presented on the title page.

Markup element: <productIntroName>

Attributes:

- None

Child elements:

- <name>. Refer to Chap 3.9.5.2.1.10.

Business rule decision point BRDP-S1-00294 - Content of the element <productIntroName>:

- Decide whether to use the element <productIntroName>.

Markup example:

```
<productIntroName><name>Mountain bike</name></productIntroName>
```

2.3.1.2 Publication title and short publication title

Description: The elements <pmTitle> and <shortPmTitle> contain the full name and the short name, respectively, of the publication to be presented on the title page.

The content is authored or derived from the source publication module.

Markup elements: <pmTitle> and <shortPmTitle>. Refer to Chap 4.9.1.

Markup examples:

```
<pmTitle>Advance maintenance publication - Pedals - Volume
16</pmTitle>
<shortPmTitle>AMP - Pedals - V16</shortPmTitle>
```

2.3.1.3 Publication code

Description: The element <pmCode> contains the publication code to be presented on the title page.

The content is authored or derived from the Identification and status section of the source publication module.

Markup element: <pmCode>. Refer to Chap 4.9.2.

2.3.1.4 Issue information and date

Description: The elements <issueInfo> and <issueDate> contain the issue number, the inwork number and the issue date, respectively, of the publication to be presented on the title page.

The content is authored or derived from the source publication module.

Note

This issue date can be different from the date given in the <identAndStatusSection> of the front matter data module depending on project decisions. Refer to Chap 3.9.5.1.

Markup elements: <issueInfo> and <issueDate>. Refer to Chap 3.9.5.1.

2.3.1.5 External publication codes

Description: The element <externalPubCode> contains a non-S1000D code, for example an ISBN.

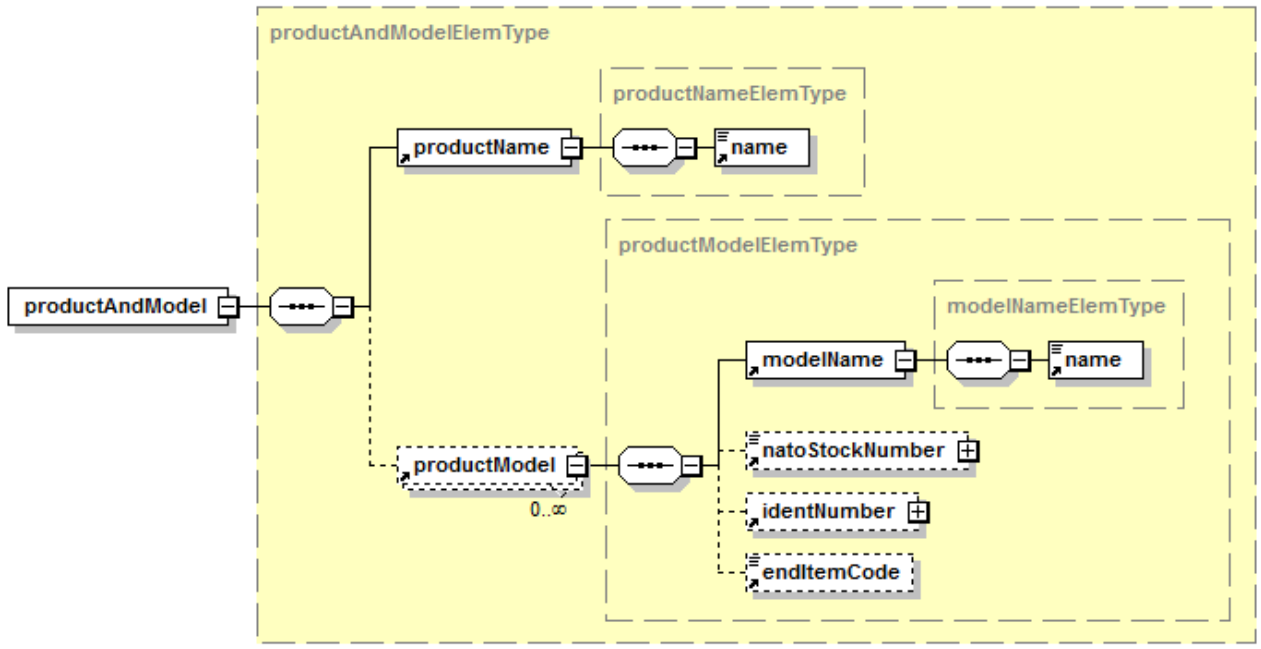
Markup element: <externalPubCode>. Refer to Chap 3.9.5.2.1.2.

2.3.1.6 Product and model name

Description: The element <productAndModel> contains one or more product names and associated model names and their identifiers which are documented in the publication.

The content of the child elements are authored (as they are not stored in the source publication module).

Markup element: <productAndModel>



ICN-S3627-S1000D0559-002-01

Fig 6 Element <productAndModel>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <productName>. Refer to Para 2.3.1.6.1.
- <productModel>. Refer to Para 2.3.1.6.2.

Business rule decision point BRDP-S1-00295 - Use of the element <productAndModel>:

- Decide whether and how to use the element <productAndModel> and its child elements.

2.3.1.6.1 Product name

Description: The element <productName> contains the name of the product documented in the publication.

Markup element: <productName>

Attributes:

- None

Child elements:

- <name>. Refer to Chap 3.9.5.2.1.10.

2.3.1.6.2 Product model

Description: The element <productModel> contains the model name and its identifiers.

Markup element: <productModel>

Attributes:

– None

Child elements:

– <modelName>. Refer to Para 2.3.1.6.3.
– <natoStockNumber>. Refer to Para 2.3.1.6.4.
– <identNumber>. Refer to Para 2.3.1.6.5.
– <endItemCode>. Refer to Para 2.3.1.6.6.

Markup example:

```
<productModel>
<modelName><name>Mk I</name></modelName>
<natoStockNumber>6240-00-027-2059</natoStockNumber>
<identNumber>
<manufacturerCode>00000</manufacturerCode>
<partAndSerialNumber>
<partNumber>P/N 19283746</partNumber>
</partAndSerialNumber>
</identNumber>
<endItemCode>99A</endItemCode>
</productModel>
<productModel>
<modelName><name>Mk I De Luxe</name></modelName>
<natoStockNumber>6240-00-027-2063</natoStockNumber>
<identNumber>
<manufacturerCode>00000</manufacturerCode>
<partAndSerialNumber>
<partNumber>P/N 91827364</partNumber>
</partAndSerialNumber>
</identNumber>
<endItemCode>99B</endItemCode>
</productModel>
```

2.3.1.6.3 Model name

Description: The element <modelName> contains the model name of the product documented in the publication.

Markup element: <modelName>

Attributes:

– None

Child elements:

– <name>. Refer to Chap 3.9.5.2.1.10.

2.3.1.6.4 NATO stock number

Description: The element <natoStockNumber> contains the NATO stock number of the model of the Product documented in the publication. Refer to Chap 3.9.5.2.7.

Markup element: <natoStockNumber>. Refer to Chap 3.9.5.2.7 with the following exceptions:

Attributes:

- `id` must not be used. Refer to default BREX rule BREX-S1-00105.
- `controlAuthorityRefs` (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

- <`refs`> must not be used. Refer to default BREX rule BREX-S1-00106.

2.3.1.6.5 Identification number

Description: The element <`identNumber`> contains the manufacturer's identification information of the model of the product documented in the publication. Refer to Chap 3.9.5.2.1.9.

Markup element: <`identNumber`>. Refer to Chap 3.9.5.2.1.9 with the following exceptions:

Attributes:

- `controlAuthorityRefs` (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

- <`refs`> must not be used. Refer to default BREX rule BREX-S1-00107.

2.3.1.6.6 End item code

Description: The element <`endItemCode`> contains the end item code which typically consists of a three-character alphanumeric code. The end item code is another type of identifier, similar to NSN, CAGE Code, part number, etc.

Markup element: <`endItemCode`>

Attributes:

- None

Child elements:

- None

2.3.1.7 Security classification

Description: The element <`security`> contains the security classification and restrictive markings of the complete publication and its contained or associated illustrations.

This is the security classification which is presented on the Title page (in the header and the footer). Refer to Chap 6.2.1.

Note

The security classification given in the Identification and status section of the title page data module is only valid for the title page data module itself.

Markup element: <`security`>. Refer to Chap 3.9.5.1.

2.3.1.8 Derivative classification

Description: The element <`derivativeClassification`> contains all derivative classification actions taken (eg, source material, date of action, action type) to the information in the complete publication.

Note

The derivative classification information given in the Identification and status section of the title page data module is only valid for the title page data module itself.

Markup element: <derivativeClassification>. Refer to Chap 3.9.5.1.

2.3.1.9 Restriction information - Copyright

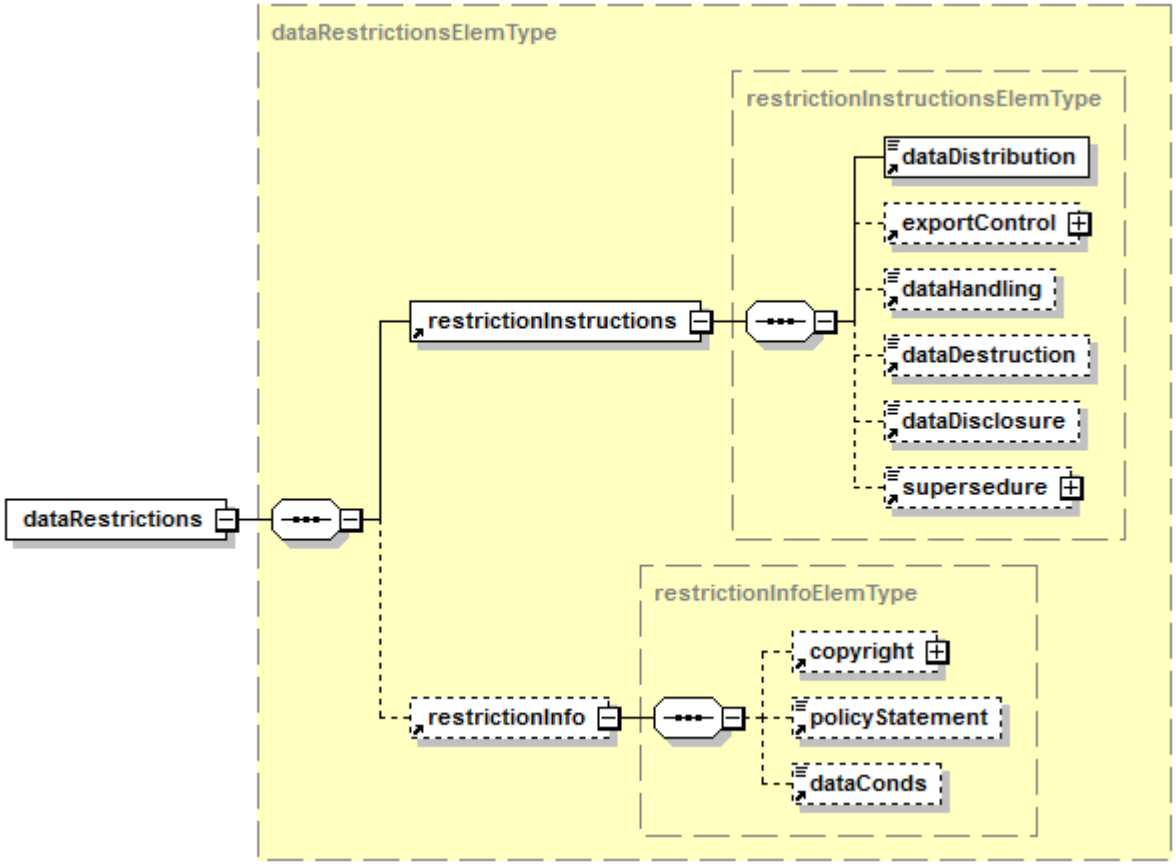
Description: The element <dataRestrictions> contains the instructions and information, applicable to the complete publication, that relate to the use, storage and handling.

The element is frequently used to include only a copyright statement using the element <copyright>. In these cases, the element <dataDistribution> is left empty.

Note

Any text to be presented in, for example bold, must be coded with corresponding attribute `emphasisType` value.

Markup element: <dataRestrictions>



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Fig 7 Element <dataRestrictions>

Attributes:

Refer to Chap 3.9.5.1 with the following exceptions:

– `id` must not be used. Refer to default BREX rule BREX-S1-00108.

- controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

- <restrictionInstructions>. Refer to Chap 3.9.5.1.
- <restrictionInfo>. Refer to Chap 3.9.5.1.

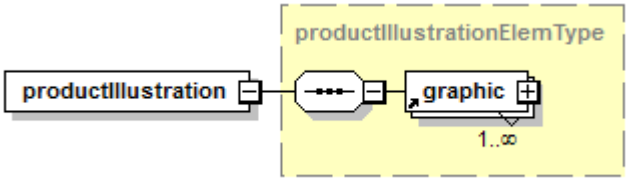
Business rule decision point BRDP-S1-00296 - Use of the element <dataRestrictions> in the element <frontMatterTitlePage>:

- Decide whether and how to use the element <dataRestrictions> and its child elements.

2.3.1.10 Product illustration

Description: The element <productIllustration> contains illustrations of the product.

Markup element: <productIllustration>



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Fig 8 Element <productIllustration>

Attributes:

- None

Child elements:

- <graphic>. Refer to Chap 3.9.5.2.1.7.

Note

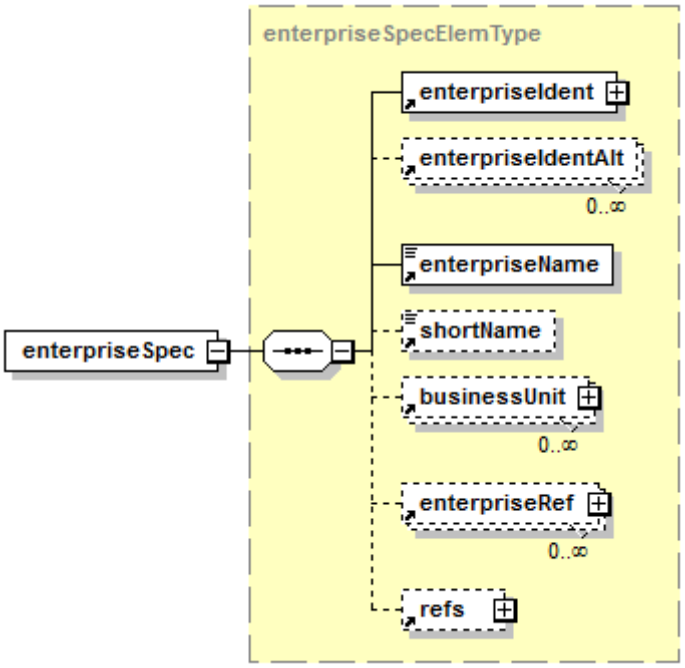
The following attributes of the element <graphic> must not be used in this context:

- id attribute must not be used. Refer to default BREX rule BREX-S1-00109.
- controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

2.3.1.11 Manufacturer

Description: The element <enterpriseSpec> contains information about the manufacturer of the product such as the enterprise name, the business unit and address.

Markup element: <enterpriseSpec>



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Fig 9 Element <enterpriseSpec>

Attributes:

Refer to Chap 3.9.5.2.11.6 with the following exceptions:

- id must not be used. Refer to default BREX rule BREX-S1-00110.
- controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

Refer to Chap 3.9.5.2.11.6 with the following Note:

Note

Typically, only the following elements are used: <enterpriseName> and <businessUnitName> giving the manufacturers name and the business unit name, and <businessUnitAddress> giving the address. Technically the Schema demands the company's CAGE code in the attribute manufacturerCodeValue. If the company has no CAGE code, it is allowed to use the value "00000".

Business rule decision point BRDP-S1-00297 - Use of the element <enterpriseSpec> in the element <frontMatterTitlePage>:

- Decide whether and how to use the element <enterpriseSpec>.

Markup example:

```
<enterpriseSpec>
<enterpriseIdent manufacturerCodeValue="00000"/>
<enterpriseName>Greasy Bikes Co. Plc
</enterpriseName>
<businessUnit>
<businessUnitName>Heavy bikes</businessUnitName>
```

```
<businessUnitAddress>
<street>Off Road 66</street>
<postalZipCode>12587</postalZipCode>
<city>Noway</city>
<country>Atlantis</country>
</businessUnitAddress>
</businessUnit>
</enterpriseSpec>
```

2.3.1.12 Manufacturer's logotype

Description: The element <enterpriseLogo> contains logotypes of the manufacturer of the Product.

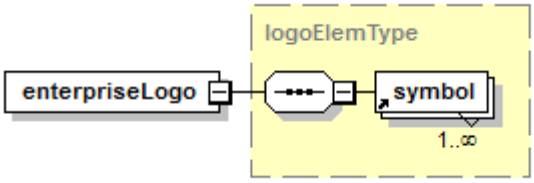
The first appearance of the element <symbol> will by default be the one presented on the title page. Refer to Chap 6.2.3.1.

The content is authored or derived from the source publication module.

Note

As a publication module can include a number of symbols (in the element <logo> in the Identification and status section), a method has to be set up which logotype to be used as the Manufacturer's logo (eg, first logo to be used).

Markup element: <enterpriseLogo>



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Fig 10 Element <enterpriseLogo>

Attributes:

– None

Child elements:

– <symbol>. Refer to Chap 3.9.5.2.1.10.

Note

The following attributes of the element <symbol> must not be used in this context:

- id attribute must not be used. Refer to default BREX rule BREX-S1-00111.
- controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Business rule decision point BRDP-S1-00298 - Use of the element <enterpriseLogo>:

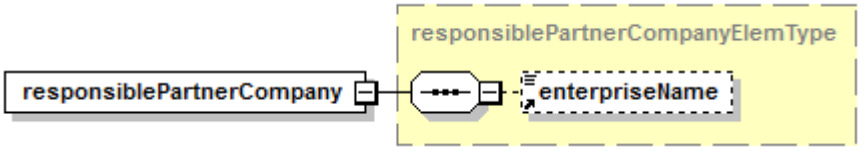
– Decide whether to use the element <enterpriseLogo> and if it is populated from the element <logo> given in the Identification and status section.

2.3.1.13 Publisher

Description: The element <responsiblePartnerCompany> contains the name of the publisher - responsible company, organization or authority - of the publication. Refer to Chap 3.9.5.1.

The content is authored or derived from the source publication module.

Markup element: <responsiblePartnerCompany>



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Fig 11 Element <responsiblePartnerCompany>

Attributes:

- enterpriseCode (O), Refer to Chap 3.9.5.1.
- id must not be used. Refer to default BREX rule BREX-S1-00112.

Child elements:

- <enterpriseName>. Refer to Chap 3.9.5.2.11.6.

Note

The element <enterpriseName> is mandatory in this context (the Schema gives it as optional) and thus governed by the default BREX data module. Refer to default BREX rule BREX-S1-00113.

Markup example:

```
<responsiblePartnerCompany enterpriseCode="I9005">
<enterpriseName>Aerospace and Defence Industries Association of
Europe</enterpriseName>
</responsiblePartnerCompany>
```

2.3.1.14 Publisher's logotype

Description: The element <publisherLogo> contains logotypes of the publisher of the publication.

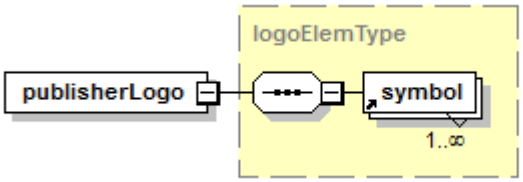
The first appearance of the element <symbol> will by default be the one presented on the title page. Refer to Chap 6.2.3.1.

The content is authored or derived from the source publication module.

Note

As a publication module can include a number of symbols (in the element <logo> in the Identification and status section), a method has to be set up which logotype to be used as the Publisher's logo (eg, first logo to be used).

Markup element: <publisherLogo>



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Fig 12 Element <publisherLogo>

Attributes:

– None

Child elements:

– <symbol>. Refer to Chap 3.9.5.2.1.10.

Note

The following attributes of the element <symbol> must not be used in this context:

– id attribute must not be used. Refer to default BREX rule BREX-S1-00111.
– controlAuthorityRefs **(O)** must not be used. Refer to default BREX rule BREX-S1-00271.

Business rule decision point BRDP-S1-00299 - Method of populating the element <publisherLogo>:

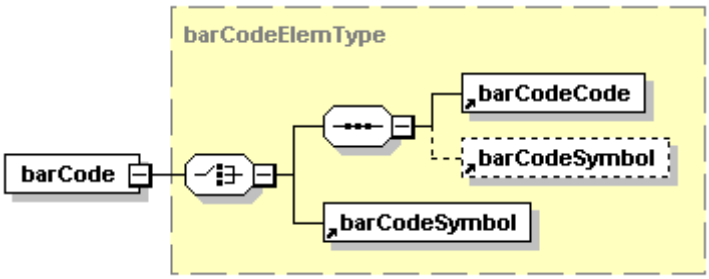
– Decide whether and how to use the element <logo> in the Identification and status section to populate the element <publisherLogo>.

2.3.1.15 Barcode

Description: The element <barCode> contains the barcode information. Several barcodes can be used.

The first appearance of the element <barCode> will by default be the one presented on the title page. Refer to Chap 6.2.3.1.

Markup element: <barCode>



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Fig 13 Element <barCode>

Attributes:

– applicRefId must not be used. Refer to default BREX rules BREX-S1-00115.
– controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

- <barCodeCode>. Refer to Para 2.3.1.15.1.
- <barCodeSymbol>. Refer to Para 2.3.1.15.2.

2.3.1.15.1 Barcode value and symbology

Description: The element <barCodeCode> contains the barcode value and the used symbology.

Markup element: <barCodeCode>

Attributes:

- barCodeValue (M), the value of the barcode
- barCodeSymbology (M), the symbology of the linear or the matrix barcode. The attribute can have one of the following values:
  - "bcs01" thru "bcs99". Refer to Chap 3.9.6.1.

Child elements:

- None

Business rule decision point BRDP-S1-00300 - Use of the attribute barCodeSymbology:

- Decide whether to use the attribute barCodeSymbology and which barcode symbology to be used.

2.3.1.15.2 Barcode symbol

Description: The element <barCodeSymbol> contains the graphical representation of the barcode.

Markup element: <barCodeSymbol>

Attributes:

- infoEntityIdent (M), Refer to Chap 3.9.5.2.1.7.
- reproductionWidth (M) and reproductionHeight (M), the presentation sizes for the presentation system
- id must not be used. Refer to default BREX rule BREX-S1-00116.

Child elements:

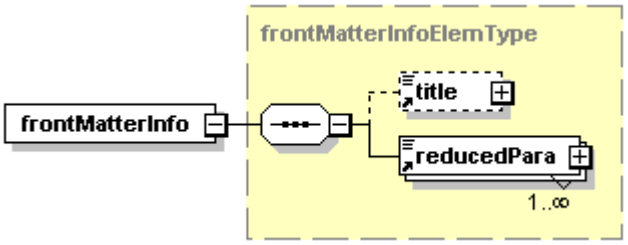
- None

2.3.1.16 Miscellaneous information - Front matter information

Description: The element <frontMatterInfo> contains miscellaneous Front matter information (eg, manufacturer's information, error reporting, availability statements or general-purpose notices including an introductory title). Several sets of Front matter information and types can be given.

The titles must be coded with attribute emphasisType value em01.

Markup element: <frontMatterInfo>



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Fig 14 Element <frontMatterInfo>

Attributes:

– `frontMatterInfoType` (O), the type of Front matter information. The values of this attribute can be used to govern the presentation of the content and also give the title of the actual Front matter information. The attribute can have one of the following values:

- "`fmi01`" thru "`fmi99`". Refer to Chap 3.9.6.1.

Child elements:

– <`title`>. Refer to Para 2.3.1.16.1.
– <`reducedPara`>. Refer to Para 2.3.1.16.2.

Business rule decision point BRDP-S1-00301 - Use of the element <`frontMatterInfo`>:

– Decide whether and how to use the element <`frontMatterInfo`> including the allowed values of the attribute `frontMatterInfoType` and their interpretation as titles at presentation. Refer to Chap 3.9.6.1.

Note

The content given in the element <`title`> takes precedence over the interpretation of the value of the attribute `frontMatterInfoType`.

Markup examples:

This is an example of General information `frontMatterInfoType` = "`fmi01`" with an authored title:

```
<frontMatterInfo frontMatterInfoType="fmi01">
<title>Notice to the reader:</title>
<reducedPara>This publication contains highly sophistcated
stuff. Read it with:
<reducedRandomList listItemPrefix="pf03">
<reducedRandomListItem>
<reducedListItemPara>reflection</reducedListItemPara>
</reducedRandomListItem>
<reducedRandomListItem>
<reducedListItemPara>pride</reducedListItemPara>
</reducedRandomListItem>
</reducedRandomList>
</reducedPara>
</frontMatterInfo>
```

This is an example of Manufacturer's information frontMatterInfoType = "fmi02" with an auto-generated title derived from the meaning of "fmi02". The information is presented on the title page:

```
<frontMatterInfo frontMatterInfoType="fmi02">
<title>Manufacturer's information:</title>
<reducedPara>Greasy Bikes is a well-reputed bike manufacturer
famous for its reliable bikes. However, if something goes wrong,
don't blame us.</reducedPara>
<reducedPara>Any complaint shall be sent to:
<reducedRandomList>
<reducedRandomListItem>
<reducedListItemPara>AECME Bikes, Poste Restante,
Somewhere City, Utopia</reducedListItemPara>
</reducedRandomListItem>
<reducedRandomListItem>
<reducedListItemPara>Greasy Bikes, Off Road 66, Noway,
Atlantis</reducedListItemPara>
</reducedRandomListItem>
</reducedRandomList>
</reducedPara>
</frontMatterInfo>
```

2.3.1.16.1 Title

Description: The element <title> contains the title of the Front matter information and must be presented before the content of the element <reducedPara>. As an alternative, the title can be derived from the attribute frontMatterInfoType if the element <title> is not used.

Note

Any title to be presented in, for example bold, must be coded with corresponding attribute emphasisType value.

Markup element: <title>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- Includes the same set of elements of the textElemGroup as used in the element <para> in descriptive data modules. Refer to Chap 3.9.5.2.1.10.

Business rule decision point BRDP-S1-00302 - Use of the element <title> in the element <frontMatterInfo>:

– Decide whether to use the content of the element <title> or the interpretation of the value of the attribute frontMatterInfoType as the title of the Front matter information.

2.3.1.16.2 Reduced paragraph

Description: The element <reducedPara> contains the Front matter information (eg, manufacturer's information, error reporting, availability statements or general-purpose notices). Refer to Chap 3.9.5.2.1.10.

2.3.2 Table of contents

Description: The element <frontMatterTableOfContent> contains the Table of contents information. Two types of Table of contents are possible:

– A non-hierarchical (flat) structure. Refer to Fig 15.
– A hierarchical structure. Refer to Fig 16.

Both types list the data modules and any publications or external publications in the order given by the source publication module.

Note

The front matter data module title to be presented is derived from the elements <infoName> and <infoNameVariant>. The content of the element <techName> is suppressed. Refer to Para 2.1 and the general rules in Chap 6.2.3.1.

Table of contents

The listed documents are included in issue 004, dated 2012-12-24, of this publication.

Title	Data module code Publication module code	Issue date	No. of pages	Applicable to
Copyright	X4-A-00-00-00-01A-021A-A	2012-12-24	1	All
Highlights	X4-A-00-00-00-00A-00UA-A	2012-12-24	1	All
Introduction	X4-A-00-00-00-01A-018A-A	2011-11-01	4	All
Steamroller - Description	X4-A-00-00-00-00A-040A-A	2008-07-01	5	All
Steamroller - Description	X4-A-00-00-00-01A-040A-A	2011-11-01	7	Mk1
Steamroller - Description	X4-A-00-00-00-03A-040A-A	2012-12-24	8	MK2
…				

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Fig 15 Table of contents, non-hierarchical - S1000D standard page-oriented presentation, example

Table of contents

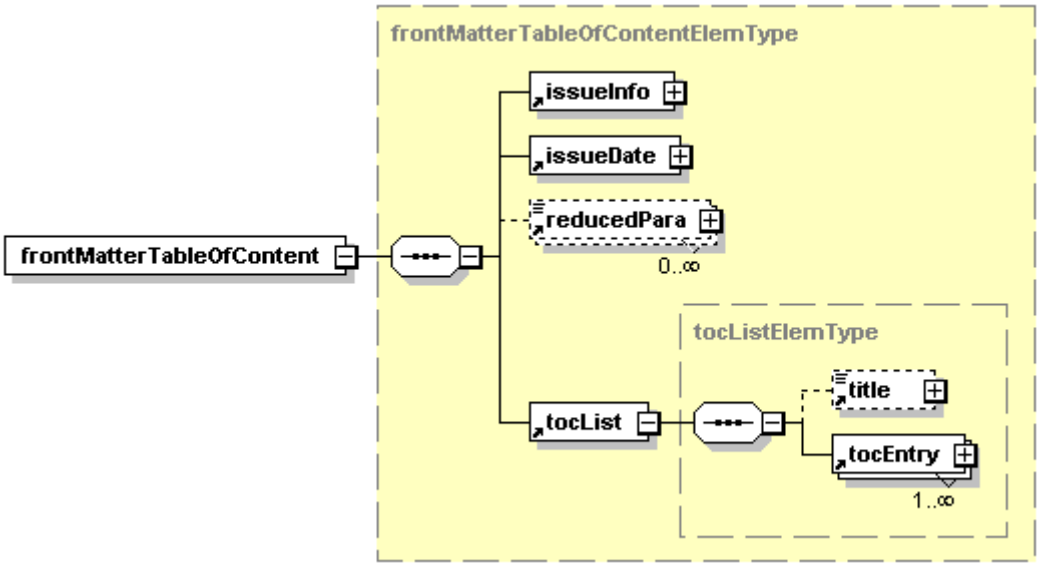
The listed documents are included in issue 016, dated 2013-01-04, of this publication.

Title	Data module code Publication module code	Issue No.	No. of pages	Applicable to
Copyright	E2-A-72-00-00-01A-021A-A	1	1	All
Highlights	E2-A-72-00-00-00A-003A-A	16	1	All
Introduction	E2-A-72-00-00-01A-018A-A	16	4	All
72 Engine				
72-00-00 Engine general				
Engine - Description of how it is made and its function	E2-A-72-00-00-00A-040A-D	12	5	All
Engine - Performance data	E2-A-72-00-00-00A-030A-D	3	7	All
72-10-00 Reduction gear, shaft section				
Reduction gear, shaft section - Description of how it is made and its function	E2-A-72-10-00-00A-040A-D	4	8	All
Reduction gear, shaft section - Performance data	E2-A-72-10-00-00A-030A-D	3	4	All
...				

ICN-S3627-S1000D0607-003-01

Fig 16 Table of contents, hierarchical - S1000D standard page-oriented presentation, example

Markup element: <frontMatterTableOfContent>



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Fig 17 Element <frontMatterTableOfContent>

Attributes:

– None

Child elements:

– <issueInfo>. Refer to Para 2.3.2.1.
– <issueDate>. Refer to Para 2.3.2.1.
– <reducedPara>. Refer to Para 2.3.2.2.
– <tocList>. Refer to Para 2.3.2.3.

2.3.2.1 Issue information and date

Description: The elements <issueInfo> and <issueDate> contain the issue number, the inwork number and the issue date, respectively, of the publication to be presented in the introductory paragraph and the footer of the Table of contents.

The content is authored or derived from the source publication module.

Markup elements: <issueInfo> and <issueDate>. Refer to Chap 3.9.5.1.

2.3.2.2 Introductory paragraph

Description: The element <reducedPara> contains the introductory paragraph of the Table of contents.

For the S1000D standard page-oriented presentation, the following introductory paragraph is used:

"The listed documents are included in issue XXX, dated YYYY-MM-DD, of this publication."

"XXX" is the issue number given in the element <issueInfo> and "YYYY-MM-DD" is the issue date given in the element <issueDate> Refer to Para 2.3.2.1.

Markup element: <reducedPara>. Refer to Chap 3.9.5.2.1.10.

Business rule decision point BRDP-S1-00303 - Use the element <reducedPara> in the element <frontMatterTableOfContent>:

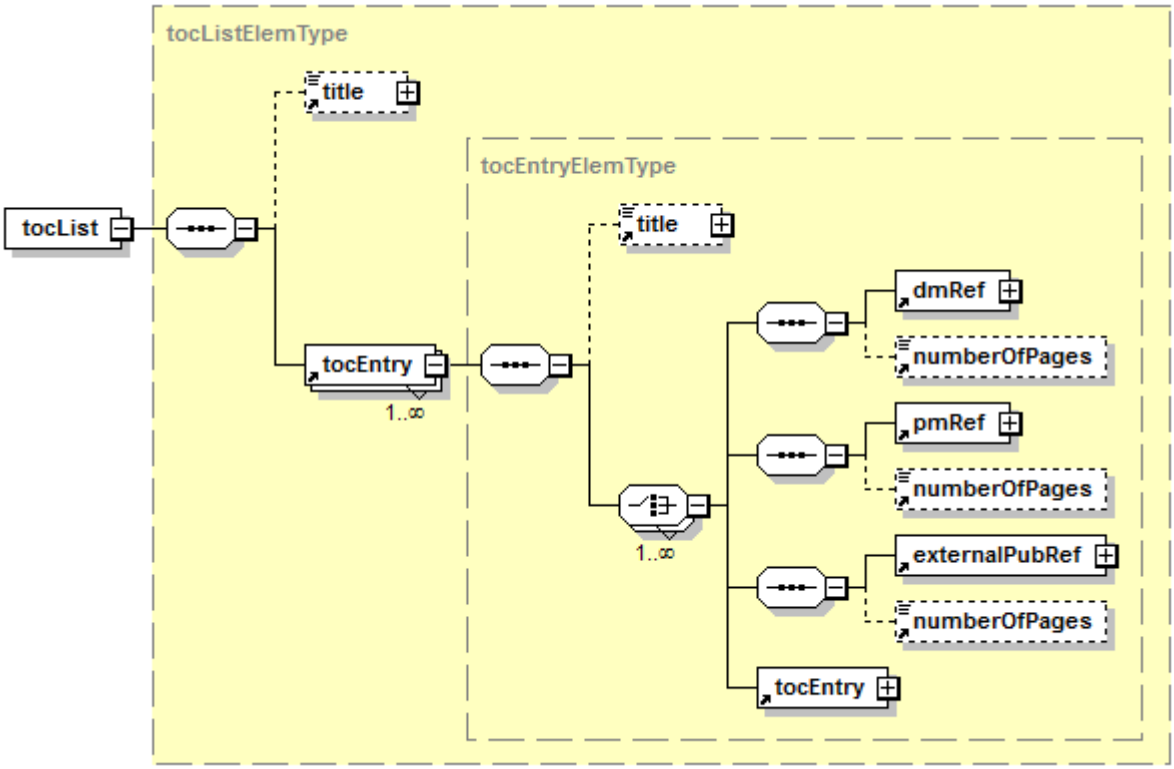
– Decide whether to use the introductory paragraph and on the wording of any standard phrase.

2.3.2.3 Table of contents list

Description: The element <tocList> contains the list of all documents (data modules, publication modules and non-S1000D publications) in the publication.

The list entries must be given in the order of appearance in the publication.

Markup element: <tocList>



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Fig 18 Element <tocList>

Attributes:

– None

Child elements:

– <title>. Refer to Para 2.3.1.16.1.
– <tocEntry>. Refer to Para 2.3.2.3.2.

2.3.2.3.1 Table of contents entry title

Description: The element <title> contains the title for a group of entries in the Table of contents. The element <title> is used for the hierarchical Table of contents.

Several hierarchical levels can be included by using the element <title> in the element <tocEntry>.

The title can be derived from the element <pmEntryTitle> in the source publication module. Refer to Chap 4.9.1.

Markup element: <title>. Refer to Para 2.3.1.16.1.

2.3.2.3.2 Table of contents entry

Description: The element <tocEntry> contains the document title, document code, issue information, number of pages and applicability for each entry in the Table of contents. It is also used to build the title hierarchy by only using the elements <title> and <tocEntry>.

The content is authored or derived from the source publication module.

Note

The titles can be derived from the element <pmEntryTitle> in the source publication module and replicate the hierarchy therein.

Markup element: <tocEntry>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.

  Note

  It is recommended not to use this attribute as the applicability for each entry (data module, publication module or non-S1000D publication) is given by the attribute applicRefId in the elements <dmRef>, <pmRef> and <externalPubRef>, respectively.

- controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

- <title>. Refer to Para 2.3.1.16.1.
- <dmRef>. Refer to Para 2.3.2.3.3.
- <pmRef>. Refer to Para 2.3.2.3.4.
- <externalPubRef>. Refer to Para 2.3.2.3.5.
- <numberOfPages>. Refer to Para 2.3.2.3.6.
- <tocEntry>. Refer to Para 2.3.2.3.2.

2.3.2.3.3 Data module entry

Description: The element <dmRef> contains the entry details for the data modules that are presented in the Table of contents. The following elements must (M)/can (O) be populated:

- the data module title by the elements <techName> (M), <infoName> (O) and <infoNameVariant> (O). Refer to default BREX rule BREX-S1-00120.
- the data module identifier by the elements <dmCode> (M) and <identExtension> (O)
- the issue information by the element <issueDate> (O) and/or the element <issueInfo> (O)
- the applicability by the attribute applicRefId (M)

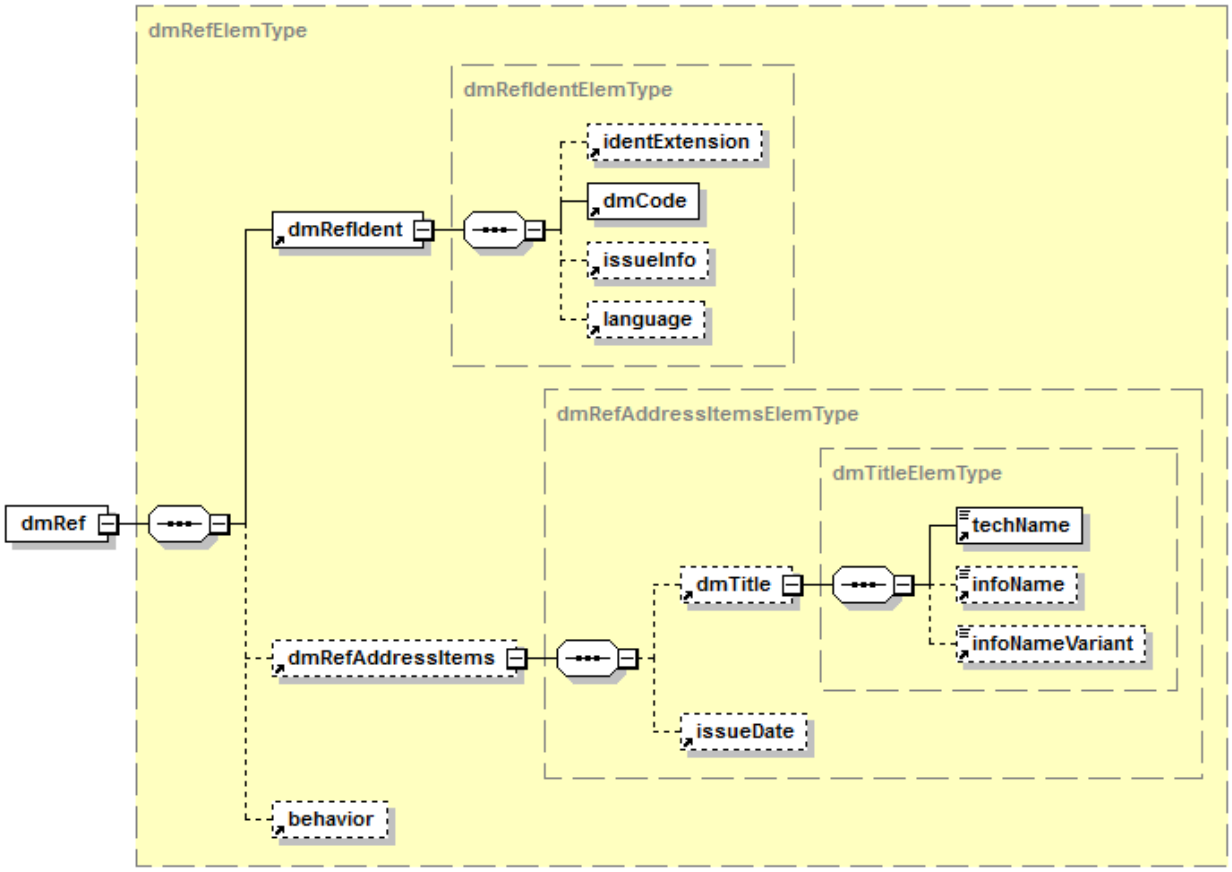
  The attribute applicRefId is mandatory in this context (the Schema gives it as optional) and thus governed by the default BREX data module. Refer to default BREX rule BREX-S1-00121.

– the number of pages by the element <numberOfPages> (O), Refer to Para 2.3.2.3.6.

Note

The TOC must not include the Title page, LOEDM, LOEP, Change Record (CR) or TOC itself.

Markup element: <dmRef>



ICN-S3627-S1000D0584-002-01

Fig 19 Element <dmRef>

Attributes:

Refer to Chap 3.9.5.2.1.2 with the following exceptions:

– applicRefId (M), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.

Recommendation: It is recommended to use/present the element <displayText> when the Table of contents data module is intended for page-oriented presentation. This simplifies the complexity of the functionality of the page-layout application.

– referredFragment and id must not be used. Refer to default BREX rules BREX-S1-00122 and BREX-S1-00123.
– controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

Refer to Chap 3.9.5.2.1.2.

2.3.2.3.4 Publication module entry

Description: The element <pmRef> contains the entry details for the publication modules to be presented in the Table of contents. The following elements must (M)/can (O) be populated:

- the publication module title by the elements <pmTitle> (M) and <shortPmTitle> (O)

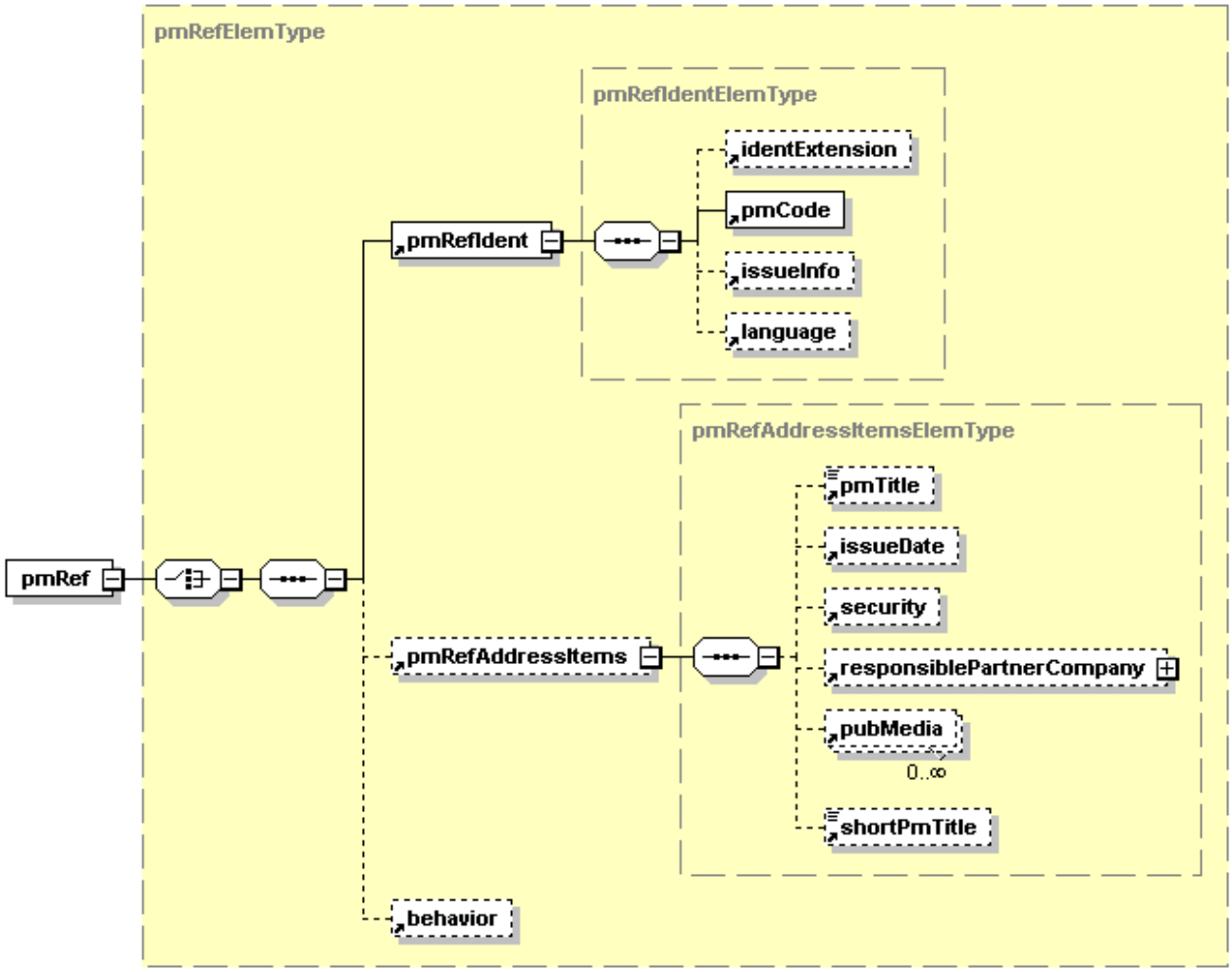
  The publication module title (<pmTitle>) must be included as it must be presented. This is governed by the default BREX data module. Refer to default BREX rule BREX-S1-00124.

- the publication module identifier by the elements <pmCode> (M) and <identExtension> (O)
- the issue information by the element <issueDate> (O) and/or the element <issueInfo> (O)
- the applicability by the attribute applicRefId (M)

  The attribute applicRefId is mandatory in this context (the Schema gives it as optional) and thus governed by the default BREX data module. Refer to default BREX rule BREX-S1-00125.

- the number of pages by the element <numberOfPages> (O), Refer to Para 2.3.2.3.6.

Markup element: <pmRef>



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Fig 20 Element <pmRef>

Attributes:

Refer to Chap 3.9.5.2.1.2 with the following exceptions:

- `applicRefId` (M), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.

  Recommendation: It is recommended to use/present the element <`displayText`> when the Table of contents data module is intended for page-oriented presentation. This simplifies the complexity of the functionality of the page-layout application.

- `id` must not be used. Refer to default BREX rule BREX-S1-00126.
- `controlAuthorityRefs` (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

Refer to Chap 3.9.5.2.1.2.

2.3.2.3.5 Non-S1000D publication entry (external publication entry)

Description: The element <externalPubRef> contains the entry details for the non-S1000D publications (external publications) to be presented in the Table of contents. The following elements must (M)/can (O) be populated:

- the non-S1000D publication title by the elements <externalPubTitle> (M) and <shortExternalPubTitle> (O)
- the non-S1000D publication identifier by the element <externalPubCode> (M)

  The identifier must be included as it must be presented. This is governed by the default BREX data module. Refer to default BREX rule BREX-S1-00127.

- the issue information by the element <externalPubIssueDate> (O) and/or the element <externalPubIssueInfo> (O)
- the applicability by the attribute applicRefId (M)

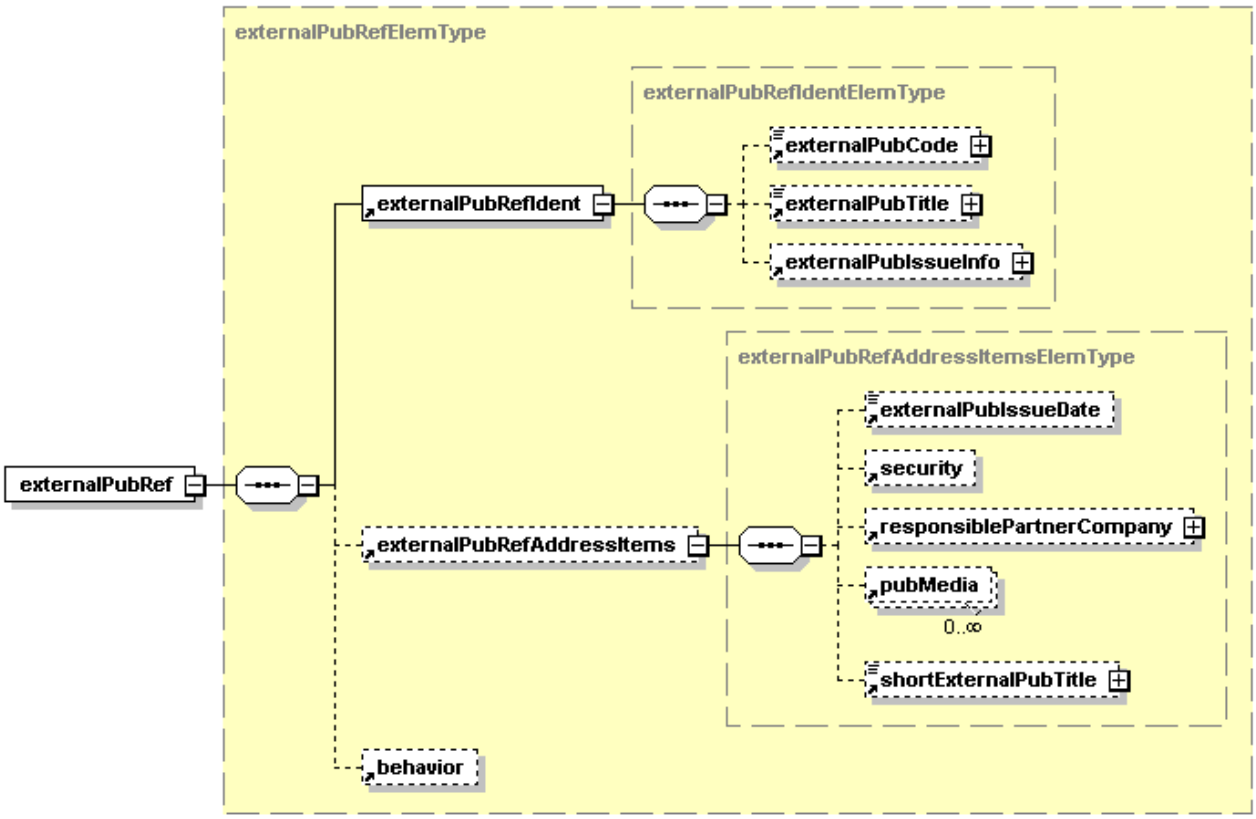
  The attribute applicRefId is mandatory in this context (the Schema gives it as optional) and thus governed by the default BREX data module. Refer to default BREX rule BREX-S1-00128.

- the number of pages by the element <numberOfPages> (O), Refer to Para 2.3.2.3.6.

Note

The classification of the elements and attributes above is based on the rules given in Chap 3.9.4.

Markup element: <externalPubRef>



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Fig 21 Element <externalPubRef>

Attributes:

Refer to Chap 3.9.5.2.1.2 with the following exceptions:

- `applicRefId` (M), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.

  Recommendation: It is recommended to use/present the element <`displayText`> when the Table of contents data module is intended for page-oriented presentation. This simplifies the complexity of the functionality of the page-layout application.

- `id` must not be used. Refer to default BREX rule BREX-S1-00129.
- `controlAuthorityRefs` (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

Refer to Chap 3.9.5.2.1.2.

2.3.2.3.6 Number of pages

Description: The element <`numberOfPages`> contains the number of pages in the entries for data modules, publications and non-S1000D publications in LOEDM and HIGH.

When used for LOEP this element contains the page number.

Markup element: <`numberOfPages`>

Attributes:

- None

Child elements:

- None

2.3.3 Front matter lists

Description: The element <`frontMatterList`> contains the information for the:

- List of effective pages - LOEP
- List of effective data modules - LOEDM
- Highlights - HIGH

The Schema also supports the capturing and representation of publication lists for the List of applicable publications.

List of effective pages

This publication includes the following pages after insertion of issue 004, dated 2012-12-24.

C = Changed page

N = New page

Data module code	Page		Issue date	Applicable to
X4-A-00-00-00-00A-001A-A	1	C	2012-12-24	All
X4-A-00-00-00-01A-021A-A	1	N	2012-12-24	All
X4-A-00-00-00-00A-00RA-A	1	C	2012-12-24	All
	2	C	2012-12-24	All
	3	C	2012-12-24	All
X4-A-00-00-00-00A-00TA-A	1		2002-11-01	All
X4-A-00-00-00-00A-00UA-A	1	C	2012-12-24	All
X4-A-00-00-00-00A-009A-A	1	C	2012-12-24	All
X4-A-00-00-00-01A-018A-A	1		2011-11-01	All
	2		2011-11-01	All
	3		2011-11-01	All
	4		2011-11-01	All
X4-A-00-00-00-00A-040A-A	1		2008-07-01	All

...

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Fig 22 LOEP - S1000D standard page-oriented presentation, example

List of effective data modules

The listed documents are included in issue 004, dated 2012-12-24, of this publication.

C = Changed data module

N = New data module

Title	Data module code Publication module code		Issue date	No. of pages	Applicable to
Title page	X4-A-00-00-00-00A-001A-A	C	2012-12-24	1	All
Copyright	X4-A-00-00-00-01A-021A-A	N	2012-12-24	1	All
List of effective data modules	X4-A-00-00-00-00A-00SA-A	C	2012-12-24	1	All
Change record	X4-A-00-00-00-00A-00TA-A		2002-11-01	1	All
Highlights	X4-A-00-00-00-00A-00UA-A	C	2012-12-24	1	All
Introduction	X4-A-00-00-00-01A-018A-A		2011-11-01	4	All
Steamroller - Description	X4-A-00-00-00-00A-040A-A		2008-07-01	5	All
Steamroller - Description	X4-A-00-00-00-01A-040A-A		2011-11-01	7	Mk1
Steamroller - Description	X4-A-00-00-00-03A-040A-A	C	2012-12-24	8	Mk2

...

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Fig 23 LOEDM - S1000D standard page-oriented presentation, example

Highlights

Issue 004

The listed changes are introduced in issue 004, dated 2012-12-24, of this publication.

Data module	Reason for update
X4-A-00-00-00-01A-021A-A	Copyright and data restrictions introduced
X4-A-00-00-00-03A-040A-A	Flywheel and piston modified
X4-A-00-41-01-00A-040A-A	New

Updating instruction

Remove or insert data modules as listed in Table 1.

I = Insert data module

R = Remove data module

Table 1 Data modules to be removed or inserted

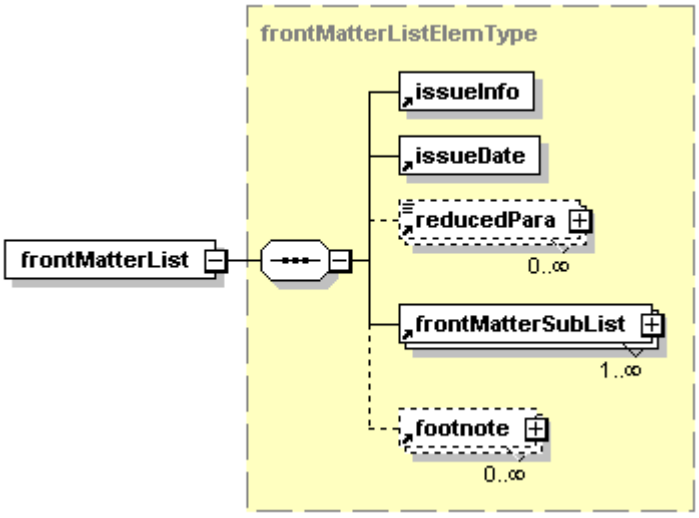
Data module code	Title		Issue date	No. of pages	Applicable to
X4-A-00-00-00-00A-001A-A	Title page	R	2011-09-30	1	All
		I	2012-12-24	1	All
X4-A-00-00-00-01A-021A-A	Copyright	I	2012-12-24	1	All
X4-A-00-00-00-00A-00SA-A	List of effective data modules	R	2011-09-30	1	All
		I	2012-12-24	1	All
X4-A-00-00-00-00A-00UA-A	Highlights	R	2011-09-30	1	All
		I	2012-12-24	1	All
X4-A-00-00-00-02A-040A-A	Steamroller - Description	R	2008-07-01	6	Mk2

...

ICN-S3627-S1000D0610-002-01

Fig 24 HIGH with updating instruction - S1000D standard page-oriented presentation, example

Markup element: <frontMatterList>



ICN-S3627-S1000D0587-001-01

Fig 25 Element <frontMatterList>

Attributes:

– frontMatterType (M), the type of Front matter (eg, HIGH, LOEDM). The values of this attribute can be used to govern the presentation of the content and also give the title of the actual Front matter. The attribute can have one of the following values:

- "fm01" thru "fm99". Refer to Chap 3.9.6.1.

Child elements:

– <issueInfo>. Refer to Para 2.3.2.1.
– <issueDate>. Refer to Para 2.3.2.1.
– <reducedPara>. Refer to Para 2.3.3.1.
– <frontMatterSubList>. Refer to Para 2.3.3.2.
– <footnote>. Refer to Para 2.3.3.3.

2.3.3.1 Introductory paragraph

Description: The element <reducedPara> contains the introductory paragraph of the actual Front matter.

For the S1000D standard page-oriented presentation, the following introductory paragraphs are used:

LOEP (value "fm01"):

"This publication includes the following pages after insertion of issue XXX, dated YYYY-MM-DD.

C = Changed page

N = New page"

LOEP (value "fm02"):

"The listed data modules are included in issue XXX, dated YYY-MM-DD, of this publication.

C = Changed data module

N= New data module"

HIGH (value "fm03" and "fm04"):

"The listed changes are introduced in issue XXX, dated YYY-MM-DD, of this publication."

"XXX" is the issue number given the element <issueInfo> and "YYYY-MM-DD" is the issue date given in the element <issueDate> Refer to Para 2.3.1.4.

Markup element: <reducedPara>. Refer to Para 2.3.1.16.2.

Business rule decision point BRDP-S1-00309 - Use the element <reducedPara> in the element <frontMatterList>:

- Decide whether to use the introductory paragraph and on the wording of any standard phrase for each of the front matter list.

2.3.3.2 Front matter sublist
Description: The element <frontMatterSubList> contains the information for the:

- List of effective pages - LOEP. Refer to Para 2.3.3.2.1.
- List of effective data modules - LOEDM. Refer to Para 2.3.3.2.2.
- Highlights - HIGH (without and with updating instructions). Refer to Para 2.3.3.2.3 and Para 2.3.3.2.4.

The entries can be grouped in one or more front matter lists (<frontMatterSubList>) each having a title (<title>) and one or more introductory paragraphs (<reducedPara>).

2.3.3.2.1 Front matter sublist - LOEP
When used for LOEP, every data module has to be broken down to pages with each page being represented by an entry (<frontMatterDmEntry>). If, by project decision, publication modules have to be included in the LOEP they are represented in their entirety by an entry (<frontMatterPmEntry>). The same applies to non-S1000D publications.

2.3.3.2.2 Front matter sublist - LOEDM
When used for LOEDM, every data module is being represented by an entry (<frontMatterDmEntry>). If, by project decision, publication modules have to be included in the LOEP they are represented in their entirety by an entry (<frontMatterPmEntry>). The same applies to non-S1000D publications.

2.3.3.2.3 Front matter sublist - HIGH
When used for HIGH, every data module having content in the element <reasonForUpdate> has to be listed as an entry (<frontMatterDmEntry>) in the first appearance of the element <frontMatterSubList>.

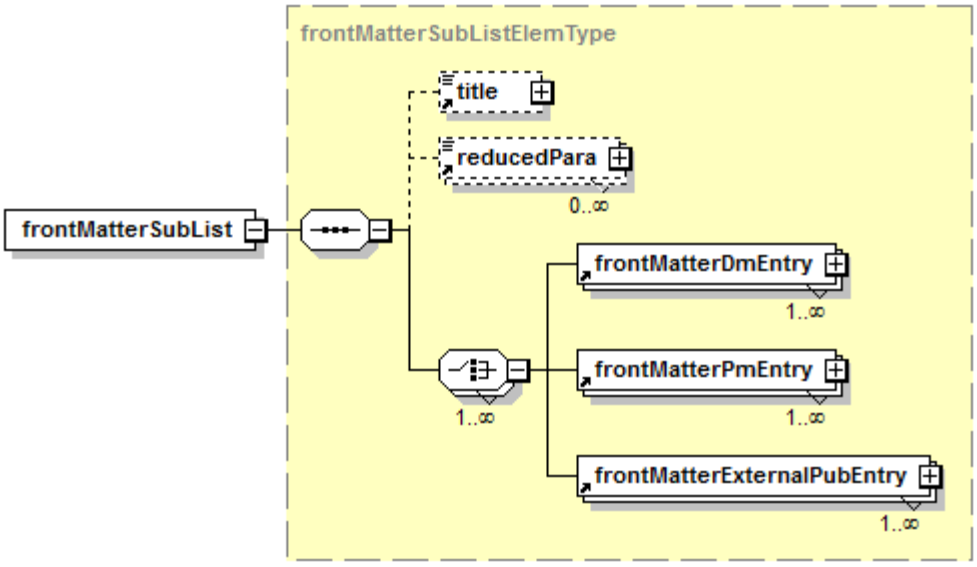
This sublist is also used for Highlights with updating instructions.

2.3.3.2.4 Front matter sublist - HIGH with updating instructions
When used for Highlights with updating instructions, the second appearance of the element <frontMatterSubList> includes a fixed title and an introductory paragraph for the Updating instruction. Refer to Para 2.3.3.2.5 and Para 2.3.3.2.6 respectively.

- All data modules having a value given for the attribute issueType must have an entry (<frontMatterDmEntry>)

- All entries with attribute issueType = "revised"/"changed"/"status" (data modules to be inserted) must be preceded by an entry with attribute issueType = "deleted" of the revised/changed/status data module (data modules to be removed).
- The elements <dmCode>, <dmTitle> and <numberOfPages>, and depending on project decision, the element <issueDate> or the element <issueInfo> are populated. The attribute applicRefId is optional.

Markup element: <frontMatterSubList>



ICN-S3627-S1000D0588-001-01

Fig 26 Element <frontMatterSubList>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

- <title>. Refer to Para 2.3.3.2.5.
- <reducedPara>. Refer to Para 2.3.3.2.6.
- <frontMatterDmEntry>. Refer to Para 2.3.3.2.7.
- <frontMatterPmEntry>. Refer to Para 2.3.3.2.8.
- <frontMatterExternalPubEntry>. Refer to Para 2.3.3.2.9.

2.3.3.2.5 Sublist title

Description: The element <title> contains the title for a group of entries (a sublist). When used for Highlights with updating instructions the fixed title "Updating instruction" must be used in the second appearance of the of <frontMatterSubList>.

Markup element: <title>. Refer to Para 2.3.1.16.1.

2.3.3.2.6 Introductory paragraphs to sublists, etc

Refer to Para 2.3.1.16.2.

When used for Highlights with updating instructions (value "fm04") and S1000D standard page-oriented presentation, the following introductory paragraphs are used:

"Remove or insert data modules as listed in Table 1.

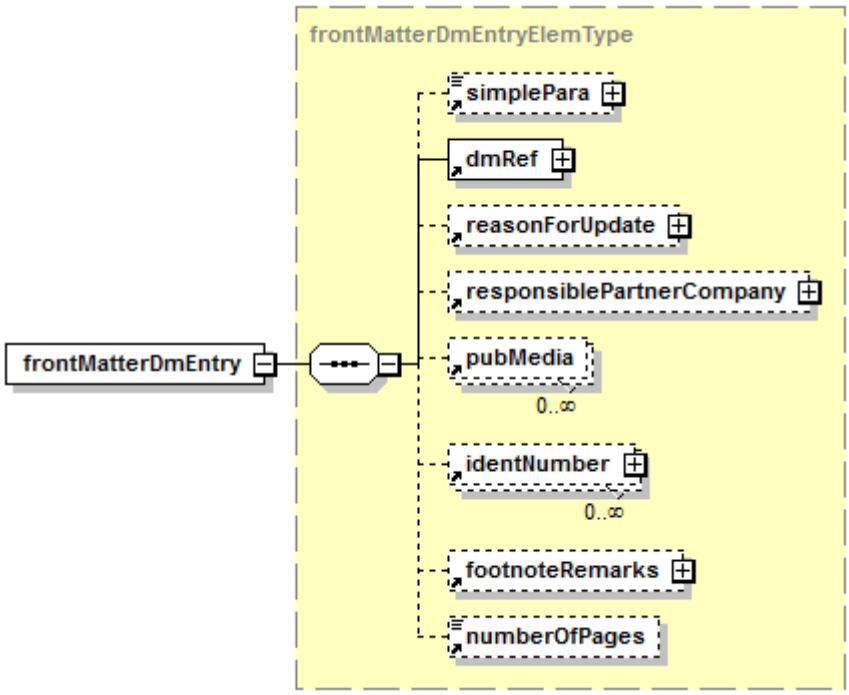
I = Insert data module

R = Remove data module"

2.3.3.2.7 Front matter data module entry

Description: The element <frontMatterDmEntry> contains the data module entry. The order of the front matter data module entries must follow structure of the publication (= TOC).

Markup element: <frontMatterDmEntry>



ICN-S3627-S1000D0589-001-01

Fig 27 Element <frontMatterDmEntry>

Attributes:

- issueType (O), Refer to Para 2.3.3.2.10.
- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3 and Para 2.3.3.2.11.
- controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

- <simplePara>. Used for simple statements. Not specifically required by any of the Front matter types. Refer to Chap 3.9.5.2.1.10.
- <dmRef>. Used for "Title", "Data module code", issue information ("Issue date" and/or "Issue No.") in LOEP, LOEDM and HIGH, and for "Language" in publication lists for the List of applicable publications (LOAP). Refer to Para 2.3.2.3.3.

Note

Para 2.3.2.3.3 gives the mandatory and optional elements related to the Table of contents.

The information is authored or derived from the source publication module.

Mandatory elements, depending on the Front matter type, are given in Chap 3.9.4. For Highlights with updating instructions, refer to Para 2.3.3.2.4.

– <reasonForUpdate>. Used for "Reason for update" in HIGH where it is mandatory. This is governed by the default BREX data module.

  The information is authored or derived from the data module referenced in the source publication module.

  Refer to Chap 3.9.5.2.1.1.

– <responsiblePartnerCompany>. Used for "Publisher" in publication lists for the List of applicable publications.

  The information is authored or derived from the data module referenced in the source publication module.

  Refer to Para 2.3.1.13.

– <pubMedia>. Used for "Media information" in publication lists for the List of applicable publications.

  The information is authored as there is no information on delivery media which can be derived from the data module referenced in the source publication module.

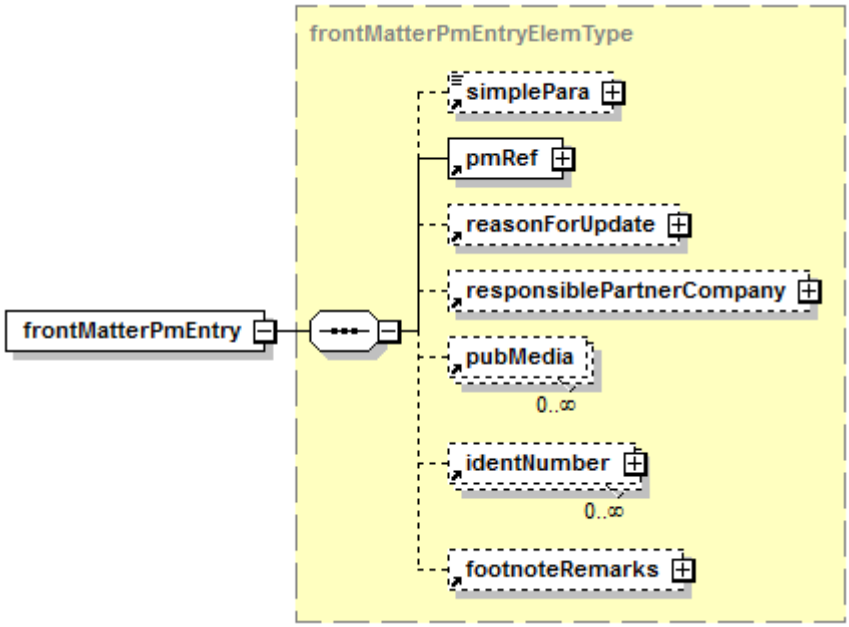
  Refer to Chap 4.9.1.

– <identNumber>. Refer to Para 2.3.1.6.5.
– <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9.
– <numberOfPages>. The total number of pages in the data module when used for "No. of pages" in the LOEDM and the HIGH with updating procedures. The individual page number when used for "Page" in the LOEP. Refer to Para 2.3.2.3.6.

2.3.3.2.8 Front matter publication module entry

Description: The element <frontMatterPmEntry> contains the publication module entry.

Markup element: <frontMatterPmEntry>



ICN-S3627-S1000D0590-001-01

Fig 28 Element <frontMatterPmEntry>

Attributes:

- issueType (O), Refer to Para 2.3.3.2.10.
- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3 and to Para 2.3.3.2.11.
- controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

- <simplePara>. Used for simple statements. Not specifically required by any of the Front matter types. Refer to Chap 3.9.5.2.1.10.
- <pmRef>. Used for "Title", "Publication module code", issue information "Issue date" and/or Issue No." in LOEP, LOEDM and HIGH, and for "Language" in publication lists for the List of applicable publications (LOAP). Refer to Para 2.3.2.3.4.

  Note

  Para 2.3.2.3.4 contains the mandatory and optional elements related to Table of contents.

  The information is authored or derived from the source publication module.

  Mandatory elements, depending on the Front matter type, are given in Chap 3.9.4.

- <reasonForUpdate>. Used for "Reason for update" in HIGH where it is mandatory. This is governed by the default BREX data module.

  The information is authored or derived from the publication module referenced in the source publication module.

  Refer to Chap 3.9.5.2.1.1.

- <responsiblePartnerCompany>. Used for "Publisher" in publication lists for the List of applicable publications.

The information is authored or derived from the publication module referenced in the source publication module.

Refer to Para 2.3.1.13.

– <pubMedia>. Used for "Media information" in publication lists for the List of applicable publications.

  The information is authored or derived from the publication module referenced in the source publication module.

  Refer to Chap 4.9.1.

– <identNumber>. Refer to Para 2.3.1.6.5.
– <footnoteRemarks>. Refer to Chap 3.9.5.2.1.9. By project decision, the element can be used to store the total number of pages to be presented in LOEDM if the LOEDM includes publications.

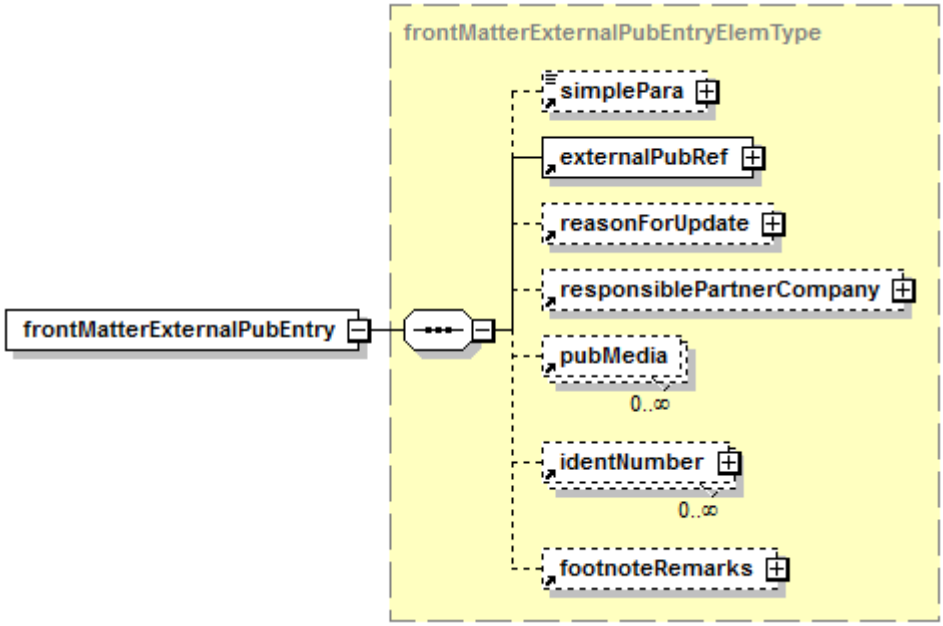
Business rule decision point BRDP-S1-00310 - How to store total number of pages for S1000D publications:

– Decide on the use of <footnoteRemarks> to store the total number of pages for a complete S1000D publication.

2.3.3.2.9 Front matter non-S1000D publication entry

Description: The element <frontMatterExternalPubEntry> contains the non-S1000D publication (external publication) entry.

Markup element: <frontMatterExternalPubEntry>



ICN-S3627-S1000D0591-001-01

Fig 29 Element <frontMatterPmEntry>

Attributes:

– issueType (O), Refer to Para 2.3.3.2.10.
– applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3 and to Para 2.3.3.2.11.

- controlAuthorityRefs (O) must not be used. Refer to default BREX rule BREX-S1-00271.

Child elements:

- <simplePara>. Used for simple statements. Not specifically required by any of the Front matter types. Refer to Chap 3.9.5.2.1.10.
- <externalPubRef>. Used in LOEP, LOEDM and HIGH for:
  - "Titles" (<externalPubTitle>)
  - "Publication module code" (<externalPubCode>)
  - issue information
    - "Issue date" (<externalPubIssueDate>)

    and/or

    - "Issue No." (<externalPubIssueInfo>)

      Can also be used for "Language" in publication lists for the List of applicable publications.

  The information is authored or derived from the external publication referenced in the source publication module.

  Note
  "Language" has to be authored as it is not available in the current construct of the element <externalPubRefIdent>.

  Refer to Para 2.3.2.3.5.

  Note
  Para 2.3.2.3.5 gives the mandatory and optional related to Table of contents.

  Mandatory elements, depending on the Front matter type, are given in Chap 3.9.4.
- <reasonForUpdate>. Used for Reason for update" in HIGH where it is mandatory. This is governed by the default BREX data module.

  The information is authored or derived from the external publication referenced in the source publication module.

  Refer to Chap 3.9.5.2.1.1.
- <responsiblePartnerCompany>. Used for "Publisher" in publication lists for the List of applicable publications.

  The information is authored or derived from the external publication referenced in the source publication module.

  Refer to Para 2.3.1.13.
- <pubMedia>. Used for "Media information" in publication lists for the List of applicable publications.

  The information is authored or derived from the external publication referenced in the source publication module.

  Refer to Chap 4.9.1.
- <identNumber>. Refer to Para 2.3.1.6.5.

– <footNoteRemarks>. Refer to Chap 3.9.5.2.1.9. By project decision, the element can be used to store the total number of pages to be presented in LOEDM if the LOEDM includes publications.

Business rule decision point BRDP-S1-00311 - How to store total number of pages for non-S1000D publications:

– Decide on the use of <footnoteRemarks> to store the total number of pages for a complete non-S1000D publication.

2.3.3.2.10 Issue type

The attribute issueType contains the issue status of the entry and can be used to generate the value to be presented on the LOEP, LOEDM and HIGH.

2.3.3.2.11 Applicability of Front matter lists entries

Care must be taken on the use of the attribute applicRefId as it appears on several levels. If there is a mismatch, the lowest level must take precedence as this is the value given in the referenced data module, publication and non-S1000D publication.

2.3.3.3 Footnotes

The element <footnote> must not include any lists or make references to other footnotes. Refer to default BREX rule BREX-S1-00130.

Refer to Chap 3.9.5.2.1.10.

3 Markup examples

The markup behind Fig 3 and Fig 4 (also presented in Chap 6.2.3.1), S1000DBIKE-AAA-DA2-20-0000-00A-001A-A is given in Chap 3.9.5.2.16.1.

Markup examples of front matter data modules originated from publication module PMC-X4-B6865-AMP00-00_004-01 are given in a front matter package downloadable from www.s1000d.org. For details of front matter package, refer to Chap 3.9.5.2.16.1.

Chapter 3.9.5.2.16.1

Front matter - Markup examples

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Table 1 References

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Chap 3.9.4	Authoring - Front matter
Chap 3.9.5.2.16	Content section - Front matter
Chap 6.2.3.1	Layout rules and examples - Front matter data modules

1 General

A package of an example of the front matter data modules for a Steamroller handbook is provided in down load package **S1000D_X-X_FM_Samples.zip** (where X-X is the issue number of the specification) from www.s1000d.org. It includes a publication module and all the basic front matter data modules for a Steamroller, which has a model identification code set to "X4".

The set of front matter data modules XML files, originated from the publication module PMC-X4-B6865-AMP00-00_004-01, can be used for setting up and testing an automated process to produce the basic front matter data modules.

The package also includes a publication module and a hierarchical Table of contents for a Steam engine handbook, which has the model identification code set to "E2".

This front matter package can be used to set up and test your system regarding front matter.

The XML markup of the title page, S1000DBIKE-AAA-DA2-20-0000-00A-001A-A, as presented in and Chap 3.9.5.2.16 and Chap 6.2.3.1 is given in Para 5.

2 Publication modules

FM sample X.X - Publication modules.zip

The package includes the publication modules that can be used to automate the production of:

– Title page - TITLE

- List of effective pages - LOEP
- List of effective data modules - LOEDM
- Highlights - HIGH
- Table of contents - TOC

A publication module for the first volume of the introduction of an advanced maintenance publication for the Steamroller, which uses a linear TOC is provided. Refer to Chap 3.9.4 and Chap 6.2.3.1.

Also, a publication module for the Steam engine handbook using a hierarchical TOC is provided. Refer to Chap 3.9.4 and Chap 6.2.3.1.

3 Data modules

FM sample X.X - Data modules.zip

The package includes examples of the following front matter data modules referred from the publication module **PMC-X4-B6865-AMP00-01**:

- Title page - TITLE
- List of effective pages - LOEP
- List of effective data modules - LOEDM
- Change record - CR
- Highlights - HIGH
- Highlights with updating instructions - HIGH[1]
- Technical standard record - TSR
- Table of contents - TOC

For each front matter data modules an example is given of:

- the data module as an XML file
- the same data module showing the XML markup in an MS Word™ file
- the final presentation of the data module in an MS Word™ file
- the final presentation of the data module in a PDF™ file

Note

The presentation is in line with the S1000D standard page-oriented presentations. Refer to Chap 6.2.3.1.

An example of a hierarchical Table of contents data module referred from the publication module **PMC-E2-B6865-EMP72-00** is included in the data module package.

4 Illustrations

FM sample X.X - Illustrations.zip

The illustrations used in the front matter PM and data modules are included.

5 Example of a basic title page

This example shows the markup of S1000DBIKE-AAA-DA2-20-0000-00A-001A-A as presented in and Chap 3.9.5.2.16 and Chap 6.2.3.1:

```
<content>
<frontMatter>
<frontMatterTitlePage>
<productIntroName>
```

[1] A HIGH with updating instructions is enclosed in the package, but not used in the PM.

```
<name>Mountain bike</name>
</productIntroName>
<pmTitle>Advance maintenance publication Pedals - Volume
16</pmTitle>
<shortPmTitle>AMP - Pedals - V16</shortPmTitle>
<pmCode modelIdentCode="S1000DBIKE" pmIssuer="B6865"
pmNumber="AMP00" pmVolume="16"/>
<issueInfo issueNumber="064" inWork="00"/>
<issueDate day="01" month="09" year="2016"/>
<productAndModel>
<productName>
<name>Mountain bike</name>
</productName>
<productModel>
<modelName>
<name>Mountain storm Mk1</name>
</modelName>
</productModel>
<productModel>
<modelName>
<name>Brook trekker Mk9</name>
</modelName>
</productModel>
</productAndModel>
<security securityClassification="01"/>
<dataRestrictions>
<restrictionInstructions>
<dataDistribution>To be made available to all S1000D
users.</dataDistribution>
<exportControl>
<exportRegistrationStmt>
<simplePara>Export of this publication to all countries that are
the residence of organizations that are users of S1000D is
permitted.</simplePara>
</exportRegistrationStmt>
</exportControl>
<dataHandling>There are no specific handling instructions for
this publication.</dataHandling>
<dataDestruction>Users may destroy this publication in
accordance with any local procedures.</dataDestruction>
<!--<dataDisclosure>There are no dissemination limitations that
apply to this publication.</dataDisclosure>-->
</restrictionInstructions>
<restrictionInfo>
<copyright>
<copyrightPara>
<emphasis emphasisType="em01">Copyright (C) 2016</emphasis> by
each of the following organizations<randomList
listItemPrefix="pf03">
<listItem>
<para>AeroSpace and Defence Industries Associations of Europe -
ASD.</para>
```

```
</listItem>
<listItem>
<para>Ministries of Defence of the member countries of
ASD.</para>
</listItem>
</randomList>
</copyrightPara>
<copyrightPara>
<randomList listItemPrefix="pf03">
<title>Limitations of liability:</title>
<listItem>
<para>This material is provided "As is" and neither ASD nor any
person who has contributed to the creation, revision or
maintenance of the material makes any representations or
warranties, express or implied, including but not limited to,
warranties of merchantability or fitness for any particular
purpose.</para>
</listItem>
<listItem>
<para>Neither ASD nor any person who has contributed to the
creation, revision or maintenance of this material shall be
liable for any direct, indirect, special or consequential
damages or any other liability arising from any use of this
material.</para>
</listItem>
<listItem>
<para>Revisions to this document may occur after its issuance.
The user is responsible for determining if revisions to the
material contained in this document have occurred and are
applicable.</para>
</listItem>
</randomList>
</copyrightPara>
</copyright>
</restrictionInfo>
</dataRestrictions>
<productIllustration>
<graphic infoEntityIdent="ICN-S1000DBIKE-AAA-D000000-0-B6865-
00001-A-001-02"/>
</productIllustration>
<enterpriseSpec>
<enterpriseIdent manufacturerCodeValue="X1234"/>
<enterpriseName>Greasy Bikes Co. Plc</enterpriseName>
<businessUnit>
<businessUnitName>Heavy Duty Bikes</businessUnitName>
<businessUnitAddress>
<postalZipCode>12587</postalZipCode>
<city>Noway</city>
<country>Atlantis</country>
</businessUnitAddress>
</businessUnit>
</enterpriseSpec>
```

```
<enterpriseLogo>
<symbol infoEntityIdent="ICN-S3627-S1000D0620-001-01"/>
</enterpriseLogo>
<responsiblePartnerCompany enterpriseCode="B6865">
<enterpriseName>AeroSpace and Defence Industries Association of
Europe - ASD</enterpriseName>
</responsiblePartnerCompany>
<publisherLogo>
<symbol infoEntityIdent="ICN-S3627-S1000D0621-001-01"/>
</publisherLogo>
<barCode>
<barCodeCode barCodeValue="http://www.asd-europe.org/"
barCodeSymbology="bcs20"/>
<barCodeSymbol infoEntityIdent="ICN-S3627-S1000D0778-001-01"
reproductionWidth="21.5mm" reproductionHeight="21.5mm"/>
</barCode>
<frontMatterInfo frontMatterInfoType="fmi01">
<title>Notice to the reader:</title>
<reducedPara>This publication includes highly sophisticated
stuff. Read it with:<reducedRandomList listItemPrefix="pf03">
<reducedRandomListItem>
<reducedListItemPara>reflection</reducedListItemPara>
</reducedRandomListItem>
<reducedRandomListItem>
<reducedListItemPara>pride</reducedListItemPara>
</reducedRandomListItem>
</reducedRandomList>
</reducedPara>
</frontMatterInfo>
<frontMatterInfo frontMatterInfoType="fmi02">
<title>Manufactor's information:</title>
<reducedPara>Greasy Bikes is a well-reputed bike manufacturer
famous for its reliable bikes, if something goes wrong don't
blame us.</reducedPara>
<reducedPara>Any complaint shall be sent to:
      <reducedRandomList listItemPrefix="pf03">
<reducedRandomListItem>
<reducedListItemPara>AECME Bikes, Poste Restante, Somewhere
City, Utopia</reducedListItemPara>
</reducedRandomListItem>
<reducedRandomListItem>
<reducedListItemPara>Greasy Bikes, Off Road 66, Noway,
Atlantis</reducedListItemPara>
</reducedRandomListItem>
</reducedRandomList>
</reducedPara>
</frontMatterInfo>
</frontMatterTitlePage>
</frontMatter>
</content>
```

Chapter 3.9.5.2.17

Content section - SCO content data module

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Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.6	Common constructs - Tables
Chap 3.9.5.2.1.7	Common constructs - Figures, multimedia and foldouts
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.3	Data modules - Applicability

Chap No./Document No.	Title
Chap 3.9.6.1	Attributes - Project configurable values

1 General

This chapter describes the Schema which is used to capture and represent SCO content information.

The granularity of SCO content data modules must follow the breakdown reflected by the SNS and the information codes, and must reflect the necessity of training information.

2 SCO content information

2.1 Schema basic rules

The SCO content Schema is composed of elements used to provide references to external SCO or S1000D managed references defining a hierarchy of training steps.

The SCO content Schema is used to define the aggregation of training information.

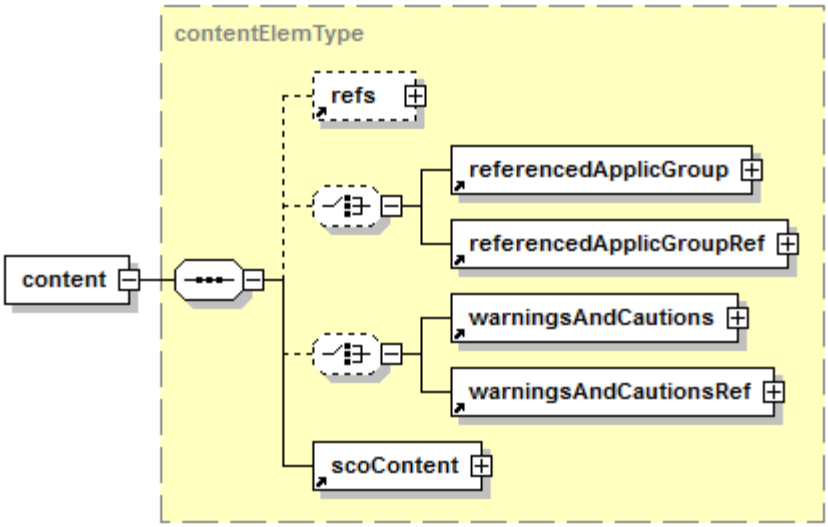
Note

An external SCO is an existing aggregation of SCORM conformant content managed outside of S1000D. A training step is a grouping of related training content and can be defined by references to one or more data modules, or by references to portions of data module content.

2.2 Content

Description: The element <content> contains the Content section of the SCO content data module.

Markup element: <content>



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Fig 1 Major elements in SCO content

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

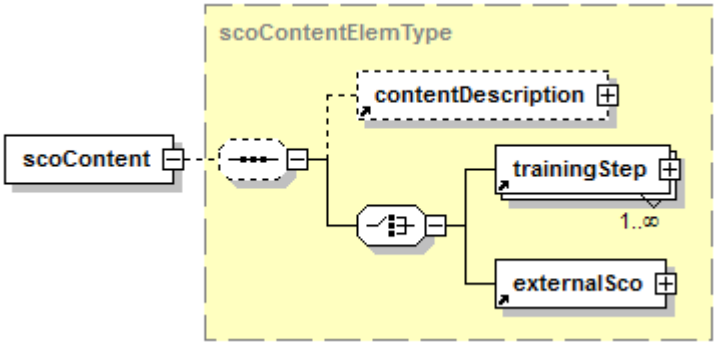
Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
- <warningsAndCautions>. Refer to Chap 3.9.3.
- <warningsAndCautionsRef>. Refer to Chap 3.9.3.
- <scoContent>. Refer to Para 2.3.

2.3 SCO content

Description: The element <scoContent> is the container for SCORM content data of the SCO content data module. This element can be populated with references to external SCO (not defined using S1000D data), or by a sequence of training steps.

Markup element: <scoContent>



ICN-AH019-S1000D0002-001-01

Fig 2 Element <scoContent>

Attributes:

- scoEntryType (O), the categorization of the type of SCO. The type of SCO can be assigned by the needs of the project or the organization, or by the SCORM asset type definitions. The attribute can have one of the following values:
  - "scot01" thru "scot99". Refer to Chap 3.9.6.1.
- warningRefs (O), the warning reference to the warnings and cautions collection. Refer to Chap 3.9.3.
- cautionRefs (O), the caution reference to the warnings and cautions collection. Refer to Chap 3.9.3.

Child elements:

- <contentDescription>. Refer to Para 2.3.1.
- <trainingStep>. Refer to Para 2.3.2.
- <externalSco>. Refer to Para 2.3.3.

Business rule decision point BRDP-S1-00313 - Use of the element <contentDescription> in the element <scoContent>:

- Decide whether and how to use the element <contentDescription> (eg, to add information about the training resource).

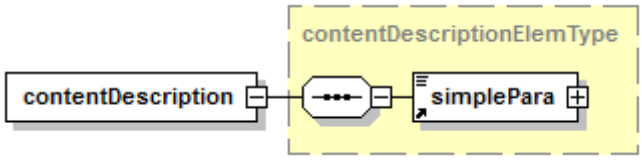
Business rule decision point BRDP-S1-00314 - Use of the element <contentDescription> in the element <trainingStep>:

– Decide whether and how to use the element <contentDescription> (eg, to add information about the content defined in the training step).

2.3.1 Content description

Description: The element <contentDescription> supports the insertion of annotations concerning the content of the SCO content data module.

Markup element: <contentDescription>



ICN-AH019-S1000D0003-001-01

Fig 3 Element <contentDescription>

Attributes:

– None

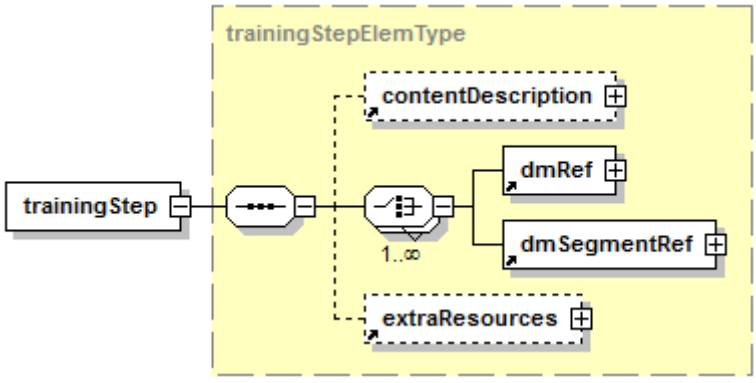
Child elements:

– <simplePara>. Refer to Chap 3.9.5.2.1.10.

2.3.2 Training step

Description: The element <trainingStep> is used for the arrangement of SCO content data module content into sections of related training content to be presented as a unit.

Markup element: <trainingStep>



ICN-AH019-S1000D0004-001-01

Fig 4 Element <trainingStep>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

– <contentDescription>, supports the insertion of annotations concerning the content of the training step. Refer to Para 2.3.1.

- <dmRef>, establishes a reference to an existing data module. Refer to Chap 3.9.5.2.1.2.
- <dmSegmentRef>, establishes a reference to a portion of an existing data module. Refer to Chap 3.9.5.2.1.2.
- <extraResources>. Refer to Para 2.3.2.1.

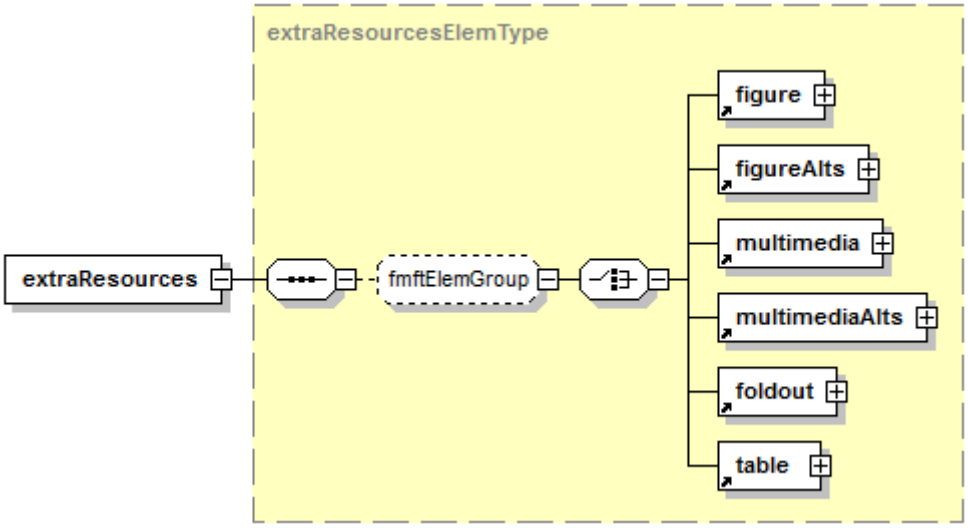
Business rule decision point BRDP-S1-00315 - Use of the element <contentDescription>:

- Decide whether the optional element <contentDescription> must be used to add information about the content defined in the training step.

2.3.2.1 Extra resources

Description: The element <extraResources> is used to refer to figures, tables and multimedia objects required by the training step.

Markup element: <extraResources>



ICN-AH019-S1000D0005-001-01

Fig 5 Element <extraResources>

Attributes:

- None

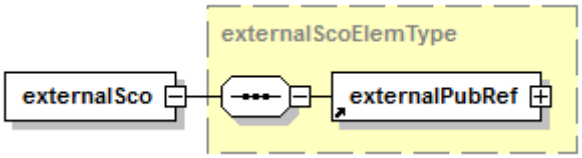
Child elements:

- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7.
- <table>. Refer to Chap 3.9.5.2.1.6.

2.3.3 External SCO

Description: The element <externalSco> is used within a SCO content data module to establish data links to existing SCO that are not managed in accordance with S1000D. The linking mechanism is the same as that used to refer from a data module to any non-S10000D publication or document.

Markup element: <externalSco>



ICN-AH019-S1000D0006-001-01

Fig 6 Element <externalSco>

Attributes:

– None

Child elements:

– <externalPubRef>, contains the identification of a referenced non-S10000D publication or document. Refer to Chap 3.9.5.2.1.2.

3 Examples

3.1 Example using training steps definition

The following is a markup example of a SCO content data module that defines the learning object by referring to existing S1000D data.

```
<scoContent>
<trainingStep>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="041" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</trainingStep>
<trainingStep>
<dmSegmentRef
targetPath="/dmodule/content/description/levelledPara[2]/
levelledPara[2]">
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="043" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmSegmentRef>
<dmSegmentRef
targetPath="/dmodule/content/description/levelledPara[2]/
levelledPara[4]">
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="043" infoCodeVariant="A" itemLocationCode="A"/>
```

```
</dmRefIdent>
</dmSegmentRef>
<dmSegmentRef
targetPath="/dmodule/content/description/levelledPara[2]/
levelledPara[3]">
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="043" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmSegmentRef>
</trainingStep>
</scoContent>
```

3.2 Example using external SCO invocation

The following is a markup example of a SCO content data module by referring to an external SCO that is not defined using S1000D data.

```
<scoContent>
<externalSco>
<externalPubRef>
<externalPubRefIdent>
<externalPubTitle>History of cycling</externalPubTitle>
</externalPubRefIdent>
<externalPubRefAddressItems>
<externalPubIssueDate day="16" month="04" year="2010"/>
<responsiblePartnerCompany enterpriseCode="AH019">
<enterpriseName>Isselnord</enterpriseName>
</responsiblePartnerCompany>
</externalPubRefAddressItems>
</externalPubRef>
</externalSco>
</scoContent>
```

Chapter 3.9.5.3

Data modules - Applicability

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Chap 7.8	Information processing - Applicability

1 General

Applicability information allows the technical author to specify which data is appropriate in what situations. The S1000D applicability model supports simple to very complex implementations. Chap 4.14 and subchapters provide an overview of applicability. It is recommended that these chapters have been read and the concepts understood before reading this chapter and subchapters.

This chapter covers general applicability implementation issues and the implementation of applicability annotations that are used within data modules.

- Chap 3.9.5.3.1 covers the authoring and implementation of the Applicability Cross-reference Table (ACT) data module
- Chap 3.9.5.3.2 covers the authoring and implementation of the Conditions Cross-reference Table (CCT) data module
- Chap 3.9.5.3.3 covers the authoring and implementation of the Products Cross-reference Table (PCT) data module

2 Applicability

2.1 Overall concepts

2.1.1 Data module applicability versus content applicability

The data module applicability (specified in the data module identification and status section) for the whole data module always applies to all parts of the content.

Within the content section, however, it is often necessary to indicate applicability at a more granular level than the data module as a whole. This is known as the content applicability and is used to restrict the applicability for a substructure of the data module, compared to that of the whole data module.

The description, known as an applicability annotation, of the content applicability limitations is collected in the element <referencedApplicGroup> within the element <content> of the data module or in the applicability annotations Common Information Repository (CIR) data module in case of externalized applicability.

When an element is affected by a content applicability, the attribute applicRefId (or applicRefIds in some contexts) is used to provide a link to its applicability annotation. This applicability annotation applies to the complete substructure of the element. Duplication within that substructure is, therefore, not required as it will have no effect.

However, different applicability annotations can be applied within substructures. In these cases the following rules apply:

- content applicability must not conflict with or contradict the data module applicability
- content applicability applied within the substructure of an element must not conflict with or contradict the applicability of that element's applicability
- when an internal reference is made within a data module, the content applicability of both the source and target of the reference must not conflict with or contradict each other

Note

When using a content applicability within a data module, the presentation system's capability to display (or not display) applicability annotations must be taken into account.

2.1.2 Applicability branches

An applicability annotation is stored in the element <applic> and has the same construct whether applied to the whole data module or to a part of the content and whether externalized or not.

The element <applic> has two logical branches (three branches for process data modules) which are used for separate purposes:

- A human-readable applicability annotation, which consists of the element <displayText> that provides human-readable applicability information. This branch can be used in conjunction with either of the other two branches as required.
- A computable applicability annotation, which consists of the elements <assert> and <evaluate> that provide applicability information in a computable format which can be used to support dynamic display of the annotated content.
- Process data module applicability expression, which consists of the element <expression> that provides an applicability expression for the logic engine with the process data module. This branch is used only within process data modules.

This three-branched model is intended to aid the author in simplifying the structure and easily identifying which branch is used for what purpose. The actual applicability S1000D model is more complex than three branches with some elements duplicated. This more complex model enforces strict validation.

2.1.3 Collecting content applicability

Content applicability must be collected directly under the element <content>, using the element:

- <referencedApplicGroup>, meaning the content applicability is directly collected into the data module, or
- <referencedApplicGroupRef>, meaning the applicability is externalized and collected into the applicability annotations CIR data module

When the applicability annotations CIR data module is used, the elements <applicRef> (in the CIR data module identification and status section) and <referencedApplicGroupRef> (in the CIR data module content section) must be used to externalize the data module applicability and the referenced applicability.

Note

There is an exception to the above for the applicability annotations CIR data module itself (refer to default BREX rule BREX-S1-00131), in which elements <applic> (in the data module status) and <referencedApplicGroup> (in the data module content) must be used (refer to default BREX rule BREX-S1-00132).

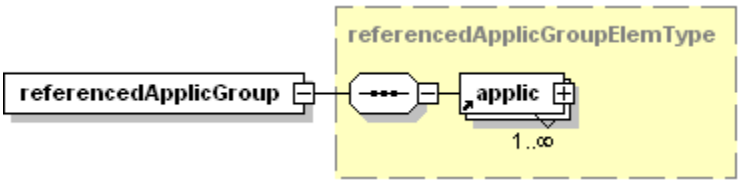
When the applicability annotations CIR data module is not used, the elements <applic> (in the identification and status section of the data module affected by the applicability) and <referencedApplicGroup> (in the data module content section) must be used.

2.1.3.1 Intra-data module collection

Description: The element <referencedApplicGroup> provides a container for collecting the applicability annotations that apply to various parts of the data module. When collected into the data module where the applicability annotations are used, the element <referencedApplicGroup> (within element <content>) must be used.

Applicability annotations collected in the element <referencedApplicGroup> can be specified once while referred to many times from within the data module content.

Markup element: <referencedApplicGroup>



ICN-S1000D-A-03090503-A-FAPE3-00001-A-001-01

Fig 1 Element <referencedApplicGroup>

Attributes:

– None

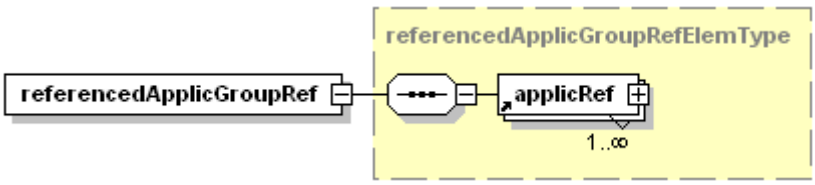
Child elements:

– <applic>, the applicability annotations. Refer to Para 2.2.

2.1.3.2 Extra-data module collection

Description: The element <referencedApplicGroupRef> provides a container for defining references to the externalized applicability annotations that apply to various parts of the data module. When the applicability annotations are externalized (ie, collected into the applicability annotations CIR data module) from the data modules where they are used, the element <referencedApplicGroupRef> (within element <content>) must be used.

Markup element: <referencedApplicGroupRef>



ICN-S1000D-A-03090503-A-FAPE3-00002-A-001-01

Fig 2 Element <referencedApplicGroupRef>

Attributes:

– None

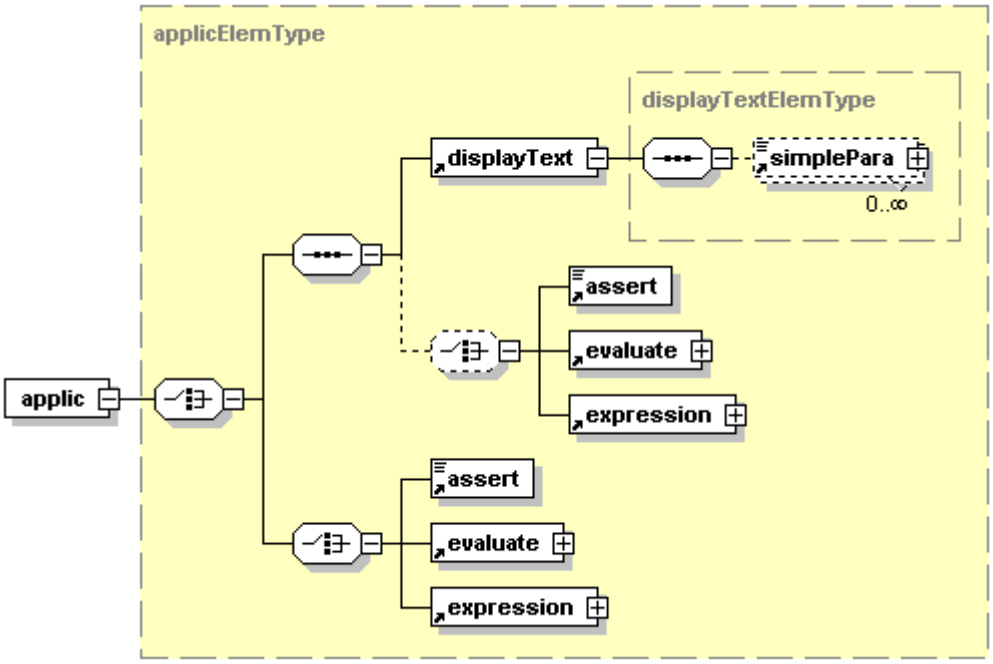
Child elements:

– <applicRef>, the references to the externalized applicability annotations. Refer to Chap 3.9.5.2.1.13.

2.2 Applicability model

Description: The element <applic> contains the applicability limitations and any text that is displayed (or not) to the user. It is populated by the technical author or generated by the production system during initial authoring and updating activity of the data module.

Markup element: <applic>



ICN-B6865-S1000D0014-001-01

Fig 3 Element <applic>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- applicConfiguration (O), the type of applicability for a given part used only in IPD data modules. The attribute can have one of the following values:
  - "allowed" - the part can be installed (with conditions or not) at a given function-position on a given Product
  - "built" - the part was installed at a function-position on a Product when it left the factory
  - "designed" - the part is included in the engineering configuration
  - "installed" - the part is theoretically installed (actual or scheduled) at a given function-position on a given Product
  - "manufactured" - the part is included in the manufacturing configuration
  - "supported" - the part is included in the support configuration
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <displayText>, a simple textual annotation. Refer to Para 2.2.1.
- <assert>, to perform a single test. Refer to Para 2.2.2.1.
- <evaluate>, to create a sub-grouping of additional tests. Refer to Para 2.2.2.2.
- <expression>, expression to be evaluated by the logic engine. Refer to Para 2.2.3.

The element <applic> must contain one of the following options for content:

- <displayText>
- <assert> with optional <displayText>
- <evaluate> with optional <displayText>
- <expression> with optional <displayText> (this option is available only in the process data module). Refer to default BREX rule BREX-S1-00134.

Business rule decision point BRDP-S1-00316 - Use of the element <applic> in the data module status and content:

- Decide how to use the element <applic> and to populate its child elements and attributes across the project or the organization.

2.2.1 Human-readable applicability annotation branch

Description: The element <displayText> provides a human-readable and printable branch of the applicability annotation.

For those projects or organizations that do not require computable applicability, the display text is the only part of the applicability annotation needed. For annotations, the repeatable simple paragraph element <simplePara> can be used. Refer to Chap 7.8 for the recommended format for the content of element <displayText>.

It is possible that auto-generated applicability statements are not completely consistent between processors. In projects or organizations deciding to use both the human-readable branch and one of the computable branches, the applicability annotation represented in both branches must match. In determining whether to populate the <displayText> a project or an organization must weigh this fact with the cost of maintaining authored <displayText>. Refer to Chap 7.8.

Markup element: <displayText>. Refer to Fig 3.

Attributes:

- None

Child elements:

- <simplePara>, the text of the applicability annotation. Refer to Chap 3.9.5.2.1.10.

Business rule decision point BRDP-S1-00317 - Use of the element <displayText> in the element <applic>:

- Decide whether the element <displayText> is populated by the technical author or generated from the computable branch or some other source when using the human-readable branch of applicability.

Markup example:

```
<applic>
<displayText><simplePara>Mountain bicycle, either:</simplePara>
<simplePara>Mountain storm Mk1 or Brook trekker
Mk9</simplePara></displayText>
</applic>
```

2.2.2 Computable applicability annotation branch

The computable applicability annotation branch is constructed with a set of individual tests which are grouped together to form a computable expression. Each individual test is represented with an element <assert> which specifies the product attribute or condition to test and the values to test against. Each grouping is represented with an element <evaluate> which associates the child elements together along with a logical operation to perform, either an "and" or an "or" operation. Groupings can contain other groupings and individual tests, thus allowing construction of very complicated expressions where needed.

2.2.2.1 Single applicability test - assert

Description: The element <assert> provides for a single test for the computable branch of the applicability annotation. The assert annotation specifies the product attribute or condition to test and a set of values and/or ranges to test against. The result of evaluating an assert annotation will be a Boolean value of "true" or "false".

In the case where an assert cannot be evaluated due to lack of a value to test against or the case where only a textual annotation is provided (not referencing a product attribute or condition) then the result must be considered the Boolean value "true".

The element <assert> can be used to represent a textual applicability annotation which does not have an associated product attribute or condition, meaning there is no test to perform. Examples of textual annotations include "volcanic conditions" and "wind speed over 30 knots". The textual content of element <assert> is used to represent the annotation and the attributes applicPropertyIdent, applicPropertyType and applicPropertyValues are not used.

Markup element: <assert>

Attributes:

- applicPropertyIdent (O), the identifier of either the product attribute (element <productAttribute> attribute id from the ACT data module) or the condition (element <cond> attribute id from the CCT data module) to test. Not used if the element <assert> contains text only.
- applicPropertyType (O), indicates whether the attribute applicPropertyIdent references a product attribute or a condition. This attribute is mandatory if the attribute applicPropertyIdent is used, otherwise not used. The attribute can have one of the following values:
  - "prodattr" - indicates the attribute applicPropertyIdent references a product attribute
  - "condition" - indicates the attribute applicPropertyIdent references a condition
- applicPropertyValues (O), the values and/or ranges to test against. This attribute is mandatory if attribute applicPropertyIdent is used, otherwise not used. Refer to Para 2.2.4 for additional information including formatting requirements.

- applicDisplayClass (O), provides information that can be used to format the applicability annotation. This can be used by publication systems when generating text in element <displayText> or by viewers when printing or displaying the content. Refer to Chap 7.8.

Child elements:

- None

Markup examples:

Assert textual applicability annotation:

```
<assert>In icy conditions</assert>
```

Assert product attribute test:

```
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
```

Single assert condition test:

```
<applic>
<assert applicPropertyIdent="SB-S001"
applicPropertyType="condition" applicPropertyValues="post"/>
</applic>
```

Single assert use of the attribute applicDisplayClass:

The following example illustrates an applicability annotation where the project or the organization has decided that hardware configuration related items should be displayed with a certain formatting. The project or the organization has decided to indicate which items get the special formatting by setting the attribute applicDisplayClass to the value "configitem". This decision, along with the specific formatting, must be documented in the project or the organization business rules.

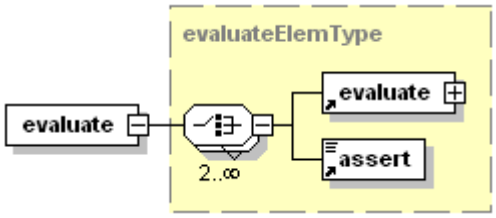
```
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker" applicDisplayClass="configitem"/>
```

2.2.2.2 Grouping applicability tests - evaluate

Description: The element <evaluate> is used to group tests together and provide the logical operation to apply to the test results. The element <evaluate> must be used whenever more than one test, element <assert>, is required. The element <evaluate> can contain other instances of the element <evaluate> and is therefore recursive. This allows for very complicated applicability annotations to be represented with a simple structure consisting of only two element types.

To process the element <evaluate> all child elements are evaluated, each providing a Boolean value of "true" or "false". Then the logical "and" or "or" operation is performed on the results, providing a single Boolean result. A result of the value "true" means the associated content is valid and a result of the value "false" means the associated content is not valid. The method of presenting validity is a project or an organization decision. Some projects or organizations will remove invalid content while others will want to de-emphasize the invalid content in some way.

Markup element: <evaluate>



ICN-S1000D-A-03090503-A-FAPE3-00006-A-001-01

Fig 4 Element <evaluate>

Attributes:

– andOr (M), specifies the logical operation to perform on the results of all child elements. The attribute can have one of the following values:

- "and" - Logical "and". All child element values of true results in the value "true", otherwise "false".
- "or" - Logical "or". Any child element value of true results in the value "true", otherwise "false".

– applicDisplayClass (O). Refer to Para 2.2.2.1.

Child elements:

– <assert>, to perform a single test. Refer to Para 2.2.2.1.
– <evaluate>, to create a sub-grouping of additional tests

Business rule decision point BRDP-S1-00318 - Use of the attribute applicDisplayClass within the element <applic>:

– Decide whether to use the attribute applicDisplayClass when using the computable applicability annotation branch.

Business rule decision point BRDP-S1-00319 - Use of textual applicability annotations in the element <assert> in the element <evaluate>:

– Decide if textual applicability annotations are allowed in the element <assert> when using the computable applicability annotation branch or if every element <assert> must reference a declared product attribute or condition.

Markup examples:

The following example illustrates an applicability annotation where two product attributes are being tested and both must be the Boolean value "true" for the entire applicability to result in the Boolean value "true". The model must be "Brook trekker" and the version must be "Mk9". If either the model or version test results in the Boolean value "false", then the entire applicability results in the Boolean value "false".

```
<applic>
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk9"/>
</evaluate>
</applic>
```

The following example illustrates an applicability annotation where the outer evaluate has a logical "or" operation which means if either of the inner evaluate annotations result in the Boolean value "true" then the entire applicability results in the Boolean value "true". This applicability annotation tests for either a "Mountain storm Mk1" or a "Brook trekker Mk9".

```
<applic>
<evaluate andOr="or">
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Mountain
storm"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk1"/>
</evaluate>
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk9"/>
</evaluate>
</evaluate>
</applic>
```

2.2.3 Process data module applicability expression branch

The process data module expression branch is only available in the process data module. The expression structure and authoring considerations are detailed in Chap 3.9.5.2.10. Refer to default BREX rule BREX-S1-00134.

2.2.4 Values and ranges (attribute `applicPropertyValues`)

The attribute `applicPropertyValues` provides a single place to define any combination of values and ranges. Two special characters are required to separate values, namely the tilde [~] used to separate values within a range and the vertical bar [|] used to separate values and ranges. These two characters cannot be used as part of a value, but other punctuation characters (eg, slash [/] or hyphen [-]) can be used to express values.

Each individual value or values used in a range must adhere to the value type of the product attribute or condition being tested. The associated product attribute declaration in the ACT data module and the condition declaration in the CCT data module must specify the data type for the product attribute or condition (attribute `valueDataType`, default value "`string`"). The different data types are detailed in Chap 3.9.5.3.1 and Chap 3.9.5.3.2.

If the associated product attribute declaration in the ACT data module or condition declaration in the CCT data module contains the attribute `valuePattern`, then each value must be compliant to the specified pattern. This pattern must be followed for both individual values and for values used in ranges.

Values and ranges examples:

– To represent the single integer value "1":

```
applicPropertyValues="1"
```

– To represent multiple integer values "1", "3". and "5":

```
applicPropertyValues="1|3|5"
```

– To represent a range of integer values "1" thru "5":

```
applicPropertyValues="1~5"
```

– To represent multiple ranges of integer values "1" thru "5" and "7" thru "10":

```
applicPropertyValues="1~5|7~10"
```

– To represent a mix of integer values and ranges "1" and "3" thru "5" and "7" and "10" and "15" thru "999":

```
applicPropertyValues="1|3~5|7|10|15~999"
```

– To represent multiple string values "F/A-18C" and "F/A-18D":

```
applicPropertyValues="F/A-18C|F/A-18D"
```

– To represent a range of string values from "F/A-18A" thru "F/A-18D":

```
applicPropertyValues="F/A-18A~F/A-18D"
```

Note

It is recommended that projects or organizations consider the use of ranges on values that are not numerical sequences. Ranges on some alphanumeric values, if used in the human-readable display text, can be difficult to understand and can be misinterpreted by users.

3 Examples

3.1 Referenced applicability

The following examples illustrate the use of the element <referencedApplicGroup> within element <content> and the use of attribute applicRefId within the content section.

Example 1: The following example is primarily used for explanation of how to display the applicability statements.

The example sets the data module applicability to Serial Numbers (SN) 1 thru 100. Also, four applicability groups (applic_1-50, applic_1-10, applic_11-20 and applic_21-100) are defined which will be referenced by the markup example. The presentation of this example is given in Chap 6.2.2.

Note

For simplicity reasons, this example uses only the element <proceduralStep>. For an example where the element <proceduralStepAlts> is used, refer to S1000DBIKE-AAA-D00-00-00-00AA-258B-A which is technically the same procedure as S1000DBIKE-AAA-D00-00-00-00AA-258A-A not using the alternates concept.

```
<referencedApplicGroup>
<applic>
<assert applicPropertyIdent="lineno"
applicPropertyType="prodattr" applicPropertyValues="1~100"/>
</applic><applic id="applic_1-50">
<displayText><simplePara>1-50</simplePara></displayText>
<assert applicPropertyIdent="lineno"
applicPropertyType="prodattr" applicPropertyValues="1~50"/>
</applic>
<applic id="applic_1-10">
<displayText><simplePara>1-10</simplePara></displayText>
<assert applicPropertyIdent="lineno"
```

```
applicPropertyType="prodattr" applicPropertyValues="1~10"/>
</applic>
<applic id="applic_11-20">
<displayText><simplePara>11-20</simplePara></displayText>
<assert applicPropertyIdent="lineno"
applicPropertyType="prodattr" applicPropertyValues="11~20"/>
</applic>
<applic id="applic_21-100">
<displayText><simplePara>21-100</simplePara></displayText>
<assert applicPropertyIdent="lineno"
applicPropertyType="prodattr" applicPropertyValues="21~100"/>
</applic>
</referencedApplicGroup>
...
<proceduralStep applicRefId="applic_1-50">
<para>This step called A is applicable to SN: 1-50</para>
<proceduralStep>
<para>This step called B is applicable to SN: 1-50</para>
<proceduralStep applicRefId="applic_1-10">
<para>This step called C is applicable to SN: 1-10</para>
</proceduralStep>
<proceduralStep applicRefId="applic_11-20">
<para>This step called D is applicable to SN: 11-20</para>
<proceduralStep>
<para>This step called E is applicable to SN: 11-20</para>
</proceduralStep>
<proceduralStep>
<para>This step called F is applicable to SN: 11-20</para>
</proceduralStep>
<proceduralStep>
<para>This step called G is applicable to SN: 11-20</para>
</proceduralStep>
<proceduralStep>
<para>This step called H is applicable to SN: 11-20</para>
</proceduralStep>
<proceduralStep>
<para>This step called I is applicable to SN: 11-20</para>
</proceduralStep>
</proceduralStep>
</proceduralStep>
<proceduralStep>
<para>This step called J is applicable to SN: 1-50</para>
</proceduralStep>
</proceduralStep>
<proceduralStep>
<para>This step called K is applicable to SN: 1-100</para>
<proceduralStep>
<para>This step called L is applicable to SN: 1-100</para>
<proceduralStep applicRefId="applic_1-10">
<para>This step called M is applicable to SN: 1-10</para>
</proceduralStep>
<proceduralStep applicRefId="applic_11-20">
```

```
<para>This step called N is applicable to SN: 11-20</para>
<proceduralStep>
<para>This step called P is applicable to SN: 11-20</para>
</proceduralStep>
<proceduralStep>
<para>This step called Q is applicable to SN: 11-20</para>
</proceduralStep>
</proceduralStep>
<proceduralStep applicRefId="applic_21-100">
<para>This step called R is applicable to SN: 21-100</para>
</proceduralStep>
</proceduralStep>
<proceduralStep>
<para>This step called S is applicable to SN: 1-100</para>
</proceduralStep>
</proceduralStep>
<proceduralStep>
<para>This step called T is applicable to SN: 1-100</para>
</proceduralStep>
```

Example 2: The following example illustrates the use of applicability in a Bike crew data module.

```
<content>
...
<referencedApplicGroup>
<applic id="app-0001">
<displayText>
<simplePara>Mountain storm Mk1</simplePara>
</displayText>
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Mountain
storm"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk1"/>
</evaluate>
</applic>
<applic id="app-0002">
<displayText>
<simplePara>Brook trekker Mk9</simplePara>
</displayText>
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk9"/>
</evaluate>
</applic>
</referencedApplicGroup>
...
<crewDrill>
<title>Computer</title>
```

```
<crewDrillStep>
<challengeAndResponse>
<challenge><para>Computer display</para></challenge>
<response>
<para>
<captionGroup cols="2" applicRefId="app-0001" changeMark="1"
reasonForUpdateRefIds="chg-0001">
<colspec colnum="1" colname="col1" colwidth="30mm"/>
<colspec colnum="2" colname="col2" colwidth="30mm"/>
<captionBody>
<captionRow>
<captionEntry colname="col1">
<caption color="co04" captionWidth="30mm">
<captionLine>ALTITUDE</captionLine>
</caption>
</captionEntry>
<captionEntry colname="col2">
<caption color="co51" captionWidth="30mm">
<captionLine>0 miles</captionLine>
</caption>
</captionEntry>
</captionRow>
<captionRow><captionEntry colname="col1">
<caption color="co04" captionWidth="30mm">
<captionLine>SPEED</captionLine>
</caption>
</captionEntry>
<captionEntry colname="col2">
<caption color="co51" captionWidth="30mm">
<captionLine>0 mph</captionLine>
</caption>
</captionEntry>
</captionRow>
<captionRow>
<captionEntry colname="col1">
<caption color="co04" captionWidth="30mm">
<captionLine>DISTANCE</captionLine>
</caption>
</captionEntry>
<captionEntry colname="col2">
<caption color="co51" captionWidth="30mm">
<captionLine>0 miles</captionLine>
</caption>
</captionEntry>
</captionRow>
</captionBody>
</captionGroup>
<captionGroup cols="2" applicRefId="app-0002" changeMark="1"
reasonForUpdateRefIds="chg-0002">
<colspec colnum="1" colname="col1" colwidth="30mm"/>
<colspec colnum="2" colname="col2" colwidth="30mm"/>
<captionBody>
```

```
<captionRow>
<captionEntry colname="col1">
<caption color="co02" captionWidth="30mm">
<captionLine>SPEED</captionLine>
</caption>
</captionEntry>
<captionEntry colname="col2">
<caption color="co51" captionWidth="30mm">
<captionLine>0 mph</captionLine>
</caption>
</captionEntry>
</captionRow>
<captionRow>
<captionEntry colname="col1">
<caption color="co02" captionWidth="30mm">
<captionLine>DISTANCE</captionLine>
</caption>
</captionEntry>
<captionEntry colname="col2">
<caption color="co51" captionWidth="30mm">
<captionLine>0 miles</captionLine>
</caption>
</captionEntry>
</captionRow>
</captionBody>
</captionGroup>
</para>
</response>
</challengeAndResponse>
</crewDrillStep>
</crewDrill>
...
</content>
```

3.2 Applicability annotations

Example 1: An applicability annotation based on model, version and maintenance level criteria.

The applicability annotation indicates that the associated technical data is:

- applicable for "Mountain storm Mk1" bicycles at maintenance level 1 or 2
- applicable for "Brook trekker Mk9" bicycles

```
<applic>
<displayText><simplePara>Type: Mountain bicycle (Model: Mountain
storm Version: Mk1 Maintenance level: 1, 2) or (Model: Brook
trekker Version: Mk9)</simplePara></displayText>
<evaluate andOr="and">
<assert applicPropertyIdent="type" applicPropertyType="prodattr"
applicPropertyValues="Mountain bicycle"/>
<evaluate andOr="or">
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Mountain
storm"/>
```

```
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk1"/>
<assert applicPropertyIdent="mntlvl"
applicPropertyType="condition"
applicPropertyValues="ml01|ml02"/>
</evaluate>
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk9"/>
</evaluate>
</evaluate>
</evaluate>
</applic>
```

Example 2: An applicability annotation based on individual Product information criteria (from Serial number "1" thru "10").

The applicability annotation indicates that the associated technical data is:

- applicable for Serial numbers "1", "2" and "5" thru "10" (no technical conditions or operational conditions need be considered)
- applicable under condition for Serial numbers "3" and "4" if Service Bulletin SB-0001 has been applied

```
<applic>
<displayText><simplePara>SN: 1-2, 5-10 or (SN: 3-4 Post SB SB-
0001)</simplePara></displayText>
<evaluate andOr="or">
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValues="1~2|5~10"/>
<evaluate andOr="and">
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValues="3~4"/>
<assert applicPropertyIdent="SB-0001"
applicPropertyType="condition" applicPropertyValues="Post"/>
</evaluate>
</evaluate>
</applic>
```

3.3 Tying it all together

The following example illustrates how the components of applicability work together to build an applicability annotation from the technical authoring viewpoint.

Note

This example illustrates a manual process for finding the information needed to build an applicability annotation.

In this scenario, a technical author has been instructed to add an applicability annotation to the content of an element <proceduralStep> within a procedural data module. The applicability annotation represents the condition where serial number is "1B070643" thru "1B070699" and Service bulletin "S001" is installed (post).

The technical author must first identify the product attribute or condition identifiers associated with the serial number and the Service bulletin "S001". The referenced ACT data module is located by looking in the status section of the procedural data module for the element <applicCrossRefTableRef>.

```
<applicCrossRefTableRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00W" infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent>
</dmRef>
</applicCrossRefTableRef>
```

Within the ACT data module, the technical author looks for product attributes (element <productAttribute>) which represent the serial number and the Service bulletin "S001". The child elements <name> and <descr> provide the information needed to make this decision. Within the ACT data module, the following product attribute declaration is found for the serial number.

Note

In this example, the product attribute is also a primary identifier. Refer to Chap 3.9.5.3.1 for more information on the attribute productIdentifier.

```
<productAttribute id="serialno" productIdentifier="primary">
<name>Serial number</name>
<displayName>SN</displayName>
<descr>Serial number etched on the frame</descr>
</productAttribute>
```

The technical author notes the value "serialno" of attribute id, which is needed to build the applicability annotation. No product attribute is found which represents Service bulletin "S001", so the technical author must next look in the CCT data module for a condition representing Service bulletin "S001". The referenced CCT data module is located by looking in the content section of the ACT data module for the element <condCrossRefTableRef>.

```
<condCrossRefTableRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00Q" infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent>
</dmRef>
</condCrossRefTableRef>
```

Within the CCT data module, the technical author looks for conditions (element <cond>) which represent the Service bulletin "S001". The child elements <name> and <descr> provide the information needed to make this decision. Within the CCT data module, the following condition declaration is found for the Service bulletin "S001":

```
<cond condTypeRefId="SB" id="SB-S001">
<name>Service bulletin S001 - Chain guard</name>
<descr>Service bulletin S001 for the installation of the chain
guard</descr>
</cond>
```

The technical author notes the value "SB-S001" of attribute id, which is needed to build the applicability annotation.

The applicability annotation can now be constructed using the product attribute and condition identifiers from the ACT and CCT data modules and the known values to test for. The following applicability annotation is added to the status section element <referencedApplicGroup> of the procedural data module:

```
<referencedApplicGroup>
...
<applic id="appl-006">
<evaluate andOr="and">
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr"
applicPropertyValues="1B070643~1B070699"/>
<assert applicPropertyIdent="SB-S001"
applicPropertyType="condition" applicPropertyValues="post"/>
</evaluate>
</applic>
...
</referencedApplicGroup>
```

Finally, the applicability annotation is applied to the appropriate content within the procedural data module:

```
<proceduralStep applicRefId="appl-006">
...
</proceduralStep>
```

Chapter 3.9.5.3.1

Applicability - Applicability cross-reference table

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Chap 3.9.5.3	Data modules - Applicability
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Chap 4.14	Information management - Applicability
Chap 4.14.4	Applicability - Applicability cross-reference table catalog
Chap 7.8	Information processing - Applicability

1 General

The Applicability Cross-reference Table (ACT) data module is used to declare product attributes. A product attribute is a property of the Product that has an effect on the applicability of technical data. Product attributes are properties of the Product that are typically set at the time of manufacture of a product instance and will usually not change throughout the service life of a product instance. Examples of product attributes are model, series and serial number.

The ACT data module serves as the central point of reference for applicability declarations. It provides references to the Conditions Cross-reference Table (CCT) and Products Cross-reference Table (PCT) data modules. By referencing the ACT data module in the status section, all other data modules will be able to access all declarations of product attributes and conditions as well as actual values for product instances.

Chap 4.14 and subchapters provide an overview of applicability. It is recommended that these chapters have been read and the concepts understood before reading this chapter.

The ACT XML Schema contains two branches:

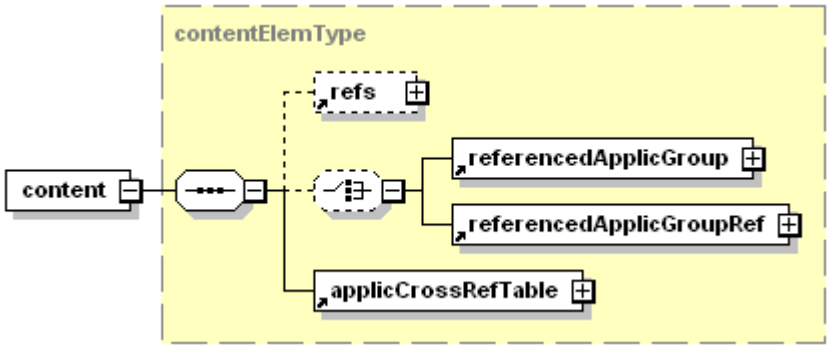
- the applicability cross-reference table catalog (element <applicCrossRefTableCatalog>). Refer to Chap 3.9.5.3.4.
- the applicability cross-reference table data module itself, which is described in this chapter. There are three components of the ACT data module:
  - Product attributes - element <productAttributeList>, to define the product attributes
  - Reference to the CCT data module - element <condCrossRefTableRef>
  - Reference to the PCT data module - element <productCrossRefTableRef>

2 ACT data module content

2.1 Content

Description: The element <content> contains the content section of the ACT data module or the ACT catalog data module.

Markup element: <content>



ICN-S1000D-A-03090503-A-FAPE3-00036-A-001-01

Fig 1 Major elements in ACT content

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

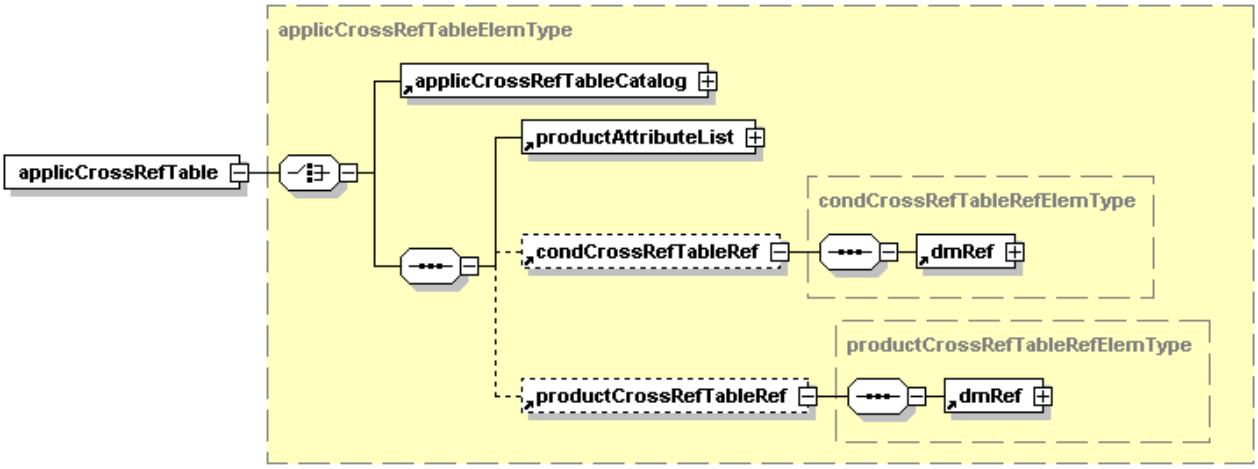
Child elements:

- <`refs`>, the references to data modules, publication modules and non-S1000D publications or documents given in the data module. Refer to Chap 3.9.5.2.1.2.
- <`referencedApplicGroup`>, the applicability annotations directly collected in the data module. Refer to Chap 3.9.5.3.
- <`referencedApplicGroupRef`>, the applicability annotations collected in the data module using the applicability annotations CIR. Refer to Chap 3.9.5.3.
- <`applicCrossRefTable`>. Refer to Para 2.2.

2.2 Applicability cross-reference table

Description: The element <`applicCrossRefTable`> contains the content of the ACT data module or the ACT catalog data module.

Markup element: <`applicCrossRefTable`>



ICN-B6865-S1000D0015-001-01

Fig 2 Applicability cross-reference table

Attributes:

– None

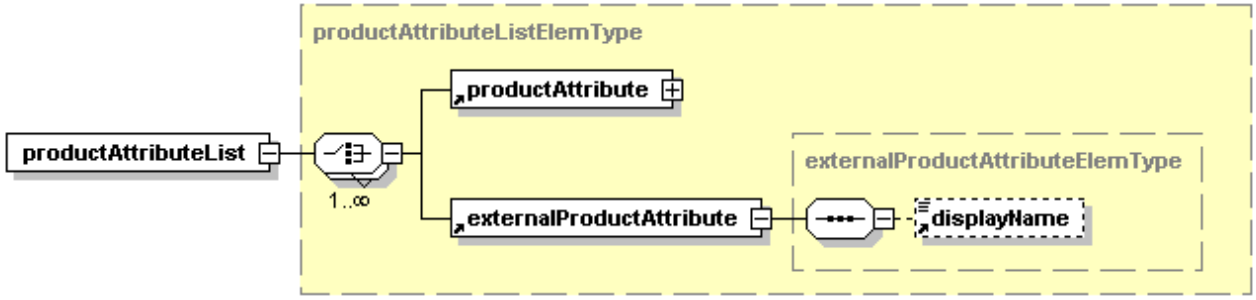
Child elements:

– <applicCrossRefTableCatalog>, the ACT catalog. Refer to Chap 3.9.5.3.4.
– <productAttributeList>. Refer to Para 2.3.
– <condCrossRefTableRef>. Refer to Para 2.4.
– <productCrossRefTableRef>. Refer to Para 2.5.

2.3 Product attributes

Description: The element <productAttributeList> contains a list of attributes of the Product. The values for product attributes will typically not change throughout the service life of product instance.

Markup element: <productAttributeList>



ICN-B6865-S1000D0016-001-01

Fig 3 Element <productAttributeList>

Attributes:

– None

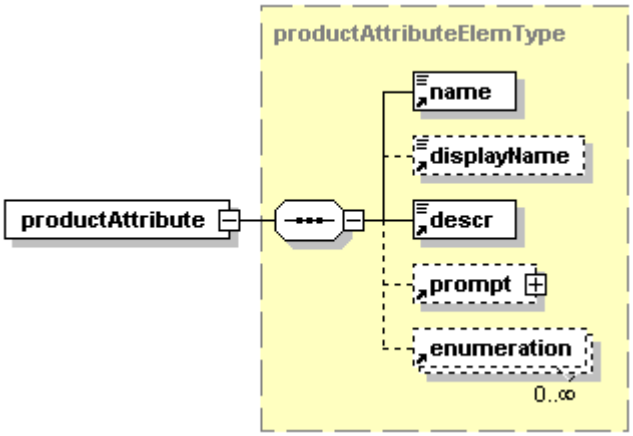
Child elements:

– <productAttribute>. Refer to Para 2.3.1.
– <externalProductAttribute>. Refer to Para 2.3.2.

2.3.1 Product attribute

Description: The element <productAttribute> is used to declare a single attribute of the Product, such as "serial number" or "model".

Markup element: <productAttribute>



ICN-B6865-S1000D0005-001-01

Fig 4 Element <productAttribute>

Attributes:

- id (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- valueDataType (O), the data type of the product attribute. The attribute can have one of the following values:
  - "string" (D) - for classical character chains
  - "boolean" - for Boolean values ("true" or "false")
  - "integer" - for integer values, which are numeric and contain no decimal point
  - "real" - for real values, which are numeric and contain a decimal point
- valuePattern (O), a pattern specifying the allowable structure for each value in the attribute applicPropertyValues in the element <enumeration>. The attribute valuePattern must only be used when the attribute valueDataType has the value "string" (refer to default BREX rule BREX-S1-00135). The pattern follows the XML Schema regular expression rules as described in the specification "REC-xmlschema-2-20041-28 W3C Recommendation: XML Schema Part 2: Datatypes Second Edition (2004 Second Edition)".
- productIdentifier (O), indicates whether this specific product attribute is a unique identifier for a specific product instance. An example might be a "serial number" product attribute. The attribute can have one of the following values:
  - "no" (D), indicates that the product attribute cannot be used to identify a specific product instance
  - "primary" - indicates that the specific product attribute is the preferred attribute to use for selecting a specific product instance. When a product attribute is identified as a primary Product identifier, it must be included in the PCT.
  - "secondary" - indicates an optional search key for identifying a specific product instance. When a product attribute is identified as a secondary Product identifier, it can be included in the PCT product description, but it is not required.
- aliasFlag (O), indicates that the product attribute has an equivalent product attribute within another ACT. This attribute must only be used by projects or organizations implementing the ACT catalog. Refer to Chap 4.14.4. In this case, the ACT catalog must

provide the corresponding alias relationship. The attribute can have one of the following values:

- "1" - Yes, for a product attribute with an alias relationship defined in the ACT catalog
- "0" - No, for a product attribute with no alias relationship

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– <name>, the name of the product attribute. Refer to Chap 3.9.5.2.1.10.
– <displayName>. Refer to Para 2.3.1.1.
– <descr>. Refer to Para 2.3.1.2.
– <prompt>. Refer to Para 2.3.1.3.
– <enumeration>. Refer to Para 2.3.1.4.

Business rule decision point BRDP-S1-00320 - Use of the attribute valuePattern and the element <enumeration> or to use open text when using ACT:

– Decide whether to specify the allowable values for a product attribute achieved by using both the attribute valuePattern and the element <enumeration> or to allow open text without using the attribute valuePattern and the element <enumeration>.

Markup example:

```
<productAttribute id="serialNumber">
<name>Serial number</name>
<displayName>SN</displayName>
<descr>Serial number etched on the bicycle frame</descr>
<prompt>
<paraBasic>Serial Number (locate under the bottom bracket where
the two pedal cranks meet)</paraBasic>
</prompt>
</productAttribute>
```

2.3.1.1 Display name

Description: The element <displayName> defines text which can be used to help automated generation of the human-readable display text on an applicability annotation. Refer to Chap 7.8.

Markup element: <displayName>

Attributes:

– None

Child elements:

– None

Business rule decision point BRDP-S1-00321 - Use of the element <displayName> in the element <productAttribute> when using ACT:

– Decide whether to use the element <displayName>.

Markup example:

```
<displayName>SN</displayName>
```

2.3.1.2 Description

Description: The element <descr> contains further clarification of the meaning of the product attribute. This value can be used to assist the technical author in the selection of the appropriate product attribute when building an applicability annotation.

Markup element: <descr>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

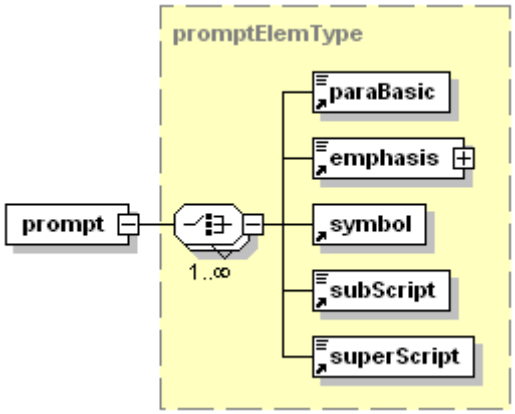
Markup example:

```
<descr>Serial number etched on the bicycle frame</descr>
```

2.3.1.3 Prompt

Description: The element <prompt> contains specific text that can be used to create a dialog in order to obtain values for product attributes or conditions from an end user. It is recommended for projects or organizations to provide a prompt in order for the viewer to present a complete and coherent dialog when eliciting the value of the attribute from the user.

Markup element: <prompt>



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Fig 5 Element <prompt>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- textDisplayPosition (O), the text display placement in relationship to the data entry or selection. The attribute can have one of the following values:
  - "top" - the prompt is positioned above the data entry information

- "bottom" - the prompt is positioned below the data entry information
- "right" - the prompt is positioned right of the data entry information
- "left" - the prompt is positioned left of the data entry information

Child elements:

– <paraBasic>, a line of text. Refer to Chap 3.9.5.2.10.3.
– <emphasis>, text that is intended to be presented highlighted. Refer to Chap 3.9.5.2.1.10.
– <symbol>, symbols. Refer to Chap 3.9.5.2.1.10.
– <subScript>, text that is intended to be presented subscripted. Refer to Chap 3.9.5.2.1.10.
– <superScript>, text that is intended to be presented superscripted. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<prompt>
<paraBasic>Serial Number (locate under the bottom bracket where
the two pedal cranks meet)</paraBasic>
</prompt>
```

2.3.1.4 Enumeration

Description: The element <enumeration> contains the allowable values for the product attribute. The allowable values can be used to assist the technical author in creating applicability annotations.

The element <enumeration> is optional and repeatable. If there are multiple values and ranges to define, several methods can be employed, including the following:

– single element <enumeration> with attribute applicPropertyValues representing the entire set of values and ranges
– multiple element <enumeration> with attribute applicPropertyValues representing a single value or range

Markup element: <enumeration>

Attributes:

– applicPropertyValues (M), defines the values and ranges of values that are allowed for this product attribute. If the parent element <productAttribute> includes the attribute valuePattern, the individual values used in the attribute applicPropertyValues must be compliant to the specified pattern. Refer to Chap 3.9.5.3 for more information on the usage of this attribute.
– enumerationLabel (O), defines the display label in an interactive selection dialog for the value defined by the attribute applicPropertyValues. If enumerationLabel is specified, the attribute applicPropertyValues cannot specify a range or list of values. Refer to default BREX rule BREX-S1-00136. It is recommended for projects or organizations to provide enumeration labels in order for the viewer to present a complete and coherent dialog when eliciting the value of the attribute from the user.
– aliasFlag (O), indicates that the product attribute value has an equivalent product attribute value within another ACT. This attribute must be used only by projects or organizations implementing the ACT catalog. Refer to Chap 4.14.4. In this case, the ACT

catalog must provide the corresponding alias relationship. The attribute can have one of the following values:

- "1" - Yes, for a product attribute value with an alias relationship defined in the ACT catalog
- "0" - No, for a product attribute value with no alias relationship

Child elements:

– None

Business rule decision point BRDP-S1-00322 - Method of defining multiple values or ranges for the element <enumeration> in the ACT:

– Decide whether to use a single element <enumeration> containing the entire set or to use multiple elements <enumeration> which each contains only one value or range.

Markup example:

```
<enumeration applicPropertyValues="Mk1|Mk9"/>
```

2.3.2 External product attribute

Description: The element <externalProductAttribute> specifies a product attribute defined in another ACT. This element must be used only by projects or organizations implementing the ACT catalog. Refer to Chap 4.14.4. In this case, the ACT catalog must provide the reference to the product attribute definition.

Markup element: <externalProductAttribute>. Refer to Fig 3.

Attributes:

– id (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– <displayName>. Refer to Para 2.3.1.1.

Markup example:

```
<externalProductAttribute id="serialNumber">
<displayName>SN</displayName>
</externalProductAttribute>
```

2.4 CCT reference

Description: The element <condCrossRefTableRef> provides a reference to the CCT data module for this project.

Markup element: <condCrossRefTableRef>. Refer to Fig 2.

Attributes:

– None

Child elements:

– <dmRef>. Data module references must be populated in accordance with Chap 3.9.5.2.1.2.

2.5 PCT reference

Description: The element <productCrossRefTableRef> provides a reference to the PCT data module for this project.

Markup element: <productCrossRefTableRef>. Refer to Fig 2.

Attributes:

– None

Child elements:

– <dmRef>. Data module references must be populated in accordance with Chap 3.9.5.2.1.2.

3 Examples

Example 1: Declaration of a product attribute representing the serial number of the bicycle.

Since there is neither an attribute valuePattern nor an element <enumeration> defined, so the allowable values are not restricted. The attribute valueDataType is not defined, therefore this product attribute defaults to the "string" data type. The element <displayName> is included which provides a hint when generating a human-readable form of an applicability annotation to identify serial numbers with "SN". For example, to represent serial numbers "1B070622" thru "1B070799": "SN 1B070622-1B070799".

```
<productAttribute id="serialNumber">
<name>Serial number</name>
<displayName>SN</displayName>
<descr>Serial number etched on the bicycle frame</descr>
</productAttribute>
```

Example 2: Declaration of a product attribute representing the version of the bicycle.

The attribute valuePattern restricts the allowable values to the characters "Mk" followed by either "1" or "9". The element <enumeration> restricts the allowable values to either "Mk1" or "Mk9". The attribute valueDataType is not defined, therefore this product attribute defaults to the string data type. In this example the attribute valuePattern and element <enumeration> are overlapping. Only one is needed, although the overlap is not harmful. The element <displayName> is included and is empty which provides a hint that no text is needed when generating a human-readable form of an applicability annotation. For example, to represent a model of "Brook trekker" (with the value of the attribute displayName set to "Model") and a version of "Mk1": "Model Brook trekker Mk1".

```
<productAttribute id="version" valuePattern="Mk(1|9)">
<name>Version</name>
<displayName></displayName>
<descr>Version of the bike</descr>
<enumeration applicPropertyValues="Mk1|Mk9"/>
</productAttribute>
```

Example 3: Declaration of a product attribute representing the version rank of the bicycle.

The attribute valueDataType declares this product attribute as having a data type of "integer". The use of attribute valuePattern is not allowed. The element <enumeration> further restricts the allowable values to "1" thru "3". This illustrates a case where both the attribute valuePattern and element <enumeration> contribute to limiting the allowable values.

```
<productAttribute id="versrank" valueDataType="integer">
<name>Version rank</name>
<displayName>series</displayName>
<descr>Version rank</descr>
<enumeration applicPropertyValues="1~3"/>
</productAttribute>
```

Example 4: Content section from the ACT for the bicycle sample data modules and combining the above examples.

Four product attributes are declared as well as references to the PCT and CCT data modules.

```
<applicCrossRefTable>
<productAttributeList>
<productAttribute id="serialno">
<name>Serial number</name>
<displayName>SN</displayName>
<descr>Serial number etched on the bicycle frame</descr>
</productAttribute>
<productAttribute id="model" valuePattern=".*">
<name>Model</name>
<displayName></displayName>
<descr>Model of the bike</descr>
<enumeration applicPropertyValues="Brook trekker|Mountain
storm"/>
</productAttribute>
<productAttribute id="version" valuePattern="Mk(1|9)">
<name>Model</name>
<displayName></displayName>
<descr>Model of the bike</descr>
<enumeration applicPropertyValues="Mk1|Mk9"/>
</productAttribute>
<productAttribute id="versrank" valueDataType="integer">
<name>Version rank</name>
<displayName>series</displayName>
<descr>Version rank</descr>
<enumeration applicPropertyValues="1~3"/>
</productAttribute>
</productAttributeList>
<condCrossRefTableRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00Q" infoCodeVariant="A" itemLocationCode="D"/>
```

```
</dmRefIdent>
</dmRef>
</condCrossRefTableRef>
<productCrossRefTableRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00P" infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent>
</dmRef>
</productCrossRefTableRef>
</applicCrossRefTable>
```

Example 5: Declaration of two product attributes where the technical author provided text to be used by a viewer to generate a prompt in order to obtain Product values from the end user.

The product attribute "serialno" uses prompt:

"Serial Number (locate under the bottom bracket where the two pedal cranks meet)"

The product attribute version has two possible values: "Mk1" and "Mk9". Each version has a prompt associated with the value of the attribute `enumerationLabel`.

```
<productAttributeList>
<productAttribute id="serialno">
<name>Serial number</name>
<descr>Serial number</descr>
<prompt>
<paraBasic>Serial Number (locate under the bottom bracket where
the two pedal cranks meet)</paraBasic>
</prompt>
</productAttribute>
<productAttribute id="version" valuePattern="Mk(1|9)">
<name>Version</name>
<descr>Version of the bike</descr>
<enumeration applicPropertyValues="Mk1" enumerationLabel="Mk 1
Version (Mountain storm Only)"/>
<enumeration applicPropertyValues="Mk9" enumerationLabel="Mk 9
Version (Brook Trekker Only)"/>
</productAttribute>
</productAttributeList>
```

Chapter 3.9.5.3.2

Applicability - Conditions cross-reference table

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Chap 4.14.4	Applicability - Applicability cross-reference table catalog
Chap 7.8	Information processing - Applicability
XML Schema	REC-xmlschema-2-20041-28 W3C Recommendation: XML Schema Part 2: Datatypes Second Edition (2004 Second Edition)

1 General

The Conditions Cross-reference Table (CCT) data module is used to declare any condition that can affect applicability of data. Conditions can be technical, operational, environmental, or any other type that can affect technical data.

Technical conditions are typically tied to the configuration of the Product, such as Service bulletins or modifications. The state of technical conditions can change throughout the service life of a product instance.

Where projects or organizations define and use conditions in their applicability, there are situations where dependencies exist between some of the defined conditions. For example, for Service Bulletin "B" to be implemented on a product, Service Bulletin "A" must first be implemented. Another example is, to accomplish Test A the airplane must be connected to ground power and for the airplane to be connected to ground power, it must first be on the ground.

Examples of operational and environmental conditions are location of maintenance, availability of support equipment, regulatory rules, temperature, wind speed and sandy conditions.

The CCT data module is divided into three sections: a definition of common types of conditions, a definition of specific conditions and an optional incorporation status list for technical conditions.

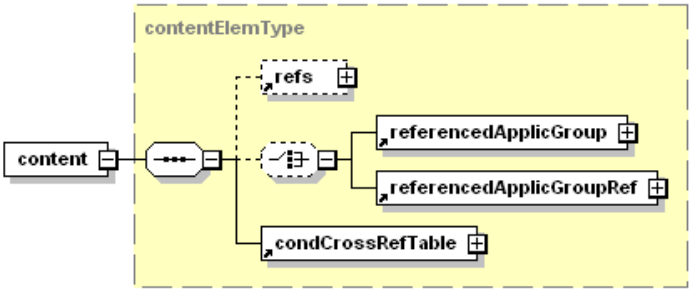
Chap 4.14 and subchapters provide an overview of applicability. It is recommended that these chapters have been read and the concepts understood before reading this chapter. Refer to Chap 7.8 for information about how dependency data can be used at runtime by an IETP.

2 CCT data module content

2.1 Content

Description: The element <content> contains the content section of the CCT data module.

Markup element: <content>



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Fig 1 Major elements in CCT content

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

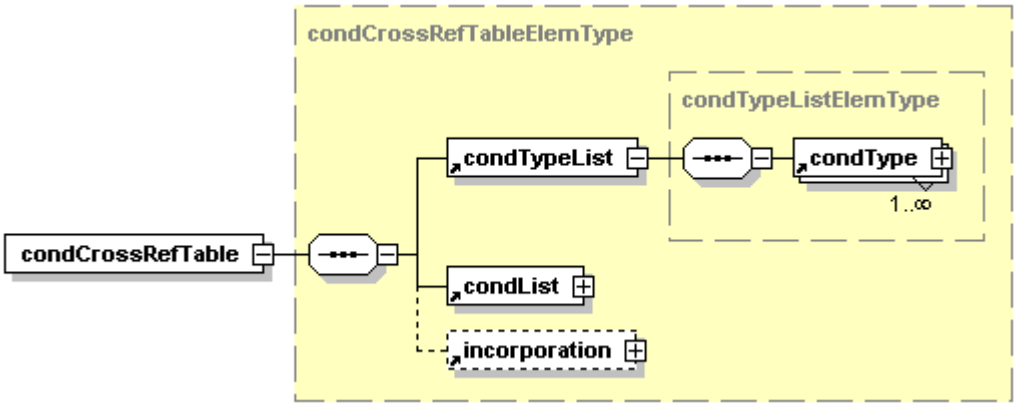
- <`refs`>, the references to data modules, publication modules and non-S1000D publications or documents given in the data module. Refer to Chap 3.9.5.2.1.2.
- <`referencedApplicGroup`>, the applicability annotations directly collected in the data module. Refer to Chap 3.9.5.3.
- <`referencedApplicGroupRef`>, the applicability annotations collected in the data module using the applicability annotations CIR. Refer to Chap 3.9.5.3.
- <`condCrossRefTable`>. Refer to Para 2.2.

2.2 Conditions cross-reference table

Description: The element <`condCrossRefTable`> is used to provide the content of the CCT data module, which is divided into three components:

- Condition type list, to define common types of conditions
- Condition list, to define specific conditions
- Incorporation status list, to document incorporated technical conditions

Markup element: <`condCrossRefTable`>



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Fig 2 Conditions cross-reference table

Attributes:

– None

Child elements:

– <condTypeList>. Refer to Para 2.3.
– <condList>. Refer to Para 2.4.
– <incorporation>. Refer to Para 2.5.

2.3 Condition types list

Description: The element <condTypeList> contains a list of common types of conditions which will be used as a basis for defining specific conditions.

Markup element: <condTypeList>. Refer to Fig 2.

Attributes:

– None

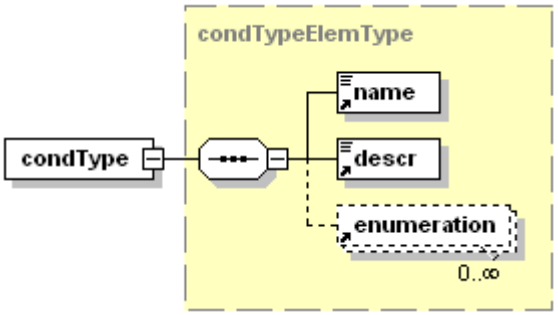
Child elements:

– <condType>. Refer to Para 2.3.1.

2.3.1 Condition type

Description: The element <condType> defines a single condition type of the Product.

Markup element: <condType>



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Fig 3 Element <condType>

Attributes:

– id (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– valueDataType (O), the data type of the product attribute. The attribute can have one of the following values:

  - "string" (D) - for classical character chains
  - "boolean" - for Boolean values ("true" or "false")
  - "integer" - for integer values, which are numeric and do not contain a decimal point
  - "real" - for real values, which are numeric and contain a decimal point

– valuePattern (O), a pattern specifying the allowable structure for each value in the attribute applicPropertyValues in the element <enumeration>. The attribute

valuePattern must only be used when the attribute valueDataType has the value "string" (refer to default BREX rule BREX-S1-00137). The pattern follows the XML Schema regular expression rules as described in the specification "REC-xmlschema-2-20041-28 W3C Recommendation: XML Schema Part 2: Datatypes Second Edition (2004 Second Edition)".

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <name>, the name of the condition type. Refer to Chap 3.9.5.2.1.10.
- <descr>. Refer to Para 2.3.1.1.
- <enumeration>. Refer to Para 2.3.1.2.

Business rule decision point BRDP-S1-00323 - Use of the attribute valuePattern and the element <enumeration> or to use open text when using CCT:

- Decide whether to specify the allowable values for a product attribute achieved by using both the attribute valuePattern and the element <enumeration> or to allow open text without using the attribute valuePattern and the element <enumeration>.

Markup example:

```
<condType id="SB">
<name>Service bulletin</name>
<descr>Generic Service bulletin type</descr>
<enumeration applicPropertyValues="Pre|Post"/>
</condType>
```

2.3.1.1 Description

Description: The element <descr> contains further clarification of the meaning of the condition type. This value can be used to assist the technical author in the selection of the appropriate condition type when defining a condition.

Markup element: <descr>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<descr>Generic Service bulletin type</descr>
```

2.3.1.2 Enumeration

Description: The element <enumeration> contains the allowable values for the condition type. The allowable values can be used to assist the technical author in creating applicability annotations.

The element <enumeration> is optional and repeatable. If there are multiple values and ranges to define, several methods can be employed, including the following:

- single element <enumeration> with attribute applicPropertyValues representing the entire set of values and ranges
- multiple element <enumeration> with attribute applicPropertyValues representing a single value or range

Markup element: <enumeration>

Attributes:

- applicPropertyValues (M), defines the values and ranges of values that are allowed for this condition type. If the parent element <condType> includes the attribute valuePattern, the individual values used in the attribute applicPropertyValues must be compliant to the specified pattern. Refer to Chap 3.9.5.3 for more information on the usage of this attribute.
- enumerationLabel (O), defines the display label in an interactive selection dialog for the value defined by the attribute applicPropertyValues. If enumerationLabel is specified, the attribute applicPropertyValues cannot specify a range or list of values. It is recommended for projects or organizations to provide enumeration labels in order for the viewer to present a complete and coherent dialog when eliciting the value of the attribute from the user.
- aliasFlag, not used in the context of <condType>

Child elements:

- None

Business rule decision point BRDP-S1-00324 - Method of defining multiple values or ranges for the element <enumeration> in the CCT:

- Decide whether to use a single element <enumeration> containing the entire set or to use multiple elements <enumeration> which each contain only one value or range.

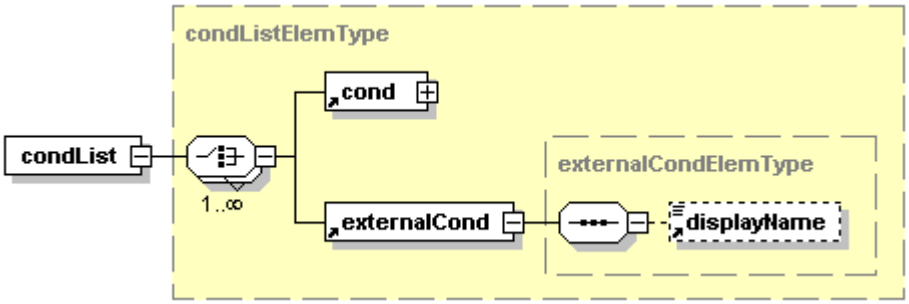
Markup example:

```
<enumeration applicPropertyValues="Pre|Post"/>
```

2.4 Conditions list

Description: The element <condList> contains a list of specific conditions which have an effect on the applicability of technical data.

Markup element: <condList>



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Fig 4 Element <condList>

Attributes:

– None

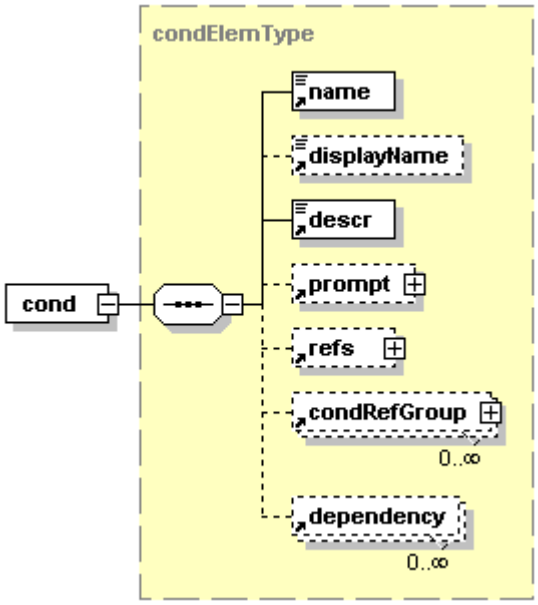
Child elements:

– <cond>. Refer to Para 2.4.1.
– <externalCond>. Refer to Para 2.4.2.

2.4.1 Condition

Description: The element <cond> declares a single condition of the Product.

Markup element: <cond>



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Fig 5 Element <cond>

Attributes:

– id (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- condTypeRefId (M), reference to a declared condition type (element <condType>) which this element represents by using the mechanism for internal links described in Chap 3.9.5.2.1.2
- aliasFlag (O), indicates that the condition has an equivalent condition within another CCT. This attribute must be used only by projects or organizations implementing the ACT catalog. Refer to Chap 4.14.4. In this case, the ACT catalog must provide the corresponding alias relationship. The attribute can have one of the following values:
  - "1" - Yes, for a condition with an alias relationship defined in the ACT catalog
  - "0" - No, for a condition with no alias relationship
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <name>, the name of the condition. Refer to Chap 3.9.5.2.1.10.
- <displayName>. Refer to Para 2.4.1.1.
- <descr>. Refer to Para 2.4.1.2.
- <prompt>. Refer to Para 2.4.1.3.
- <refs>. Refer to Para 2.4.1.4.
- <condRefGroup>. Refer to Para 2.4.1.5.
- <dependency>. Refer to Para 2.4.1.6.

Markup example:

```
<cond condTypeRefId="SB" id="SB-S001">
<name>Service bulletin S001 - Chain guard</name>
<descr>Service bulletin S001 for the installation of the chain
guard</descr>
</cond>
```

2.4.1.1 Display name

Description: The element <displayName> defines text which can be used to help automated generation of the human-readable display text on an applicability annotation. Refer to Chap 7.8.

Markup element: <displayName>

Attributes:

- None

Child elements:

- None

Business rule decision point BRDP-S1-00325 - Use of the element <displayName> in the element <productAttribute> when using CCT:

- Decide whether to use the element <displayName>.

Markup example:

```
<displayName>SB-S001 (Chain guard)</displayName>
```

2.4.1.2 Description

Description: The element <descr> contains further clarification of the meaning of the condition. This value can be used to assist the technical author in the selection of the appropriate condition when building an applicability annotation.

Markup element: <descr>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<descr>Service bulletin S001 for the installation of the chain guard</descr>
```

2.4.1.3 Prompt

The element <prompt> is used to contain specific text that can be used to create a dialog in order to obtain values for product attributes or conditions from an end user. Refer to Chap 3.9.5.3.1.

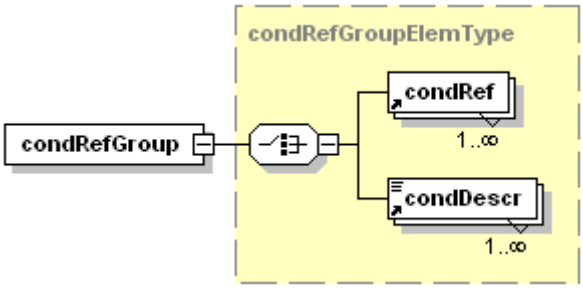
2.4.1.4 References

The element <refs> contains the standard referencing mechanism to associate additional material with the condition. For example, a Service bulletin condition can include a reference to the Service bulletin publication which incorporates the Service bulletin. Refer to Chap 3.9.5.2.1.2.

2.4.1.5 Group of referenced conditions

Description: The element <condRefGroup> refers to other conditions linked to the described conditions. It is possible to refer to a defined condition using the element <condRef> or to another condition using the element <condDescr>.

Markup element: <condRefGroup>



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Fig 6 Element <condRefGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- condRefGroupType (M), the type of relationship with the other condition
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <condRef>. Refer to Para 2.4.1.5.1.
- <condDescr>. Refer to Para 2.4.1.5.2.

Markup example:

```
<condRefGroup condRefGroupType="customerWorkOrder">
...
</condRefGroup>
```

2.4.1.5.1 Condition reference

Description: The element <condRef> identifies a single condition that is defined in the CCT condition list using the element <cond> or the element <externalCond>.

Markup element: <condRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- condRefId (M), reference to a declared condition (element <cond> or <externalCond>) which this element represents by using the mechanism for internal links described in Chap 3.9.5.2.1.2
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<condRef condRefId="SB-S001"/>
```

2.4.1.5.2 Condition description

Description: The element <condDescr> specifies a condition that is not defined in the CCT.

Markup element: <condDescr>

Attributes:

- None

Child elements:

- None

Markup example:

```
<condDescr>E028-53000X</condDescr>
```

2.4.1.6 Dependency

Description: The element <dependency> identifies a condition that is dependent on the existence of another condition.

Markup element: <dependency>

Attributes:

- forCondValues (M), contains the values of the condition which has a dependency on another condition identified by the attribute dependencyTest. The allowed values are defined in the condition types list. Refer to Para 2.3.
- dependencyTest (M), a reference to an applicability annotation that expresses the dependency

Child elements:

- None

Business rule decision point BRDP-S1-00326 - Constraining conditions by use of the element <dependency> in the element <cond> in the CCT:

- Decide whether to constrain allowable conditions based on other condition values by use of the element <dependency>.

Markup example:

```
<dependency forCondValues="POST" dependencyTest="app-0001"/>
```

Note

The dependency above is populated in the context of its parent condition, SB-B, shown here:

```
<cond id="SB-B" condTypeRefId="A-CT01">
<name>SB-B</name>
<descr>Service Bulletin B</descr>
<dependency forCondValues="POST" dependencyTest="app-0001"/>
</cond>
```

The dependency above refers to the applicability "app-00001", asserting that SB-A has been incorporated (is set to POST) as shown below:

```
<applic id="app-00001">
<assert applicPropertyIdent="SB-A"
applicPropertyType="condition" applicPropertyValues="POST"/>
</applic>
```

In this example the author put a constraint on SB-B enforcing that SB-A must be set to "POST" for SB-B to be set to "POST". An example of a reason for doing this is if SB-B modifies a widget on the Product that was added to the Product by SB-A. This constraint applies to one of the possible results when tested against the state of a product instance. Refer to Table 2.

Table 2 Allowed and invalid dependency results

SB-B	SB-A	Result
POST (widget modified on Product)	POST (widget added to Product)	allowed
POST (widget modified on Product)	PRE (widget not on Product)	invalid

SB-B	SB-A	Result
PRE (widget not modified)	POST (widget added to Product)	allowed
PRE (widget not modified)	PRE (widget not on Product)	allowed

2.4.2 External condition

Description: The element <externalCond> specifies a condition defined in another CCT. This element must be used only by projects or organizations implementing the ACT catalog. Refer to Chap 4.14.4. In this case, the ACT catalog must provide the reference to the condition definition.

Markup element: <externalCond>. Refer to Fig 4.

Attributes:

- id (M), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- condTypeRefId (M), reference to a declared condition type (element <condType>) which this element represents by using the mechanism for internal links described in Chap 3.9.5.2.1.2
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <displayName>. Refer to Para 2.4.1.1.

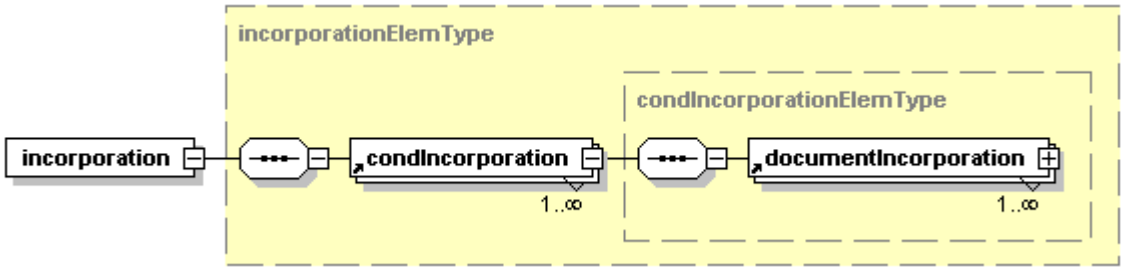
Markup example:

```
<externalCond id="SB-S023" condTypeRefId="SB">
<displayName>SB S023</displayName>
</externalCond>
```

2.5 Incorporation status list

Description: The element <incorporation> contains the incorporation status of technical conditions in the documentation.

Markup element: <incorporation>



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Fig 7 Element <incorporation>

Attributes:

- None

Child elements:

– <condIncorporation>. Refer to Para 2.5.1.

2.5.1 Condition incorporation

Description: The element <condIncorporation> represents a technical condition that has or is planned to be incorporated into the technical data. It can reference a declared condition (element <cond>) and consists of a list of documents affected by the technical condition.

Markup element: <condIncorporation>. Refer to Fig 7.

Attributes:

– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– condRefId (M), reference to a declared condition (element <cond>) which this element represents by using the mechanism for internal links described in Chap 3.9.5.2.1.2
– condIssueNumber (O), specifies the issue number of the technical condition for which the incorporation status is given
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

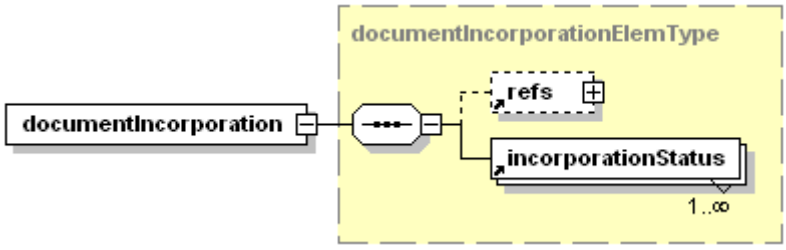
Child elements:

– <documentIncorporation>. Refer to Para 2.5.1.1.

2.5.1.1 Document incorporation

Description: The element <documentIncorporation> lists the data modules and publications that this technical condition affects.

Markup element: <documentIncorporation>



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Fig 8 Element <documentIncorporation>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <refs>. Refer to Para 2.5.1.1.1.
- <incorporationStatus>. Refer to Para 2.5.1.1.2.

Markup example:

```
<documentIncorporation>
<incorporationStatus incorporationStatus="incorporated"/>
</documentIncorporation>
```

2.5.1.1.1 References

The element <refs> is used to reference publications and data modules associated with this technical condition. It must be populated in accordance with Chap 3.9.5.2.1.2.

2.5.1.1.2 Incorporation status

Description: The element <incorporationStatus> is used to define the status of the incorporation of a technical condition.

Markup element: <incorporationStatus>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- incorporationStatus (M), the incorporation status. The attribute can have one of the following values:
  - "inprogress" - for a technical condition which is partially incorporated into the data module or publication content
  - "incorporated" - for a technical condition which is completely incorporated into the data module or publication content
  - "noeffect" - for a technical condition which has no impact on the data module or publication content
- year (O), month (O) and day (O), the date of the incorporation. These attributes are mandatory if the attribute incorporationStatus has the value "incorporated".
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup example:

```
<incorporationStatus incorporationStatus="incorporated"/>
```

3 Examples

Example 1: Definition of a generic Service bulletin condition type.

The type is given an identifier of "SB" and the allowable values for a Service bulletin are defined to be "Pre" and "Post". Display labels for an interactive selection dialog for each allowable value are provided in order to aid the end user in the selection.

```
<condType id="SB">
<name>Service bulletin</name>
<descr>Generic Service bulletin type</descr>
<enumeration applicPropertyValues="Pre" enumerationLabel="Not
incorporated"/>
<enumeration applicPropertyValues="Post"
enumerationLabel="Incorporated"/>
</condType>
```

Example 2: Declaration of a condition specifically for the Service bulletin called "S001" for installing a chain guard on the bicycle.

The condition is given an identifier of "SB-S001", it is of condition type "SB", referring to the above example, which means it inherits the allowable values of "Pre" and "Post".

```
<cond condTypeRefId="SB" id="SB-S001">
<name>Service bulletin S001 - Chain guard</name>
<descr>Service bulletin S001 for the installation of the chain
guard</descr>
</cond>
```

Example 3: Incorporation status for the above declared technical condition.

It provides a reference to the condition with identifier of "SB-S001", references the data module with was affected and provides the status of "incorporated" and the effective date.

```
<condIncorporation condRefId="SB-S001">
<documentIncorporation>
<refs><dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="2" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="520" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef></refs>
<incorporationStatus incorporationStatus="incorporated"
year="2007" month="07" day="31"/>
</documentIncorporation>
</condIncorporation>
```

Example 4: Complete content section of a CCT data module by combining the three examples from this paragraph above.

```
<condCrossRefTable>
<condTypeList>
<condType id="SB">
<name>Service bulletin</name>
<descr>Generic Service bulletin type</descr>
```

```
<enumeration applicPropertyValues="Pre|Post"/>
</condType>
</condTypeList>
<condList>
<cond condTypeRefId="SB" id="SB-S001">
<name>Service bulletin S001 - Chain guard</name>
<descr>Service bulletin S001 for the installation of the chain
guard</descr>
</cond>
</condList>
<incorporation>
<condIncorporation condRefId="SB-S001">
<documentIncorporation>
<refs><dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="2" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="520" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef></refs>
<incorporationStatus incorporationStatus="incorporated"
year="2007" month="07" day="31"/>
</documentIncorporation>
</condIncorporation>
</incorporation>
</condCrossRefTable>
```

Chapter 3.9.5.3.3

Applicability - Products cross-reference table

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Chap 3.9.5.3	Data modules - Applicability
Chap 4.14	Information management - Applicability

1 General

The Products Cross-reference Table (PCT) data module is a repository for defining product instances and associating values to product attributes and conditions for each product instance. A product instance is an actual physical Product, for example a Brook trekker Mk9 bicycle with serial number 1B070643.

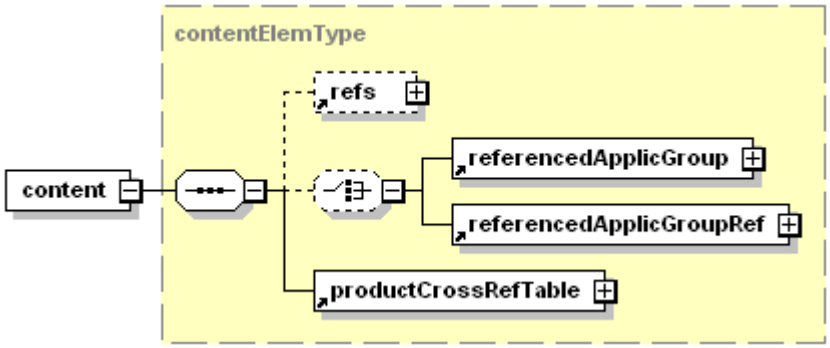
Chap 4.14 and subchapters provide an overview of applicability. It is recommended that these chapters have been read and the concepts understood before reading this chapter.

2 PCT data module content

2.1 Content

Description: The element <content> contains the content section of the PCT data module.

Markup element: <content>



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Fig 1 Major elements in PCT content

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

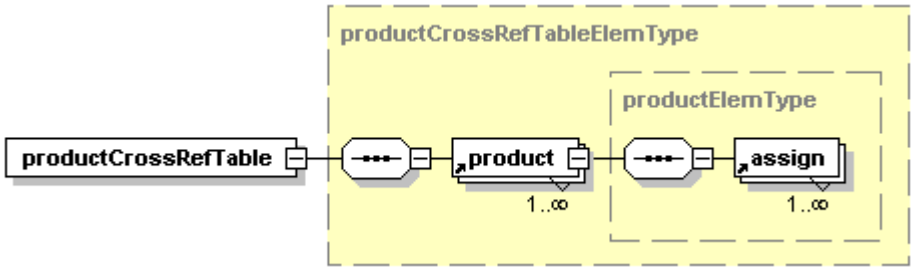
Child elements:

- <refs>, the references to data modules, publication modules and non-S1000D publications or documents given in the data module. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>, the applicability annotations directly collected in the data module. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>, the applicability annotations collected in the data module using the applicability annotations CIR. Refer to Chap 3.9.5.3.
- <productCrossRefTable>. Refer to Para 2.2.

2.2 Products cross-reference table

Description: The element <productCrossRefTable> contains the content of the PCT data module, which is a list of product instances.

Markup element: <productCrossRefTable>



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Fig 2 Products cross-reference table

Attributes:

– None

Child elements:

– <product>. Refer to Para 2.3.

2.3 Product

Description: The element <product> identifies an individual product instance.

Markup element: <product>. Refer to Fig 2.

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– <assign>. Refer to Para 2.3.1.

2.3.1 Assign

Description: The element <assign> associates a value with a product attribute or condition.

Markup element: <assign>

Attributes:

– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– applicPropertyIdent (M), the identifier of either the product attribute (element <productAttribute> attribute id from the Applicability Cross-reference Table (ACT) data module) or the condition (element <cond> attribute id from the Conditions Cross-reference Table (CCT) data module)
– applicPropertyType (O), indicates whether the attribute applicPropertyIdent references a product attribute or a condition. The attribute can have one of the following values:
  - "prodattr" - indicates the attribute applicPropertyIdent references a product attribute
  - "condition" - indicates the attribute applicPropertyIdent references a condition
– applicPropertyValue (M), the value to assign to the referenced product attribute or condition. The value cannot contain the characters tilde [~] or vertical bar [|] as these characters will be interpreted as separators when used as a value in the attribute applicPropertyValues elsewhere in the applicability model.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– None

Business rule decision point BRDP-S1-00327 - Product attributes and conditions to include in the PCT:

– Decide which product attributes and conditions to include in the PCT. Conditions that represent operational or environmental properties will usually not be included in the PCT as they are not associated with a product instance.

Markup example:

```
<assign applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValue="1B070643"/>
```

3 Examples

The following markup example illustrates the definition of three product instances.

```
<productCrossRefTable>
<product>
<assign applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValue="1B070643"/>
<assign applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValue="Brook
trekker"/>
<assign applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValue="Mk9"/>
<assign applicPropertyIdent="versrank"
applicPropertyType="prodattr" applicPropertyValue="2"/>
<assign applicPropertyIdent="SB-S001"
applicPropertyType="condition" applicPropertyValue="Pre"/>
</product>
<product>
<assign applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValue="1B070644"/>
<assign applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValue="Brook
trekker"/>
<assign applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValue="Mk9"/>
<assign applicPropertyIdent="versrank"
applicPropertyType="prodattr" applicPropertyValue="1"/>
<assign applicPropertyIdent="SB-S001"
applicPropertyType="condition" applicPropertyValue="Post"/>
</product>
<product>
<assign applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValue="1B070701"/>
<assign applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValue="Mountain
storm"/>
<assign applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValue="Mk1"/>
<assign applicPropertyIdent="versrank"
applicPropertyType="prodattr" applicPropertyValue="1"/>
<assign applicPropertyIdent="SB-S001"
applicPropertyType="condition" applicPropertyValue="Pre"/>
```

```
</product>
</productCrossRefTable>
```

Chapter 3.9.5.3.4

Applicability - Applicability cross-reference table catalog

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Chap 4.14.4	Applicability - Applicability cross-reference table catalog

1 General

The Applicability cross-reference table (ACT) catalog is a dedicated data module type to be used in the context of projects with several ACT data modules. The purpose of this ACT catalog data module is to coordinate different ACT/CCT sets in the same project, in order to adequately address this scenario from a content management and IETP rendering perspective. Refer to Chap 4.14.4 for more information about the ACT catalog principles.

The ACT schema contains two branches:

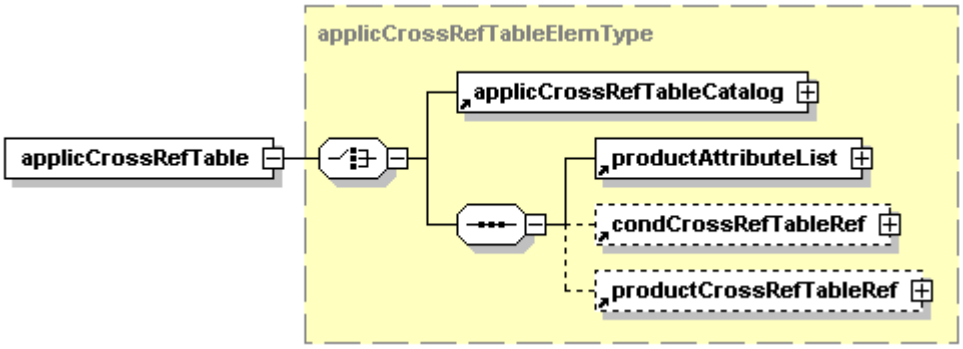
- One for the ACT catalog data module (element <applicCrossRefTableCatalog>), which is described in this chapter
- One for the ACT data module. Refer to Chap 3.9.5.3.1 for more information on the content of this data module

2 ACT Catalog content

2.1 Applicability cross-reference table

Description: The element <applicCrossRefTable> is used to provide the content of the ACT data module or the ACT catalog data module.

Markup element: <applicCrossRefTable>



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Fig 1 Applicability cross-reference table

Attributes:

- None

Child elements:

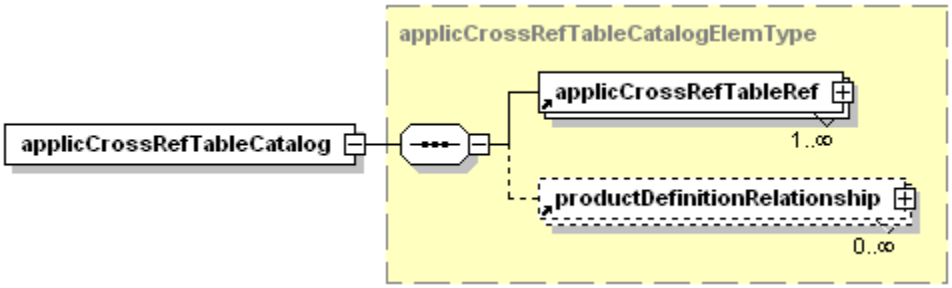
- <applicCrossRefTableCatalog>. Refer to Para 2.2.
- <productAttributeList>. Refer to Chap 3.9.5.3.1.
- <condCrossRefTableRef>. Refer to Chap 3.9.5.3.1.
- <productCrossRefTableRef>. Refer to Chap 3.9.5.3.1.

2.2 Applicability cross-reference table catalog

Description: The element <applicCrossRefTableCatalog> contains the whole ACT catalog. This is the parent element for the ACT catalog data module. The ACT catalog contains two parts:

- The list of ACT data modules in the project
- The relationships between the different ACT/CCT sets

Markup element: <applicCrossRefTableCatalog>



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Fig 2 Element <applicCrossRefTableCatalog>

Attributes:

– None

Child elements:

– <applicCrossRefTableRef>, the different ACT data modules used by the project. Refer to Chap 3.9.5.1.
– <productDefinitionRelationship>. Refer to Para 2.2.1.

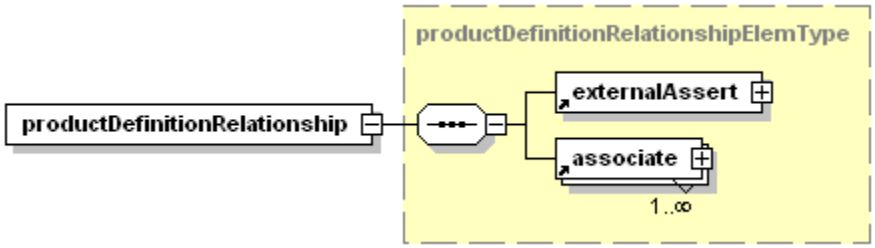
Markup example:

```
<applicCrossRefTableCatalog>
<applicCrossRefTableRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00W" infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent>
</dmRef>
</applicCrossRefTableRef>
<applicCrossRefTableRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="BRAKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00W" infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent>
</dmRef>
</applicCrossRefTableRef>
<productDefinitionRelationship>
...
</productDefinitionRelationship>
</applicCrossRefTableCatalog>
```

2.2.1 Product definition relationships

Description: The element <productDefinitionRelationship> is used to make relationships between two or more product attributes, product attribute values or conditions coming from different ACT/CCT sets.

Markup element: <productDefinitionRelationship>



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Fig 3 Element <productDefinitionRelationship>

Attributes:

– None

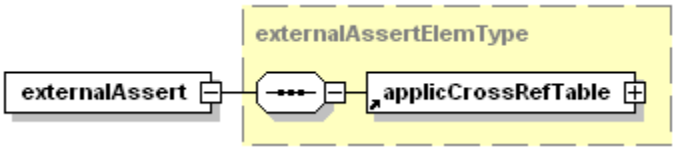
Child elements:

– <externalAssert>. Refer to Para 2.2.2.
– <associate>. Refer to Para 2.2.3.

2.2.2 External assertions

Description: The element <externalAssert> is based on the element <assert>. Refer to Chap 3.9.5.3. An external assertion identifyies a product attribute, a product attribute value or a condition defined in an ACT data module using the element <applicCrossRefTableRef>.

Markup element: <externalAssert>



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Fig 4 Element <externalAssert>

Attributes:

– applicPropertyIdent (M), for the identifier of either the product attribute (element <productAttribute> attribute id from the ACT data module) or condition (element <cond> attribute id from the CCT data module) to test
– applicPropertyType (M), indicates whether the value of the attribute applicPropertyIdent references a product attribute or a condition. The attribute can have one of the following values:
  - "prodattr" - indicates the attribute applicPropertyIdent references a product attribute
  - "condition" - indicates the attribute applicPropertyIdent references a condition
– applicPropertyValues (O), for the values and/or ranges to test against. Refer to Chap 3.9.5.3 for additional information including formatting requirements. This attribute is used only when referencing a product attribute value or a condition.

Child elements:

– <applicCrossRefTableRef>. Refer to Chap 3.9.5.1.

Markup example:

```
<externalAssert applicPropertyIdent="brakeModel"
applicPropertyType="prodattr">
<applicCrossRefTableRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00W" infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent>
</dmRef>
</applicCrossRefTableRef>
</externalAssert>
```

2.2.3 Associating external assertions

Description: The element <associate> is used to associate an external assertion (product attribute, product attribute value or condition as defined within a specific ACT data module) to one or several other ones. There are two types of association:

– The "reference", associating an external product attribute or condition to the full definition of this product attribute or condition within another ACT/CCT data module (external definition)
– The "alias", associating several product attributes, or product attribute values or conditions, that represents the same thing but are defined in several ACT/CCT data modules (equivalent definition)

The association is made between the external assertion as defined as the child of the product relationship (element <productDefinitionRelationship>) and the external assertion(s) as defined under the association (element <association>)

Example:

Product definition relationship

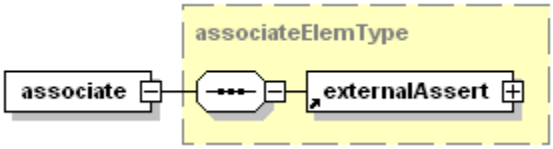
External assertion #1

Associate Type = "Alias"

External assertion #2

means that External assertion #1 and #2 are linked by an "alias" association.

Markup element: <associate>



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Fig 5 Element <associate>

Attributes:

– associationType (O). The attribute can have one of the following values:

- "extref" - for external definitions
- "alias" - for equivalent definitions

Child elements:

– <externalAssert>. Refer to Para 2.2.2.

Markup example:

```
<productDefinitionRelationship>
<externalAssert applicPropertyIdent="brakeSerialNo"
applicPropertyType="prodattr">
<applicCrossRefTableRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00W" infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent></dmRef>
</applicCrossRefTableRef>
</externalAssert>
<associate associationType="alias">
<externalAssert applicPropertyIdent="serialNo"
applicPropertyType="prodattr">
<applicCrossRefTableRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="BRAKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00W" infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent>
</dmRef>
</applicCrossRefTableRef>
</externalAssert>
</associate>
</productDefinitionRelationship>
```

Chapter 3.9.6

Authoring - Attributes

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Chap 3.9.6.2	Attributes - Fixed values

1 General

1.1 Scope

This chapter regards attributes that contain specific enumerated sets of predefined allowable values. Other attributes (eg, attributes used to contain non-specific character strings) are not concerned herein.

1.2 Purpose

The chapter introduces different classes of attributes and gives the principles for how these are populated. Specifically, the chapter describes how to code project configurable attributes.

2 Attribute principles

2.1 Attribute classes

In the Schemas, supplied with this specification, there are three classes of attributes with predefined allowable sets of values:

These classes are characterized as follows:

– Class 1 - Specific (for a project)

  These attributes are used to represent information of project related character. They reflect facts and circumstances that do not have any relevance for the general function of the

specification. To some extent these attributes can be tailored to meet the needs of a specific project etc.

Note

In order to avoid ambiguities, it is crucial to consider the entire environment where the attributes will be involved and to make sure that tailoring is not in conflict with the overall interoperability requirements as agreed within the project.

– Class 2 - Generic (within scope of the specification)

  These attributes represent characteristics and properties of general interest and relevance within the scope of the specification. They carry facts and circumstances that are essential to the function of the specification and its application. Therefore they must be applied strictly in accordance with the specification where their intended use is described.

– Class 3 - Public (inherited from other Schemas, etc)

  These attributes are incorporated due to reuse of structures, elements and attributes created in contexts outside S1000D. An example would be the "align" attribute of the (CALS) table structure.

2.2 General coding principles

Under the interoperability constraint, attributes of class 1 can be tailored to specific projects as needed. Chap 3.9.6.1 and Chap 3.9.6.2 list these attributes, including their ranges of allowable values, and the S1000D interpretation of these values. Interpretations are provided in English.

A project can, by project decision, translate the "S1000D interpretation" given to the allowable values listed. The translation must be a direct translation without any deviations in its meaning.

Business rule decision point BRDP-S1-00328 - Translation of the "S1000D interpretation" of configurable attribute values:

– Decide whether to translate and use the "S1000D interpretation" of configurable attribute values in the languages adopted by the project.

Note

At no time must a project allocate values outside the ranges given in the subchapters.

Attributes belonging to classes 2 and 3 are not available for project specific use.

2.3 Attributes available for tailoring

The attributes that are available for tailoring are defined in the following subchapters:

– Chap 3.9.6.1 - Attributes - Project configurable values
– Chap 3.9.6.2 - Attributes - Fixed values

Chapter 3.9.6.1

Attributes - Project configurable values

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Chap 3.9.5	Authoring - Data modules
Chap 7.3.1.5	Schema - Configuration of attributes
Chap 9.2.2	Terms, acronyms and subject index - Abbreviations and acronyms

1 General

This chapter describes the group of attributes for which the set of allowable values to some extent can be adjusted to the specific needs of a project. The attributes are listed and their respective sets of allowable coded values are defined.

Other attributes (eg, attributes used to contain non-specific character strings) are not concerned herein.

2 Attributes available for tailoring

The tables below specify those attributes available for project tailoring. For each attribute there is a description of what range of values is allocated to that attribute (allowable values). Refer to default BREX rules BREX-S1-00181 thru BREX-S1-00243, BREX-S1-00251 thru BREX-S1-00260, BREX-S1-00262, BREX-S1-00263 and BREX-S1-00264.

Note

If an attribute and its value are not listed in these tables, it is not allowed.

For advice on how to technically configure attribute value sets to the project specific needs, refer to Chap 7.3.1.5.

All tailoring of attribute values must be agreed to within a project and documented in the project or organization business rules. Furthermore, interpretation of attribute values must be exchanged and agreed upon between all parties.

Business rule decision point BRDP-S1-00329 - Application of project specific values for configurable attributes:

– Decide whether to use any project specific attribute values, which values to use and allocate suitable definitions and interpretations.

Note

There are specific business rules decision points for some of the configurable attributes given in the authoring chapters. Refer to Chap 3.9.5 and its subchapters.

The attributes available for tailoring are:

– Access point type - attribute `accessPointTypeValue`
– Type of acronym or abbreviation - attribute `acronymType`
– Classification action – attribute `actionIdentType`
– Type of barcode - attribute `barCodeSymbology`

- Business rule decision point priority - attribute `brDecisionPointPriority`
- Business rule breach severity level - attribute `brSeverityLevel`
- Business rule quality assurance status - attribute `brStatus`
- Caption for Dialog cancel function - attribute `cancelCaption`
- National caveat - attribute `caveat`
- Check list category - attribute `checkListCategory`
- Type of circuit breaker reference - attribute `circuitBreakerRefType`
- Type of circuit breaker - attribute `circuitBreakerType`
- Caption color - attribute `color`
- Priority level of a comment - attribute `commentPriorityCode`
- Commercial security classification - attribute `commercialClassification`
- Type of control authority - attribute `controlAuthorityType`
- Type of crew member required for drill or procedural step - attribute `crewMemberType`
- Crew step condition - attribute `crewStepCondition`
- Default business rule breach severity level - attribute `defaultBrSeverityLevel`
- Type of aircrew drill - attribute `drillType`
- Type of emphasis - attribute `emphasisType`
- Type of front matter information - attribute `frontMatterInfoType`
- Type of front matter - attribute `frontMatterType`
- Maintenance function - attribute `function`
- Type of functional item reference - attribute `functionalItemRefType`
- Type of functional item - attribute `functionalItemType`
- Generic property type - attribute `genericPropertyType`
- Value of hazardous class - attribute `hazardousClassValue`
- Type of ICN metadata item - attribute `icnInfoItemType`
- Type of resource files associated to the ICN - attribute `icnResourceFileType`
- Type of source files associated to the ICN - attribute `icnSourceFileType`
- Type of equipment install location - attribute `installationLocationType`
- Type of target of the internal reference - attribute `internalRefTargetType`
- Item characteristic - attribute `itemCharacteristic`
- Origin of item - attribute `itemOriginator`
- Limit type - attribute `limitUnitType`
- Prefix of <`randomList`> items - attribute `listItemPrefix`
- Lowest authorized level - attribute `lowestLevel`
- Maintenance level code - attribute `maintLevelCode`
- Material usage - attribute `materialUsage`
- Operation type - attribute `operationType`
- Part characteristic - attribute `partCharacteristic`
- Part status for the item sequence number - attribute `partStatus`
- Part usage code - attribute `partUsageCode`
- Publication module entry type - attribute `pmEntryType`
- Type of publication in a publication module - attribute `pmType`
- Product category - attribute `productCategory`
- Type of product item - attribute `productItemType`
- Quantity type - attribute `quantityType`
- Refer to type - attribute `refType`
- Required condition category - attribute `reqCondCategory`
- Required technical information category - attribute `reqTechInfoCategory`

- Caption for Dialog reset function - attribute `resetCaption`
- Type of response to a comment - attribute `responseType`
- Service bulletin compliance category - attribute `sbComplianceCategory`
- Service bulletin impact type - attribute `sbImpactType`
- Service bulletin material type - attribute `sbMaterialType`
- Category of the Service bulletin task - attribute `sbTaskCategory`
- Service bulletin time compliance type - attribute `sbTimeComplianceType`
- Service bulletin topic type - attribute `sbTopicType`
- Type of SCO entry – attribute `scoEntryType`
- Security classification - attribute `securityClassification`
- Paragraph significant data type - attribute `significantParaDataType`
- Personnel skill level - attribute `skillLevelCode`
- Personnel skill category - attribute `skillType`
- Software classification - attribute `softwareClassificationValue`
- Software customization status - attribute `softwareCustomizationStatusValue`
- Source criticality - attribute `sourceCriticality`
- Source type code - attribute `sourceTypeCode`
- Part sourcing type - attribute `sourcingTypeValue`
- Caption for Dialog submit function - attribute `submitCaption`
- Supervisor level - attribute `supervisorLevelCode`
- Type of supply number - attribute `supplyNumberType`
- Task code - attribute `taskCode`
- Unit of measure for the threshold interval - attribute `thresholdUnitOfMeasure`
- Update reason type for reason for update - attribute `updateReasonType`
- Style/class of verbatim text - attribute `verbatimStyle`

Table 2 `accessPointTypeValue` - Access point type

Allowable values	S1000D interpretation
"`accpnl01`"	Door
"`accpnl02`"	Panel
"`accpnl03`"	Electrical panel
"`accpnl04`"	Hatch
"`accpnl05`"	Fillet
"`accpnl51`" - "`accpnl99`"	Available for projects

Table 3 `acronymType` - Type of acronym or abbreviation

Allowable values	S1000D interpretation
"`at01`" (default value)	Acronym (Candidate for list of abbreviations)

Allowable values	S1000D interpretation
"at02"	Term (Candidate for list of terms)
"at03"	Symbol (Candidate for list of symbols)
"at04"	Spec (Candidate for list of applicable specs)
"at51" - "at99"	Available for projects

Table 4 actionIdentType - Classification action

Allowable values	S1000D interpretation
"ai01"	Classified On
"ai02"	Declassify On
"ai03"	Downgrade On
"ai04"	Upgrade On
"ai05"	Downgrade securityClassification to 03
"ai06"	Downgrade securityClassification to 04
"ai07"	Downgrade securityClassification to 05
"ai08"	Upgrade securityClassification to 03
"ai09"	Upgrade securityClassification to 04
"ai10"	Upgrade securityClassification to 05
"ai51" - "ai99"	Available for projects

Table 5 barCodeSymbology - Type of barcode

Allowable values	S1000D interpretation
"bcs01"	Codabar
"bcs02"	Code 11
"bcs03"	EAN-13
"bcs04"	EAN-8
"bcs05"	Industrial 2 of 5
"bcs06"	Interleaved 2 of 5
"bcs07"	MSI

Allowable values	S1000D interpretation
"bcs08"	Plessey
"bcs09"	POSTNET
"bcs10"	UPC-A
"bcs11"	Standard 2 of 5
"bcs12"	UPC-E
"bcs13"	Code 128
"bcs14"	Code 39
"bcs15"	Code 93
"bcs16"	LOGMARS
"bcs17"	PDF417
"bcs18"	DataMatrix
"bcs19"	Maxicode
"bcs20"	QR Code
"bcs21"	Data Code
"bcs22"	Code 49
"bcs23"	16K
"bcs24"	Bookland EAN
"bcs25"	ISSN and the SISAC Barcode
"bcs26"	OPC
"bcs27"	UCC/EAN-128
"bcs28"	UPC Shipping Container Symbol: ITF-14
"bcs29"	PLANET
"bcs30"	Intelligent Mail (USPS4CB)
"bcs51" - "bcs99"	Available for projects

Table 6 `brDecisionPointPriority` - Business rule decision point priority

Allowable values	S1000D interpretation
"brpr01"	Highest BR priority
"brpr02"	Next lower level of BR priority

Allowable values	S1000D interpretation
"brpr03"	Next lower level of BR priority
"brpr04"	Next lower level of BR priority
"brpr05"	Lowest level of BR priority
"brpr51" - "brpr99"	Available for projects

Table 7 brSeverityLevel - Business rule breach severity level

Allowable values	S1000D interpretation
"brsl01"	Most severe
"brsl02"	Medium severity
"brsl03"	Least severe
"brsl51" - "brsl99"	Available for projects

Note

Allowable values for this attribute must comply with the values of attribute defaultBrSeverityLevel.

Table 8 brStatus - Business rule quality assurance status

Allowable values	S1000D interpretation
"brst01"	Unverified
"brst02"	First verified
"brst03"	Second verified
"brst51" - "brst99"	Available for projects

Table 9 cancelCaption - Caption for Dialog cancel function

Allowable values	S1000D interpretation
"ca01"	Sets the caption to "CANCEL"
"ca02"	Sets the caption to "ABORT"
"ca03"	Sets the caption to "NO"
"ca04"	Sets the caption to "END"
"ca05"	Sets the caption to "QUIT"
"ca51" - "ca99"	Available for projects

Table 10 `caveat` - National caveat

Allowable values	S1000D interpretation
"cv51" - "cv99"	Available for projects

Table 11 `checkListCategory` - Check list category

Allowable values	S1000D interpretation
"clc01"	Preventive maintenance inspection form
"clc02"	Preventive maintenance checks and services
"clc03"	Schematic
"clc51" - "clc99"	Available for projects

Table 12 `circuitBreakerRefType` - Type of circuit breaker reference

Allowable values	S1000D interpretation
"cbr01"	Reference to the primary circuit breaker
"cbr02"	Reference to the provisioned circuit breaker (for a dummy circuit breaker)
"cbr51" - "cbr99"	Available for projects

Table 13 `circuitBreakerType` - Type of circuit breaker

Allowable values	S1000D interpretation
"cbt01"	Electronic circuit breaker
"cbt02"	Electromechanical circuit breaker
"cbt03"	Clipped circuit breaker
"cbt51" - "cbt99"	Available for projects

Table 14 `color` - Caption color

Allowable values	S1000D interpretation
"co00"	None
"co01"	Green
"co02"	Amber
"co03"	Yellow
"co04"	Red

Allowable values	S1000D interpretation
"co07"	White
"co08"	Grey
"co09" (default value)	Clear
"co10"	Black
"co51" - "co99"	Available for projects

Table 15 commentPriorityCode - Priority level of a comment

Allowable values	S1000D interpretation
"cp01"	Routine
"cp02"	Emergency
"cp03"	Safety critical
"cp51" - "cp99"	Available for projects

Table 16 commercialClassification - Commercial security classification

Allowable values	S1000D interpretation
"cc51" - "cc99"	Available for projects

Table 17 controlAuthorityType - Type of control authority

Allowable values	S1000D interpretation
"cat01"	Airworthiness Directive (AD)
"cat02"	Alternate Method of Compliance (AMOC)
"cat03"	Airworthiness Limitation (AWL)
"cat04"	Autoland Category III (CAT III)
"cat05"	Critical Design Configuration Control Limitation (CDCCL)
"cat06"	Certification Maintenance Requirement (CMR)
"cat07"	Extended Operations (ETOPS)
"cat08"	Electrical Wiring Interconnection Systems (EWIS)
"cat09"	Letter of Investigation (LOI)
"cat10"	Required Inspection Item (RII)

Allowable values	S1000D interpretation
“cat11”	Reduced Vertical Separation Minimum (RVSM)
“cat12”	Special FAR for Fuel Tank Flammability (SFAR 88)
"cat13"	Equipment Owner or Customer Originated Change (COC)
"cat51" - "cat99"	Available for projects

Table 18 `crewMemberType` - Type of crew member required for drill or procedural step

Allowable values	S1000D interpretation
"cm01"	All
"cm02"	Pilot
"cm03"	Co-pilot
"cm04"	Navigator
"cm05"	Engineer
"cm06"	Ground crew
"cm07"	Load master
"cm08"	Cabin supervisor
"cm51" - "cm99"	Available for projects

Table 19 `crewStepCondition` - Crew step condition

Allowable values	S1000D interpretation
"csc01"	Equipment is installed or available
"csc02"	A detailed procedure for the step is located in the performance section of the condensed checklist
"csc03"	Performance of the step is mandatory for all through-flights used for combat/tactical operations
"csc04"	A step that is mandatory for night flights
"csc05"	A task or step required by the operator’s manual
"csc51" - "csc99"	Available for projects

Table 20 `defaultBrSeverityLevel` - Default business rule breach severity level

Allowable values	S1000D interpretation
"brsl01"	Most severe

Allowable values	S1000D interpretation
"brsl02"	Medium severity
"brsl03"	Least severe
"brsl51" - "brsl99"	Available for projects

Note

Allowable values for this attribute must comply with the values of attribute `brSeverityLevel`.

Table 21 `drillType` - Type of aircrew drill

Allowable values	S1000D interpretation
"dt00" (default value)	None
"dt01"	Green
"dt02"	Amber
"dt03"	Yellow
"dt04"	Red
"dt05"	Orange
"dt06"	Blue
"dt51" - "dt99"	Available for projects

Table 22 `emphasisType` - Type of emphasis

Allowable values	S1000D interpretation
"em01" (default value)	Bold
"em02"	Italic (only for legacy data, refer to Chap 3.9.1)
"em03"	Underline (only for legacy data, refer to Chap 3.9.1)
"em04"	Overline (only for marking vectors)
"em05"	Strikethrough (not to be used to mark deleted text)
"em51" - "em99"	Available for projects

Table 23 `frontMatterInfoType` - Type of front matter information

Allowable values	S1000D interpretation
"fmi01"	Generic front matter information

Allowable values	S1000D interpretation
"fmi02"	Manufacturer's information
"fmi03"	Reporting errors and recommending improvements statement
"fmi04"	Availability statement
"fmi05"	Preventive maintenance service warning
"fmi06"	General purpose notice
"fmi07"	Ozone depleting chemical information
"fmi08"	Hazardous materials information
"fmi51" - "fmi99"	Available for projects

Table 24 `frontMatterType` - Type of front matter

Allowable values	S1000D interpretation
"fm01"	LOEP - List of effective pages
"fm02"	LOEDM - List of effective data modules
"fm03"	HIGH - Highlights
"fm04"	HIGH - Highlights with updating instructions
"fm05"	Publication list data modules
"fm06"	LOI - List of illustrations
"fm07"	LOA - List of abbreviations
"fm08"	LOT - List of terms
"fm09"	LOS - List of symbols
"fm10"	TSR - Technical standard record
"fm11"	LOM - List of modifications
"fm12"	LOASD - List of applicable specifications and documentation
"fm13"	LOW - List of warnings
"fm14"	LOC - List of cautions
"fm15"	LOSE - List of support equipment
"fm16"	LOSU - List of supplies
"fm17"	LOSP - List of spares
"fm18"	LOV - List of vendors

Allowable values	S1000D interpretation
"fm51" - "fm99"	Available for projects

Table 25 `function` - Maintenance function

Allowable values	S1000D interpretation
"ft00"	None
"ft01"	Inspect
"ft02"	Test
"ft03"	Service
"ft04"	Adjust
"ft05"	Align
"ft06"	Calibrate
"ft07"	Remove/Install
"ft08"	Replace
"ft09"	Repair
"ft10"	Overhaul
"ft11"	Rebuild
"ft51" - "ft99"	Available for projects

Table 26 `functionalItemRefType` - Type of functional item reference

Allowable values	S1000D interpretation
"fir01"	Reference to the card functional item
"fir02"	Reference to soft functional item (for hard functional items)
"fir03"	Reference to LRI functional items (for LRU functional items)
"fir04"	Reference to the shunt functional item (for a Circuit breaker)
"fir05"	Reference to the mate equipment/connector functional item (for another equipment/connector functional item)
"fir06"	Reference to the equipment functional item, electrically protected by a given circuit breaker
"fir07"	Reference to the harness functional item, for an equipment functional item
"fir51" - "fir99"	Available for projects

Table 27 `functionalItemType` - Type of functional item

Allowable values	S1000D interpretation
"fit01"	Exact functional item = A functional item representing a component with only one position
"fit02"	Family functional item = A functional item with generic code representing a component which has more than one position (eg, seats, lights)
"fit51" - "fit99"	Available for projects

Table 28 `genericPropertyType` - Generic property type

Allowable values	S1000D interpretation
"gpt01"	Passenger comfort affected
"gpt02"	Reliability affected
"gpt03"	Cost saving
"gpt04"	Structural life extension
"gpt05"	Cancels inspection Service bulletin
"gpt06"	Product operation affected
"gpt07"	LROPS affected
"gpt08"	ETOPS affected
"gpt09"	Potential Airworthiness Directive
"gpt10"	Disposition for removed spare that can be on customer shop
"gpt11"	Support code for removed spare
"gpt51" - "gpt99"	Available for projects

Table 29 `hazardousClassValue` - Value of hazardous class

Allowable values	S1000D interpretation
"hz01"	Explosive
"hz02"	Compressed gases
"hz03"	Flammable liquids
"hz51" - "hz99"	Available for projects

Table 30 `icnInfoItemType` - Type of ICN metadata item

Allowable values	S1000D interpretation
"iiit01"	Unspecified
"iiit02"	Size in kb
"iiit03"	Duration in s
"iiit04"	Default width in mm
"iiit05"	Default height in mm
"iiit06"	Transcript
"iiit07" - "iiit50"	Not available for projects
"iiit51" - "iiit99"	Available for projects

Table 31 `icnSourceFileType` - Type of source files associated with the ICN

Allowable values	S1000D interpretation
"isft01"	Unspecified
"isft02" - "isft50"	Not available for projects
"isft51" - "isft99"	Available for projects

Table 32 `icnResourceFileType` - Type of resource files associated with the ICN

Allowable values	S1000D interpretation
"irft01"	Unspecified
"irft02" - "irft50"	Not available for projects
"irft51" - "irft99"	Available for projects

Table 33 `installationLocationType` - Type of equipment install location

Allowable values	S1000D interpretation
"instloctyp02"	Section
"instloctyp03"	Station
"instloctyp04"	Water line
"instloctyp05"	Buttock line
"instloctyp51" - "instloctyp99"	Available for projects

Table 34 `internalRefTargetType` - Type of target of the internal reference

Allowable values	S1000D interpretation
"irtt01"	Figure
"irtt02"	Table
"irtt03"	Multimedia
"irtt04"	Supply
"irtt05"	Support equipment
"irtt06"	Spare
"irtt07"	Paragraph
"irtt08"	Step
"irtt09"	Graphic
"irtt10"	Multimedia object
"irtt11"	Hotspot
"irtt12"	Parameter
"irtt13"	Zone
"irtt14"	Work location
"irtt15"	Service bulletin material set, support equipment set, supply set, spare set or removed spare set (including individual and external material)
"irtt16"	Access point
"irtt51" - "irtt99"	Available for projects

Table 35 `itemCharacteristic` - Item characteristic

Allowable values	S1000D interpretation
"ic01"	Step related to hardness critical process
"ic02"	Step related to electrostatic discharge
"ic03"	Step with a quality assurance effect
"ic51" - "ic99"	Available for projects

Table 36 `itemOriginator` - Origin of item

Allowable values	S1000D interpretation
"orig01"	Manufacturer

Allowable values	S1000D interpretation
"orig02"	Vendor
"orig03"	Partner
"orig51" - "orig99"	Available for projects

Table 37 limitUnitType - Limit type

Allowable values	S1000D interpretation
"lt01"	Time between overhaul
"lt02"	Hard time
"lt03"	Since last maintenance
"lt04"	Out time limit
"lt05"	On condition
"lt06"	Check maintenance
"lt07"	Functional check
"lt51" - "lt99"	Available for projects

Table 38 listItemPrefix - Prefix for list items of random/unordered lists

Allowable values	S1000D interpretation
"pf01"	Simple (No prefix, only indent)
"pf02" (default value)	Unorder [-], [•], [-] (Depending on list level, prefix with short dash for first level, bullet for second, and short dash for third level - ISOpub: bull, dash)
"pf03"	Dash [-] (short dash - ISOpub: dash)
"pf04"	Disc [⊙] (filled circle in circle - ISOamsb: ocir)
"pf05"	Circle [○] (outline - ISOpub: cir)
"pf06"	Square [□] (outline - ISOtech: square)
"pf07"	Bullet [•] (outline - ISOpub: bull)
"pf51" - "pf99"	Available for projects

Note

For a basic (standard) S1000D implementation, use "pf02".

Table 39 lowestLevel - Lowest authorized level

Allowable values	S1000D interpretation
"la01"	None
"la02"	Field (Service) level
"la03"	Field/ASB maintenance can remove, replace, and use the item.
"la04"	Below depot sustainment maintenance can remove, replace, and use the item.
"la05"	Specialized repair activity/TASMG can remove, replace, and use the item.
"la06"	Afloat and ashore intermediate maintenance can remove, replace, and use the item.
"la07"	Contractor facility can remove, replace, and use the item.
"la08"	Item is not authorized to be removed, replaced, or used at any maintenance level.
"la09"	Depot can remove, replace, and use the item.
"la51" - "la99"	Available for projects

Table 40 maintLevelCode - Maintenance level code

Allowable values	S1000D interpretation
"ml01"	Level 1
"ml02"	Level 2
"ml03"	Level 3
"ml04"	Level 4
"ml05"	Level 5
"ml51" - "ml99"	Available for projects

Table 41 materialUsage - Material usage

Allowable values	S1000D interpretation
"mu01"	Discarded
"mu02"	Retained
"mu03"	Modified from

Allowable values	S1000D interpretation
"mu04"	Referenced
"mu05"	Material set
"mu06"	Modified to
"mu51" - "mu99"	Available for projects

Table 42 operationType - Operation type

Allowable values	S1000D interpretation
"op01"	ETOPS (Refer to Chap 9.2.2)
"op02"	RNP (Required Navigation Performance) system
"op03"	OMTS (On-board Mobile Telephony System)
"op51" - "op99"	Available for projects

Table 43 partCharacteristic - Part characteristic

Allowable values	S1000D interpretation
"pc01"	A hardness critical item
"pc02"	Flight safety and critical aircraft part
"pc03"	Mandatory replacement part
"pc04"	Critical safety item
"pc05"	Test equipment
"pc06"	Part with electrostatic discharge sensitivity
"pc51" - "pc99"	Available for projects

Table 44 partStatus - Part status for the item sequence number

Allowable values	S1000D interpretation
"pst01"	Basic part
"pst02"	Oversize/Undersize
"pst03"	Select from
"pst04"	Interchangeable
"pst05"	Alternative
"pst51" - "pst99"	Available for projects

Table 45 `partUsageCode` - Part usage code

Allowable values	S1000D interpretation
"pu01"	Standard part
"pu02"	Expendable part
"pu03"	Components of end-item parts
"pu04"	Basic issue item parts
"pu05"	Item required to operate equipment
"pu06"	Tool item
"pu07"	Special tool
"pu8"	Standard mechanical hardware items
"pu9"	Hardware
"pu10"	Line replaceable item
"pu11"	Anesthetics/Medical chemicals
"pu12"	Module
"pu13"	Ammunition with dangerous substances
"pu14"	Modification leaflet
"pu15"	Medical supplies
"pu16"	Modification set
"pu17"	None of the other codes applies
"pu18"	Role equipment
"pu19"	Raw materials
"pu20"	Split design module
"pu21"	Software remarks
"pu22"	Part
"pu23"	Basic issue item
"pu24"	Components of end item
"pu25"	Tool
"pu26"	Additional authorization list item
"pu51" - "pu99"	Available for projects

Table 46 `pmEntryType` - Publication module entry type

Allowable values	S1000D interpretation
"pmt01"	Title page (TP)
"pmt02"	Configuration (CONF)
"pmt03"	Copyright statements (COPY)
"pmt04"	Administrative and legal statements (ADMIN)
"pmt05"	Safety statements (SAFE)
"pmt06"	List of effective data modules (LOEDM)
"pmt07"	Change record (CR)
"pmt08"	Highlights (HIGH)
"pmt09"	List of abbreviations (LOA)
"pmt10"	List of terms (LOT)
"pmt11"	List of symbols (LOS)
"pmt12"	Technical standard record (TSR)
"pmt13"	Table of contents (TOC)
"pmt14"	List of illustrations (LOI)
"pmt15"	List of tables (LOTBL)
"pmt16"	List of applicable specifications and documentation (LOASD)
"pmt17"	List of suppliers (LOSUP)
"pmt18"	List of support equipment (LOSE)
"pmt19"	List of supplies (LOSU)
"pmt20"	List of spares (LOSP)
"pmt21"	Introduction (INTRO)
"pmt22"	Description of function (FUNC)
"pmt23"	Technical description (DESC)
"pmt24"	Diagrams and schematics (SCHEM)
"pmt25"	Maintenance planning (MAINT)
"pmt26"	Removal and installation (RI)
"pmt27"	Task sets (TS)
"pmt28"	Servicing (SERVC)

Allowable values	S1000D interpretation
"pmt29"	Examination, test, checks, and fault isolation (TEST)
"pmt30"	Disassemble (DIS)
"pmt31"	Repair (REP)
"pmt32"	Assemble (ASSY)
"pmt33"	Storage (STORE)
"pmt34"	Illustrated Parts Data (IPD)
"pmt51" - "pmt99"	Available for projects

Table 47 pmType - Type of publication in a publication module

Allowable values	S1000D interpretation
"pt01"	Component maintenance publication
"pt02"	Illustrated parts data
"pt03"	Service bulletin
"pt51" - "pt99"	Available for projects

Table 48 productCategory - Product category

Allowable values	S1000D interpretation
"pcg01"	Adhesives sealant
"pcg04"	Anti freeze and de-icing products
"pcg08"	Biocide products
"pcg09"	Coating and paints, fillers, putties, thinners
"pcg13"	Fuels
"pcg14"	Metal surface treatment products
"pcg15"	Non-metal surface treatment products
"pcg16"	Heat transfers fluids
"pcg17"	Hydraulic fluids
"pcg24"	Lubricants, grease, release products
"pcg32"	Polymer preparation and compounds
"pcg35"	Washing and cleaning product

Allowable values	S1000D interpretation
"pcg51" - "pcg99"	Available for projects

Table 49 `productItemType` - Type of product item

Allowable values	S1000D interpretation
"pi01"	Frame
"pi02"	Rib
"pi03"	Stringer
"pi51" - "pi99"	Available for projects

Table 50 `quantityType` - Quantity type

Allowable values	S1000D interpretation
"qty01"	Length
"qty02"	Price
"qty03"	Temperature
"qty04"	Time
"qty05"	Torque value
"qty06"	Voltage
"qty07"	Volume
"qty08"	Mass
"qty51" - "qty99"	Available for projects

Table 51 `refType` - Refer to type

Allowable values	S1000D interpretation
"rft01"	Refer to next higher assembly
"rft02"	Refer to detail(s)
"rft03"	Equivalent part(s)
"rft04"	Substitute part(s)
"rft05"	Attaching part(s)
"rft06"	Removal/Installation part(s)
"rft07"	Select from part(s)

Allowable values	S1000D interpretation
"rft08"	Oversize/Undersize
"rft09"	Connecting item(s)
"rft10"	Breakdown
"rft51" - "rft99"	Available for projects

Table 52 reqCondCategory - Required condition category

Allowable values	S1000D interpretation
"rcc01"	Normal
"rcc02"	Special environmental conditions such as reduced lighting, ventilation, and temperature
"rcc03"	Jacked
"rcc04"	Electric power
"rcc05"	Pneumatic power
"rcc06"	Hydraulic power
"rcc51" - "rcc99"	Available for projects

Table 53 reqTechInfoCategory - Required technical information category

Allowable values	S1000D interpretation
"ti01"	Publication module
"ti02"	Data module
"ti03"	Drawing
"ti04"	Electrical diagram
"ti05"	Schematic diagram
"ti06"	Safety sheet
"ti51" - "ti99"	Available for projects

Table 54 resetCaption - Caption for Dialog reset caption

Allowable values	S1000D interpretation
"re01"	Sets the caption to "RESET"
"re02"	Sets the caption to "CLEAR"

Allowable values	S1000D interpretation
"re51" - "re99"	Available for projects

Table 55 responseType - Type of response to a comment

Allowable values	S1000D interpretation
"rt01"	Accepted
"rt02"	Pending
"rt03"	Partly accepted
"rt04"	Rejected
"rt51" - "rt99"	Available for projects

Table 56 sbComplianceCategory - Service bulletin compliance category

Allowable values	S1000D interpretation
"sbcc01"	Mandatory (Service bulletin must be accomplished)
"sbcc02"	Recommended (Service bulletin recommended to be accomplished to prevent significant operational disruptions)
"sbcc03"	Desirable (Service bulletin to introduce improvements)
"sbcc04"	Optional (Service bulletin for convenience or option)
"sbcc51" - "sbcc99"	Available for projects

Table 57 sbImpactType - Service bulletin impact type

Allowable values	S1000D interpretation
"sbit01"	Weight
"sbit02"	Balance
"sbit03"	Direct current electrical load
"sbit04"	Alternating current electrical load
"sbit05"	Maintenance publications
"sbit06"	Operational publications
"sbit07"	Electrical Structure Network (ESN) load
"sbit51" - "sbit99"	Available for projects

Table 58 `sbMaterialType` - Service bulletin material type

Allowable values	S1000D interpretation
"sbmt01"	Set of material or individual material specific to the Service bulletin
"sbmt02"	Set of material or individual material not specially built for the Service bulletin
"sbmt03"	Set of references to set of material or individual material or external material
"sbmt04"	Set of hazardous removed material
"sbmt05"	Set of re-identified material
"sbmt51" - "sbmt99"	Available for projects

Table 59 `sbTaskCategory` - Category of the Service bulletin task

Allowable values	S1000D interpretation
"sbtc01"	Modification
"sbtc02"	Inspection
"sbtc03"	Repair
"sbtc04"	Evaluation
"sbtc05"	Administrative
"sbtc51" - "sbtc99"	Available for projects

Table 60 `sbTimeComplianceType` - Service bulletin time compliance type

Allowable values	S1000D interpretation
"sbtct01"	Basic limit
"sbtct02"	Grace period
"sbtct03"	Repetitive interval
"sbtct51" - "sbtct99"	Available for projects

Table 61 `sbTopicType` - Service bulletin topic type

Allowable values	S1000D interpretation
"sbtt01"	Revision information
"sbtt02"	Summary
"sbtt03"	Planning information

Allowable values	S1000D interpretation
"sbtt04"	Additional information
"sbtt05"	Applicability
"sbtt06"	Concurrent requirements
"sbtt07"	Reason
"sbtt08"	Description
"sbtt09"	Compliance
"sbtt10"	Approval
"sbtt11"	Manpower
"sbtt12"	Weight and balance
"sbtt13"	Electrical load data
"sbtt14"	Software accomplishment summary
"sbtt15"	Referenced documentation
"sbtt16"	Documentation affected
"sbtt17"	Industry support information
"sbtt18"	Material information
"sbtt19"	General evaluation
"sbtt20"	General illustration
"sbtt21"	Additional work
"sbtt22"	Revision reason
"sbtt23"	Revision history
"sbtt24"	Revision sequence
"sbtt51" - "sbtt99"	Available for projects

Table 62 scoEntryType - Type of SCO entry

Allowable values	S1000D interpretation
"scot01"	IMS/SCORM manifest resources
"scot02"	IMS/SCORM manifest "asset" type resources
"scot51" - "scot99"	Available for projects

Table 63 securityClassification - Security classification

Allowable values	S1000D interpretation
"01"	1 (lowest level of security classification, eg, Unclassified)
"02"	2 (next higher level of security classification, eg, Restricted)
"03"	3 (next higher level of security classification, eg, Confidential)
"04"	4 (next higher level of security classification, eg, Secret)
"05"	5 (next higher level of security classification, eg, Top secret)
"06"	6 (another level of security classification)
"07"	7 (another level of security classification)
"08"	8 (another level of security classification)
"09"	9 (another level of security classification)
"51" - "99"	Available for projects

Note

Security classification is likely to be developed and applied on a national basis (refer to Chap 3.6). The S1000D interpretation above is to be regarded as a suggestion that reasonably well synthesizes current practices.

Table 64 significantParaDataType - Paragraph significant data type

Allowable values	S1000D interpretation
"psd01"	Ammunition
"psd02"	Instruction disposition
"psd03"	Lubricant
"psd04"	Maintenance level
"psd05"	Manufacturer code
"psd06"	Manufacturers recommendation
"psd07"	Modification code
"psd08"	Qualification code
"psd09"	Training level
"psd10"	Control or indicator value
"psd51" - "psd99"	Available for projects

Table 65 `skillLevelCode` - Personnel skill level

Allowable values	S1000D interpretation
"sk01"	Basic
"sk02"	Intermediate
"sk03"	Advanced
"sk51" - "sk99"	Available for projects

Table 66 `skillType` - Personnel skill category

Allowable values	S1000D interpretation
"st01"	Airframe (AIRPL)
"st02"	Electrical (ELEC)
"st03"	Avionic (AVION)
"st04"	Engine (ENGIN)
"st51" - "st99"	Available for projects

Table 67 `softwareClassificationValue` - Software classification

Allowable values	S1000D interpretation
"scv01"	Loadable software aircraft part (LSAP)
"scv02"	Aeronautical database (ADB)
"scv03"	Technical publication software
"scv04"	Maintenance operation software (MOS)
"scv05"	Flight operation software (FOS)
"scv51" - "scv99"	Available for projects

Table 68 `softwareCustomizationStatusValue` - Software customization status

Allowable values	S1000D interpretation
"scs01"	Software customization mandatory
"scs02"	Software customization allowed
"scs03"	Software customization not allowed
"scs51" - "scs99"	Available for projects

Table 69 `sourceCriticality` - Source criticality

Allowable values	S1000D interpretation
"sc51" - "sc99"	Available for projects

Table 70 `sourceTypeCode` - Source type code

Allowable values	S1000D interpretation
"stc51" - "stc99"	Available for projects

Table 71 `sourcingTypeValue` - Part sourcing type

Allowable values	S1000D interpretation
"stv01"	BFE (Buyer furnished equipment) part
"stv02"	SFE (Seller furnished equipment) part
"stv51" - "stv99"	Available for projects

Table 72 `submitCaption` - Caption for Dialog submit function

Allowable values	S1000D interpretation
"ok01"	Sets the caption to "OK"
"ok02"	Sets the caption to "SUBMIT"
"ok04"	Sets the caption to "CONTINUE"
"ok05"	Sets the caption to "EXIT"
"ok51" - "ok99"	Available for projects

Table 73 `supervisorLevelCode` - Supervisor level

Allowable values	S1000D interpretation
"sl01"	Low
"sl02"	Low intermediate
"sl03"	High intermediate
"sl04"	High
"sl51" - "sl99"	Available for projects

Table 74 `supplyNumberType` - Type of supply number

Allowable values	S1000D interpretation
"sp01"	Commercial reference
"sp02"	Specification
"sp03"	Mixture
"sp04"	Set
"sp05"	Article
"sp51" - "sp99"	Available for projects

Table 75 `taskCode` - Task code

Allowable values	S1000D interpretation
"taskcd01"	Detailed inspection (DET)
"taskcd02"	Discard (DIS)
"taskcd03"	Functional check (FNC)
"taskcd04"	General visual inspection (GVI)
"taskcd05"	Lubrication (LUB)
"taskcd06"	Operational check (OPC)
"taskcd07"	Restoration (RST)
"taskcd08"	Servicing (SVC)
"taskcd09"	Visual check (VCK)
"taskcd10"	Special detailed inspection (SDI).
"taskcd51" - "taskcd99"	Available for projects

Table 76 `thresholdUnitOfMeasure` - Unit of measure for the threshold interval

Allowable values	S1000D interpretation
"th01"	Flight hours
"th02"	Flight cycles
"th03"	Months
"th04"	Weeks
"th05"	Years

Allowable values	S1000D interpretation
"th06"	Days
"th07"	Supersonic cycles
"th08"	Pressure cycles
"th09"	Engine cycles
"th10"	Engine change
"th11"	Shop visits
"th12"	Auxiliary power unit change
"th13"	Landing gear change
"th14"	Wheel change
"th15"	Engine start
"th16"	APU hours
"th17"	Engine hours
"th18"	Elapsed hours
"th19"	Landings
"th20"	Operating cycles
"th21"	Operating hours
"th22"	Supersonic hours
"th23"	"A" check
"th24"	"B" check
"th25"	"C" check
"th26"	"D" check
"th27"	Daily
"th28"	"E" check
"th29"	Overnight
"th30"	Preflight
"th31"	Routine check
"th32"	Structural "C" check
"th33"	Service check
"th34"	Transit

Allowable values	S1000D interpretation
"th35"	Kilometers
"th36"	Consumption in cubic meter
"th37"	Consumption in liter
"th38"	Number of shots - each
"th39"	Number of shots - equivalent full charge (EFC)
"th51" - "th99"	Available for projects

Table 77 `updateReasonType` - Update reason type for reason for update

Allowable values	S1000D interpretation
"urt01"	Editorial change (authored/technical content changed, but technically changes are deemed insignificant)
"urt02"	Technical change (authored/technical content has changed, changes are significant and should be reviewed)
"urt03"	Markup change (changes are solely related to XML markup)
"urt04"	Applicability change (only the applicability has changed)
"urt05"	Unique identifier of the referencing structure has changed.
"urt51" - "urt99"	Available for projects

Table 78 `verbatimStyle` – Style/class of verbatim text

Allowable values	S1000D interpretation
"vs01"	Generic verbatim
"vs02"	Filename
"vs11"	XML/SGML markup
"vs12"	XML/SGML element name
"vs13"	XML/SGML attribute name
"vs14"	XML/SGML attribute value
"vs15"	XML/SGML entity name
"vs16"	XML/SGML processing instruction

Allowable values	S1000D interpretation
"vs21"	Program prompt
"vs22"	User input
"vs23"	Computer output
"vs24"	Program listing
"vs25"	Program variable name
"vs26"	Program variable value
"vs27"	Constant
"vs28"	Class name
"vs29"	Parameter name
"vs51" - "vs99"	Available for projects

Chapter 3.9.6.2

Attributes - Fixed values

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References

Table 1 References

Chap No./Document No.	Title
Chap 7.3.1.5	Schema - Configuration of attributes
ISO/IEC 80000-2	Quantities and units - Part 2. Mathematical signs and symbols to be used in the natural sciences and technology

1 General

This chapter describes how to code project configurable attributes that have as their basis a set of fixed values.

The description regards attributes that are supposed to apply specified sets of predefined allowable values. Other attributes, for example, attributes containing not pre-defined character strings, are not concerned herein.

2 Attributes available for tailoring

The tables below specify the set of fixed values, and the values available for project tailoring, that apply to the attribute concerned. Refer to default BREX rule BREX-S1-00244.

For advice on how to technically configure attribute value sets to the project specific needs, refer to Chap 7.3.1.5.

All tailoring of attribute values must be agreed to within a project and documented in the project business rules. Furthermore, interpretation of attribute values must be exchanged and agreed upon between all parties concerned.

Business rule decision point BRDP-S1-00330 - Application of project specific values for the attribute `quantityUnitOfMeasure`:

- Decide whether any project specific attribute values are needed for the attribute `quantityUnitOfMeasure`. If needed, decide which project specific values to use for the attribute `quantityUnitOfMeasure` and allocate suitable project interpretations.

The quantity unit of measure attribute available for tailoring is:

Attributes:

- `quantityUnitOfMeasure`

Note

An XML document of the S1000D units of measure is provided as part of the S1000D™ suite of information and is available for download from the S1000D web site. For each unit, this document includes the name, the type or types of quantity (which is not the same as the "Quantity data type") that the unit represents, the annotation to be used in the markup (= "Allowable value"), and the relationship to a base unit (for derived units).

Note

For SI units, it is highly recommended that the unit of measure is displayed in accordance with the ISO/IEC 80000-2 Quantities and units - Part 2.

Note

The common symbols for Volts Alternating Current (AC) and Volts Direct Current (DC) must be presented as "V AC" and “V DC”.

Table 2 `quantityUnitOfMeasure` - Quantity data unit of measure

Allowable values	S1000D interpretation
"%"	percent
"(dyne/cm)4/gcm3"	dynes/centimeter fourth/gram cm cubed
"(N/m)4/kg.m3"	newton/meter fourth/kilogram meter cubed
"1/a"	per annum
"1/angstrom"	per angstrom
"1/bar"	per bar
"1/bbl"	per barrel
"1/cm"	per centimeter
"1/d"	per day
"1/degC"	per degree Celsius
"1/degF"	per degree Fahrenheit
"1/degR"	per degree Rankine
"1/ft"	per foot

Allowable values	S1000D interpretation
"1/ft2"	per square foot
"1/ft3"	per cubic foot
"1/g"	per gram
"1/galUK"	per UK gallon
"1/galUS"	per US gallon
"1/H"	inverse henry
"1/h"	per hour
"1/in"	per inch
"1/K"	per kelvin
"1/kg"	per kilogram
"1/km2"	per square kilometer
"1/kPa"	per kilopascal
"1/L"	per liter
"1/lbf"	per pound force
"1/lbm"	per pound
"1/m"	per meter
"1/m2"	per square meter
"1/m3"	per cubic meter
"1/mi"	per mile
"1/mi2"	per square mile
"1/min"	per minute
"1/mm"	per millimeter
"1/N"	per newton
"1/nm"	per nanometer
"1/Pa"	per pascal
"1/pPa"	per picopascal
"1/psi"	per pounds per square inch
"1/s"	per second
"1/upsi"	per micropounds per square inch

Allowable values	S1000D interpretation
"1/uV"	per microvolt
"1/V"	per volt
"1/wk"	per week
"1/yd"	per yard
"1000ft3"	thousand cubic feet
"1000ft3/bbl"	thousand cubic feet per barrel
"1000ft3/d"	thousand cubic feet per day
"1000ft3/d.ft"	thousand cubic feet per day per foot
"1000ft3/psi.d"	thousand cubic feet per day per psi
"1000m3/d"	thousand cubic meters per day
"1000m3/d.m"	thousand cubic meter per day per meter
"1000m3/h"	thousand cubic meters per hour
"1000m3/h.m"	thousand cubic meters per hour per meter
"1000m4/d"	thousand (cubic meter per day)-meter
"100ka"	100000 years
"10Mg/m3"	ten thousand kilograms per cubic meter
"A"	ampere
"a"	annum
"A.h"	ampere hour
"A.m2"	amperes meters squared
"A/cm2"	ampere per square centimeter
"A/ft2"	ampere per square foot
"A/m"	Amperes per meter
"A/m2"	amperes per square meter
"A/mm"	ampere per millimeter
"A/mm2"	ampere per square millimeter
"acre"	acre
"acre.ft"	acre foot
"acre.ft/MMstb"	acre feet per million stock tank barrels, 60 degree Fahrenheit

Allowable values	S1000D interpretation
"ag"	attogram
"aJ"	attojoule
"angstrom"	Angstrom
"at"	technical atmosphere
"atm"	atmosphere
"atm/ft"	atmospheres per feet
"atm/h"	atmospheresper hour
"atm/hm"	atmospheres per hundred meter
"atm/m"	atmospheres per meter
"B"	bel
"b"	barn
"b/cm3"	barns per cubic centimeter
"b/elec"	barns per electron
"B/m"	bels per meter
"B/O"	bels per octave
"bar"	bar
"bar/h"	bars per hour
"bar/km"	bars per kilometer
"bar/m"	bars per meter
"bar2"	bar squared
"bar2/cP"	bar squared per centipoise
"bbl"	barrel
"bbl/100bbl"	barrels per hundred barrel
"bbl/acre"	barrels per acre
"bbl/acre.ft"	barrels per acre foot
"bbl/bbl"	barrels per barrel
"bbl/cP.d.psi"	barrels per centipoise day psi
"bbl/d"	barrel per day
"bbl/d.acre.ft"	barrels per day acre foot

Allowable values	S1000D interpretation
"bbl/d.ft"	barrels per day foot
"bbl/d.ft.psi"	barrels per day foot pounds per square inch
"bbl/d.psi"	barrel per day pounds per square inch
"bbl/d2"	barrels per day per day
"bbl/ft"	barrels per foot
"bbl/ft3"	barrels per cubic foot
"bbl/hr"	barrels per hour
"bbl/hr2"	barrels per hour per hour
"bbl/in"	barrels per inch
"bbl/k(ft3)"	barrels per thousand cubic feet
"bbl/kPa.d"	barrels per day per kilopascal
"bbl/M(ft3)"	barrels per million cubic feet
"bbl/mi"	barrels per mile
"bbl/min"	barrel per minute
"bbl/MMscf(60F)"	barrels per million standard cubic feet, 60 degree Fahrenheit
"bbl/psi.d"	barrels per day per psi
"bbl/stb(60F)"	barrels per stock tank barrel, 60 degree Fahrenheit
"bbl/tonUK"	barrel per U.K. ton
"bbl/tonUS"	barrel per U.S. ton
"bcf"	billion cubic feet
"Bd"	baud
"bit"	bit
"Bq"	becquerel
"Bq/kg"	becquerels per kilogram
"Btu"	British thermal unit
"Btu(million)/hr"	million British thermal units per hour
"Btu.in/hr.ft2.F"	British thermal units per hour foot squared degree Fahrenheit per inch
"Btu/bbl"	British thermal units per barrel

Allowable values	S1000D interpretation
"Btu/bhp.hr"	British thermal units per brake-horsepower hour
"Btu/ft3"	British thermal units per cubic foot
"Btu/galUK"	British thermal units per U.K. gallon
"Btu/galUS"	British thermal units per U.S. gallon
"Btu/hr"	British thermal units per hour
"Btu/hr.ft.degF"	British thermal units per hour foot degree Fahrenheit
"Btu/hr.ft2"	British thermal unit per hour per square foot
"Btu/hr.ft2.degF"	British thermal units per hour foot squared degree Fahrenheit
"Btu/hr.ft2.degR"	British thermal units per hour foot squared degree Rankine
"Btu/hr.ft3"	British thermal units per hour cubic foot
"Btu/hr.ft3.degF"	British thermal units per hour foot cubed degree Fahrenheit
"Btu/hr.m2.degC"	British thermal units per hour meter squared degree Celsius
"Btu/lbm"	British thermal units per pound mass
"Btu/lbm.degF"	British thermal units per pound mass degree Fahrenheit
"Btu/lbm.degR"	British thermal units per pound mass degree Rankine
"Btu/min"	British thermal units per minute
"Btu/mol(lbm)"	British thermal units per pound mass mol
"Btu/mol(lbm).F"	British thermal unit per pound mass mol degree Fahrenheit
"Btu/s"	British thermal units per second
"Btu/s.ft2"	British thermal units per second square foot
"Btu/s.ft2.degF"	British thermal unit per second per square foot degree Fahrenheit
"Btu/s.ft3"	British thermal unit per second per cubic foot
"Btu/s.ft3.degF"	British thermal unit per second per cubic foot degree Fahrenheit
"byte"	byte
"C"	coulomb
"c"	cycle

Allowable values	S1000D interpretation
"C.m"	coulomb meters
"C/cm2"	coulombs per square centimeter
"C/cm3"	coulombs per cubic centimeter
"C/g"	coulombs per gram
"C/kg"	coulombs per kilogram
"C/m2"	coulombs per square meter
"C/m3"	coulombs per cubic meter
"C/mm2"	coulombs per square millimeter
"C/mm3"	coulombs per cubic millimeter
"c/s"	cycles per second
"cal"	calorie
"cal/cm3"	calories per cubic centimeter
"cal/g"	calories per gram
"cal/g.K"	calories per gram kelvin
"cal/h.cm.degC"	calories per hour centimeter degree Celsius
"cal/h.cm2"	calories per hour centimeter squared
"cal/h.cm2.degC"	calories per hour square centimeter degree Celsius
"cal/h.cm3"	calories per hour cubic centimeter
"cal/kg"	calories per kilogram
"cal/lbm"	calories per pound mass
"cal/mL"	calories per milliliter
"cal/mm3"	calories per cubic millimeter
"cal/mol(g).degC"	calories per gram mol degree Celsius
"cal/s.cm.degC"	calories per second centimeter degree Celsius
"cal/s.cm2.degC"	calories per second square centimeter degree Celsius
"cal/s.cm3"	calories per second cubic centimeter
"ccgr"	centesimal second
"cd"	candela
"cd/m2"	candelas per square meter

Allowable values	S1000D interpretation
"cEuc"	centiEuclid
"cgr"	centesimal minute
"ch"	ch
"ch.h"	ch hour
"chBnA"	benoit chain (1895 A)
"chBnB"	benoit chain (1895 B)
"chCla"	clarke chain
"chSe"	sears chain
"Chu"	chus
"chUS"	US survey chain
"Ci"	curie
"cL"	centiliter
"cm"	centimeter
"cm/a"	centimeters per year
"cm/s"	centimeters per second
"cm/s2"	centimeters per second per second
"cm2"	square centimeter
"cm2/g"	centimeters squared per gram
"cm2/s"	centimeters squared per second
"cm3"	cubic centimeter
"cm3/30min"	cubic centimeters per thirty minutes
"cm3/cm3"	cubic centimeters per cubic centimeters
"cm3/g"	cubic centimeters per gram
"cm3/h"	cubic centimeters per hour
"cm3/m3"	cubic centimeters per cubic meter
"cm3/min"	cubic centimeters per minute
"cm3/s"	cubic centimeters per second
"cm4"	centimeters fourth
"cmH2O(4degC)"	cm of water at 4 degree Celsius

Allowable values	S1000D interpretation
"cP"	centipoise
"cs"	ten millisecond
"cSt"	centistoke
"ct"	carat
"cu"	capture unit
"cu ft"	cubic feet
"cu in"	cubic inch
"cu yd"	cubic yard
"cubem"	cubic mile
"curie"	curie
"CV"	cheval vapeur
"CV.h"	cheval vapeur hour
"cwtUK"	UK hundredweight
"cwtUS"	US hundredweight
"D"	darcy
"d"	day
"D.ft"	darcy foot
"D.m"	darcy meter
"d/bbl"	days per barrel
"d/ft3"	days per cubic foot
"d/k(ft3)"	days per thousand cubic feet
"d/m3"	days per cubic meter
"daN"	decanewton
"daN.m"	decanewton meter
"dAPI"	API gravity
"dB"	decibel
"dB/100m"	decibels per 100meter
"dB/ft"	decibels per foot
"dB/km"	decibels per kilometer

Allowable values	S1000D interpretation
"dB/m"	decibels per meter
"dB/O"	decibels per octave
"ddegC"	change in degrees Celsius
"ddegF"	change in degrees Fahrenheit
"ddegK"	change in kelvin
"ddegR"	change in degrees Rankine
"dega"	degree of an angle
"dega/100ft"	degrees of an angle per 100 feet
"dega/30ft"	degrees of an angle per thirty feet
"dega/30m"	degrees of an angle per 30 meters
"dega/ft"	degrees of an angle per foot
"dega/ft(100)"	degrees of an angle per 100 feet
"dega/h"	degrees of an angle per hour
"dega/m"	degrees of an angle per meter
"dega/m(30)"	degrees of an angle per 30 meters
"dega/min"	degrees of an angle per minute
"dega/s"	degrees of an angle per second
"degC"	degrees Celsius
"degC.m2.h/kcal"	degrees Celsius square meters hours per kilocalorie
"degC/100m"	degrees Celsius per hundred meter
"degC/ft"	degrees Celsius per foot
"degC/h"	degrees Celsius per hour
"degC/km"	degrees Celsius per kilometer
"degC/m"	degrees Celsius per meter
"degC/min"	degrees Celsius per minute
"degC/s"	degrees Celsius per second
"degF"	degree Fahrenheit
"degF.ft2.h/Btu"	degrees Fahrenheit square feet hours per British thermal units
"degF/100ft"	degrees Fahrenheit per 100 feet

Allowable values	S1000D interpretation
"degF/ft"	degrees Fahrenheit per foot
"degF/ft(100)"	degrees Fahrenheit per 100 feet
"degF/h"	degrees Fahrenheit per hour
"degF/m"	degrees Fahrenheit per meter
"degF/min"	degrees Fahrenheit per minute
"degF/s"	degrees Fahrenheit per second
"degR"	degrees Rankine
"dL"	deciliter
"dm"	decimeter
"dm/s"	decimeter per second
"dm3"	cubic decimeter
"dm3/100km"	cubic decimeters per 100 kilometers
"dm3/kg"	cubic decimeters per kilogram
"dm3/km(100)"	cubic decimeters per 100 kilometers
"dm3/kW.h"	cubic decimeters per kilowatt hour
"dm3/m"	cubic decimeters per meter
"dm3/m3"	cubic decimeters per cubic meter
"dm3/MJ"	cubic decimeters per megajoule
"dm3/mol(kg)"	cubic decimeters per kilogram mole
"dm3/s"	cubic decimeters per second
"dm3/s2"	cubic decimeters per second per second
"dm3/t"	cubic decimeters per ton
"dN.m"	decinewton meter
"dyne"	dyne
"dyne.cm2"	dyne centimeter squared
"dyne.s/cm2"	dyne seconds per square centimeter
"dyne/cm"	dynes per centimeter
"dyne/cm2"	dynes per square centimeter
"ehp"	electric horsepower

Allowable values	S1000D interpretation
"EJ"	exajoule
"EJ/a"	exajoules per year
"eq"	equivalent
"eq/kg"	equivalent per kilogram
"eq/L"	equivalents per liter
"eq/m3"	equivalents per cubic meter
"erg"	erg
"erg/a"	ergs per year
"erg/cm2"	ergs per square centimeter
"erg/cm3"	ergs per cubic centimeter
"erg/g"	ergs per gram
"erg/kg"	ergs per kilogram
"erg/m3"	ergs per cubic meter
"Euc"	euclid
"eV"	electron volt
"F"	farad
"F/m"	farads per meter
"fathom"	fathom
"fC"	femtocoulomb
"fl ozUK"	UK fluid ounce
"fl ozUS"	US fluid ounce
"flops"	flops
"flozUK"	UK fluid ounce
"flozUS"	US fluid ounce
"fm"	femtometer
"footcandle"	footcandle
"footcandle.s"	footcandle second
"ft"	foot
"ft.lbf"	foot pounds force

Allowable values	S1000D interpretation
"ft.lbf/bbl"	foot pounds force per barrel
"ft.lbf/galUS"	foot pounds force per US gallon
"ft.lbf/lbm"	foot pounds force per pound mass
"ft.lbf/min"	foot pounds force per minute
"ft.lbf/s"	foot pounds force per second
"ft.lbm"	foot pound mass
"ft/100ft"	feet per 100 feet
"ft/bbl"	feet per barrel
"ft/d"	feet per day
"ft/degF"	feet per degree Fahrenheit
"ft/ft"	feet per feet
"ft/ft3"	feet per cubic foot
"ft/galUS"	feet per US gallon
"ft/h"	feet per hour
"ft/in"	feet per inch
"ft/m"	feet per meter
"ft/mi"	feet per mile
"ft/min"	feet per minute
"ft/ms"	feet per millisecond
"ft/s"	feet per second
"ft/s2"	feet per second squared
"ft/us"	feet per microsecond
"ft2"	square foot
"ft2/h"	square feet per hour
"ft2/in3"	square feet per cubic inch
"ft2/s"	square feet per second
"ft3"	cubic feet
"ft3(std,60F)"	cubic feet at standard conditions
"ft3/bbl"	cubic feet per barrel

Allowable values	S1000D interpretation
"ft3/d"	cubic feet per day
"ft3/d.ft.psi"	cubic feet per day foot psi
"ft3/d2"	cubic feet per day per day
"ft3/ft"	cubic feet per foot
"ft3/ft3"	cubic feet per cubic foot
"ft3/h"	cubic feet per hour
"ft3/h2"	cubic feet per hour per hour
"ft3/kg"	cubic feet per kilogram
"ft3/lbm"	cubic feet per pound mass
"ft3/min"	cubic feet per minute
"ft3/min.ft2"	cubic feet per min square foot
"ft3/min2"	cubic feet per minute per minute
"ft3/mol(lbm)"	cubic feet per mole (pound mass)
"ft3/s"	cubic feet per second
"ft3/s.ft2"	cubic feet per second square foot
"ft3/s2"	cubic feet per second per second
"ft3/sack94"	cubic feet per 94 pound sack
"ft3/scf(60F)"	cubic feet per standard cubic foot, 60 degree Fahrenheit
"ftBnA"	British foot (Benoit 1895 A)
"ftBnB"	British foot (Benoit 1895 B)
"ftBr(65)"	British foot 1865
"ftCla"	imperial foot
"ftGC"	gold coast foot
"ftInd"	indian foot
"ftInd(37)"	indian foot, 1937
"ftInd(62)"	indian foot, 1962
"ftInd(75)"	indian foot, 1975
"ftMA"	modified American foot
"ftSe"	sears foot

Allowable values	S1000D interpretation
"ftUS"	US survey foot
"g"	gram
"g.ft/cm3.s"	gram feet per cubic centimeter second
"g/cm3"	grams per cubic centimeter
"g/cm4"	grams per centimeter fourth
"g/dm3"	grams per cubic decimeter
"g/galUK"	grams per UK gallon
"g/galUS"	grams per US gallon
"g/kg"	grams per kilogram
"g/L"	grams per liter
"g/m3"	grams per cubic meter
"g/s"	grams per second
"Ga"	gigayear
"Gal"	galileo
"gal/sack"	US gallons per 94 pounds sack
"galUK"	UK gallon
"galUK/d"	UK gallons per day
"galUK/ft3"	UK gallons per cubic foot
"galUK/hr"	UK gallons per hour
"galUK/hr.ft"	UK gallons per hour foot
"galUK/hr.ft2"	UK gallons per hour square foot
"galUK/hr.in"	UK gallons per hour inch
"galUK/hr.in2"	UK gallons per hour square inch
"galUK/hr2"	UK gallons per hour per hour
"galUK/kgalUK"	UK gallons per thousand UK gallons
"galUK/lbm"	UK gallons per pound mass
"galUK/Mbbl"	UK gallons per 1000 barrels
"galUK/mi"	UK gallons per mile
"galUK/min"	UK gallons per minute

Allowable values	S1000D interpretation
"galUK/min.ft"	UK gallons per minute foot
"galUK/min.ft2"	UK gallons per minute square foot
"galUK/min2"	UK gallons per minute per minute
"galUS"	US gallon
"galUS/10bbl"	US gallons per ten barrels
"galUS/bbl"	US gallons per barrels
"galUS/d"	US gallons per day
"galUS/ft"	US gallons per foot
"galUS/ft3"	US gallons per cubic foot
"galUS/hr"	US gallons per hour
"galUS/hr.ft"	US gallons per foot hour
"galUS/hr.ft2"	US gallons per hour square foot
"galUS/hr.in"	US gallons per hour inch
"galUS/hr.in2"	US gallons per hour square inch
"galUS/hr2"	US gallons per hour per hour
"galUS/kgalUS"	US gallons per thousand US gallons
"galUS/lbm"	US gallons per pound mass
"galUS/Mbbl"	US gallons per 1000 barrels
"galUS/mi"	US gallons per mile
"galUS/min"	US gallons per minute
"galUS/min.ft"	US gallons per minute foot
"galUS/min.ft2"	US gallons per minute square foot
"galUS/min2"	US gallons per minute per minute
"galUS/Mscf(60F)"	US gallons per 1000 standard cubic feet, 60 degree Fahrenheit
"galUS/sack94"	US gallons per 94 pounds sack
"galUS/tonUK"	US gallons per UK ton
"galUS/tonUS"	US gallons per US ton
"gamma"	gamma
"gAPI"	API gamma ray unit

Allowable values	S1000D interpretation
"gauss"	gauss
"GBq"	gigabecquerel
"GeV"	billions of electron volts
"gf"	gram force
"GHz"	gigahertz
"GJ"	gigajoule
"gn"	gravity
"Gohm"	gigaohm
"gon"	gons
"GPa"	gigapascal
"GPa/cm"	gigapascals per centimeter
"GPa2"	gigapascals squared
"gr"	grad
"Grad"	gigaradian
"grain"	grain
"grain/100ft3"	grains per 100 cubic feet
"grain/ft3"	grains per cubic foot
"grain/ft3(100)"	grains per 100 cubic feet
"grain/galUS"	grains per US gallon
"GS"	gigasiemens
"Gsm3"	giga standard cubic meters 15 degree Celsius
"gu"	gas unit
"GW"	gigawatt
"GW.h"	gigawatt hour
"Gy"	gray
"H"	henry
"h"	hour
"h/ft3"	hours per cubic foot
"h/kft"	hours per thousand foot

Allowable values	S1000D interpretation
"h/km"	hours per kilometer
"H/m"	henries per meter
"h/m3"	hours per cubic meter
"ha"	hectare
"ha.m"	hectare meter
"hbar"	hectobar
"hhp"	hydraulic horsepower
"hhp/in2"	(hydraulic) horsepower per square inch
"hL"	hectoliter
"hp"	horsepower
"hPa"	hectopascal
"hp.hr"	horsepower hour
"hp.hr/bbl"	horsepower hours per barrel
"hp.hr/lbm"	horsepower hours per pound mass
"hp/ft3"	horsepower per cubic foot
"hp/in2"	horsepower per square inch
"hs"	hundred second
"Hz"	hertz
"in"	inch
"in/10"	tenth of an inch
"in/16"	16th of an inch
"in/32"	32nd of an inch
"in/64"	64th of an inch
"in/a"	inches per year
"in/in.degF"	inches per inch degree Fahrenheit
"in/min"	inches per minute
"in/s"	inches per second
"in2"	square inch
"in2/ft2"	square inches per square foot

Allowable values	S1000D interpretation
"in2/in2"	square inches per square inch
"in2/s"	square inches per second
"in3"	cubic inche
"in3/ft"	cubic inches per foot
"in4"	inches to the fourth
"inH2O(39.2F)"	inches of water at 39.2 degree Fahrenheit
"inH2O(60F)"	inches of water at 60 degree Fahrenheit
"inHg(32F)"	inches of mercury at 32 degree Fahrenheit
"inHg(60F)"	inches of mercury at 60 degree Fahrenheit
"inUS"	US survey inch
"J"	joule
"J/cm2"	joules per square centimeter
"J/dm3"	joules per cubic decimeter
"J/g"	joules per gram
"J/g.K"	joules per gram kelvin
"J/K"	joules per delta kelvin
"J/kg"	joules per kilogram
"J/kg.K"	joules per kilogram kelvin
"J/m"	joules per meter
"J/m2"	joules per square meter
"J/m3"	joules per cubic meter
"J/mol"	joules per mole
"J/mol.K"	joules per mole kelvin
"J/s.m2.degC"	joules per second square meter degree Celsius
"K"	kelvin
"K.m2/kW"	degrees kelvin square meters per kilowatt
"K.m2/W"	kelvin meters squared per watt
"K/m"	degrees kelvin per meter
"K/s"	kelvin per second

Allowable values	S1000D interpretation
"K/W"	delta kelvin per watt
"kA"	kiloampere
"kbbl/d"	thousand barrels per day
"kbyte"	kilobyte
"kC"	kilocoulomb
"kcal"	kilocalorie
"kcal.m/cm2"	kilocalorie meters per square centimeter
"kcal/cm3"	kilocalories per cubic centimeter
"kcal/g"	kilocalories per gram
"kcal/h"	kilocalories per hour
"kcal/h.m.degC"	kilocalories per hour meter degree Celsius
"kcal/h.m2.degC"	kilocalories per hour square meter degree Celsius
"kcal/kg"	kilocalories per kilogram
"kcal/kg.degC"	kilocalories per kilogram degree Celsius
"kcal/m3"	kilocalroies per cubic meter
"kcal/mol(g)"	kilocalories per mole (gram)
"kcd"	kilocandela
"kdyne"	kilkodyne
"kEuc/s"	thousand per second
"keV"	kiloelectron volt
"kft.lbf"	thousand feet pounds force
"kft/h"	thousand feet per hour
"kft/s"	thousand feet per second
"kg"	kilogram
"kg.m"	kilogram meter
"kg.m/cm2"	kilogram meters per square centimeter
"kg.m/s"	kilogram meters per second
"kg.m2"	kilogram meter squared
"kg/d"	kilograms per day

Allowable values	S1000D interpretation
"kg/dm3"	kilograms per cubic decimeter
"kg/dm4"	kilograms per decimeter fourth
"kg/h"	kilograms per hour
"kg/J"	kilograms per joule
"kg/kg"	kilograms per kilogram
"kg/kW.h"	kilograms per kilowatt hour
"kg/L"	kilogram per liter
"kg/m"	kilograms per meter
"kg/m.s"	kilograms per meter second
"kg/m2"	kilograms per square meter
"kg/m2.s"	kilograms per square meter seconds
"kg/m3"	kilograms per cubic meter
"kg/m4"	kilograms per meter fourth
"kg/min"	kilograms per min
"kg/MJ"	kilograms per megajoule
"kg/s"	kilograms per second
"kg/sack94"	kilograms per 94 pound sack
"kgf"	kilogram force
"kgf.m"	kilogram force meters
"kgf.m/cm2"	kilogram force meters per square centimeter
"kgf.m/m"	kilograms force meters per meter
"kgf.m2"	kilogram force meters squared
"kgf.s/m2"	kilograms force seconds per square meter
"kgf/cm"	kilograms force per centimeter
"kgf/cm2"	kilograms per square centimeter
"kgf/kgf"	kilogram force per kilogram force
"kgf/mm2"	kilogram force per square millimeter
"kHz"	kilohertz
"kJ"	kilojoule

Allowable values	S1000D interpretation
"kJ.m/h.m2.K"	kilojoule meters per hour square meter kelvin
"kJ/dm3"	kilojoules per cubic decimeter
"kJ/h.m2.K"	kilojoules per hour square meter kelvin
"kJ/kg"	kilojoules per kilogram
"kJ/kg.K"	kilojoules per kilogram kelvin
"kJ/m3"	kilojoules per cubic meter
"kJ/mol(kg)"	kilojoules per mole (kilogram)
"kJ/mol(kg).K"	kilojoules per mole (kilogram) kelvin
"klbf"	thousand pounds force
"klbm"	thousand pounds mass
"klbm/in"	thousand pounds mass per inch
"klx"	kilolux
"km"	kilometer
"km/cm"	kilometers per centimeter
"km/dm3"	kilometers per cubic decimeter
"km/h"	kilometers per hour
"km/L"	kilometers per liter
"km/s"	kilometers per second
"km2"	square kilometer
"km3"	cubic kilometer
"kmol"	kilomole
"kN"	kilonewton
"kN.m"	kilonewton meter
"kN.m2"	kilonewton meters squared
"kN/m"	kilonewtons per meter
"kN/m2"	kilonewtons per square meter
"knot"	knot
"kohm"	kilohm
"kohm.m"	kiloohm meter

Allowable values	S1000D interpretation
"kPa"	kilopascal
"kPa.s/m"	kilopascal seconds per meter
"kPa/100m"	kilopascals per hundred meter
"kPa/h"	kilopascals per hour
"kPa/m"	kilopascals per meter
"kPa/min"	kilopascals per min
"kPa2"	kilopascal squared
"kPa2/cP"	kilopascal squared per centipoise
"kPa2/kcP"	kilopascal squared per thousand centipoise
"kpsi"	thousand pounds per square inch
"kpsi2"	thousand pound per square inch, squared
"krad"	kiloradian
"kS"	kilosiemens
"ksm3"	kilo standard cubic meters 15 degree Celsius
"ksm3/d"	kilo standard cubic meters per day
"ksm3/sm3"	kilo standard cubic meters per standard cubic meter
"kV"	kilovolt
"kW"	kilowatt
"kW.h"	kilowatt hour
"kW.h/dm3"	kilowatt hours per decimeter
"kW.h/kg"	kilowatt hours per kilogram
"kW.h/kg.degC"	kilowatt hours per kilogram degree Celsius
"kW.h/m3"	kilowatt hours per cubic meters
"kW/cm2"	kilowatts per square centimeter
"kW/m2"	kilowatts per square meter
"kW/m2.K"	kilowatts per square meter kelvin
"kW/m3"	kilowatts per cubic meter
"kW/m3.K"	kilowatts per cubic meter kelvin
"L"	liter

Allowable values	S1000D interpretation
"L/100kg"	liters per hundred kilogram
"L/100km"	liters per 100 kilometers
"L/10bbl"	liters per ten barrel
"L/bar.min"	liters per minute per bar
"L/h"	liters per hour
"L/kg"	liters per kilogram
"L/km(100)"	liters per 100 kilometers
"L/m"	liters per meter
"L/m3"	liters per cubic meter
"L/min"	liters per minute
"L/mol(g)"	liters per mole (gram)
"L/mol(kg)"	liters per mole (kilogram)
"L/s"	liters per second
"L/s2"	liters per second/second
"L/t"	liters per tonne
"L/tonUK"	liters per UK ton
"lbf"	pounds force
"lbf.ft"	foot pounds force
"lbf.ft/bbl"	foot pounds force per barrel
"lbf.ft/in"	pounds force feet per inch
"lbf.ft/in2"	foot pounds force per square inch
"lbf.ft/lbm"	foot pounds force per pound mass
"lbf.in"	inch pounds force
"lbf.in/in"	pounds force inches per inch
"lbf.in2"	pounds force inches squared
"lbf.s/ft2"	pounds force seconds per square foot
"lbf.s/in2"	pounds force seconds per square inch
"lbf/100ft"	pounds force per hundred foot
"lbf/100ft2"	pounds force per 100 square foot

Allowable values	S1000D interpretation
"lbf/30m"	pounds force per thirty meters
"lbf/ft"	pounds force per foot
"lbf/ft2"	pounds force per square foot
"lbf/ft2(100)"	pounds force per 100 square foot
"lbf/ft3"	pounds force per cubic foot
"lbf/galUS"	pounds force per US gallon
"lbf/in"	pounds force per inch
"lbf/in2"	pounds force per square inch
"lbf/lbf"	pounds force per pound force
"lbm"	pounds mass
"lbm(million)/yr"	million pounds mass per year
"lbm.ft/s"	foot pounds mass per second
"lbm.ft2"	pounds mass square feet
"lbm.ft2/s2"	pounds mass square feet per second squared
"lbm/1000galUK"	pounds mass per 1000 UK gallons
"lbm/1000galUS"	pounds mass per 1000 US gallons
"lbm/100ft2"	pounds mass per hundred square foot
"lbm/10bbl"	pounds mass per 10 barrel
"lbm/bbl"	pounds mass per barrel
"lbm/d"	pounds mass per day
"lbm/ft"	pounds mass per foot
"lbm/ft.h"	pounds mass per foot hour
"lbm/ft.s"	pounds mass per foot second
"lbm/ft2"	pounds mass per square foot
"lbm/ft3"	pounds mass per cubic foot
"lbm/ft4"	pounds mass per foot fourth
"lbm/galUK"	pounds mass per UK gallon
"lbm/galUK(1000)"	pounds mass per 1000 UK gallons
"lbm/galUK.ft"	pounds mass per UK gallon foot

Allowable values	S1000D interpretation
"lbm/galUS"	pounds mass per US gallon
"lbm/galUS(1000)"	pounds mass per 1000 US gallons
"lbm/galUS.ft"	pounds mass per US gallon foot
"lbm/h"	pounds mass per hour
"lbm/h.ft"	pounds mass per hour foot
"lbm/h.ft2"	pounds mass per hour square foot
"lbm/hp.h"	pounds mass per horsepower hour
"lbm/in3"	pounds mass per cubic inch
"lbm/Mbbl"	pounds mass per 1000 barrels
"lbm/min"	pounds mass per minute
"lbm/s"	pounds mass per second
"lbm/s.ft"	pounds mass per second foot
"lbm/s.ft2"	pounds mass per second square foot
"lkBnA"	British link 1895 A
"lkBnB"	British link 1895 B
"lkCla"	clarke link
"lkSe"	sears link
"lkUS"	US survey link
"lm"	lumen
"lm.s"	lumen second
"lm/m2"	lumens per square meter
"lm/W"	lumens per watt
"lx"	lux
"lx.s"	lux second
"m"	meter
"M(ft3)"	million cubic feet
"M(ft3)/acre.ft"	million cubic feet per acre-foot
"M(ft3)/d"	million cubic feet per day
"M(m3)"	million cubic meters

Allowable values	S1000D interpretation
"M(m3)/d"	million cubic meters per day
"m/30m"	meters per thirty meters
"m/cm"	meters per centimeter
"m/d"	meters per day
"m/h"	meters per hour
"m/K"	meters per kelvin
"m/km"	meters per kilometer
"m/m"	meters per meter
"m/m.K"	meters per meter kelvin
"m/m3"	meters per cubic meter
"m/min"	meters per minute
"m/ms"	meters per millisecond
"m/s"	meters per second
"m/s2"	meters per second squared
"m2"	square meter
"m2/cm3"	square meters per cubic centimeter
"m2/d.kPa"	square meters per day kilopascal
"m2/g"	square meters per gram
"m2/h"	square meters per hour
"m2/kg"	square meters per kilogram
"m2/m2"	square meters per square meter
"m2/m3"	square meters per cubic meter
"m2/mol"	square meters per mol
"m2/Pa.s"	square meters per second pascal
"m2/s"	square meters per second
"m3"	cubic meter
"m3(std,0C)"	cubic meters at standard condition (0 degree Celsius)
"m3(std,15C)"	cubic meters at standard condition (15 degree Celsius)
"m3/bar.d"	cubic meters per day per bar

Allowable values	S1000D interpretation
"m3/bar.h"	cubic meters per hour per bar
"m3/bar.min"	cubic meters per minute per bar
"m3/cP.d.kPa"	cubic meters per centipoise day kilopascal
"m3/cP.Pa.s"	cubic meters per centipoise pascal second
"m3/d"	cubic meters per day
"m3/d.kPa"	cubic meters per day kilopascal
"m3/d.m"	cubic meters per day per meter
"m3/d2"	cubic meters per day per day
"m3/g"	cubic meters per gram
"m3/h"	cubic meters per hour
"m3/h.m"	cubic meters per hour per meter
"m3/ha.m"	cubic meters per hectare meter
"m3/J"	cubic meters per joule
"m3/kg"	cubic meters per kilogram
"m3/km"	cubic meters per kilometer
"m3/kPa.d"	cubic meters per day per kilopascal
"m3/kPa.h"	cubic meters per hour per kilopascal
"m3/kW.h"	cubic meters per kilowatt hour
"m3/m"	cubic meters per meter
"m3/m2"	cubic meters per square meter
"m3/m3"	cubic meters per cubic meter
"m3/min"	cubic meters per minute
"m3/mol"	cubic meters per mole
"m3/mol(kg)"	cubic meters per mole (kilogram)
"m3/Pa.s"	cubic meters per second pascal
"m3/Pa/s"	(cubic meters per second) per pascal
"m3/Pa2.s2"	cubic meters per pascal second squared
"m3/psi.d"	cubic meters per day per (pound per square inch)
"m3/s"	cubic meters per second

Allowable values	S1000D interpretation
"m3/s.ft"	cubic meters per second per foot
"m3/s.m"	cubic meters per second meter
"m3/s.m2"	cubic meters per second square meter
"m3/s2"	cubic meters per seconds squared
"m3/scm(0C)"	cubic meters per standard cubic meters, 0 degree Celsius
"m3/scm(15C)"	cubic meters per standard cubic meters, 15 degree Celsius
"m3/t"	cubic meters per tonne
"m3/tonUK"	cubic meters per UK ton
"m3/tonUS"	cubic meters per US ton
"m4"	meters fourth
"m4/s"	meters fourth per second
"mA"	milliampere
"Ma"	megayear
"MA"	megaampere
"mA/cm2"	milliamperes per square centimeter
"mA/ft2"	milliamperes per square foot
"mbar"	millibar
"Mbbl"	thousand barrel
"Mbbl.ft/d"	thousand barrels feet per day
"Mbbl/d"	thousand barrels per day
"MBq"	megabecquerel
"MBtu/hr"	million British thermal units per hour
"Mbyte"	megabyte
"mC"	millicoulomb
"mC/m2"	millicoulombs per square meter
"Mcf"	thousand cubic feet
"mCi"	millicurie
"mcurie"	millicurie

Allowable values	S1000D interpretation
"mD"	millidarcy
"mD.ft"	millidarcy foot
"mD.ft2/lbf.s"	millidarcy square feet per pound force second
"mD.in2/lbf.s"	millidarcy square inches per pound force second
"mD.m"	millidarcy meter
"mD/cP"	millidarcies per centipoise
"mD/Pa.s"	millidarcies per pascal second
"meq"	milliequivalent
"meq/100g"	milliequivalents per hectogram
"meq/cm3"	milliequivalents per cubic centimeter
"meq/g"	milliequivalents per gram
"mEuc"	millieuclid
"MeV"	millions of electron volts
"Mflops"	megaflops
"Mg"	megagram
"mg"	milligram
"Mg/a"	megagrams per year
"Mg/d"	megagrams per day
"mg/dm3"	milligrams per cubic decimeter
"mg/galUS"	milligrams per US gallon
"Mg/h"	megagrams per hour
"Mg/in"	thousand kilograms per inch
"mg/J"	milligrams per joule
"mg/kg"	milligrams per kilogram
"mg/L"	milligrams per liter
"Mg/m2"	megagrams per square meter
"mg/m3"	milligrams per cubic meter
"Mg/m3"	thousand kilograms per cubic meter
"mGal"	milligalileo

Allowable values	S1000D interpretation
"mgauss"	milligauss
"mGer"	German legal meter
"Mgf"	thousand kilograms force
"mgn"	milligravity
"mGy"	milligray
"mH"	millihenry
"mho"	mho
"mho/m"	mhos per meter
"MHz"	megahertz
"mHz"	millihertz
"mi"	mile
"mi/galUK"	miles per UK gallon
"mi/galUS"	miles per US gallon
"mi/h"	miles per hour
"mi/in"	miles per inch
"mi2"	square mile
"mi3"	cubic mile
"mil"	mil, a thousandth of an inch
"mil/yr"	mils per year
"mila"	mil_6400
"min"	minute
"min/ft"	minutes per foot
"min/m"	minutes per meter
"mina"	minutes angular
"miUS"	U.S. survey mile
"miUS2"	U.S. survey square mile
"MJ"	megajoule
"mJ"	millijoule
"MJ/a"	megajoules per year

Allowable values	S1000D interpretation
"mJ/cm2"	millijoules per square centimeter
"MJ/kg"	megajoules per kilogram
"MJ/m"	megajoules per meter
"mJ/m2"	millijoules per square meter
"MJ/m3"	megajoules per cubic meter
"MJ/mol(kg)"	megajoules per mole (kilogram)
"mK/m"	millidegrees kelvin per meter
"mL"	milliliter
"mL/galUK"	milliliters per UK gallon
"mL/galUS"	milliliters per US gallon
"mL/mL"	milliliters per milliliter
"Mlbm/yr"	million pounds mass per year
"mm"	millimeter
"Mm"	megameter
"mm/a"	millimeters per year
"mm/mm.K"	millimeters per millimeter kelvin
"mm/s"	millimeters per second
"mm2"	square millimeter
"mm2/mm2"	square millimeters per square millimeter
"mm2/s"	square millimeters per second
"mm3"	cubic millimeter
"mm3/J"	cubic millimeters per joule
"MMbbl"	million barrels
"MMbbl/acre.ft"	million barrels per acre foot
"MMcf"	million cubic feet
"mmHg(0C)"	millimeters of Mercury at 0 degree Celsius
"mmho/m"	millimhos per meter
"mmol"	millimole
"MMscf(60F)"	million standard cubic feet at 60 degree Fahrenheit

Allowable values	S1000D interpretation
"MMscf(60F)/d"	million standard cubic feet per day
"MMscf60/stb60"	million standard cubic feet per stock tank barrel
"MMscm(15C)"	million standard cubic meters, 15 degree Celsius
"MMscm(15C)/d"	million standard cubic meters, 15 degree Celsius per day
"MMstb(60F)"	million stock tank barrels, 60 degree farenheit
"MMstb(60F)/d"	million stock tank barrels, 60 degree farenheit per day
"MMstb/acre"	million stock tank barrels 60 degree farenheit per acre
"MMstb/acre.ft"	million stock tank barrels, 60 degree farenheit per acre foot
"MN"	meganewton
"mN"	millinewton
"mN.m2"	millinewton meters squared
"mN/km"	millinewtons/kilometer
"mN/m"	millinewtons/meter
"Mohm"	megaohm
"mohm"	milliohm
"mohm/m"	milliohms per meter
"mol"	mole
"mol(g)"	mole (gram)
"mol(kg)"	mole (kilogram)
"mol(kg)/h"	moles (kilogram) per hour
"mol(kg)/m3"	moles (kilogram) per cubic meter
"mol(kg)/s"	moles (kilogram) per second
"mol(lbm)"	moles (pounds mass)
"mol(lbm)/ft3"	moles (pounds mass) per cubic foot
"mol(lbm)/galUK"	moles (pounds mass) per UK gallon
"mol(lbm)/galUS"	moles (pounds mass) per US gallon
"mol(lbm)/h"	moles (pounds mass) per hour
"mol(lbm)/h.ft2"	moles (pounds mass) per hour square foot
"mol(lbm)/s"	moles (pounds mass) per second

Allowable values	S1000D interpretation
"mol(lbm)/s.ft2"	moles (pounds mass) per second square foot
"mol/m2"	moles per square meter
"mol/m2.s"	moles per square meter second
"mol/m3"	moles per cubic meter
"mol/s"	moles per second
"mPa"	millipascal
"MPa"	megapascals
"mPa.s"	millipascal seconds
"MPa.s/m"	megapascal seconds per meter (megarayl)
"MPa/h"	megapascals per hour
"MPa/m"	megapascals per meter
"Mpsi"	mega pounds per square inch
"mrad"	milliradian
"Mrad"	megaradian
"mrem"	millirem
"mrem/h"	millirems per hour
"mS"	millisiemens
"ms"	millisecond
"ms/2"	half a millisecond
"ms/cm"	milliseconds per centimeter
"ms/ft"	milliseconds per foot
"ms/in"	milliseconds per inch
"mS/m"	millisiemens per meter
"ms/m"	milliseconds per meter
"ms/s"	milliseconds per second
"Mscf(60F)"	thousand cubic feet, 60 degree Fahrenheit
"Mscf(60F)/d"	thousand standard cubic feet per day
"Mscf60/stb60"	thousand standard cubic feet per stock tank barrel
"Mscm(15C)/d"	thousand standard cubic meters, 15 degree Celsius/day

Allowable values	S1000D interpretation
"mseca"	milliseconds angular
"Msm3"	mega standard cubic meters, 15 degree Celsius
"Mstb(60F)"	thousand stock tank barrels, 60 degree Fahrenheit
"Mstb(60F)/d"	thousand stock tank barrels, 60 degree Fahrenheit/day
"mSv"	millisievert
"mSv/h"	millisieverts per hour
"mT"	millitesla
"MV"	megavolt
"mV"	millivolt
"mV/ft"	millivolts per foot
"mV/m"	millivolts per meter
"MW"	megawatt
"mW"	milliwatt
"MW.h"	megawatt hour
"MW.h/kg"	megawatt hours per kilogram
"MW.h/m3"	megawatt hours per cubic meter
"mW/m2"	milliwatts per square meter
"mWb"	milliweber
"MY"	megayear
"N"	newton
"N.m"	newton meter
"N.m/m"	newton meters per meter
"N.m2"	newton square meter
"N.s/m2"	newton seconds per meter squared
"N/30m"	newtons per thirty meters
"N/m"	newtons per meter
"N/m2"	newtons per square meter
"N/m3"	newtons per cubic meter
"N/mm2"	newtons per square millimeter

Allowable values	S1000D interpretation
"N4/kg.m7"	newtons fourth meters per kilogram
"nA"	nanoampere
"nAPI"	API neutron unit
"nautmi"	nautical mile
"nC"	nanocoulomb
"nCi"	nanaocurie
"ncurie"	nanocurie
"nEuc"	nanoeuclid
"nH"	nanohenry
"nJ"	nanojoule
"nm"	nanometer
"nm/s"	nanometers per second
"nohm"	nanohm
"ns"	nanosecond
"ns/ft"	nanoseconds per foot
"ns/m"	nanoseconds per meter
"nT"	nanotesla
"nW"	nanowatt
"O"	octave
"Oe"	oersted
"ohm"	ohm
"ohm.cm"	ohms centimeter
"ohm.m"	ohms meter
"ohm/km"	ohms per kilometer
"ohm/m"	ohms per meter
"oz(av)"	avoirdupois ounce
"oz(troy)"	troy ounce
"ozf"	ounce force
"ozm"	ounce mass

Allowable values	S1000D interpretation
"P"	poise
"Pa"	pascal
"pA"	picoampere
"Pa(g)"	pascal gauge
"Pa.s"	pascal second
"Pa.s/m3"	pascal seconds per cubic meter
"Pa.s/m6"	pascal seconds per cubic meter squared
"Pa.s2/m3"	pascal seconds squared per cubic meter
"Pash"	pascals per hour
"Pa/m"	pascals per meter
"Pa/m3"	pascals per cubic meter
"Pa/s"	pascals per second
"Pa2"	pascals squared
"pC"	picocoulomb
"pCi"	picocurie
"pCi/g"	picocurie per gram
"pcurie"	picocurie
"pdl"	poundal
"pdl.cm2"	poundal centimeter squared
"pdl.ft"	foot poundal
"pdl/cm"	poundals per centimeter
"permil"	per mille
"pF"	picrofarad
"pH"	phenry
"pm"	picometer
"pPa"	picopascal
"ppdk"	parts per ten thousand
"ppk"	parts per thousand
"ppm"	parts per million

Allowable values	S1000D interpretation
"ppm/degC"	parts per million per degree Celsius
"ppm/degF"	parts per million per degree Fahrenheit
"ps"	picosecond
"pS"	picosiemens
"psf"	pounds per square foot
"psi"	pounds per square inch
"psi.d/bbl"	pounds per square inch days per barrel
"psi.s"	pounds per square inch second
"psi/100ft"	pounds per square inch per 100 feet
"psi/ft"	pounds per square inch per foot
"psi/ft(100)"	pounds per square inch per 100 feet
"psi/h"	pounds per square inch per hour
"psi/kft"	pounds per square inch per thousand feet
"psi/m"	pounds per square inch per meter
"psi/min"	pounds per square inch per minute
"psi2"	pounds per square inch squared
"psi2.d/cP.ft3"	pounds per square inch squared days per centipoise cubic foot
"psi2.d/cp.ft3"	pounds per square inch squared days per centipoise cubic foot
"psi2.d2/cP.ft6"	(psi days per cubic foot)squared per centipoise
"psi2.d2/cp.ft6"	(psi days per cubic foot)squared per centipoise
"psi2/cP"	pounds per square inch squared per centipoise
"psia"	pounds per square inch absolute
"psig"	pounds per square inch gauge
"ptUK"	UK pint
"ptUK/hp.hr"	UK pints per horsepower hour
"ptUK/Mbbl"	UK pints per 1000 barrels
"ptUS"	US pint
"ptUS/10bbl"	US pints per ten barrel

Allowable values	S1000D interpretation
"qtUK"	UK quart
"qtUS"	US quart
"quad"	quad
"quad/yr"	quads per year
"rad"	radian
"rad/ft"	radians per foot
"rad/ft3"	radians per cubic foot
"rad/m"	radians per meter
"rad/m3"	radians per cubic meter
"rad/s"	radians per second
"rad/s2"	radians per second squared
"rd"	rad
"rem"	rem
"rem/h"	rems per hour
"rev/min"	revolutions/minute
"rev/s"	revolutions/second
"rpm"	revolutions/minute
"rpm/s"	revolutions/minute per second
"S"	siemens
"s"	second
"s/cm"	seconds per centimeter
"s/ft"	seconds per foot
"s/ft3"	seconds per cubic foot
"s/in"	seconds per inch
"s/L"	second per liter
"S/m"	siemens per meter
"s/m"	seconds per meter
"s/m3"	seconds per cubic meter
"s/qtUK"	second per UK quart

Allowable values	S1000D interpretation
"s/qtUS"	second per US quart
"sack94"	sack
"scf(60F)"	standard cubic feet at 60 degree Fahrenheit
"scf(60F)/bbl"	standard cubic feet at 60 degree Fahrenheit/barrel
"scf(60F)/d"	standard cubic feet per day
"scf(60F)/ft2"	standard cubic feet at 60 degree Fahrenheit per square foot
"scf(60F)/ft3"	standard cubic feet at 60 degree Fahrenheit per cubic foot
"scm(0C)"	standard cubic meters at 0 degree Celsius
"scm(0C)/m2"	standard cubic meters at 0 degree Celsius per square meter
"scm(0C)/m3"	standard cubic meters at 0 degree Celsius per cubic meter
"scm(15C)"	standard cubic meters at 15 degree Celsius
"scm(15C)/d"	standard cubic meters at 15 degree Celsius per day
"scm(15C)/m2"	standard cubic meters at 15 degree Celsius per square meter
"scm(15C)/m3"	standard cubic meters at 15 degree Celsius per cubic meter
"scm(15C)/s"	standard cubic meters at 15 degree Celsius per second
"scm15/stb60"	standard cubic meters per stock tank barrel
"seca"	seconds angular
"sigma"	capture unit
"sm3/ksm3"	standard cubic meters per 1000 standard cubic meter
"sm3/sm3"	standard cubic meters per standard cubic meters
"sq ft"	square foot
"sq in"	square inch
"sq mi"	square mile
"sq yd"	square yard
"sr"	steradian
"stb(60F)"	stock tank barrel at 60 degree Fahrenheit

Allowable values	S1000D interpretation
"stb(60F)/acre"	stock tank barrels, 60 degree Fahrenheit per acre
"stb(60F)/bbl"	stock tank barrels, 60 degree Fahrenheit per barrel
"stb(60F)/d"	stock tank barrels, 60 degree Fahrenheit per day
"stb60/MMscf60"	stock tank barrels per million standard cubic feet
"stb60/MMscm15"	stock tank barrels per million standard cubic meters
"stb60/Mscf60"	stock tank barrels per 1000 standard cubic feet
"stb60/Mscm15"	stock tank barrels per 1000 standard cubic meters
"stb60/scm15"	stock tank barrels per standard cubic meter
"Sv"	sievert
"Sv/h"	sieverts per hour
"Sv/s"	sieverts per second
"T"	tesla
"t"	tonne
"t/a"	tonnes per year
"t/d"	tonnes per day
"t/h"	tonnes per hour
"t/min"	tonnes per minute
"talbot"	talbot
"TBq"	terabecquerel
"tcf"	trillion cubic feet
"TeV"	tera electron volts
"therm"	therm
"therm/ft3"	therms per cubic foot
"therm/galUK"	therms per UK gallon
"therm/lbm"	therms per pound mass
"TJ"	terajoule
"TJ/a"	terajoules per year
"Tohm"	teraohm
"ton of refrig"	tons of refrigeration

Allowable values	S1000D interpretation
"tonfUK"	UK tons force
"tonfUK.ft2"	UK ton feet squared
"tonfUK/ft"	UK tons force per foot
"tonfUK/ft2"	UK tons force per square foot
"tonfUS"	US tons force
"tonfUS.ft"	US tons force feet
"tonfUS.ft2"	US tons force feet squared
"tonfUS.mi"	US tons force miles
"tonfUS.mi/bbl"	US ton force miles per barrel
"tonfUS.mi/ft"	US tons force miles per foot
"tonfUS/ft"	US tons force per foot
"tonfUS/ft2"	US tons force per square foot
"tonfUS/in2"	US tons force per square inch
"tonUK"	UK tons
"tonUK/a"	UK tons per year
"tonUK/d"	UK tons per day
"tonUK/h"	UK tons per hour
"tonUK/min"	UK tons per minute
"tonUS"	US tons
"tonUS/a"	US tons per year
"tonUS/d"	US tons per day
"tonUS/ft2"	US tons per square foot
"tonUS/h"	US tons per hour
"tonUS/min"	US tons per minute
"torr"	torr
"TW"	terawatt
"TW.h"	terrawatt hour
"uA"	microampere
"uA/cm2"	microamperes per square centimeter

Allowable values	S1000D interpretation
"uA/in2"	microamperes per square inch
"ubar"	microbar
"uC"	microcoulomb
"ucal/s.cm2"	microcalories per second square centimeter
"uCi"	microcurie
"ucurie"	microcurie
"uEuc"	microeuclid
"uF"	microfarad
"uF/m"	microfarads per meter
"ug"	microgram
"ug/cm3"	micrograms per cubic centimeter
"uH"	microhenry
"uH/m"	microhenries per meter
"uHz"	microhertz
"uJ"	microjoule
"um"	micron
"um/s"	micrometer per second
"um2"	square micron
"um2.m"	square micron meter
"umHg(0C)"	microns of Mercury at 0 degree Celsius
"umol"	micromole
"uN"	micronewton
"unitless"	unitless
"uohm"	microohm
"uohm/ft"	microohms per foot
"uohm/m"	microohms per meter
"uPa"	micropascal
"upsi"	micropounds per square inch
"urad"	microradian

Allowable values	S1000D interpretation
"uS"	microsiemens
"us"	microsecond
"us/ft"	microseconds per foot
"us/m"	microseconds per meter
"uT"	microtesla
"uV"	microvolt
"uV/ft"	microvolts per foot
"uV/m"	microvolts per meter
"uW"	microwatt
"uW/m3"	microwatts per cubic meter
"uWb"	microweber
"V"	volt
"V/B"	volts per bel
"V/dB"	volts per decibel
"V/m"	volts per meter
"volpercent"	volume percent
"volppm"	volume parts per million
"W"	watt
"W/cm2"	watts per square centimeter
"W/K"	watts per delta kelvin
"W/kW"	watts per kilowatt
"W/m.K"	watts per meter kelvin
"W/m2"	watts per square meter
"W/m2.K"	watts per square meter kelvin
"W/m2.sr"	watts per square meter steradian
"W/m3"	watts per cubic meter
"W/m3.K"	watts per cubic meter kelvin
"W/mm2"	watts per square millimeter
"W/sr"	watts per steradian

Allowable values	S1000D interpretation
"W/W"	watts per watt
"Wb"	weber
"Wb.m"	weber meter
"Wb/m"	webers per meter
"Wb/mm"	webers per millimeter
"wk"	week
"wtpercent"	weight percent
"wtppm"	weight parts per million
"yd"	yard
"yd2"	square yard
"yd3"	cubic yard
"ydBnA"	benoits yard (1895 A)
"ydBnB"	benoits yard (1895 B)
"ydCla"	clarkes yard
"ydIm"	imperial yard
"ydInd"	indian yard
"ydInd(37)"	indian yard (1937)
"ydInd(62)"	indian yard (1962)
"ydInd(75)"	indian yard (1975)
"ydSe"	sears yard
"yr(100k)"	100000 years
"um01" - "um50"	Not available for projects
"um51" - "um99"	Available for projects

Chapter 3.9.7

Authoring - Human performance technology and training information

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1 General

This chapter deals with the authoring of learning data modules to be used for human performance technology and training information. Refer to Chap 3.9.5.2.13.

The scope and depth of the information reflects the associated maintenance data modules and the level of training information to be supplied. This latter aspect is based on the level of maintenance to be conducted and the complexity of the Product.

2 Human performance technology and training Information

2.1 Human performance technology

2.1.1 Performance analysis

When engineering any type of system, requirements must be established to ensure the final product will meet its purpose. In the process of defining such requirements, factors within the greater system, or system of systems, in which a product will reside must be analyzed to ensure successful integration. Human Performance Technology (HPT) accounts for the human performance system and its interaction with the product that is subject of an S1000D project.

Central to the human performance system is the worker. Performance Analysis (PA) studies factors and interactions in the worker's external and internal environments that influence desired system output to ensure appropriate performance requirements are defined, and the target system is not adversely affected by the introduction of a new or changed component.

The use of the HPT learning data modules within a project allows life cycle systems engineers to capture critical information from a performance analysis, and allow human performance system requirements to be established and managed throughout the life cycle of the project.

2.1.1.1 Scope of human performance technology performance analysis information
Data and requirements from five common types of HPT analyses can be captured within learning data modules that use the learning plan information model of the learning schema. Refer to Chap 3.9.5.2.13.1.

2.1.1.1.1 Organizational analysis
Provides information needed to derive requirements of the organization that will use the product. This analysis will provide the vision, mission and values of the organization. It will also define the organization's measureable goal and objectives in relation to the product.

2.1.1.1.2 Gap analysis
Provides key human performance requirements that must be met in order for the organization's goal and objectives for the product (within the system) to be achieved.

2.1.1.1.3 Organizational environment analysis
Provides information about internal and external forces that can influence the sponsoring organization's ability to meet its vision, mission, goals and objectives through the product. Some examples could include: political activist groups, environmental laws, and conventions or norms of the incumbent culture.

2.1.1.1.4 Work environment analysis
Provides information about work design factors that can influence the sponsoring organization’s workers' abilities to meet its vision, mission, goals and objectives through the product. Such factors are external to the workers performing jobs. Some examples could include:

- availability of required material resources or tools
- work processes
- job hierarchy
- work location or area layout
- standard operating procedures

2.1.1.1.5 Performer analysis
Provides information about factors internal to the sponsoring organization'

s workforce that can influence its abilities to meet its vision, mission, goals and objectives through the product of the project. Some examples could include:

- employee knowledge
- skills
- motivation
- physical capabilities
- aptitude

2.1.2 Cause analysis

Data and requirements from an HPT cause analyses can be captured within learning data modules that use the learning plan information model of the learning schema. Refer to Chap 3.9.5.2.13.1.

This analysis provides information about the root causes (internal or external to the job performers) of a performance deficiency that is preventing the sponsoring organization from achieving its vision, mission, goals and objectives. Such causes may have been the catalyst for the product or may be a result of introducing that product into the organization's system.

2.1.3 Intervention definition

Requirements of an intervention needed to support successful integration and use of the product can be captured within learning data modules that use the learning plan information model of the learning schema. Refer to Chap 3.9.5.2.13.1.

An intervention may consist of training or non-training type, and multiple intervention types may be required to support product integration. Requirements for the intervention are derived from a performance analysis, and are designed to remedy the causes of a potential or current human performance gap.

2.1.3.1 Non-training interventions

Learning data modules that define the requirements for a non-training intervention designed to positively affect the human performance system in which the product is used. For example, as a result of the product, the job procedure for a specific worker may require changes. The requirements and specifications for that job procedure change, such as work responsibilities, placement within the organization, or reporting structure, are defined in a learning data module.

2.1.3.2 Training interventions

Learning data modules that define the requirements for a training intervention designed to positively affect the human performance system in which the product is used. For example, as a result of the product, the use of a new tool may become required of a specific worker. The training requirements and training product specifications needed to support the worker's skill development are defined in a learning data module.

2.1.4 Intervention implementation

Requirements to implement an intervention successfully within the target system can be captured within learning data modules that use the learning plan information model of the learning schema. Refer to Chap 3.9.5.2.13.1.

In addition to, but logistically separate from, the requirements and specifications for the production of an intervention, requirements to ensure proper integration and use of the intervention may be required. For example, a training intervention may require that the trainer receives training prior to the implementation. Any such logistical, change management, or other factors critical to the intervention implementation are defined in a learning data module.

2.1.5 Performance evaluation

Requirements and associated criteria of an evaluation instrument to be used to assess an intervention's success within the target system can be captured within learning data modules that use the learning plan information model of the learning schema. Refer to Chap 3.9.5.2.13.1.

A performance evaluation instrument can be used to complete a formative assessment during the development and testing of an intervention to determine how successful an intervention will be before its final release or implementation. It can also be used to complete summative assessments of an intervention's impact on the worker, job, or organizational performance.

2.2 Training information

2.2.1 Writing for maintenance

Maintenance information data modules are written to a scope and depth that reflect the project requirements, the skill level of the maintainer and the activity to be conducted. These data modules tend to be written to detail the procedure to be conducted in the least ambiguous format and define the sequence to be followed.

2.2.2 Writing for training

Training information, by its very nature, is written from a supporting context, it is provided in some cases as support to the maintenance information to allow further breakdown of the elements of the task so that learning can be achieved. The style of writing training information reflects the requirement to transfer knowledge to the student, as opposed to maintenance which is written to instruct the maintainer to carry out a procedure. In other cases it is used to establish an initial knowledge of the Product to aid understanding prior to maintenance activities being conducted.

The design requirements for a training intervention can be captured within learning data modules that use the learning plan information model of the learning schema. The content and information to be delivered within a training intervention can be captured within the overview, content, summary and assessment information models of the learning schema. Refer to Chap 3.9.5.2.13.1.

2.2.2.1 Scope of training information

Five information model types exist to allow learning information to be presented these are:

- learning plan information
- learning overview information
- learning summary information
- learning content information
- learning assessment information

2.2.2.1.1 The learning plan information model type

The learning plan information type describes a training intervention's instructional design requirements.

2.2.2.1.2 The learning overview information model type

The learning overview information model type contains information used in the introductory part of a training intervention.

2.2.2.1.3 The learning summary information model type

The learning summary information model type contains information used in the culminating activities of training intervention to reinforce the learning process.

2.2.2.1.4 The learning content information model type

The learning content information model type provides the information and assets used to create the content of a training intervention. A learning data module using the learning content information model may be comprised of a set of self-contained content required to meet single learning objective.

2.2.2.1.5 The learning assessment information model type

The learning assessment information model type contains information used to create activities that measure learner progress, encourage recall, and reinforce the learning process during a training intervention. For example, a learning data module using the learning assessment

information model can contain information used in a pre-assessment test, comprehension checks during instructional activities, or as a post-assessment test.

2.2.2.2 Harmonizing issues

When a project has a requirement to support integration of the product into the end organization's system, or produce training information in data modules, they must ensure that there is consistency and coherence within the project. This means that the creation and management of human performance technology and the training data modules are an integral part of the project technical information. This will involve these data modules being included in project aspects such as business rules, data module requirements list and must identify aspects such as PA and Training Needs Analysis (TNA) as information drivers.

2.2.2.3 Effects on maintenance and training information production

To ensure that there is consistency and coherence, the project must align, at the earliest possible stages, any information requirements for human performance, training and maintenance. This will allow the project to identify any information requirement dependencies. This aspect must also take into consideration how the information will be used by the end user and life cycle support personnel.

In the case of training interventions, the activity of verification, whether it is maintenance or training data module verification, must ensure that the data modules work together as a coherent group and align with the human performance system requirements, prior to the publishing activity.

2.2.2.4 Granularity of training data modules

Often training information needs to be produced at a much finer level of granularity than maintenance data modules might normally be written to. In order to achieve the best fit for granularity, it is essential that the requirements of granularity, for both training and maintenance information are addressed before any data modules are produced. The results of a PA, and information and requirements captured in HPT data modules, can help guide this process. This will establish an environment where the maintenance data modules used within a training intervention are used as created; allowing them to be used, as the trainee will use them in a maintenance environment.

It has to be noted that training data modules must be written with maintenance data modules as the "driver" for the task being taught.

2.2.3 Presentation issues

This aspect will depend on the project infrastructure and how it delivers technical data. Chap 6.4 details functionality required from a technical data viewpoint. If a project wishes to integrate its IETP with a Learning Management System (LMS) or an Electronic Performance Support System (EPSS), functionality that enables this interaction must be contracted for. The functionality must also take cognizance of how the training activation is to be conducted, for example, a named maintainer having a training profile inherent within the IETP to ensure training was invoked at the appropriate time and appropriate to the maintainer's profile.

2.2.4 Linking

When producing HPT or training information as data modules, linking can be achieved either at the data module level or at deeper levels within the data modules.

2.2.4.1 Linking at the data module level

Linking at data module level is achieved using the element <dmRef> as defined in Chap 3.9.5.2.1.2.

2.2.4.2 Linking at deeper levels
The linking at deeper levels applies only from training information to maintenance information. This is only to be used when maintenance data modules cannot be broken down to meet the granularity requirements of training.

There can be situations where, for example, because of safety reasons, maintenance data modules cannot be broken down to the exact level of granularity required by training objectives. When linking into lower levels within a maintenance data module, care must be taken not to compromise any safety related information at a higher level. The mechanism for this is described in Chap 3.9.5.2.1.2.

2.2.5 Data module code
Data modules using the learning schema are coded using a learn code and learn event code. Refer to Chap 4.3.9 and Chap 4.3.10.

The rules for the preparation and coding for training information are described in Chap 5.2.1.19.

2.2.6 Preplanning
2.2.6.1 Introduction
Preplanning for a project aims to leverage the potential economies of integrating human performance system requirements, technical data and technical training data into S1000D, and encompasses three major areas:

- scope guidance. Refer to Para 2.2.6.1.1.
- business issues guidance. Refer to Para 2.2.6.1.2.
- process guidance. Refer to Para 2.2.6.1.3.

Preplanning addresses some of the organizational, project management, and business issues that require advance consideration in order to minimize problems later in the project. Preplanning also serves to focus the project planning toward the long-term cost savings of an integrated approach.

The following sections identify possible guidance areas:

2.2.6.1.1 Scope guidance
Possible guidance areas are:

- major components of Scope
- requirements: List types of technical publications and training required to support the intended purpose of the system
- requirements: Describe the end-users requirements of the documentation and training
- requirements: Understand the performance environment
- presentation: Identify the general format of the presentations
- presentation: Identify media used for presentations of training content (media choices may need to work for both training and tech data in different presentation environments)
- presentation: Identify factors that will affect the contexts of instruction and technical documentation
- presentation: Identify content to be covered
- presentation: Identify project access to sources
- requirements: Identify organizational and environmental constraints that can influence design decisions
- establish relationship between SCO and S1000D content

2.2.6.1.2 Business issues guidance
Possible guidance areas are:

- who pays for each activity?
- who owns content?
- who can use the content?

- who must pay for content?
- when an update to one requires an update to the other, who pays for it?

2.2.6.1.3 Process guidance

This is relative to stages of: identify content, design and develop, authorize, publish/disseminate, and use. Possible guidance areas are:

- all stages: Obey the fundamental rule that constraints can direct a project but that multiple options exist
- all stages: Assign roles in the process
- all stages: Describe the process
- identify content: Search existing training content. Some organizations are implementing guidelines that require the registry of training materials along with policies that require new projects to identify suitable existing materials in order to maximize reuse and minimize cost).
- identify content: Integrate for efficiency
- identify content: Establish synergy with other deliverables such as Parts data
- design and develop: Determine linking and embedding approach
- design and develop: Establish a common data module coding strategy that satisfies the granularity
- design and develop: Determine grain size
- design and develop: Use a consistent language style
- design and develop: Address safety issues
- design and develop: Choose a data flow model for instructional content sourced from technical publications
- design and develop: Decide how to insert content
- publish: Make general project decisions about the publication process and the dissemination flow for both instructional and tech data products to identify conflicts and redundancies
- design and develop: Identify requirements of both training and maintenance
- design and develop: Establish link-back to storyboards
- design and develop: Analyze analysis for commonality
- design and develop: Establish synergy with logistic database

Chapter 4

Information management

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Chap 4.11	Information management - Process data module
Chap 4.12	Information management - Multiple instances of CSDB objects
Chap 4.13	Information management - Optimizing and reuse
Chap 4.14	Information management - Applicability
Chap 4.15	Information management - Learning Information
Chap 4.16	Information management - Content specific data
Chap 7	Information processing

1 General

Information management is comprised of the addressing, storage and handling of information objects such as data modules, illustrations and publications that enables the production and use of common technical publications within a project.

This chapter provides an overview of the chapters that give the rules for information management in an S1000D project.

2 Content

Chap 4.2 gives an overview of the CSDB concept, the information objects and the standards that are used.

Chap 4.3 describes the details of the coding of data modules and Chap 4.4 describes the details of the coding of illustrations or associated data. The data module lists used for planning, management and control of the CSDB content are described in Chap 4.5. The handling of comments on data modules and publications are contained in Chap 4.6. Version control of data modules is described in Chap 4.7, and the interchange of data modules, publication modules and SCORM content package modules is described in Chap 4.8.

Chap 4.9 explains the managements of publication modules built from the data modules in the CSDB together with the methods of coding, building and updating of publications.

Chap 4.10 contains a description of recording and exchange of business rules within projects.

Chap 4.11 gives an explanation of the concept and management of the process data module. The issue of occurrences of multiple instances of data modules is contained in Chap 4.12. Chap 4.13 deals with optimization and reuse and Chap 4.14 explains the concept and management of applicability.

Chap 4.15 explains the managements of Shareable Content Object Reference Model (SCORM) content package modules, built from the data modules in the CSDB together with the methods of coding, building and updating of SCORM content package modules.

Chap 4.16 introduces the concepts of contents specific and quantity data.

The internal structures of the information objects are described in Chap 7, which deals with information processing.

Chapter 4.2

Information management - Common source database

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Chap 3.9.2.7	Illustration rules and multimedia - ICN metadata file
Chap 3.9.5	Authoring - Data modules
Chap 4.5	Information management - Data management lists
Chap 4.6	Information management - Comment
Chap 4.9	Information management - Publication management
Chap 4.13.2.2	Incremental update of CIR data modules - Data update file content
Chap 7.5	Information processing - Information interchange

1 General

The key element in information management is the CSDB. It is an information store and management tool for all objects required to produce the technical publications within projects. CSDB information objects are based on the identified standards. Refer to Chap 2.2.

The major objectives for a CSDB are:

- support the technical publication process
- support the controlled authoring
- support the QA process
- support the data exchange with partners, suppliers and customers

- support the delivery of technical publications on various media independent from the source storage format

2 Concepts

The central object in the CSDB is the data module. It is the smallest self-contained information unit within a technical publication. Data modules control and contain text, illustrations, multimedia, and data. They have defined neutral structures based on international standards. Illustrations, multimedia and other data are not directly stored inside the data modules, but referenced.

Careful planning of the breakdown of technical information into data modules is important to ensure efficient data use and reuse. It is recommended that chains of references be avoided.

3 CSDB design

S1000D does not specify the design and implementation rules for a CSDB. It only specifies the data structure of the information objects, which is independent from any software implementation.

The information objects to be stored and managed in the CSDB are the following addressable and exchangeable units:

- data modules, refer to Chap 3.9.5
- illustrations, multimedia, and other data associated with and called up by data modules, refer to Chap 3.9.2
- ICN metadata file, refer to Chap 3.9.2.7
- data management lists, refer to Chap 4.5
- comments, refer to Chap 4.6
- publication modules, refer to Chap 4.9
- data update file, refer to Chap 4.13.2.2
- data dispatch notes, refer to Chap 7.5

4 XML objects

The S1000D information objects, listed above, with the exception of illustrations, multimedia and other data, must be produced in XML.

Chapter 4.3

Information management - Data module code

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Chap 4.3.8	Data module code - Item location code
Chap 4.3.9	Data module code - Learn code
Chap 4.3.10	Data module code - Learn event code
Chap 4.3.11	Data module code - Summary
Chap 4.12	Information management - Multiple instances of CSDB objects

1 General

The data module code is the standardized and structured identifier of a data module. It is contained in the identification section of the data module. The data module code is part of the

unique identifier of the data module. The data module code is used to manage data modules in the CSDB, to retrieve them or to gain access to them in an electronic environment.

The element <dmCode> is used to store the data module code. Refer to Chap 3.9.5.1.

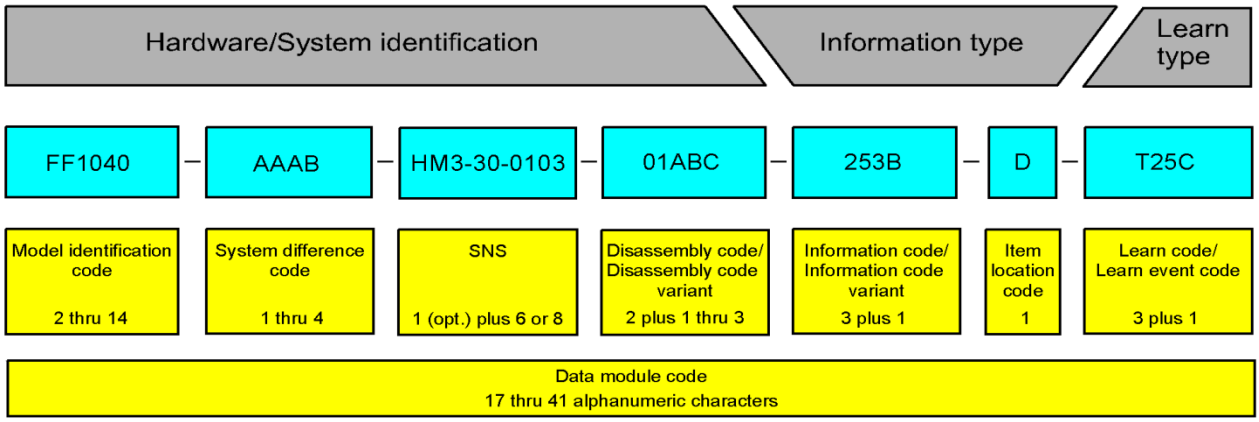
A summary of the data module code is given Chap 4.3.11.

If there is a need for multiple instances of any data module issue the data module code is extended with two proceeding attributes and the identifier of the data module code becomes an extended data module code. Refer to Chap 4.12.

2 Data module code

2.1 Data module code structure

The data module code comprises up to 41 alphanumeric characters and is built up as shown in Fig 1. The minimum length is 17 alphanumeric characters as given in Fig 2.



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Fig 1 *Generic structure of the data module code*

A single project can require the use of multiple model identification codes in data module codes, which can contain a SNS with the same characters but with a different definition. The additional optional character, called the material item category code, within the SNS, shown in Fig 1, is used to indicate the different SNS. To avoid a complete renumbering of the data modules where multiple SNS are used it is allowable for the material item category code to be used where applicable. This means that it is not required to populate the data module code elements to a consistent length in such projects.

Business rule decision point BRDP-S1-00331 - Data module coding strategy:

– Decide on the data module coding strategy to use for the Product and/or the project.

2.2 Data module code partitions

Breakdown details for the three partitions "hardware/system identification", "information type" and "learn type" are given in Table 2, Table 3 and Table 4.

Table 2 Hardware/System identification

Breakdown	Rule
Model identification code	2 thru 14 uppercase alphanumeric characters
System difference code	1 thru 4 uppercase alphanumeric characters

Breakdown	Rule
Standard numbering System	1 (optional material item category code) plus 6 or 8 uppercase alphanumeric characters
– System	– 1 (optional material item category code) plus 2 uppercase alphanumeric characters
– Subsystem + sub-subsystem	– 2 (1+1) uppercase alphanumeric characters
– Unit or assembly	– 2 or 4 uppercase alphanumeric characters
Disassembly code	2 uppercase alphanumeric characters
Disassembly code variant	1 thru 3 uppercase alphanumeric characters

Table 3 Information type

Breakdown	Rule
Information code	3 uppercase alphanumeric characters
Information code variant	1 uppercase alphanumeric character
Item location code	1 uppercase alphanumeric character

Table 4 Learn type

Breakdown	Rule
Learn code	3 uppercase alphanumeric characters
Learn event code	1 uppercase alpha character

The learn type information applies to human performance technology or training data modules.

Chap 4.3.1 to Chap 4.3.8 describe the 17 alphanumeric character data module code without learn type information and the 41 alphanumeric characters data module code with learn type information as given in Fig 2. The minimum length of the data module code without learn type information is 17 alphanumeric characters, the minimum length of the data module code with learn type information is 21 alphanumeric characters. The maximum length of the data module code without learn type information is 37 alphanumeric characters, the maximum length of the data module code with learn type information is 41 alphanumeric characters.

Learn type information is described in Chap 4.3.9 and Chap 4.3.10.

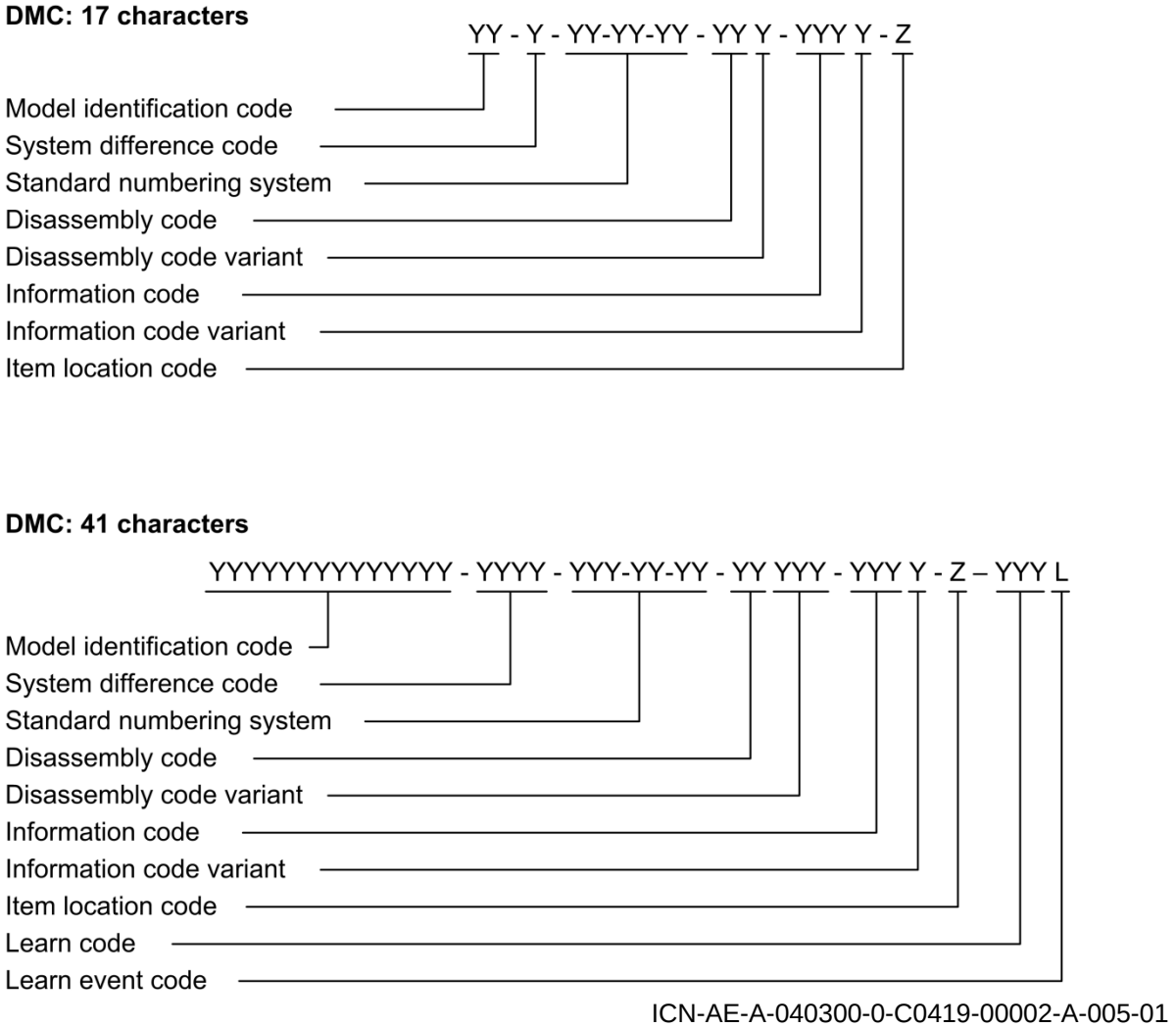


Fig 2 Data module code for a Product

2.3 Use of hyphens

The data module code must be presented with hyphens [-] in the positions as shown in Fig 2 and without spaces in between. The hyphens delimit the contents of the codes, as shown, but are not included within the population of the data module code attributes. This rule applies also to cases where the data module code is given as a single string.

Note

For ease of reading, spaces are used in coding examples in this specification.

Chapter 4.3.1

Data module code - Model identification code

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Chap No./Document No.	Title
Chap 3.9.5.1	Data modules - Identification and status section
www.nspa.nato.int	NATO Support and Procurement Agency (NSPA)

1 General

The model identification code is identified in the data module code by the highlighted characters:

YY - Y - YY - YY - YY - YYY - YYYY - Z (17 characters)

thru

YYYYYYYYYYYYY - YYYY - YYY - YY - YYYY - YYYYY - YYYY - Z - YYYL (41 characters)

The attribute `modelIdentCode` of the element <`dmCode`> is used to store the model identification code. Refer to Chap 3.9.5.1.

The model identification code is variable with a minimum of two and a maximum of 14 alphanumeric characters.

2 Model identification code

2.1 General

The model identification code identifies the Product to which the data applies and is the point of reference for all applicability information. The model identification code includes all related model variants. The variable length of the model identification code enables a coupling between a Product or project name (eg, a 10 character End Item Acronym Code, (EIAC)) and a Product or project variant (eg, a one thru four character "end item Usable On Code", (UOC)) from a logistics database (eg, Logistics Support Analysis Record, (LSAR)).

The decision on how to use the model identification code in this way is a project or organization decision and must be documented in the project or organization business rules.

Projects must apply to North Atlantic Treaty Organization (NATO) Support and Procurement Agency (NSPA) for the allocation of the model identification code and must specify the number of model identification codes the user wishes to reserve for models or variants. If applicable, the project or the organization must ensure that the model identification codes are harmonized between the users of S1000D and S2000M.

In order to control the available sequences and prevent duplications, the model identification codes must be registered with:

S2000M Administrator

NATO Support and Procurement Agency (NSPA)

L-8325 CAPELLEN

G.-D. Luxembourg

Email: spec2000m@nspa.nato.int

When applying for a code, indicate the name and title of the requester, company name and postal address, telephone, fax number and e-mail address. If not self-evident, please indicate the type of Product (aircraft, engine, missile, radar, ship, tank, vehicle, etc) for which the code is being requested. If the name of the system is not in English, please provide also an English translation. In principle the project or the organization can propose a code.

By maintaining a central database, NSPA will ensure the global uniqueness of the model identification codes. A new model identification code will be taken into use at the discretion of the project whenever a new type/model or variant is thought to need specific identification.

When this is necessary, the project or the organization will establish their own arrangements for cross-indexing. It is suggested that if this requirement can be foreseen, the project or the organization can allocate the first model identification code of a block to be the common or baseline.

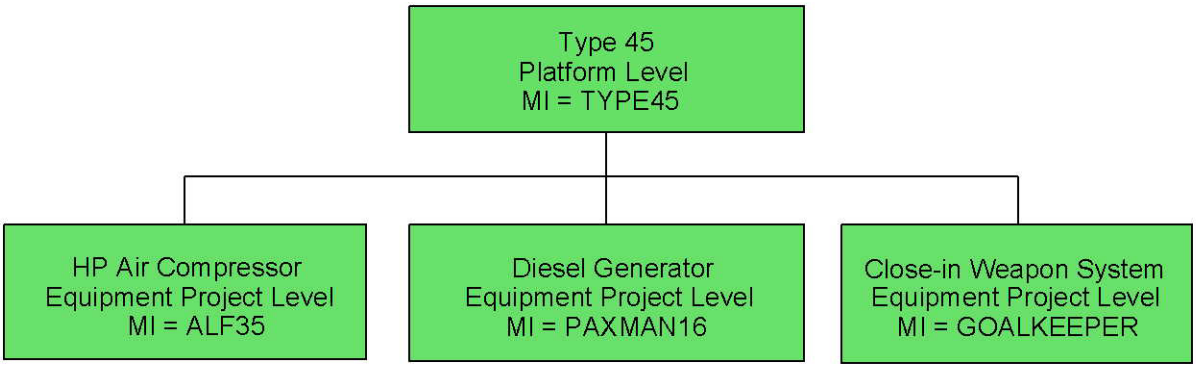
The allocation of a model identification code for a Product does not imply that all data modules and publications applicable to a project have to use the same code. Data modules on the platform level as shown in Fig 1 can contain interface data modules to reference to other model identification codes. Therefore individual data modules and publication modules can be used on several projects. This allows the use of existing data without change or recoding. The model identification code in itself has no significance outside the project.

Business rule decision point BRDP-S1-00332 - Allocation of Product model identification code:

- Decide which model identification codes to use for the Product and/or project.

Business rule decision point BRDP-S1-00333 - Allow the use of one or several model identification codes:

– Decide whether to allow the use of one or several model identification codes.



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Fig 1 Multiple model identification code within a project

2.2 Allocated model identification codes

A list of all allocated model identification codes can be found at www.nspa.nato.int. The list is common for both S1000D and S2000M.

Chapter 4.3.2

Data module code - System difference code

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Table 1 References

Chap No./Document No.	Title
Chap 3.9.5.1	Data modules - Identification and status section

1 General

The system difference code is identified in the data module code by the highlighted characters:

YY - **Y** - YY - YY - YY - YYY - YYYY - Z (17 characters)

thru

YYYYYYYYYYYYYY - **YYYY** - YYY - YY - YYYY - YYYYY - YYYY - Z - YYYL (41 characters)

The attribute `systemDiffCode` of the element <`dmCode`> is used to store the system difference code. Refer to Chap 3.9.5.1.

The system difference code is variable between one and four characters each of which can be alphanumeric.

2 System difference code

The system difference code identifies alternative versions of the system and subsystem/sub-subsystem identified by the SNS without affecting the type, model or variant identity.

The variable length of the system difference code enables for example, a relationship between the system difference codes and the one thru four alphanumeric characters of the "System level Usable On Code (UOC)" from a logistics database (eg, Logistic Support Analysis Record (LSAR)).

When set to one character it is important to positively identify the system/subsystem variant and the applicability of the related information. The initial or basic installation is coded to the project defined default and assigned successively as variants are specified. The value "A" is always used for the first configuration, the value "B" for the second and so on.

An example of how the system difference code would differentiate two navigation systems is shown in Fig 1.

Example:

There can be more than one system variant available (eg, system 34 (Navigation), sub-subsystem 41 (Navigation radar)). This can be used to identify the independent positioning determining installation in the air vehicle. However it can be that there are several types of Navigation radar available.

Business rule decision point BRDP-S1-00334 - Allocation of system difference code:

- Decide which system difference code values to be used for the Product.

2.1 Specific use of the system difference code

For data modules valid for several configurations, the project or the organization must define the assignment of the system difference code.

For projects assigning a UOC to each configuration, they can assign as many system difference code values as actual combinations of configurations.

Table 2 Example for UOC assignment

Configuration	UOC
Conf 1	A
Conf 2	B
Conf 3	C

Table 3 Example for system difference code assignment

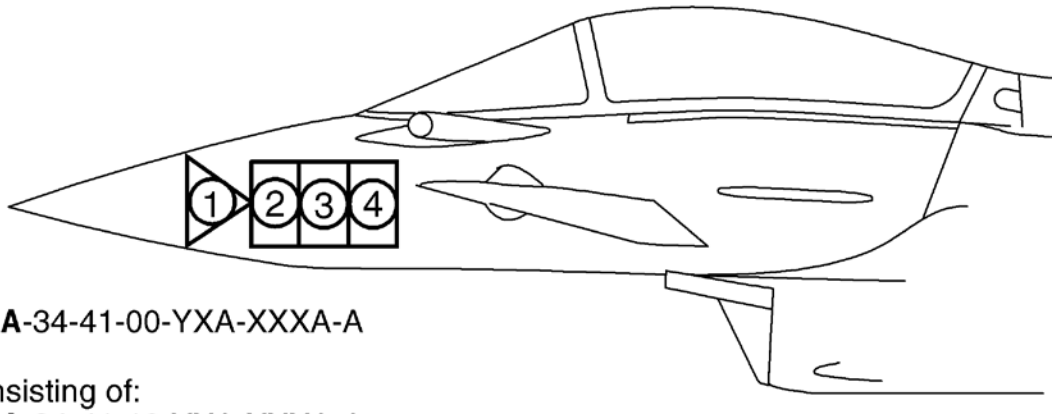
Combinations of configuration	System difference code
Conf 1	A0
Conf 2	B0
Conf 3	C0
Conf 1 + Conf 2	A1
Conf 1 + Conf 3	A2
Conf 1 + Conf 2 + Conf 3	A3
Conf 2 + Conf 3	B1

In these examples, the system difference code value "A3" defined for the combination of all the configurations can be used in the data module code for all valid configurations.

Business rule decision point BRDP-S1-00335 - UOC as system difference code:

– Decide whether to use UOC as the system difference code.

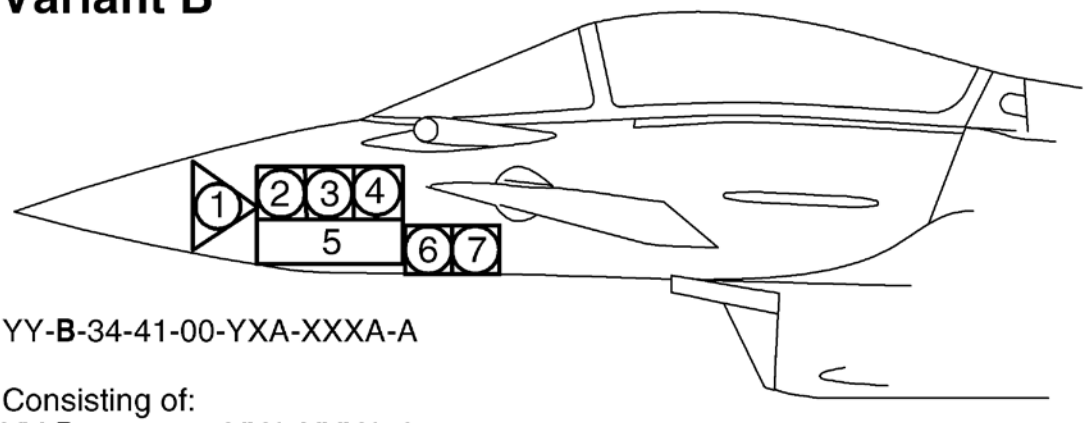
Variant A



YY-**A**-34-41-00-YXA-XXXA-A

Consisting of:
YY-**A**-34-41-10-YXA-XXXA-A
YY-**A**-34-41-20-YXA-XXXA-A
YY-**A**-34-41-30-YXA-XXXA-A
YY-**A**-34-41-40-YXA-XXXA-A

Variant B



YY-**B**-34-41-00-YXA-XXXA-A

Consisting of:
YY-**B**-34-41-10-YXA-XXXA-A
YY-**B**-34-41-20-YXA-XXXA-A
YY-**B**-34-41-30-YXA-XXXA-A
YY-**B**-34-41-40-YXA-XXXA-A
YY-**B**-34-41-50-YXA-XXXA-A
YY-**B**-34-41-60-YXA-XXXA-A
YY-**B**-34-41-70-YXA-XXXA-A

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Fig 1 System difference code

Chapter 4.3.3

Data module code - Standard numbering system

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Chap 5	Information sets and publications
Chap 5.2.1.6	Common information sets - Maintenance planning information
Chap 5.3.1.3	Common requirements - Illustrated parts data
Chap 8.2	SNS, information codes and learn codes - Maintained SNS
Chap 8.2.1	Maintained SNS - Generic
Chap 8.2.2	Maintained SNS - Support and training equipment

Chap No./Document No.	Title
Chap 8.2.3	Maintained SNS - Ordnance
Chap 8.2.4	Maintained SNS - General communications
Chap 8.2.5	Maintained SNS - Air vehicle, engines and equipment
Chap 8.2.6	Maintained SNS - Tactical missiles
Chap 8.2.7	Maintained SNS - General surface vehicles
Chap 8.2.8	Maintained SNS - General sea vehicles
S2000M	International specification for material management - Integrated data processing

1 General

SNS is applicable in the data module code to the characters identified as follows:

YY - Y - **YY - YY - YY** - YYY - YYYY - Z (17 characters)

thru

YYYYYYYYYYYYYY - YYYY - **YYY - YY - YYYY** - YYYYY - YYYY - Z - YYYL (41 characters)

2 Standard numbering system

2.1 General

The SNS specified for publications and database information consists of three groups of characters. This system is designed to provide standardization in the arrangement or addressing of the Product.

Chap 8.2 contains maintained SNS for air vehicles, land and sea systems. It allocates and provides definitions for the system, subsystem and in some cases for the sub-subsystem.

Users of the specification can allocate a project specific SNS at their own discretion. Each project or organization must define the SNS structure being used in its business rules. The same SNS numbering scheme must apply across the project disciplines.

In some of the information sets given in Chap 5 a specific use of the SNS elements is defined, for example in Chap 5.2.1.6 for maintenance planning and Chap 5.3.1.3 for illustrated parts data.

Business rule decision point BRDP-S1-00336 - Product SNS structure:

– Decide which SNS structure to use for the Product.

2.2 SNS structure

2.2.1 System

The system is identified in the data module code by the highlighted characters:

YY - Y - **YY** - YY - YY - YYY - YYYY - Z (17 characters)

thru

YYYYYYYYYYYYYY - YYYY - **YYY** - YY - YYYY - YYYYY - YYYY - Z - YYYL (41 characters)

The attribute `systemCode` of the element <`dmCode`> is used to store the system. Refer to Chap 3.9.5.1.

The system represents the general systems and the basic structure of the Product and is populated with two or three alphanumeric characters.

The system is identified by two alphanumeric characters. In case a project or an organization requires the indication of the type of SNS used, an additional single alphanumeric character can be placed in front of the SNS as part of the attribute `systemCode`. This character is called the material item category code.

2.2.2 Material item category code

The material item category code is used to indicate different SNS coding structures that are applicable to an individual project at the system, subsystem and sub-subsystem level within the SNS. The material item category code is also used to differentiate between different definitions within the same SNS.

The example below shows where a civil aircraft includes a military aircraft system with the same SNS and the military definition is to be used for System 42. These data modules can then be uniquely identified within the CSDB. This differentiation is established when identifying the data module requirements.

Civil aircraft system: YYYYYYYYYYYYY - YYYY - **J**42 - YY - YY - YYYYY - YYYY - Z

Military aircraft system: YYYYYYYYYYYYY - YYYY - **E**42 - YY - YY - YYYYY - YYYY - Z

The following list gives the allocation of the material item category code.

- "A" - Generic SNS, refer to Chap 8.2.1
- "B" - Support and training equipment SNS, refer to Chap 8.2.2
- "C" - Ordnance SNS, refer to Chap 8.2.3
- "D" - General communications SNS, refer to Chap 8.2.4
- "E" - Air vehicle, engines and equipment SNS, refer to Chap 8.2.5
- "F" - Tactical missiles SNS, refer to Chap 8.2.6
- "G" - General surface vehicles SNS, refer to Chap 8.2.7
- "H" - General sea vehicles SNS, refer to Chap 8.2.8
- "J" - Civil aircraft deviations from E
- "K" thru "S" - Not available for projects
- "T" thru "Y" - Available for projects.
- "Z" is used for non-chapterized illustrated parts data modules, refer to Fig 2
- "0" thru "9" - Available for projects

Refer to default BREX rule BREX-S1-00145.

Refer to Chap 1.3 for the definitions of "Not available for projects" and "Available for projects".

Business rule decision point BRDP-S1-00337 - Use of the material item category code:

- Decide whether to use the material item category code.

2.2.3 Subsystem/sub-subsystem

Subsystem/sub-subsystem describes the further breakdown of system. The subsystem/sub-subsystem is identified in the data module code by the highlighted characters:

YY - Y - YY - **YY** - YY - YYY - YYYY - Z (17 characters)

thru

YYYYYYYYYYYYY - YYYY - YYY - **YY** - YYYY - YYYYY - YYYY - Z - YYYL (41 characters)

The subsystem and sub-subsystem of the data module code are stored in the following attributes. Refer to Chap 3.9.5.1.

- subsystem: attribute subSystemCode of the element <dmCode>
- sub-subsystem: attribute subSubSystemCode of the element <dmCode>

Each attribute is populated with a single alphanumeric character.

The specification contains only allocations for the first attribute unless provision has been made in the detailed specification of the information sets. The definitions for sub-subsystems are allocated by the project/manufacturer, depending on the complexity and are to be provided in the project or organization business rules. Refer to Fig 1.

Note

When the sub-subsystem is zero (eg, 26-20-00), the two digits "20" represent the subsystem as a whole.

2.2.4 Unit or assembly

The unit or assembly is identified in the data module code by the highlighted characters:

YY - Y - YY - YY - **YY** - YYY - YYYY - Z (17 characters)

thru

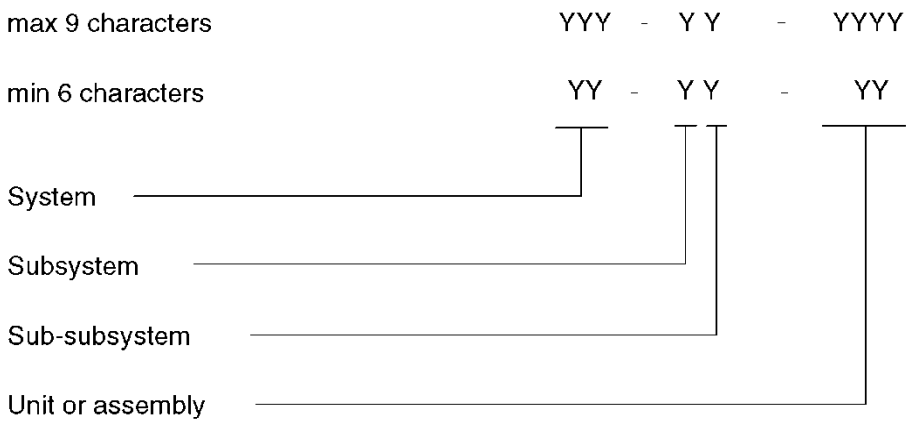
YYYYYYYYYYYYYY - YYYY - YYY - YY - **YYYY** - YYYYY - YYYY - Z - YYYL (41 characters)

The attribute assyCode of the element <dmCode> is used to store the unit or assembly. Refer to Chap 3.9.5.1.

Unit or assembly is populated with two or four alphanumeric characters. The use of four characters provides identification for units in complex systems. An extension to four characters must not be used to give a further hierarchical breakdown. Refer to Fig 1.

Business rule decision point BRDP-S1-00338 - Number of characters in assembly code:

- Decide whether to use two or four characters for unit or assembly.



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Fig 1 SNS structure

2.3 Use of SNS for illustrated parts data modules

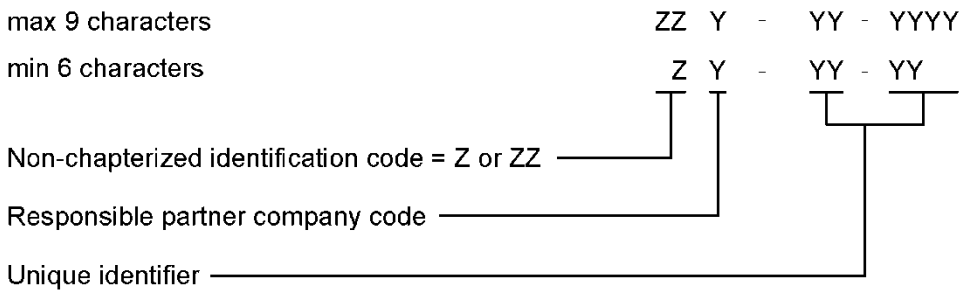
2.3.1 Chapterized illustrated parts data modules

For chapterized illustrated parts data modules the SNS attributes are allocated as described in Para 2.2.

Certain items which are required to be contained in separate figures (eg, raw material, rivets, consumables) should be listed in subsystem/sub-subsystem "01" or "99" for each system.

2.3.2 Non-chapterized illustrated parts data modules, S2000M

For non-chapterized illustrated parts data modules the SNS attributes must be coded with the following specific rules. Refer to Fig 2.



ICN-AE-A-040303-0-C0419-00005-A-04-1

Fig 2 SNS for non-chapterized illustrated parts data modules

Note

For non-chapterized illustrated parts data modules only this structure of the SNS is allowed.

Business rule decision point BRDP-S1-00339 - Responsible partner company codes for non-chapterized illustrated parts data modules:

– Decide which responsible partner company codes to use for non-chapterized illustrated parts data modules.

For S2000M projects, the unique identifier must be the last four digits of the initial provisioning project number. For a six digits unique identifier, the writing rule is "YY-YY00".

2.3.3 Non-chapterized illustrated parts data modules, non-S2000M

For non-chapterized illustrated parts data modules, where S2000M is not used, the SNS attributes must be coded as given in Fig 2 with project defined values and follow the rules for chapterized illustrated parts data modules.

Business rule decision point BRDP-S1-00340 - Responsible partner company codes for non-chapterized, non-S2000M illustrated parts data modules:

– Decide which responsible partner company codes to use for non-chapterized, non-S2000M illustrated parts data modules.

Business rule decision point BRDP-S1-00341 - Unique identifier for non-chapterized, non-S2000M illustrated parts data modules:

– Decide which unique identifiers to use for non-chapterized, non-S2000M illustrated parts data modules.

Chapter 4.3.4

Data module code - Disassembly code

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2 Disassembly code 1

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References

Table 1 References

Chap No./Document No.	Title
Chap 3.8	Information generation - Disassembly principles
Chap 5	Information sets and publications

1 General

The disassembly code is identified in the data module code by the highlighted characters:

YY - Y - YY - YY - YY - **YY**Y - YYYY - Z (17 characters)

thru

YYYYYYYYYYYYYY - YYYY - YYY - YY - YYYY - **YY**YYY - YYYY - Z - YYYL (41 characters)

The attribute `disassyCode` of the element <`dmCode`> is used to identify the breakdown condition of an assembly to which maintenance information applies.

The disassembly code consists of two alphanumeric characters.

2 Disassembly code

The disassembly code identifies the breakdown condition of an assembly to which maintenance information applies. The generic disassembly principles are explained in Chap 3.8.

The characters are typically numeric. However they can be extended when more than 99 identifiers are needed. The extension must commence "A1" to "A9", "B1" to "B9" and so on until "Z9" continuing with "AA" to "AZ", "BA" to "BZ" and so on until "ZZ".

The disassembly code is also used for sequential numbering of data modules when more than one data module is used for the same SNS. Refer to rules given in the subchapters of Chap 5.

Chapter 4.3.5

Data module code - Disassembly code variant

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Table 1 References

Chap No./Document No.	Title
Chap 5.3.1.3	Common requirements - Illustrated parts data
S2000M	International specification for material management - Integrated data processing

1 General

The disassembly code variant is identified in the data module code by the highlighted characters:

YY - Y - YY - YY - YY - YY**Y** - YYYY - Z (17 characters)

thru

YYYYYYYYYYYYYY - YYYY - YYY - YY - YYYY - YY**YYY** - YYYY - Z - YYYL (41 characters)

The attribute `disassyCodeVariant` of the element <`dmCode`> designates alternative items of equipment or components differing slightly in design.

The disassembly code variant is populated with one, two or three alphanumeric characters.

2 Disassembly code variant

The disassembly code variant designates alternative items of equipment or components differing slightly in design, but not enough to warrant a change of the system difference code. The characters are typically alpha characters.

The variable length of the disassembly code variant allows the use of the "Alternate Logistic Control number (ALC)" or the "Alternate Indentured Product Code (AIPC)" from LSA records. Whenever possible, the disassembly code variant starts with an alphabetic character. The decision on how to use the disassembly code variant in this way is a project or organization decision and has to be documented in the project or organization business rules.

Business rule decision point BRDP-S1-00342 - Use of the disassembly code variant:

– Decide whether to use one, two or three characters for the disassembly code variant and how to populate.

The disassembly code variant is also used for figure number variants when IPD data modules are generated from an S2000M provisioning database. Refer to Chap 5.3.1.3.

Chapter 4.3.6

Data module code - Information code

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1 References....1

References

Table 1 References

Chap No./Document No.	Title
Chap 3.9.5.1	Data modules - Identification and status section
Chap 8.4	SNS information and learn codes - Information codes

1 General

The information code is identified in the data module code by the highlighted characters:

YY - Y - YY - YY - YY - YYY - **YYY**Y - Z (17 characters)

thru

YYYYYYYYYYYYYY - YYYY - YYY - YY - YYYY - YYYYY - **YYY**Y - Z - YYYL (41 characters)

The attribute `infoCode` of the element <`dmCode`> is used to store the information code. Refer to Chap 3.9.5.1.

The information code is populated with three alphanumeric characters.

2 Information code

The information code identifies the type of information within a data module. The information codes and rules for the allocation of alphanumeric characters in the information codes are also given in Chap 8.4.

Chapter 4.3.7

Data module code - Information code variant

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2 Information code variant....1

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Table 1 References

Chap No./Document No.	Title
Chap 3.9.5.1	Data modules - Identification and status section

1 General

The information code variant is identified in the data module code by the highlighted character:

YY - Y - YY - YY - YY - YYY - YYY**Y** - Z (17 characters)

thru

YYYYYYYYYYYYYY - YYYY - YYY - YY - YYYY - YYYYY - YYY**Y** - Z - YYYL (41 characters)

The attribute `infoCodeVariant` of the element <`dmCode`> is used to store the information code variant. Refer to Chap 3.9.5.1.

The information code variant is populated with one alphanumeric character.

2 Information code variant

The information code variant identifies any variation in the activity defined by the information code. The characters are typically alpha characters.

The default information code variant is always coded "A". Successive variants are coded "B" thru "Z" followed by the numeric values "0" thru "9" if necessary.

Chapter 4.3.8

Data module code - Item location code

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Chap No./Document No.	Title
Chap 3.9.5.1	Data modules - Identification and status section
Chap 4.3.9	Data module code - Learn code
Chap 4.3.10	Data module code - Learn event code
Chap 5.2.1.19	Common information sets - Training

1 General

The item location code is identified in the data module code by the highlighted characters:

YY - Y - YY - YY - YY - YYY - YYYY - **Z** (17 characters)

thru

YYYYYYYYYYYYY - YYYY - YYY - YY - YYYY - YYYYY - YYYY - **Z** - YYYL (41 characters)

The attribute `itemLocationCode` of the element <`dmCode`> is used to store the item location code. Refer to Chap 3.9.5.1.

The item location code is populated with one alpha character.

2 Item location code

The item location code identifies the situation to which the information is applicable, for example where the maintenance task will be carried out in terms of a Product.

The attribute can have one of the following values:

- "A" - information related to items installed on the Product
- "B" - information related to items installed on a major assembly removed from the Product
- "C" - information related to items on the bench. In this context, it does not matter, for example, whether an item has been removed from the Product.
- "D" - information related to all three locations A, B, and C. No other combinations are allowed.
- "T" - information related to training data module, refer to Para 2.1

Refer to default BREX rule BREX-S1-00138.

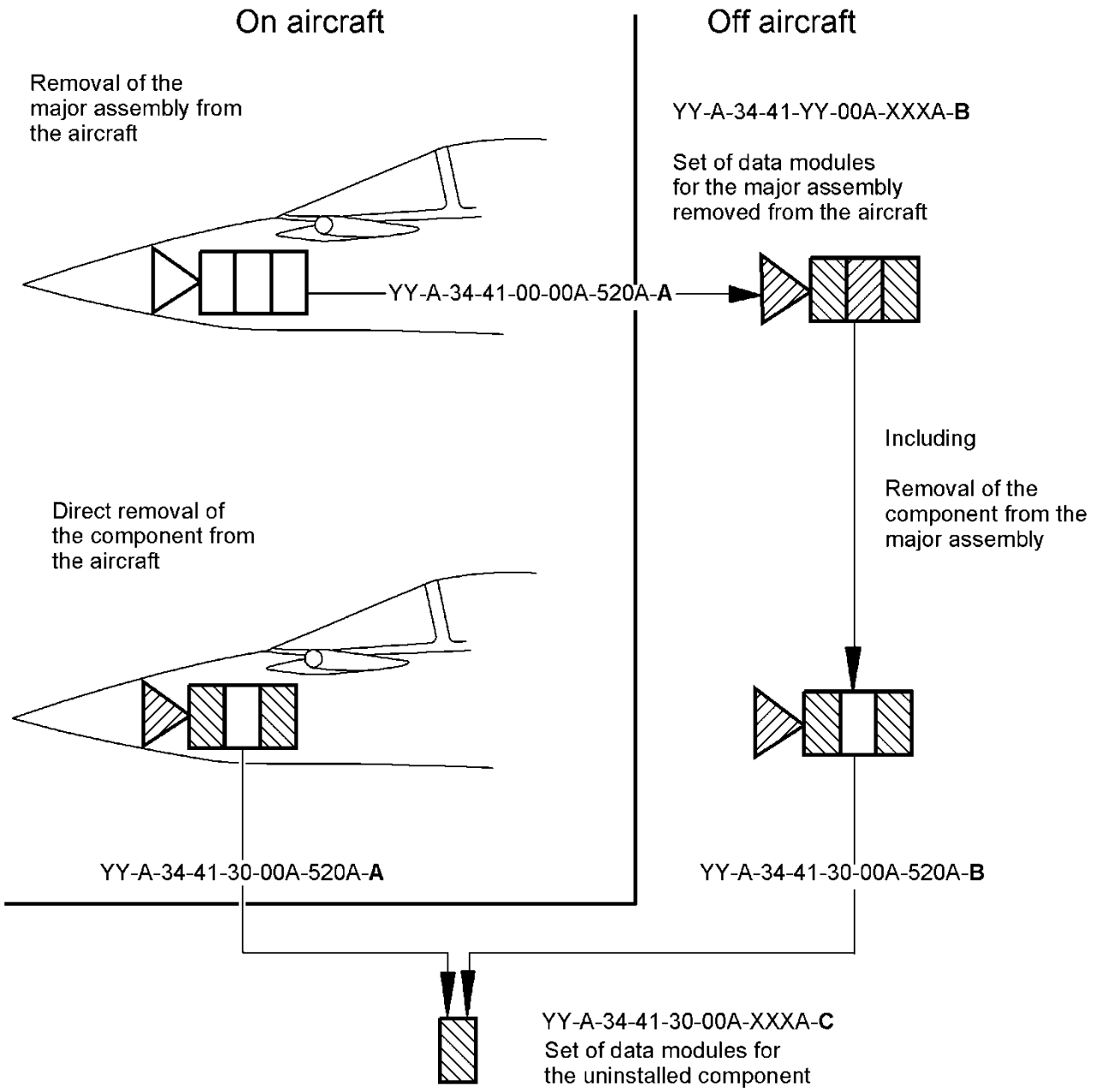
This specification uses "Z" in the information sets and publication chapters to indicate that one of the values "A", "B", "C", "D" or "T" must be used.

2.1 Training information

The item location code for a training data module depends on the use of learn code and learn event code. Refer to Chap 4.3.9 and Chap 4.3.10.

- Training data modules that do not use learn code and learn event code must use item location code value "T".
- Training data modules that use learn code and learn event code can have one of the item location code values "A", "B", "C", "D" or "T". Refer to Chap 5.2.1.19.

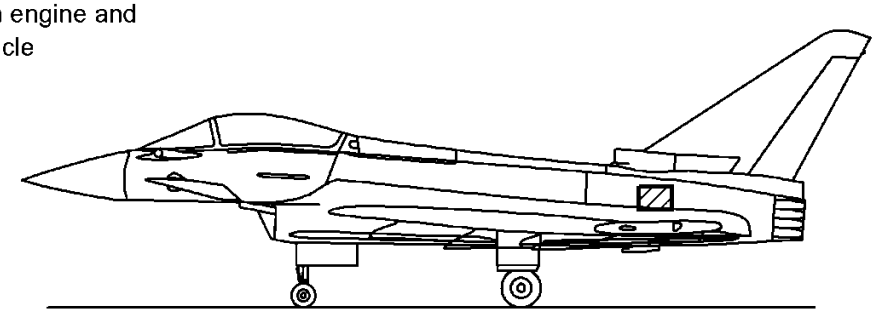
3 Examples



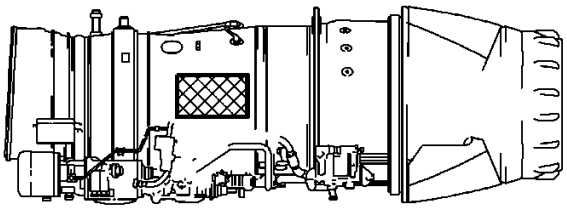
ICN-AE-A-040308-0-C0419-00006-A-02-1

Fig 1 Item location codes - Example 1

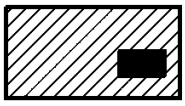
1 YY-A-7X-YY-YY-**00A**-XXXA-**A**
Set of data modules,
Component on engine and
engine on vehicle



2 YY-A-7X-YY-YY-**00A**-XXXA-**B**
Set of data modules,
Component on engine



3 YY-A-7X-YY-YY-**00A**-XXXA-**C**
Set of data modules,
Component removed whole



4 YY-A-7X-YY-YY-**01A**-XXXA-**C**
Set of data modules,
first assembly requiring maintenance actions



ICN-AE-A-040308-0-C0419-00007-A-02-1

Fig 2 Item location codes - Example 2

Chapter 4.3.9

Data module code - Learn code

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 4.3.10	Data module code - Learn event code
Chap 8.5.1	Learn codes - Human performance technology codes
Chap 8.5.2	Learn codes - Training codes

1 General

The learn code is an optional code that is applied to human performance technology and training data modules for projects that wish to use the functionality brought about by the learn code. The code describes the type of human performance technology or training information that is in the content of the data module. Each learn code represents a category of human performance technology or training information. When used, the learn code must be used with a learn event code. Refer to Chap 4.3.10.

There are two types of learn codes:

- human performance technology
- training

The learn code is identified in the data module code by the highlighted characters:

YY - Y - YY - YY - YY - YYY - YYYY - Z -**YYYL** (21 characters)

thru

YYYYYYYYYYYYYY - YYYY - YYY - YY - YYYY - YYYYY - YYYY - Z - **YYYL** (41 characters)

Where:

- **YYY** is the learn code (HYY or TYY). Refer to Para 2.
- **L** is the learn event code (A, B, C, D, or E). Refer to Chap 4.3.10.

The attribute `learnCode` of the element <`dmCode`> is used to store the learn code. Refer to Chap 3.9.5.1.

The learn code is populated with three alphanumeric characters.

2 Learn code

The first character of the learn code must be set to either "H" for human performance technology codes or "T" for training codes. Refer to the default BREX rule BREX-S1-000139.

2.1 Human performance technology

For human performance technology data modules, the last two characters define the specific learn code for the human performance technology information contained in the data module. Refer to Chap 8.5.1 and the default BREX rule BREX-S1-000139.

Example data module code for a human performance technology learning data module:

- S1000DBIKE-A-00-00-00-00A-234A-A-H18A

2.2 Training content

For training data modules, the last two characters define the specific learn code for the training information contained in the data module. Refer to Chap 8.5.2 and the default BREX rule BREX-S1-000139.

Example data module code for a training learning data module:

- S1000DBIKE-A-10-10-00-00A-520A-A-T25A

Chapter 4.3.10

Data module code - Learn event code

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Chap No./Document No.	Title
Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2.13	Content section - Learning data module
Chap 4.3.9	Data module code - Learn code

1 General

The learn event code is an optional code that is applied only to human performance technology or training data modules for projects that wish to use the functionality brought about by the learn event code. Whenever a learn code is used, the learn event code must be used. Refer to Chap 4.3.9 and default BREX rule BREX-S1-00140.

There are five branches in the learn Schema associated with the learn event code. Refer to Chap 3.9.5.2.13.

The learn schema supports five types of learning information identified below. Each type is supported by a unique branch in the learning data module schema. Only one branch can be used per learn learning data module instance.

- Learning plan
- Learning overview
- Learning content
- Learning summary
- Learning assessment

The learn event code is identified in the data module code by the highlighted character:

YY - Y - YY - YY - YY - YYY - YYYY - Z - YYY**L** (21 characters)

thru

YYYYYYYYYYYYY - YYYY - YYY - YY - YYYY - YYYYY - YYYY - Z - YYY**L** (41 characters)

The attribute learnEventCode of the element <dmCode> is used to store the learn event code. Refer to Chap 3.9.5.1.

The learn event code is populated with one alpha character.

2 Learn event code

The learn event code identifies which branch of the learn Schema is being used.

The attribute learnEventCode can have one of the following values:

- "A" - Learning plan
- "B" - Product overview
- "C" - Learning content
- "D" - Learning summary
- "E" - Learning assessment

Refer to the default BREX rule BREX-S1-000141.

This specification uses "**L**" in the information sets and publication chapters to indicate that one of the values "A", "B", "C", "D" or "E" must be used.

Chapter 4.3.11

Data module code - Summary

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3 Data module code - Example for training data module 6

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Table 1 References

Chap No./Document No.	Title
None	

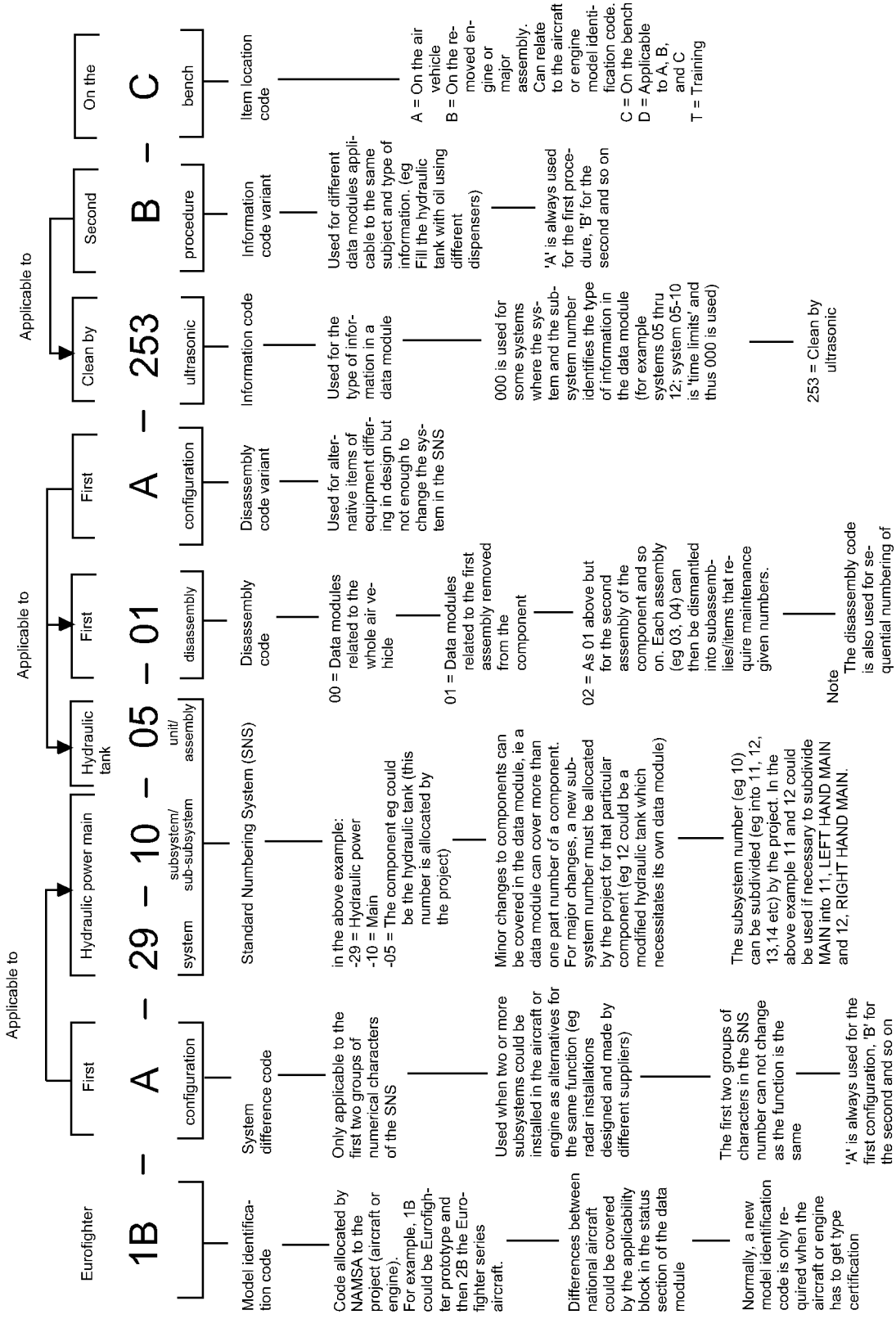
1 General

This chapter gives a summary of the data module coding in form of examples.

2 Examples

2.1 Data module code example for air vehicles

Fig 1 presents as an example a 17 characters data module code for an air vehicle and it contains detailed information about the relationship between the data module code elements. These relationships are generic and do not depend on the SNS used.



ICN-AE-A-040309-0-C0419-00012-A-006-01

Fig 1 Data module code - Example for air vehicles

2.2 Data module code example for sea vehicles

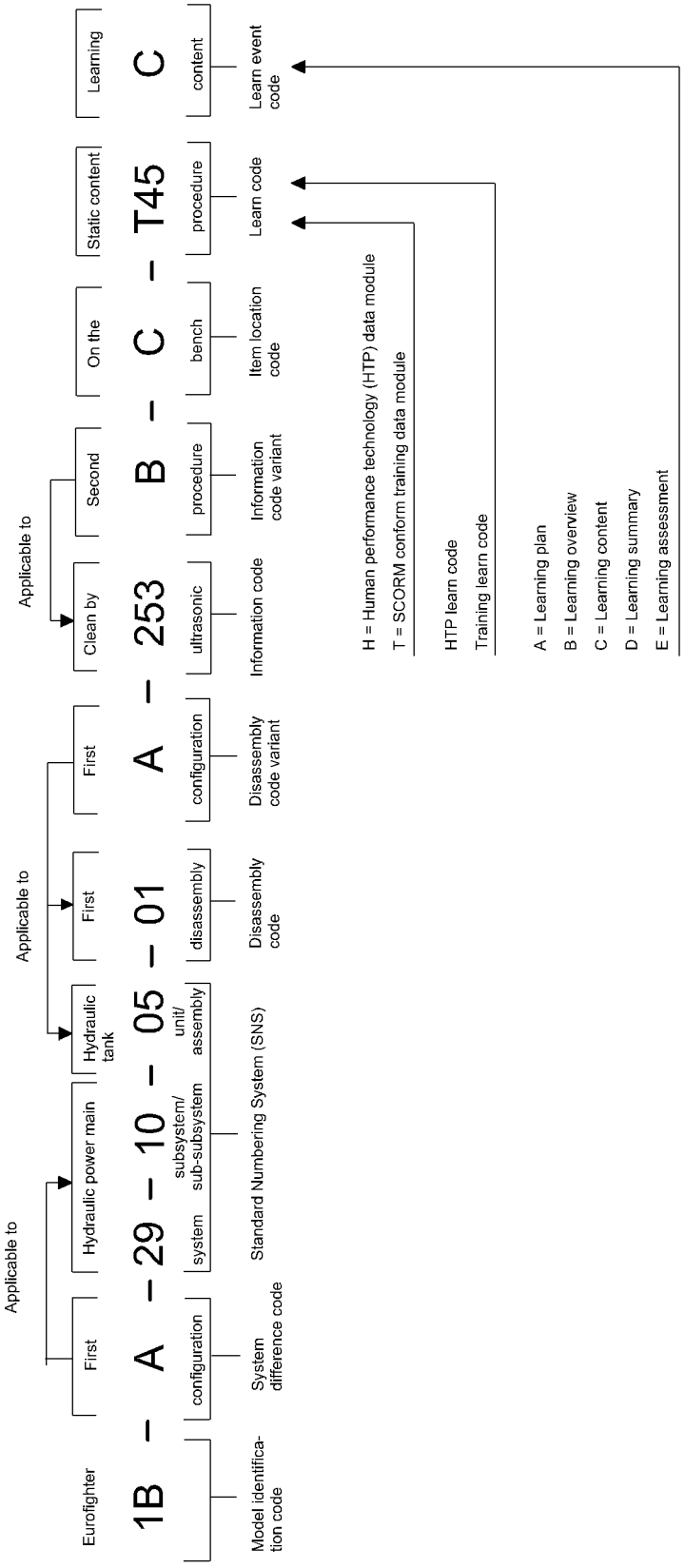
Fig 2 presents as an example a 37 characters data module code for a sea vehicle and shows the use of a maximum length version of the data module code without learn type information.

ICN-D1253-S1000D0001-002-01

Fig 2 Data module code - Example for sea vehicles

2.3 Data module code example for training and human performance technology data module

Fig 3 presents as an example a 21 characters data module code for an air vehicle and shows the use of the learn type information.



ICN-1654N-S1000D0001-002-01

Fig 3 Data module code - Example for training data module

Chapter 4.4

Information management - Information control number

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Chap No./Document No.	Title
Chap 1.3	How to use the specification
Chap 3.9.6.1	Attributes - Project configurable values
Chap 4.3.1	Data module code - Model identification code
Chap 4.3.2	Data module code - System difference code

Chap No./Document No.	Title
Chap 4.3.3	Data module code - Standard numbering system

1 General

Each illustration sheet, multimedia object or other data attached to a data module must be identified by an ICN assigned by the originator. This chapter specifies the coding required for the control number. In a CSDB, the ICN is the unique identifier of an illustration sheet, multimedia object, or attached data, and is used to establish the relationship to one or more data modules. The ICN is independent of the file format.

2 Information control numbering methods

The unique ICN can be based on:

– a company/organization code - CAGE code

or on:

– a project code - model identification code

Business rule decision point BRDP-S1-00344 - Use of CAGE code and/or model identification code based ICN:

– Decide which method to be used for the ICN.

The security classification, the last part of the ICN, is not part of the unique identifier

The ICN addresses an illustration sheet, multimedia object, or other attached data including its update status independent of the status of a data module. The ICN is contained in the following markup elements:

```
<graphic infoEntityIdent="ICN-...">
```

```
<symbol infoEntityIdent="ICN-...">
```

```
<multimediaObject infoEntityIdent="ICN-...">
```

For human-readability and due to the variable length of the subfields, the ICN must be written with hyphens [-] and with the term "ICN" exactly as shown in Fig 1 and Fig 2. An exception is the content of element <entityControlNumber> within data dispatch notes, where the prefix "ICN-", is not included.

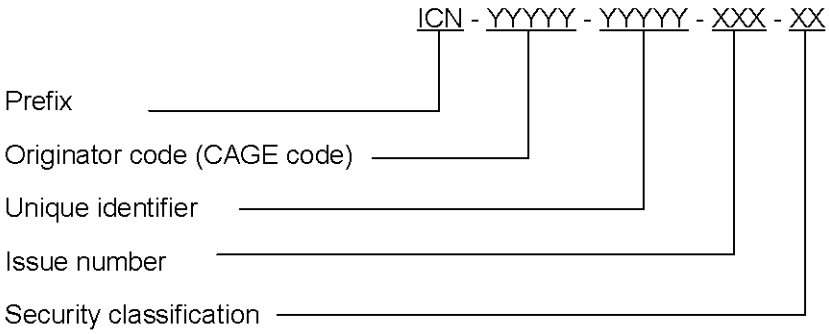
The allocation of an ICN with a certain model identification code, system difference code, SNS and responsible partner company does not imply that the addressed illustrations, symbols, multimedia objects, or other data must be re-identified when usable in several data modules. This allows the reuse of data without recoding.

Refer to Chap 1.3 for the permissible characters.

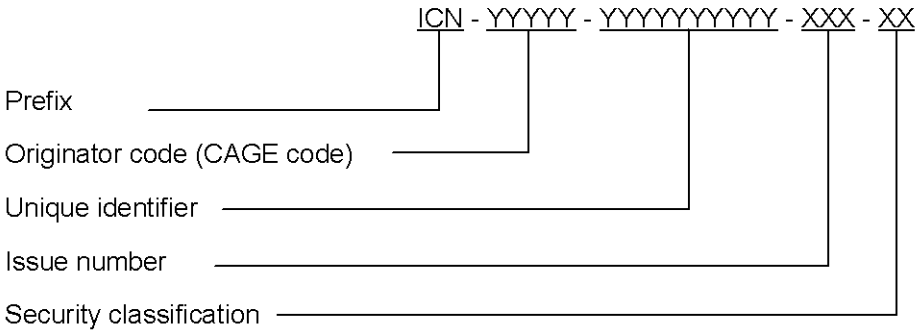
2.1 ICN - CAGE code based

The CAGE code based ICN comprises five parts, including the prefix "ICN-", and is built as follows. Refer to Fig 1.

ICN – min 5 character unique identifier:



ICN – max 10 character unique identifier:



ICN-S3627-S1000D0493-001-01

Fig 1 ICN - CAGE code based

2.1.1 Originator code

The originator code contains the originator of an illustration, multimedia object or other data. It consists of five alphanumeric characters. The code is the originator's CAGE code.

2.1.2 Unique identifier

The unique identifier consists of minimum five and maximum 10 alphanumeric characters. The identifier must be unique for each originator code.

2.1.3 Issue number

The issue number is a three digit numerical value with leading zeros. It starts from 001 for each basic illustration, multimedia object or other data or variant thereof, and must be incremented each time the illustration, multimedia object or other data is updated.

2.1.4 Security classification

The security classification of the illustration or the multimedia object is identified by a two digit number. The illustration, multimedia object or other data has its individual security classification independent of where it is used and must use the security classification values as the project.

If an illustration, multimedia object or other data is reclassified, it must be given a new issue number.

2.2 ICN - Model identification code based

The model identification code based ICN comprises 10 parts, including the prefix "ICN-", and is built as follows. Refer to Fig 2.

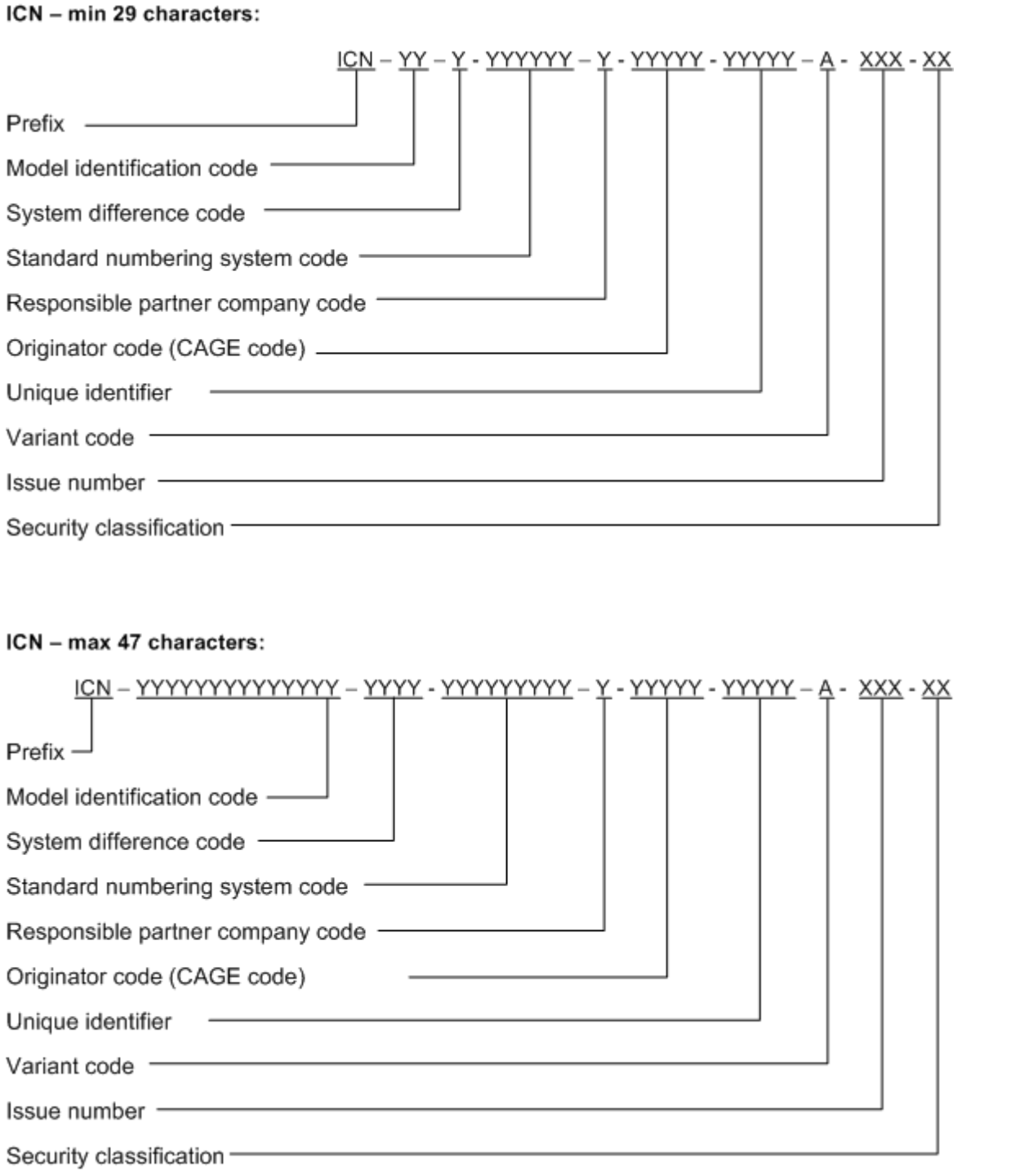


Fig 2 ICN - Model identification code based

2.2.1 Model identification code

The code is identical in construction to the model identification code used for data module code. Refer to Chap 4.3.1.

2.2.2 System difference code

The code is identical in construction to the system difference code used for data module code. Refer to Chap 4.3.2.

2.2.3 SNS code

The code is identical in construction to the SNS code used for data module code. Refer to Chap 4.3.3.

2.2.4 Responsible partner company code

The responsible partner company is the company or organization responsible for the illustration, multimedia object or other data independent of its use in data modules. The responsible partner company code must be defined by the project or organization.

Business rule decision point BRDP-S1-00348 - Allocation of responsible partner company codes for model identification code based ICN:

– Decide which values on responsible partner company codes to be used.

2.2.5 Originator code

Refer to Para 2.1.1.

2.2.6 Unique identifier

The unique identifier consists of five alphanumeric characters. For each model identification code, the identifier must be unique for each originating company.

2.2.7 Variant code

The variant code is a single alphabetic character, which identifies the variants of a basic illustration, multimedia object or other data. The variant code "A" identifies a basic illustration, multimedia object or other data and "B" identifies the first variant. A variant is a supplemented, scaled, cropped, rotated, mirrored and/or annotated basic illustration, multimedia object or other data.

2.2.8 Issue number

Refer to Para 2.1.3.

Note

Illustrations, multimedia objects or other data using a two digit issue number in the ICN based on an S1000D Issue before 4.0 can still be used.

2.2.9 Security classification

Refer to Para 2.1.4.

Note

Illustrations, multimedia objects or other data using a one digit security classification number in the ICN based on an S1000D Issue before 4.0 can still be used. The value "1" is then equivalent to security classification "01", "2" to "02", etc, as given in Chap 3.9.6.1.

3 Examples

3.1 CAGE code based ICN

ICN - minimum 18 characters (excluding hyphens):

– ICN-U8025-12345-001-01

ICN - maximum 23 characters (excluding hyphens):

– ICN-S3627-S1000D0494-001-01

3.2 Model identification code based ICN

ICN - minimum 29 characters (excluding hyphens):

– ICN-AE-A-004004-G-S3627-00355-A-002-01

ICN - maximum 47 characters (excluding hyphens):

– ICN-S1000DLIGHTING-ABCD-D00000000-0-U8025-54321-A-001-01

Chapter 4.5

Information management - Data management lists

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Chap No./Document No.	Title
Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 4.3.1	Data module code - Model identification code
Chap 4.4	Information management - Information control number
Chap 4.6.1	Comment - Identification and status section
Chap 7.5.2	Information interchange - Interchange Schemas
Chap 7.7.4	Guidance and examples - XLink
S2000M	International specification for material management - Integrated data processing

1 General

For the planning, management and control of the content of the CSDB for individual projects the use of the following data management lists are recommended:

- Data Management Requirement List (DMRL), refer to Para 2
- CSDB Status List (CSL), refer to Para 3

Both are implemented in one and the same Schema. For information about markup requirements, refer to Chap 7.5.2 and Para 4.

2 Data management requirement list

2.1 Definition

A Data Management Requirement List (DMRL) is used to identify the required data modules and, by project decision, publication modules for a project. The data management requirement list supports planning, reporting, production and configuration control, especially in a work share environment. A data management requirement list can be generated in parts (eg, by partner companies for later merging) or in a complete form.

The DMRL is normally created at the start of a project and is constantly updated during the life of the project. It contains all the data modules and publication modules that are expected to be created, and hence at a given time, it will contain data modules and publication modules that exist and do not yet exist in the CSDB. This is where it differs from the CSDB status list.

Business rule decision point BRDP-S1-00350 - Use of data management requirement list:

- Decide whether to use the data management requirement list for specification and exchange of CSDB planning information.

Under normal circumstances, a DMRL must not contain illustrations or multimedia objects. The exceptions are IPD illustrations for a project where the IPD data modules are created by one partner using the illustrations generated by the other partners (for example, where the IP data itself is transferred between the partners by non-S1000D mechanisms as in S2000M).

Note

A DMRL must not contain comments or other data management lists. Refer to default BREX rule BREX-S1-00001.

Business rule decision point BRDP-S1-00351 - Object types to be listed in the data management requirement list:

– Decide whether to list publication modules and/or IPD illustrations in the data management requirement list.

The DMRL must contain the titles and details of the responsible partner company for each of the data modules and publication modules. If required, the security classification of the entries can also be recorded. Refer to default BREX rule BREX-S1-00002.

As the DMRL does not contain the issue information of its contained objects, it does not change as data modules or publication modules are created or up-issued, unless there is a change to the titles or other details, or the requirement for new data modules is realized. Refer to default BREX rule BREX-S1-00003.

Note

In certain circumstances, the entries in a DMRL can contain issue information - for example when a data module issue applies to a certain customer and previous issues did not.

Special consideration must be given to deleted data modules and publication modules as their issues are increased and normally will be removed from the DMRL later.

2.2 Merging management requirement lists

In a multi-partner project, each partner is responsible for the maintenance of their portion of the complete DMRL (for data modules and publication modules that cover the items that are their responsibility). These DMRL are called "partial".

There must be only one entry for each CSDB object in the DMRL, and care must be taken when considering applicability effects - such as a new issue of a data module having a new applicability value.

In such a multi-partner project, one partner is normally responsible for merging the partial DMRLs into a complete DMRL for the entire project (this DMRL has the attribute `dmlType` set to "C"), and this involves processing the DMRL portions and comparing the entries in each. Typical problems that occur and have to be resolved are:

– sometimes different partners "claim" the same data module (or publication module) as the same DMC appears in different partial DMRL
– entries for the data modules / publication modules that are different to the exchanged versions of the data modules / publication modules
– missing entries for data modules / publication modules that have already been exchanged and are not deleted status

These issues have to be resolved before the complete DMRL can be created and published.

3 CSDB status list

3.1 Definition

The purpose of a CSDB Status List (CSL) is to exchange information about the status of the CSDB. For example, in a multi-partner project, the CSL is used to check that the CSDB objects (data modules, illustrations, etc) that have been sent by one partner have been successfully loaded by another, or the data received by a customer is what has been sent by the project.

At all times, the CSDB at the originating company is the definitive source of data for which that company has responsibility. To ensure that all CSDB in a multi-partner project are built up

without divergence, it is recommended that each enterprise/company will produce and exchange a periodic reference listing of all CSDB objects that it has issued for interchange.

Business rule decision point BRDP-S1-00352 - Use of CSDB status list:

– Decide whether to use the CSDB status list for exchange of CSDB status information.

Business rule decision point BRDP-S1-00353 - Objects types to be tracked by the CSDB status list:

– Decide what CSDB objects types must be tracked in the CSDB status list, and at a minimum these must be data modules, illustrations/multimedia objects and publication modules.

The CSL must contain the issue numbers of the CSDB objects it contains. Refer to default BREX rule BREX-S1-00004.

3.2 Processing a CSDB status list

The CSL can be checked by a program (which can be a part of the CSDB management system) that reads the received CSL and compares content against the CSDB. The program can produce an error report that lists any discrepancies, for example:

– a CSDB object loaded in the CSDB is not listed in the CSL
– an object listed in the CSL is not loaded into the CSDB
– the details of a CSDB object listed in the CSL are different from those loaded in the CSDB

In what follows, the term receiver CSDB indicates the CSDB of the partner/customer who has received the CSL and is performing the CSL check, and the term sender CSDB is the creator of the CSL that is being checked by the receiver.

3.2.1 Discrepancy reporting

3.2.1.1 A CSDB object loaded in the CSDB is not listed in the CSL

This means that a CSDB object that has been loaded into the receiver CSDB is not recorded in the sender's CSL. This indicates that the receiver has either:

– loaded a CSDB object from another partner that has not also been loaded by the sender of the CSL

or

– the receiver has created a CSDB object and sent it, but it has not been loaded by the sender

Note

In some CSDB implementations, where one partner acts as the holder of the master CSDB, there will be CSDB objects that are not the sender of the CSL responsibility to load to the master CSDB, and in this model of operation, this will not be an error.

3.2.1.2 An object listed in the CSL is not loaded into the CSDB

This means that a CSDB object that has been loaded into the sender's CSDB (and recorded in the CSL) is not loaded into the receiver's CSDB. This indicates that the receiver has either not received the data module or has failed to load it.

3.2.1.3 The details of a CSDB object listed in the CSL are different from those loaded in the CSDB

This means that the metadata that is in the CSDB for the CSDB object are different to the details for the same CSDB object in the CSL. This normally indicates a potential discrepancy between the data loaded in both the sender and receiver CSDB. For data modules, the differences could be in data module title, the security classification, and the responsible partner company and the issue date.

3.2.2 Dealing with data module issue numbers in the CSL

Unlike a DMRL, a CSL must always include the CSDB object's issue number (and if applicable to the CSDB object, the "inwork" number).

Business rule decision point BRDP-S1-00354 - CSDB object issues to be included in the CSDB status list:

- Decide whether to include only the latest issues of CSDB objects or all issues in the CSDB status list.

3.2.3 Selection of data modules for inclusion in the CSL

The CSDB objects that must be listed in the CSL from a sender to a receiver depend on the CSDB interchange process and requirements as well as the relationship between the sender and receiver. Several models can apply, such as:

- All partners and their customers have identical CSDB
- The sender CSDB contains a subset of the receiver CSDB

3.2.3.1 All partners and their customers have identical CSDB

In this model, each of the partners and customers:

- must have the same issued data loaded
- must have the same data in the CSDB
- the CSL created by the sender will include all CSDB objects (that are of the types that is agreed to be included in the CSL) created by all partners and suppliers that have been either created by the sender or received by the sender from other partners or suppliers. In this case the CSDB objects listed in the CSL must match the CSDB objects listed in the CSDB.

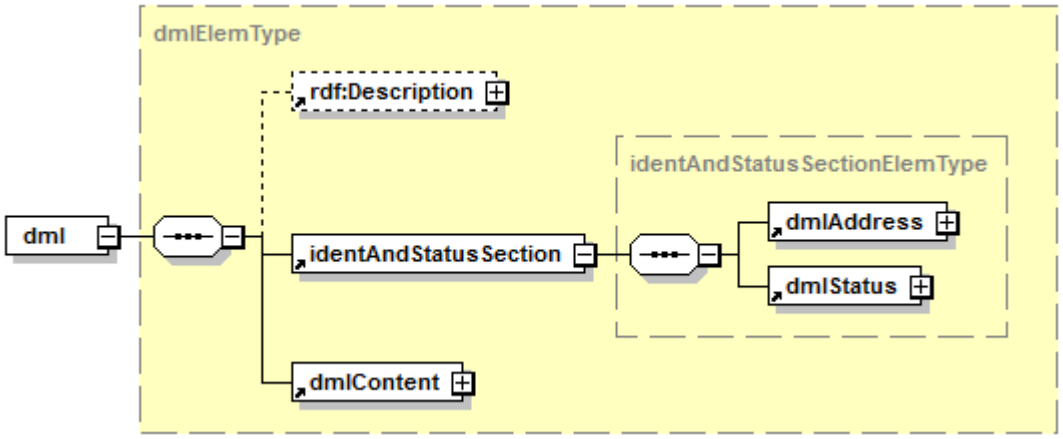
3.2.3.2 The sender CSDB contains a subset of the receiver CSDB

Examples of this type of model are when the sender is a supplier to the receiver, and the receiver is holding the master CSDB on behalf of other partners. In this model, the CSDB objects (that are of the type that are agreed to be in the CSL) from the sender, and held in the receiver CSDB, will be a subset of the CSDB objects held in the receiver's CSDB. The CSL processing will only check the CSDB objects that the sender is responsible for, and that the sender does not have any CSDB objects that they are not responsible for (exceptions to this rule are shared CSDB objects - for example warning logos).

4 Data management lists - markup requirements

The data management list (DML) consists of two main sections:

- The identification and status section, using the element <identAndStatusSection>. Refer to Para 4.1.
- The main body of the data management list, using the element <dmlContent>. Refer to Para 4.2.



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Fig 1 DML structure

4.1 Identification and status section

Description: The element <identAndStatusSection> contains the identification and status information of the data management list, refer to Fig 1.

Attributes:

– None

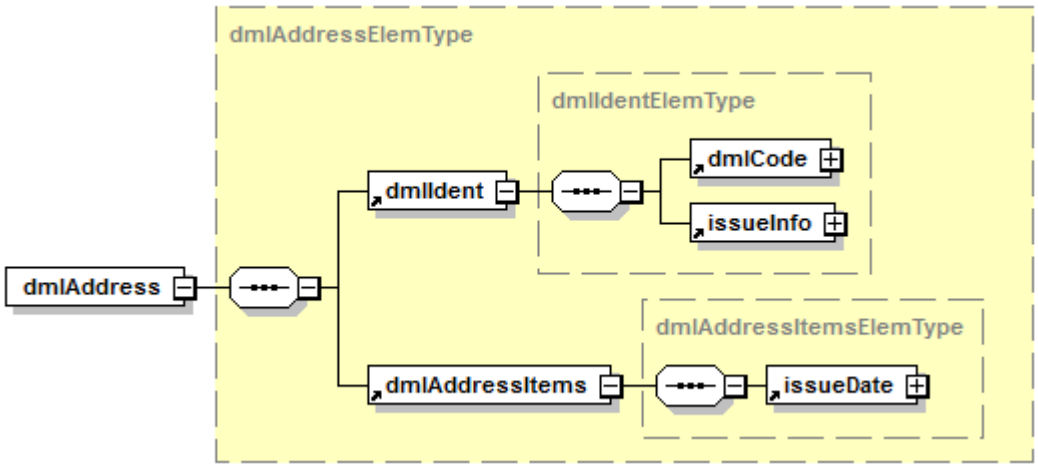
Child elements:

– <dmlAddress>. Refer to Para 4.1.1.
– <dmlStatus>. Refer to Para 4.1.2.

4.1.1 Data management list address

Description: The element <dmlAddress> consists of two blocks of information items used to uniquely address the data management list object.

Markup element: <dmlAddress>



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Fig 2 Element <dmlAddress>

Attributes:

– None

Child elements:

– <dmlIdent>, which uses the element <dmlCode> (refer to Para 4.1.1.1) and <issueInfo> (refer to Para 4.1.1.1.6) to establish the unique identity of a data management list object
– <dmlAddressItems>, which uses the element <issueDate> (refer to Para 4.1.1.2) to support identification of a data management list object

4.1.1.1 Data management list code

Description: The element <dmlCode> contains the data management list code. Together with the issue information, it gives an identification that is unique within the S1000D domain.

The data management list code is comprised of up to 29 alphanumeric characters and is built up as shown in Table 2. The minimum length is 17 characters.

Data management lists must be coded:

YY - YYYYY - A - XXXX - NNNNN (17 characters)

thru

YYYYYYYYYYYYYY - YYYYY - A - XXXX - NNNNN (29 characters)

Table 2 Data management list code

Breakdown	Rule
Model identification code	2 thru 14 uppercase alphanumeric characters
Originator	5 uppercase alphanumeric characters
Type of the data management list	1 alpha character ("P", "C" or "S")
Issue year	4 numeric characters
Sequential number per year	5 numeric characters

Markup element: <dmlCode>

Attributes:

– modelIdentCode (M). Refer to Table 2 and Para 4.1.1.1.1.
– senderIdent (M). Refer to Table 2 and Para 4.1.1.1.2.
– dmlType (M). Refer to Table 2 and Para 4.1.1.1.3.
– yearOfDataIssue (M). Refer to Table 2 and Para 4.1.1.1.4.
– seqNumber (M). Refer to Table 2 and Para 4.1.1.1.5.

Child elements:

– None

Markup example:

The following example shows the 21st CSDB status list sent by the organization with CAGE code K0378 in the year 2010 for the project that has model identification code E2.

```
<dmlCode modelIdentCode="E2" senderIdent="K0378" dmlType="s"
yearOfDataIssue="2010" seqNumber="00021"/>
```

4.1.1.1.1 Model identification code

Description: The model identification code is given in the data management list code by the highlighted characters as follows:

YY - YYYYY - A - XXXX - NNNNN (17 characters)

thru

YYYYYYYYYYYYY - YYYYY - A - XXXX - NNNNN (29 characters)

The model identification code is contained in the attribute `modelIdentCode`. Refer to Chap 4.3.1.

4.1.1.1.2 Originator

Description: The CAGE code of the originator (sender) is given in the data management list code by the highlighted characters as follows:

YY - **YYYYY** - A - XXXX - NNNNN (17 characters)

thru

YYYYYYYYYYYYY - **YYYYY** - A - XXXX - NNNNN (29 characters)

The CAGE code of the originator (sender) is contained in the attribute `senderIdent`.

Note

The CAGE code used in this attribute must be a registered CAGE code.

4.1.1.1.3 Data management list type

Description: The data management list type is given in the data management list code by the highlighted character as follows:

YY - YYYYY - **A** - XXXX - NNNNN (17 characters)

thru

YYYYYYYYYYYYY - YYYYY - **A** - XXXX - NNNNN (29 characters)

The following types are used:

- "P" - a partial data management requirement list, value "p'
- "C" - a complete data management requirement list, value "c"
- "S" - a CSDB status list, value "s"

The data management list type is contained in the attribute `dmlType`.

4.1.1.1.4 Issue year

Description: The issue year of the data management list is given in the data management list code by the highlighted characters as follows:

YY - YYYYY - A - **XXXX** - NNNNN (17 characters)

thru

YYYYYYYYYYYYY - YYYYY - A - **XXXX** - NNNNN (29 characters)

The issue year of the data management list is contained in the attribute `yearOfDataIssue`.

4.1.1.1.5 *Sequential number per year*
Description: The sequential number per year is given in the data management list code by the highlighted characters as follows:

YY - YYYYY - A - XXXX - **NNNNN**

thru

YYYYYYYYYYYYYY - YYYYY - A - XXXX - **NNNNN**

The sequential number of the data management list per year is contained in the attribute `seqNumber`.

The sequential number per year starts from `00001`.

4.1.1.1.6 *Issue information*
Description: The element <`issueInfo`> contains the issue information.

Markup element: <`issueInfo`>

Attributes:

- `issueNumber` (M), the issue number of the data management list. Every issue of a data management list receives a consecutive number. The initial issue is numbered 001. Refer to Para 5 and default BREX rule BREX-S1-00005.
- `inWork` (M), the inwork number. Refer to Para 5.

Child elements:

- None

4.1.1.2 Issue date
Description: The element <`issueDate`> contains the issue date of the data management list in the format: YYYY-MM-DD.

Markup element: <`issueDate`>

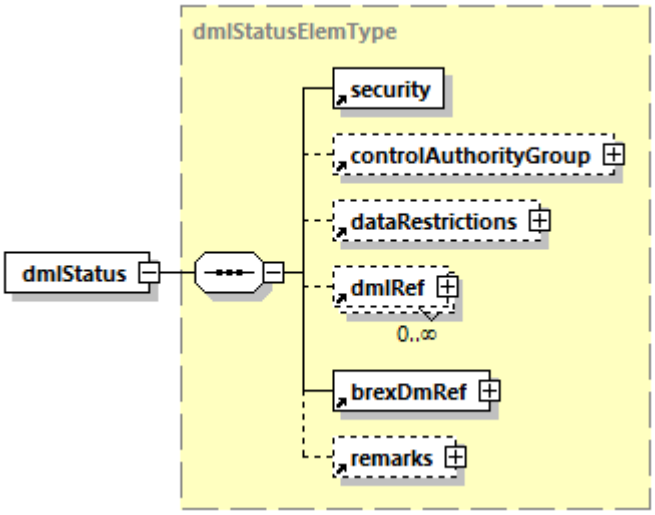
The issue date is the input date of the data management list (the date it was released to CSDB), the cut-off date for the information, the planning date or some other more appropriate date, as decided by the project or the organization. Refer to Chap 3.9.5.1.

Business rule decision point BRDP-S1-00355 - Data management requirement list issue date:

- Decide whether the issue date of a data management requirement list must be the input date (the release to CSDB date), the cut-off date for the information, the planning date or some other more appropriate date.

4.1.2 **Data management list status**
Description: The element <`dmlStatus`> contains information about the status of the list.

Markup element: <`dmlStatus`>



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Fig 3 Element <dmlStatus>

Attributes:

– issueType (O), the issue status of the data management list. Refer to Chap 3.9.5.1.

Child elements:

– <security>, contains the security classification of the complete data management list. Refer to Chap 3.9.5.1.
– <controlAuthorityGroup>. Refer to Chap 3.9.5.1.
– <dataRestrictions>, contains the data instructions applicable to the data management list. This element can contain applicability information. Refer to Chap 3.9.5.1.
– <dmlRef>. Refer to Para 4.1.2.1.
– <brexDmRef>. Refer to Chap 3.9.5.1.
– <remarks>. Refer to Para 4.1.2.2.

4.1.2.1 Data management list reference

Description: The element <dmlRef> contains any references to other data management lists (eg, for partial data management requirement list).

The references can be given by using the element <dmlRefIdent> within the element <dmlRef>. The element <dmlRefIdent> is similar to the element <dmlIdent> with the exception of an optional child element <issueInfo>.

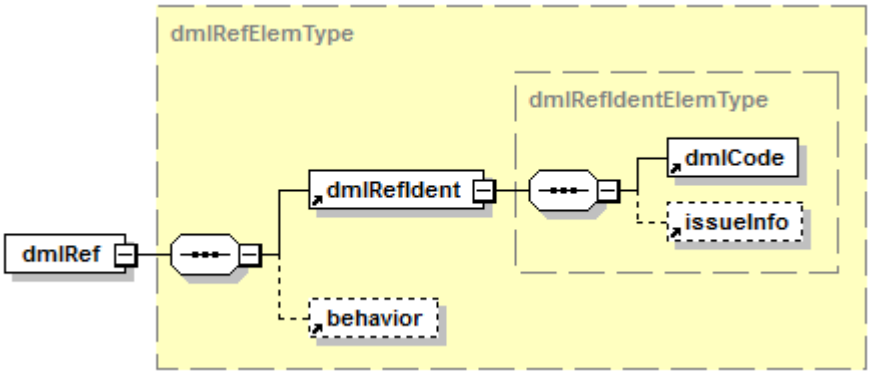
Note 1

The element <dmlRef> can also be used in the body of the DML in order to list DML that are in the CSDB. Refer to Para 4.2.1.

Note 2

References in a CSDB status list must only refer to other CSDB status list. Refer to default BREX rule BREX-S1-00006.

Markup element: <dmlRef>



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Fig 4 Element <dmlRef>

Attributes:

The element includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

- <dmlCode>, the data management list code. Refer to Para 4.1.1.1.
- <issueInfo>, the data management list issue information. Refer to Para 4.1.1.1.6.
- <behavior>, specifies how a link corresponding to the reference operates, which must not be used in this context.

4.1.2.2 Remarks

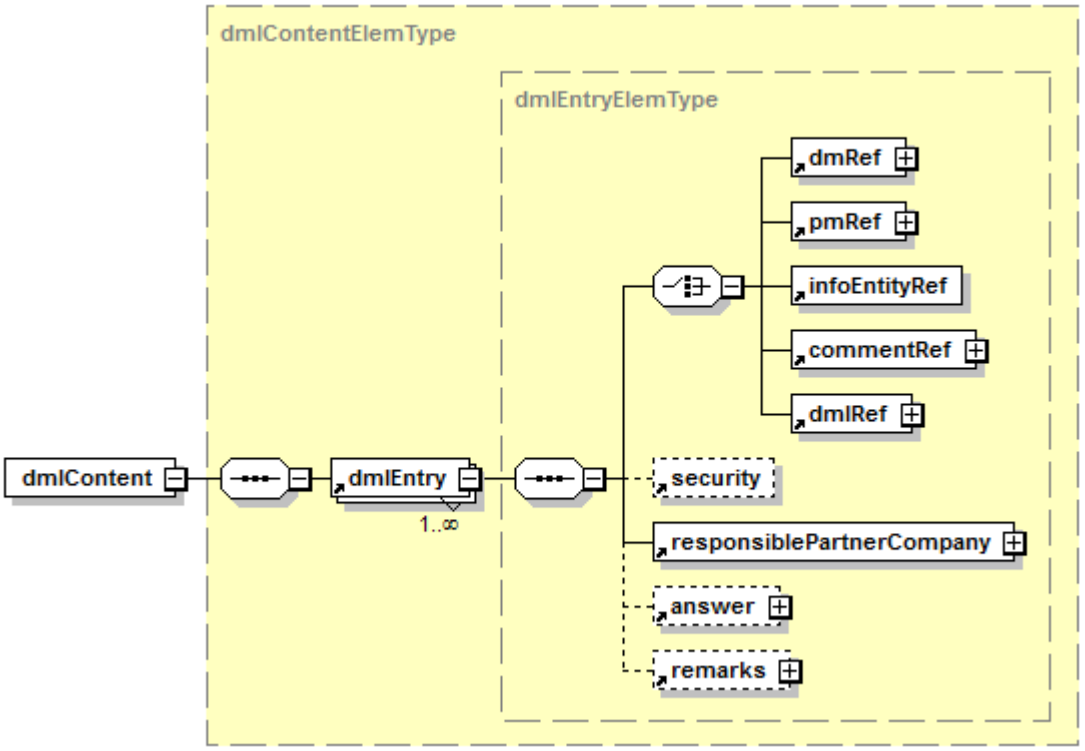
Description: The element <remarks> contains any general remarks to the data management list.

Markup element: <remarks>. Refer to Chap 3.9.5.1.

4.2 Data management list content

Description: The content of the data management list, contained in element <dmlContent>, consists of one or several <dmlEntry> subelements. Each of these subelements contains a CSDB object entry.

Markup element: <dmlEntry>



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Fig 5 Element <dmlContent>

Attributes:

- dmlEntryType (O), specifies the type of entry (compared to the last issue of the DML). The attribute can have one of the following values:
  - "n" - new
  - "c" - changed
  - "d" - deleted
- issueType (O), the issue type (new, changed, revised, deleted, reinstated, etc) of the CSDB object represented by the <dmlEntry>. Refer to Chap 3.9.5.1.

Child elements:

- <dmRef>, the reference to the data module concerned. Refer to Chap 3.9.5.2.1.2.

  Note

  The element includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism, which must not be used.

- <pmRef>, the reference to the publication module concerned. Refer to Chap 3.9.5.2.1.2.

  Note

  The element includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism, which must not be used.

- <infoEntityRef>, the reference to the illustration or multimedia concerned. Refer to Para 4.2.1.
- <commentRef>, the reference to the comment form concerned. Refer to Para 4.2.2.
- <dmlRef>, the reference to the data management list concerned. Refer to Para 4.2.3.
- <security>, the security classification of the entry. Refer to Chap 3.9.5.1.

- <responsiblePartnerCompany>, the responsible partner company for the entry. Refer to Chap 3.9.5.1.
- <answer>, the data management requirement answer for the entry. Applies to a DMRL only. Refer to Para 4.2.4.
- <remarks>, general remarks for the entry as required by the project or the organization. Refer to Chap 3.9.5.1.

4.2.1 ICN reference

Description: The element <infoEntityRef> contains a reference to an illustration/multimedia included in the data management list.

Markup element: <infoEntityRef>

Attributes:

- infoEntityRefIdent (M), the ICN (the unique identifier) of a graphic, symbol or multimedia object, always entered with the initial "ICN-". Refer to Chap 4.4.

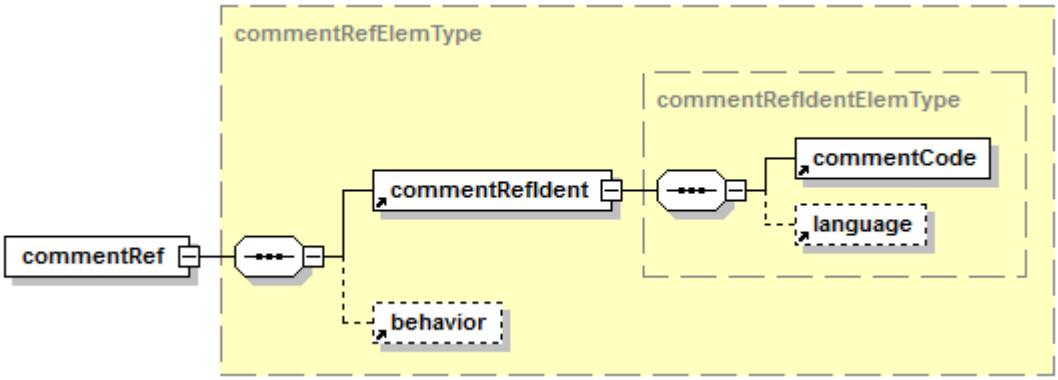
Child elements:

- None

4.2.2 Comment form reference

Description: The element <commentRef> contains a reference to a comment form included in the data management list.

Markup element: <commentRef>



ICN-SYU52-AASER00024-001-01

Fig 6 Element <commentRef>

Attributes:

- None

Child elements:

- <commentRefIdent>, the identification of the referred comment form. Refer to Para 4.2.2.1.
- <behavior>, the appearance/behavior of the referred comment form. Refer to Chap 3.9.5.2.1.2.

4.2.2.1 Comment form reference identity

Description: The element <commentRefIdent> is used to provide the identity of a comment form to which a comment form reference is pointing.

Markup element: <commentRefIdent>

Attributes:

– None

Child elements:

– <commentCode>, contains the items constituting the unique identity of a comment form.. Refer to Chap 4.6.1.
– <language>. Refer to Chap 3.9.5.1.

4.2.3 Data management list reference

Description: The element <dmlRef> contains a reference to a DML included in the data management list. Refer to Para 4.1.2.1.

4.2.4 Data management requirement list answer

Description: The element <answer> can be used to insert comments on a DMRL entry. This element must not be used in a CSL, and must only be used for data module entries. Refer to default BREX rules BREX-S1-00007 and BREX-S1-00008.

Examples of use of the element <answer>:

The element <answer> can be used to get an answer from the CSDB owner when an industry partner or customer asks for a data module code to be reserved in the CSDB. The requestor sends a DMRL containing the requested data module code and receives it back with an entry for each data module code which could be the value "y" or value "n" in the attribute answerToEntry. This typically indicates the fact that the data module code was free or already reserved, and if needed a justification (generally in case of rejection) in the element <remarks>.

In the DMRL from the CSDB owner, the proposed changes for the next issue of the documentation, each entry can be marked as changed, deleted or new by using the attribute dmlEntryType. As a reply the partner or customer can agree with the proposed changes or not by using the attribute answerToEntry (value "y" or value "n"). If the customer does not agree to the proposed change, the customer can give a short reason or comment using the element <remarks>.

Markup element: <answer>

Attributes:

– answerToEntry (O), the indicator of that there are comments to the entry. The attribute can have one of the following values:
  - "y" (D) - Yes
  - "n" - No

Child elements:

– <remarks>, used to provide a narrative answer, when needed. Refer to Chap 3.9.5.1.

5 Data management list issues

There are rules that determine the values of the sequential number, the issue number and the inwork number of DMRL and CSL. The rules for DMRL are given in Para 5.1 and the rules for CSL are given in Para 5.2. Refer to Chap 3.9.5.1 for further information about issue numbering. Note that more than one data management list can exist with the same sequential number

provided that the combination of model identification code, sender identification, data management list type and year make it a unique data management list code in the CSDB.

5.1 DMRL issue numbering

When DMRL are delivered, the first delivery of the year is given the sequential number 00001 and issue number 001 (inwork 00) and the second delivery of the DMRL in the year is given the sequential number 00002 issue number 001 (inwork 00). Refer to default BREX rule BREX-S1-00009. The issue number is used to indicate consecutive DMRL versions and the inwork number is used to allow draft versions. This is shown in the following example. The first two deliveries in the example represent the DMRL merging requirements in a two partner project:

`DML-E2-K0378-P-2015-00001-001-00` - the first partial DMRL from K0378 in 2015

`DML-E2-D3309-P-2015-00001-001-00` - the first partial DMRL from D3309 in 2015

`DML-E2-K0378-C-2015-00001-001-00` - the merged first complete DMRL in 2015 that contains both D3309 and K0378 data (K0378 is responsible for the merging)

`DML-E2-K0378-C-2015-00002-000-01` - a draft of the second complete DMRL in 2015 from K0378

`DML-E2-K0378-C-2015-00002-001-00` - the official issue of the second DMRL from K0378 in 2015

`DML-E2-K0378-C-2015-00002-002-00` - an update to the second DMRL from K0378 in 2015

`DML-E2-K0378-C-2015-00003-001-00` - the official issue of the third DMRL from K0378 in 2015

5.2 CSL issue numbering

CSL follow a similar coding scheme to DMRLs. Refer to default BREX rule BREX-S1-00009. The issue number is used when a CSL is updated due to errors or problems found when the receiver processed the CSL.

`DML-E2-K0378-S-2015-00003-001-00` - the third CSL from K0378 in 2015

`DML-E2-K0378-S-2015-00003-002-00` - the second issue of the third CSL from K0378 in 2015 (which has been updated as a result of changes made to K0378's CSDB following errors detected by the receiver).

Chapter 4.6

Information management - Comment

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Chap 4.6.2	Comment - Content section
Chap 7.4.1.1.2	Generation process - Metadata

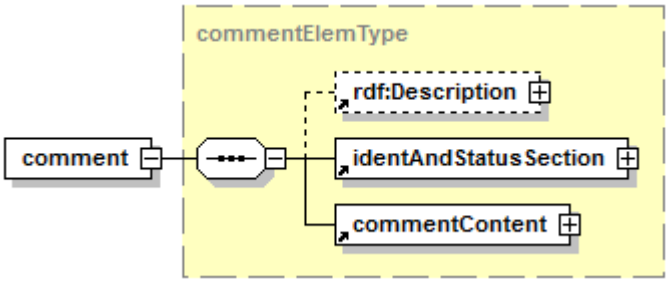
1 General

Commenting and reporting on issues raised on data modules or publication modules during the verification process and the in-service phase of the Product can be done using the comment form. This form is compiled by the commenting authority and sent to the issuing authority of the data modules or publication modules. The comment form is also used to provide a response to the originator of the comment. The commenting process itself is explained in Chap 3.7.

2 Comment form

Description: The comment form consists of two main sections of information: the identification and status section, and the content section.

Markup element: <comment>



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Fig 1 Element <comment>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

Child elements:

– <rdf:Description>. Refer to Chap 7.4.1.1.2
– <identAndStatusSection>. Refer to Chap 4.6.1.
– <commentContent>. Refer to Chap 4.6.2.

Business rule decision point BRDP-S1-00356 - Use of the comment form:

– Decide whether to use the comment form.

Note

Control authority references must not be used in comments.

3 Example

```
<comment>
<identAndStatusSection>
<commentAddress>
<commentIdent>
<commentCode senderIdent="AAAAA" yearOfDataIssue="2016"
modelIdentCode="AA" commentType="q" seqNumber="00001"/>
<language countryIsoCode="AA" languageIsoCode="aa"/>
</commentIdent>
<commentAddressItems>
<issueDate day="08" month="01" year="2016"/>
<commentOriginator>
<dispatchAddress>
<enterprise>
<enterpriseName>...</enterpriseName>
</enterprise>
<dispatchPerson>
<lastName>...</lastName>
</dispatchPerson>
<address>
<city>...</city>
<country>...</country>
</address>
</dispatchAddress>
</commentOriginator>
</commentAddressItems>
```

```
</commentAddress>
<commentStatus>
<security securityClassification="01"/>
<commentPriority commentPriorityCode="cp01"/>
<commentResponse responseType="rt01"/>
<commentRefs>
<ddnRefGroup>
<ddnRef>
<ddnRefIdent>
<ddnCode senderIdent="AAAAA" yearOfDataIssue="2016"
modelIdentCode="AA" receiverIdent="AAAAB" seqNumber="00001"/>
</ddnRefIdent>
</ddnRef>
</ddnRefGroup>
</commentRefs>
<brexDmRef>
<dmRef>...</dmRef>
</brexDmRef>
<remarks>...</remarks>
</commentStatus>
</identAndStatusSection>
<commentContent>
<simplePara>...</simplePara>
<attachmentRef attachmentNumber="01" fileExtension="PDF"/>
</commentContent>
</comment>
```

Chapter 4.6.1

Comment - Identification and status section

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Table 1 References

Chap No./Document No.	Title
Chap 3.6	Information generation - Security and data restrictions
Chap 3.9.5.1	Data modules - Identification and status section
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Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.6.1	Attributes - Project configurable values
Chap 4.3.1	Data module code - Model identification code

Chap No./Document No.	Title
Chap 4.5	Information management - Data management lists
Chap 4.6	Information management - Comment
Chap 7.7.4	Guidance and examples - XLink

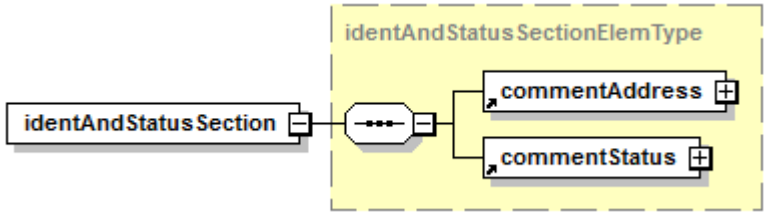
1 General

Similar to data modules, the comment form contains two main sections, the identification and status section and the content section. This chapter contains the details regarding the identification and status section.

2 Comment form identification and status - markup requirements

Description: The element <identAndStatusSection> contains the identification elements to address and control the comment form. It also provides status elements for information on the security, quality and technical status together with the applicability of the overall content.

Markup element: <identAndStatusSection>



ICN-S3627-S1000D0634-001-01

Fig 1 Element <identAndStatusSection>

Attributes:

– None

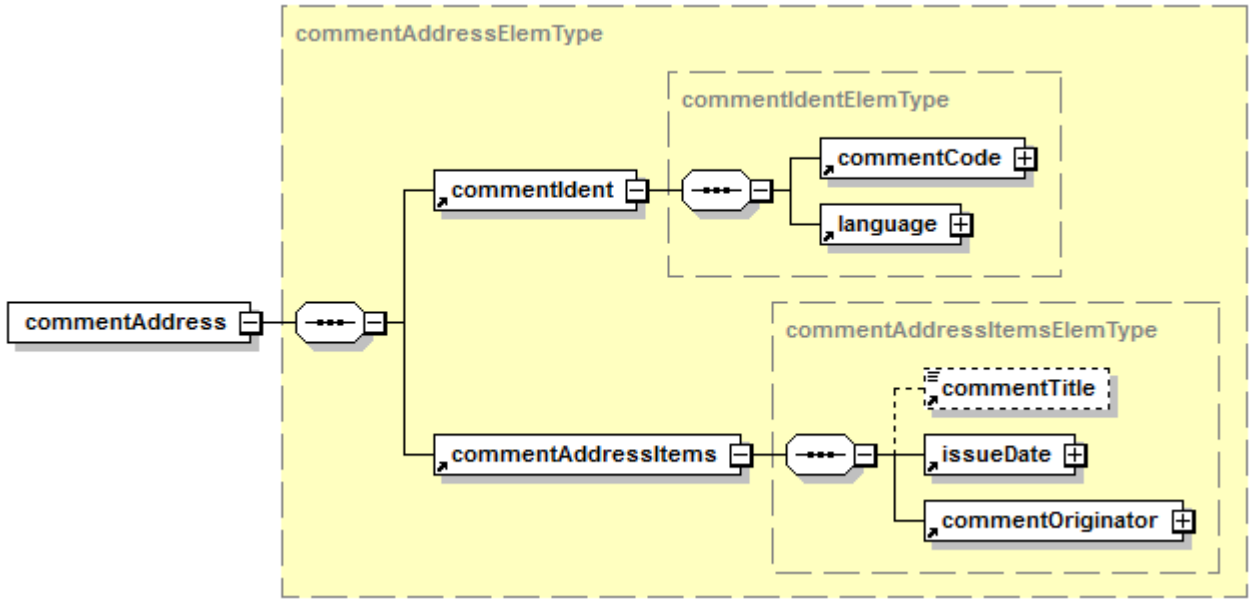
Child elements:

– <commentAddress>. Refer to Para 2.1.
– <commentStatus>. Refer to Para 2.2.

2.1 Comment address

Description: The element <commentAddress> consists of two blocks of information items used to address the comment object, the comment identification and the supplementary comment address items.

Markup element: <commentAddress>



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Fig 2 Element <commentAddress>

Attributes:

– None

Child elements:

– <commentIdent>. Refer to Para 2.1.1.
– <commentAddressItems>. Refer to Para 2.1.2.

2.1.1 Comment identification

Description: The element <commentIdent> contains the unique identity of a comment object.

Markup element: <commentIdent>

Attributes:

– None

Child elements:

– <commentCode>. Refer to Para 2.1.1.1.
– <language>. Refer to Chap 3.9.5.1.

Markup example:

```
<commentIdent>
<commentCode senderIdent="AAAAA" yearOfDataIssue="2012"
modelIdentCode="AA" commentType="q" seqNumber="00001"/>
<language countryIsoCode="AA" languageIsoCode="aa"/>
</commentIdent>
```

2.1.1.1 Comment code

Description: The element <commentCode> contains the comment code. Together with the issue information, it gives an identification that is unique within the S1000D domain.

The comment code is comprised of up to 29 alphanumeric characters and is built up as shown in Table 2. The minimum length is 17 characters.

YY - YYYYY - XXXX - NNNNN - A (17 characters)

thru

YYYYYYYYYYYYYY - YYYYY - XXXX - NNNNN - A (29 characters)

Table 2 Comment code

Breakdown	Rule
Model identification code	2 thru 14 uppercase alphanumeric characters
Issuing authority	5 uppercase alphanumeric characters
Issue year	4 numeric characters
Sequential number per year	5 numeric characters
Type of comment	1 alpha character - Q, I or R

Markup element: <commentCode>

Attributes:

- modelIdentCode (M). Refer to Table 2 and Para 2.1.1.1.1.
- senderIdent (M). Refer to Table 2 and Para 2.1.1.1.2.
- yearOfDataIssue (M). Refer to Table 2 and Para 2.1.1.1.3.
- seqNumber (M). Refer to Table 2 and Para 2.1.1.1.4.
- commentType (M). Refer to Table 2 and Para 2.1.1.1.5.

Child elements:

- None

Markup example:

The following example shows the markup corresponding to the final response, AA-AAAAA-2012-00001-R, to a comment that was raised previously.

```
<commentCode senderIdent="AAAAA" yearOfDataIssue="2012"
modelIdentCode="AA" commentType="r" seqNumber="00001"/>
```

2.1.1.1.1 Model identification code

Description: The model identification code is given in the comment code by the highlighted characters as follows:

YY - YYYYY - XXXX - NNNNN - A (17 characters)

thru

YYYYYYYYYYYYYY - YYYYY - XXXX - NNNNN - A (29 characters)

The model identification code is contained in the attribute modelIdentCode. Refer to Chap 4.3.1.

2.1.1.1.2 Issuing authority of the comment

Description: The CAGE code of the issuing authority of the comment is given in the comment code by the highlighted characters as follows:

YY - **YYYYY** - XXXX - NNNNN - A (17 characters)

thru

YYYYYYYYYYYYYY - **YYYYY** - XXXX - NNNNN - A (29 characters)

The CAGE code of the issuing authority is contained in the attribute `senderIdent`.

Note

The CAGE code used in this attribute must be a registered CAGE code.

2.1.1.1.3 Issue year

Description: The issue year of the comment is given in the comment code by the highlighted characters as follows:

YY - YYYYY - **XXXX** - NNNNN - A (17 characters)

thru

YYYYYYYYYYYYYY - YYYYY - **XXXX** - NNNNN - A (29 characters)

The issue year is contained in the attribute `yearOfDataIssue`.

2.1.1.1.4 Sequential number per year

Description: The number of the comment per year is identified in the comment code by the highlighted characters as follows:

YY - YYYYY - XXXX - **NNNNN** - A (17 characters)

thru

YYYYYYYYYYYYYY - YYYYY - XXXX - **NNNNN** - A (29 characters)

The sequential number of the comment per year is contained in the attribute `seqNumber`.

The sequential number per year starts with 00001. Refer to default BREX rule BREX-S1-00010.

2.1.1.1.5 Type of comment

Description: The type of comment is given in the comment code by the highlighted character as follows:

YY - YYYYY - XXXX - NNNNN - **A** (17 characters)

thru

YYYYYYYYYYYYYY - YYYYY - XXXX - NNNNN - **A** (29 characters)

The following types of comment are permitted:

- Q - Query (raised comment), value "`q`"
- I - Interim response, value "`i`"
- R - Final response, value "`r`"

The type of comment is contained in the attribute `commentType`.

Note

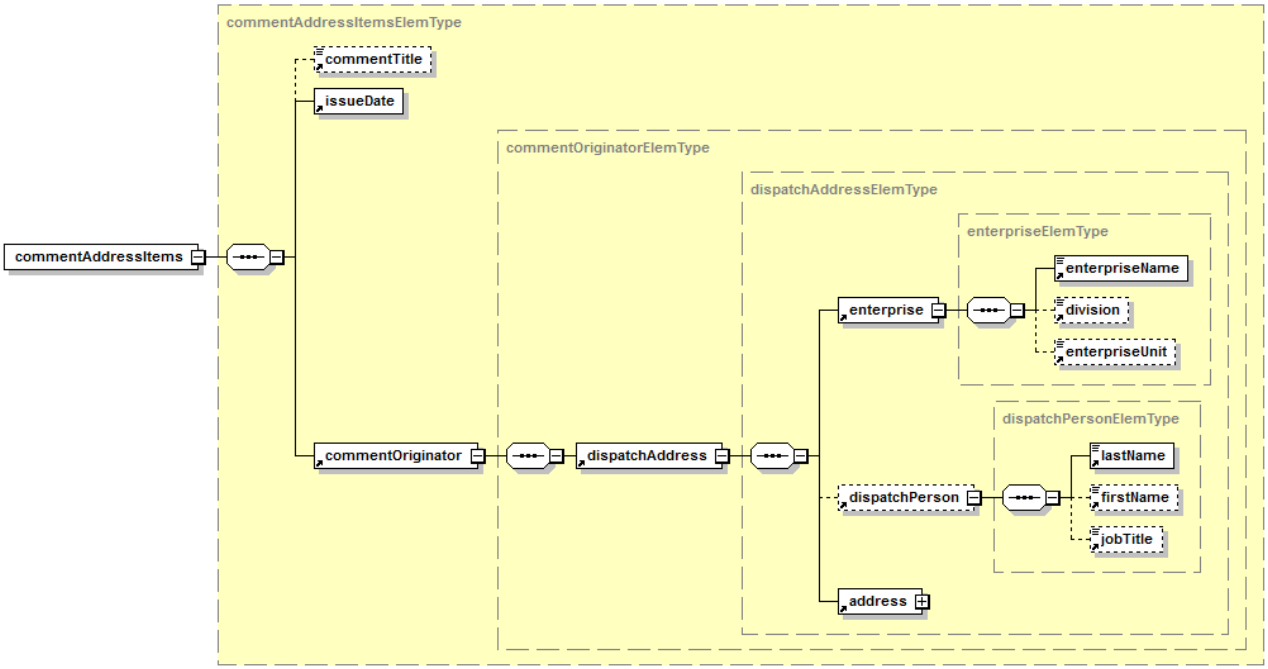
There is a maximum of two responses (interim and final) allowed to a raised comment/query to avoid unlimited chaining up of comments. The comment code of the response is taken from the query and differs only in the attribute `commentType`. This

links query and response together. Any reaction to a response must result in generating a new comment/query.

2.1.2 Comment address items

Description: The element <commentAddressItems> contains the complementary address items, supporting identification of a comment object.

Markup element: <commentAddressItems>



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Fig 3 Element <commentAddressItems>

Attributes:

– None

Child elements:

– <commentTitle>, the title of the comment, given as a simple text string.
– <issueDate>, the date when the comment or response was issued. Refer to Chap 3.9.5.1.
– <commentOriginator>. Refer to Para 2.1.2.1.

2.1.2.1 Originator

Description: The element <commentOriginator> contains information about the originator of the comment.

Markup element: <commentOriginator>

Attributes:

– None

Child elements:

– <dispatchAddress>. Refer to Para 2.1.2.1.1.

2.1.2.1.1 Dispatch address

Description: The element <dispatchAddress> contains information about the originator of the comment such as the enterprise name, point of contact and the address from where the comment/response is sent.

Markup element: <dispatchAddress>

Attributes:

– None

Child elements:

– <enterprise>, the name of the sending enterprise. Refer to Para 2.1.2.1.2.
– <dispatchPerson>, the name of the sending person. Refer to Para 2.1.2.1.3.
– <address> the address of the sending enterprise or person. Refer to Para 2.1.2.1.4.

2.1.2.1.2 Enterprise

Description: The element <enterprise> contains the name of the enterprise, and when applicable, the body within an enterprise, from where the comment/response is sent.

Markup element: <enterprise>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
– changeMark (O), changeType (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
– securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

– <enterpriseName>, the name of the sending enterprise, given as a simple text string
– <division>, the sending division of the enterprise, given as a simple text string
– <enterpriseUnit>, the business unit of the division, given as a simple text string

2.1.2.1.3 Dispatch person

Description: The element <dispatchPerson> contains information about the dispatch person who is the point of contact at the sending enterprise.

Markup element: <dispatchPerson>

Attributes:

– personPrefix (O), the title or prefix added to a person's name to signify veneration, an official position or a professional or academic qualification (eg, colonel, doctor, officer, lady, Mr, Mrs, Ms, Dr)

Child elements:

– <lastName>, the surname of the dispatch person, given as a simple text string
– <firstName>, the first or given name of the dispatch person, given as a simple text string
– <jobTitle>, the job title or position held by the dispatch person, given as a simple text string

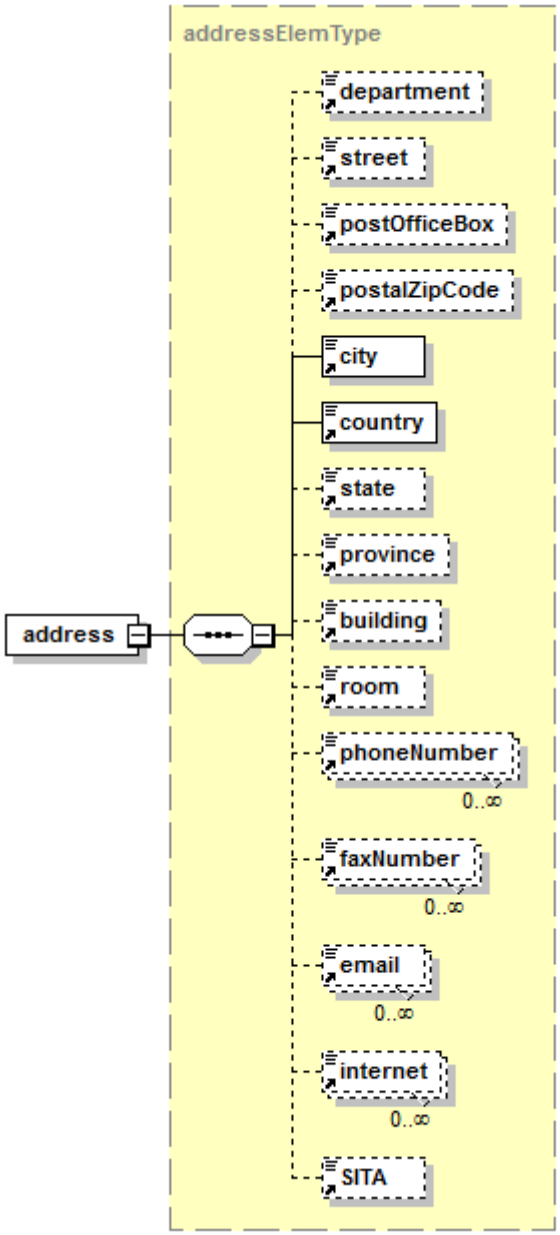
Markup example:

```
<dispatchPerson>
<lastName>Smiley</lastName>
<firstName>Jonathon</firstName>
<jobTitle>Morale Booster</jobTitle>
</dispatchPerson>
```

2.1.2.1.4 Address

Description: The element <address> contains the postal address from where the comment/response is sent.

Markup element: <address>



ICN-S3627-S1000D0637-001-01

Fig 4 Element <address>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeMark` (O), `changeType` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), and `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`department`>, the functional or territorial department of the comment/response originator, given as a simple text string
- <`street`>, the physical location (eg, road or street name/number, or similar), given as a simple text string
- <`postOfficeBox`>, the post office box, given as a simple text string
- <`postalZipCode`>, the postal zip code, given as a simple text string
- <`city`>, the city or town name, given as a simple text string
- <`country`>, the name of the country, given as a simple text string
- <`state`>, the name of the state, given as a simple text string
- <`province`>, the name of the province, given as a simple text string
- <`building`>, the building number or name, given as a simple text string
- <`room`>, the room identification, given as a simple text string
- <`phoneNumber`>, the phone number, given as a simple text string. Optionally this element contains the attribute `contactRole` giving the professional role of the point of contact.
- <`faxNumber`>, the fax number, given as a simple text string. Optionally this element contains the attribute `contactRole` giving the professional role of the point of contact.
- <`email`>, the email address, given as a simple text string. Optionally this element contains the attribute `contactRole` giving the professional role of the point of contact.
- <`internet`>, the internet address (website address) of the comment/response originator, given as a simple text string. Optionally this element contains the attribute `contactRole` giving the professional role of the point of contact.
- <`SITA`>, the SITA address of the enterprise

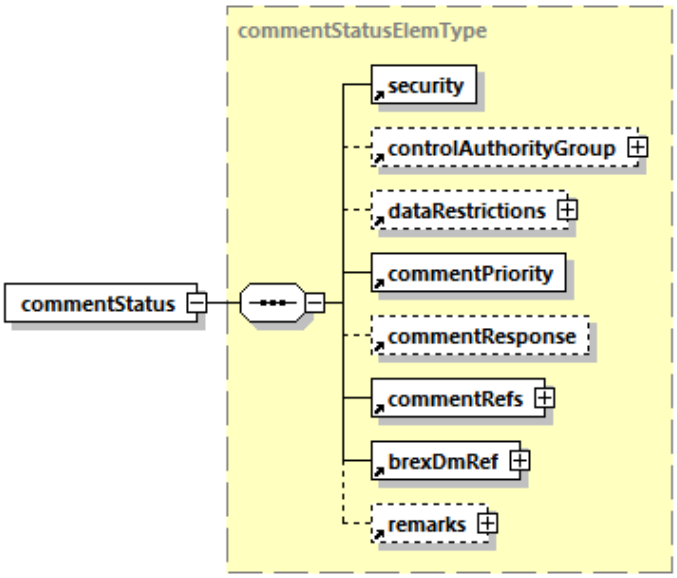
Markup example:

```
<address>
<street>Heaven street</street>
<postalZipCode>99999</postalZipCode><city>Saint Vitus</city>
<country>UTOPIA</country>
<phoneNumber>111 222 333 444</phoneNumber>
<faxNumber>111 222 333 445</faxNumber>
<email>customers_services@utopia.com</email>
<email>info@utopia.com</email>
<internet>www.utopia.customers.services.online.com</internet>
<internet>www.utopia.online.com</internet>
</address>
```

2.2 Comment status

Description: The element <commentStatus> contains the status information for the comment form.

Markup element: <commentStatus>



ICN-S3627-S1000D0638-003-01

Fig 5 Element <commentStatus>

Attributes:

- issueType (O). Refer to Chap 3.9.5.1.

Child elements:

- <security>. Refer to Chap 3.9.5.1.
- <controlAuthorityGroup>. Refer to Chap 3.9.5.1.
- <dataRestrictions>. Refer to Chap 3.9.5.1.
- <commentPriority>. Refer to Para 2.2.1.
- <commentResponse>. Refer to Para 2.2.2.
- <commentRefs>. Refer to Para 2.2.3.
- <brexDmRef>. Refer to Chap 3.9.5.1.
- <remarks>. Refer to Chap 3.9.5.1.

Markup example:

```
<commentStatus>
<security securityClassification="01"/>
<commentPriority commentPriorityCode="cp01"/>
<commentRefs>
<noReferences/>
</commentRefs>
<brexDmRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000D" systemDiffCode="E"
systemCode="04" subSystemCode="1" subSubSystemCode="0"
```

```
assyCode="0301" disassyCode="00" disassyCodeVariant="A"
infoCode="022" infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent>
</dmRef>
</brexDmRef>
</commentStatus>
```

2.2.1 Comment priority

Description: The element <commentPriority> contains the priority code of the comment.

Markup element: <commentPriority>

Attributes:

– commentPriorityCode (M), used to store the priority of the comment in coded form. The attribute can have one of the following values:

- "cp01" thru "cp99". Refer to Chap 3.9.6.1

Child elements:

– None

2.2.2 Comment response

Description: The element <commentResponse> contains the type code of response to the comment.

Markup element: <commentResponse>

Attributes:

– responseType (M), used to store the type of response in coded form. The attribute can have one of the following values:

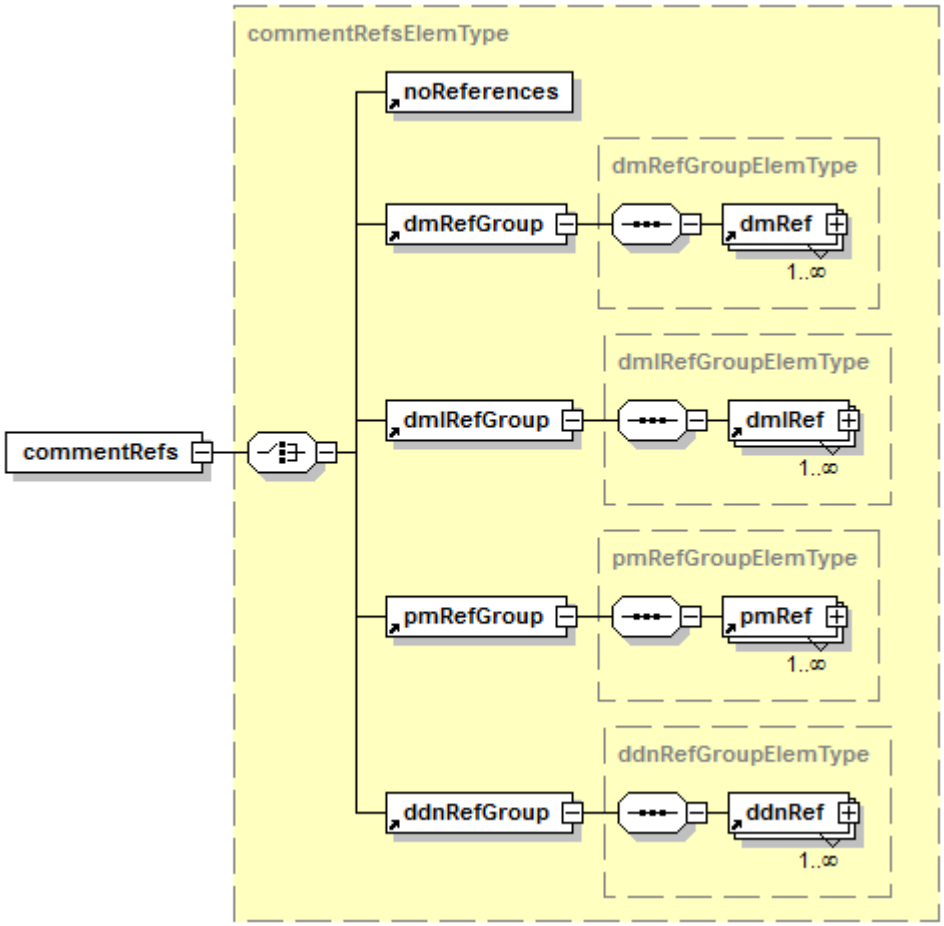
- "rt01" thru "rt99". Refer to Chap 3.9.6.1.

Child elements:

– None

2.2.3 Comment references

Description: The element <commentRefs> contains the reference to the information the comment is referring to. References are allowed to publication modules (including the entire publication set via list of applicable publications), data modules, data management lists or data dispatch notes. For each comment raised, there must be at least one reference. Comments to the comments are not permitted (use the element <noReferences> when a response to a comment is submitted).



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Fig 6 Element <commentRefs>

Note

For a comment related to a data or publication module instance identified using the data or publication module code extension, the reference must include the element <identExtension> contained in element <dmRef> or <pmRef> within this block of references. Refer to default BREX rule BREX-S1-00011.

Markup element: <commentRefs>

Attributes:

– None

Child elements:

One of the following must be selected:

– <noReferences>, used to indicate that there are no references
– <dmRefGroup>, the references to data modules. Refer to Para 2.2.3.1.
– <dmlRefGroup>, the references to data management lists. Refer to Para 2.2.3.2.
– <pmRefGroup>, the references to publication modules. Refer to Para 2.2.3.3.
– <ddnRefGroup>, the references to data dispatch notes. Refer to Para 2.2.3.4.

2.2.3.1 Data module reference group
Description: The element <dmRefGroup> contains one or several references to data modules to which the comment relates.

Markup element: <dmRefGroup>

Attributes:

– None

Child elements:

– <dmRef>. Refer to Chap 3.9.5.2.1.2.

2.2.3.2 Data management list reference group
Description: The element <dmlRefGroup> contains one or several references to data management lists to which the comment relates.

Markup element: <dmlRefGroup>

Attributes:

– None

Child elements:

– <dmlRef>. Refer to Chap 4.5.

2.2.3.3 Publication module reference group
Description: The element <pmRefGroup> contains one or several references to publication modules to which the comment relates.

Markup element: <pmRefGroup>

Attributes:

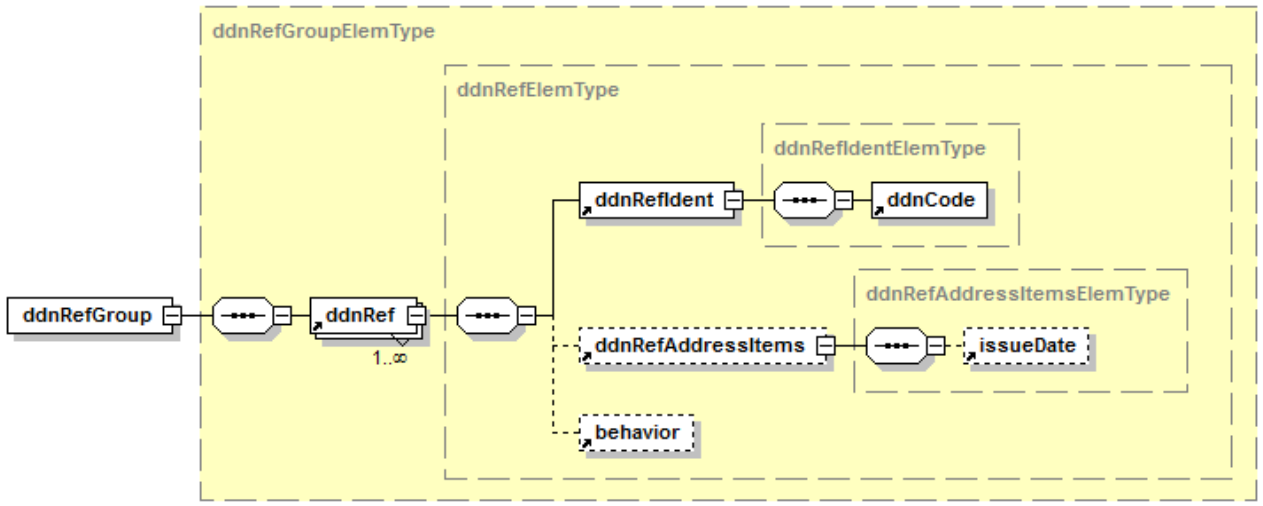
– None

Child elements:

– <pmRef>. Refer to Chap 3.9.5.2.1.2.

2.2.3.4 Data dispatch note reference group
Description: The element <ddnRefGroup> contains one or several references to data dispatch notes to which the comment relates.

Markup element: <ddnRefGroup>



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Fig 7 Element <ddnRefGroup>

Attributes:

– None

Child elements:

– <ddnRef>. Refer to Para 2.2.3.4.1.

Markup example:

```
<ddnRefGroup>
<ddnRef>
<ddnRefIdent>
<ddnCode senderIdent="AAAAA" yearOfDataIssue="2016"
modelIdentCode="AA" receiverIdent="AAAAB" seqNumber="00001"/>
</ddnRefIdent>
</ddnRef>
</ddnRefGroup>
```

2.2.3.4.1 Data dispatch note reference

Description: The element <ddnRef> contains a reference to a data dispatch note to which the comment relates.

Markup element: <ddnRef>

Attributes:

– The element also includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism. Refer to Chap 7.7.4.

Child elements:

– <ddnRefIdent>. Refer to Para 2.2.3.4.2.
– <ddnRefAddressItems>. Refer to Para 2.2.3.4.4.
– <behavior>. Refer to Chap 3.9.5.2.1.2.

Markup example:

– Refer to Chap 4.6.

2.2.3.4.2 Data dispatch note reference identity

Description: The element <ddnRefIdent> contains the unique identity of a referred data dispatch note.

Markup element: <ddnRefIdent>

Attributes:

– None

Child elements:

– <ddnCode>. Refer to Para 2.2.3.4.3.

Markup example:

– Refer to Chap 4.6.

2.2.3.4.3 Data dispatch note identification code

Description: This element <ddnCode> contains the code identifying the referred data dispatch note.

Markup element: <ddnCode>

Attributes:

– modelIdentCode (M). Refer to Chap 4.3.1.
– senderIdent (M), the CAGE code of the sender of the comment
– receiverIdent (M), the CAGE code of the receiver of the comment
– yearOfDataIssue (M), the year (YYYY) when the issue was raised
– seqNumber (M), the sequence number of the comment, related to senderIdent and yearOfDataIssue

Child elements:

– None

Markup example:

– Refer to Chap 4.6.

2.2.3.4.4 Supplementary addressing information pertinent to a dispatch note

Description: The element <ddnRefAddressItems> contains a reference to a data dispatch note to which the comment relates.

Markup element: <ddnRefAddressItems>

Attributes:

– None

Child elements:

– <issueDate>. Refer to Chap 3.9.5.1.

Chapter 4.6.2

Comment - Content section

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References

Table 1 References

Chap No./Document No.	Title
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 7.7.4	Guidance and examples - XLink

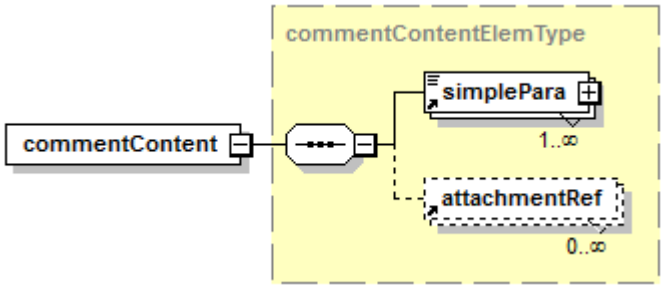
1 General

Similar to data modules the comment form contains two main sections, the identification and status section and the content section. This chapter contains the details regarding the content section.

2 Comment form content section - markup requirements

Description: The element <commentContent> contains the comment and/or the response to a comment and references to attachments.

Markup element: <commentContent>



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Fig 1 Element <commentContent>

Attributes:

– None

Child elements:

– <simplePara>. Refer to Para 2.1.
– <attachmentRef>. Refer to Para 2.2.

2.1 Simple paragraph

This element contains the description of the comment/response. This description must be in paragraph form. A reference to an attachment only is not sufficient. Refer to Chap 3.9.5.2.1.10.

2.2 Reference to an attachment

Description: The element <attachmentRef> contains the file name of the attachment.

The full file name consists of the prefix "COM", the comment code (ie, the attributes of the element <commentCode>) and the attachment number, all items separated by dashes. The file name ends with a separation character (usually ".") and the file type extension (eg, PDF, ZIP, XLS).

COM-YY-YYYYY-XXXX-NNNNN-A-**MM**.**EXT**

or

COM-YYYYYYYYYYYYYY-YYYYY-XXXX-NNNNN-A-**MM**.**EXT**

Where:

– "**MM**" is the attachment number starting with "01"
– "**EXT**" is the file type extension

Note

The allowed file types must be defined by the project or the organization and must be supported by the viewing systems.

Markup element: <attachmentRef>

Attributes:

– attachmentNumber (M), a two digit sequential attachment number
– fileExtension (M), the file type extension

Note

The element also includes five attributes normally populated by the authoring application to make use of the W3C XLink mechanism. Refer to Chap 7.7.4

Child elements:

– None

Business rule decision point BRDP-S1-00359 - Allowed file types for attachments to comment forms:

– Decide which file types are allowed for attachments to comment forms.

Markup example:

```
<attachmentRef attachmentNumber="01" fileExtension="PDF"/>
```

Chapter 4.7

Information management - Version control of data modules, publication modules and SCORM content package modules

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Chap 3.9.5.1	Data modules - Identification and status section

1 General

Updating of data modules, publication modules and SCORM content package modules are driven by changes to the Product or due to the technical publication process. This chapter gives the rules for the version control of data modules, publication modules and SCORM content package modules.

2 Version control

2.1 Issue and inwork number

The issue information is used to record and control the issue information of data modules, publication modules and SCORM content package modules. Any published update of these cause the issue date to change and the issue number to increase. A consecutive three to five digit sequential number indicates every issue of a data module, publication module or a SCORM content package module.

2.2 Change of a data module, publication module or a SCORM content package module

Any published update of a data module, publication module or a SCORM content package module is identified with the type of update. The type of update is captured by using the attribute `issueType` of the element <`dmStatus`>. There are eight values for the attribute `issueType`. Refer to Chap 3.9.5.1.

Chapter 4.8

Information management - Interchange of data modules

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Chap 7.3.2	CSDB objects - Graphics
Chap 7.3.3	CSDB objects - Multimedia
Chap 7.5	Information processing - Information interchange
Chap 7.5.1	Information interchange - File based transfer

1 General

This chapter details the requirements and provides background for implementation of data interchange. The means for data interchange described herein are not limited to the interchange of data modules. They can also be used for technical information interchange in general.

To achieve an orderly and systematic digital interchange of data modules and other related CSDB information, it is necessary to work within a set of formal data interchange standards and procedures.

While certain conditions are presumed valid at the time of writing, technology is moving forward so that the interchange procedures detailed in this chapter have to be taken only as a basis.

Actual implementation must be defined on the agreed optimum means available to a project during its lifecycle. The security regulations must conform to the applicable project or organization security instructions.

2 Data interchange

2.1 Interchange data format

The basic interchange unit defined in this chapter is a data module. For all types of data modules the references to illustrations, multimedia and other associated data are given within the data module text.

In order to allow cross references from data module text to documents stored in Adobe PDF, the data format PDF is used. Both multimedia and PDF files are treated like an illustration when referenced, stored and interchanged.

2.1.1 Data module text

The logical structure of an S1000D data module is defined in the XML Schema in accordance with the corresponding W3C recommendations. The S1000D XML Schema for data modules are described in Chap 7.3.1. The Schema defines the structure of the content of a data module, not the actual presentation or output.

2.1.2 Data module illustrations, multimedia and other associated data

The illustrations referenced within a data module are normally line drawings in vector and/or raster form. If agreed by the project, photographs (half tones) can also be used provided they meet all requirements to show clear details.

Business rule decision point BRDP-S1-00545 - File formats for information objects:

- Decide which file formats to use.

2.1.2.1 CGM graphics

The basic data standard for 2-dimensional graphics is the CGM standard as defined in International Standards Organization ISO/IEC 8632. A dedicated S1000D CGM profile is given in Chap 7.3.2, which defines a subset of the WebCGM profile.

WebCGM is a full CGM V4 profile based on the proforma and model profile of ISO/IEC 8632:1999-1 (second edition: 1999-12-15), "Functional specification". It has the additional value that there is an associated product certification testing service.

Note

CGM provides a raster graphics capability, which enables the integration of other raster encoding such as Comité Consultatif Internationale de Télégraphique et Téléphonique-4 (CCITT-4), Portable Network Graphics (PNG) and Joint Photographic Experts Group (JPEG) embedded in metafiles. Therefore, the CGM standard can be used for all types of illustrations.

2.1.2.2 Raster graphics

The data standard for binary (ie, monochrome) raster graphics is either:

- Continuous Acquisition and Life-cycle Support (CALS) raster CCITT Gr 4 as defined in MIL-PRF-28002, but limited here to data subtype "Type 1 - untiled". The preferred resolution is 300 dpi. Other resolutions can be decided by project regulations.
- Tagged Image File Format (TIFF) based on the definition given in Chap 7.3.2 of this specification.

Note

Colored raster graphics in TIFF format as defined in the Adobe TIFF 6.0 specification using the loss-less Lempel-Ziv-Welch (LZW) compression method is also permitted in S1000D.

Business rule decision point BRDP-S1-00360 - Raster graphic resolution:

- Decide which resolution to use for raster graphics.

2.1.2.3 Photographs and artwork

The data standard for color and grey scale photographic images and artwork is:

- JPEG as defined in ISO/IEC 10918
- GIF as defined in CompuServe GIF 89a
- PNG as defined in REC-PNG-20031110

The preferred resolution is 300 dpi

Business rule decision point BRDP-S1-00361 - Use of photographs:

- Decide whether photographs will be used. If used, for what purposes.

2.1.2.4 Multimedia

The multimedia within a data module can be of any type defined in the project's business rules. Guidance on the use of multimedia is given in Chap 7.3.3, and authoring rules are given in Chap 3.9.2.

2.1.2.5 ICN metadata files

If agreed in a project, illustrations and multimedia objects can be accompanied by separate ICN metadata files (IMF), ie, objects containing metadata pertinent to a graphics or multimedia object. Refer to Chap 3.9.2.7 for details about the IMF object.

2.2 Interchange (transfer) package structure

An S1000D CSDB interchange (transfer) package consists of one data dispatch note as given in Chap 7.5 and at least one of the following data categories:

- one or more data modules, illustrations, multimedia, ICN metadata files and other data
- one or more data management lists
- one or more comment forms and associated attachments
- one or more Publication or SCORM content package modules
- one or more Data update files

There is an associated Schema for each of these data categories, except for the categories CSDB status list and data module requirements list. Both of these lists are handled with the single data module list Schema. The Schemas are described in Chap 7 together with examples.

Note

Electronic copies of the Schemas are available for downloading from the S1000D web site at www.s1000d.org.

2.3 File based transfer

The file based transfer method and the file name conventions are given in Chap 7.5.1.

Chapter 4.9

Information management - Publication management

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Chap 4.9.2	Publication management - Coding publication modules
Chap 4.9.3	Publication management - Building publications
Chap 4.9.4	Publication management - Updating publications

1 General

In order to define, prepare and manage publications generated of data modules, S1000D uses the publication module.

2 Content

The publication module is built similar to data modules with an identifier, a status section and a content section. The content section contains the references to data modules, legacy technical publications or other publication modules in the order and the structure the publication is delivered.

Chap 4.9.1 gives the structure of the publication module and Chap 4.9.2 defines the publication module code. The building of publications is explained in Chap 4.9.3 and the updating of publications is described in Chap 4.9.4.

Chapter 4.9.1

Publication management - Publication module

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Chap 3.9.5.2.1.10	Common constructs - Text elements

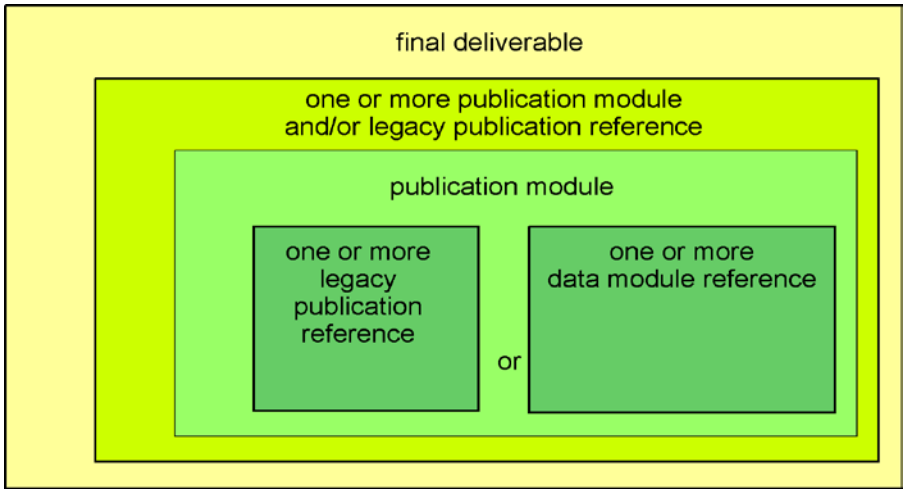
Chap No./Document No.	Title
Chap 3.9.5.2.1.11	Common constructs - Controlled content
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Chap 7.4.1.1.2	Generation process - Metadata
Chap 7.4.2	Generation of publications - Publication module Schema and SCORM content package module Schema
Chap 7.8	Information processing - Applicability

1 General

The publication module defines the content and the structure of a publication. It is to contain one or more references to:

- data modules (including front matter data modules and access illustration data modules)
- publication modules
- legacy technical publications

The publication module Schema is defined in Chap 7.4.2.



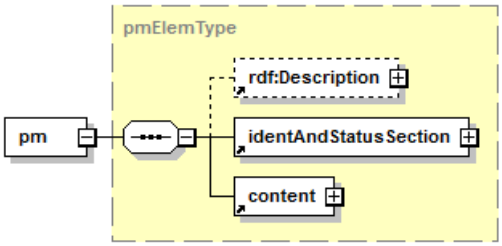
ICN-AE-A-040901-0-C0419-00011-A-01-1

Fig 1 Publication module concept

2 Content of the publication module

Description: The element <pm> defines the content and structure of a publication.

Markup element: <pm>



ICN-1654N-S1000D0009-001-01

Fig 2 Element <pm>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- pmType (O), the type of publication. The attribute can have one of the following values:
  - "pt01" thru "pt99". Refer to Chap 3.9.6.1.

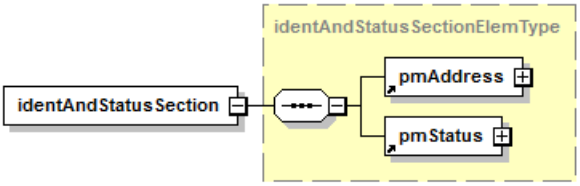
Child elements:

- <rdf:Description>. Refer to Chap 7.4.1.1.2.
- <identAndStatusSection>. Refer to Para 2.1.
- <content>. Refer to Para 2.2.

2.1 Identification and status section

Description: The element <identAndStatusSection> contains the identification and status of the publication module.

Markup element: <identAndStatusSection>



ICN-1654N-S1000D0010-001-01

Fig 3 Element <identAndStatusSection>

Attributes:

- None

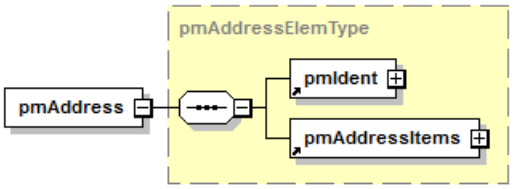
Child elements:

- <pmAddress>. Refer to Para 2.1.1.
- <pmStatus>. Refer to Para 2.1.2.

2.1.1 Publication module address

Description: The element <pmAddress> contains the publication module address information.

Markup element: <pmAddress>



ICN-1654N-S1000D0011-001-01

Fig 4 Element <pmAddress>

Attributes:

– None

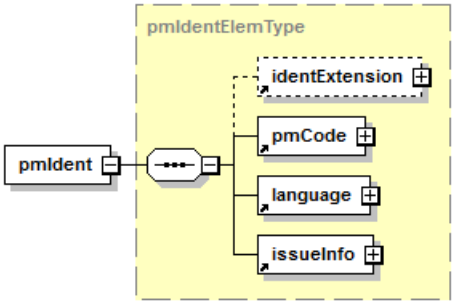
Child elements:

– <pmIdent>. Refer to Para 2.1.1.1.
– <pmAddressItems>. Refer to Para 2.1.1.2.

2.1.1.1 Publication module identification

Description: The element <pmIdent> contains the publication module identification information.

Markup element: <pmIdent>



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Fig 5 Element <pmIdent>

Attributes:

– None

Child elements:

– <identExtension>. Refer to Chap 4.12.
– <pmCode>. Refer to Chap 4.9.2.
– <language>. Refer to Chap 3.9.5.1.
– <issueInfo>. Refer to Chap 3.9.5.1.

Markup example:

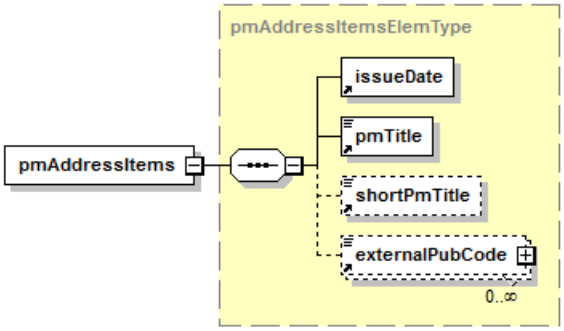
```
<pmIdent>
<pmCode modelIdentCode="S1000D" pmIssuer="I9005"
pmNumber="01000" pmVolume="00"/>
<language languageIsoCode="sx" countryIsoCode="US"/>
```

```
<issueInfo issueNumber="001" inWork="00"/>
</pmIdent>
```

2.1.1.2 Publication module address items

Description: The element <pmAddressItems> contains additional information about a publication module.

Markup element: <pmAddressItems>



ICN-1654N-S1000D0013-001-01

Fig 6 Element <pmAddressItems>

Attributes:

– None

Child elements:

– <issueDate>. Refer to Chap 3.9.5.1.
– <pmTitle>. Refer to Para 2.1.1.2.1.
– <shortPmTitle>. Refer to Para 2.1.1.2.2.
– <externalPubCode>. Refer to Chap 3.9.5.2.1.2.

Markup example:

```
<pmAddressItems>
<issueDate day="01" month="08" year="2008"/>
<pmTitle>International specification for technical publications
utilizing a common source database</pmTitle>
<externalPubCode pubCodingScheme="XFILEID">S9XXX-X4-ZZZ-
010</externalPubCode>
</pmAddressItems>
```

2.1.1.2.1 Publication module title

Description: The element <pmTitle> gives the meaning of the publication and is defined by the project.

Markup element: <pmTitle>

Attributes:

– None

Child elements:

– None

Markup example:

```
<pmTitle>International specification for technical publications
using a common source database</pmTitle>
```

2.1.1.2.2 Short publication module title

Description: The element <shortPmTitle> contains the short title of the publication or an extension to the publication title like "- Volume No. 2" defined by the project.

Markup element: <shortPmTitle>

Attributes:

– None

Child elements:

– None

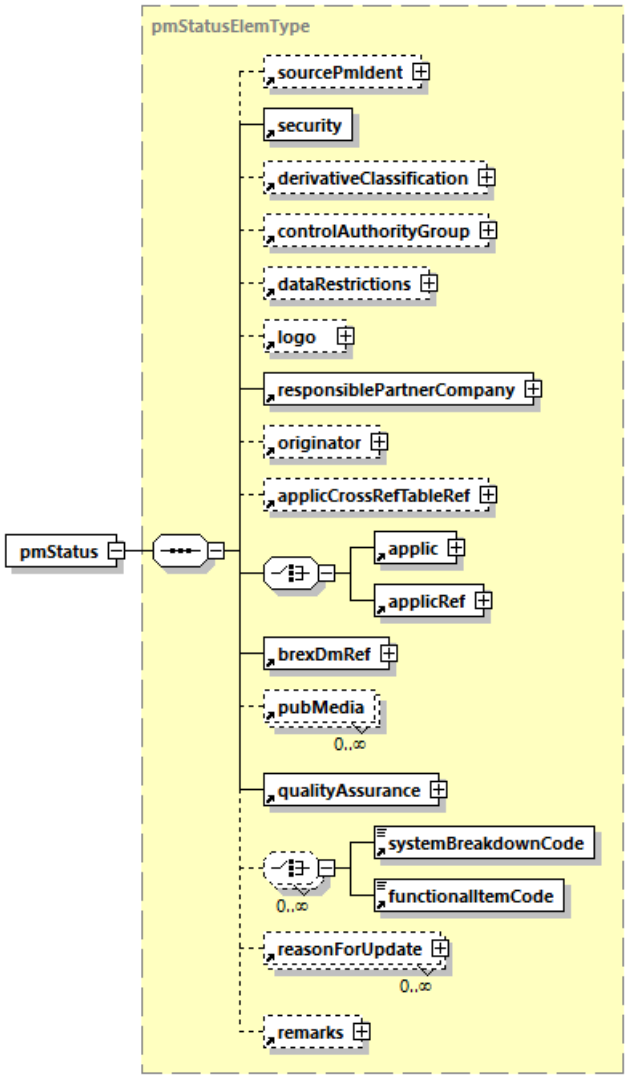
Markup example:

```
<shortPmTitle>S1000D</shortPmTitle>
```

2.1.2 Publication module status information

Description: The element <pmStatus> contains the publication module status information.

Markup element: <pmStatus>



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Fig 7 Element <pmStatus>

Attributes:

- issueType (O). Refer to Chap 3.9.5.1.

Child elements:

- <sourcePmIdent>. Refer to Para 2.1.2.1.
- <security>. Refer to Para 2.1.2.2.
- <derivativeClassification>. Refer to Para 2.1.2.3.
- <controlAuthorityGroup>. Refer to Chap 3.9.5.1.
- <dataRestrictions>. Refer to Para 2.1.2.4.
- <logo>. Refer to Para 2.1.2.5.
- <responsiblePartnerCompany>. Refer to Para 2.1.2.6.
- <originator>. Refer to Para 2.1.2.7.
- <applicCrossRefTableRef>. Refer to Para 2.1.2.8.
- <applic>. Refer to Chap 3.9.5.3.
- <brexDmRef>. Refer to Chap 3.9.5.1.

- <pubMedia>. Refer to Para 2.1.2.9.
- <qualityAssurance>. Refer to Para 2.1.2.10.
- <systemBreakdownCode>. Refer to Chap 3.9.5.1.
- <functionalItemCode>. Refer to Chap 3.9.5.1.
- <reasonForUpdate>. Refer to Para 2.1.2.11.
- <remarks>. Refer to Para 2.1.2.12.

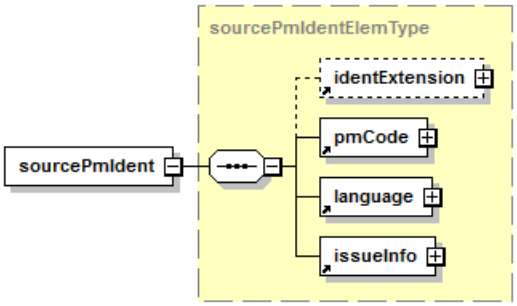
Markup example:

```
<pmStatus>
<security securityClassification="01"/>
<responsiblePartnerCompany enterpriseCode="B6865">
<enterpriseName>ASD</enterpriseName>
</responsiblePartnerCompany>
<applic>
<displayText>
<simplePara>ALL</simplePara>
</displayText>
</applic>
<brexDmRef>...</brexDmRef>
<qualityAssurance>
<unverified/>
</qualityAssurance>
</pmStatus>
```

2.1.2.1 Source publication module identification

Description: The element <sourcePmIdent> contains the source publication module identification information such as publication module code, language and issue information.

Markup element: <sourcePmIdent>



ICN-1654N-S1000D0015-001-01

Fig 8 Element <sourcePmIdent>

Attributes:

- None

Child elements:

- <identExtension>. Refer to Chap 4.12.
- <pmCode>. Refer to Chap 4.9.2.
- <language>. Refer to Chap 3.9.5.1.
- <issueInfo>. Refer to Chap 3.9.5.1.

Markup example:

```
<sourcePmIdent>
<pmCode modelIdentCode="S1000D" pmIssuer="I9005"
pmNumber="01000" pmVolume="00"/>
<language countryIsoCode="US" languageIsoCode="sx"/>
<issueInfo issueNumber="005" inWork="00"/>
</sourcePmIdent>
```

2.1.2.2 Security classification

Description: The element <security> contains the security classification and restrictive marking of the complete publication module and its contained or associated illustrations.

Markup element: <security>. Refer to Chap 3.9.5.1.

2.1.2.3 Derivative classification

Description: The element <derivativeClassification> contains all derivative classification actions taken (eg, source material, date of action, action type) to the information in the complete publication module.

Markup element: <derivativeClassification>. Refer to Chap 3.9.5.1.

2.1.2.4 Data restrictions

Description: The element <dataRestrictions> contains the instructions and information, applicable to the publication module, that relate to the use, storage and handling.

Markup element: <dataRestrictions>. Refer to Chap 3.9.5.1.

2.1.2.5 Logotype

Description: The element <logo> contains the reference to the manufacturer's, project's or sponsor's logotype.

Note

The element <logo> can be used in front matter data modules. Refer to Chap 3.9.5.2.16.

Markup element: <logo>

Attributes:

– None

Child elements:

– <symbol>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<logo>
<symbol infoEntityIdent="ICN-S3627-S1000D0494-001-01"/>
</logo>
```

2.1.2.6 Responsible partner company

Description: The element <responsiblePartnerCompany> contains the company, organization or authority responsible for the publication module.

Markup element: <responsiblePartnerCompany>. Refer to Chap 3.9.5.1.

2.1.2.7 Originator

Description: The element <originator> contains the originating company or organization responsible for the production of the publication module.

Markup element: <originator>. Refer to Chap 3.9.5.1.

2.1.2.8 Applicability cross-reference table reference

Description: The element <applicCrossRefTableRef> contains a reference to the Applicability Cross-reference Table (ACT) data module that applies to the publication module. Applicability and the ACT data module and related aspects are described in Chap 3.9.5.3.1, Chap 4.14, and Chap 7.8.

Markup element: <applicCrossRefTableRef>. Refer to Chap 3.9.5.3.1.

2.1.2.9 Publication media

Description: The element <pubMedia> contains the information about the media on which the publication is delivered.

Markup element: <pubMedia>

Attributes:

- pubMediaType (M), the media type on which the publication module is delivered (eg, paper, CD-ROM, DVD, online)
- pubMediaCode (M), the media identification (label)
- volumeNumber (O), the identifier of the volume of the media, defined by two numeric characters. It is used when the information needs to be separated into several volumes due to media restrictions. It is not related to the attribute pmVolume within the publication module code.
- mediaLocation (O), the location of the media

Child elements:

- None

Markup example:

```
<pubMedia pubMediaCode="DVD01" pubMediaType="DVD"/>
```

2.1.2.10 Quality assurance status

Description: The element <qualityAssurance> contains details of the status of the quality assurance process as required by the project. The publication module must be identified as either being unverified or verified. The element <qualityAssurance> can contain applicability information to indicate the applicability of the quality assurance information. This applicability information must be a subset of the mandatory applicability settings for the complete publication module. This applies equally to the element <qualityAssurance> and all its child elements.

Markup element: <qualityAssurance>. Refer to Chap 3.9.5.1.

2.1.2.11 Reason for update

Description: The element <reasonForUpdate> contains a short explanation of the reason for updating the publication module.

Markup element: <reasonForUpdate>. Refer to Chap 3.9.5.2.1.1.

2.1.2.12 Remarks

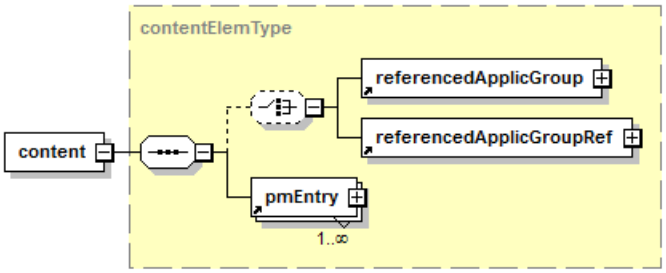
Description: The element <remarks> is used for inserting general remarks if required by the project. Compliance category of service bulletins are to be given under this heading.

Markup element: <remarks>. Refer to Chap 3.9.5.1.

2.2 Publication module content section

Description: The element <content> contains the content section of the publication module.

Markup element: <content>



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Fig 9 Element <content>

Attributes:

– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

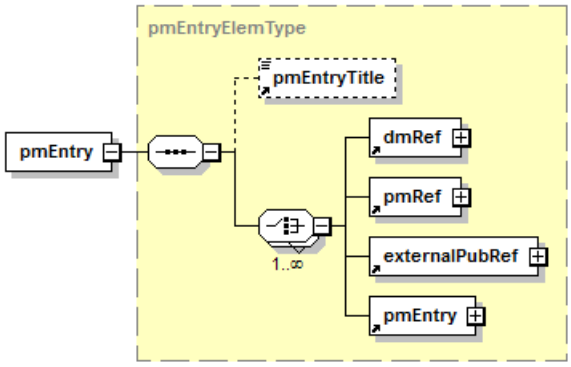
Child elements:

– <referencedApplicGroup>. Refer to Chap 3.9.5.3.
– <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
– <pmEntry>. Refer to Para □.

2.2.1 Publication module entry

Description: The element <pmEntry> contains references to one or more data modules, publications, non-S1000D publications or publication module entries. The publication module entry is central for a publication module and can be defined recursively. This allows publication module structures in variable depth.

Markup element: <pmEntry>



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Fig 10 Element <pmEntry>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `pmEntryType` (O), the publication module entry type. The attribute can have one of the following values:
  - "`pmt01`" thru "`pmt99`". Refer to Chap 3.9.6.1.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `authorityName` (O) and `authorityDocument` (O), the controlled content indications. Refer to Chap 3.9.5.2.1.11.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`pmEntryTitle`>. Refer to Para 2.2.2.
- <`dmRef`>. Refer to Chap 3.9.5.2.1.2.
- <`pmRef`>. Refer to Chap 3.9.5.2.1.2.
- <`externalPubRef`>. Refer to Chap 3.9.5.2.1.2.
- <`pmEntry`>. Refer to Para □.

2.2.2 Title of the publication module entry

Description: The element <`pmEntryTitle`> contains the title of the publication entry for one or more data modules, publications, non-S1000D publications or publication module entries. The title can be used to populate the element <`title`> in the element <`tocEntry`> in the hierarchical structured table of contents. Refer to Chap 3.9.5.2.16.

Markup element: <`pmEntryTitle`>

Attributes:

- None

Child elements:

- None

Markup example:

```
<pmEntryTitle>Introduction</pmEntryTitle>
```

Chapter 4.9.2

Publication management - Coding publication modules

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Chap No./Document No.	Title
Chap 4.3.1	Data module code - Model identification code
Chap 7.5.1	Information interchange - File based transfer

1 General

The publication module code is the standardized and structured identifiers of a publication module or a final deliverable publication product. It is an element of the status section of the publication module package.

The publication module code is part of the unique identifier of the publication module. The publication module code is used to manage publication modules in the CSDB, to retrieve them or to gain access to them in an IETP environment, as an entry in the list of applicable publications and as a reference in data modules and publications.

2 Content

2.1 Publication module code

Description: The element <pmCode> contains the publication module code. Together with the issue information, it gives an identification that is unique within the S1000D domain.

The publication module code is part of the unique identifier of the publication module and is comprised of up to 26 alphanumeric characters and is built up as shown in Table 2. The minimum length is 14 characters.

YY - YYYYY - YYYYY - NN (14 characters)

thru

YYYYYYYYYYYYYY - YYYYY - YYYYY - NN (26 characters)

Table 2 Publication module code

Breakdown	Rule
Model identification code	2 thru 14 uppercase alphanumeric characters
Issuing authority	5 uppercase alphanumeric characters
Number of the publication	5 uppercase alphanumeric characters
Volume number	2 numeric characters

Markup element: <pmCode>

Attributes:

- modelIdentCode (M). Refer to Para 2.1.1.
- pmIssuer (M). Refer to Para 2.1.2.
- pmNumber (M). Refer to Para 2.1.3.
- pmVolume (M). Refer to Para 2.1.4.

Child elements:

- None

2.1.1 Model identification code

Description: The model identification code is given in the publication module code by the highlighted characters as follows:

YY - YYYYY - YYYYY - NN (14 characters)

thru

YYYYYYYYYYYYYY - YYYYY - YYYYY - NN (26 characters)

The model identification code is contained in the attribute modelIdentCode. Refer to Chap 4.3.1.

2.1.2 Issuing authority

Description: The CAGE code of the publication module issuing authority is given in the publication module code by the highlighted characters as follows:

YY - **YYYYY** - YYYYY - NN (14 characters)

thru

YYYYYYYYYYYYYY - **YYYYY** - YYYYY - NN (26 characters)

The CAGE code of the issuing authority is contained in the attribute pmIssuer.

Business rule decision point BRDP-S1-00365 - Use of the attribute `pmIssuer`:

- Decide on the use of the attribute `pmIssuer`.

2.1.3 Number of the publication module

Description: The number of the publication module is given in the publication module code by the highlighted characters as follows:

YY - YYYYY - **YYYYY** - NN (14 characters)

thru

YYYYYYYYYYYYYY - YYYYY - **YYYYY** - NN

The issuing authority assigns the number of the publication module. The number of the publication module is a unique alphanumeric identifier for a given on the model identification code (attribute `modelIdentCode`) and issuing authority (attribute `pmIssuer`).

The number of the publication module is contained in the attribute `pmNumber`.

2.1.4 Volume of the publication

Description: The volume is given in the publication module code by the highlighted characters as follows:

YY - YYYYY - YYYYY - **NN**

thru

YYYYYYYYYYYYYY - YYYYY - YYYYY - **NN**

This element is used in cases where a publication has to be separated into volumes without assigning a new number. Default value is "`00`" if only one volume exists.

The volume of the publication is contained in the attribute `pmVolume`.

2.2 Presentation of the publication module code

2.2.1 Use of hyphens

The publication module code must be presented with hyphens [-] in the positions as shown in the examples and without spaces in between. The hyphens delimit the contents of the codes, as shown, but are not included within the population of the publication module code elements. This rule applies also to cases where the publication module code is given as a single string.

2.2.2 Example for the publication module code

On output, (eg, on paper, CD-ROM), the publication module code must be presented for proper identification of the pages or the media.

Note

For clarification, for example when data module codes and publication module codes are presented it can be useful to add the prefix "PMC-" or "PME-" to the code.

Example of publication module codes:

- A1-C0149-00111-01
- A1-C0149-00111-02

Example of extended publication module codes:

- SF518-USER001-A1-C0149-00111-01
- SF518-USER001-A1-C0149-00111-02

The output media, contained in the status section of the publication module in the attribute `pubMediaType`, can be added if required by the project. For example, when a publication is delivered on different media. In this case the following abbreviations are recommended.

- P = paper
- CD = CD-ROM
- W = webURL
- DVD = Digital Versatile Disc

Example of publication module codes:

- A1-C0149-00111-01-W
- A1-C0149-00111-01-P

Example of extended publication module codes:

- SF518-USER001-A1-C0149-00111-01-W
- SF518-USER001-A1-C0149-00111-01-P

The media must not be printed on the pages in paper publications when used as a reference.

Note

Refer to Chap 7.5.1 for file naming conventions.

Chapter 4.9.3

Publication management - Building publications

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Chap No./Document No.	Title
Chap 3.9.5.1	Data modules - Identification and status section
Chap 4.9.1	Publication management - Publication module
Chap 5.3.1.1	Common requirements - Front matter

1 General

The publication module allows the building of the publication to be independent of the end user presentation software. The preparation of the publication module is an authoring process.

2 Content

2.1 Publication construction

2.1.1 Status information

The status section contains the identification elements required to address and control the publication module as defined in Chap 4.9.1. The elements of the status section are similar to the elements of the status section of the data module as defined in Chap 3.9.5.1.

2.1.2 Content information

The content of the publication module is primarily built of data modules extracted from the CSDB. This includes the required front matter as given in Chap 5.3.1.1.

The structure of the publication module is defined by the publication module entries. These can be recursively defined and give the table of contents of the final publication. An additional method of navigating through an IETP can be achieved by the use of access illustrations.

Each publication module entry must have a title and references to one or more elements of the following type:

- data module
- publication module
- legacy technical publication

The generation of a publication module facilitates a top down design for the publication structure of the Product. The publication structure can be defined at an early stage of a project prior to population of the content.

3 Example

The following markup example represents a valid publication module fragment in XML format:

```
<pm xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="http://www.s1000d.org/S1000D_4-
2/xml_schema_flat/pm/pmSchema.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
<identAndStatusSection>
<pmAddress>
<pmIdent>
<pmCode pmVolume="00" modelIdentCode="DEE1B" pmNumber="01132"
pmIssuer="C0419"/>
<language countryIsoCode="US" languageIsoCode="sx"/>
<issueInfo inWork="01" issueNumber="002"/>
</pmIdent>
<pmAddressItems>
<issueDate day="01" month="01" year="2010"/>
<pmTitle>Air vehicle maintenance - Landing gear system</pmTitle>
</pmAddressItems>
</pmAddress>
<pmStatus>
<security securityClassification="02"/>
<responsiblePartnerCompany enterpriseCode="C0419"/>
<applicCrossRefTableRef>
<dmRef>
<dmRefIdent>
<dmCode systemDiffCode="A" infoCode="001" subSystemCode="A"
modelIdentCode="S1000D" infoCodeVariant="A" disassyCodeVariant="A"
subSubSystemCode="1" itemLocationCode="A" assyCode="11"
systemCode="33" disassyCode="01"></dmCode>
</dmRefIdent>
</dmRef>
</applicCrossRefTableRef><applic>
<displayText></displayText>
</applic>
<qualityAssurance>
<firstVerification verificationType="tabtop"/>
</qualityAssurance>
</pmStatus>
</identAndStatusSection>
<content>
<pmEntry>
<pmEntryTitle>Front matter</pmEntryTitle>
<dmRef>
```

```
<dmRefIdent>
<dmCode systemDiffCode="A" infoCode="001" subSystemCode="A"
modelIdentCode="S1000D" infoCodeVariant="A" disassyCodeVariant="A"
subSubSystemCode="1" itemLocationCode="A" assyCode="11"
systemCode="33" disassyCode="01"></dmCode>
</dmRefIdent>
</dmRef>
</pmEntry>
<pmEntry>
<pmEntryTitle>Extension and retraction</pmEntryTitle>
<dmRef>
<dmRefIdent>
<dmCode systemDiffCode="B" infoCode="040" subSystemCode="3"
modelIdentCode="DEE1B" infoCodeVariant="A" disassyCodeVariant="A"
subSubSystemCode="0" itemLocationCode="A" assyCode="00"
systemCode="32" disassyCode="00"></dmCode>
</dmRefIdent>
</dmRef>
</pmEntry>
</content>
</pm>
```

Chapter 4.9.4

Publication management - Updating publications

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 5.3.1.1	Common requirements - Front matter

1 General

Publications are represented by publication modules. Consequently, needs to update a publication will normally induce an update to the corresponding publication module instance, due to changes as to which entries are contained or due to changes to the referenced elements of the publication modules (eg, the data modules of the Product). Updates of publications can be prepared as complete publication modules, including all referenced elements or partly by updating the constituent publication modules and the referenced changed elements. The update of a publication must be reflected in the front matter data modules (eg, change record, highlights) as defined in Chap 5.3.1.1.

Updating of publication modules includes the element <issueInfo> in the element <pmIdent> and attribute issueType in the element <pmStatus> and follows the same rules as of data modules. Refer to Chap 3.9.5.1.

Chapter 4.10

Information management - Business rules exchange

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Chap 4.10.1	Business rules exchange - Business rules document data module
Chap 4.10.2	Business rules exchange - BREX data module

1 General

This chapter describes the CSDB support for creation and management of business rules in S1000D.

Two dedicated data module types are provided for this purpose, the Business rules document data module and the BREX data module.

2 Business rules document data module

The data module provides a means to create and manage the business rules developed by a project, enterprise, etc. The basic structure is inherited from the descriptive data module, however enhanced to facilitate a structured representation of business rules and business rules decision points, as well as information valuable in the business rules development process. The data module is described in Chap 4.10.1.

3 BREX data module

The data module provides a means to represent adopted business rules in a formal way that enables unambiguous automatic processing of the rules. Such processing includes, without being restricted to, verification that the XML objects in the CSDB fulfill the requirements expressed in the business rules. The data module is described in Chap 4.10.2.

Chapter 4.10.1

Business rules exchange - Business rules document data module

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1 General

This chapter describes the purpose and the structure of the business rules document data module. It is divided into three main areas:

- data module coding
- data module structure
- template data module

1.1 Primary purpose

A business rules document data module is one of a set of data modules that define all the business rules together with descriptions and examples that are required to support an organization and/or project. This includes the rules and requirements regarding how S1000D XML files must be configured and all of the other types of rules defined in Chap 2.5.1. This includes the entities, notations, elements, and attributes that are allowed and any restrictions on their values. The intent is to provide S1000D implementation guidance to authors, editors, and Information Technology personnel, who are responsible for the creation and development of valid content conforming to the design considerations of project managers and information architects (in accordance with contractual obligations and corporate, organization, and/or customer guidelines). Refer to Chap 2.5.1.

S1000D and project specific Business Rules Decision Points (BRDP) and the corresponding decisions can be recorded using <brPara> in the business rules document data module. Decisions are recorded using the element <brDecision>. Refer to Chap 2.5.2 and Chap 2.5.3 for the concept of the business rules generation and use for the business rules decision point index.

Note

This guidance can be captured in various project or organization specific documents. Refer to Chap 2.5.2.

Note

Data module codes are allocated in accordance with Chap 4.3 and Para 3.

1.2 Document structure

The business rules document data module Schema is based on the descriptive Schema, but modified to satisfy the specific requirement for the business rules document. The Schema structure provides references to other publications. Refer to Para 4 and Chap 3.9.5.2.1.2.

1.3 Template

A business rules template data module is provided by the specification. The template presents all BRDP defined by the specification. Refer to Para 5.

2 Concept

2.1 Use as method of governing the business rule in the life cycle of the project

The business rules document data module provides unambiguous descriptions of business rules decisions for a project. A project can decide to exclusively use the business rules document data module or use another means to capture the business rules.

Business rules document data modules provide:

- a place to record decisions
- a means of exchanging business rules between concerned parties while rules are being developed
- provide a reference to business rules in various documents
- reduced risk of any misinterpretations and misunderstandings through formal descriptions of the business rules
- governance and capturing of business rule decisions including explanations and guidance through the life of the project and/or organization
- a means to record the priority and severity information for each business rule decision. Refer to Para 4.
- a means of identifying the business rules decisions to capture in a BREX data module. Refer to Chap 4.10.2.
- a means of indicating relationships between various BRDP and various constructs defined by S1000D
- a method of tracking the required dates for business rules development and recording the progress of business rules development

2.2 Layered business rules document data module

Business rules document data modules can be layered in various ways depending on the requirements of the project. It can also indicate the corresponding BREX layering. Refer to Chap 2.5.1, Chap 2.5.2, Chap 4.10.2 and Chap 7.9.

2.3 Single and multiple business rules document data modules

A single business rules document data module can be created covering all business rule decisions for a project. An alternative is to create a collection of business rules document data modules, which belong to the same layer of the business rules. The decision on what information goes is in which data module, is the responsibility of the project. In this case, these data modules should include, but not be limited to, projects containing multiple model identification codes, system difference codes, SNS, and/or disassembly codes.

Business rule decision point BRDP-S1-00564 - Single or multiple business rules document:

- Decide whether to use a single or multiple business rules document data module to capture business rules. If multiple data modules are needed, identify which rules will go into which data module. Refer to Para 3.1.

3 Coding

The information code for a business rules document data module is IC 024, and the item location code is set to D. Refer to BREX-S1-00265. Coding business rules document data modules is the same as all other data modules, with the exception of the following.

3.1 Coding for single business rules documents data module

When business rules for the whole Product are contained in a single business rules document data module. It must be coded:

YY-A-00-00-00-00A-024A-D (17 characters)

thru

YYYYYYYYYYYYYY-AAAA-**Y**00-00-0000-00AAA-024A-D (37 characters)

Where "**YY**" and "**YYYYYYYYYYYYYY**" are the Product's model identifier. Refer to Chap 4.3.1.

3.2 Coding for multiple business rules documents data modules at the Product level

When business rules for the whole Product are contained in multiple business rules document data modules. They must be coded:

YY-A-00-00-00-**NN**A-024A-D (17 characters)

thru

YYYYYYYYYYYYYY-AAAA-**Y**00-00-0000-**NN**AAA-024A-D (37 characters)

Where:

- "**YY**" and "**YYYYYYYYYYYYYY**" are the Product's model identifier. Refer to Chap 4.3.1.
- "**NN**", in the disassembly code, is a sequential number starting from "00".

3.3 Coding for business rules documents data modules at the system level

When business rules apply to a specific system of a Product thy can be contained in one or more business rules document data modules. They must be coded:

YY-A-**SS**-00-00-**NN**A-024A-D (17 characters)

thru

YYYYYYYYYYYYYY-AAAA-**YSS**-00-0000-**NN**AAA-024A-D (37 characters)

Where:

- "**YY**" and "**YYYYYYYYYYYYYY**" are the Product's model identifier. Refer to Chap 4.3.1.
- "**SS**" is the system code. Refer to Chap 4.3.3.
- "**NN**", in the disassembly code, is a sequential number for each system, starting from "00".

4 Schema basic rules

The business rules data module has a structure based on the descriptive Schema. Additionally, it contains a business rules paragraph structure, which allows the BRDP and business rules

decisions to be recorded. A business rules data module can also include the audit and status (refer to Para 4.12.4), and provide an indication of the relationships between various BRDP definitions, business rule decisions, S1000D text, S1000D Schemas, business rules categories, configurable attributes, and project/organization specific remarks.

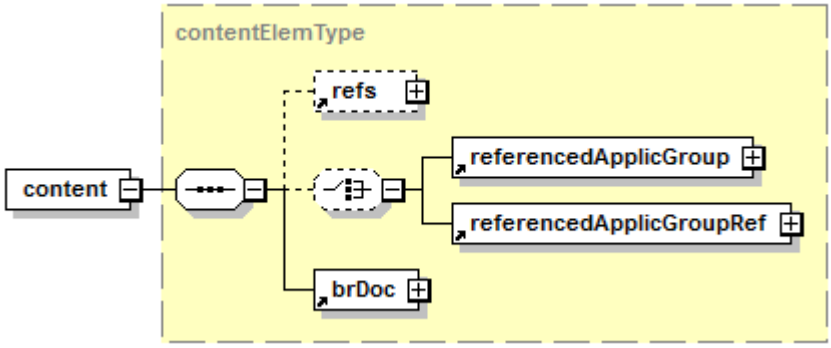
The descriptive structure of the business rules data module Schema permits simple conversion of project and organizational business rules documents into an XML format and an efficient addition for the maintenance of business rules and related information.

The alternates concept (refer to Chap 4.13.3) is not used in the business rules data module Schema.

4.1 Content

Description: The element <content> captures all types of information related to business rules documentation. Through its descriptive structure, the business rules data module Schema can be used to create project and/or organization business rules. It can also be used to create any kind of documentation related to business decisions and business rules. For elements and attributes similar to the descriptive data module structure, refer to Chap 3.9.5.2.2.

Markup element: <content>



ICN-I9005-0410010001-001-01

Fig 1 Element <content>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

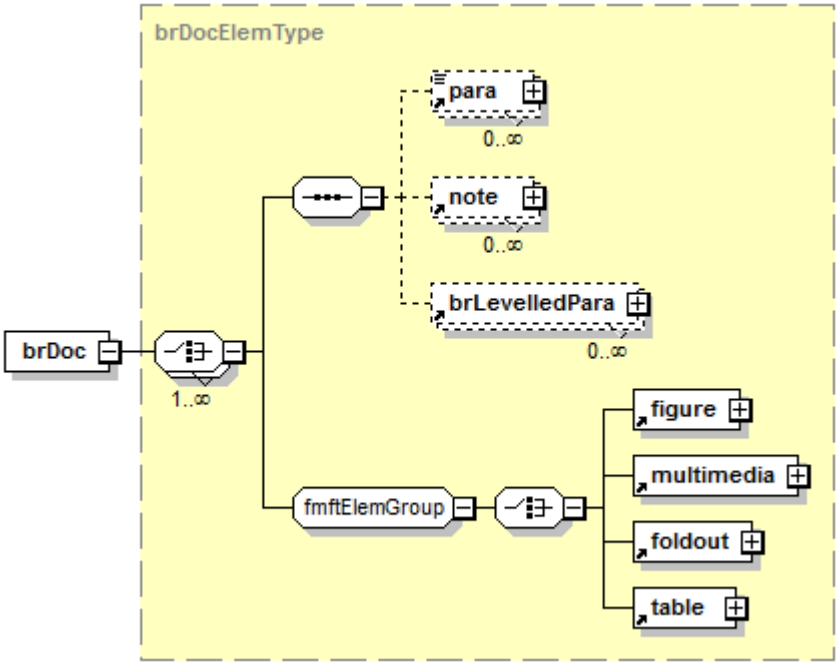
- <refs>. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
- <brDoc>. Refer to Para 4.2.

4.2 Business rules document

Description: The element <brDoc> has a similar structure to the main content of descriptive data modules with the exception of warningAndCautionElemGroup, which is not included in the Business rules document data module. Refer to Chap 3.9.5.2.2. There are additional elements and attributes provided in the element <brLevelledPara> for recording business rules information.

Additional referencing elements are available in the business rules document data module. These three elements, <brDecisionef>, <brDecisionPointRef>, and <sourceDocRef>, provide the ability to reference business rule decisions, business rule decision points, and other internal or external locations in the data module or publication. These referencing elements are available within the element <para>, <notePara>, and other various locations in the structure. Refer to Para 4.2.1, Para 4.4.1, and Para 4.8.

Markup element: <brDoc>



ICN-I9005-0410010002-001-01

Fig 2 Element <brDoc>

Attributes:

- defaultBrSeverityLevel (O), the default business rules severity level which indicates the severity level of any rules which have no explicit severity specified for that rule. Refer to Para 4.4.

Child elements:

- <para>, unnumbered paragraphs used for an introduction before the business rules document starts. Refer to Chap 3.9.5.2.1.10.
- <note>. Refer to Chap 3.9.3.
- <brLevelledPara>. Refer to Para 4.3.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7 and Chap 3.9.5.2.1.6.
- <table>. Refer to Chap 3.9.5.2.1.6.

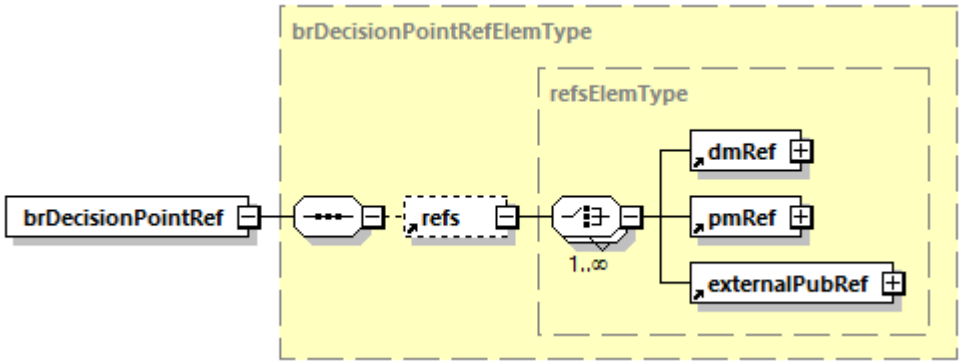
Markup example:

Refer to Para 6.2.

4.2.1 Business rule decision point reference

Description: The element <brDecisionPointRef> defines a reference of a business rule decision point or another element to a business rule decision point. The direct reference from a business rule decision point to itself is not allowed.

Markup element: <brDecisionPointRef>



ICN-1G6E8-00001-001-01

Fig 3 Element <brDecisionPointRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O), and reasonForUpdateRefIds (O), the change indiciations. Refer to Chap 3.9.5.2.1.1.
- brDecisionPointUniqueIdent (O), the unique identifier of the element <brPara> being referred to. It is used for the purpose of implicit referencing. Refer to Para 4.4.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification(O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <refs>. Used together with the attribute referredFragment and attribute id on the element <brPara> for explicit referencing. Refer to Para 4.6 and Chap 3.9.5.2.1.2.

Markup example:

```
<brDecisionPointRef brDecisionPointUniqueIdent="BRDP-S1-00566"/>
```

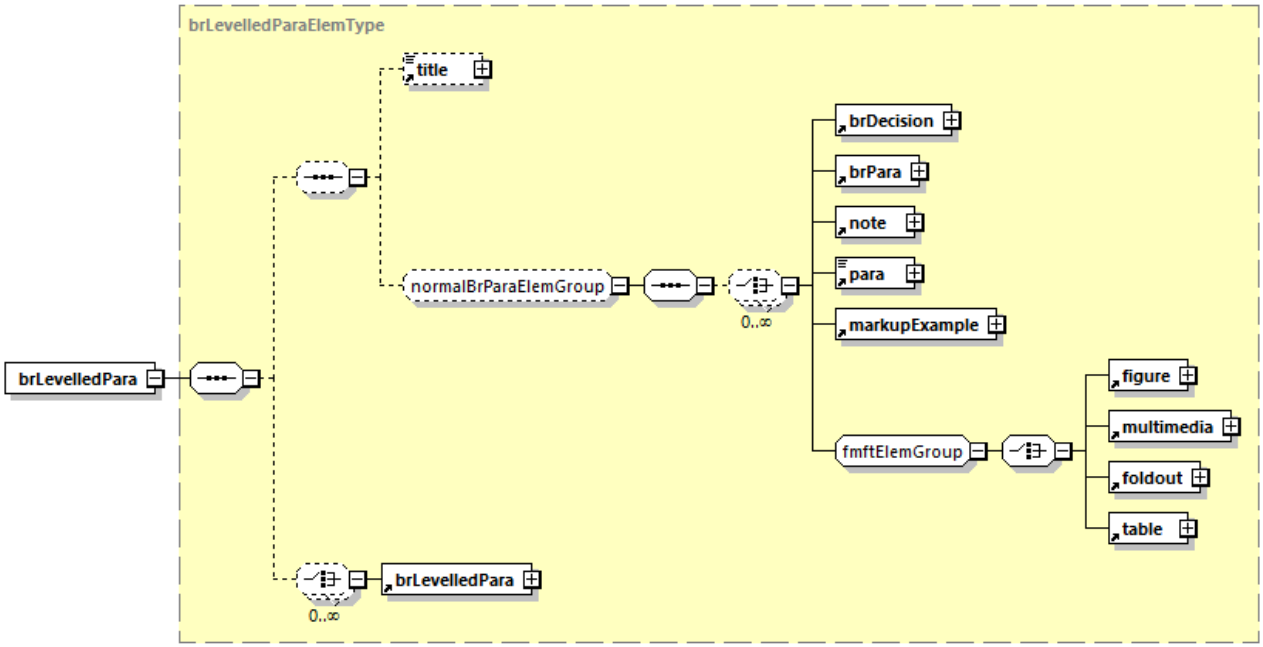
4.3 Business rule levelled paragraph

Description: The element <brLevelledPara> is the equivalent of a headed paragraph and can also contain subparagraphs. Similar to the element <levelledPara> in a descriptive data module, the element <brLevelledPara> can have one or more occurrences of the element <brLevelledPara> nested within it. The depth of this structure is unlimited, however, it is recommended to not exceed five levels of depth.

When a <brLevelledPara> contains a nested <brLevelledPara>, it is recommended for two or more of this element be provided at the same level, otherwise

standard heading rules can be violated for the project. Rules and recommendations for <levelledPara> in descriptive data modules apply here. Refer to Chap 3.9.5.2.2.

Markup element: <brLevelledPara>



ICN-I9005-0410010003-002-01

Fig 4 Element <brLevelledPara>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <note>. Refer to Chap 3.9.3.
- <brDecision>. Refer to Para 4.4.
- <brPara>. Refer to Para 4.6.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <markupExample>, captures one or more markup examples by use of the element <verbatimText>. Refer to Chap 3.9.5.2.1.10.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7 and Chap 3.9.5.2.1.6.

- <table>. Refer to Chap 3.9.5.2.1.6.
- <brLevelledPara>

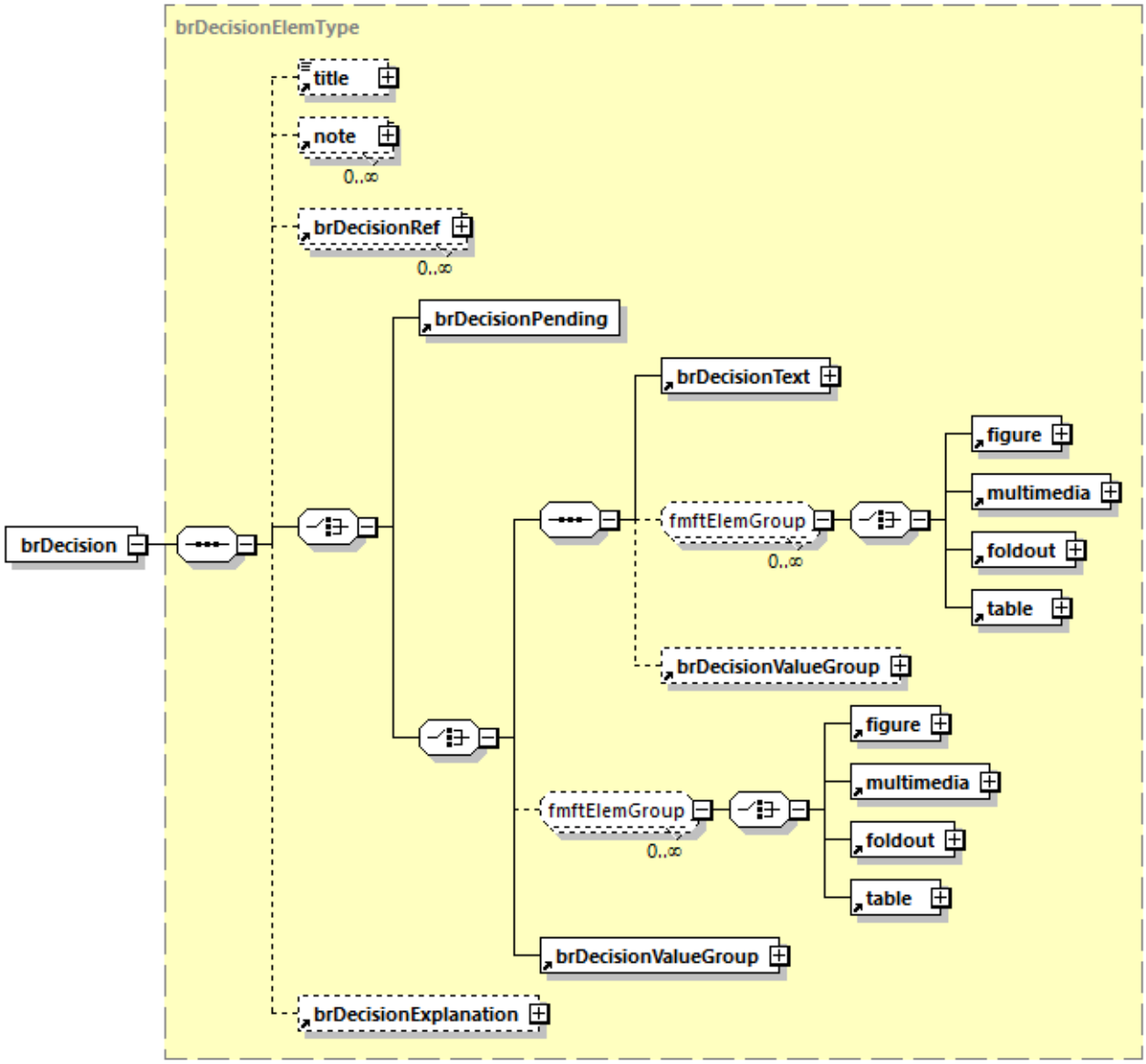
Business rule decision point BRDP-S1-00565 - Level of depth of business rules document data modules:

- Decide whether to exceed five levels of depth for new data.

4.4 Business rule decision

Description: The element <brDecision> contains a single decision applicable to the project or organization. A decision is not limited to authoring or publishing, but can contain anything related to the organization or project. These decisions can be included in whole or in part and addressed throughout the lifecycle of the product.

Markup element: <brDecision>



ICN-I9005-0410010004-002-01

Fig 5 Element <brDecision>

Attributes:

- applicRefId (O), the applicability information by referencing the element <applic>. Refer to Chap 3.9.5.3.
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- brDecisionIdentNumber (M), the unique identifier of the element <brDecision>. It must be used when at least one element <brDecisionText> and/or element <brDecisionValueGroup> is populated. The only allowed case for not including the attribute brDecisionIdentNumber is when the mandatory choice is element <brDecisionPending> is used. The coding scheme of the attribute brDecisionIdentNumber is a project/organizational decision. It must be defined in such a way that inter-project, inter-program or inter-organizational referencing is possible by using solely the identifier coded by this attribute. For example, model identifier, as well as originator's CAGE code can be included as a part of the brDecisionIdentNumber. The project and/or organization must ensure the uniqueness of the identifiers captured by the attribute brDecisionIdentNumber. Refer to BREX-S1-00266.
- brexRuleFlag (O), indicates whether the business rule decision must or must not be captured in a BREX data module. When used, the textual information captured in the element <brDecisionText> must go into the textual response definitions of the element <objectUse> inside a BREX data module. These can be identified and automatically imported if needed.
- brSeverityLevel (O), the indicator of the severity of not implementing the business rule decision with its definition. The concept of business rules severity level is described in Chap 2.5.2. This attribute can have one of the following values:
  - "brsl01" thru "brsl99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Business rule decision point BRDP-S1-00566 - Identification numbering:

- Decide on the numbering scheme for the attribute brDecisionIdentNumber and the attribute id as applicable.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <note>. Refer to Chap 3.9.3.
- <brDecisionRef>. Refer to Para 4.4.1.
- <brDecisionPending>. Refer to Para 4.4.2.
- <brDecisionText>. Refer to Para 4.4.3.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7 and Chap 3.9.5.2.1.6.
- <table>. Refer to Chap 3.9.5.2.1.6.
- <brDecisionValueGroup>. Refer to Para 4.4.4.

– <brDecisionExplanation>. Refer to Para 4.5.

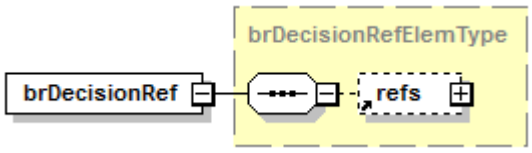
Markup example:

```
<brDecision brDecisionIdentNumber="K0378-00124"
brexRuleFlag="1">
<brDecisionText>
<para>(Prohibited inclusion of the element &lt;note&gt; within
the element &lt;commonInfo&gt;. Content must be authored using
the element &lt;commonInfoDescrPara&gt;.) The element
&lt;commonInfo&gt; has one branch that contains &lt;note&gt;,
&lt;para&gt;, and &lt;commonInfoDescrPara&gt; and one branch
that contains only &lt;commonInfoDescrPara&gt;. The branch
containing &lt;note&gt;, &lt;para&gt;, and
&lt;commonInfoDescrPara&gt; shall not be used in all except BREX
DM. There it is allowed.</para>
</brDecisionText>
<brDecisionExplanation>
<para>Occassionally, it is necessary to include a figure
(optionally with a primary title). For this reason, the titles
and figures are allowed under commonInfo. </para>
<para>The path "//commonInfo/para" must be prohibited to prevent
a &lt;para&gt; and a &lt;commonInfoDescrPara&gt; from appearing
at the same level.</para>
</brDecisionExplanation>
</brDecision>
```

4.4.1 Business rule decision reference

Description: The element <brDecisionRef> defines a reference of a business rule decision or another element to a business rule decision. The direct reference from a business rule decision to itself is not allowed.

Markup element: <brDecisionRef>



ICN-I9005-0410010005-001-01

Fig 6 Element <brDecisionRef>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- brDecisionIdentNumber (O), the unique identifier of the element <brDecision> being referred to. It is used for the purpose of implicit referencing. Refer to Para 4.4.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`refs`>. Used together with the attribute `referredFragment` and the attribute `id` (refer to Chap 3.9.5.2.1.2) on the element <`brDecision`> for explicit referencing. Refer to Para 4.4.

Markup example:

```
<brDecision brDecisionIdentNumber="K0378-00124">
…
</brDecision>
<brDecision brDecisionIdentNumber="K0378-00125"
brSeverityLevel="brsl03">
<brDecisionRef brDecisionIdentNumber="K0378-00124"/>
…
</brDecision>
```

4.4.2 Business rule decision pending

Description: The empty element <`brDecisionPending`> indicates that a business rule decision, or its part on a BRDP, has not been determined and is "to be defined".

Markup element: <`brDecisionPending`>

Attributes:

- None

Child elements:

- None

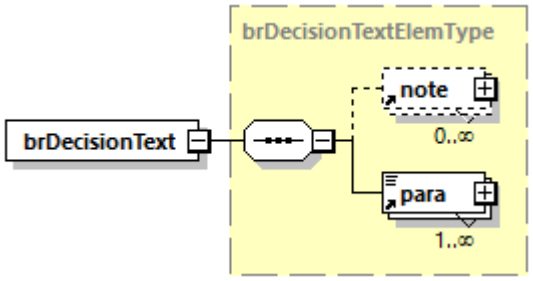
Markup example:

```
<brDecision brDecisionIdentNumber="K0378-00124">
<brDecisionText>…</brDecisionText>
</brDecision>
<brDecision brDecisionIdentNumber="K0378-00125"
brSeverityLevel="brsl03">
<brDecisionRef brDecisionIdentNumber="K0378-00124"/>
<brDecisionPending/>
</brDecision>
```

4.4.3 Business rule decision text

Description: The element <`brDecisionText`> defines the exact wording of a business rule decision taken for a BRDP.

Markup element: <`brDecisionText`>



ICN-I9005-0410010006-002-01

Fig 7 Element <brDecisionText>

Attributes:

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`note`>. Refer to Chap 3.9.3.
- <`para`>. Refer to Chap 3.9.5.2.1.10.

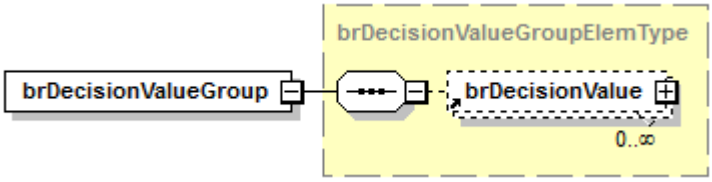
Markup example:

```
<brDecisionText>
<para>(Prohibited the use of the element &lt;note&gt; within the
element &lt;commonInfo&gt;. Content must be authored using the
element &lt;commonInfoDescrPara&gt;.) The element
&lt;commonInfo&gt; has one branch that contains &lt;note&gt;,
&lt;para&gt;, and &lt;commonInfoDescrPara&gt; and one branch
that contains only &lt;commonInfoDescrPara&gt;. The branch
containing &lt;note&gt;, &lt;para&gt;, and
&lt;commonInfoDescrPara&gt; shall not be used in all except BREX
DM. There it is allowed.</para>
</brDecisionText>
```

4.4.4 Business rule decision value group

Description: The element <`brDecisionValueGroup`> contains the allowed value, if any. The allowed values can be defined by the project (eg, CAGE code), or the values can be selected from the defined values in the business rule decision point value group (element <`brDecisionPointValueGroup`>) (eg, language). Refer to Para 4.12.2.

Markup element: <`brDecisionValueGroup`>



ICN-I9005-0410010007-001-01

Fig 8 Element <brDecisionValueGroup>

Attributes:

– None

Child elements:

– <brDecisionValue>. Refer to Para 4.4.4.1.

Markup example:

The following example shows all CAGE codes used for the project. The corresponding enterprise name is included for information only in the paragraph (element <para>).

```
<brDecisionValueGroup>
<brDecisionValue brDecisionValueRegistered="SF815">
<para>SIOM</para>
</brDecisionValue>
<brDecisionValue brDecisionValueRegistered="U8025">
<para>UK MoD</para>
</brDecisionValue>
<brDecisionValue brDecisionValueRegistered="1L6T4">
<para>LOGSA</para>
</brDecisionValue>
<brDecisionValue brDecisionValueRegistered="07GB6">
<para>BTAS COE</para>
</brDecisionValue>
<brDecisionValue brDecisionValueRegistered="0DVT5">
<para>EMC Corporation</para>
</brDecisionValue>
<brDecisionValue brDecisionValueRegistered="06RT9">
</brDecisionValue>
<brDecisionValue brDecisionValueRegistered="FAPE3">
<para>Airbus</para>
</brDecisionValue>
<brDecisionValue brDecisionValueRegistered="C3002">
<para>ESG</para>
</brDecisionValue>
</brDecisionValueGroup>
```

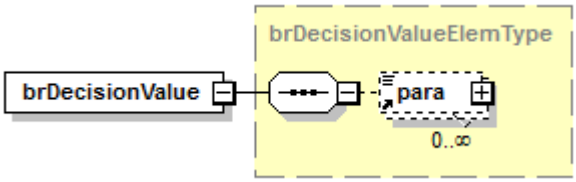
The following example shows the decided language for the project. The International Standards Organisation (ISO) 639 defined value is spelled out in the paragraph (element <para>).

```
<brDecisionValueGroup>
<brDecisionValue brDecisionValueRegistered="en">
<para>English</para>
</brDecisionValue>
</brDecisionValueGroup>
```

4.4.4.1 Business rule decision value

Description: The element <brDecisionValue> defines the type and, where required, the content of a business rules decision within the range and definitions of BRDP values as a recorded decision taken for a BRDP. Refer to Para 4.12.2.1.

Markup element: <brDecisionValue>



ICN-I9005-0410010008-001-01

Fig 9 Element <brDecisionValue>

Attributes:

– `brDecisionValueRegistered` (M), the recorded value of a business rules decision. If a business rules decision is made for a certain BRDP and is not a stand-alone business rules decision, then this value must be within the range and of the type of the corresponding BRDP value. In case of a stand-alone business rules decision, the business rules decision values are already available in the legacy business rules documentation and (correspondingly) need to be captured in the business rules data module using the attribute `brDecisionValueRegistered`.

Child elements:

– <para>. Refer to Chap 3.9.5.2.1.10.

Business rule decision point BRDP-S1-00567 - Standardized responses to describe business rules decision values:

– Decide whether to use standardized sentences to describe business rules decision values or not. If the decision is to use standardized responses, decide which responses must be taken from text describing BRDP values defined in the specification or by the project/organization. It is also necessary to identify which responses must be defined beyond what is already defined within the specification. If standardized responses for business rules decision values are defined, decide whether all possible business rules decision values are covered or whether there will be cases when a business rules author will need to define text for business rules decision values during business rules production.

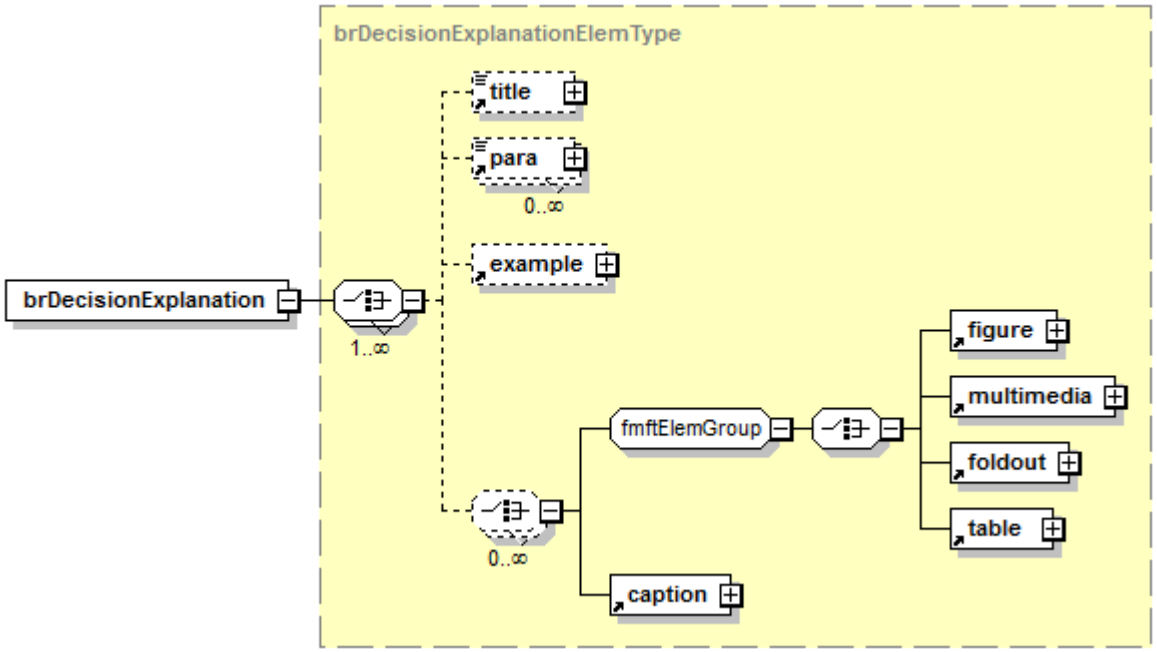
Markup example:

```
<brDecisionValue brDecisionValueRegistered="01">
<para>01 (Unclassified)</para>
</brDecisionValue>
```

4.5 Business rules decision explanation

Description: The element <brDecisionExplanation> provides additional information for a business rules definition which was not defined by the element <brDecisionText>. This can be information taken from the specification or any other information formulated by the project or organization. For example, these could be markup examples, extracts from the specification or data/documents from other projects or organizations. The purpose of this added explanation is to enhance the reader's understanding of the decision made for a BRDP.

Markup element: <brDecisionExplanation>



ICN-I9005-0410010009-001-01

Fig 10 Element <brDecisionExplanation>

Attributes:

- changeMark (O), changeType (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <title>. Refer to Chap 3.9.5.2.1.5.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <example>. Refer to Para 4.5.1.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7 and Chap 3.9.5.2.1.6.
- <table>. Refer to Chap 3.9.5.2.1.6.
- <caption>. Refer to Chap 3.9.5.2.1.4.

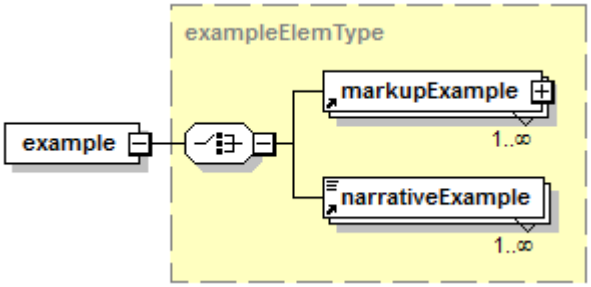
Markup example:

```
<brDecisionExplanation>
<para>Occassionally, it is necessary to include a figure
(optionally with a primary title). For this reason, the path
"//commonInfo/title" and the path "//commonInfo/figure" are not
prohibited.</para>
<para>The path "//commonInfo/para" must be prohibited to prevent
a &lt;para&gt; and a &lt;commonInfoDescrPara&gt; from appearing
at the same level.</para>
</brDecisionExplanation>
```

4.5.1 Example

Description: The element <example> provides markup and/or narrative examples illustrating the effect of the business rule decisions with a corresponding definition.

Markup element: <example>



ICN-I9005-0410010010-001-01

Fig 11 Element <example>

Attributes:

– None

Child elements:

– <markupExample>, captures one or more markup examples by use of the element <verbatimText>. Refer to Chap 3.9.5.2.1.10.
– <narrativeExample>, captures one or more narrative examples for the business rules definition

Markup example:

```
<example>
<markupExample>
<verbatimText>
<exportControl exportRegulationType="EAR"
governmentAuthority="GB">
...
</exportControl>
</verbatimText>
</markupExample>
</example>
```

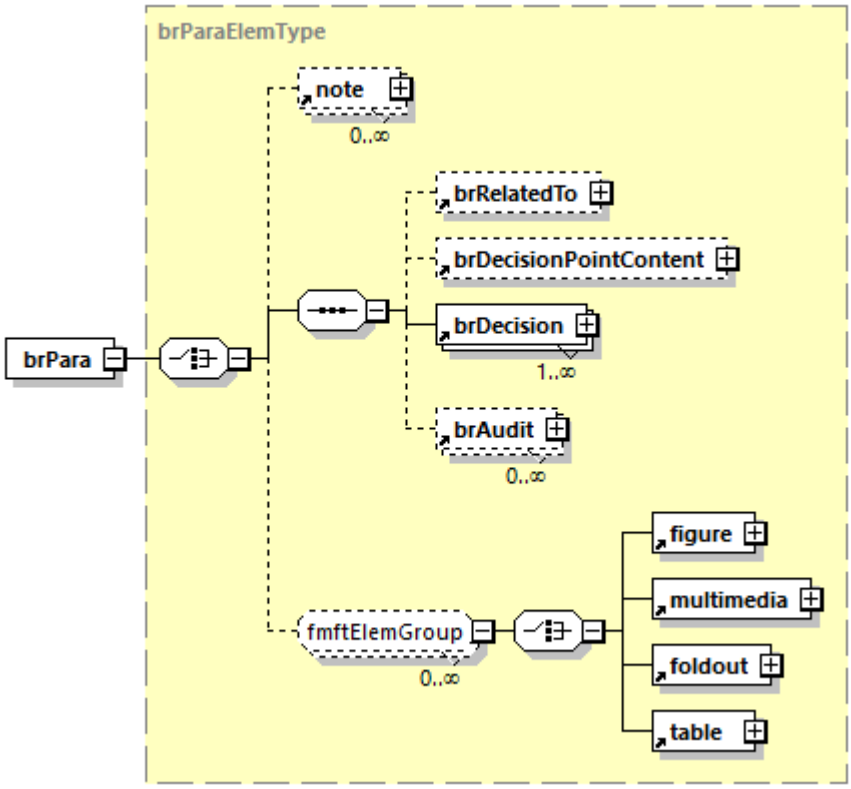
4.6 Business rule paragraph

Description: The element <brPara> is a child of element <brLevelledPara> in the descriptive structure of a business rules data module. It contains information about:

– a business rule that includes the definition of a BRDP
– a business rule decision that has been made
– an indication of the relationship of the business rule to various concepts and constructs defined by the specification
– the audit information on the BRDP and/or business rules decisions taken upon it

This includes possible open actions, as well as the closing date when the decisions must be, or were, made.

Markup element: <brPara>



ICN-I9005-0410010011-002-01

Fig 12 Element <brPara>

Attributes:

- `applicRefId` (O), the applicability information by referencing the element <`applic`>. Refer to Chap 3.9.5.3.
- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `brDecisionPointUniqueIdent` (M), the unique identifier of a BRDP. Refer to Chap 2.5.3 and Para 4.8.
- `brDecisionPointPriority` (O), indicates the priority of the BRDP for a project or organization. The setting of the BRDP priority can assist the project and/or organization by identifying which business rules should be defined first. This attribute has five predefined values. Refer to Chap 3.9.6.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`note`>. Refer to Chap 3.9.3.
- <`brRelatedTo`>. Refer to Para 4.7.
- <`brDecisionPointContent`>. Refer to Para 4.12.
- <`brDecision`>. Refer to Para 4.4.
- <`brAudit`>. Refer to Para 4.12.4.

- <figure>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7 and Chap 3.9.5.2.1.6.
- <table>. Refer to Chap 3.9.5.2.1.6.

Markup example:

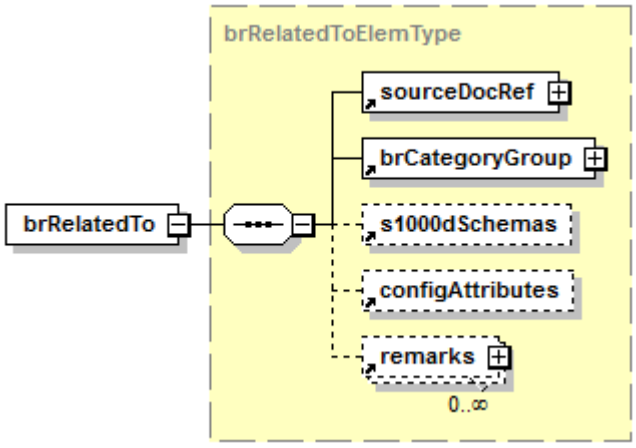
```
<brPara brDecisionPointUniqueIdent="BRDP-S1-00253"
brDecisionPointPriority="brpr03">
<brRelationship>
...
</brRelationship>
<brDecisionPointContent>
...
</brDecisionPointContent>
<brDecision>
...
</brDecision>
</brPara>
```

4.7 Business rule decision point relationship

Description: The element <brRelatedTo> indicates where in the source document the definition of the BRDP can be found and how the BRDP relates to decisions by the project or organization with respect to:

- business rules categories
- Schemas
- configurable attributes
- remarks

Markup element: <brRelatedTo>



ICN-I9005-0410010012-001-01

Fig 13 Element <brRelatedTo>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

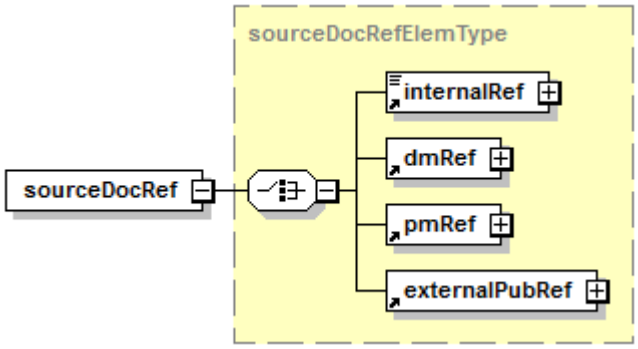
Child elements:

- <sourceDocRef>. Refer to Para 4.8.
- <brCategoryGroup>. Refer to Para 4.9.
- <s1000dSchemas>. Refer to Para 4.10.
- <configAttributes>. Refer to Para 4.11.
- <remarks>. Refer to Chap 3.9.5.1.

4.8 Business rules document reference

Description: The element <sourceDocRef> indicates where the information for the BRDP is defined. This reference can point to a place inside the same business rules data module, a data module with related business rule information or external documents in a non-S1000D or non-XML format.

Markup element: <sourceDocRef>



ICN-I9005-0410010013-001-01

Fig 14 Element <sourceDocRef>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <internalRef>. Refer to Chap 3.9.5.2.1.2.
- <dmRef>. Refer to Chap 3.9.5.2.1.2.
- <pmRef>. Refer to Chap 3.9.5.2.1.2.
- <externalPubRef>. Refer to Chap 3.9.5.2.1.2.

Markup example:

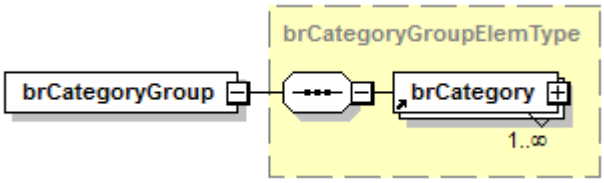
```
<sourceDocRef>
<dmRef referredFragment="Para-0204">
<dmRefIdent>
<dmCode assyCode="00" disassyCode="00" disassyCodeVariant="00A"
infoCode="040" infoCodeVariant="A" itemLocationCode="A"
modelIdentCode="S1000D" subSubSystemCode="6" subSystemCode="0"
```

```
systemCode="03" systemDiffCode="A"/>
</dmRefIdent>
</dmRef>
</sourceDocRef>
```

4.9 Business rule category group

Description: The element <brCategoryGroup> indicates the whole group of business rules categories to which the BRDP relates. Refer to Chap 2.5.1.

Markup element: <brCategoryGroup>



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Fig 15 Element <brCategoryGroup>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <brCategory>. Refer to Para 4.9.1.

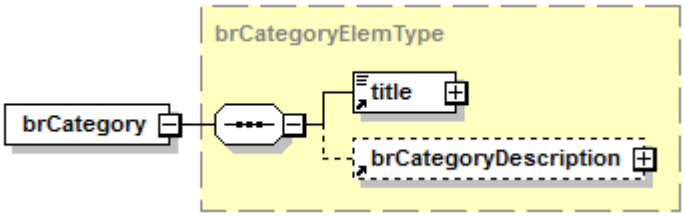
Markup example:

```
<brCategoryGroup>
<brCategory brCategoryNumber="1">
<title>General</title>
<brCategoryDescription>
<para>General business rules cover all decisions made by a
project or an organization that are not covered by any of the
specific business rule categories below. They serve as overall
decisions for the implementation of S1000D.</para>
</brCategoryDescription>
</brCategory>
</brCategoryGroup>
```

4.9.1 Business rule category

Description: The element <brCategory> indicates the relationship of the BRPD to a certain business rules category. For example, a decision on "model identifiers" belongs to the business rules category 2, "Product business rules". Refer to Chap 2.5.1.

Markup element: <brCategory>



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Fig 16 Element <brCategory>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `brCategoryNumber` (O), the number of the business rules category. Refer to Chap 2.5.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`title`>. Refer to Chap 3.9.5.2.1.5.
- <`brCategoryDescription`>. Refer to Para 4.9.2.

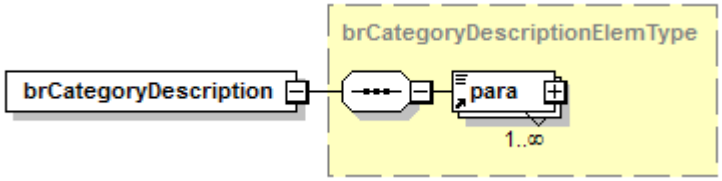
Markup example:

```
<brCategory brCategoryNumber="1">
<title>General</title>
<brCategoryDescription>
<para>General business rules cover all decisions made by a
project or an organization that are not covered by any of the
specific business rule categories below. They serve as overall
decisions for the implementation of S1000D.</para>
</brCategoryDescription>
</brCategory>
```

4.9.2 Business rule category description

Description: The element <`brCategoryDescription`> provides a description of the related business rules category. Refer to Chap 2.5.1. A project or organization can add any information to assist with understanding and relating to the business rules category or categories.

Markup element: <`brCategoryDescription`>



ICN-I9005-0410010016-001-01

Fig 17 Element <brCategoryDescription>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <para>. Refer to Chap 3.9.5.2.1.10.

Markup example:

```
<brCategoryDescription>
<para>General business rules cover all decisions made by a
project or an organization that are not covered by any of the
specific business rule categories below. They serve as overall
decisions for the implementation of S1000D.</para>
</brCategoryDescription>
```

4.10 S1000D Schemas

Description: The element <s1000dSchemas> defines the relationship between a BRDP to one or a number of Schemas defined by S1000D. The identification of this relationship results in mapping of the BRDP to S1000D Schemas.

Markup element: <s1000dSchemas>

Attributes:

The attributes can have one of the following values:

- "1", the BRDP relates to the Schema identified by this attribute
- "0" or omission of this attribute, "Not related"

- appliccrossreftableXsd (O), relation to, or choice of, applicability crossreference table data module. The attribute can have the values as given above.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- brDocXsd (O), relation to, or choice of, business rules data module. The attribute can have the values as given above.
- brexXsd (O), relation to or choice of, BREX data module. The attribute can have the values as given above.
- checklistXsd (O), relation to, or choice of, checklist and maintenance planning data module. The attribute can have the values as given above.
- commentXsd (O), relation to, or choice of comment Schema. The attribute can have the values as given above.
- comrepXsd (O), relation to, or choice of, common repository data module. The attribute can have the values as given above.
- condcrossreftableXsd (O), relation to or choice of conditions crossreference table data module. The attribute can have the values as given above.
- containerXsd (O), relation to or choice of container data module. The attribute can have the values as given above.
- crewXsd (O), relation to or choice of crew data module. The attribute can have the values as given above.
- ddnXsd (O), relation to or choice of data dispatch note Schema. The attribute can have the values as given above.

- descriptXsd (O), relation to or choice of descriptive data module. The attribute can have the values as given above.
- dmlXsd (O), relation to or choice of data management list Schema. The attribute can have the values as given above.
- faultXsd (O), relation to or choice of fault data module. The attribute can have the values as given above.
- frontmatterXsd (O), relation to or choice of front matter data module. The attribute can have the values as given above.
- icnMetadataXsd (O), relation to or choice of the ICN metadata file Schema. The attribute can have the values as given above.
- ipdXsd (O), relation to or choice of illustrated parts data module. The attribute can have the values as given above.
- learningXsd (O), relation to or choice of learning data module. The attribute can have the values as given above.
- pmXsd (O), relation to or choice of publication modules Schema. The attribute can have the values as given above.
- prdcrossreftableXsd (O), relation to or choice of product crossreference table data module. The attribute can have the values as given above.
- procedXsd (O), relation to or choice of procedural data module. The attribute can have the values as given above.
- processXsd (O), relation to or choice of process data module. The attribute can have the values as given above.
- sbXsd (O), relation to or choice of service bulletin data module. The attribute can have the values as given above.
- schedulXsd (O), relation to or choice of maintenance planning data module. The attribute can have the values as given above.
- scocontentXsd (O), relation to or choice of SCO content data module. The attribute can have the values as given above.
- scormcontentpackageXsd (O), relation to or choice of SCORM content package Schema. The attribute can have the values as given above.
- updateXsd (O), relation to or choice of update file Schema. The attribute can have the values as given above.
- wrngdataXsd (O), relation to or choice of wiring data module. The attribute can have the values as given above.
- wrngfldsXsd (O), relation to or choice of wiring fields data module. The attribute can have the values as given above.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<s1000dSchemas containerXsd="1" descriptXsd="1" dmlXsd="1"
ddnXsd="1" brexXsd="1" frontmatterXsd="1" procedXsd="1"
crewXsd="1" sbXsd="1" comrepXsd="1" pmXsd="1" updateXsd="1"/>
```

4.11 Relation to configurable attributes

Description: The element <configAttributes> indicates the relationship of the BRDP to configurable attributes (ie, to the attributes defined both in Chap 3.9.6.1 and Chap 3.9.6.2). By filtering BRDP for configurable attributes, it is possible to identify specific context dependent

values for each configurable attribute. It is also possible to identify if these attributes can have the same range of values for all elements and for all contexts.

Markup element: <configAttributes>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

The configurable attributes indicating a BRDP have a relationship and include the text "AttRelation" at the end of each attribute name. This is done to avoid redefinition of the types for configurable attributes defined in various S1000D Schemas. These attributes can have one the following values:

- "1", the BRDP relates to the Schema identified by this attribute
- "0" or omission of this attribute, "Not related"

- accessPointTypeValueAttRelation (O)
- acronymTypeAttRelation (O)
- actionIdentTypeAttRelation (O)
- barCodeSymbologyAttRelation (O)
- brDecisionPointPriorityAttRelation (O)
- brSeverityLevelAttRelation (O)
- brStatusAttRelation (O)
- cancelCaptionAttRelation (O)
- caveatAttRelation (O)
- checkListCategoryAttRelation (O)
- circuitBreakerRefTypeAttRelation (O)
- circuitBreakerTypeAttRelation (O)
- colorAttRelation (O)
- commentPriorityCodeAttRelation (O)
- commercialClassificationAttRelation (O)
- crewMemberTypeAttRelation (O)
- crewStepConditionAttRelation (O)
- defaultBrSeverityLevelAttRelation (O)
- drillTypeAttRelation (O)
- emphasisTypeAttRelation (O)
- frontMatterInfoTypeAttRelation (O)
- frontMatterTypeAttRelation (O)
- functionAttRelation (O)
- functionalItemRefTypeAttRelation (O)
- functionalItemTypeAttRelation (O)
- genericPropertyTypeAttRelation (O)
- hazardousClassValueAttRelation (O)
- icnInfoItemTypeAttRelation (O)
- icnResourceFileTypeAttRelation (O)
- icnSourceFileTypeAttRelation (O)
- installationLocationTypeAttRelation (O)

- internalRefTargetTypeAttRelation (O)
- itemCharacteristicAttRelation (O)
- itemOriginatorAttRelation (O)
- limitUnitTypeAttRelation (O)
- listItemPrefixAttRelation (O)
- lowestLevelAttRelation (O)
- maintLevelCodeAttRelation (O)
- materialUsageAttRelation (O)
- operationTypeAttRelation (O)
- partCharacteristicAttRelation (O)
- partStatusAttRelation (O)
- partUsageCodeAttRelation (O)
- pmEntryTypeAttRelation (O)
- pmTypeAttRelation (O)
- productCategoryAttRelation (O)
- productItemTypeAttRelation (O)
- quantityTypeAttRelation (O)
- refTypeAttRelation (O)
- reqCondCategoryAttRelation (O)
- reqTechInfoCategoryAttRelation (O)
- resetCaptionAttRelation (O)
- responseTypeAttRelation (O)
- sbComplianceCategoryAttRelation (O)
- sbImpactTypeAttRelation (O)
- sbMaterialTypeAttRelation (O)
- sbTaskCategoryAttRelation (O)
- sbTimeComplianceTypeAttRelation (O)
- sbTopicTypeAttRelation (O)
- scoEntryTypeAttRelation (O)
- securityClassificationAttRelation (O)
- significantParaDataTypeAttRelation (O)
- skillLevelCodeAttRelation (O)
- skillTypeAttRelation (O)
- softwareClassificationValueAttRelation (O)
- softwareCustomizationStatusValueAttRelation (O)
- sourceCriticalityAttRelation (O)
- sourceTypeCodeAttRelation (O)
- sourcingTypeValueTypeAttRelation (O)
- submitCaptionAttRelation (O)
- supervisorLevelCodeAttRelation (O)
- supplyNumberTypeAttRelation (O)
- taskCodeAttRelation (O)
- thresholdUnitOfMeasureAttRelation (O)
- updateReasonTypeAttRelation (O)
- verbatimStyleAttRelation (O)
- quantityUnitOfMeasureAttRelation (O)

Child elements:

– None

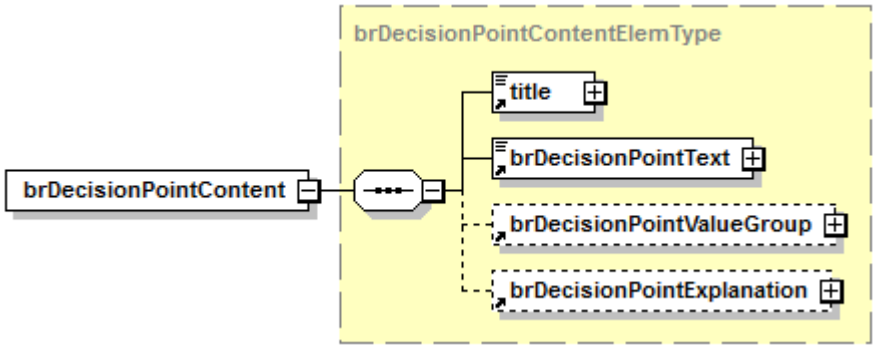
Markup example:

```
<configAttributes colorAttRelation="1"
crewMemberTypeAttRelation="1"
frontMatterInfoTypeAttRelation="1"/>
```

4.12 Business rule decision point content

Description: The element <brDecisionPointContent> provides information for a BRDP. It includes the BRDP title and definition, BRDP values and their meaning, plus explanation of the BRDP of interest.

Markup element: <brDecisionPointContent>



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Fig 18 Element <brDecisionPointContent>

Attributes:

– changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
– controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– <title>. Refer to Chap 3.9.5.2.1.5.
– <brDecisionPointText>. Refer to Para 4.12.1.
– <brDecisionPointValueGroup>. Refer to Para 4.12.2.
– <brDecisionPointExplanation>. Refer to Para 4.12.3.

Markup example:

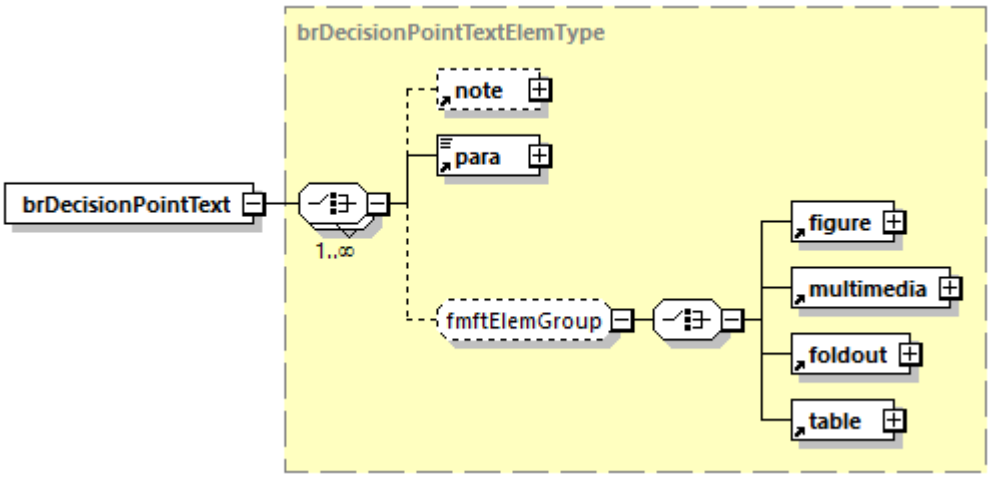
```
<brDecisionPointContent>
<title>Use of the optional element &lt;commonInfo&gt;</title>
<brDecisionPointText>Decide whether to use the element
&lt;commonInfo&gt;, when to use the element, and give guidance
and rules that will make sure it is consistently
used.&#xd;</brDecisionPointText>
<brDecisionPointValueGroup brDecisionValueSelection="single"/>
<brDecisionPointExplanation>
<para>The &lt;commonInfo&gt; structure allows for multiple
```

```
methods of authoring. In order for a publication to maintain
consistent authoring (benefiting style sheets and user-
legibility), authoring methods should be kept to a
minimum.</para>
</brDecisionPointExplanation>
</brDecisionPointContent>
```

4.12.1 Business rule decision point text

Description: The element <brDecisionPointText> defines a BRDP for the business rule. For all business rule decision points that have unique identifiers starting with "BRDP-S1-", the text captured in <brDecisionPointText> must be the text defined by this specification. Refer to Chap 2.5.3. The only extension allowed for these BRDP is the reference to the place in the specification where the BRDP is defined. Any explanatory information is to be captured in <brDecisionPointExplanation>. Refer to Para 4.12.3.The text of a project/organizational specific BRDP must be defined specifically for the needs of the project and/or organization. Refer to Chap 2.5.3.

Markup element: <brDecisionPointText>



ICN-I9005-0410010018-002-01

Fig 19 Element <brDecisionPointText>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <note>. Refer to Chap 3.9.3.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7 and Chap 3.9.5.2.1.6.
- <table>. Refer to Chap 3.9.5.2.1.6.

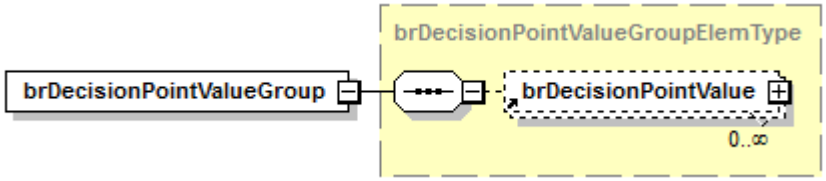
Markup example:

```
<brDecisionPointText>Decide whether to use the element
&lt;commonInfo&gt;, when to use the element, and give guidance
and rules that will make sure that it is consistently used
(Refer to Chap 3.9.5.2.3, Para 2.3).</brDecisionPointText>
```

4.12.2 Business rule decision point value group

Description: The element <brDecisionPointValueGroup> specifies what the BRDP is about. For example, business rules decision points can be about the choice of available values, or about allowing the use of a concept, an element, or an attribute in a certain context. It can also be used to define new values, etc. S1000D provides BRDP values for BRDP defined in the specification and captured inside the business rules template data module. Refer to Chap 2.5.3 and Para 5. The information mapped in the business rules template data module is based on S1000D text, Schemas and the default BREX.

Markup element: <brDecisionPointValueGroup>



ICN-I9005-0410010019-001-01

Fig 20 Element <brDecisionPointValueGroup>

Attributes:

– brDecisionValueSelection (M), identifies whether a single or multiple (ie, one or more) values can be chosen when deciding upon the BRDP. The attribute can have one of the following values:

- "single"
- "multiple"

Child elements:

– <brDecisionPointValue>. Refer to Para 4.12.2.1.

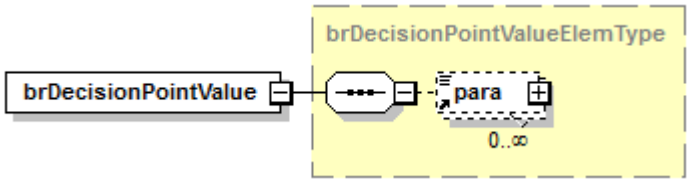
Markup example:

```
<brDecisionPointValueGroup brDecisionValueSelection="single"/>
```

4.12.2.1 Business rule decision point value

Description: The element <brDecisionPointValue> provides information on separate values for the BRDP.

Markup element: <brDecisionPointValue>



ICN-I9005-0410010020-001-01

Fig 21 Element <brDecisionPointValue>

Attributes:

– `brDecisionValueAllowed` (M), the allowed value for the BRDP. Multiple values can be defined and this attribute defines each value.

Child elements:

– <para>, defines textual information about the value. For BRDP, the unique business rule prefix "BRDP-S1-", is provided by the specification inside the business rules template data module. Refer to Chap 2.5.3, and Chap 3.9.5.2.1.10.

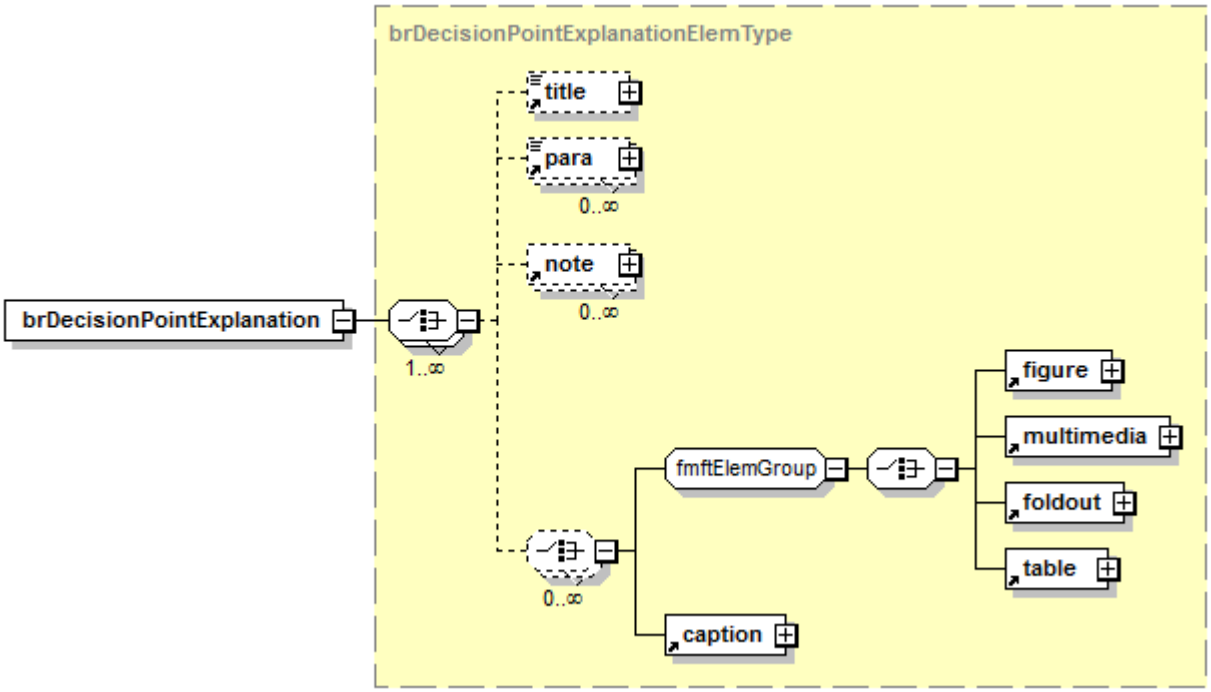
Markup example:

```
<brDecisionPointValue brDecisionValueAllowed="dml">
<para>Data module list</para>
</brDecisionPointValue>
```

4.12.3 Business rule decision point explanation

Description: The element <brDecisionPointExplanation> provides additional information on a BRDP, to that provided in the element <brDecisionPointText>. This can be information taken from the specification or any other information required by the project or organization. For example, this could be questions arising when making a decision for a BRDP in a specific context of the project and/or organization.

Markup element: <brDecisionPointExplanation>



ICN-I9005-0410010021-001-01

Fig 22 Element <brDecisionPointExplanation>

Attributes:

- `changeType` (O), `changeMark` (O) and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

Child elements:

- <`title`>. Refer to Chap 3.9.5.2.1.5.
- <`para`>. Refer to Chap 3.9.5.2.1.10.
- <`note`>. Refer to Chap 3.9.3.
- <`figure`>. Refer to Chap 3.9.5.2.1.7.
- <`multimedia`>. Refer to Chap 3.9.5.2.1.7.
- <`foldout`>. Refer to Chap 3.9.5.2.1.7 and Chap 3.9.5.2.1.6.
- <`table`>. Refer to Chap 3.9.5.2.1.6.
- <`caption`>. Refer to Chap 3.9.5.2.1.4.

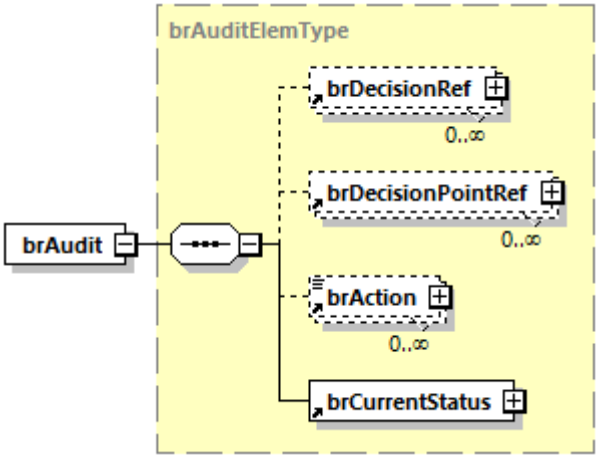
Markup example:

```
<brDecisionPointExplanation>
<para>The &lt;commonInfo&gt; structure allows for multiple
methods of authoring. In order for a publication to maintain
consistent authoring (benefiting style sheets and user-
legibility), authoring methods should be kept to a
minimum.</para>
</brDecisionPointExplanation>
```

4.12.4 Business rule audit

Description: The element <brAudit> captures the audit status on the BRDP and/or business rules decisions defined for it, including possible actions to be accomplished in order to come to a satisfying decision and the status with required date of completion. If one or more child elements <brDecisionRef> are defined, then the element <brAudit> refers both to the BRDP it applies to and to one or more of its business rules decisions. If the <brDecisionRef> is missing, then <brAudit> is attributed only to the BRDP defined under the <brPara>. Multiple elements <brAudit> within a <brPara> make it possible to capture status not only per BRDP but also per business rules decision. Recording of one <brAudit> for a group of business rules decisions defined within the same <brPara> is allowed.

Markup element: <brAudit>



ICN-I9005-0410010022-002-01

Fig 23 Element <brAudit>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <brDecisionRef>. Refer to Para 4.4.1.
- <brDecisionPointRef>. Refer to Para 4.2.
- <brAction>. Refer to Para 4.12.4.1.
- <brCurrentStatus>. Refer to Para 4.12.4.2.

Markup example:

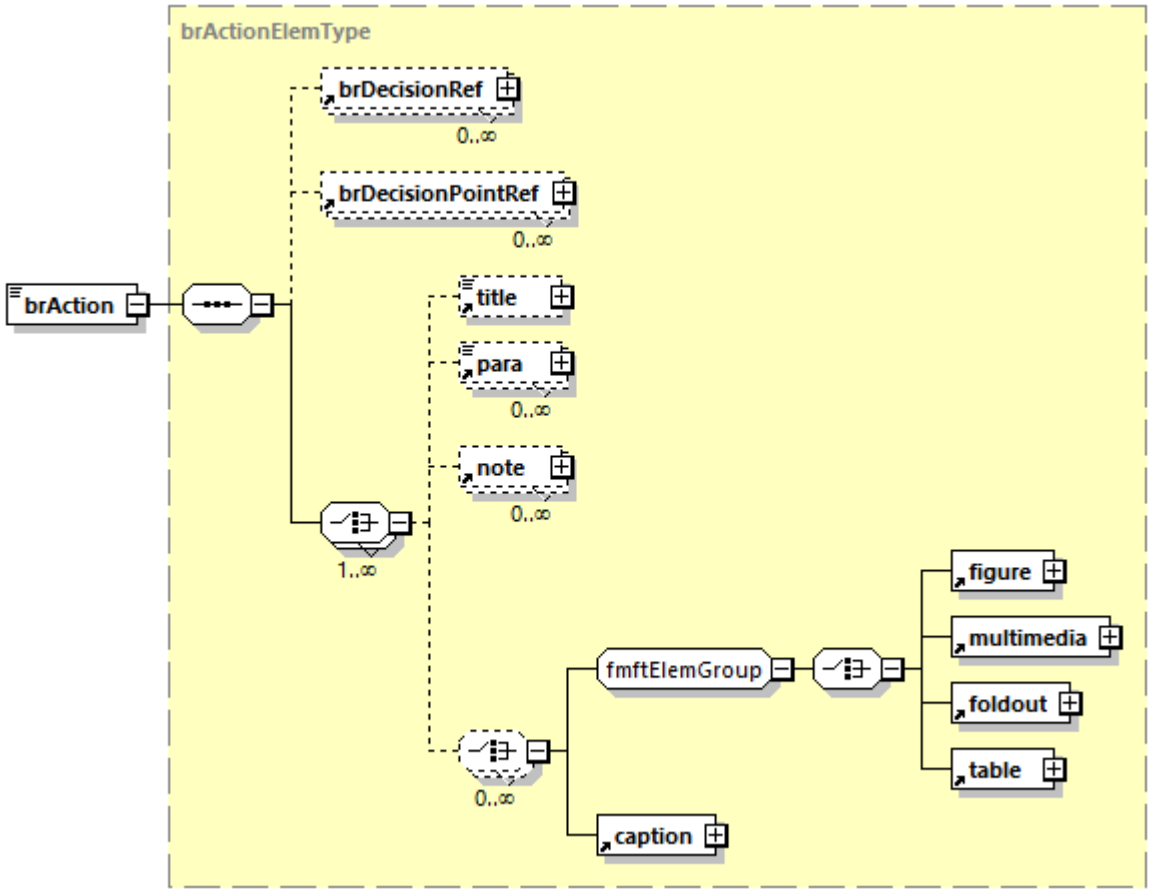
```
<brAudit>
<brDecisionRef brDecisionIdentNumber="K0378-00125"/>
<brAction brActionOwner="K0378-PSmith" brActionCompleted="1">
```

```
<para>Clarify whether all partners in the project agree to use
common info. Clarify the pro and con reasons and communicate the
result to the project management at all partners
sides.</para></brAction>
<brCurrentStatus brStatus="brst01">
<brStatusDate year="2015" month="05" day="25"/>
</brCurrentStatus>
</brAudit>
```

4.12.4.1 Business rule action

Description: The element <brAction> defines an action that is to be fulfilled to define a complete set of business rules decisions for the BRDP. The information provided under the element <brAction> identifies the owner of the action and if it is complete or not. If one or more child elements <brDecisionRef> are defined, then the element <brAudit> refers both to the BRDP it applies to and to one or more of its business rules decisions. If the <brDecisionRef> is missing, then <brAction> is attributed only to the BRDP defined under the <brPara>. Multiple elements <brAction> within <brPara> make it possible to capture actions not only per BRDP but also per business rules decision. Recording of one <brAction> for a group of business rules decisions defined within the same <brPara> is allowed.

Markup element: <brAction>



ICN-I9005-0410010023-002-01

Fig 24 Element <brAction>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- brActionOwner (M), the action owner. The text marked up with this attribute can be a person's name, an organization name, CAGE code or combination of various. This can be decided case by case.
- brActionCompleted (O), of "yes" or "no" type, shows whether the action has been completed or not at the required date defined inside <brCurrentStatus>. Refer to Para 4.12.4.2. The absence of this attribute indicates the required date for the business rules is not reached yet, or the action has not been reviewed and evaluated since the last review.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <brDecisionRef>. Refer to Para 4.4.1.
- <brDecisionPointRef>. Refer to Para 4.2.
- <title>. Refer to Chap 3.9.5.2.1.5.
- <para>. Refer to Chap 3.9.5.2.1.10.
- <note>. Refer to Chap 3.9.3.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <foldout>. Refer to Chap 3.9.5.2.1.7 and Chap 3.9.5.2.1.6.
- <table>. Refer to Chap 3.9.5.2.1.6.
- <caption>. Refer to Chap 3.9.5.2.1.4.

Markup example:

In the examples below both actions are captured inside the same <brAudit> for the BRDP with the unique ID = BRDP-S1-00177.

```
<brAction id="brAction-S1-00177-01" brActionOwner="K0378-
NClarkson" brActionCompleted="1">
<para>Clarify whether all partners in the project agree to use
common info. Clarify the reasons and communicate the result to
the project management at all partners sides.</para></brAction>

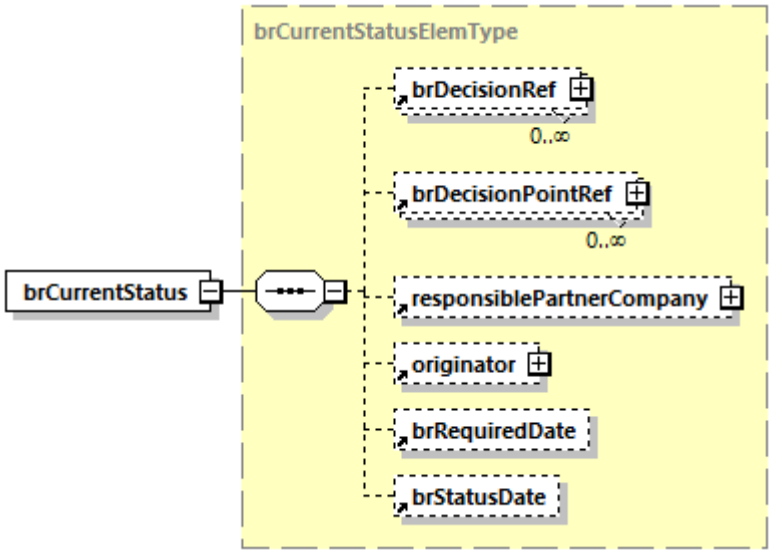
<brAction id="brAction-S1-00177-02" brActionOwner="D5067-
DEmerson" brActionCompleted="1">
<para>Capture the information gathered for <internalRef
internalRefId="brAction-S1-00177-01"/> inside
&lt;brDecisionExplanation&gt; for business rules decision(s) on
the BRDP.</para></brAction>
```

4.12.4.2 Business rule current status

Description: The element <brCurrentStatus> gives the status of the BRDP and/or related business rules decisions. The business rules data module Schema defines only one <brCurrentStatus> for each element <brAudit>. Therefore, if the <brAudit>

does not contain a reference to business rules decisions, then the business rules status also refers to the BRDP as a whole. If there is an element <brAudit> for each business rules decision (or separate group of business rules decisions), then the status also describes a separate business rules decision (or a separate group of business rules decisions).

Markup element: <brCurrentStatus>



ICN-I9005-0410010024-002-01

Fig 25 Element <brCurrentStatus>

Attributes:

- changeType (O), changeMark (O) and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- brStatus (M), indicates the status of the BRDP and/or business rules decisions to which the audit status applies. This attribute can have one of the following values:
  - "brst01" thru "brst99". Refer to Chap 3.9.6.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <brDecisionRef>. Refer to Para 4.4.1.
- <brDecisionPointRef>. Refer to Para 4.2.
- <responsiblePartnerCompany>. Refer to Chap 3.9.5.1.
- <originator>. Refer to Chap 3.9.5.1.
- <brRequiredDate>. Refer to Para 4.12.4.2.1.
- <brStatusDate>. Refer to Para 4.12.4.2.2.

Markup example:

```
<brCurrentStatus brStatus="brst01">
<brDecisionRef brDecisionIdentNumber="K0378-Miller"/>
<brStatusDate year="2014" month="05" day="25"/>
</brCurrentStatus>
...
```

```
<brCurrentStatus brStatus="brst02">
<brRequiredDate year="2014" month="12" day="31"/>
<brStatusDate year="2014" month="05" day="25"/>
</brCurrentStatus>
```

4.12.4.2.1 Business rule required date

Description: The element <brRequiredDate> indicates the date when the business rules decision must be taken and/or the date that the BRDP must be addressed. The business rules data module Schema defines only one <brCurrentStatus> for each element <brAudit>. Therefore, if the element <brAudit> does not contain any reference to business rules decisions, then the required date also refers to the BRDP as a whole. If there is an element <brAudit> for each business rules decision (or separate group of business rules decisions), then the required date also applies to a separate business rules decision (or a separate group of business rules decisions).

Markup element: <brRequiredDate>

Attributes:

- year (M). Refer to Chap 3.9.5.1.
- month (M). Refer to Chap 3.9.5.1.
- day (M). Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<brRequiredDate year="2014" month="12" day="31"/>
```

4.12.4.2.2 Business rule status date

Description: The element <brStatusDate> indicates the date when the business rules status was recorded. The business rules data module Schema defines only one <brCurrentStatus> for each element <brAudit>. Therefore, if the element <brAudit> does not contain any reference to business rules decisions, then the status date also refers to the BRDP as a whole. If there is an element <brAudit> for each business rules decision (or separate group of business rules decisions), then the status date also applies to a separate business rules decision (or a separate group of business rules decisions).

Markup element: <brStatusDate>

Attributes:

- year (M). Refer to Chap 3.9.5.1.
- month (M). Refer to Chap 3.9.5.1.
- day (M). Refer to Chap 3.9.5.1.

Child elements:

- None

Markup example:

```
<brStatusDate year="2012" month="05" day="25"/>
```

5 Template data module

The business rules template data module includes all BRDP applicable to, and defined by, the current issue of the specification. While the same BRDP are included in Chap 2.5.3, the business rules template data module provides complete and extensive information for each BRDP defined by S1000D, as follows:

– the unique ID, as defined by S1000D relationship information:

  - the source location (ie, the Chap and Para numbers, providing where and in which context the BRDP can be found)
  - the applicable business rules category or categories, defined in Chap 2.5.1
  - relationship to the S1000D Schemas, where applicable
  - relationship to configurable attributes defined by S1000D Schemas, where applicable
  - the BRDP title and text (as defined throughout this specification, as well as, in Chap 2.5.3)
  - the predefined values for the BRDP, if any
  - the placeholder for the project or organization business rules decision. This is completed when the business rules template data module is implemented as it applies to the project or organization business rule set.

The business rules template data module can be expanded by including additional BRDP specific to a project or organization. The inclusion of additional BRDP must follow the formatting requirements defined in Chap 2.5.3 for organization-specific IDs for BRDP.

The data module code of the S1000D provided business rules template is DMC-S1000D-**Y**-04-10-0102-00A-024A-D, where:

– the system difference code, here indicated by "**Y**", is used to distinguish between business rules templates related to, and published with, different issues of the specification

For Issue 5.0, the system difference code "G" applies. Refer to Chap 4.10.3.

6 Examples

6.1 Excerpt from business rule template data module

Using BRDP-S1-0001 as an example, the BRDP requires projects or organizations to decide whether or not to allow the use of the alpha characters "I" or "O" in codes (eg, data module codes, publication module codes, learn codes, learn event codes, data management lists).

```
<!-- Each BRDP is included in a separate <brPara> -->
<brPara brDecisionPointUniqueIdent="BRDP-S1-00001">
<!-- Note
The unique identifier for BRDP is placed on the element
<brPara>. -->
<!-- Relationship information -->
<brRelatedTo>
<!-- Source reference -->
<sourceDocRef>
<dmRef referredFragment="Para_6.2.5">
<dmRefIdent>
<dmCode assyCode="00" disassyCode="00" disassyCodeVariant="00A"
infoCode="040" infoCodeVariant="A" itemLocationCode="A"
modelIdentCode="S1000D" subSubSystemCode="3" subSystemCode="0"
systemCode="01" systemDiffCode="A"/>
</dmRefIdent>
<dmRefAddressItems>
<dmTitle>
```

```
<techName>How to use the specification</techName>
<infoName/>
</dmTitle>
</dmRefAddressItems>
</dmRef>
</sourceDocRef>
<!-- Applicable category -->
<brCategoryGroup>
<brCategory brCategoryNumber="Cat002">
<title>Product definition business rules</title>
<brCategoryDescription>
<para>Product definition business rules cover the data module
coding strategy related to how the Product is broken down (eg,
physical or functional). Included is the definition of the model
identification codes to be used in the Product and its
subsystems. Supplier subsystems and identifications also need to
be considered.</para>
</brCategoryDescription>
</brCategory>
</brCategoryGroup>
<!-- Schemas applicable to the Issue of S1000D. -->
<s1000dSchemas appliccrossreftableXsd="1" brexXsd="1"
checklistXsd="1" commentXsd="1" comrepXsd="1"
condcrossreftableXsd="1" containerXsd="1" crewXsd="1" ddnXsd="1"
descriptXsd="1" dmlXsd="1" faultXsd="1" frontmatterXsd="1"
ipdXsd="1" learningXsd="1" pmXsd="1" prdcrossreftableXsd="1"
procedXsd="1" processXsd="1" sbXsd="1" schedulXsd="1"
scocontentXsd="1" scormcontentpackageXsd="1" updateXsd="1"
wrngdataXsd="1" wrngfldsXsd="1"/>
<!-- End of relationship information definition -->
</brRelatedTo>
<!-- BRDP content including the title, the text and BRDP value
definition. -->
<brDecisionPointContent>
<title>Use of "I" and "O"</title>
<brDecisionPointText>Decide whether and when to use the alpha
characters "I" and "O".</brDecisionPointText>
<brDecisionPointValueGroup brDecisionValueSelection="single">
<brDecisionPointValue brDecisionValueAllowed="Yes"/>
<brDecisionPointValue brDecisionValueAllowed="No"/>
</brDecisionPointValueGroup>
</brDecisionPointContent>
<brDecision>
<!-- Placeholder for business rule decisions for a project
and/or organization. -->
<brDecisionPending/>
</brDecision>
</brPara>
```

6.2 Example of a project business rule data module

```
<brDoc>
<brLevelledPara>
<brPara brDecisionPointUniqueIdent="BRDP-S1-00001">
```

```
<brRelatedTo>
<sourceDocRef>
<dmRef referredFragment="Para_6.2.5">
<dmRefIdent>
<dmCode modelIdentCode="S1000D" systemDiffCode="A"
systemCode="01" subSystemCode="0" subSubSystemCode="3"
assyCode="00" disassyCode="00" disassyCodeVariant="00A"
infoCode="040" infoCodeVariant="A" itemLocationCode="A" />
</dmRefIdent>
<dmRefAddressItems>
<dmTitle>
<techName>How to use the specification</techName>
<infoName/>
</dmTitle>
</dmRefAddressItems>
</dmRef>
</sourceDocRef>
<brCategoryGroup>
<brCategory brCategoryNumber="Cat002">
<title>Product definition business rules</title>
<brCategoryDescription>
<para>Product definition business rules cover the data module
coding strategy related to how the Product is broken down (eg,
physical or functional). Included is the definition of the model
identification codes to be used in the Product and its
subsystems. Supplier subsystems and identifications also need to
be considered.</para>
</brCategoryDescription>
</brCategory>
</brCategoryGroup>
</brRelatedTo>
<brDecisionPointContent>
<title>Use of "I" and "O"</title>
<brDecisionPointText>Decide whether and when to use the alpha
characters "I" and "O".</brDecisionPointText>
<brDecisionPointValueGroup brDecisionValueSelection="single">
<brDecisionPointValue brDecisionValueAllowed="Yes"/>
<brDecisionPointValue brDecisionValueAllowed="No"/>
</brDecisionPointValueGroup>
</brDecisionPointContent>
<brDecision brDecisionIdentNumber="BIKE-BR-00001">
<brDecisionValueGroup>
<brDecisionValue brDecisionValueRegistered="No">
<brDecisionValueComment>The alpha characters "I" and "O" must
not be used in any SDC, SNS, or DC/DCV.</brDecisionValueComment>
</brDecisionValue>
</brDecisionValueGroup>
</brDecision>
</brPara>
…
</brLevelledPara>
</brDoc>
```

Chapter 4.10.2

Business rules exchange - BREX data module

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Chap 7.3	Information processing - CSDB objects
Chap 7.9	Information processing - Business rules processing

1 General

This chapter describes the BREX mechanism provided by the specification.

The mechanism is a means to communicate business rules that have been developed and agreed upon within a project or enterprise.

2 The BREX concept

2.1 Introduction

Generally, business rules agreed upon within a project or enterprise can be of different characters, some of which are concerned with how the XML structures must be used in the CSDB objects. To facilitate a formalized and machine readable representation of how such rules apply to the XML structures, a corresponding BREX data module can be used. BREX data modules are stored in the CSDB.

Examples of use of the BREX data module include:

- recording and exchanging rules while they are being developed in a project or enterprise. The possibility to make a formal description of the business rules decreases the risk of misinterpretations and misunderstandings.
- supporting a correct interpretation of CSDB objects. This is of particular significance for security and safety related information (for example classification and units of measure for threshold intervals).
- enabling validation of the CSDB objects against agreed upon rules, for example when applying automated methods

Every data module must refer to a BREX data module containing the business rules that apply to the content of that data module. Each data module is written in accordance with one and only one BREX data module and the layers of BREX subsequently referred to. The BREX data module provides the rules that govern the production of the data module. If a data module must be changed, changes must be in accordance with its associated BREX data module.

Note

Only in extraordinary circumstances would a data module be changed to reference a new BREX data module. A data module is considered re-authored if it is altered to reflect a new BREX data module. If a data module is changed to be associated with a new BREX data module, the data module can need changes in content to conform to the requirements of the associated BREX data module.

If a project or enterprise chooses to encompass all the constructs laid out by S1000D, and not to diverge or refine from any of the applicable rules, the data modules can refer to a default BREX data module. If a project or enterprise decides to apply its own set of business rules it must also develop its own BREX data module.

In many cases, the business rules for a project or an enterprise will include several documents constituting the entire batch of rules that apply. If so, the BREX data module can be a document that summarizes the complete set of rules. It is possible to refer from any rule given in the BREX data module to any background documentation that can contain full descriptions and explanations of the reasons for the rule.

The rules for the data module codes of BREX data modules are given in Chap 4.10.2.4.

The detailed structure of the BREX data module is described herein.

The default BREX data module is described in Chap 4.10.3.

2.2 Layered BREX data modules

A layered business rules structure can be reflected in a corresponding layered BREX data module hierarchy. Refer to Chap 2.5.1.

For example, a data module in a project can refer to a project BREX data module defining the rules for the project. This project BREX data module can be based on and refer to an enterprise BREX data module. The enterprise BREX data module can itself be based on and refer to a set of even more general rules defined for a higher level enterprise (eg, a BREX data module for the civil aviation industry). At the top level are the S1000D default BREX data module and the XML schemas, which reflect the rules that are imposed by the specification itself.

Any layered BREX data module must only contain restrictions to the rules defined by the BREX data module on which it is based. For example, if an enterprise BREX restricts a certain value to be a capital letter A thru M, a project BREX based on that enterprise BREX must not allow values out of the range A thru M. However, it can restrict the allowed values to (eg, A thru H).

The project or the enterprise must ensure that there are no conflicts between various business rules within a hierarchical BREX data module structure. The rules given in a certain BREX data module must be based on the rules given in the BREX data module to which it refers (ie, rules of the layer above). In case there are conflicts between the rules in the two modules then the referred upper-layer BREX data module takes precedence. For rules and guidance regarding conflicting business rules, refer to Chap 2.5.1. For guidance regarding how to verify that layered BREX rules are not in conflict with each other, refer to Chap 7.9.

It must be noted that a BREX data module in a layered hierarchy does not have to repeat the rules given in the BREX data module on which it is based. It is sufficient that it contains only the additional specific restrictions that apply in its own layer. Therefore, to ensure that a full set of BREX encoded rules is provided for a data module of interest, it is necessary to provide the whole hierarchy of BREX data modules, throughout the layers to the S1000D default BREX.

Any layered BREX hierarchy ends in the S1000D default BREX data module. Refer to Chap 4.10.3. This hierarchy reflects a corresponding layering in the business rules, where the basis for any defined complex of business rules (layered or not) is S1000D itself.

Note

A BREX data module for any specific environment does normally define the rules that apply to it, regardless of whether these rules are generic within the environment, or if they apply specifically to the BREX data module. The procedure of verifying a BREX data module can therefore deviate slightly from verification of data modules in general, since it can be verified against the rules it contains in addition to the rules contained in the BREX data module to which it refers.

Business rule decision point BRDP-S1-00367 - Use of layered BREX data modules:

- Decide whether to apply a layered BREX data module structure. This decision is related to, but not entirely dependent on, whether a layered business rules structure applies.

2.3 BREX data module structure

The BREX data module contains the business rules applicable to a project. It can contain:

- specifications of SNS that apply to the context concerned
- specifications of elements and attributes that must or must not be applied to CSDB objects generated for the project

- definitions of which values are allowed/used for specified elements and/or attributes and how these values are to be interpreted
- descriptions of the purpose of markup elements and attributes

Like other data modules the BREX data module has an identification and status section contained within the markup element <identAndStatusSection> as described in Chap 3.9.5.1.

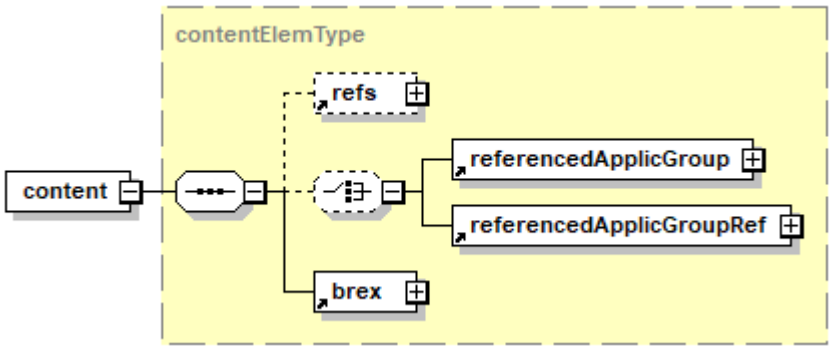
For technical information about the BREX Schema, refer to Chap 7.3.

The default BREX data module provided with the specification shows how the data module is to be marked up.

2.3.1 Content section

Description: The element <content> contains the content section of a BREX data module.

Markup element: <content>



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Fig 1 Element <content>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

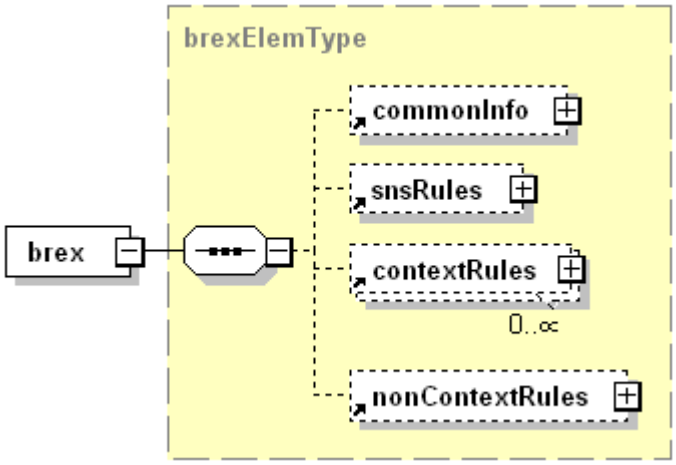
Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <referencedApplicGroup>. Refer to Chap 3.9.5.3.
- <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
- <brex>. Refer to Para 2.3.2.

2.3.2 Exchange business rules

Description: The element <brex> contains all business rules specified by a BREX data module.

Markup element: <brex>



ICN-83007-0000000013-002-01

Fig 2 Element <brex>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- defaultBrSeverityLevel (O). Refer to Chap 4.10.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <commonInfo>. Contains an introduction to the data module, describing for example the background of and general notes on when it is to be applied. It is recommended to include in this element references to additional data modules, and/or other external document, specifying further business rules information related to the BREX data module. Refer to Chap 3.9.5.2.1.12.
- <snsRules>. Refer to Chap 4.10.2.1.
- <contextRules>. Refer to Chap 4.10.2.2.
- <nonContextRules>. Refer to Chap 4.10.2.3.

Business rule decision point BRDP-S1-00369 - Use of the BREX data module to exchange SNS:

- Decide whether to use the BREX data module for exchange of information on the applied SNS.

3 Examples

The following example shows a BREX data module for a project "PRODUCT". This module constitutes a number of restrictions compared to a parent layer applying a BREX data module identified by the model identification code "PRODUCTGROUP".

The example below gives a brief view of how to represent an SNS definition in a BREX data module. It also includes a number of common structural rules, including rules on formats/notations, applicable to all Schemas. Further, it defines one structural rule applicable to

one specific Schema, the Comment Schema, and notation rules that apply to IPD and Process data modules.

Note

The example given below does not intend to provide a complete realistic BREX data module. Normally, the rules contained in a BREX data module will be far more extensive than is reflected in the example.

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/brex.xsd"
xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/">
<identAndStatusSection>
<dmAddress>
<dmIdent>
<dmCode modelIdentCode="PRODUCT" systemDiffCode="A"
systemCode="00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="A"
infoCode="022" infoCodeVariant="A" itemLocationCode="D"/>
<language languageIsoCode="sx" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</dmIdent>
<dmAddressItems>
<issueDate day="01" month="01" year="2016"/>
<dmTitle>
<techName>This project</techName>
<infoName>Business rules</infoName>
</dmTitle>
</dmAddressItems>
</dmAddress>
<dmStatus>
<security securityClassification="01"/>
<responsiblePartnerCompany enterpriseCode="SI">
<enterpriseName>SF518</enterpriseName>
</responsiblePartnerCompany>
<originator enterpriseCode="SI">
<enterpriseName>SF518</enterpriseName>
</originator>
<applic><displayText>
<simplePara>Product type A</simplePara></displayText></applic>
<brexDmRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="PRODUCTGROUP" systemDiffCode="A"
systemCode="00" subSystemCode="0" subSubSystemCode="0"
assyCode="0000" disassyCode="00" disassyCodeVariant="A"
infoCode="022" infoCodeVariant="A" itemLocationCode="D"/>
<issueInfo issueNumber="003" inWork="00"/>
</dmRefIdent>
</dmRef>
</brexDmRef>
```

```
<qualityAssurance>
<firstVerification verificationType="tabtop"/>
</qualityAssurance>
</dmStatus>
</identAndStatusSection>
<content>
<brex>
<commonInfo>
<para>This BREX data module gives the rules that apply to the
PRODUCT. The rules are based on the PRODUCTGROUP rules.</para>
</commonInfo>
<snsRules>
<snsDescr>
<snsSystem>
<snsCode>30</snsCode>
<snsTitle>Ice and rain protection</snsTitle>
<snsSubSystem>
<snsCode>0</snsCode>
<snsTitle>General</snsTitle>
<snsSubSubSystem>
<snsCode>0</snsCode>
<snsTitle>General</snsTitle>
</snsSubSubSystem>
</snsSubSystem>
<snsSubSystem>
<snsCode>1</snsCode>
<snsTitle>Air foil</snsTitle>
<snsSubSubSystem>
<snsCode>0</snsCode>
<snsTitle>Air foil general</snsTitle>
</snsSubSubSystem>
</snsSubSystem>
<snsSubSystem>
<snsCode>2</snsCode>
<snsTitle>Air intakes</snsTitle>
</snsSubSystem>
<snsSubSystem>
<snsCode>3</snsCode>
<snsTitle>Pitot and static</snsTitle>
</snsSubSystem>
<snsSubSystem>
<snsCode>4</snsCode>
<snsTitle>Windows, windshields, canopies and doors</snsTitle>
</snsSubSystem>
<snsSubSystem>
<snsCode>5</snsCode>
<snsTitle>Antennas and radomes</snsTitle>
</snsSubSystem>
<snsSubSystem>
<snsCode>6</snsCode>
<snsTitle>Propellers/rotors</snsTitle>
</snsSubSystem>
```

```
</snsSystem>
</snsDescr>
</snsRules>
<!-- Rules applicable to all Schemas -->
<contextRules>
<structureObjectRuleGroup>
<structureObjectRule>
<objectPath
allowedObjectFlag="0">//dmAddress/dmIdent/dmCode/@infoCode</obje
ctPath>
<objectUse>This BREX applies a small subset of information codes
(actually, too small for practical purposes)</objectUse>
<objectValue valueTailoring="closed" valueForm="range"
valueAllowed="000~022">Use iaw S1000D Iss 4.2</objectValue>
<objectValue valueTailoring="closed" valueForm="single"
valueAllowed="920">Change</objectValue>
<objectValue valueTailoring="closed" valueForm="single"
valueAllowed="993">Neutralization of a bacterial
substance</objectValue>
</structureObjectRule>
<structureObjectRule>
<objectPath allowedObjectFlag="0">//changeInline</objectPath>
<objectUse>Element changeInLine must not be used</objectUse>
</structureObjectRule>
<structureObjectRule>
<objectPath
allowedObjectFlag="0">//@changeType="delete"</objectPath>
<objectUse>Change annotation value -delete- is not allowed.
Deleted text must always be removed from the context, ie not
just marked deleted using the attribute change set to -delete-.
Change history must not be preserved in data modules (and other
CSDB objects). This means that marked up changes in a data
module issue must always only concern changes since last issue.
For all non-editorial changes, reason for change must be given
using the attribute reasonForUpdateRefIds on the element
concerned</objectUse>
</structureObjectRule>
<structureObjectRule>
<objectPath allowedObjectFlag="2">//refs</objectPath>
<objectUse>The absence of the element refs will be presented
with None.</objectUse>
</structureObjectRule>
<structureObjectRule>
<objectPath
allowedObjectFlag="0">//title/internalRef</objectPath>
<objectUse>References in titles are not allowed</objectUse>
</structureObjectRule>
<structureObjectRule>
<objectPath allowedObjectFlag="0">//title/dmRef</objectPath>
<objectUse>References in titles are not allowed</objectUse>
</structureObjectRule>
<structureObjectRule>
```

```
<objectPath allowedObjectFlag="0">//title/pmRef</objectPath>
<objectUse>References in titles are not allowed</objectUse>
</structureObjectRule>
<structureObjectRule>
<objectPath
allowedObjectFlag="0">//title/externalPubRef</objectPath>
<objectUse>References in titles are not allowed</objectUse>
</structureObjectRule>
</structureObjectRuleGroup>
<!-- The following list is not related to any specific context.
Thus, it explicitly limits the commonly allowable notations for
the project (ie, the base set) to CGM, JPG, TIF and PNG -->
<notationRuleList>
<notationRule>
<notationName allowedNotationFlag="1">JPG</notationName>
<objectUse>Only CGM, JPG, TIF and PNG illustration formats are
allowed</objectUse>
</notationRule>
<notationRule>
<notationName allowedNotationFlag="1">TIF</notationName>
<objectUse>Only CGM, JPG, TIF and PNG illustration formats are
allowed</objectUse>
</notationRule>
<notationRule>
<notationName allowedNotationFlag="1">PNG</notationName>
<objectUse>Only CGM, JPG, TIF and PNG illustration formats are
allowed</objectUse>
</notationRule>
</notationRuleList>
</contextRules>
<!-- A structure rule specific to the Comment Schema -->
<contextRules rulesContext="http://www.s1000d.org/S1000D_4-
2/xml_schema_flat/comment.xsd">
<structureObjectRuleGroup>
<structureObjectRule>
<objectPath allowedObjectFlag="2">//comment</objectPath>
<objectUse>The comment object is not applied to these
projects</objectUse>
</structureObjectRule>
</structureObjectRuleGroup>
</contextRules>
<!-- The following rule is specific to IPD data modules and
limits the formats/notations for IPD modules to CGM only -->
<contextRules rulesContext="http://www.s1000d.org/S1000D_4-
2/xml_schema_flat/ipd.xsd">
<notationRuleList>
<notationRule>
<notationName allowedNotationFlag="1">CGM</notationName>
<objectUse>CGM is mandated to support hotpotting functionality
in the catalogs.</objectUse>
</notationRule>
</notationRuleList>
```

```
</contextRules>
<!-- The following rule is specific to Process data modules and
excludes the use of TIF while the rest of the base set (ie CGM,
JPG and PNG) are still allowed -->
<contextRules rulesContext="http://www.s1000d.org/S1000D_4-
2/xml_schema_flat/process.xsd">
<notationRuleList>
<notationRule>
<notationName allowedNotationFlag="0">TIF</notationName>
<objectUse>Excluded since the project Process data module engine
cannot render TIF illustrations.</objectUse>
</notationRule>
</notationRuleList>
</contextRules>
<nonContextRules><nonContextRule>
<simplePara>CSDB synchronization between partner companies must
occur last Sunday of each month.</simplePara>
</nonContextRule></nonContextRules>
</brex>
</content>
</dmodule>
```

Chapter 4.10.2.1

BREX data module - SNS rules

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Chap 4.10.1	Business rules - Business rules document data module
Chap 4.10.2.2	BREX data module - Context related rules
Chap 4.10.2.3	BREX data module - Context independent rules

1 General

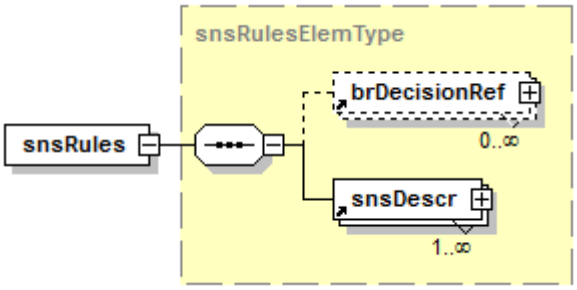
The BREX data module content section consists of three main blocks of rules, one of which is the block of SNS rules described below. The other two blocks contain:

- context related rules. Refer to Chap 4.10.2.2.
- context independent rules. Refer to Chap 4.10.2.3.

2 SNS rules

Description: The element <snsRules> contains descriptions of one or several SNS systems that apply to the project concerned.

Markup element: <snsRules>



ICN-83007-0000000014-003-01

Fig 1 Element <snsRules>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- brSeverityLevel (O). Refer to Chap 4.10.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

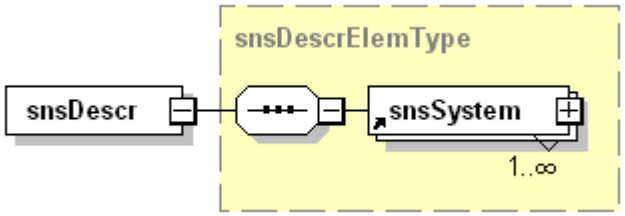
Child elements:

- <brDecisionRef>. Refer to Chap 4.10.1.
- <snsDescr>. Refer to Para 2.1.

2.1 SNS description

Description: The element <snsDescr> provides a description of each specific SNS system.

Markup element: <snsDescr>



ICN-83007-0000000015-002-01

Fig 2 Element <snsDescr>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeMark` (O), `changeType` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

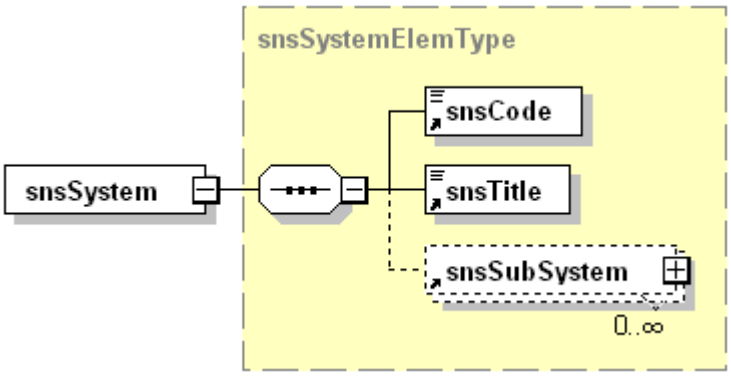
Child elements:

- <`snsSystem`>. Refer to Para 2.1.1.

2.1.1 SNS system code

Description: The element <`snsSystem`>contains the specification of each system defined for the SNS.

Markup element: <`snsSystem`>



ICN-83007-0000000016-002-01

Fig 3 Element <snsSystem>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeMark` (O), `changeType` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.

- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

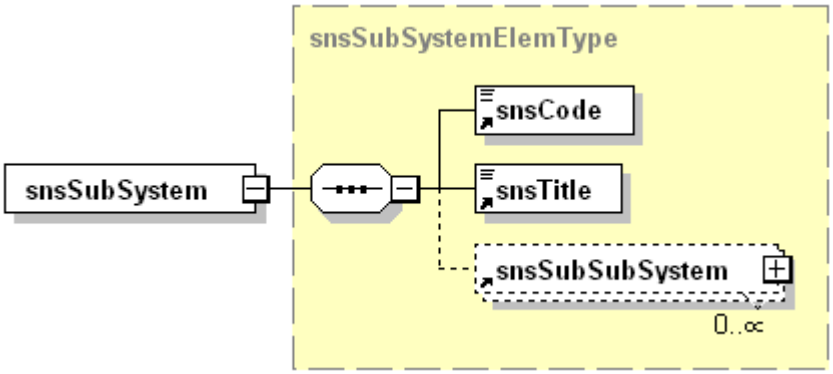
Child elements:

- <snsCode>. Refer to Para 2.1.5 and default BREX rule BREX-S1-000145.
- <snsTitle>. Refer to Para 2.1.6.
- <snsSubSystem>. Refer to Para 2.1.2.

2.1.2 SNS subsystem code

Description: The element <snsSubSystem> contains the specification of each subsystem defined for the SNS system.

Markup element: <snsSubSystem>



ICN-83007-0000000017-002-01

Fig 4 Element <snsSubSystem>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

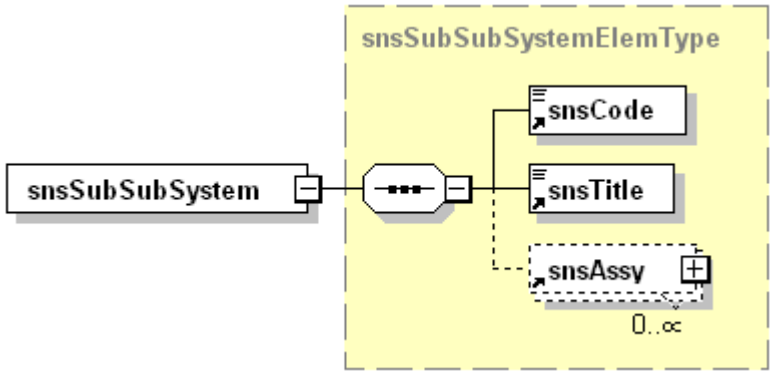
Child elements:

- <snsCode>. Refer to Para 2.1.5 and default BREX rule BREX-S1-000146.
- <snsTitle>. Refer to Para 2.1.6.
- <snsSubSubSystem>. Refer to Para 2.1.3.

2.1.3 SNS sub-subsystem code

Description: The element <snsSubSubSystem> contains the specification of each sub-subsystem defined for the SNS subsystem concerned.

Markup element: <snsSubSubSystem>



ICN-83007-0000000018-002-01

Fig 5 Element <snsSubSubSystem>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeMark` (O), `changeType` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

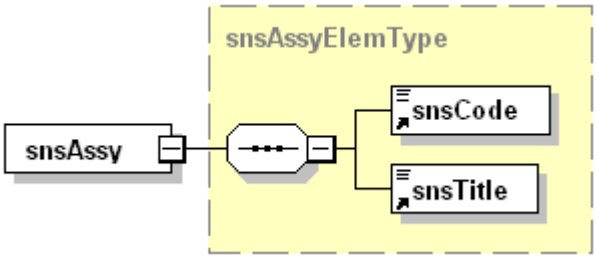
Child elements:

- <`snsCode`>. Refer to Para 2.1.5 and default BREX rule BREX-S1-000147.
- <`snsTitle`>. Refer to Para 2.1.6.
- <`snsAssy`>. Refer to Para 2.1.4.

2.1.4 SNS assembly code

Description: The element <`snsAssy`> contains the specification of each assembly defined for the SNS sub-subsystem concerned.

Markup element: <`snsAssy`>



ICN-83007-0000000019-002-01

Fig 6 Element <snsAssy>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeMark` (O), `changeType` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.

- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <snsCode>. Refer to Para 2.1.5 and default BREX rule BREX-S1-000148.
- <snsTitle>. Refer to Para 2.1.6.

2.1.5 SNS code

Description: The element <snsCode> contains a code used to define a component in an SNS structure. The code concerned is represented as text content. Depending on the context it can be either the code of a system, a subsystem, a sub-subsystem or an assembly.

Markup element: <snsCode>

Attributes:

- None

Child elements:

- None

2.1.6 SNS title

Description: The element <snsTitle> contains a title corresponding to a code used to define a component in an SNS structure. The title is represented as text content. Depending on the context it can be either the title of a system, a subsystem, a sub-subsystem or an assembly.

Markup element: <snsTitle>

Attributes:

- None

Child elements:

- None

Chapter 4.10.2.2

BREX data module - Context related rules

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Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.3	Data modules - Applicability
Chap 4.10.1	Business rules exchange - Business rules document data module

Chap No./Document No.	Title
Chap 4.10.2.1	BREX data module - SNS rules
Chap 4.10.2.3	BREX data module - Context independent rules
REC-xmlschema-2-20041028	W3C Recommendation: XML Schema Part 2: Datatypes Second Edition

1 General

The BREX data module content section consists of three main blocks of rules, one of which is the block of context related rules described below. The other two blocks contain:

- SNS rules. Refer to Chap 4.10.2.1.
- Context independent rules. Refer to Chap 4.10.2.3.

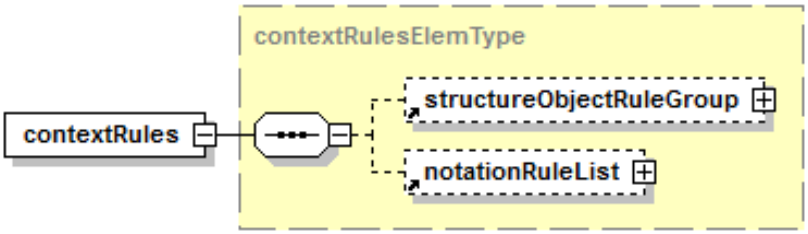
2 Rules related to context

Description: The element <`contextRules`> contains rules that can be related to one or more Schema contexts (ie, rules regarding the use of elements in various Schemas).

The element can be repeated to give rules that are specific to different Schemas, where the Schema concerned is identified by the attribute `rulesContext`. If the attribute is not specified the contained rules will commonly apply to all objects, regardless of Schema.

Rules given for a specific Schema override rules applicable to all Schema contexts. Rules specific to a Schema must be true restrictions to commonly applicable rules.

Markup element: <`contextRules`>



ICN-83007-0000000020-002-01

Fig 1 Element <`contextRules`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeMark` (O), `changeType` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `rulesContext` (O), specifies the context (ie, the Schema) to which the contained rules apply. Context must be specified by the applicable URL of the Schema for XML encoded CSDB objects (eg, http://www.s1000d.org/S1000D_4-2/xml_schema_flat/descriptSchema.xsd).
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

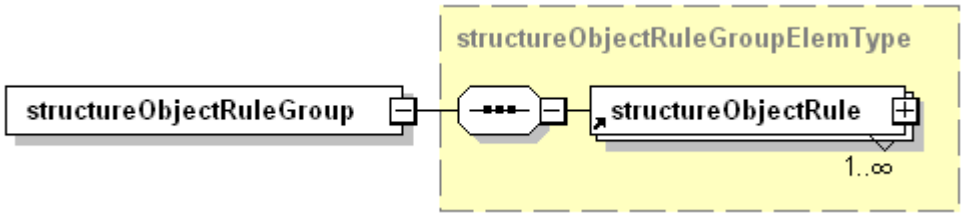
Child elements:

- <structureObjectRuleGroup>. Refer to Para 2.1.
- <notationRuleList>. Refer to Para 2.2.

2.1 Structure rules

Description: The element <structureObjectRuleGroup> specifies all rules about the project specific use of elements and attributes for all the various document types (Schema) used within the project.

Markup element: <structureObjectRuleGroup>



ICN-83007-0000000021-002-01

Fig 2 Element <structureObjectRuleGroup>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

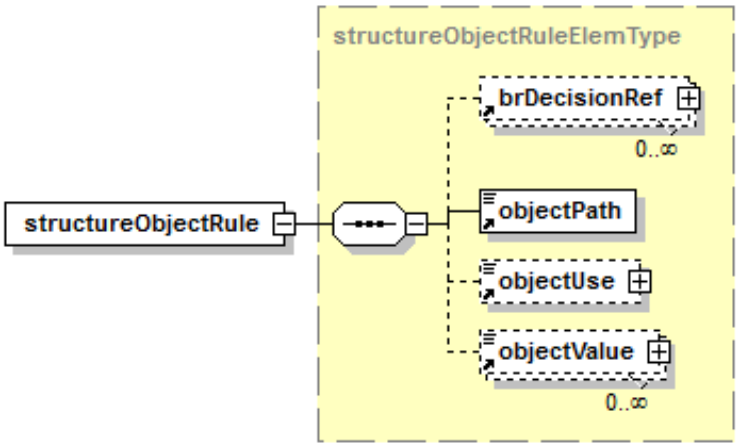
Child elements:

- <structureObjectRule>, the project specific rules. Each occurrence representing a rule regarding one object. Refer to Para 2.1.1.

2.1.1 Structure object rule

Description: The element <structureObjectRule> contains rules that apply to an element or an attribute, which must be given when the intended use of that object does not fully coincide with the specification, for instance by being more restrictive.

Markup element: <structureObjectRule>



ICN-83007-0000000022-003-01

Fig 3 Element <structureObjectRule>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- brSeverityLevel (O). Refer to Chap 4.10.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <brDecisionRef>. Refer to Chap 4.10.1.
- <objectPath>. Refer to Para 2.1.2.
- <objectUse>. Refer to Para 2.3.
- <objectValue>. Refer to Para 2.1.3.

2.1.2 Object path

Description: The element <objectPath> contains an XPath address defining where the element or attribute occurs in the Schema structure. This must be identified for an element or attribute for which rules are given.

Markup element: <objectPath>

Attributes:

- allowedObjectFlag (M), defines if and how the object is applied within the organization or the project. The attribute can have one of the following values:
  - "0" - No, the object must not be used in the context concerned
  - "1" - Yes, the object must be included in the context concerned
  - "2" - the object can optionally be used in the context concerned, however, fully in accordance with the specification text and the Schemas
- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- None

Markup examples:

The following example shows a rule expressing a narrative statement concerning the use of an optional element.

```
<structureObjectRule>
<objectPath
allowedObjectFlag="2">//graphic/@boardno</objectPath>
<objectUse>Responsible partner company code in ICN must be an
uppercase A</objectUse>
</structureObjectRule>
```

The following example shows how the use of either the element <systemBreakdownCode> or the element <functionalItemCode> (in the status section) is mandated.

```
<structureObjectRule>
<objectPath
allowedObjectFlag="0">not(//dmStatus/systemBreakdownCode or
//dmStatus/functionalItemCode)</objectPath>
<objectUse>The use of element systemBreakdownCode or element
functionalItemCode is required</objectUse>
</structureObjectRule>
The following example shows how the attribute learnCode is
mandated in the identification of a data module.
<structureObjectRule>
<objectPath
allowedObjectFlag="1">//dmIdent/dmCode/@learnCode</objectPath>
<objectUse>Learn code must always be included in the data module
identifications</objectUse>
</structureObjectRule>
```

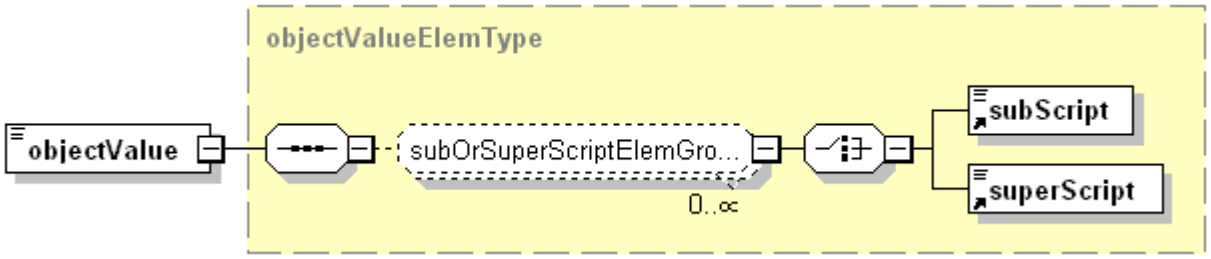
2.1.3 Object value

Description: The element <objectValue> contains the description of the intended meaning.

When relevant, each specific single value, range of values, or pattern value that is applicable to an element or attribute within a project or organization must be given. In addition, there should be a short description of each single value, value range, or pattern value to explain the intended meaning of the value.

Since this element is repeatable, it is possible to specify multiple and/or single values, ranges of values, or pattern values for a specific element or attribute.

Markup element: <objectValue>



ICN-83007-0000000023-002-01

Fig 4 Element <objectValue>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- valueTailoring (O), specifies if and how the given values can be tailored by a lower level BREX data module. The attribute can have one of the following values:
  - "restrictable" - a BREX at a lower level can impose further restrictions to the given value by changing the textual interpretation to reflect that restriction
  - "lexical" - a BREX at a lower level can adjust the text string constituting the interpretation, however, only in respects that do not in any way change the conceptual and semantic meaning of the interpretation
  - "closed" (D) - a BREX at a lower level must not in any way restrict or alter the interpretation of a value declared at this level
- valueForm (O), the type of content contained in the attribute valueAllowed. The attribute can have one of the following values:
  - "single" - a single value applies to the object
  - "range" - a range of values applies to the object
  - "pattern" - a pattern value applies to the object
- valueAllowed (O), the specification for the single value, range of values or pattern value applicable to the object. A range should be specified in the format defined in Chap 3.9.5.3. A pattern should be provided as a regular expression in accordance with "REC-xmlschema-2-20041028 "W3C Recommendation: XML Schema Part 2: Datatypes Second Edition (2004 Second Edition)".
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <subScript>. Refer to Chap 3.9.5.2.1.10.
- <superScript>. Refer to Chap 3.9.5.2.1.10.

2.2 Notation rules

Description: The element <notationRuleList> contains rules concerning which types of CSDB objects can contain illustrations or multimedia objects of specified formats/notations.

The element can be used to define a base set of formats/notations commonly allowable to all CSDB object types. However, as described below it is also used to specify restrictions of the base set when such restrictions are suitable to any specific CSDB object type (eg, an IPD data module).

A project or an organization can specify the base set of formats/notations (ie, the total project scope of acceptable formats/notations) by listing the allowed formats/notations using the element <notationRuleList> where its parent structure (ie, the element <contextRules>) does not name any specific CSDB object type (refer to Para 2). Since no specific CSDB object type is given, the listed formats/notations will be commonly applicable to all CSDB object types.

Sometimes there is a need in specific CSDB object types (ie, written to a certain Schema) to impose restrictions from the base set of allowable formats/notations commonly adopted by a project or an organization. This can be achieved by specifying the desired restrictions using the element <notationRuleList> in the context concerned, where context is specified in the parent element <contextRules>.

Note

It is recommended that projects and/or organizations use the applicable BREX data module to specify which formats/notations are allowed. If this is not the case, the scope of allowable formats/notations must be specified by using other means, especially since S1000D leaves an option open for users to include formats/notations not named in the specification text.

Markup element: <notationRuleList>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <notationRule>. Refer to Para 2.2.1.

Business rule decision point BRDP-S1-00370 - Include restrictions in using various illustration, multimedia object or other data information formats:

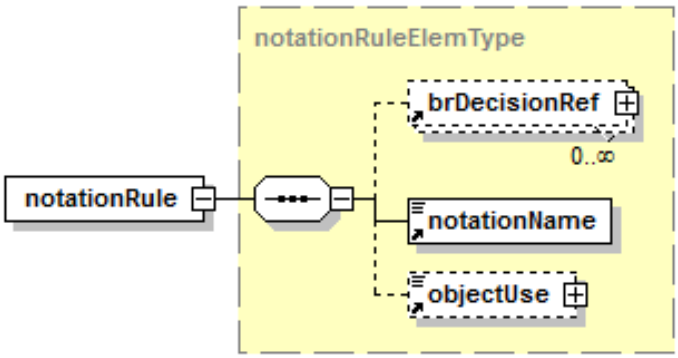
- Decide whether to use the BREX data module to impose any restrictions in the use of various formats for illustrations, multimedia objects or other data.

2.2.1 Notation specific rule

Description: The element <notationRule> contains the rule for one specific format/notation. Typically, the element is used to include an allowable format/notation in an explicitly specified set of formats/notations. In addition, when applied for a specified Schema/context the element can be used to explicitly exclude the use of a specified format/notation from a certain type of CSDB objects.

Markup element: <notationRule>

Each occurrence of the element represents its own notation.



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Fig 5 Element <notationRule>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeType (O), changeMark (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- brSeverityLevel (O). Refer to Chap 4.10.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <brDecisionRef>. Refer to Chap 4.10.1.
- <notationName>. Refer to Para 2.2.2.
- <objectUse>. Refer to Para 2.3.

2.2.2 Notation name

Description: The element <notationName> contains a specific format/notation name. Each format/notation, for which special project rules are given, must be specified and its intended use explained.

Markup element: <notationName>

Attributes:

- allowedNotationFlag (O), declares if and how the format/notation is applied within the context concerned. The declaration is always relative to the base set of formats/notations. Given the commonly allowable base set of formats/notations, the attribute allowedNotationFlag is used to further specify the applicability of various formats/notations in various contexts. The attribute can have one of the following values:
  - "0" - No, the format/notation must not be used within the project in the context concerned. Thus, by using this attribute value it is possible to exclude the use of the named format/notation from a specified CSDB object type, even though the format/notation can be allowed in other CSDB object types.
  - "1" - Yes, the format/notation is one among those that must be used in the context concerned. When no explicit context is given for the parent structure, assigning this value includes the named format/notation in the base set of allowable formats/notations. When an explicit context is given, the set of notations for that

context is redefined and the format/notation will be one allowed for the context concerned. Regardless of whether the context is the base set or a Schema specific context, several such inclusions mean that all the included formats/notations are equally allowed.

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

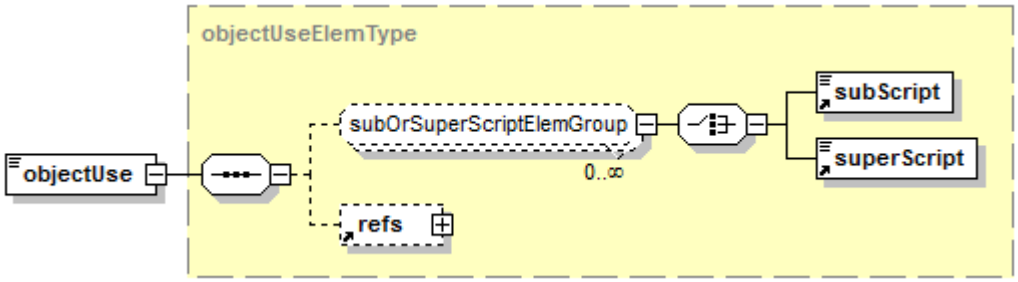
- None

2.3 Object use

Description: The element <`objectUse`> contains a specific description and intended use for each element, attribute, or notation that is recorded in the BREX data module.

The description should be a short narrative explanation of the use to the extent that interpretation of the object is perfectly clear. This description can contain references to supporting data modules and/or other technical publications. Refer to Chap 3.9.5.2.1.2.

Markup element: <`objectUse`>



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Fig 6 Element <`objectUse`>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeType` (O), `changeMark` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`subScript`>. Refer to Chap 3.9.5.2.1.10.
- <`superScript`>. Refer to Chap 3.9.5.2.1.10.
- <`refs`>. Refer to Chap 3.9.5.2.1.2.

Chapter 4.10.2.3

BREX data module - Context independent rules

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Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 4.10.1	Business rules - Business rules document data module
Chap 4.10.2.1	BREX data module - SNS rules
Chap 4.10.2.2	BREX data module - Context related rules

1 General

The BREX data module content section consists of three main blocks of rules, one of which is the block of context independent rules described below. The other two blocks contain:

- SNS rules. Refer to Chap 4.10.2.1.
- Context related rules. Refer to Chap 4.10.2.2.

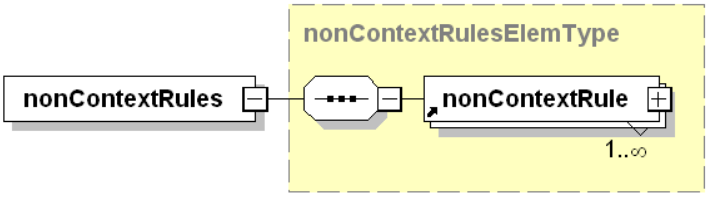
2 Rules not related to context

Description: The element <nonContextRules> contains the set of project-specific business rules which cannot be related to any particular schema/context or any particular elements and attributes in the schema structures.

Note

The element must not be used for general comments.

Markup element: <nonContextRules>



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Fig 1 Element <nonContextRules>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- changeMark (O), changeType (O), and reasonForUpdateRefIds (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.
- securityClassification (O), commercialClassification (O), caveat (O) and derivativeClassificationRefId (O), the security and restrictive marking. Refer to Chap 3.6.

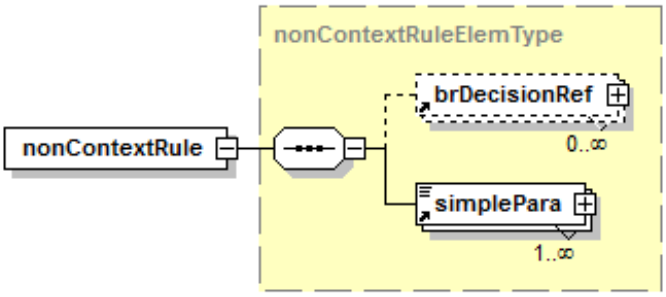
Child elements:

- <nonContextRule>, each occurrence representing one business rule. Refer to Para 2.1.

2.1 Non-context related rule

Description: The element <nonContextRule> contains a rule not related to any particular schema, schema element or attribute.

Markup element: <nonContextRule>



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Fig 2 Element <nonContextRule>

Attributes:

- `id` (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- `changeMark` (O), `changeType` (O), and `reasonForUpdateRefIds` (O), the change indications. Refer to Chap 3.9.5.2.1.1.
- `brSeverityLevel` (O). Refer to Chap 4.10.1.
- `controlAuthorityRefs` (O), the control authority information by referencing the element <`controlAuthority`>. Refer to Chap 3.9.5.1.
- `securityClassification` (O), `commercialClassification` (O), `caveat` (O) and `derivativeClassificationRefId` (O), the security and restrictive marking. Refer to Chap 3.6.

Child elements:

- <`brDecisionRef`>. Refer to Chap 4.10.1.
- <`simplePara`>. Refer to Chap 3.9.5.2.1.10.

Chapter 4.10.2.4

BREX data module - Coding BREX data modules

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Chap 4.3	Information management - Data module code
Chap 4.3.1	Data module code - Model identification code
Chap 4.3.3	Data module code - Standard numbering system

1 General

The BREX data module is stored in the CSDB. This chapter explains the data module code for a BREX data module. The general principles for the data module code are given in Chap 4.3.

2 The BREX data module code

A BREX data module contains information about a whole Product or some part of a Product and must apply the data module code accordingly.

The model identification code for a BREX data module will in most production situations be the model identification code of the project concerned. However, BREX data modules can be developed on a higher level (eg, national or enterprise level) in order to constitute a platform for developing modules for several projects. In this situation, the organization has to allocate/apply for a model identification code that will serve the organization purposes.

The SNS code must not be applied below sub-subsystem level. The unit of assembly code of the BREX data module code must always be "00" or "0000". The disassembly code is applied as described below. As far as employment of material item category code is appropriate, depending on the scope of a BREX data module, it can be used in the BREX data module code.

The information code for a BREX data module is 022, and the item location code is set to D.

It is recommended that a project applies the same set of business rules to all data modules, and therefore has one BREX data module for the project. If this is not possible, it is recommended that the project or the organization keeps the number of BREX data modules to a minimum.

Note

There can be only one BREX referred to by each CSDB XML object, reflecting the business rules that apply to that particular object. Nevertheless, a CSDB object can of course fulfil the rules in several differing BREX data modules.

Business rule decision point BRDP-S1-00368 - Applicable sets of business rules:

– Decide which set or sets of business rules are allowed within the given project or the organization. Accordingly, decide which BREX data modules will be used to reflect those business rules.

2.1 Coding for single business rules documents data module

When business rules for the whole Product are contained in a single business rules document data module, that data module must be coded:

YY-A-00-00-00-00A-022A-D (17 characters)

thru

YYYYYYYYYYYYYY-AAAA-**Y**00-00-0000-00AAA-022A-D (37 characters)

Where "**YY**" and "**YYYYYYYYYYYYYY**" are the Product's model identifier. Refer to Chap 4.3.1.

2.2 Coding for multiple business rules documents data modules at the Product level

When business rules for the whole Product are contained in multiple business rules document data modules, these must be coded:

YY-A-00-00-00-**NN**A-022A-D (17 characters)

thru

YYYYYYYYYYYYYY-AAAA-**Y**00-00-0000-**NN**AAA-022A-D (37 characters)

Where:

"**YY**" and "**YYYYYYYYYYYYYY**" are the Product's model identifier. Refer to Chap 4.3.1.

"**NN**", in the disassembly code, is a sequential number starting from "00".

Example:

Two different BREX variants are needed within a project. They both apply to the Product level. They are coded:

XX - A - 00 - 00 - 00 - 00A - 022A - D (17 characters)

XX - A - 00 - 00 - 00 - 01A - 022A - D (17 characters)

2.3 Coding for business rules documents data modules at the system level

When business rules apply to a specific system of a Product they can be contained in one or more business rules document data modules. They must be coded:

YY-A-**SS**-00-00-**NN**A-022A-D (17 characters)

thru

YYYYYYYYYYYYYY-AAAA-**YSS**-00-0000-**NN**AAA-022A-D (37 characters)

Where:

"**YY**" and "**YYYYYYYYYYYYY**" are the Product's model identifier. Refer to Chap 4.3.1.

"**SS**" is the system code. Refer to Chap 4.3.3.

"**NN**", in the disassembly code, is a sequential number for each system, starting from "00".

Chapter 4.10.3

Business rules exchange - Default BREX data module

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Chap 4.10	Information management - Business rules exchange
Chap 8.4.1	Information codes - Short definitions
Chap 8.5.1	Learn codes - Human performance technology codes
Chap 8.5.2	Learn codes - Training codes
S1000D-F-04-10-0301-00A-022A-D	Default BREX data module

1 General

This chapter describes the default BREX data module provided by the specification.

2 The default BREX data module

Since business rules carry information essential for the correct interpretation of the content of the CSDB, the rules must be carefully recorded in a BREX data module. The project or the organization should examine the default data module to conclude if it meets the project or the organization requirements.

This default BREX data module specifies a number of rules generally applicable to the current issue of the specification. These are:

- the predefined value sets of the configurable attributes as specified as these in Chap 3.9.6.1
- the allowable information codes as these are specified in Chap 8.4.1
- the allowable learn codes as these are specified in Chap 8.5.1 and Chap 8.5.2
- a collection of rules not possible to reflect directly in the Schemas

Each rule mandated by S1000D but not captured by Schema constructs corresponds to a default BREX rule, which is identified as BREX-S1-NNNNN, where:

- S1 indicates that the given rule is defined by S1000D
- NNNNN is a unique persistent number assigned by S1000D to each default BREX rule. This number will not change between Issues of this specification. Any new default BREX rule will be assigned a completely new unique default BREX rule number.

The default BREX data module specifies itself as the applicable BREX data module.

The data module code of the default BREX is S1000D-**Y**-04-10-0301-00A-022A-D, where:

- the system difference code, here indicated by "**Y**", is used to distinguish between default BREX data modules related to, and published with, different issues of the specification

For this issue, Issue 5.0, the system difference code "G" applies.

Note

Normally, the data module code of a BREX data module will be at the top level of the product structure (system code, subsystem code, etc, will all be zeros). The default BREX data module, since also serving as an example of how a BREX module can be marked up, is assigned a data module code distinguishing it as a part of Chap 4.10.

Chapter 4.11

Information management - Process data module

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Chap 3.9.5.2.10	Content section - Process data module
Chap 8.4	SNS, information and learn codes - Information codes

1 General

This chapter gives an overview of the process data module.

2 Process data module

2.1 Principle

The S1000D process data module represents a procedural flow consisting of several data modules and/or steps that are sequenced. Decision points (branching), looping, and selective filtering are supported. An interface to external applications which can return results to direct procedural flow is supported. The process data module can be considered a procedural flow script.

The process data module can be used to represent any level of granularity of information except for an entire publication. Typically, a process data module represents a small discrete task and

is simply an alternate method to markup procedural data, descriptive data, fault data, etc. A process data module can also be used to sequence several "smaller" data modules and therefore represents larger overall processes.

The process data module can be used to represent most types of information. It is especially well suited to represent procedural data, fault data and descriptive data. It is not well suited to represent wiring data, parts data and schedule data.

The conceptual logic engine component of S1000D reads a process data module as an input and executes instructions contained within. In computing terms, it acts as an interpreter on the process data module. In an IETP implementation, the logic engine can be a separate software component, or it can be directly contained within the viewer.

The process data module uses variables to control branching and looping, and to support context filtering, passing data to external applications, and providing state information to the IETP user. It is necessary to maintain the values assigned to the declared variables and to evaluate expressions containing them in support of decision points and context filtering. The variables and associated values are referred to as state information.

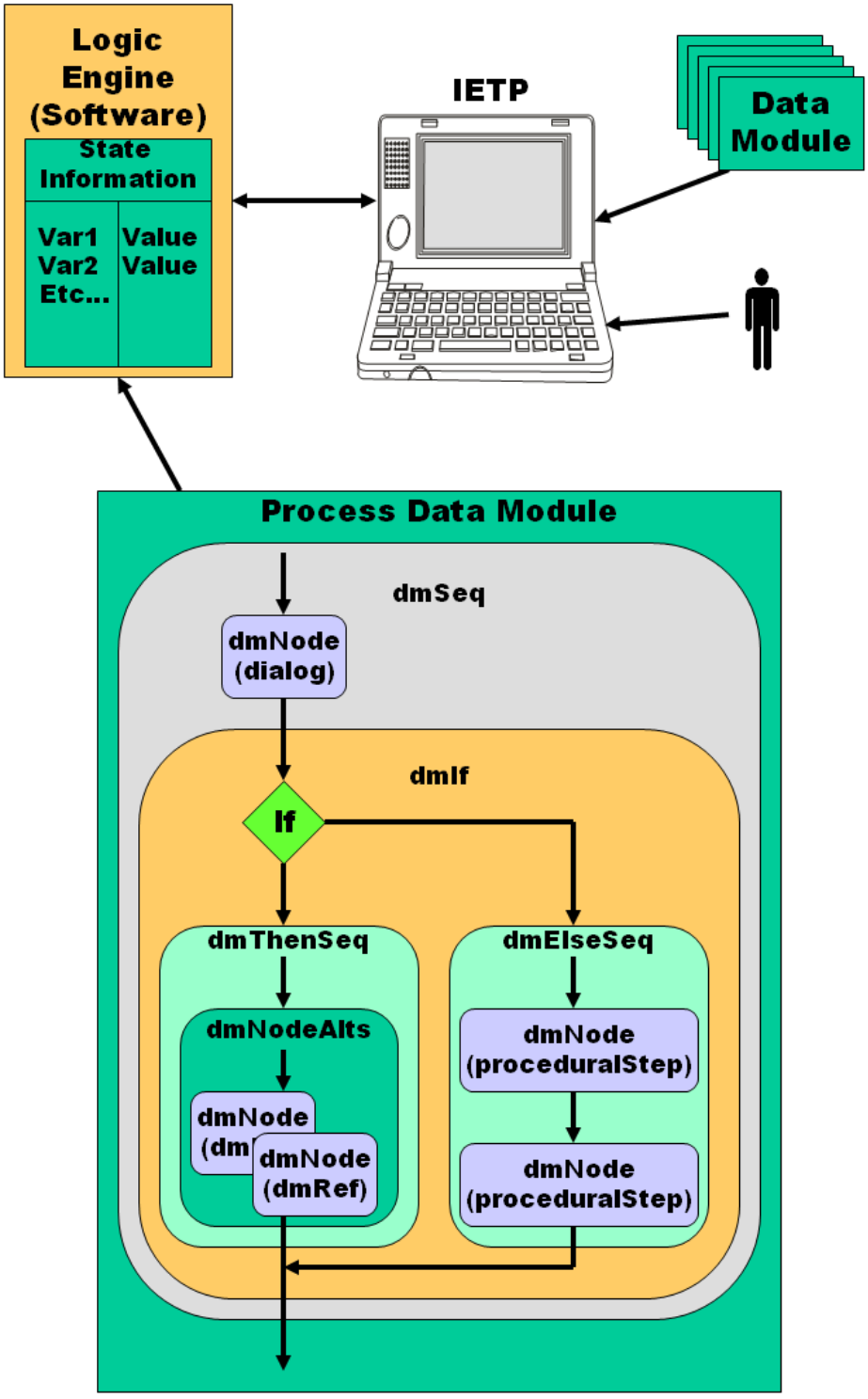
Variables can have global or local scope. Local variables are declared and initialized within the process data module in which they are to be used. Local variables are unavailable to any other data module. Global variables are defined in the ACT and CCT as applicability properties and conditions and can be initialized in the PCT. They are used for applicability processing as well as global variables in process data modules. Global variables are available to any data module.

There are several ways for variables to obtain values. Values can be directly assigned to variables within the process data module content using presets and postsets. Dialogs can be used to ask questions of the user and assign values depending on the user's answer, and external applications can return values which get assigned to variables.

The user is presented with data modules, steps and dialogs as they are sequenced within the process data module. The logic engine and the process data module work together, in the background, to guide the procedural flow. In order to allow the user to navigate through the process data module, two functions are available:

- the "Next" function, which instructs the logic engine to continue executing the process data module until a new data module, step or dialog is to be presented
- the "Previous" function, which instructs the logic engine to return to the previous data module, step or dialog

Fig 1 provides a conceptual overview of the process data module, its interaction with other data modules, the logic engine and the user.



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Fig 1 Process data module conceptual diagram

In Fig 1, a process data module sequences (one or) several occurrences of element <dmNode> which include an element <dialog>, two occurrences of element <dmRef>,

and two occurrences of element <proceduralStep>. The user interacts with the logic engine through navigation functions ("Next" and "Previous") which instruct the logic engine to proceed or return, and through dialog functions which collect state information values. Refer to Chap 3.9.5.2.10 for more details.

The architecture in Fig 1 implies that the logic engine and the IETP are separate components. This architecture is used only for illustration purposes and is not mandated by S1000D. Any number of architectures can provide the same functionality.

A typical sequence of operation includes:

1 The logic engine starts executing the process data module.
The element <dmNode> (dialog) is executed.
The logic engine sends the dialog fragment to the IETP for display to the user.

2 The user answers the dialog in the IETP.
The IETP sends the user response to the logic engine.
The logic engine updates the appropriate variable in the state information table.

3 The element <dmIf> is executed.
The logic engine evaluates the (IF) expression against variables in the state table.
The logic engine determines which path to take.

4 Assuming the element <dmThenSeq> branch:

4.1 The element <dmNodeAlts> is executed.
The applicability expression of each element <dmNode> within element <dmNodeAlts> is evaluated against variables in the state table.
The first element <dmNode> with its applicability expression evaluated to TRUE is executed.

4.2 The element <dmNode> (containing an element <dmRef>) is executed.
The logic engine notifies the IETP to display the referenced data module.
The IETP locates the data module and displays it to the user.

5 Assuming the element <dmElseSeq> branch:

5.1 The element <dmNode> (proceduralStep) is executed.
The logic engine sends the element <proceduralStep> fragment to the IETP for display to the user.

5.2 The user activates the "Next" function within the IETP.
The IETP notifies the logic engine to move NEXT.

5.3 The second element <dmNode> (proceduralStep) is executed.
The logic engine sends the element <proceduralStep> fragment to the IETP for display to the user.

2.2 Benefits

The process data module adds some advanced capability not available from other data module types. The cost of these advanced capabilities is complexity, both in the applications to create and display the data, and in the data itself. A project or an organization must carefully consider the requirements for these advanced capabilities and use them where the benefits will outweigh the additional effort.

2.2.1 Applicability processing model

The process data module provides for the use of expressions within applicability. The element <expression> has all the capabilities of the standard applicability structure. It contains the element <assert> and can thus employ applicability properties/global variables anywhere within it. In addition, expressions provide access to local variables and higher math functions. As a result, the IETP can customize the display to the user based on known product configuration, operating conditions, or any previously collected information.

2.2.2 Interaction with the user

The process data module can be much more interactive than other data module types. Dialogs can ask the user questions and store the answer for further use. These answers can be used to direct the maintenance flow and the customized display. State information can also be displayed to the user in paragraphs, prompts, and other structures.

2.2.3 External application interface

An external application interface is provided that allows for initiating a software program external to the IETP, sending information to that external application and retrieving results. One of the more powerful uses of this is to interface with automated test equipment or even the Product itself to retrieve information that will further direct the maintenance flow. This works much the same as the interaction with the user, but it is a machine interface.

2.2.4 Branching and looping

If-then-else branching is supported in the process data module along with conditional looping. The point of branching is to simplify the maintainer's navigation through a procedure by ensuring everything he sees is applicable to him in his current circumstance. Looping can ensure that a user performs a complicated series of actions repeatedly until some goal is achieved. Conditional constructs such as these make navigation through the same data potentially different every time it is used dependent on equipment configuration, equipment failure conditions, operating conditions or any number of variables created within the data module.

2.3 Identification of a process data module

A process data module must always be written with a maintenance or operational goal in mind. As such, the standard method of assigning data module codes must be applied. In the case where an information code cannot be found to express the maintenance or operational goal, the generic process information code 951 is available. Refer to Chap 8.4. The implication of using this method is that the maintenance or operational goal represented by the process data module is not available.

Chapter 4.12

Information management - Multiple instances of CSDB objects

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Chap 4.13.1	Optimizing and reuse - Common information repository concept
Chap 7.5.1	Information interchange - File based transfer

1 General

This chapter describes the management of multiple instances of the "same" CSDB object. There are several situations where multiple instances can be required, which adds another level of complexity to the identification of the objects concerned.

The most prominent need for multiple instances of a CSDB object is in the relation between a manufacturer and his customers. Normally manufacturers have to maintain information, ie, data modules, for all configurations of a product whereas a specific customer, who owns and operates a limited number of product configurations, is only concerned with the information that is applicable to his specific configurations.

For example, there can be a need to create one data module instance per customer. Instances will be derived from the master data module by filtering mechanisms based on applicability, where filtering includes removal of information applicable to product configurations (which do not belong to the considered customer). This strategy is often referred to as the master-customized concept.

The various CSDB object types that can appear in several instances are:

- the data module
- the publication module
- the SCORM content package module
- the data update file

For a more thorough definition of the term applicability, refer to Chap 3.9.5.3.

2 The conceptual model

The discussion below describes the incentives for allowing multiple instances of data modules and how unique identities and object traceability are achieved. It should be recognized, though, that the principles of the discussion applies similarly to all the objects that can exist in multiple instances, regardless of their type.

When allowing multiple instances (refer to business rule decision point in Para 3.1) the object identifier is extended with two preceding attributes (refer to Para 3.4) and the object code is renamed as follows:

- the data module code (DMC) becomes the Extended data module code (Data Module code - Extended (DME))
- the publication module code (PMC) becomes the Extended publication module code (Publication Module code - Extended (PME))
- the SCORM content package module code, also known as SCORM Module Code, (SMC) becomes the Extended SCORM content package module code (SCORM content package Module code - Extended (SME))
- the data UPdate File code (UPF) becomes the data Extended update file code (data UPdate file code - Extended (UPE))

The conceptual model of identifying multiple instances of data modules is detailed in Para 3. The same applies to all the objects listed above.

For detailed information about file names, refer to Chap 7.5.1.

3 Conceptual model applied to data modules

The data module is a central concept in S1000D. It is the smallest independent piece of data that is administered by S1000D.

3.1 Data module instances

A data module can be instantiated in several instances (customer variants etc). For example, this could be due to needs for:

- an updated and new issue of the data module
- ongoing updating that generate a new in-work version
- a data module variant in a second, third, etc, language
- a data module variant in a particular (country related) dialect of a language
- a variant marked up using a different S1000D version
- a self-contained instance derived from a data module - dependent on Common Information Repository (CIR) data module(s) - and the associated CIR data module(s). Refer to Chap 4.13.1.
- instances that for other reasons than above are generated to the specific needs of a particular user community, for example a tailored for certain customer's product versions

The first two examples represent the normal situation, typically information about a Product that needs updating for various reasons during the product lifecycle. The other examples represent a feature in S1000D that is frequently used when there are multiple customers for a single data module.

Different customers of a Product often have different configurations of that Product and so, the supporting information must reflect those configurations. S1000D provides the means to filter a master data module to generate several customer specific instances - applicable to the various configurations and effective to the various customers' needs. Such filtering is based on the metadata provided with the data module and, in particular, based on the applicability given for the master data module as a whole and optionally for fragments of those data modules that use referenced applicability. Refer to Chap 3.9.5.3.

A specific instance can also be generated by resolving the references to CIR from a master CIR-dependent data module, and thereby insert the target fragments into the generated instance. Such a generation is managed by the publication process.

It is important to understand that even though an instance of a data module can be derived from another data module (eg, a source/master) it is managed as an independent data module in the same way as its source. For example, even though it is not normally the case, a source data module can be deleted while the instances derived from it still exist.

Even though a data module instance can be derived as the result of a filtering process where data is extracted based on referenced applicability markings, there are cases when this is not possible, and each instance must be created and managed separately.

Business rule decision point BRDP-S1-00373 - Use of multiple instances of CSDB object:

- Decide whether to generate multiple instances of CSDB objects to generate several customized instances of any one object issue. If so, decide how the attributes `extensionProducer` and `extensionCode` must be used.

3.2 Applicability and sensitivity

3.2.1 Applicability

Applicability is used to indicate which configuration of a Product that data module supports. The range and scope of a data module's applicability is declared in the identification and status section (Refer to Chap 3.9.5.1) and the specific applicability for various configurations is declared in the content section, using referenced applicability. Refer to Chap 3.9.5.3.

3.2.2 Sensitivity

When there are multiple customers, it is possible that any one (or more) of those customers do not wish to take delivery of information that supports a configuration of the Product that they have not received. Further, there can be cases where a particular customer does not wish other

customers to know that he has taken delivery of a particular configuration of the Product and, therefore, not even reveal that he receives the supporting data modules for that configuration. In cases like this, applicability within S1000D can be used to filter the information.

3.3 Data module identification

A data module is identified by the parameters specified in its identification and status section. In several cases it is sufficient to use only a subset of these parameters to uniquely identify a data module globally. The most applied subset consists of the data module code but it is quite common that issue and inwork numbers and language/country codes are added to provide the unique identification.

Chap 7.5.1 describes how data module files are named based on the following parameters (with subparameters) in order to achieve globally unique identities in a web environment:

- data module code, element <dmCode> with attributes
- language, element <language> with attributes
- issue number, element <issueInfo> with attributes

3.4 Data module instance identification

3.4.1 Data module code extension

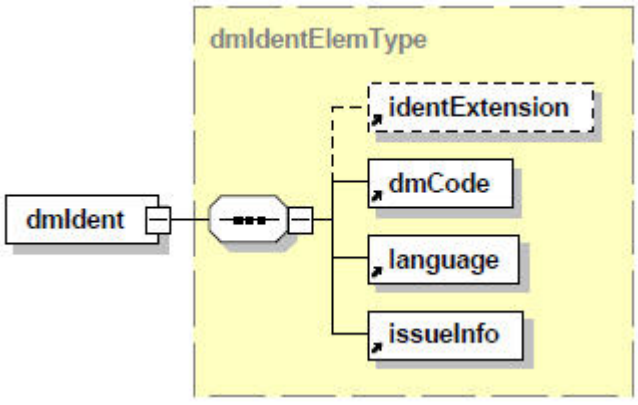
When there are several instances of a data module, the instances must be properly and uniquely identified.

To ensure that uniqueness of the identity is always achieved, there is an extended identification scheme available for instances of a data module. This scheme ensures that unique identities are provided, regardless of the reasons or situation that requires the extended identification.

The identification scheme adds two attributes that contain extra parameters in addition to those mentioned in Para 3.3.

Description: The element <identExtension> establishes a producer unique subdomain for instance identification. The data module identification extension gives the additional parameters needed to establish a unique identification of a data module in those cases when data module code, issue and in-work numbers together with the language and country are insufficient to form a universally unique identity.

Markup element: <identExtension>



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Fig 1 Element <identExtension>

Attributes:

- `extensionProducer` (M), the CAGE code of the producer of the data module instance
- `extensionCode` (M), the data module extended code. The value is decided by the data module producer. Typically, but not necessarily, it will contain a customer related content. When it is used, it must contain uppercase alphabetic (A-Z) and numeric (0-9) characters.

Child elements:

- None

3.4.2 Basic identification items

The basic identification parameters, contained in the element <dmCode>, the element <language> and the element <issueInfo> are applied in the same way to all instances. An implication is that issue numbering is specific to each instance, and the increase in issue numbers does not have to be synchronized between various instances and their sources.

3.4.3 Data module code extension interchange

Chap 7.5.1 explains how this extended identification scheme is applied to interchange file names.

3.5 Instance traceability

To ensure the traceability of the master data module, related to its instances, it is possible to record the identification of the source data module from which an instance has been derived. When an instance is created from a master data module, the content of the element <dmAddress> of the source is copied into the corresponding element <sourceDmIdent> within the status section of the new instance.

When the instance is derived from a CIR-dependent master data module, the content of the element <dmAddress> of the associated CIR data modules is copied into the optional and multiple element <repositorySourceDmIdent> within the status section of the new instance.

The element <dmAddress>, of the new instance is updated to reflect its particular properties, if these differ from the source. Typically, element <identExtension> (containing attribute `extensionProducer` and attribute `extensionCode`) as well as element <issueInfo> must be updated.

3.6 Instance referencing

Usually, it is not of interest to address a particular instance of a data module in a data module reference, since the use case will keep track of which instance that is the relevant one.

However, there can be cases when a direct reference to a particular instance, out of several possible, needs to be addressed. In order to enable such referencing, the element <dmRef> is supplied with sufficient parameters to point at any instance using the regular or the extended identification scheme. Chap 3.9.5.2.1.2 describes how <dmRef> can be populated.

Chapter 4.13

Information management - Optimizing and reuse

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Chap 4.13.3	Optimizing and reuse - Alternates concept
Chap 4.13.4	Optimizing and reuse - Container data module

1 General

This chapter presents various mechanisms to optimize the content management of data modules including:

- Common information repository concept. Refer to Chap 4.13.1.
- Incremental update of common information repository data modules. Refer to Chap 4.13.2.
- Alternates concept. Refer to Chap 4.13.3.
- Container data module. Refer to Chap 4.13.4.

Chapter 4.13.1

Optimizing and reuse - Common information repository concept

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1 General

1.1 The common information repository concept

The Common Information Repository (CIR) data modules are listing common information objects of a certain type (eg, parts, zones, warnings) with their description. Each object is accompanied with an extensive set of properties (eg, name, short name in the parts or the zones CIR), its full wording (eg, warning text and caution text in the warnings and the cautions CIR) or applicability annotations (applicability statements in the applicability annotations CIR).

The CIR concept supports the concepts of optimizing, non-redundancy and re-use of information.

This concept can be implemented in the CSDB by setting up internal databases based on the content and structure of the CIR data modules. These internal databases can then be used to generate the CIR data modules upon request for internal use, for delivery (eg, in the case of data exchange) or for publication.

The CIR concept supports the two basic uses of the S1000D (refer to Chap 1.3):

- Publishing
- Data consistency and exchange

A project can use the CIR concept for publishing as well as data consistency and exchange or only for one of these purposes.

The CIR data module structure is described in one single XML Schema, the Common repository XML Schema (comrep.xsd), which includes a branch for each of the following object types:

- Functional items
- Circuit breakers
- Parts
- Zones

- Access points
- Support equipment
- Enterprises
- Supplies
- Supply requirements
- Functional and/or physical areas
- Controls and indicators
- Applicability annotations
- Warnings
- Cautions

Refer to Chap 3.9.5.2.11 for detailed information about each common information type.

This chapter gives an overview of the CIR concept, why to use it and how to implement it.

1.2 Publishing

A CIR data module can be published as a data module in a page-oriented publication or be used in an IETP.

1.3 Classical data modules and common information objects

As regards to classical data modules (procedures, IPD data modules, etc), some common information object properties consists of additional information. For example, the zone properties are not mandatory information for a maintenance task. Simple references to the zone properties can be interesting and enough to fulfill the maintenance task without getting any further properties of the object than the zone number itself. The maintenance task data module remains self-standing without the zone properties. For more information on self-standing data modules, refer to Chap 1.3.

Some other common information objects consist of mandatory information for the classical data modules, which are not self-standing anymore without this information. It is the case for the applicability of a data module for example. Such data modules, from which a piece of information is externalized into a CIR data module, are called the "CIR-dependent" data modules. Refer to Para 6.

When publishing page-oriented publications, the data modules must be self-standing (ie, normalized). This means, that only a limited set of mandatory data from the CIR data modules is included (not linked) in the data modules delivered to the customer or end user. For example, applicability annotations and warnings must be included in the data modules for page-oriented publications and not linked to CIR data modules.

When publishing an IETP, CIR-dependent data modules can be used. It means that mandatory data from the CIR data modules are not necessarily included in the data modules prior to delivery to the customer or end user.

1.4 Data consistency and exchange

A CIR data module can be used in the production process either:

- as an "internal repository" for a certain type of information objects, or
- for data exchange between project partners' CSDB or for delivery to customers' CSDB

The use as an "internal repository" supports the consistency of basic data and enables a "late" inclusion of some of the common information into data modules before delivering self-standing data modules. The "late" inclusion minimizes unnecessary updates of data modules before final approval and delivery. For example, the inclusion of name and short name can be automatically included before delivery or publishing process.

Note

For most of the common information types (except warnings, cautions, applicability annotations and parts), the exchange of CIR data modules enables exchanging more properties than the late inclusion into self-standing data modules due to XML Schema limitation.

1.5 General business rule decisions

The use of CIR concept and data modules is optional. If the CIR concept is used, decisions on its implementation, types and publishing must be made.

Business rule decision point BRDP-S1-00374 - Use of the CIR concept (internal databases for common information):

– Decide whether to use the CIR concept.

Business rule decision point BRDP-S1-00376 - Internal/External use of CIR data modules:

– Decide whether the CIR data modules must be used only internally to the manufacturer or integrator, as part of the production/integration environment ("internal repositories") or if the CIR data modules are also a deliverable to the customer.

Business rule decision point BRDP-S1-00377 - Types of CIR data modules to be used:

– Decide which CIR data module types to be used. In order to avoid any redundancy and inconsistency, care must be paid on some types, depending on other project specific decisions, for example tailoring of the S2000M (IPD data modules vs parts CIR data module).

Business rule decision point BRDP-S1-00378 - Delivery of CIR-dependent data module:

– Decide whether CIR-dependent data modules are delivered to customer, as it implies a specific process to retrieve the self-standing data modules from the CIR-dependent data module and the CIR data module.

Business rule decision point BRDP-S1-00379 - Publishing of CIR data modules:

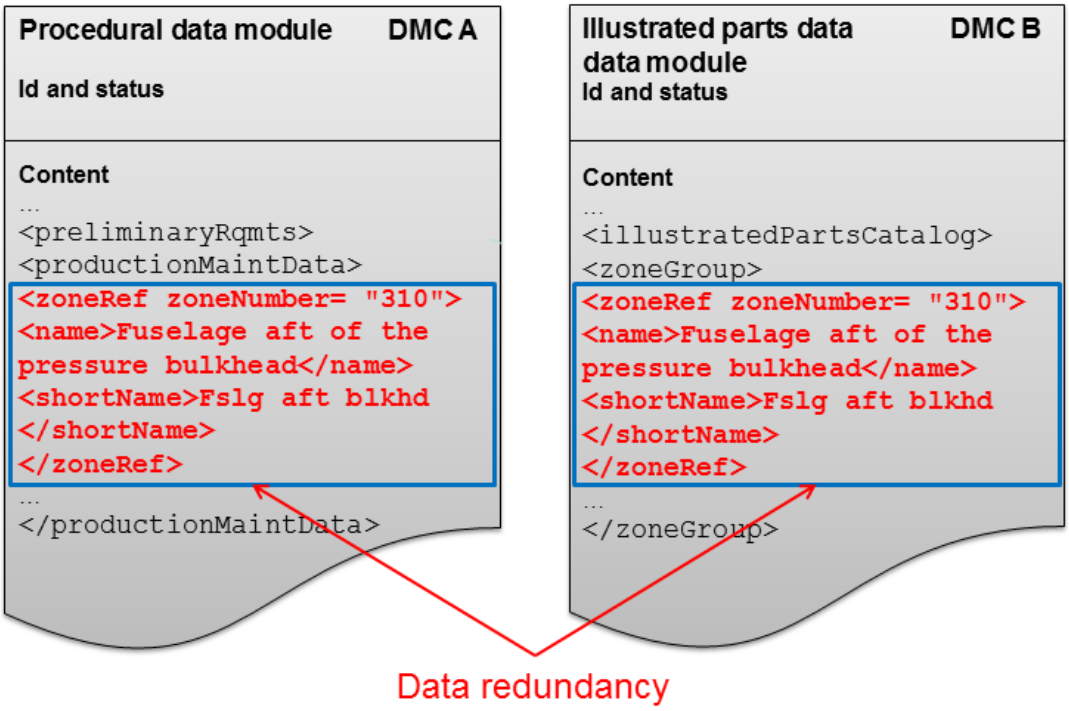
– Decide whether and which CIR data module types to be published.

2 Common information repository principle

The CIR data modules are database-oriented data modules, which contain common information objects with their associated properties. A CIR data module follows the same configuration rules as any other type of data module (eg, data module coding, data module issue number update and data module status).

They are database-oriented because of their structure (list of entries with properties) and because they can be generated from internal databases in the production environment. For instance the zones CIR is basically a list of zones with their associated properties (eg, zone number, description, boundaries, contained zones, illustrations).

These common information objects can be used in many places in many data modules. For example, zones appear several times within data modules and across data modules (eg, procedural data modules, IPD data modules). If not using a zones CIR data module, the zone properties would have to be repeated each time the zone is used. It means duplication of data, as shown in Fig 1.

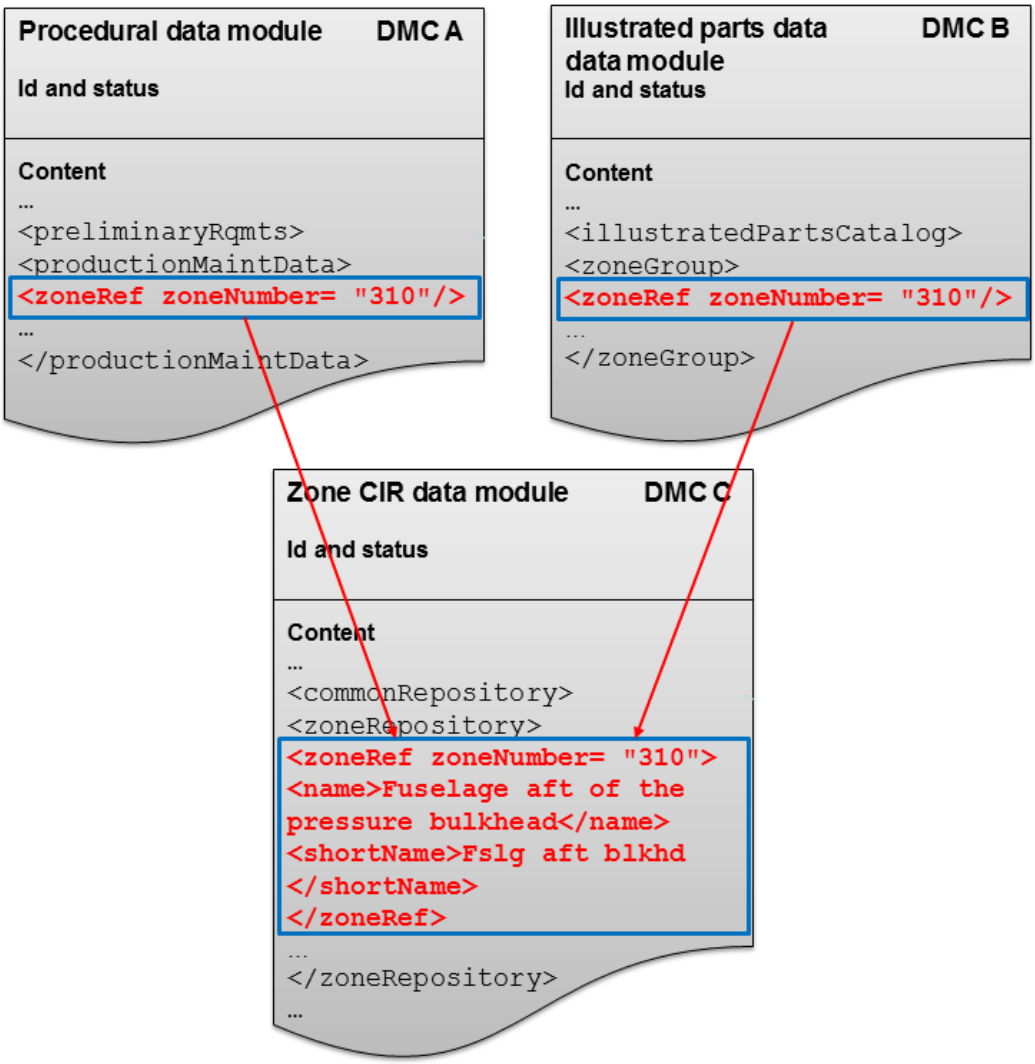


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Fig 1 Data redundancy

The duplication of data can lead to data inconsistency and adds complexity for data receivers modifying the data and thus having to perform the same modification in several places.

Instead of duplicating the zone properties each time the zone is used and to avoid complicating the data modules with too much information, the CIR concept has been introduced. It is a neutral place where these properties are stored only once and avoids the duplication of information, as shown in Fig 2.



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Fig 2 The CIR data module concept

The concept also enables the implementation of a data module describing zoning information following a dedicated XML Schema. This zones CIR data module can then be published to provide general zoning information in the publications. Refer to Para 3.2.

3 Reasons for using common information repositories

3.1 Data consistency and exchange optimization

The use of CIR data modules in a data exchange context supports the following purposes:

- Reducing information redundancy and increasing data consistency within the publication package
- Reducing the data exchange volume
- Easing data exchange between partner companies, subcontractors and customers who want to process and modify the data

Instead of duplicating properties of a common information object each time it is used within a data module, the CIR data module enables gathering these properties in one place. When these

properties are used in maintenance data modules, a link can be made to the CIR data module. The non-duplication supports data consistency within the publications.

Note

The CIR concept supports the data consistency with the management of internal repositories within the production environment for repeated information. This is commonly used for support equipment, consumables, warnings, etc.

Reducing the data exchange volume helps:

- Speed-up the online data loading. The data can be downloaded online by the customers that will then work on it. There can also be a need to load the data for example onboard an aircraft. The need to speed-up the loading is especially essential in this context where the technology used is different and less effective.
- Reduce processing time and guaranteeing data consistency for customers who would like to extract and load common information data into databases. For example:
  - The implementation of the applicability annotations CIR data module can significantly reduce the volume of exchanged data, as the applicability annotations are stored once in the CIR data module and referenced from all other data modules. For projects or organizations, which data modules are often revised only because of applicability annotation changes, the use of the applicability annotations CIR avoids delivering the data modules when only their applicability has changed.
  - Delivering the warnings with the warnings CIR data module will enable customers who want to translate the warnings into a specific language to translate it once in the warnings CIR data module, instead of several times in each data module where the warnings are used.

3.2 Publishing

CIR data modules can be used to publish structured information based on the dedicated Common repository XML Schema. Using this dedicated XML Schema gives semantic tagging of the information which can be associated to advanced functionalities in an IETP.

For example, using the zones CIR data module will enable publishing of detailed zone information as a document in a page-oriented publication. The zones CIR can then be seen as a consolidated list for zone information for the publication or publication package. In the case of publishing a CIR data module, the project or the organization can provide an introductory text by populating the element <`commonInfo`> within the CIR data module.

If the publication is distributed in PDF format, any links to a specific zone can direct the user to the detailed information in the published zones CIR. The same zones CIR can be used in an IETP to support the same basic linking of information as in the PDF publication, but there can be several more advanced functions in the IETP for, for example, searching and presenting the information.

4 Common information repository data module coding

CIR data modules are allocated data module codes in the same way as other data modules. Refer to Chap 4.3.

A specific information code is allocated for each CIR data module type. Refer to Chap 8.4 for the information code definitions.

For each of the CIR types, it is recommended to have only one data module within a project or an organization (or at least for a specific model identification code). In the case of several data modules for a dedicated CIR data module type, the granularity of these data modules can be determined by the application of the Standard Numbering System (SNS). Refer to Chap 4.3.3.

Using a single CIR data module for the Product means that the CIR data module is valid for a whole publication package or a whole CSDB. For this type of implementation setting the value of the SNS to 00-00-00 is recommended.

An example of data module coding for the parts CIR data module, when only one parts CIR data module is used (SNS: D00-00-00) is:

DMC-S1000DLIGHTING-AAA-D00-00-00-00AA-**00G**A-D

Where "**00G**" is the information code for a parts CIR data module

Business rule decision point BRDP-S1-00380 - Use of one or several data modules for a CIR type:

– Decide whether there is one single or several data modules for a dedicated type of CIR data module within a project or an organization, or for a specific model identification code.

5 References to common information repository data modules

References from maintenance data modules to common information objects and their properties in a CIR data module are made using content specific data elements (eg, <zoneRef>, <partRef>, refer to Chap 3.9.5.2.1.10 and to Chap 4.16). Two alternate methods can be used:

– Implicit, which uses the object identifier only
– Explicit, which uses the object identifier and a reference to the CIR data module

In order to cover the two reference methods, content specific data elements share a similar definition, comprising:

– a mandatory object identifier uniquely identifying the object. This identifier is represented by one or several semantic attributes. For example, the part is identified by the attributes `partNumber` and `manufacturerCodeValue` of the element <partIdent> in the CIR part data module and the associated element <partRef> in maintenance data modules.
– an optional CIR data module identifier, using the element <dmRef>

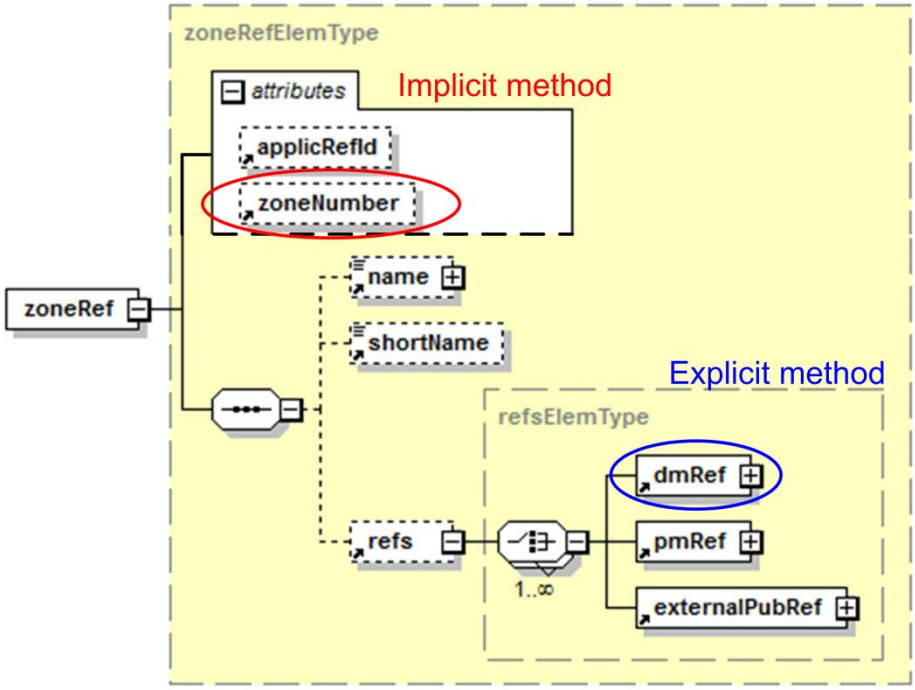
Note

It is possible to make a reference to a particular common information object within a CIR data module using the attribute `referredFragment` in the element <dmRef>.

When referencing a common information object from another data module, different IETP display methods can be applied. For example:

– embedded into the referencing data module text
– displayed as a fragment in a pop-up window
– whole CIR data module shown in the main window

The element <behavior> can be used to specify which display method has to be used, when explicit references to CIR data module are made.



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Fig 3 Reference methods

5.1 Reference methods

5.1.1 Implicit referencing

The reference is resolved by using only the attribute values of the identifier of the information type, for example, the value of the attribute `zoneNumber`, in the element <`zoneRef`>, or the value of the attribute `partNumberValue` and the value of the attribute `manufacturerCode` in the element <`partRef`>.

5.1.2 Explicit referencing

The reference is resolved by both the element <`dmRef`> (referring to the corresponding CIR data module) and the attribute value of the identifier of the considered information type element, for example the value of the attribute `zoneNumber` in the element <`zoneRef`>, or the value of the attribute `partNumberValue` and the value of the attribute `manufacturerCode` in the element <`partRef`>. An alternative to use the attribute value of the identifier must use the attribute `referredFragment` on the element <`dmRef`>.

Business rule decision point BRDP-S1-00381 - Use of implicit or explicit reference method to CIR data module:

– Decide whether to use implicit or explicit references, or both, between content specific data elements and the CIR data modules.

Note

It is recommended to use only one method to avoid difficulties which can appear during the publishing process.

6 CIR-dependent data module

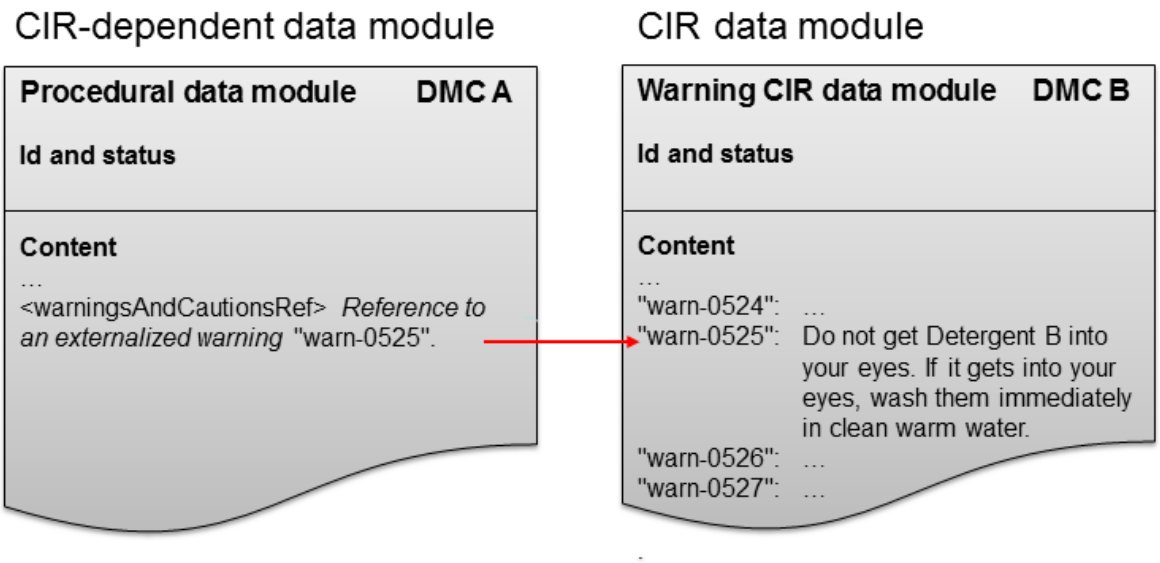
6.1 Definition

The CIR-dependent data modules are data modules from which a piece of mandatory information has been externalized to a CIR data module. This concerns the following CIR types:

- warnings
- cautions
- applicability annotations

Warnings and cautions contribute to the safety and can be mandatory in, for example, a procedure. Thus special attention must be paid to the use of CIR data modules for warnings and cautions due to the potential safety impact.

The references from CIR-dependent data modules to CIR data modules are inclusions, as opposed to simple references. Refer to Para 1.3. By definition these data modules are not self-standing anymore as a piece of information has been "removed" and externalized into a CIR. Refer to Fig 4.



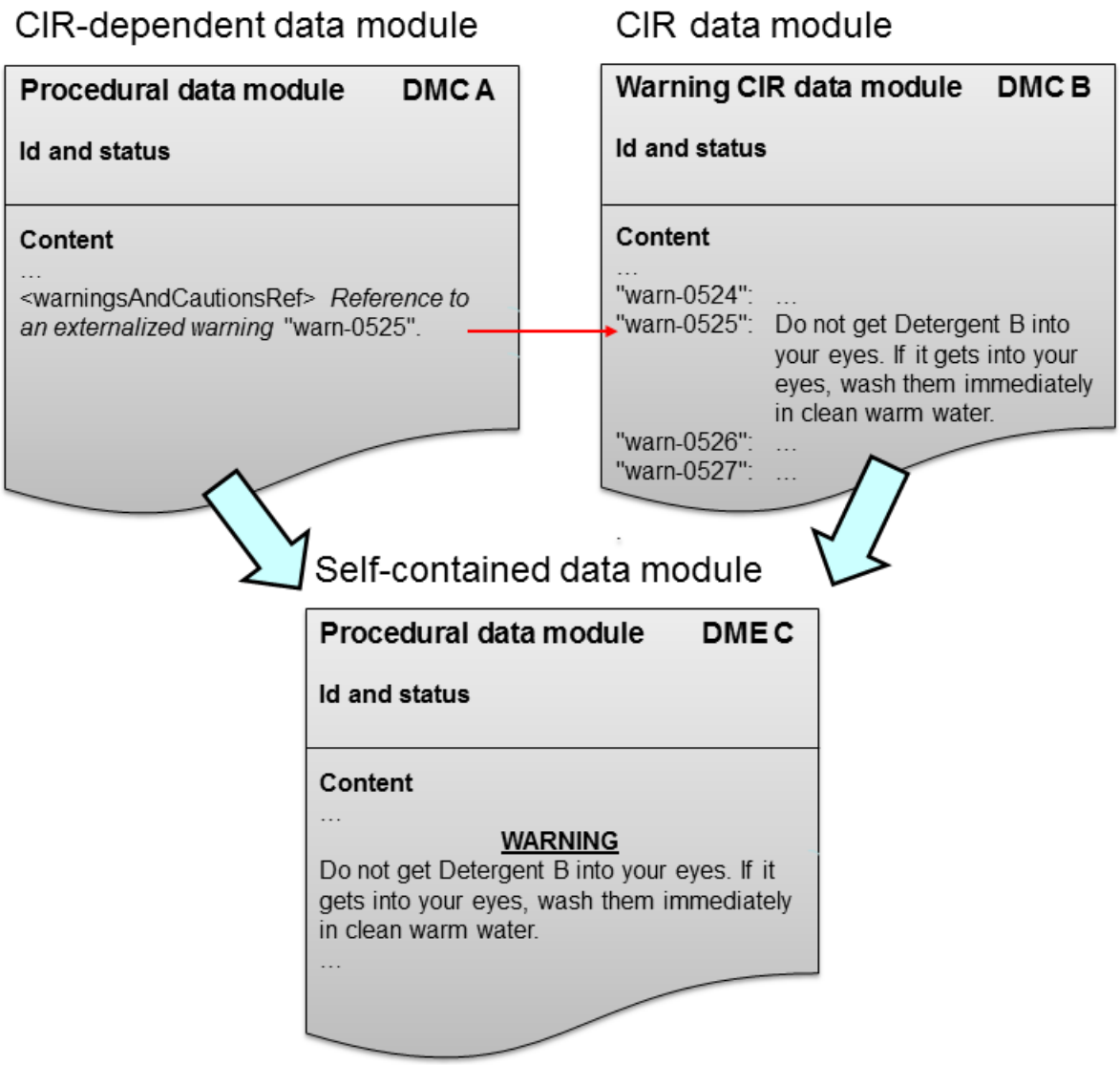
ICN-S3627-S1000D0598-001-01

Fig 4 CIR-dependent data module

6.2 Externalization principle

The externalization is a mechanism that can be used by projects or organizations exchanging data, as opposed to projects or organizations exchanging publications only (refer to Chap 1.3) and striving to optimize the data exchange by reducing the volume of the "CSDB interchange package".

For publishing, the externalization can, and in most of the cases must, be resolved. It means that a self-standing data module can always be retrieved from the CIR-dependent data module and the CIR data module as presented in Fig 5.



ICN-S3627-S1000D0599-001-01

Fig 5 Externalization principle

7 Building self-standing data modules from CIR-dependent data modules

7.1 General

Self-standing customized publications (publications without use of CIR data modules) are built from CIR-dependent and CIR data modules creating self-standing data modules. These self-standing data modules are called "publication self-standing data modules".

Note

Data modules which are not depending of any CIR content are also self-standing data modules.

To build publication self-standing data modules, the publication manager must use the master-customer concept. Refer to Chap 4.12. Applying this concept to a CIR-dependent data module makes the self-standing data module a "customer" instance of the CIR-dependent data module (master).

7.2 Identification of a publication of self-standing data modules

The first time a publication is built from CIR-dependent data modules and when corresponding publication self-standing data modules are created, it is necessary to:

- retrieve the list of CIR-dependent data modules and create the corresponding publication self-standing data modules
- assign DMC and extension code (DME, refer to Chap 4.12) to the publication self-standing data modules based on the DMC of the CIR-dependent data modules
- indicate in the elements <sourceDmIdent> (for CIR-dependent data module) and <repositorySourceDmIdent> (for CIR data module) from which master data modules these self-standing data modules have been built. The issue numbers of the master data modules must be indicated.
- assign the issue number "001" to the publication self-standing data module and the status "New"

The next time the publication is updated:

- Existing publication self-standing data modules awaiting update must be retrieved. Refer to Para 7.3.
  - If the publication self-standing data modules must be updated, then the publication self-standing data module content must be updated (refer to Para 7.4) and its issue number incremented
  - If the publication self-standing data modules do not need to be updated, the existing publication self-standing data module issues can be published as is
- New publication self-standing data modules have to be created from any new CIR-dependent data modules.

7.3 Deciding which publication self-standing data modules need updating

This step occurs when a publication has to be updated, for example when a new CSDB interchange package is received.

An existing publication self-standing data module must be updated if any of the following applies:

- Its CIR-dependent master data module has a new issue number
- One of the externalized information objects has been updated in the CIR data module

7.4 Publication self-standing data module content

Publication self-standing data modules must be updated if:

- the CIR-dependent data module has been updated since previous publication. The new issue of the CIR-dependent data module must be used to create a new issue of the publication self-standing data module. Then links to externalized common information objects must be resolved. Refer to Para 7.5.
- the CIR-dependent data module and/or the referenced CIR data module has been updated since previous publication. The publication self-standing data module must be duplicated and its issue number must be incremented as well as the issue status has to be set to changed. Then links to externalized common information objects must be resolved. Refer to Para 7.5.

7.5 Adding externalized information objects

In the publication self-standing data modules, the element <xxxRef> (eg, <warningRef>) branches indicating a reference to externalized data in the CIR-dependent data module, must

be superseded by the element <xxx> branch (eg, <warning>), which will contain the actual content (eg, the warning text).

The following examples indicate how to resolve the links from the CIR-dependent data module and the CIR data module to make a CIR-dependent data module a publication self-standing data module.

Example 1: CIR-dependent data module

```
<content>
<warningsAndCautionsRef>
<warningRef id="warn-0001" warningIdentNumber="warn-
00525"><dmRef><dmRefIdent><dmCode
modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="0A3" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent></dmRef>
</warningRef>
</warningsAndCautionsRef>
<procedure>...</procedure>
</content>
```

Example 2: Warnings CIR

```
<commonRepository>
<warningRepository>
<warningSpec changeType="modify">
<warningIdent warningIdentNumber="warn-00525"></warningIdent>
<warningAndCautionPara>Make sure that the bulb is cool before
you replace it.</warningAndCautionPara>
</warningSpec>
...
</warningRepository>
</commonRepository>
```

Example 3: Publication self-standing data module (links resolved)

```
<warningsAndCautions>
<warning id="warn-0001" changeType="modify">
<warningAndCautionPara>Make sure that the bulb is cool before
you replace it.</warningAndCautionPara>
</warning>
</warningsAndCautions>
<procedure>...</procedure>
</content>
```

The following rules must be applied, when resolving the links and adding externalized data:

- The attribute `id` of the element <xxxRef> must be reported to the element <xxx>, so that the intra-data module collection of warnings, cautions and applicability annotations works. Refer to Chap 3.9.3 for warnings and cautions and Chap 3.9.5.3 for applicability annotations. In the previous example, attribute `id` "`warn-0001`" to the element <warningRef> is reported on the element <warning>.
- The attribute `changeType` (and the associated attribute `reasonForUpdateRefIds` and the attribute `changeMark` information) from the

element <xxxSpec> in the CIR data module must be reported to the element <xxx>. In the previous example, the attribute changeType "modify" from the element <warningSpec> is reported to the element <warning>.

Therefore, the indication of change for the publication self-standing data module is provided by the CIR data module. When this is implemented, the project or the organization must manage change marks within the CIR data modules.

Chapter 4.13.2

Optimizing and reuse - Incremental update of CIR data modules

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Chap 4.13.2.1	Incremental update of CIR data modules – Principles
Chap 4.13.2.2	Incremental update of CIR data modules – Data update file content

1 General

The Data update file is a dedicated type of CSDB object. This file can be used to deliver fragments from a given Common Information Repository (CIR) data module. These fragments correspond to the ones that have been added, deleted, modified or reinstated since a previous issue of the CIR data module. Refer to Chap 4.13.1.

Note

The use of the Data update file is limited to the update of CIR data modules and it can be used in the context of data exchange only.

It avoids delivering a whole data module. The advantage of using the Data update file is to optimize the data exchange by reducing the volume of the "CSDB interchange package". Refer to Chap 4.13.

This chapter provides more information about the Data update file concept:

- CIR incremental update principles. Refer to Chap 4.13.2.1.
- Data update file content. Refer to Chap 4.13.2.2.

Chapter 4.13.2.1

Incremental update of CIR data modules - Principles

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Chap 7.5.1	Information interchange - File based transfer

1 General

Common Information Repository (CIR) data modules can become huge throughout their life cycle. Typically, a source CIR data module is changed and delivered to the data receiver, who can, for example, use it to for loading into databases.

The increasing volume of CIR data modules can cause data exchange problems, such as:

– Increased online data exchange times:

  - Data can be downloaded online by data receivers who can then work on it
  - Data can be uploaded onboard a platform. For aircraft for example, the upload time is critical because increased upload time generally means increased aircraft turnaround times.

– Increased processing times for those customers who need to extract the changed data into databases:

  - Guaranteeing data consistency and integrity between a data sender and a data receiver
  - Guaranteeing configuration and control of the data

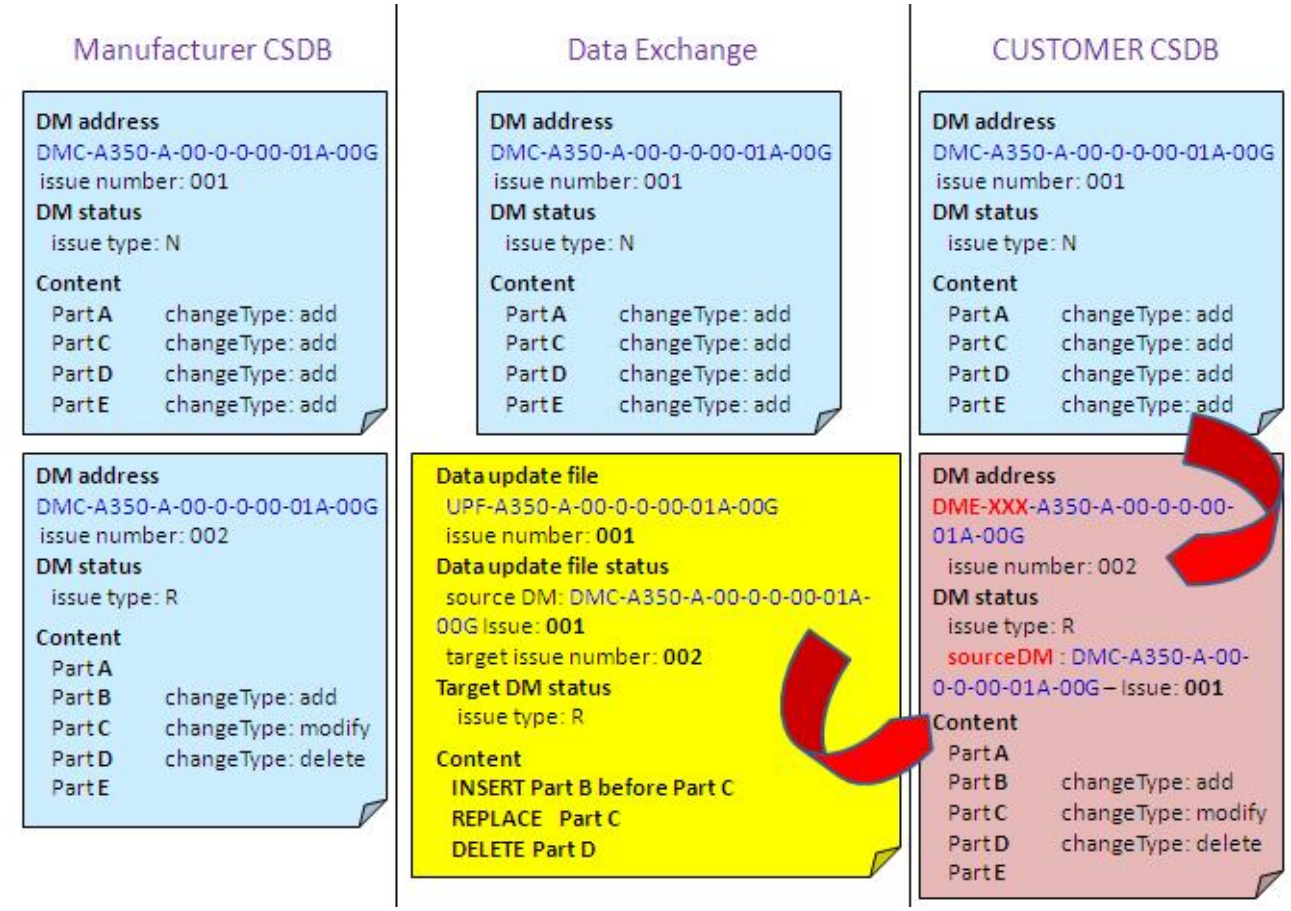
– Poor support of on-demand, scheduled or regular data exchanges

To improve this situation, a concept for indicating to data receivers only what has changed in a CIR data module is introduced. This concept is called incremental update, which uses a new S1000D data exchange object called the data update file.

2 Data update file principle

2.1 Data exchange

The CIR incremental update supports the concept of optimizing and reuse of information, however, use of a data update file is limited to the exchange of CIR data module information only. Typically, a data update file is auto-generated from a data sender's CIR data module, which, from that point on, is known as a source CIR data module. Upon receipt of a data update file, a data receiver would update his CIR data module within his own data module management system. From this point on, the data receiver's CIR data module is known as a target CIR data module. Using a data update file, enables a project or an organization to incrementally update a CIR data module by exchanging only the information that has changed. Refer to Fig 1.



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Fig 1 Data update file principle

2.2 Data configuration control, consistency and integrity

2.2.1 Configuration control

The data update file uses the same naming convention as data modules. Refer to Chap 7.5.1. To identify the file as an update file the prefix "UPF" is used. The control number is then exactly the same as the source and target CIR data modules. For example:

Parts CIR data module code: DMC-S1000DLIGHTING-AAA-D00-00-00-00AA-00GA-D

Corresponding data update file code: UPF-S1000DLIGHTING-AAA-D00-00-00-00AA-00GA-D

The issue numbers of the data update file, the source CIR data module and the target data module also play an important part in maintaining configuration control. When a source data module is changed, it is up-issued in the normal way. The changes are recorded in the data update file, which has its own issue number, the issue number of the source data module at which the changes were made and the issue number and type that the target data module will become, once the changes indicated in the data update file are incorporated.

For example, a new source CIR data module has issue number "001", inwork "00" and issue type "new". The data receiver's CIR data module issue details have the same values. Changes are made and the resulting source CIR data module has issue number "002", inwork "00" and issue type "revised".

A data update file is auto-generated to contain only the changes made in the source CIR data module made between issue "001" and issue "002". Since this is the first change to the source

CIR data module, the data update file is new. So, it has an issue number "001", inwork "00" and issue type "new".

The data update file also contains the issue number ("002") and issue type ("revised") that the target CIR data module will become, once the changes in the data update file are incorporated. So, the data receiver incorporates the changes in his target CIR data module, up-issues it to issue number "002", inwork "00" and issue type "revised", as indicated in the metadata in the data update file.

It is the combination of the control number and the issue details that guarantee configuration control.

2.2.2 Consistency and integrity

The data update file contains metadata about the individual changes, which leads the data receiver directly to the element and/or attribute that is being changed. The consistency and integrity of the CIR data is achieved by the metadata having values in the data update file that are the same values in both the source and target CIR data module. Refer to Para 2.3.1.

2.3 Relationship with the CIR data modules

2.3.1 Fragments

Incremental update introduces the use of extracts from a data module called fragments. All the available fragment types are pre-defined by the data update file XML Schema. These are all the elements and attributes that are child elements of:

- element <insertObject>
- element <replaceObject>
- element <deleteObject>
- element <reinstateObject>

The data module extracts that are eligible to be a fragment are not arbitrary.

These fragments are self-standing fragments that can be managed and understood without relying on other fragments. (eg, a Part fragment that contains all the information about that part does not rely on any other Part fragments because it already has all the information itself).

They have a mandatory identifier that must be persistent over time. Because this is important in the context of incremental update, the value of a fragment identifier is exactly the same as the target fragment in the CIR data module. It is this value, together with the identical control numbers in the file name, that provides the relationship between a data update file and its target CIR data module. The fragment identifiers are:

- element <partIdent> for a Part fragment
- element <zoneIdent> for a Zone fragment
- element <functionalItemIdent> for a Functional Item fragment
- element <circuitBreakerIdent> for a Circuit Breaker fragment
- element <accessPointIdent> for an Access Point fragment
- element <toolIdent> for a Tool or Support Equipment fragment
- element <enterpriseIdent> for an Enterprise fragment
- element <supplyIdent> for a Supply fragment
- element <supplyRqmtIdent> for a Supply Requirement fragment
- element <functionalPhysicalAreaIdent> for a Functional or Physical Area fragment
- element <controlIndicatorIdent> for a Controls and indicators fragment
- element <applicSpecIdent> for an Applicability Annotation fragment
- element <warningIdent> for a Warning fragment

- element <cautionIdent> for a Caution fragment
- attribute id for figure, figure alternate group, multimedia, multimedia alternate group, applicability annotation, externalized applicability annotation

The fragments must not have any meaningful and mandatory sequential relationships with the rest of the content of a data module. For example, the element <partSpec> must not have a mandated element that must follow it.

The relationship between a data update file and a CIR data module is that a data update file can only be associated with one and only one CIR data module. Both the fragment and the CIR data module must also be of the same type. For example, one Part data update file is directly related to one and only one parts CIR data module. Within that constraint, a data update file can also update other information within that CIR data module. This information is limited to:

- Applicability annotations and applicability references
- Figures and alternate figures
- Multimedia and alternate multimedia

Refer to default BREX rules BREX-S1-00014 to BREX-S1-00026.

2.4 Change indicators

2.4.1 Indication types

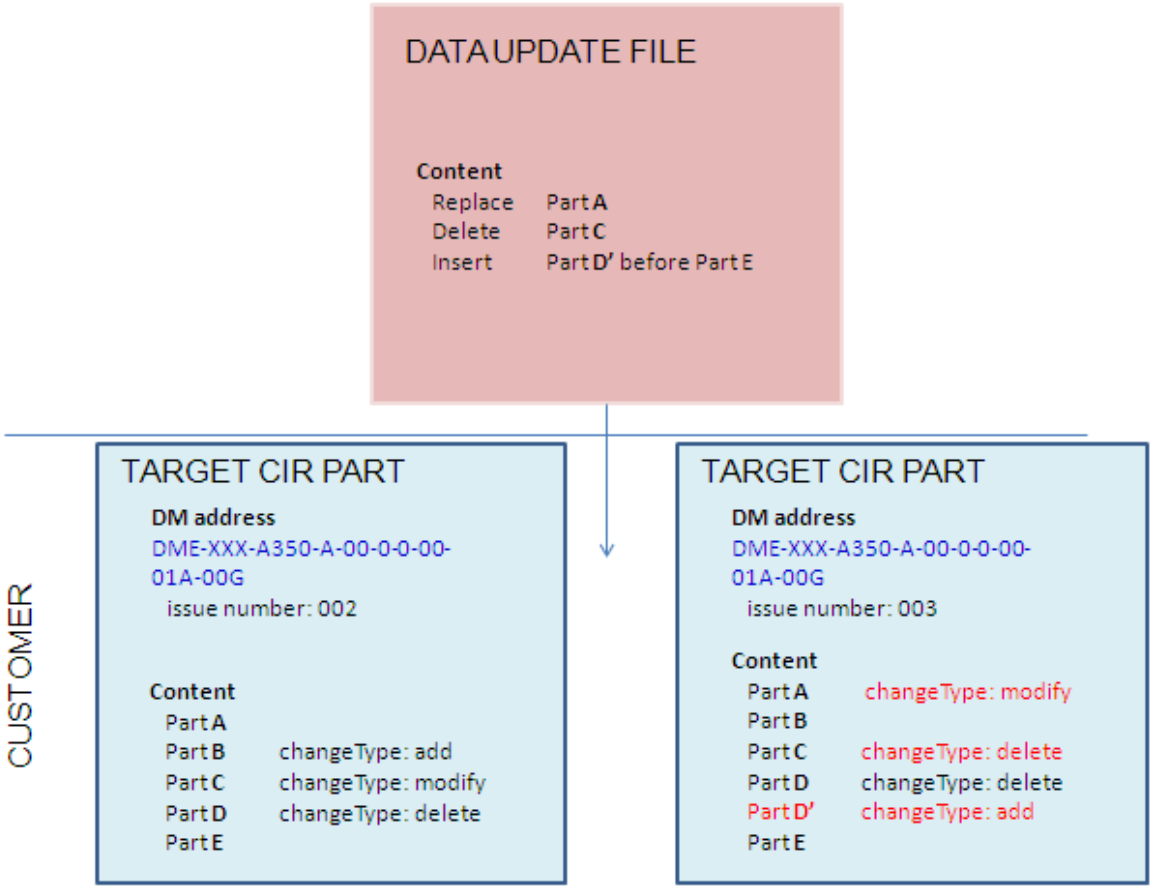
The fragment changes in the source CIR data module are indicated in the data update file as follows:

- New fragments that were added in the source CIR data module must be inserted into the target CIR data module. These are stored in the <insertObjectGroup> branch of the data update file.
- Existing fragments that were modified in the source CIR data module must be replaced in the target CIR data module. These are stored in the <replaceObjectGroup> branch of the data update file.
- Existing fragments that were deleted in the source CIR data module must be deleted in the target CIR data module. These are stored in the <deleteObjectGroup> branch of the data update file.
- Fragments that were deleted in a previous issue of a source CIR data module and reinstated in the target data module. These are stored in the <reinstateObjectGroup> branch of the data update file.

2.4.2 Indication differences

The way indication types "insert" and "reinstate" indicate changes differs slightly from that of the indication types "replace" and "delete":

- For indication types "insert" and "reinstate", the place (eg, at element <xxx>) and order (before or after) are given because the fragment does not exist in the previous issue of the target CIR data module. Refer to Fig 2.
- For indication types "replace" and "delete", the place and order is not given because the fragment already exists in the previous issue of the CIR data module. These two indication types use the mandatory fragment identifier to indicate which fragment must be replaced or deleted. Refer to Para 2.3.1.



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Fig 2 Indication types - principle

2.5 Implementation

This section explains how the data receiver can incrementally update his self-contained target CIR data module using the data update file.

2.5.1 Source data modules

To do this, the data receiver must use:

- The received data update file
- The previous issue of the target CIR data module, whose issue number is indicated in the data update file's status section, within the element <sourceDmIdent>.

For example, the receiver of the data receiving this data update file

```
<dataUpdateFile>
<updateIdentAndStatusSection>
<updateAddress>...</updateAddress>
<updateStatus>
<sourceDmIdent>
<dmCode modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
```

```
infoCode="00G" infoCodeVariant="A" itemLocationCode="D"/>
<language languageIsoCode="en" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</sourceDmIdent>
...
</updateStatus>
...
</updateIdentAndStatusSection>
...
</dataUpdateFile>
```

must use this data update file and issue 001 of the target CIR data module

DMC-S1000DLIGHTING-AAA-D00-00-00-00AA-00GA-D

to incrementally update the target CIR data module.

Note

Any problems regarding the issue number of the target data module must be resolved between the data sender and the data receiver.

2.5.2 Target data modules

To incrementally update the target data module, the data receiver has to perform the following actions on the previous issue of the target data module:

2.5.2.1 Target data module identification

The data module code of the target data module remains the same and it is up-issued in the normal way.

However, it is recommended that the data receiver to use the data module code extension, indicating that the data module is retrieved by the data receiver from a source data module. Refer to Chap 4.13.2.

The issue number of the target CIR data module is indicated in the status section of the source CIR, in element <targetDmIssueInfo>.

For example, the data receiver receiving this data update file:

```
<dataUpdateFile>
<updateIdentAndStatusSection>
<updateAddress>...</updateAddress>
<updateStatus>
...
<targetDmIssueInfo inWork="00" issueNumber="002"/>
...
</updateStatus>
...
</updateIdentAndStatusSection>
...
</dataUpdateFile>
```

must assign issue number "002" to its target CIR data module.

2.5.2.2 Target data module address items

The target CIR data module language and title do not change when updates are performed using the data update file.

The issue date of the target CIR data module is changed to be the same as the Data update file.

2.5.2.3 Target data module status

The required status of the target CIR data module is indicated in the element <targetDmStatus> within the data update file. This is achieved by the data receiver updating the target CIR data module by replacing the entire contents of the element <dmStatus>, in the target CIR data module, with the entire content of the element <targetDmStatus> in the data update file, including the value of its attribute issueType.

2.5.2.4 Target data module content

Concerning the content of the target data module, the data receiver must apply the updates on the previous target data module issue content. This means that the content of the previous issue of the target CIR data module is incrementally updated to include the content of the data update file.

Before updating the content, the data receiver must delete all the change marking information from the target CIR data module content by removing the values of the attributes changeType, changeMark and reasonForUpdateRefIds.

2.5.2.5 Fragment usage

There are four different types of updates:

2.5.2.5.1 Fragments to insert

One occurrence of the element <insertObject> within the element <insertObjectGroup> contains a single occurrence of a fragment, the content of which must be inserted in the target CIR data module. When there are multiple fragments of the same type, multiple occurrences of the element <insertObject> are used.

The attributes targetPath and insertionOrder indicate where the element must be inserted using an XPath expression.

Note

It is recommended that the data sender populate these two attributes so that the target CIR data module has the same sequential order as the source CIR data module, which is at the same issue. If the attributes are not populated, the data receiver must insert the fragments at the end of the content section of the target CIR data module.

For example:

Target data module previous issue:

```
<partSpec id="part-0007">...</partSpec>
<partSpec id="part-0009">...</partSpec>
```

Data update file:

```
<insertObject targetPath="//partSpec[@id='part-0009']"
insertionOrder="before">
<partSpec id="part-0008" changeType="add">...</partSpec>
</insertObject>
```

Target data module:

```
<partSpec id="part-0007">...</partSpec>
<partSpec id="part-0008" changeType="add">...</partSpec>
<partSpec id="part-0009">...</partSpec>
```

2.5.2.5.2 Fragments to replace

One occurrence of the element <replaceObject> within the element <replaceObjectGroup> contains a single occurrence of a fragment, the content of which must be replaced in the target CIR data module. When there are multiple fragments of the same type, multiple occurrences of the element <replaceObject> are used.

For example:

Target data module previous issue:

```
<partSpec id="part-0007">...</partSpec>
<partSpec id="part-0008">...</partSpec>
<partSpec id="part-0009">...</partSpec>
```

Data update file:

```
<replaceObject>
<partSpec id="part-0008" changeType="modify">...</partSpec>
</replaceObject>
```

Target data module:

```
<partSpec id="part-0007">...</partSpec>
<partSpec id="part-0008" changeType="modify">...</partSpec>
<partSpec id="part-0009">...</partSpec>
```

2.5.2.5.3 Fragments to delete

One occurrence of the element <deleteObject> within the element <deleteObjectGroup> contains a single occurrence of a fragment, the content of which must be deleted from the target CIR data module. When there are multiple fragments of the same type, multiple occurrences of the element <deleteObject> are used.

The project or the organization must decide what actions are performed on deleted objects. Refer to Chap 3.9.5.2.1.1.

Note

If the decision is to remove the deleted elements from the up-issued data modules, the data receiver physically removes the element from the target CIR data module that has the same identifier as that in the data update file.

For example:

Target data module previous issue:

```
<partSpec id="part-0007">
<partIdent partNumberValue="part0007"
manufacturerCodeValue="XXXXX"/>
...</partSpec>
<partSpec id="part-0008">
<partIdent partNumberValue="part0008"
manufacturerCodeValue="XXXXX"/>
</partSpec>
<partSpec id="part-0009">
<partIdent partNumberValue="part0009"
```

```
manufacturerCodeValue="XXXXX"/>
...</partSpec>
```

Data update file:

```
<deleteObject>
<partIdent partNumberValue="part0008"
manufacturerCodeValue="XXXXX"/>
</deleteObject>
```

Target data module:

```
<partSpec id="part-0007">
<partIdent partNumberValue="part0007"
manufacturerCodeValue="XXXXX"/>
...</partSpec>
<partSpec id="part-0009">
<partIdent partNumberValue="part0009"
manufacturerCodeValue="XXXXX"/>
...</partSpec>
```

Note

If the decision is to keep the change marks on deleted elements, the data receiver must apply change marking. Refer to Chap 3.9.5.2.1.1.

For example:

Target data module previous issue:

```
<partSpec id="part-0007">
<partIdent partNumberValue="part0008"
manufacturerCodeValue="XXXXX"/>
...</partSpec>
<partSpec id="part-0008">
<partIdent partNumberValue="part0008"
manufacturerCodeValue="XXXXX"/>
</partSpec>
<partSpec id="part-0009">
<partIdent partNumberValue="part0008"
manufacturerCodeValue="XXXXX"/>
...</partSpec>
```

Data update file:

```
<deleteObject>
<partIdent partNumberValue="part0008"
manufacturerCodeValue="XXXXX"/>...</partSpec>
</replaceObject>
```

Target data module:

```
<partSpec id="part-0007">
<partIdent partNumberValue="part0008"
manufacturerCodeValue="XXXXX"/>
...</partSpec>
<partSpec id="part-0008" changeType="delete">
<partIdent partNumberValue="part0008"
```

```
manufacturerCodeValue="XXXXX"/>
...</partSpec>
<partSpec id="part-0009">
<partIdent partNumberValue="part0008"
manufacturerCodeValue="XXXXX"/>
...</partSpec>
```

2.5.2.5.4 Fragments to reinstate

One occurrence of the element <reinstateObject> within the element <reinstateObjectGroup> contains a single occurrence of a fragment, the content of which must be reinstated in the target CIR data module. When there are multiple fragments of the same type, multiple occurrences of the element <reinstateObject> are used.

Depending on the project or the organization decision on marking deletions (refer to Chap 3.9.5.2.1.1), the following rules apply for reinstating an object:

– If deleted elements are physically removed, then apply the same rule as for elements to insert. Refer to Para 2.5.2.5.1.

The attributes `targetPath` and `insertionOrder` indicate where the element must be reinstated using an XPath expression.

Note

It is recommended that the data sender populate these two attributes so that the target CIR data module has the same sequential order as the source CIR data module, which is at the same issue. If the attributes are not populated, the data receiver must insert the fragments at the end of the content section of the target CIR data module.

For example:

Target data module previous issue:

```
<partSpec id="part-0007">...</partSpec>
<partSpec id="part-0009">...</partSpec>
```

Data update file:

```
<reinstateObject targetPath="//partSpec[@id='part-0009']"
insertionOrder="before">
<partSpec id="part-0008" changeType="add">...</partSpec>
</reinstateObject>
```

Target data module:

```
<partSpec id="part-0007">...</partSpec>
<partSpec id="part-0008" changeType="add">...</partSpec>
<partSpec id="part-0009">...</partSpec>
```

If deleted elements are marked as deleted, then apply the same rule as for elements to replace. Refer to Para 2.5.2.5.2.

Note

In this case, there is no need for the data provider to populate the two attributes `targetPath` and `insertionOrder`.

For example:

Target data module previous issue:

```
<partSpec id="part-0007">...</partSpec>
<partSpec id="part-0008" changeType="deleted">...</partSpec>
<partSpec id="part-0009">...</partSpec>
```

Data update file:

```
<reinstateObject>
<partSpec id="part-0008" changeType="modify">...</partSpec>
</insertObject>
```

Target data module:

```
<partSpec id="part-0007">...</partSpec>
<partSpec id="part-0008" changeType="modify">...</partSpec>
<partSpec id="part-0009">...</partSpec>
```

Chapter 4.13.2.2

Incremental update of CIR data modules - Data update file content

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1 General

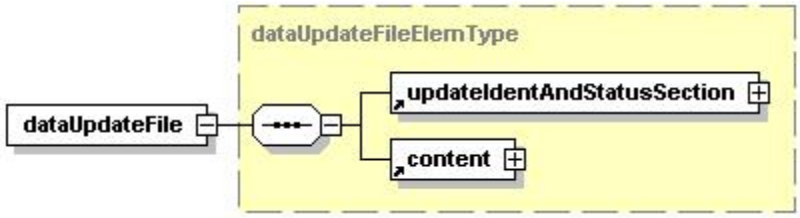
The Data update file Schema must be used to implement the CIR incremental update. Many of the elements and attributes used in this schema are unique due to the schema's specialized application. For more information about the CIR incremental update general implementation, refer to Chap 4.13.2.1.

2 Data update file

Description: The element <dataUpdateFile> contains the complete data update file. The data update file is not a data module so it has its own definition. But like data modules, the data update file is split into two parts:

- the data update file identification and status section
- the data update file content section

Markup element: <dataUpdateFile>



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Fig 1 Element <dataUpdateFile>

Attributes:

– None

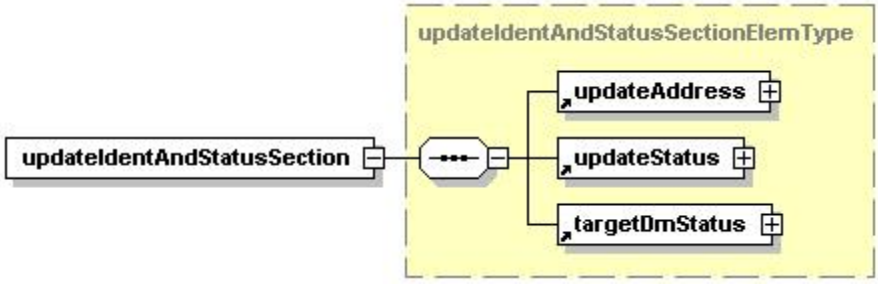
Child elements:

– <updateIdentAndStatusSection>. Refer to Para 2.1.
– <content>. Refer to Para 2.2.

2.1 Data update file identification and status section

Description: The element <updateIdentAndStatusSection> is used to provide the data update file identification (data update file address), the data update file status and the status of the data module to be updated.

Markup element: <updateIdentAndStatusSection>



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Fig 2 Element <updateIdentAndStatusSection>

Attributes:

– None

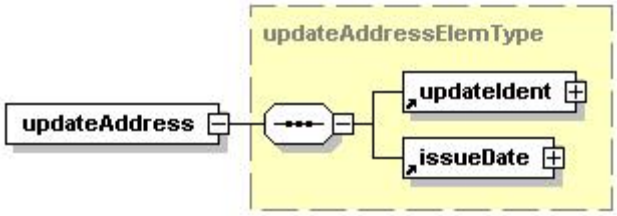
Child elements:

– <updateAddress>. Refer to Para 2.1.1.
– <updateStatus>. Refer to Para 2.1.2.
– <targetDmStatus>. The status of the target data module to be retrieved from the data update file. This element contains the same elements and attributes as the status section of a normal data module. Refer to Chap 3.9.5.1.

2.1.1 Data update file address

Description: The element <updateAddress> contains the identification and issue date of the data update file.

Markup element: <updateAddress>



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Fig 3 Element <updateAddress>

Attributes:

– None

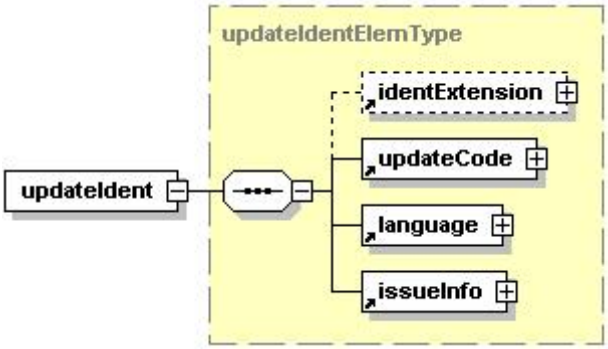
Child elements:

– <updateIdent>. Refer to Para 2.1.1.1.
– <issueDate>. Refer to Chap 3.9.5.1.

2.1.1.1 Data update file identification

Description: The element <updateIdent> contains the unique identification of the data update file.

Markup element: <updateIdent>



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Fig 4 Element <updateIdent>

Attributes:

– None

Child elements:

– <identExtension>. Refer to Chap 3.9.5.1.
– <updateCode>. Refer to Para 2.1.1.2.
– <language>. Refer to Chap 3.9.5.1.
– <issueInfo>. Refer to Chap 3.9.5.1.

Markup example:

```
<updateIdent>
<updateCode objectIdentCode="UPF"
modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
```

```
infoCode="00G" infoCodeVariant="A"
itemLocationCode="D"/><language languageIsoCode="sx"
countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</updateIdent>
```

2.1.1.2 Data update file code

Description: The element <updateCode> contains the code that identifies the data update file. The data update file code is based on the data module code of the target data module. For example, the data update file address of the part CIR data module must be based on the part CIR data module code (see markup example).

Markup element: <updateCode>

Attributes:

- objectIdentCode (M), the file object type. It enables distinguishing the data update file from other CSDB objects (data modules, publication modules etc). For data update file, this attribute must be set to:
  - "UPF", meaning data update file
- modelIdentCode (M), the model identification code. Refer to Chap 4.3.1.
- systemDiffCode (M), the system difference code. Refer to Chap 4.3.2.
- systemCode (M), the system code (part of the SNS). Refer to Chap 4.3.3.
- subSystemCode (M), the subsystem code (part of the SNS). Refer to Chap 4.3.3.
- subSubSystemCode (M), the sub-subsystem code (part of the SNS). Refer to Chap 4.3.3.
- assyCode (M), the assembly code. Refer to Chap 4.3.3.
- disassyCode (M), the disassembly code. Refer to Chap 4.3.4.
- disassyCodeVariant (M), the disassembly code variant. Refer to Chap 4.3.5.
- infoCode (M), the information code. The use of the data update file is limited to CIR data modules. This limits the information codes to those defined for CIR data modules. Refer to default BREX rule BREX-S1-00179. Refer to Chap 4.3.6.
- infoCodeVariant (M), the information code variant. Refer to Chap 4.3.7.
- itemLocationCode (M), the item location code. Refer to Chap 4.3.8.

Child elements:

- None

Markup example:

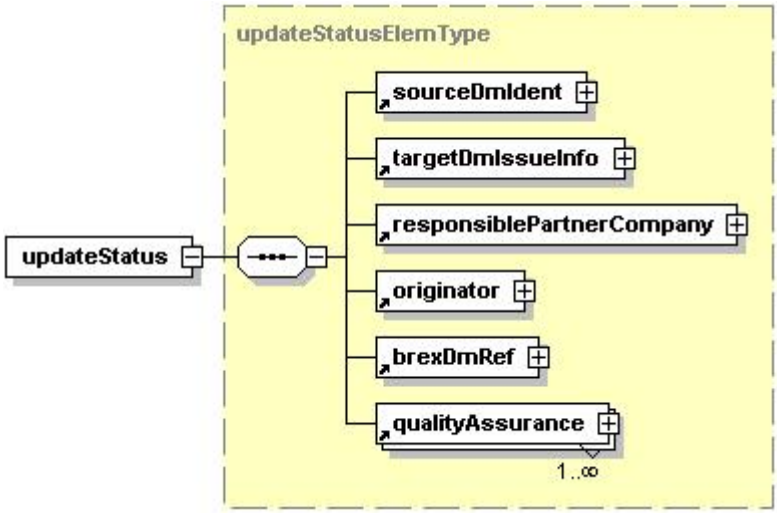
```
<dataUpdateFile>
<updateIdentAndStatusSection>
<updateAddress>
<updateIdent>
<updateCode objectIdentCode="UPF"
modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00G" infoCodeVariant="A" itemLocationCode="D"/>
...
<language languageIsoCode="sx" countryIsoCode="US"/>
...
```

```
<issueInfo issueNumber="001" inWork="00"/>
...
</updateIdent>
<issueDate day="01" month="02" year="2011"/>
</updateAddress>
<updateStatus>...</updateStatus>
<targetDmStatus>...</targetDmStatus>
</updateIdentAndStatusSection>
<content>...</content>
</dataUpdateFile>
```

2.1.2 Data update file status

Description: The element <updateStatus> contains the status of the data update file. Among other information, the data update file status indicates from which data module the update was calculated.

Markup element: <updateStatus>



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Fig 5 Element <updateStatus>

Attributes:

- None

Child elements:

- <sourceDmIdent>. the data module code of the data module from which the data update file was calculated. Refer to Chap 3.9.5.1.
- <targetDmIssueInfo>. The issue information of the target data module, which is populated in the same way as normal data modules. Refer to Chap 3.9.5.1.
- <responsiblePartnerCompany>. The responsible partner company of the data update file. Refer to Chap 3.9.5.1.
- <originator>. The originator of the data update file. Refer to Chap 3.9.5.1.
- <brexDmRef>. The reference to the BREX data module. Refer to Chap 3.9.5.1.
- <qualityAssurance>. Refer to Chap 3.9.5.1.

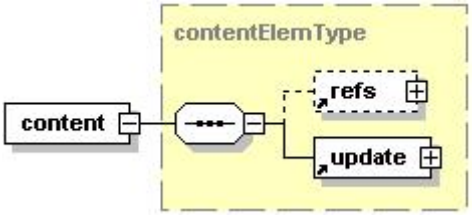
Markup example:

```
<updateStatus>
<sourceDmIdent>
<dmCode modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00G" infoCodeVariant="A" itemLocationCode="D"/>
<language languageIsoCode="en" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</sourceDmIdent>
<targetDmIssueInfo inWork="00" issueNumber="002"/>
<responsiblePartnerCompany enterpriseCode="U8025">
<enterpriseName>UK MoD</enterpriseName>
</responsiblePartnerCompany>
<originator enterpriseCode="U8025">
<enterpriseName>UK MoD</enterpriseName>
</originator>
<brexDmRef>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="022" infoCodeVariant="A" itemLocationCode="D"/>
<issueInfo issueNumber="007" inWork="00"/>
</dmRefIdent>
</dmRef>
</brexDmRef>
<qualityAssurance><unverified/></qualityAssurance>
</updateStatus>
```

2.2 Data update file content section

Description: The element <content> contains the content section of the date update file.

Markup element: <content>



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Fig 6 Element <content>

Attributes:

- id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

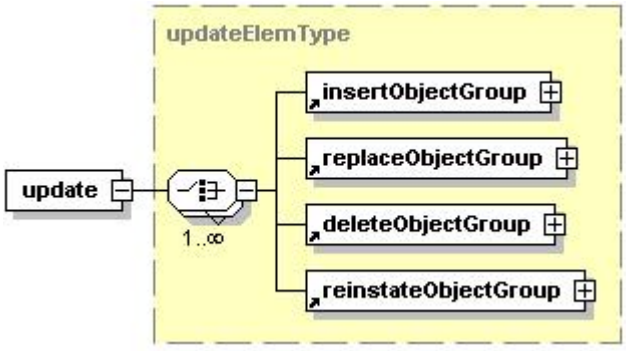
Child elements:

- <refs>. Refer to Chap 3.9.5.2.1.2.
- <update>. Refer to Para 2.3.

2.3 Updates

Description: The element <update> contains the data module fragments that have been added, deleted or modified since a previous issue of the target data module. A fragment can be updated only once in a data update file.

Markup element: <update>



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Fig 7 Element <update>

Attributes:

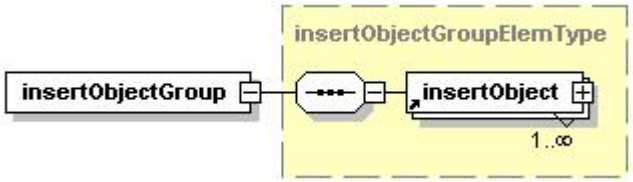
- None

Child elements:

- <insertObjectGroup>. Refer to Para 2.3.1.
- <replaceObjectGroup>. Refer to Para 2.3.2.
- <deleteObjectGroup>. Refer to Para 2.3.3.
- <reinstateObjectGroup>. Refer to Para 2.3.4.

2.3.1 Group of objects to insert

Description: The element <insertObjectGroup> contains all the data module fragments that have been added since a previous issue of the data module. When retrieving the new issue of the data module, these fragments must be inserted.



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Fig 8 Element <insertObjectGroup>

Markup element: <insertObjectGroup>

Attributes:

- None

Child elements:

– <insertObject>. Refer to Para 2.3.1.1.

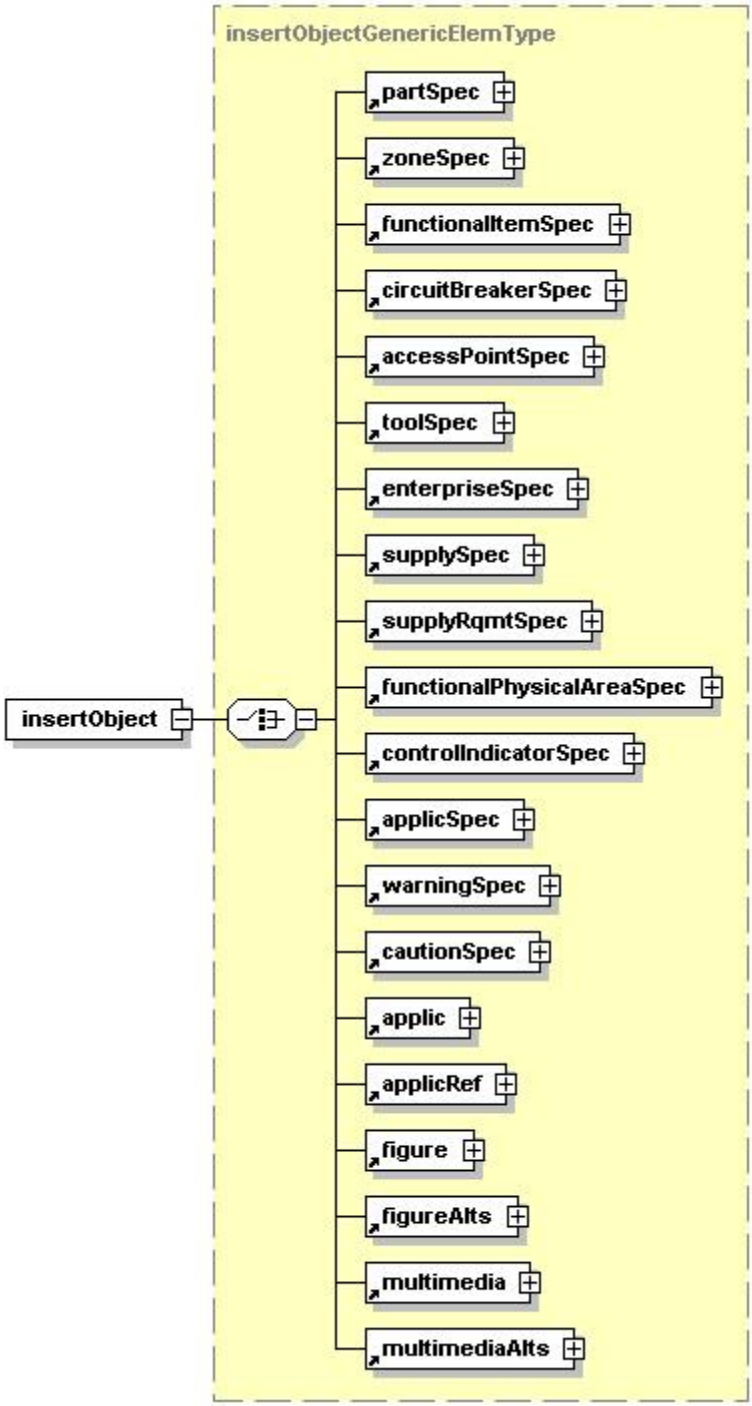
2.3.1.1 Object to insert

Description: The element <insertObject> represents one data module fragment that has been added since a previous issue of the data module. When retrieving the new issue of the data module, this fragment must be inserted.

The attributes of the <insertObject> indicate the place where the new object must be inserted. It is recommended that these two attributes are used.

Only the objects that are allowed into the data module can be used in a data update file. For instance the data update file related to the part CIR data module must insert <partSpec> elements only.

Markup element: <insertObject>



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Fig 9 Element <`insertObject`>

Attributes:

- `targetPath` (O), the XPath expression that indicates whether before or after an object, that the subject object must be inserted

- `insertionOrder` (O), indicates whether the subject object must be inserted after or before. Possible values are:
  - "`before`"
  - "`after`"

Child elements:

- <`functionalItemSpec`>. An entry of the functional item CIR data module. Refer to Chap 3.9.5.2.11.1.
- <`circuitBreakerSpec`>. An entry of the circuit breaker CIR data module. Refer to Chap 3.9.5.2.11.2.
- <`partSpec`>. An entry of the part CIR data module. Refer to Chap 3.9.5.2.11.3.
- <`zoneSpec`>. An entry of the zone CIR data module. Refer to Chap 3.9.5.2.11.4.
- <`accessPointSpec`>. An entry of the access point CIR data module. Refer to Chap 3.9.5.2.11.5.
- <`enterpriseSpec`>. An entry of the enterprise CIR data module. Refer to Chap 3.9.5.2.11.6.
- <`supplySpec`>. An entry of the supply CIR data module. Refer to Chap 3.9.5.2.11.7.
- <`supplyRqmtSpec`>. An entry of the supply requirement CIR data module. Refer to Chap 3.9.5.2.11.8.
- <`toolSpec`>. An entry of the tool CIR data module. Refer to Chap 3.9.5.2.11.9.
- <`functionalPhysicalAreaSpec`>. An entry of the functional and/or physical area CIR data module. Refer to Chap 3.9.5.2.11.10.
- <`controlIndicatorSpec`>. An entry of the control and indicator CIR data module. Refer to Chap 3.9.5.2.11.11.
- <`applicSpec`>. An entry of the applicability annotation CIR data module. Refer to Chap 3.9.5.2.11.12.
- <`warningSpec`>. An entry of the warning CIR data module. Refer to Chap 3.9.5.2.11.13.
- <`cautionSpec`>. An entry of the caution CIR data module. Refer to Chap 3.9.5.2.11.14.
- <`figure`>. Refer to Chap 3.9.5.2.1.7.
- <`figureAlts`>. Refer to Chap 3.9.5.2.1.7.
- <`multimedia`>. Refer to Chap 3.9.5.2.1.7.
- <`multimediaAlts`>. Refer to Chap 3.9.5.2.1.7.
- <`applic`>. A referenced applicability annotation. Refer to Chap 3.9.5.3.
- <`applicRef`>. A reference to an externalized applicability annotation. Refer to Chap 3.9.5.2.1.12.

Markup example:

```
<dataUpdateFile>
<updateIdentAndStatusSection>
<updateAddress>
<updateIdent>
<updateCode objectIdentCode="UPF"
modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00G" infoCodeVariant="A" itemLocationCode="D"/>
<language languageIsoCode="sx" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
```

```
</updateIdent>
...
</updateAddress>
<updateStatus>
<sourceDmIdent>
<dmCode modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00G" infoCodeVariant="A" itemLocationCode="D"/>
<language languageIsoCode="en" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</sourceDmIdent>
...
</updateStatus>
<targetDmStatus>...</targetDmStatus>
</updateIdentAndStatusSection>
<content>
<update>
<insertObjectGroup>
<insertObject targetPath="//partSpec[@id='part-0008']"
insertionOrder="before">
<partSpec id="part-0007" changeType="add">...</partSpec>
</insertObject>
</insertObjectGroup>
</update>
</content>
</dataUpdateFile>
```

2.3.2 Group of objects to replace

Description: The element <replaceObjectGroup> contains all the data module fragments that have been modified since a previous issue of the data module. When retrieving the new issue of the data module, these fragments must be replaced.

Markup element: <replaceObjectGroup>

Attributes:

– None

Child elements:

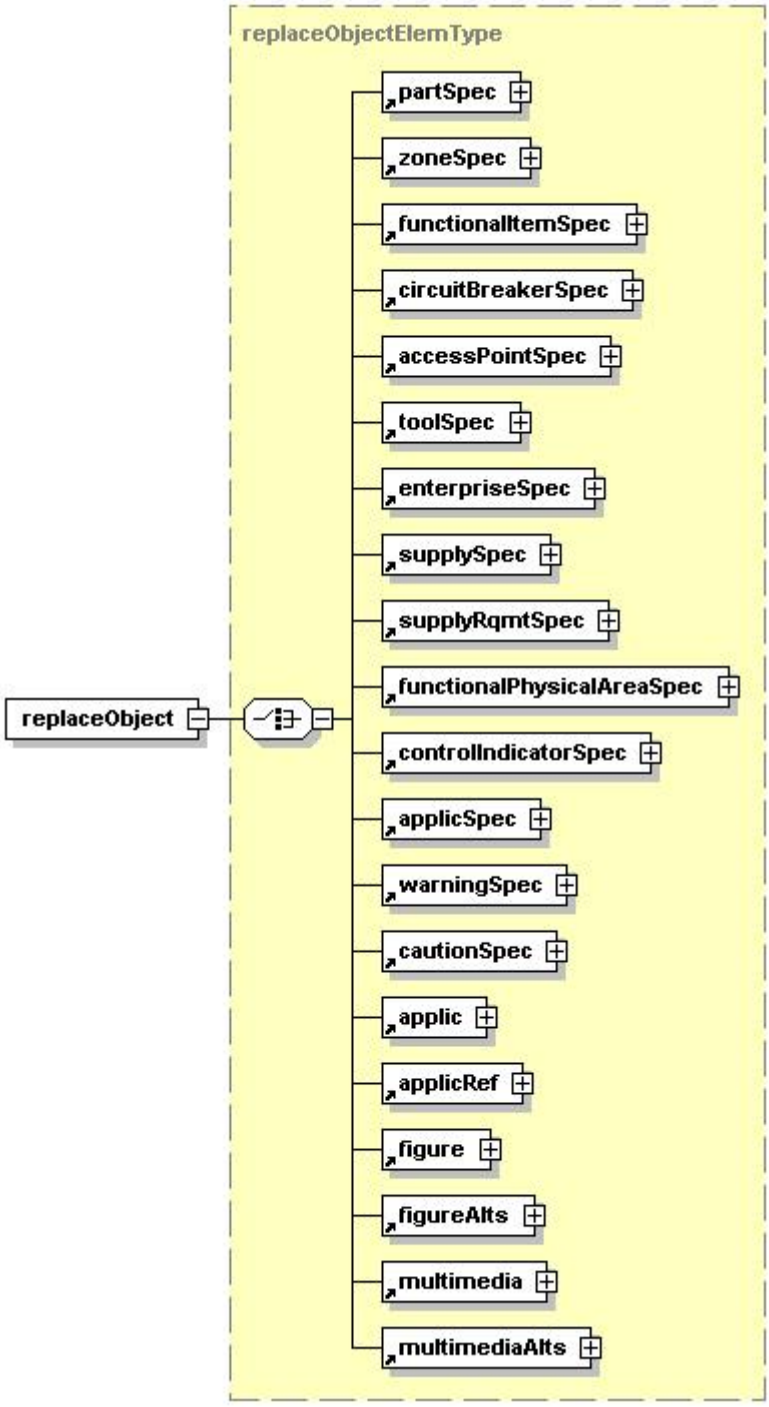
– <replaceObject>. Refer to Para 2.3.2.1.

2.3.2.1 Object to replace

Description: The element <replaceObject> represents one data module fragment that has been modified since a previous issue of the data module. When retrieving the new issue of the data module, this fragment must be used instead of the previous one.

Only the objects that are allowed into the data module can be used in a data update file. For example the data update file related to the part CIR data module must replace <partSpec> elements only.

Markup element: <replaceObject>



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Fig 10 Element <replaceObject>

Attributes:

– None

Child elements:

– <functionalItemSpec>. An entry of the functional item CIR data module. Refer to Chap 3.9.5.2.11.1.

- <circuitBreakerSpec>. An entry of the circuit breaker CIR data module. Refer to Chap 3.9.5.2.11.2.
- <partSpec>. An entry of the part CIR data module. Refer to Chap 3.9.5.2.11.3.
- <zoneSpec>. An entry of the zone CIR data module. Refer to Chap 3.9.5.2.11.4.
- <accessPointSpec>. An entry of the access point CIR data module. Refer to Chap 3.9.5.2.11.5.
- <enterpriseSpec>. An entry of the enterprise CIR data module. Refer to Chap 3.9.5.2.11.6.
- <supplySpec>. An entry of the supply CIR data module. Refer to Chap 3.9.5.2.11.7.
- <supplyRqmtSpec>. An entry of the supply requirement CIR data module. Refer to Chap 3.9.5.2.11.8.
- <toolSpec>. An entry of the tool CIR data module. Refer to Chap 3.9.5.2.11.9.
- <functionalPhysicalAreaSpec>. An entry of the functional and/or physical area CIR data module. Refer to Chap 3.9.5.2.11.10.
- <controlIndicatorSpec>. An entry of the control and indicator CIR data module. Refer to Chap 3.9.5.2.11.11.
- <applicSpec>. An entry of the applicability annotation CIR data module. Refer to Chap 3.9.5.2.11.12.
- <warningSpec>. An entry of the warning CIR data module. Refer to Chap 3.9.5.2.11.13.
- <cautionSpec>. An entry of the caution CIR data module. Refer to Chap 3.9.5.2.11.14.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <applic>. A referenced applicability annotation. Refer to Chap 3.9.5.3.
- <applicRef>. A reference to an externalized applicability annotation. Refer to Chap 3.9.5.2.1.12.

Markup example:

```
<dataUpdateFile>
<updateIdentAndStatusSection>
<updateAddress>
<updateIdent>
<updateCode objectIdentCode="UPF"
modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00G" infoCodeVariant="A" itemLocationCode="D"/>
<language languageIsoCode="sx" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</updateIdent>
...
</updateAddress>
<updateStatus>
<sourceDmIdent>
<dmCode modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00G" infoCodeVariant="A" itemLocationCode="D"/>
```

```
<language languageIsoCode="en" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</sourceDmIdent>
...
</updateStatus>
<targetDmStatus>...</targetDmStatus>
</updateIdentAndStatusSection>
<content>
<update>
<replaceObjectGroup>
<replaceObject>
<partSpec id="part-0010" changeType="modify">...</partSpec>
</replaceObject>
</replaceObjectGroup>
</update>
</content>
</dataUpdateFile>
```

2.3.3 Group of objects to delete

Description: The element <deleteObjectGroup> contains all the data module fragments that have been deleted since a previous issue of the data module. When retrieving the new issue of the data module, these fragments must be deleted.

Markup element: <deleteObjectGroup>

Attributes:

– None

Child elements:

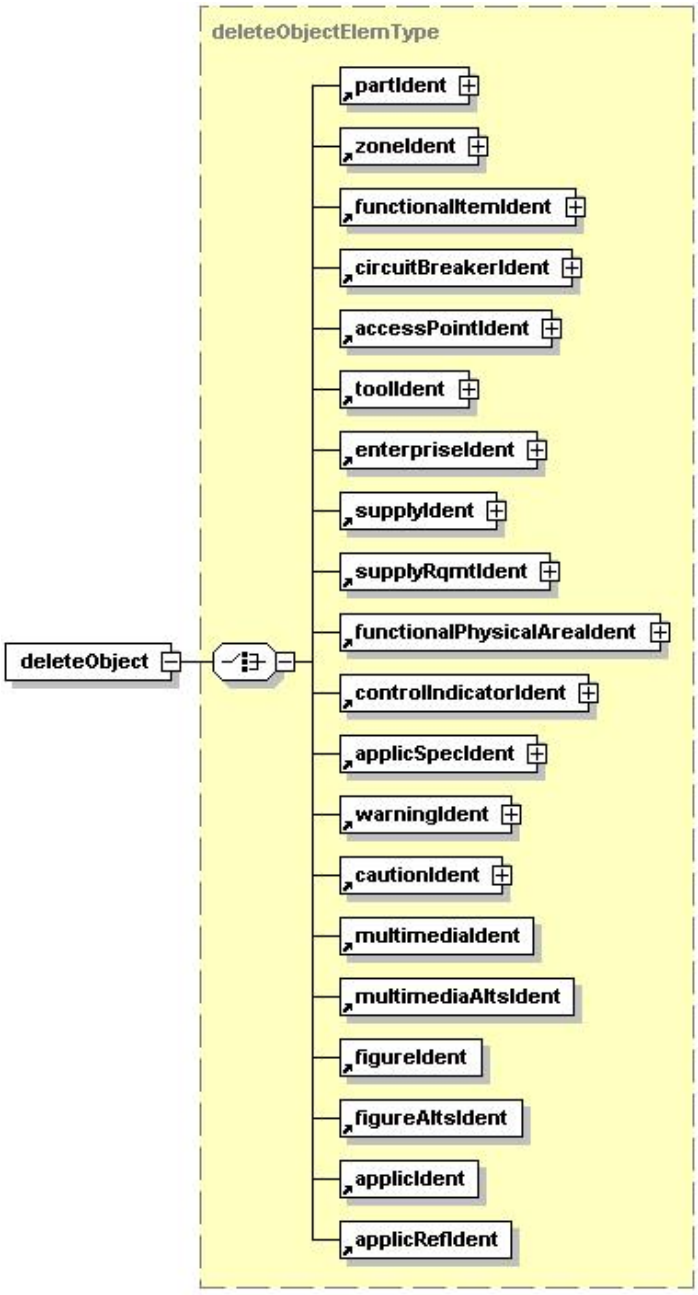
– <deleteObject>. Refer to Para 2.3.3.1.

2.3.3.1 Object to delete

Description: The element <deleteObject> represents one data module fragment that has been deleted since a previous issue of the data module. When retrieving the new issue of the data module, this fragment must be deleted. For deleted data module fragments, the data update file indicates the identifier of the object to delete only. For example, the data update file of the part CIR data module, the element <deleteObject> will contain the element <partIdent> indicating that the element <partSpec> containing this <partIdent> must be deleted.

Only the objects that are allowed into the data module can be used in a data update file. For example the data update file related to the part CIR data module must delete <partSpec> elements only.

Markup element: <deleteObject>



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Fig 11 Element <deleteObject>

Attributes:

– None

Child elements:

– <functionalItemSpec>. An entry of the functional item CIR data module. Refer to Chap 3.9.5.2.11.1.
– <circuitBreakerSpec>. An entry of the circuit breaker CIR data module. Refer to Chap 3.9.5.2.11.2.
– <partSpec>. An entry of the part CIR data module. Refer to Chap 3.9.5.2.11.3.
– <zoneSpec>. An entry of the zone CIR data module. Refer to Chap 3.9.5.2.11.4.

- <accessPointSpec>. An entry of the access point CIR data module. Refer to Chap 3.9.5.2.11.5.
- <enterpriseSpec>. An entry of the enterprise CIR data module. Refer to Chap 3.9.5.2.11.6.
- <supplySpec>. An entry of the supply CIR data module. Refer to Chap 3.9.5.2.11.7.
- <supplyRqmtSpec>. An entry of the supply requirement CIR data module. Refer to Chap 3.9.5.2.11.8.
- <toolSpec>. An entry of the tool CIR data module. Refer to Chap 3.9.5.2.11.9.
- <functionalPhysicalAreaSpec>. An entry of the functional and/or physical area CIR data module. Refer to Chap 3.9.5.2.11.10.
- <controlIndicatorSpec>. An entry of the control and indicator CIR data module. Refer to Chap 3.9.5.2.11.11.
- <applicSpec>. An entry of the applicability annotation CIR data module. Refer to Chap 3.9.5.2.11.12.
- <warningSpec>. An entry of the warning CIR data module. Refer to Chap 3.9.5.2.11.13.
- <cautionSpec>. An entry of the caution CIR data module. Refer to Chap 3.9.5.2.11.14.
- <figureIdent>. Refer to Para 2.3.3.2.
- <figureAltsIdent>. Refer to Para 2.3.3.3.
- <multimediaIdent>. Refer to Para 2.3.3.4.
- <multimediaAltsIdent>. Refer to Para 2.3.3.5.
- <applicIdent>. A referenced applicability annotation. Refer to Para 2.3.3.6.
- <applicRefIdent>. A reference to an externalized applicability annotation. Refer to Para 2.3.3.7.

Markup example:

```
<dataUpdateFile>
<updateIdentAndStatusSection>
<updateAddress>
<updateIdent>
<updateCode objectIdentCode="UPF"
modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00G" infoCodeVariant="A" itemLocationCode="D"/>
<language languageIsoCode="sx" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</updateIdent>
...
</updateAddress>
<updateStatus>
<sourceDmIdent>
<dmCode modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00G" infoCodeVariant="A" itemLocationCode="D"/>
<language languageIsoCode="en" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</sourceDmIdent>
...
```

```
</updateStatus>
<targetDmStatus>...</targetDmStatus>
</updateIdentAndStatusSection>
<content>
<update>
<deleteObjectGroup>
<deleteObject>
<partIdent partNumberValue="LRU1010"
manufacturerCodeValue="KZ777"/>
</deleteObject>
</deleteObjectGroup>
</update>
</content>
</dataUpdateFile>
```

2.3.3.2 Figure identifier

Description: The element <figureIdent> identifies a figure.

Markup element: <figureIdent>

Attributes:

– id (M), the identifier of the markup element to be deleted

Child elements:

– None

Markup example:

```
<content>
<update>
<deleteObjectGroup>
<deleteObject>
<figureIdent id="fig-0010"/>
</deleteObject>
...
</deleteObjectGroup>
</update>
</content>
```

2.3.3.3 Figure alternates group identifier

Description: The element <figureAltsIdent> identifies a figure alternates group.

Markup element: <figureAltsIdent>

Attributes:

– id (M), the identifier of the markup element to be deleted

Child elements:

– None

Markup example:

```
<content>
<update>
```

```
<deleteObjectGroup>
<deleteObject>
<figureAltsIdent id="figalts-0010"/>
</deleteObject>
...
</deleteObjectGroup>
</update>
</content>
```

2.3.3.4 Multimedia identifier

Description: The element <multimediaIdent> identifies the multimedia.

Markup element: <multimediaIdent>

Attributes:

– id (M), the identifier of the markup element to be deleted

Child elements:

– None

Markup example:

```
<content>
<update>
<deleteObjectGroup>
<deleteObject>
<multimediaIdent id="mul-0010"/>
</deleteObject>
...
</deleteObjectGroup>
</update>
</content>
```

2.3.3.5 Multimedia alternates group identifier

Description: The element <multimediaAltsIdent> identifies a multimedia alternates group.

Markup element: <multimediaAltsIdent>

Attributes:

– id (M), the identifier of the markup element to be deleted

Child elements:

– None

Markup example:

```
<content>
<update>
<deleteObjectGroup>
<deleteObject>
<multimediaAltsIdent id="mulalts-0010"/>
</deleteObject>
...
```

```
</deleteObjectGroup>
</update>
</content>
```

2.3.3.6 Applicability annotation identifier

Description: The element <applicIdent> identifies an applicability annotation. It must be used by projects or organizations, which do not externalize applicability.

Markup element: <applicIdent>

Attributes:

– id (M), the identifier of the markup element to be deleted

Child elements:

– None

Markup example:

```
<content>
<update>
<deleteObjectGroup>
<deleteObject>
<applicIdent id="appl-0010"/>
</deleteObject>
...
</deleteObjectGroup>
</update>
</content>
```

2.3.3.7 Reference to externalized applicability annotation identifier

Description: The element <applicRefIdent> identifies a reference to an externalized applicability annotation. It must be used by projects or organizations, which do externalize applicability.

Markup element: <applicRefIdent>

Attributes:

– id (M), the identifier of the markup element to be deleted

Child elements:

– None

Markup example:

```
<content>
<update>
<deleteObjectGroup>
<deleteObject>
<applicRefIdent id="applref-0010"/>
</deleteObject>
...
</deleteObjectGroup>
</update>
</content>
```

2.3.4 Group of objects to reinstate

Description: The element <reinstateObjectGroup> contains all the data module fragments that have been reinstated since a previous issue of the data module. When retrieving the new issue of the data module, these fragments must be inserted.

Markup element: <reinstateObjectGroup>

Attributes:

– None

Child elements:

– <reinstateObject>. Refer to Para 2.3.5.

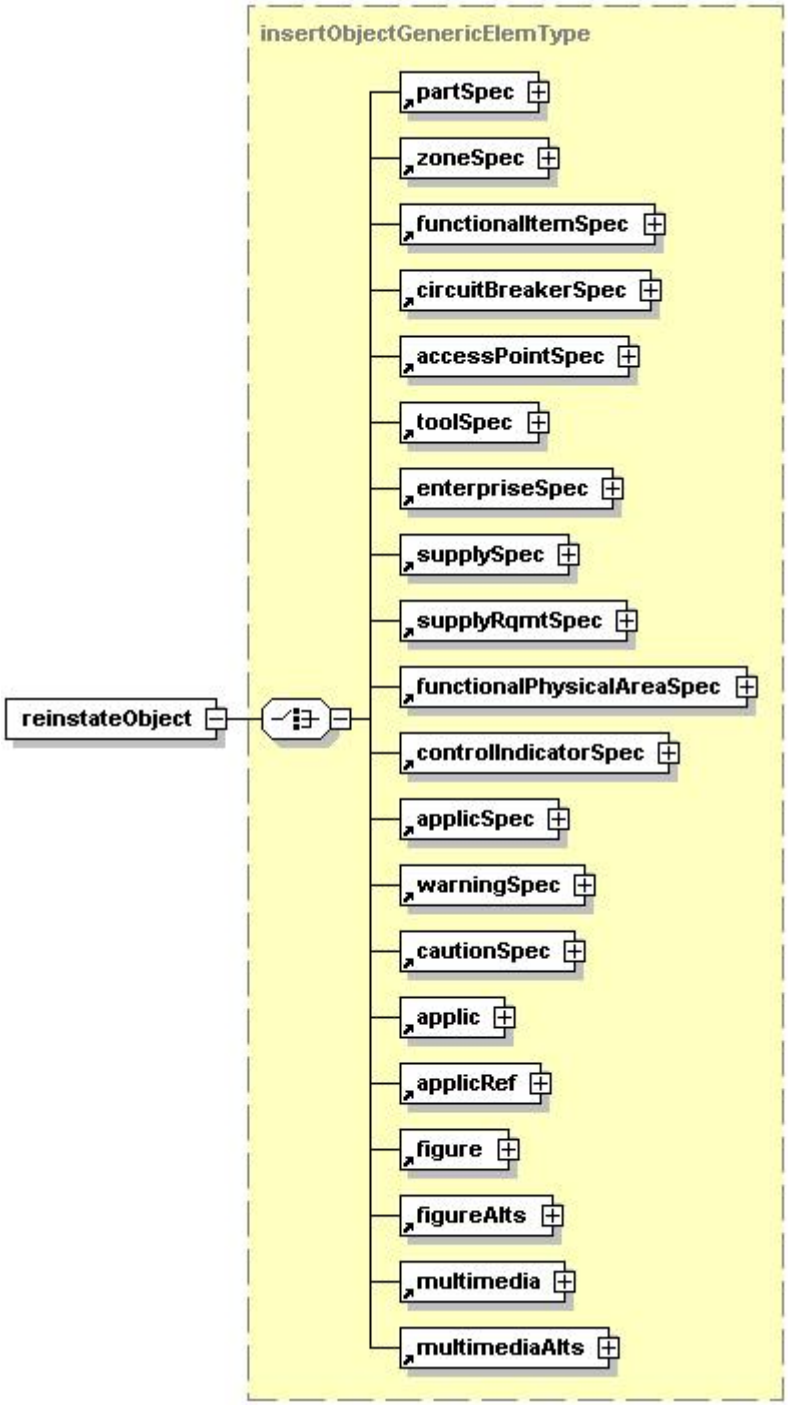
2.3.5 Object to reinstate

Description: The element <reinstateObject> represents one data module fragment that has been reinstated since a previous issue of the data module. When retrieving the new issue of the data module, this fragment must be inserted.

The attributes of the element <reinstateObject> indicate the place where the new object must be inserted. It is recommended that these two attributes are used for projects or organizations removing the deleted objects.

Only the objects that are allowed into the data module can be used in a data update file. For instance the data update file related to the part CIR data module must reinstate <partSpec> elements only.

Markup element: <reinstateObject>



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Fig 12 Element <`reinstateObject`>

Attributes:

- `targetPath` (O), the XPath expression that indicates whether before or after an object, that the subject object must be inserted

- insertionOrder (O), indicates whether the subject object must be inserted after or before. The attribute can have on of the following values:
  - "before"
  - "after"

Child elements:

- <functionalItemSpec>. An entry of the functional item CIR data module. Refer to Chap 3.9.5.2.11.1.
- <circuitBreakerSpec>. An entry of the circuit breaker CIR data module. Refer to Chap 3.9.5.2.11.2.
- <partSpec>. An entry of the part CIR data module. Refer to Chap 3.9.5.2.11.3.
- <zoneSpec>. An entry of the zone CIR data module. Refer to Chap 3.9.5.2.11.4.
- <accessPointSpec>. An entry of the access point CIR data module. Refer to Chap 3.9.5.2.11.5.
- <enterpriseSpec>. An entry of the enterprise CIR data module. Refer to Chap 3.9.5.2.11.6.
- <supplySpec>. An entry of the supply CIR data module. Refer to Chap 3.9.5.2.11.7.
- <supplyRqmtSpec>. An entry of the supply requirement CIR data module. Refer to Chap 3.9.5.2.11.8.
- <toolSpec>. An entry of the tool CIR data module. Refer to Chap 3.9.5.2.11.9.
- <functionalPhysicalAreaSpec>. An entry of the functional and/or physical area CIR data module. Refer to Chap 3.9.5.2.11.10.
- <controlIndicatorSpec>. An entry of the control and indicator CIR data module. Refer to Chap 3.9.5.2.11.11.
- <applicSpec>. An entry of the applicability annotation CIR data module. Refer to Chap 3.9.5.2.11.12.
- <warningSpec>. An entry of the warning CIR data module. Refer to Chap 3.9.5.2.11.13.
- <cautionSpec>. An entry of the caution CIR data module. Refer to Chap 3.9.5.2.11.14.
- <figure>. Refer to Chap 3.9.5.2.1.7.
- <figureAlts>. Refer to Chap 3.9.5.2.1.7.
- <multimedia>. Refer to Chap 3.9.5.2.1.7.
- <multimediaAlts>. Refer to Chap 3.9.5.2.1.7.
- <applic>. A referenced applicability annotation. Refer to Chap 3.9.5.3.
- <applicRef>. A reference to an externalized applicability annotation. Refer to Chap 3.9.5.2.1.12.

Markup example:

```
<dataUpdateFile>
<updateIdentAndStatusSection>
<updateAddress>
<updateIdent>
<updateCode objectIdentCode="UPF"
modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00G" infoCodeVariant="A" itemLocationCode="D"/>
<language languageIsoCode="sx" countryIsoCode="US"/><issueInfo
issueNumber="001" inWork="00"/></updateIdent>
```

```
...
</updateAddress>
<updateStatus>
<sourceDmIdent>
<dmCode modelIdentCode="S1000DLIGHTING" systemDiffCode="AAA"
systemCode="D00" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="00G" infoCodeVariant="A" itemLocationCode="D"/>
<language languageIsoCode="en" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</sourceDmIdent>
...
</updateStatus>
<targetDmStatus>
...
</targetDmStatus>
</updateIdentAndStatusSection>
<content>
<update>
<reinstateObjectGroup>
<reinstateObject targetPath="//partSpec[@id='part-0021']"
insertionOrder="after">
<partSpec id="part-0022" changeType="add">
...
</partSpec>
</reinstateObject>
</reinstateObjectGroup>
</update>
</content>
</dataUpdateFile>
```

Chapter 4.13.3

Optimizing and reuse - Alternates concept

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Table 1 References

Chap No./Document No.	Title
Chap 3.9.5.3	Data modules - Applicability
Chap 4.13.4	Optimizing and reuse - Container data module

1 General

This chapter describes the concept of "alternates group" used in data module content. The "alternates group" mechanism can be used in data module content to group elements that represent alternates of the same information but for different applicability.

The alternates group concept is similar to the concept of container data modules described in Chap 4.13.4, but is specific to the content of an individual data module.

2 Implementation of the alternates group in data module content

The elements defined in the XML Schemas to manage alternates groups are named <xxxAlts> where xxx is the name of the element for which alternates can be given in an alternates group. For example, the element <commonInfoDescrParaAlts> provides the ability to group alternates of the element <commonInfoDescrPara> (eg, depending on applicability).

This chapter applies to all alternates group elements in any S1000D XML Schema. Refer to default BREX rules BREX-S1-00150 to BREX-S1-00177.

The following alternates groups are available in

- most data module types:
  - <figureAlts>
  - <multimediaAlts>
  - <commonInfoDescrParaAlts>
- crew/operator, descriptive, learning and Service bulletin data modules:
  - <levelledParaAlts>
- procedural and Service bulletin data modules:
  - <proceduralStepAlts>
- fault data modules:
  - <isolatedFaultAlts>
  - <detectedFaultAlts>
  - <observedFaultAlts>
  - <correlatedFaultAlts>
  - <warningMalfunctionAlts>
  - <assocWarningMalfunctionAlts>
  - <bitMessageAlts>
  - <isolationStepAlts>
  - <isolationProcedureEndAlts>
- maintenance planning data modules:
  - <taskDefinitionAlts>
- wiring data data modules:
  - <wireAlts>
  - <harnessAlts>
  - <electricalEquipAlts>
- process data modules:
  - <dialogAlts>
  - <dmNodeAlts>
  - <dmSeqAlts>
  - <proceduralStepAlts>
  - <messageAlts>

The implementation of alternates groups in data module content is optional.

Business rule decision point BRDP-S1-00382 - Use of alternates groups in data module content:

– Decide whether to use alternates group elements. If used, specify which groups and in which data modules types.

All XML Schemas listed above propose a choice between grouping the elements into an alternates group (element <xxxAlts>) or using the elements (element <xxx>) directly. Within a given structure, the mix of using alternate groups and elements directly is allowed.

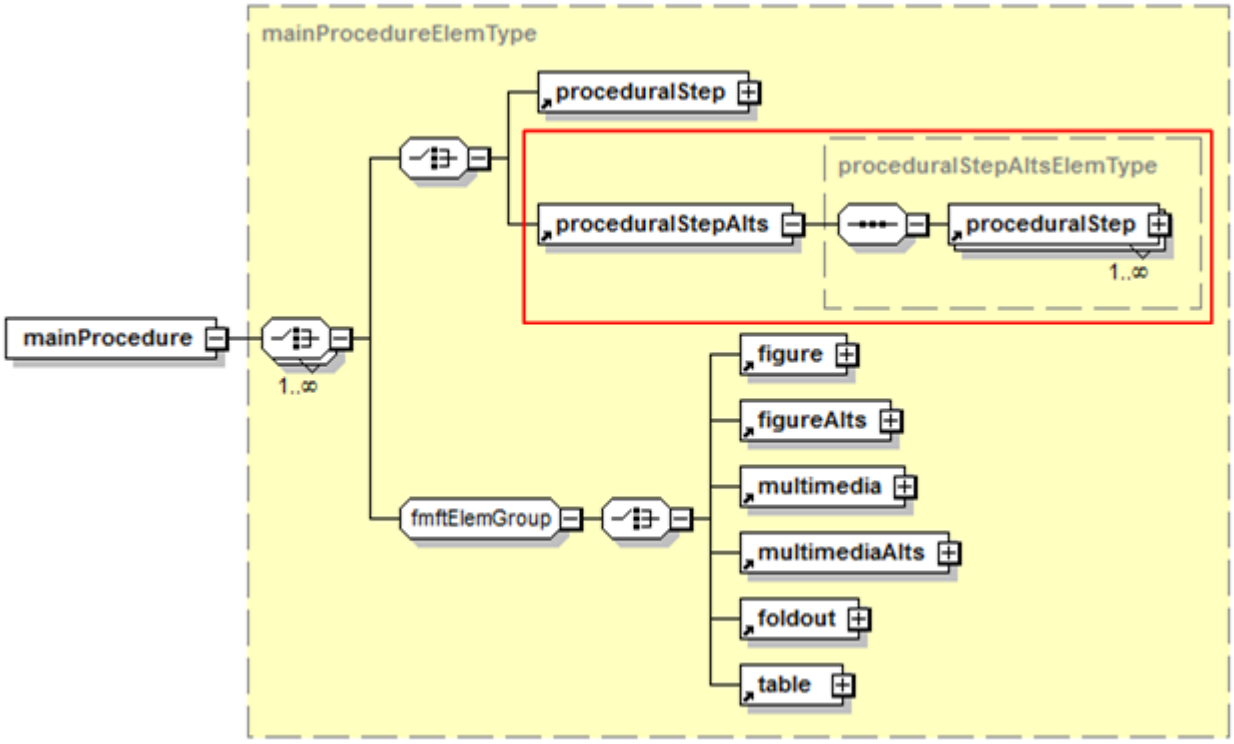
Business rule decision point BRDP-S1-00383 - Mix of alternates groups and elements:

– Decide whether alternates groups and elements can be mixed in a given structure.

3 Principle

An alternates group aims at grouping one to n alternates (or variants) of the same information, each of these alternates being valid for different applicability annotations (Product configuration, environment, other conditions, etc). This means that for a given applicability only one (or none) of the alternates is applicable. Refer to default BREX rules BREX-S1-00150 to BREX-S1-00177.

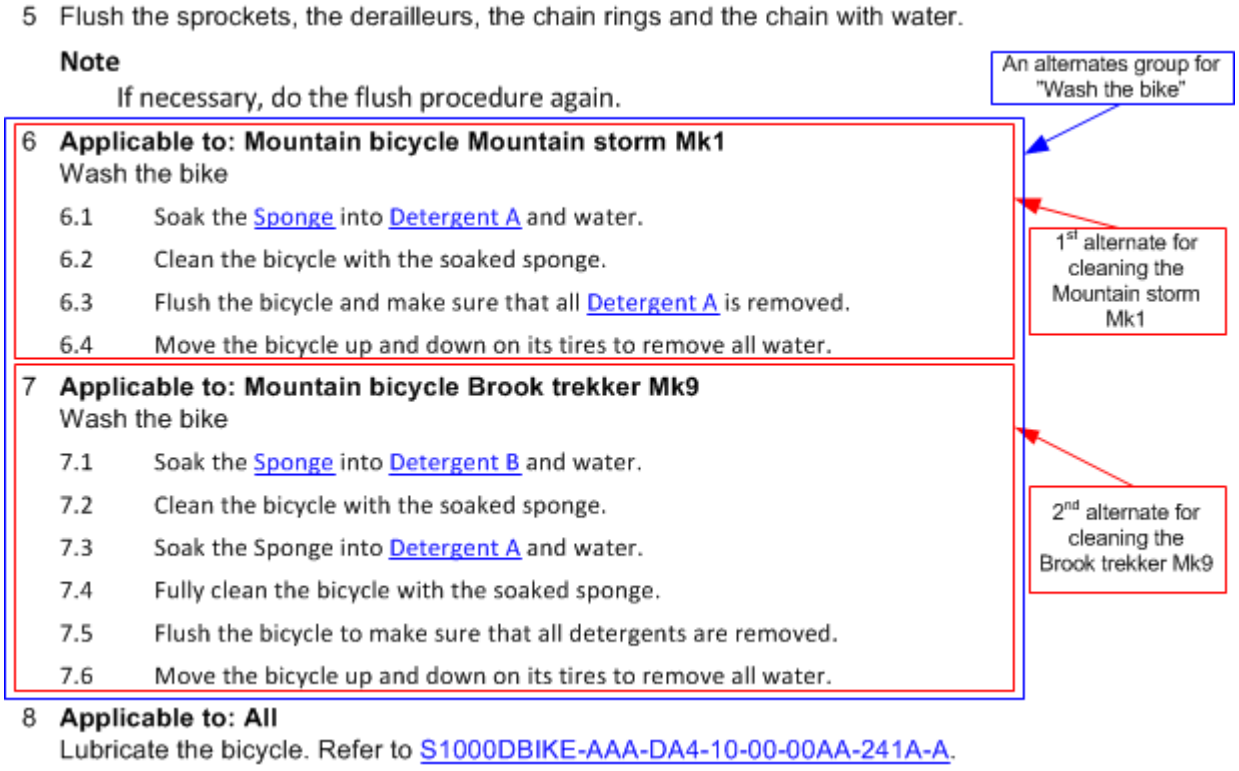
For example (refer to Fig 1 and Fig 2), in a maintenance procedure, the maintenance step concerning the cleaning of a mountain bike ("Wash the Bike") can vary depending on the mountain bike version (determined by the applicability).



ICN-S3627-S1000D0592-001-01

Fig 1 Element <proceduralStepAlts>

When the end user consults the documentation for the "Mountain bicycle Mountain storm Mk1", only the first alternate step is applicable. When consulting for the "Mountain bicycle Brook trekker Mk9" the second alternate step is applicable.



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Fig 2 Example of alternate steps in a maintenance procedure

Note

There is no need to display both alternates to the end user. The IETP can suppress the alternates group that is not applicable depending on configuration context. The same applies when customized page-oriented publications are distributed.

4 Benefits

4.1 General

The use of an alternates group (rather than a single alternate) has several benefits for data management and referencing purposes:

- Reduce the configuration dependencies in internal references. Refer to Para 4.2.
- Control the configuration consistency. Refer to Para 4.3.
- Ease the numbering of alternates. Refer to Para 4.4.

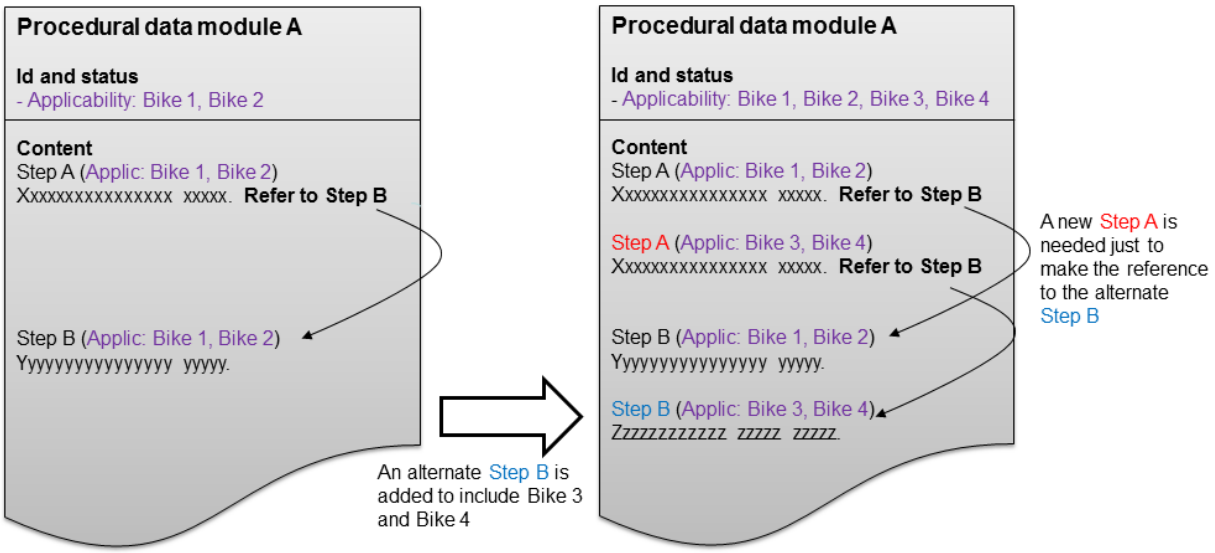
4.2 Reduction of configuration dependencies in references

The use of an alternates group element in data module content limits the impact of evolutions due to configurations. This is illustrated in the following example:

For example (refer to Fig 3 and Fig 4), in the first issue of a maintenance procedure data module, an author can create a cross-reference from one step to another step (eg, step A and step B are valid for bike 1 and bike 2 and step A is referencing step B).

In a further issue of the data module, the applicability is extended to include bike 3 and bike 4. As step B for bike 3 and bike 4 is different from step B for bike 1 and bike 2, the author must create a new alternate for step B which is valid for bike 3 and bike 4.

The impact of such a configuration change is different depending on the use of an alternates group or not.

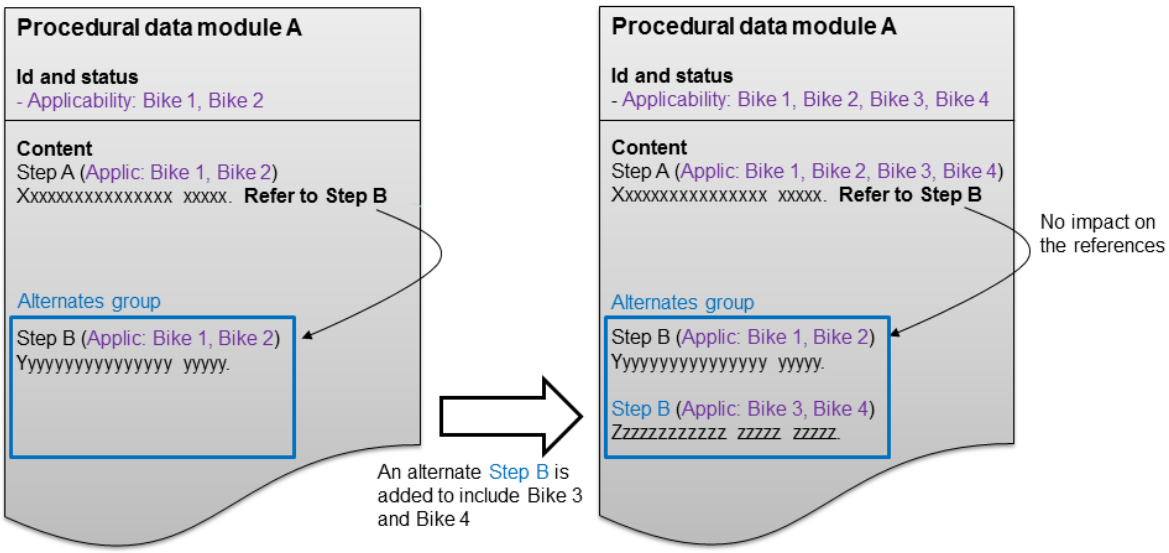


ICN-S3627-S1000D0594-001-01

Fig 3 Configuration dependencies - Alternates group not used

Alternates group elements used (refer to Fig 4):

– step A already refers to step B in an alternates group, so there is no impact on step A regarding the reference to step B.



ICN-S3627-S1000D0595-003-01

Fig 4 Configuration dependencies - Alternates group used

4.3 Configuration consistency check

The configuration consistency between the various alternates can be ensured. At a given point in time (ie, for a given Product configuration and a given operational condition), only one alternate is applicable in an alternates group. The applicability of an alternate within an

alternates group must not overlap the applicability of any other alternate within the same alternates group. Refer to Chap 3.9.5.3.

The sum of all applicabilities of the alternates within an alternates group must not cover every possible Product configuration or technical condition. It is allowed to have a case where none of the alternates within an alternates group is applicable to a certain Product configuration or technical condition. If the information for a specific configuration (filtering mode) is displayed and none of the alternates in a given alternates group is applicable, no information will be displayed.

4.4 Improving the numbering of alternates

When a sequence of elements is displayed as numbered steps, they must reuse the same sequence number for the elements that are alternates of the same information. Using this numbering rule for alternates ensures that no "hole" will appear in the sequential numbering when the information is filtered with a given condition in an IETP or when distributed as customized page-oriented publications.

If the alternates are not gathered in an alternates group, there is no information in the data to detect that a given element is an alternate of another one (two consecutive elements with different applicability annotations are not necessarily alternates). Consequently, there is no possibility to develop a reliable numbering algorithm associating the same step number to all the alternates.

If alternates are grouped in an alternates group, the information that the elements are alternates of the same information is explicit. This enables the implementation of a simple numbering algorithm to associate the same number to all the alternates of the same element.

5 Examples

5.1 Alternates group example for procedural steps

This markup example shows the use of grouping alternate procedural steps in a maintenance procedure data module (element <proceduralStepAlts>) and corresponds to the one illustrated in Fig 2.

```
<mainProcedure>
...
<!-- ProceduralStep alternates grouping (two alternates of step 6)-->
<proceduralStepAlts>
<!-- First procedural step (step 6) alternate with applicability:
"Model: Mountain storm Version: Mk1"-->
<proceduralStep applicRefId="apMK1">
<para>Wash the Bike</para>
<proceduralStep>
<para>Soak the <internalRef xlink:actuate="onRequest"
xlink:show="replace" xlink:href="#seq-0003" internalRefId="seq-0003"
internalRefTargetType="irtt05"></internalRef> into <internalRef
xlink:actuate="onRequest" xlink:show="replace" xlink:href="#sup-0002"
internalRefId="sup-0002" internalRefTargetType="irtt04"></internalRef>
and water.</para>
</proceduralStep>
<proceduralStep>
<para>Clean the bicycle with the soaked sponge.</para>
</proceduralStep>
<proceduralStep>
<para>Flush the bicycle and make sure that all <internalRef
xlink:actuate="onRequest" xlink:show="replace" xlink:href="#sup-0002"
internalRefId="sup-0002" internalRefTargetType="irtt04"></internalRef>
is removed.</para>
```

```
</proceduralStep>
<proceduralStep>
<para>Move the bicycle up and down on its tires to remove all
water.</para>
</proceduralStep>
</proceduralStep>
<!-- Second procedural step (step 6) alternate with
applicability:"Model: Brook trekker Version: Mk9"-->
<proceduralStep applicRefId="apMK9">
<para>Wash the Bike</para>
<proceduralStep>
<para>Soak the <internalRef xlink:actuate="onRequest"
xlink:show="replace" xlink:href="#seq-0003" internalRefId="seq-0003"
internalRefTargetType="irtt05"></internalRef> into <internalRef
xlink:actuate="onRequest" xlink:show="replace" xlink:href="#sup-0003"
internalRefId="sup-0003" internalRefTargetType="irtt04"></internalRef>
and water.</para>
</proceduralStep>
<proceduralStep>
<para>Clean the bicycle with the soaked sponge.</para>
</proceduralStep>
<proceduralStep>
<para>Soak the <internalRef xlink:actuate="onRequest"
xlink:show="replace" xlink:href="#seq-0003" internalRefId="seq-0003"
internalRefTargetType="irtt05"></internalRef> into <internalRef
xlink:actuate="onRequest" xlink:show="replace" xlink:href="#sup-0002"
internalRefId="sup-0002" internalRefTargetType="irtt04"></internalRef>
and water.</para>
</proceduralStep>
<proceduralStep>
<para>Fully clean the bicycle with the soaked sponge.</para>
</proceduralStep>
<proceduralStep>
<para>Flush the bicycle to make sure that all detergents are
removed.</para>
</proceduralStep>
<proceduralStep>
<para>Move the bicycle up and down on its tires to remove all
water.</para>
</proceduralStep>
</proceduralStep>
</proceduralStepAlts>
...
</mainProcedure>
```

5.2 Alternates group example for functional items

This markup example shows the use of grouping functional items in a CIR data module (element <functionalItemAlts>). The example illustrates the case where there are two alternate locations (thus two functional item alternates) for the mountain bike rear light depending on the mountain bike model and version ("Model: Mountain storm Version: Mk1" or "Model: Brook trekker Version: Mk9").

```
<functionalItemRepository id="ID00003">
...
<functionalItemSpec>
<functionalItemIdent functionalItemNumber="L2"
functionalItemType="fit01" id="fin-002"/>
```

```
<name>Rear light</name>
<functionalItemAlts>
<!-- First functional item "L2" alternate with applicability: "Model:
Mountain storm Version: Mk1"-->
<functionalItem normativeComponentFlag="1"
applicRefId="app-0001">
<location><installationLocation
installationLocationType="instloctyp05"
unitOfMeasure="cm">30</installationLocation></location>
<functionalItemFamily>Lights</functionalItemFamily>
</functionalItem>
<!-- Second functional item "L2" alternate with applicability: "Model:
Brook trekker Version: Mk9"-->
<functionalItem normativeComponentFlag="1"
applicRefId="app-0002">
<location><installationLocation
installationLocationType="instloctyp05"
unitOfMeasure="cm">40</installationLocation></location>
<functionalItemFamily>Lights</functionalItemFamily>
</functionalItem>
</functionalItemAlts>
</functionalItemSpec>
...
</functionalItemRepository>
```

Chapter 4.13.4

Optimizing and reuse - Container data module

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Chap 3.9.5.2.12	Content section - Container data module
Chap 3.9.5.3	Data modules - Applicability
Chap 8.4.1	Information codes - Short definitions

1 General

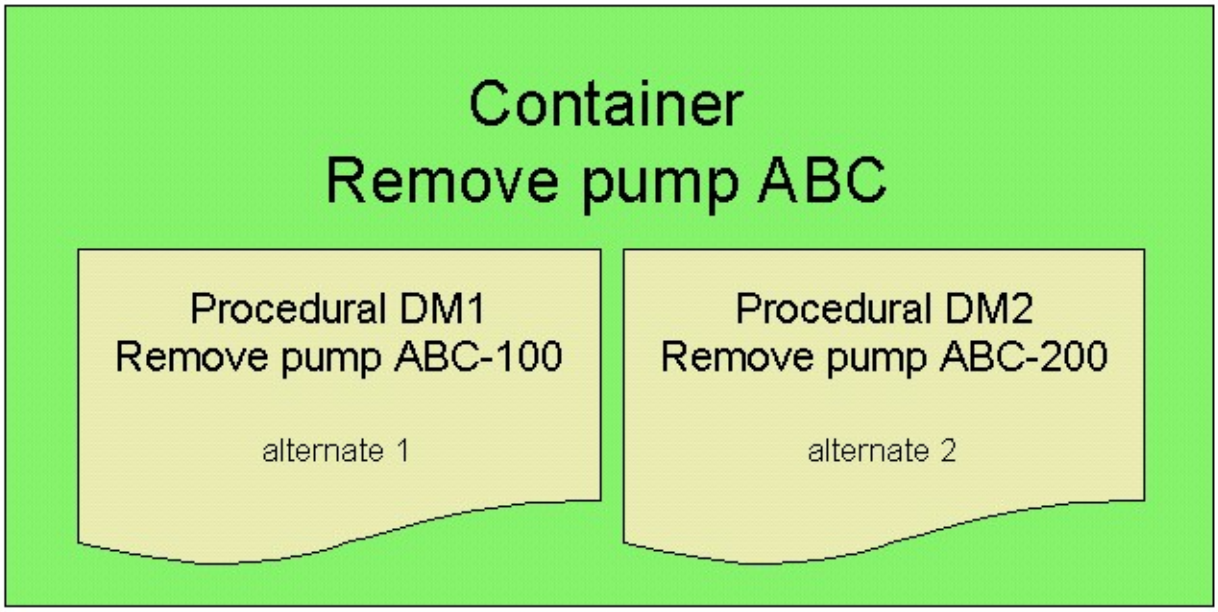
This chapter describes the container data module concept. The container data module is a production management mechanism to associate several data modules representing the same data. Refer to Chap 3.9.5.2.12.

2 Container data module

2.1 Principle

The grouping of data modules can be used when several data modules achieve the same maintenance goal, but the detailed procedures differ due to Product configuration, maintenance environment or other conditions.

For example (refer to Fig 1), a maintenance action to remove a pump can be performed differently depending on the type of pump, such as "Remove pump ABC-100" (data module alternate 1) and "Remove pump ABC-200" (data module alternate 2). A container data module "Remove pump ABC" can be used to associate the two alternate data modules. References to the "Remove pump ABC" container data module will target the group of two alternate data modules.



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Fig 1 Container data module "Remove pump ABC"

As the container data module is a data management tool, there is no specific need to display it to the end user. The IETP process can suppress the container data module and display the accurate alternate data module 1 or data module 2 depending on configuration context.

2.2 Benefits

As the container is configuration independent, referencing a container data module has several benefits for data management and referencing purposes:

- reduction of configuration dependencies between data modules
- consistency of links
- configuration consistency checks
- content management
- reuse of classical configuration management processes and tools

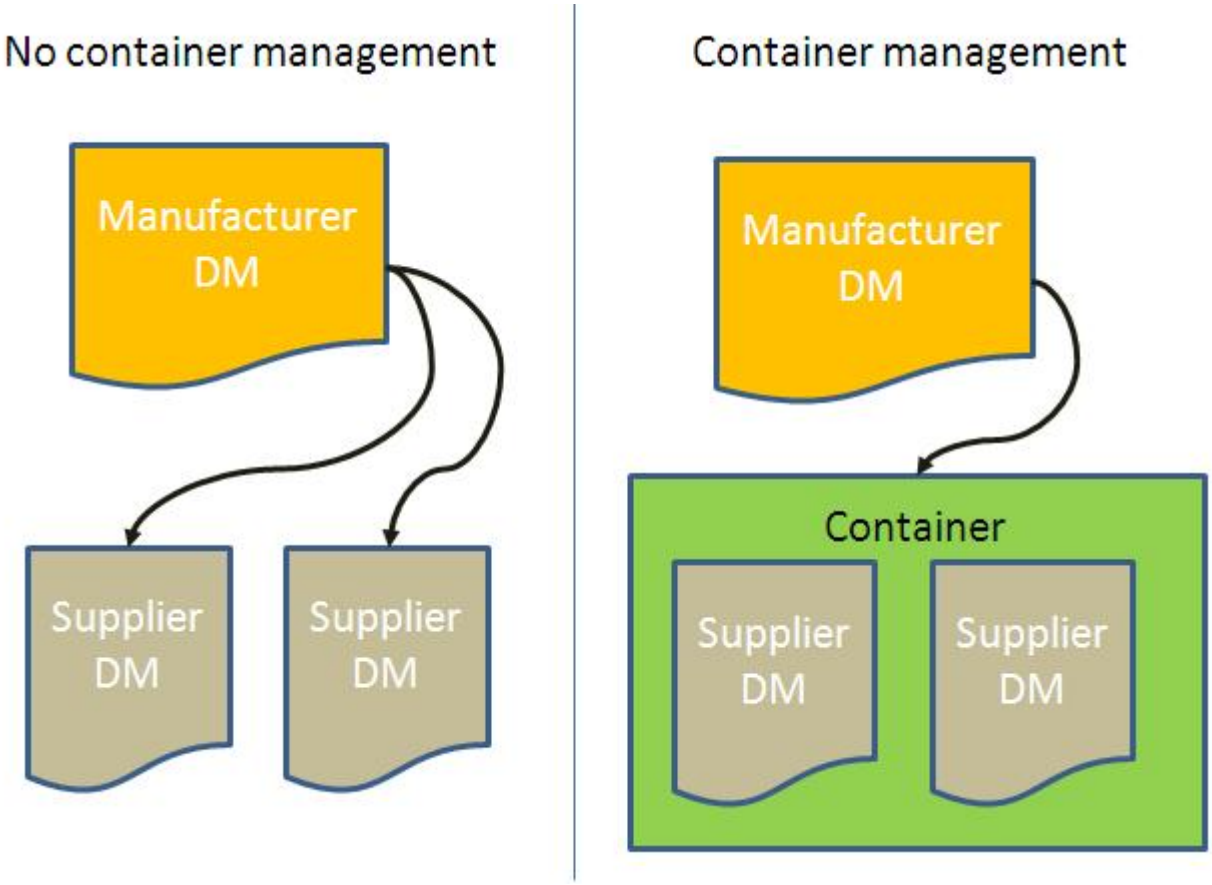
2.2.1 Reduction of configuration dependencies between data modules

A container data module limits the impact of evolutions linked to configuration. For example, consider a data module referring to supplier data module (refer to Fig 2):

- left part describes the way of working without container

– right part describes the container data module approach, where the reference does not target the supplier's procedural data module directly, but targets the supplier's container data module

With configuration evolution, a second variant of the supplier procedural data module is created (description of a new configuration). The following figure illustrates the new situation.



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Fig 2 Manufacturer and supplier relationship with configuration evolution

Without the container data module, the manufacturer will have to create a new issue of the referencing data module in order to reference both the initial supplier procedural data module and the new "variant" of the supplier procedural data module. In other words, the manufacturer has to follow and react to each configuration evolution of the supplier procedural data modules.

With the container approach, a new issue of the manufacturer's data module is not necessary since the reference to the container data module remains valid. The workload of the manufacturer will be strongly reduced, and the opposite is also true in case of a supplier data module referencing a manufacturer's container data module.

The example illustrates how configuration dependency can be avoided and how workload can be reduced by use of container data module.

2.2.2 Consistency of links

The container data module helps to maintain the consistency of links by centralizing the link management and providing the capability to define the linking at the source instead of at the point of usage. Taking the previous example using the container data module and assuming a publication contains 10 separate links to the supplier data module, when the supplier adds the variant data module, the links only have to be changed one time in the container as opposed to

10 times at each usage. The container also provides the capability to have the supplier define and deliver the alternate data module relationships in container data modules as opposed to requiring the manufacturer to define them.

2.2.3 Configuration consistency checks

The configuration consistency between the various alternate data modules can be ensured. At a given moment in time (ie, for a given Product configuration and under a given operational condition), only one alternate data module is applicable for a container data module. The applicability of one referenced data module within a container must not overlap the applicability of any other referenced data module within the same container. Refer to Chap 3.9.5.3.

The sum of all applicability of referenced data modules within a container does not have to cover every possible Product configuration or technical condition. It is allowed to have a case where none of the referenced data modules within a container is applicable to a certain product attribute or condition.

The configuration check between alternate data modules is simplified by grouping the references to various alternates within an explicit structure of the container data module.

2.3 Identification of container data module

2.3.1 General

A container data module is used to associate a number of data modules with the same maintenance goal. Although it does not contain the procedure to perform the maintenance action, the target of the container data module has the same maintenance goal as the alternates it references. Therefore, the container can be considered a variant of the referenced data modules and could be identified as a variant. This method works well if the data modules referenced by the container have similar data module codes. It becomes more difficult when the data module codes differ (such as different SNS numbers or different information code numbers).

Container data modules are identified by one of the following methods:

- use of the disassembly code variant of the data module code. The disassembly code variant distinguishes the container data module from the referencing alternate data modules. The characters used for the container disassembly code variant and the number of characters for the container disassembly code variant is a project or an organization decision.
- use of the generic container information code. Refer to Chap 8.4.1. The implication of using this method is that the maintenance goal represented by the container is not available.

The choice of the container identification method is a business rule decision.

2.3.2 Container identification example

For example, the business rule decisions are:

- the disassembly code variant is used to identify the container
- the disassembly code variant character "A" is always used for container
- the disassembly code variant has one character of length

The following example illustrates the data module code for one container referencing two alternate data modules:

- the data module code for the container is AJ-A-35-13-51-00A-720A-A
- the data module code for the first alternate is AJ-A-35-13-51-00B-720A-A
- the data module code for the second alternate is AJ-A-35-13-51-00C-720A-A

Business rule decision point BRDP-S1-00385 - Identification of container data module:

- Decide which identification method to use for container data modules. The chosen method must be used systematically.

2.4 Printing and displaying of container data modules

The main purpose of the container data module is for data management, therefore the display or printing of a container data module provides no benefit to the end user. In fact, displaying or printing the container data module will force the user to select an additional link or look up an additional data module which is detrimental to the end user in both cases.

Although not prohibited, it is recommended that an IETP viewer process both the link to a container data module and the subsequent link to the target alternate data modules in a single operation. The container data module is hidden from the end user and it must appear that the target alternate data modules are linked at the source data module. Likewise, it is recommended that the same principle of hiding the container data module is used when composing a printed publication.

2.5 Implementation rules

Although not required by the XML Schema, the following rules must be respected:

- A container data module cannot refer to another container data module. A container data module can only refer to data modules with content (eg, procedural, descriptive).
- The configuration consistency between the various alternate data modules must be ensured. Refer to Para 2.2.3.

It is recommended not to duplicate applicability annotations from the referenced data modules in the container data module. If necessary, the IETP could retrieve the applicability of referenced data modules.

Business rule decision point BRDP-S1-00386 - Use of applicability within container data module content:

- Decide whether applicability annotations are duplicated from the referenced data modules to the container data module.

Chapter 4.14

Information management - Applicability

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1 General

Applying applicability to information objects, or parts thereof, identifies the context for which they are valid. This context is usually associated with the physical configuration of the Product but can include other aspects such as support equipment availability and environmental conditions. Applicability capabilities can vary greatly, from a simple annotation placed in the content of a data module to managing the life cycle of applicability which includes Product definition, applicability authoring and product instance configuration tracking. This chapter provides an overview of applicability capabilities and the mechanisms for managing applicability.

The applicability mechanism is supported by the applicability annotation within data modules, publications modules, data management lists, data update files and by three specific data module types:

- the Applicability Cross-reference Table (ACT) data module
- the Conditions Cross-reference Table (CCT) data module
- the Products Cross-reference Table (PCT) data module

Chap 4.14.1 provides a detailed overview of the capabilities and mechanisms available in the ACT data module.

Chap 4.14.2 provides a detailed overview of the capabilities and mechanisms available in the CCT data module.

Chap 4.14.3 provides a detailed overview of the capabilities and mechanisms available in the PCT data module.

Chap 4.14.4 provides a detailed overview of the capabilities and mechanisms available in the ACT catalog data module.

Detailed information for authoring applicability can be found in Chap 3.9.5.3.

2 Applicability

2.1 Applicability concepts

2.1.1 Static versus filtered view

2.1.1.1 Filtered view

With the advent of cheap portable computing devices and viewers, it is possible to generate a tailored view of the data which is filtered for the product instance. It is the applicability model along with a defined set of rules for processing of applicability annotations that makes this filtered view possible.

For example, in the sample bicycle data set, the data module S1000DBIKE-AAA-D00-00-00-00AA-258A-A contains a procedural step with an applicability annotation specifying that the step information is appropriate for the "Mountain bicycle Mountain storm Mk1" bicycle. The next procedural step has an applicability annotation specifying that the step information is appropriate for the "Mountain bicycle Brook trekker Mk9" bicycle. The viewer could use the applicability annotations and the known model of the bicycle being serviced to filter the data module content and only show the information that is appropriate.

Filtering on applicability can also be used to perform customization during publication. In this scenario a master data module contains the information for all deliveries (customers) and during publishing for a specific delivery (customer) the data module is customized (filtered) to contain only data that is appropriate for that delivery (customer). Taking the above example, customer A only resells "Mountain bicycle Mountain storm Mk1" bicycles and does not want information about "Mountain bicycle Brook trekker Mk9" bicycles included in their manuals. During publication, all data modules are customized to remove any "Mountain bicycle Brook trekker Mk9" specific information. The applicability model with its filtering capability facilitates this. Refer to Chap 4.12 for more information about customization.

2.1.1.2 Static view

With page-oriented publications or conditions where a viewer is not available, a static view of the applicability and associated data must be supported. In a static view, all information must be presented and the maintainer must determine which data is appropriate for the product instance.

Note

The data can be filtered before publishing.

Taking the example from Para 2.1.1.1, both steps would have to be presented along with the applicability pertaining to each. The maintainer must decide which of the two steps are appropriate for the bicycle he/she is working on.

2.1.1.3 Functionality comes at a cost

The applicability model can support schemes from the very simple to the complex, supporting the full range from page-oriented to automated filtering in a viewer.

If only static applicability is required and computation of applicability is not needed, then only a part of the applicability annotation is used within data modules. The ACT, CCT and PCT data modules are not needed.

If applicability filtering is required, then the full applicability annotation, including the ACT, CCT and PCT data modules, are required. The project or the organization must decide to which level applicability must be implemented.

Refer to Chap 3.9.5.3 and subchapters for implementation details.

2.1.2 Life cycle of applicability data

The applicability model provides the mechanism to manage applicability throughout the life cycle as it relates to technical data. A project or an organization can elect to adopt only portions of the process depending upon business requirements. Refer to Fig 1 for a diagram of the life cycle.

Business rule decision point BRDP-S1-00387 - Use of applicability:

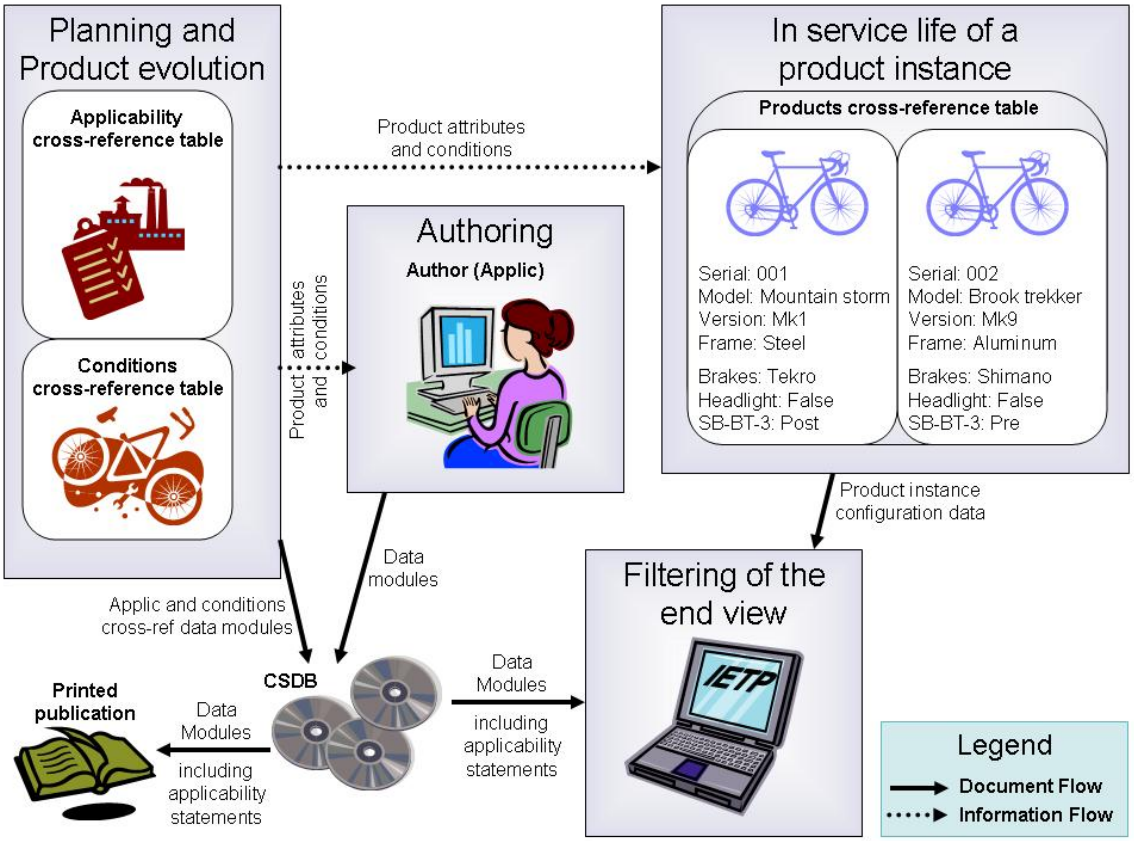
– Decide if the project or the organization will use applicability.

Business rule decision point BRDP-S1-00388 - Applicability functionality:

– Define the required functionality for applicability.

Business rule decision point BRDP-S1-00389 - Use of applicability data module types (ACT, CCT and PCT):

– If functionality is limited to print and static display, decide if applicability data module types (ACT, CCT and PCT) will be used.



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Fig 1 Applicability life cycle

2.1.2.1 Planning

During planning, information from engineering, logistics support analysis, manufacturing and other sources is used to identify attributes about the Product and an initial set of conditions which effect the applicability of technical data. These product attributes and conditions will be the basis for creating applicability annotations in data modules. Product attributes are declared and configuration managed in the ACT data module. Conditions are declared and configuration managed in the CCT data module.

Business rule decision point BRDP-S1-00390 - Product attribute and conditions naming and identification scheme:

– Define a consistent naming and identification scheme for product attributes and conditions, when ACT and CCT data modules are implemented.

2.1.2.2 Authoring

During authoring, product attributes from the ACT data module and conditions from the CCT data module as well as some free text conditions are used to build applicability annotations. Applicability annotations can apply to an entire data module or to only a portion of the content.

2.1.2.3 Product evolution

As the Product evolves, new product attributes and conditions will be identified. The ACT and CCT data modules, respectively, are modified and up-issued to reflect the new product attributes and conditions. New applicability annotations are created and existing applicability annotations are updated as needed within the data modules.

2.1.2.4 In-service life of a product instance
As product instances are maintained throughout their life, the actual configuration of the product instance will change and is maintained in the PCT data module. The PCT data module can be published in cases where the product instance configuration is fairly static. The PCT data module can also be a transient file used only to convey the product instance configuration at a particular time between an authoritative source, such as a maintenance management system, and a viewer.

2.1.2.5 Filtering of the end view
At the final point of usage, a viewer uses the product instance configuration information, from the PCT data module, as actual values to "plug in" to an applicability annotation in order to evaluate the outcome. A positive outcome indicates that the associated data is appropriate to display, a negative outcome indicates that the associated data is not appropriate to display. Thus the display can be tailored for the specific product instance.

Business rule decision point BRDP-S1-00391 - Presentation of content that is not applicable:

- Specify the method that content is presented which is not valid for the current maintenance context. The content can be removed, hidden or de-emphasized in some manner.

2.1.3 Applicability annotation components

The applicability annotation is divided into two parts:

- one part designed for human readability
- one part designed for computer processing

The project or the organization must determine which parts of applicability to implement depending on the requirements.

A project or an organization that is required to support a printed or static electronic display and does not need to support customized deliveries will only need to use the human-readable part of the applicability annotation. The computer processing part of the applicability annotation as well as the ACT, CCT and PCT data modules are not required. Refer to Chap 3.9.5.3 for implementation details.

A project or an organization that is required to support filtering of the end view or customized deliveries will need to use the computer processing part of applicability. Applicability annotations will still need to be presented to the user in a human-readable form. This can be achieved either by providing the human-readable part of applicability or by relying on the viewer to generate the human-readable part from the computer processing part at the time of display. The project or the organization must decide whether to provide the human-readable part or rely on the viewer to generate the human-readable part.

Business rule decision point BRDP-S1-00392 - Providing the human-readable part of applicability:

- Decide whether to also provide the human-readable part of applicability or rely on the viewer to build the human-readable part, when providing the computer processing part of applicability.

Refer to Chap 7.8 for details on generating the human-readable part from the computer processing part of applicability.

2.2 Structure of applicability

2.2.1 General

To facilitate the life cycle view of applicability, three specific data module types contain applicability information in addition to the applicability annotations contained in data modules

and publication modules. Although not prohibited, the ACT data module is not intended to be displayed to the end user.

Business rule decision point BRDP-S1-00393 - Number of ACT, CCT and PCT data module instances:

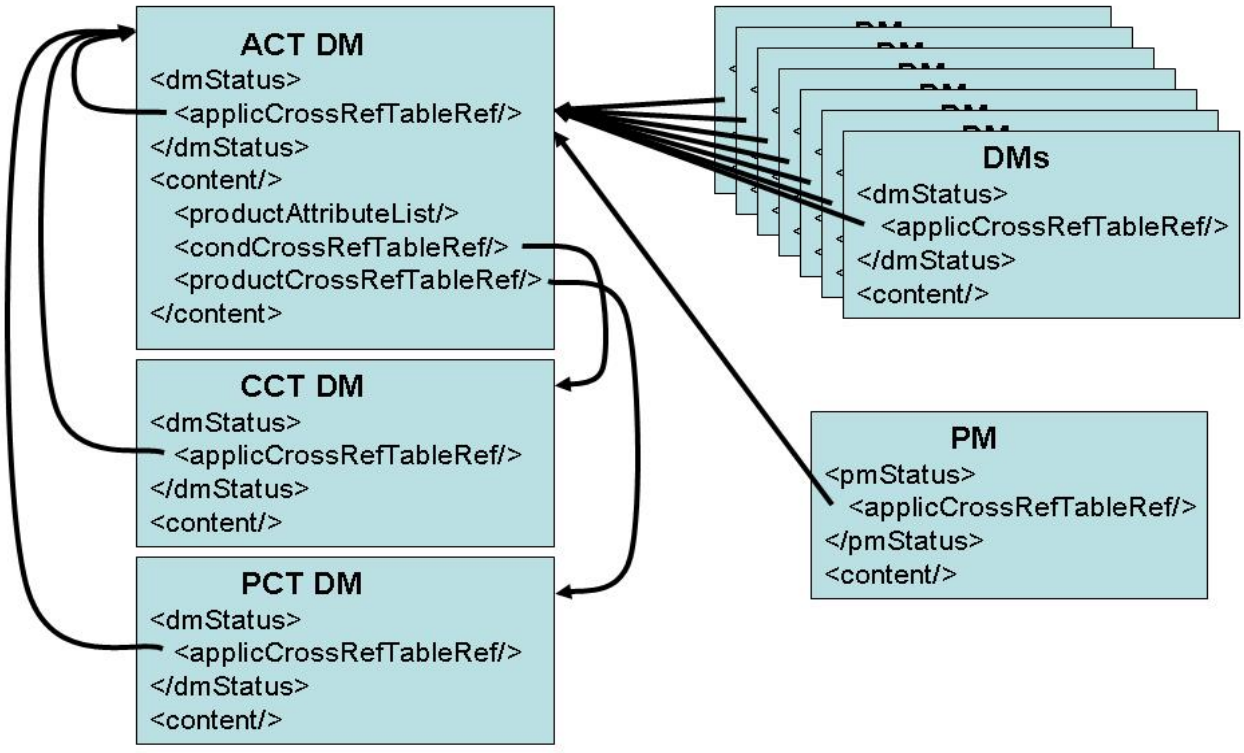
– Decide whether to provide one instance of each data module types (ACT, CCT and PCT) or to segregate the project or the organization into multiple instances of each data module type, and the method for segregation.

For projects or organizations managing several ACT/CCT/PCT sets, the ACT catalog data module can be used in order to ease the coordination between the different ACT/CCT/PCT sets. Refer to Chap 4.14.4 for details on the ACT catalog data module concept.

2.2.2 ACT data module

The ACT data module is used to declare product attributes that can affect applicability of data. Product attributes are properties of the Product that will typically not change throughout the service life of a product instance, such as model or serial number.

The ACT data module serves as the central point of reference for applicability definitions. It provides references to one CCT and one PCT data modules. All data modules, publication modules and SCORM content package modules requiring applicability filtering must reference one ACT data module from the identification and status section. Refer to Fig 2.



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Fig 2 Referencing scheme

Refer to Chap 4.14.1 for details on the ACT data module.

2.2.3 CCT data module

The CCT data module is used to declare any type of condition that can affect applicability of data. Conditions can be technical, operational, environmental or any other type of condition that can affect technical data. Technical conditions are typically tied to the configuration of the Product, such as Service bulletins or modifications. The state of technical conditions can change throughout the service life of a product instance. Examples of operational and environmental conditions are location of maintenance, availability of support equipment, regulatory rules, temperature, wind speed and sandy conditions.

Similar to the ACT data module, a project or an organization can have multiple CCT data module instances. A project or an organization can decide to use more than one CCT data module instance to segregate conditions between major subsystems or to segregate between project partners.

The CCT data module is divided into three sections:

- an element to define common types of conditions
- an element to define specific conditions
- an optional incorporation status list for technical conditions

Refer to Chap 4.14.2 for details on the CCT data module.

2.2.4 PCT data module

The PCT data module is a repository for defining product instances and the specific values for product attributes and conditions for each product instance. It is a formal method of defining product instances and the configuration of each product instance.

Similar to the ACT data module, a project or an organization can have multiple PCT data module instances. A project or an organization can decide to use more than one PCT data module instance to segregate conditions between major subsystems or to segregate between project partners.

Refer to Chap 4.14.3 for details on the PCT data module.

2.2.5 Referencing scheme

The ACT data module serves as the central point of reference for applicability definitions. All data modules, publication modules and SCORM content package modules reference an ACT data module from the data module or publication module status section, respectively. The ACT data module references the CCT and PCT data modules. Thus all data modules and publication modules can gain access to all three applicability data modules with a single reference. Refer to Fig 2.

Chapter 4.14.1

Applicability - Applicability cross-reference table

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Chap 4.14.4	Applicability - Applicability cross-reference table catalog
Chap 7.8	Information processing - Applicability

1 General

The Applicability Cross-reference Table (ACT) data module is the central point of reference for applicability definitions when applicability filtering is required for either customized deliveries or filtering by a viewer. Refer to Chap 4.14 for an overview of these processes.

The ACT data module contains the following elements:

- mandatory definition of product attributes
- optional reference to the Conditions Cross-reference Table (CCT) data module
- optional reference to the Products Cross-reference Table (PCT) data module

This combination provides access to all applicability definitions and product instance values from a single data module.

2 ACT data module

2.1 Product attribute definition

2.1.1 Product attributes

A product attribute is a property of the Product that can affect the applicability of technical data. Product attributes are properties of the Product that are typically set at the time of manufacture of a product instance and will usually not change throughout the service life of a product instance. Examples of product attributes are model, series and serial number.

There are as many methods for classifying what is a Product's product attribute (or a Product's condition). These include, but are not limited to:

- Divide product attributes into properties that are set during Product manufacture and condition types into properties that are set after Product delivery
- Divide product attributes into properties that will not change during the life cycle of the Product and condition types into properties that can change

Note

The condition types are defined in the CCT data module. Refer to Chap 4.14.2.

Business rule decision point BRDP-S1-00394 - Classifying product attributes and conditions in an ACT data module:

- Decide how to divide the properties of the Product into product attributes or condition types.

Modification of existing product attributes can have a significant effect on existing applicability statements. Therefore it is recommended that product attributes are configuration managed and that editing access to that content in ACT data modules is limited.

Business rule decision point BRDP-S1-00395 - Configuration management of product attributes in an ACT data module:

- Decide on the extent of configuration management and editing access to be applied to product attributes within an ACT data module.

2.1.2 Definition of the product attributes

There are two kinds of product attribute definitions:

- the internal definition, using the element <productAttribute>
- the external definition, using the element <externalProductAttribute>

2.1.2.1 Internal definition

The definition of a product attribute in the ACT data module includes a mandatory unique identifier, name and description as well as optional display name, Product identifier flag, data type, enumeration, pattern and user prompting labels.

The unique identifier is used to reference this product attribute from other data modules. The name and description provide help in identifying the product attribute.

A product attribute can optionally be specified as a product identifier. This specific product attribute (eg, serial number) can be used to uniquely identify a specific instance of the Product. The product attribute can be specified as a "primary" or "secondary" Product identifier. A "primary" product identifier is used to indicate that the specific product attribute is the preferred attribute to use for selecting a specific product instance. When a product attribute is identified as a "primary" product identifier, it must be included in the PCT data module for the product instance. A "secondary" product identifier is used to indicate an optional search key for identifying a specific product instance. When a product attribute is identified as a "secondary" product identifier, it can be included in the PCT data module Product description, but it is not required. Refer to Chap 3.9.5.3.1.

The display name can be used when generating a human-readable applicability annotation. Refer to Chap 7.8.

The data type indicates whether the product attribute contains a Boolean, string (the default), integer or real value. The enumeration and pattern together define the allowable values for a product attribute.

The values that are allowed for a product attribute are restricted by the data type. The values that are allowed for a product attribute can be further specified with either the enumeration or pattern or with both. The pattern specifies a format that values must adhere to. For example, a serial number must be three digits or the version of bicycle must be "Mk" followed by either 1 or 9. The enumeration specifies a number of discrete values or ranges allowable. For example, the model of bicycle must be "Brook trekker" or "Mountain storm", the serial number must be "1" thru "999", or the version of bicycle must be "Mk1" or "Mk9". There is some overlap in the capabilities of these two methods but there are also unique capabilities with each. The examples in this paragraph can be found in the bicycle sample data module DMC-S1000DBIKE-AAA-D00-00-00-00AA-00WA-D.

A product attribute value cannot contain the reserved tilde (~) or vertical bar (|) characters.

The prompting labels consist of authored sentences that are used to generate an interactive dialog for obtaining an attribute value from the user when the value has not been provided within the PCT data module. These are used when a simple dialog auto-generated with the display name is insufficient. Example of prompting label can be: "Serial Number (locate under the bottom bracket where the two pedal cranks meet)".

2.1.2.2 External definition

The external product attribute is a product attribute which is identified in the ACT data module, so that it can be used in the applicability annotations of the data modules or in the PCT data module linked to this ACT data module, which definition (name, description, allowed values, etc) is available in another ACT data module.

For example, the external product attributes can be used in a multi-partner project, where each partner defines its own product attributes. One partner can use a product attribute already defined by one of the other partners.

The partner using an external product attribute can provide its own display name for this product attribute defined externally.

The use of external product attributes requires the implementation of the ACT catalog data module. Refer to Chap 4.14.4 for more information on the external product attributes management and on the ACT catalog data module.

2.1.3 Product attribute relationship to process data module variables

In the process data module, product attributes function as global variables, called global properties. These are used in expressions, assertions and all other such structures the same as local variables defined within the process data module. Refer to Chap 3.9.5.2.10.3.

2.2 Reference to the CCT data module

If one or more sets of ACT/CCT/PCT data modules are used by a project or an organization, the reference to the associated CCT data module instance (if any) must be given in the ACT data module instance.

2.3 Reference to the PCT data module

If one or more sets of ACT/CCT/PCT data modules are used by a project or an organization, the reference to the associated PCT data module instance (if any) must be given in each ACT data module instance.

Chapter 4.14.2

Applicability - Conditions cross-reference table

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1 General

The Conditions Cross-reference Table (CCT) data module is used to declare conditions that have an effect on the applicability of data and is used to define the incorporation status for technical conditions. Refer to Chap 4.14.

The CCT data module is divided into three sections:

- a definition of common types of conditions
- a definition of specific conditions
- an optional incorporation status list for technical conditions

2 Conditions cross-reference table

2.1 Conditions

A condition is any property other than a product attribute that has an effect on the applicability of data. Conditions differ from product attributes in that values of a condition are more likely to change throughout service life of a product instance or are often not tracked against a product instance. Conditions can be associated with the physical configuration of the Product, with maintenance conditions, with weather conditions or any other condition that has an effect on the applicability of data. Refer to Chap 4.14.1 for business rules related to the classification and configuration management of product attributes and conditions of the Product.

2.1.1 Technical conditions

Technical conditions are conditions that can be associated with the physical configuration of the Product. These technical conditions can be tracked against a product instance. Examples of technical conditions include but are not limited to Service bulletins, engineering orders and modifications.

2.1.2 Operational conditions

Operational conditions are conditions that can be associated with the operation and/or at time of maintenance of the Product. These operational conditions are usually not considered as part of the configuration of the Product and are not tracked as such. An example of an operation condition is regulatory rules that are in effect, such as ETOPS. Examples of maintenance conditions include but are not limited to availability of support equipment, internal or external power and location of maintenance (such as indoor or outdoor).

2.1.3 Environmental conditions

Environmental conditions are conditions that can be associated with environmental conditions at the time of maintenance or during operation prior to maintenance. Examples of environmental conditions include but are not limited to temperature, wind speed, rain, sandy conditions and volcanic ash.

2.1.4 Other conditions

As systems become more integrated, other conditions can be associated with information not typically available to technical documentation. For example, as training and technical data become more integrated, conditions could be created to represent the qualifications and training records of the person performing maintenance and the technical data could be tailored for that person’s qualifications. The extensible nature of the CCT data module will allow any condition to be created.

2.2 Definition of the conditions

The definition of a condition in the CCT data module is a process in two steps:

- first, a general condition type must be defined
- then, a specific condition must be defined of that type

For example, a generic Service bulletin type can be defined with allowable values of "pre" and "post", then a specific Service bulletin condition can be defined for whether a chain guard Service bulletin has been installed ("post") or not ("pre"). Many specific conditions can be defined which are the same general condition type.

2.2.1 Condition types list definition

The definition of a condition type in the CCT data module includes a mandatory unique identifier, name, description and data type as well as an optional pattern, enumeration, references and interactive user prompting labels.

The unique identifier is used to reference this condition type when defining a specific condition.

The name and description provide help in identifying the condition type.

The data type indicates whether the product attribute contains a Boolean, string (the default), integer, or real value.

The enumeration and pattern together further define the allowable values for a condition type.

The prompting labels consist of authored sentences that are used to generate an interactive dialog for obtaining an attribute value from the user when the value has not been provided within the PCT data module. Since conditions can be based on environmental conditions, the value for a given condition can only be known at the time a maintenance procedure is executed. Example of prompting label can be: "SB 002 (requires incorporation of SB 001)".

The condition type definition is similar to the product attribute definition and follows the same rules with the exception that a display name does not exist in the condition type. Refer to Chap 4.14.1.

2.2.2 Condition list definition

There are two kinds of condition definitions:

- the internal definition, using the element <cond>
- the external definition, using the element <externalCond>

2.2.2.1 Internal definition

The definition of a condition in the CCT data module includes a mandatory unique identifier, condition type reference, name and description as well as an optional display name and references. The unique identifier is used to reference this condition from other data modules and from the incorporation list of this data module. The name and description provide help in identifying the condition. The display name can be used when generating a human-readable applicability annotation. Refer to Chap 7.8. The references are used if there is additional information associated with this condition. A common use of this is to refer to Service bulletin documentation for a Service bulletin condition.

2.2.2.2 External definition

The external condition is a condition which is identified in the CCT data module, so that it can be used in the applicability annotations of the data modules or in the PCT data module linked to this ACT data module, but which definition is available in another CCT data module. The definition means: name, description, reference.

For example, the external conditions can be used in a multi-partner project, where each partner defines its own conditions. One partner can use a condition already defined by one of the other partners. The partner using an external condition can provide its own display name for this condition defined externally.

Note

For external conditions, the condition type must be defined internally in the CCT data module (no use of external condition types).

The use of external condition requires the implementation of the ACT catalog data module. Refer to Chap 4.14.4 for more information on the external condition management and the ACT catalog data module.

2.2.3 Condition relationship to process data module variables

In the process data module, conditions function as global variables, called global properties. These are used in expressions, assertions and all other such structures the same as local variables defined within the process data module. Refer to Chap 3.9.5.2.10.3.

2.3 Incorporation status list

The optional incorporation status list of the CCT data module is used to document which technical conditions have been incorporated into the associated publications or data modules

for the relevant product instances. If used, a reference to a condition defined earlier in the data module must be given, to give the issue number of this technical condition and provide a list of documents the condition affects. The list can include a reference to the data module or publication affected, the status of the incorporation including optional date and applicability information which can identify which product instances are affected.

This information can be used to create incorporation status front matter.

Business rule decision point BRDP-S1-00396 - Use of the incorporation status list in a CCT data module:

– Decide whether to use the incorporation status list in the CCT data module.

Chapter 4.14.3

Applicability - Products cross-reference table

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1 General

The Products Cross-reference Table (PCT) data module is a repository of product instances and the values for product attributes and conditions for each product instance.

2 Product

2.1 Definition

A product instance is a single physical occurrence of the Product.

2.2 Definition of Products and actual values

The definition of a product instance in the PCT data module includes a list of assignments of actual values to product attributes and conditions for the product instance. Each assignment must include three pieces of information:

- a reference to the product attribute or condition
- an indicator whether this is a product attribute or condition
- the actual value

2.3 Scope of Products

The PCT data module can contain any number of product instances that are appropriate for the operating environment as defined by the project or the organization. In many cases only the product instances of a certain organization are listed. For example:

- A commercial airline listing only the Airbus A330 aircraft that it owns

- A battalion listing only the Abrams M1 battle tanks within the battalion
- United States (US) Naval Air squadron listing only the F/A-18 aircraft in the squadron

In other cases all product instances can be listed. For example:

- Airbus wanting an internal list of all A330 aircraft in-service regardless of owner
- US Navy wanting a list of all F/A-18 aircraft it owns

Business rule decision point BRDP-S1-00397 - Scope of the product instances in a PCT data module:

- Decide which product instances are contained in a PCT data module. Options include listing all product instances in-service or listing only the product instances within an organization.

2.4 Operational use of a temporary file

Many organizations already own and maintain systems to track the configuration of their product instances. These systems are often considered the authoritative source for configuration information and these organizations will not want to also maintain a PCT data module. In cases such as this, the PCT data module can be generated from the configuration management authoritative source and used as a temporary input to a viewer. The PCT data module provides a standard interface independent of which viewer is being used.

Business rule decision point BRDP-S1-00398 - Use of a published or a temporary PCT data module:

- Decide whether to publish a static issue of the PCT data module or use the data module as a temporary input between an external system and a viewer.

Business rule decision point BRDP-S1-00399 - Management of the product instance configurations in PCT data modules:

- Decide how to maintain the list of product instance configuration specifications and the associated values for product attributes and conditions.

Chapter 4.14.4

Applicability - Applicability cross-reference table catalog

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1 General

The Applicability Cross-reference Table (ACT) catalog is a dedicated data module type to be used in the context of projects or organizations with several ACT data modules. The purpose of this ACT catalog data module is to coordinate different ACT/CCT sets in the same project or organization, in order to adequately address this scenario from a content management and IETP rendering perspective.

The implementation of the ACT catalog data module is a project or an organization business rule decision. All the more it is relevant only for multi-ACT data module projects or organizations.

Business rule decision point BRDP-S1-00400 - Use of the ACT catalog data module:

– Decide whether to use the ACT catalog data module.

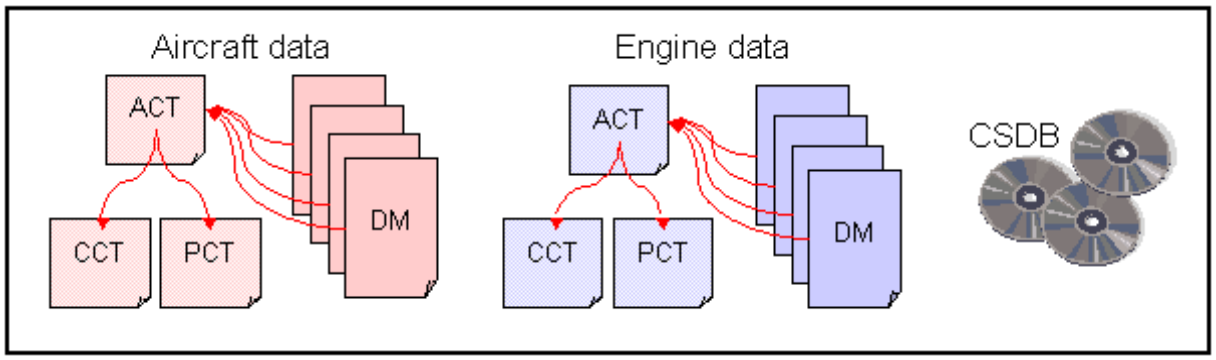
The ACT catalog is a branch of the ACT XML Schema, which is described in Chap 3.9.5.3.4.

2 ACT catalog data module principle

2.1 Multi-partner project

In order to illustrate the ACT catalog data module principle, a classical multi-partner scenario is used in this chapter. This is a simple example to ease the understanding, but the ACT catalog can also fulfill more complex scenarios.

A multi-partner project contains a collection of data modules provided by several partners, for instance: data modules from an aircraft data provider and from an engine data provider. Each data provider is able to define and maintain its own ACT/CCT/PCT as shown in Fig 1.



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Fig 1 Example of multi-partner CSDB

2.2 Integrator and supplier

There is a hierarchy between the different partners:

– **The integrator**: The integrator is the company delivering the final and consistent publication for a given Product. This final publication can include data coming from different suppliers. The integrator can be the data provider of the main Product. For instance, the aircraft data provider is the integrator in our example. But the integrator can also be a company especially contracted to play this role.
– **The supplier**: The supplier is a data provider contributing to the Product publication. In our example, the engine data provider is a supplier.

The integrator can interact with several suppliers. It is up to the integrator to manage the ACT catalog data module.

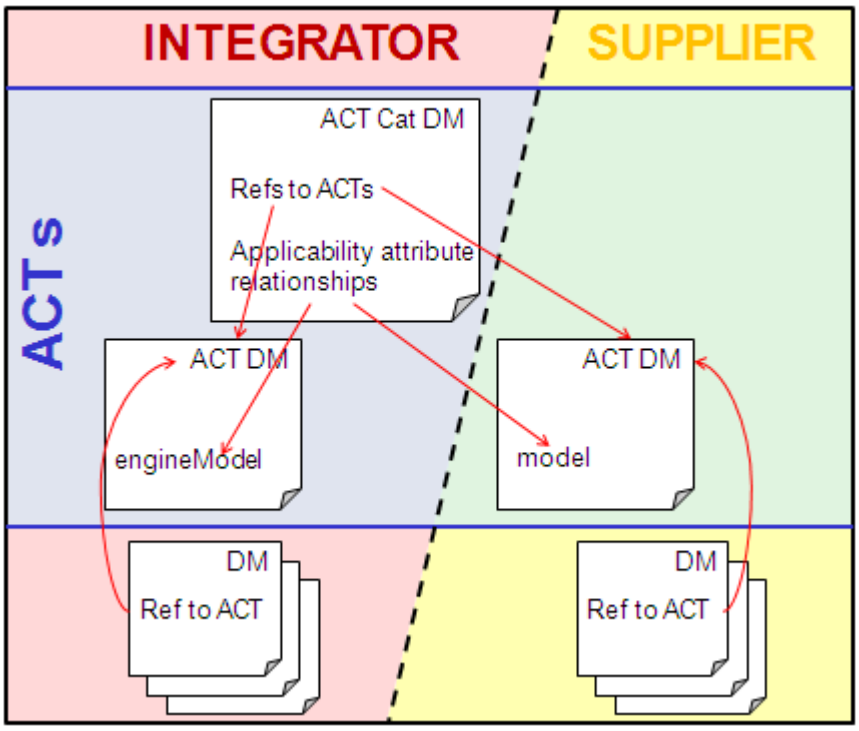
2.3 ACT catalog data module overview

The ACT catalog data module is a top-level data module providing relationships between the different applicability attributes (product attributes or conditions) defined in the different ACT and CCT data modules constituting the project or the organization.

The ACT catalog data module contains two parts:

- The list of ACT data modules constituting the project or the organization
- The list of applicability attributes relationships. An example of applicability attribute relationship is the equivalence between the product attributes "engineModel" as defined by the aircraft data provider, and model as defined by the engine data provider.

Fig 2 shows the global picture of ACT catalog use:



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Fig 2 ACT catalog use

2.4 ACT catalog data module purpose

The implementation of the ACT catalog data module supports:

- the use of supplier applicability attributes (ie, product attributes or conditions pertaining to the supplier Product definition) in integrator data module applicability annotations. For instance, the aircraft data provider can express the applicability of some procedures depending on the engine model.
- the capability to filter supplier data modules according to integrator applicability attributes via the IETP

3 Management of the ACT catalog data module within the IETP

The ACT catalog is not linked to a given set of data modules. This means that, by default, each IETP must look for an ACT catalog data module, to know if it is implemented or not in a given CSDB.

If the ACT catalog data module is implemented and thus found by the IETP, then the IETP can build the links between the different ACT data modules.

4 ACT catalog data module coding

A specific information code is allocated for the ACT catalog data module type: 0A3.

For a given integrator, there must be only one ACT catalog data module. The model identification code must follow the model identification code as defined by the integrator for the main Product, and for example, the SNS 00-00-00 can be used.

Example of data module coding for the bike ACT catalog data module:

– S1000DBIKE-AAA-D00-00-00-00AA-0A3A-D

5 Use of supplier applicability attributes

If an integrator wants to use supplier applicability attribute(s) in its data module applicability annotations, then it must declare an identifier for these applicability attribute(s) in its own ACT and/or CCT data modules.

For example, the aircraft data provider can express the applicability in terms of engine model in its data modules. In this case a product attribute must be created for the engine model in its ACT data module.

Then there are two ways to define these supplier applicability attributes:

– The integrator provides its own definition of the applicability attribute (internal definition)
– The integrator uses the supplier definition for this applicability attribute (external definition)

Business rule decision point BRDP-S1-00401 - Internal or external definition of supplier applicability attributes:

– Decide whether the supplier applicability attributes are defined in the ACT data module or if the supplier definition is used.

Refer to Chap 4.14.1 and Chap 4.14.2 for more information on internal and external definitions of product attributes and conditions.

The use of an external definition requires the implementation of the ACT catalog data module. Refer to Para 6 for more details on the use of the ACT catalog data module for applicability attribute external definitions.

6 Product definition relationships

A product definition relationship basically consists of an association between two applicability attributes or two applicability attribute values.

There are two kinds of associations that can be managed through the ACT catalog data module.

6.1 External references

The external references support the use of external applicability attributes, when the integrator wants to use supplier applicability attributes.

This kind of association is always between two product attributes or two conditions.

In such a case, the integrator must create an external applicability attribute in its ACT or CCT data module (elements <`externalProductAttribute`> and <`externalCond`>).

Then the integrator must create a corresponding product definition relationship in its ACT catalog data module. This product definition relationship provides the association between the integrator external applicability attribute and the supplier applicability attribute. The product association type must be set to "extref" value.

6.2 Examples

6.2.1 Engine ACT data module

```
<dmodule>
<identAndStatusSection>
<dmAddress>DMC-ENG-AAA-XX-XX-XX-00AA-00WA-A</dmAddress>
<dmStatus>
...
<responsiblePartnerCompany>ENG data
provider</responsiblePartnerCompany>
...
</dmStatus>
...
<content>
<applicCrossRefTable>
<productAttributeList>
<productAttribute id="model"/>
</productAttributeList>
</applicCrossRefTable>
</content>
</dmodule>
```

6.2.2 Aircraft ACT data module

```
<dmodule>
<identAndStatusSection>
<dmAddress>DMC-AIR-AAA-XX-XX-XX-00AA-00WA-A</dmAddress>
<dmStatus>
...
<responsiblePartnerCompany>AIR data
provider</responsiblePartnerCompany>
...
</dmStatus>
...
<content>
<applicCrossRefTable>
<productAttributeList>
<externalProductAttribute id="engineModel"/>
</productAttributeList>
</applicCrossRefTable>
</content>
</dmodule>
```

6.2.3 ACT catalog data module

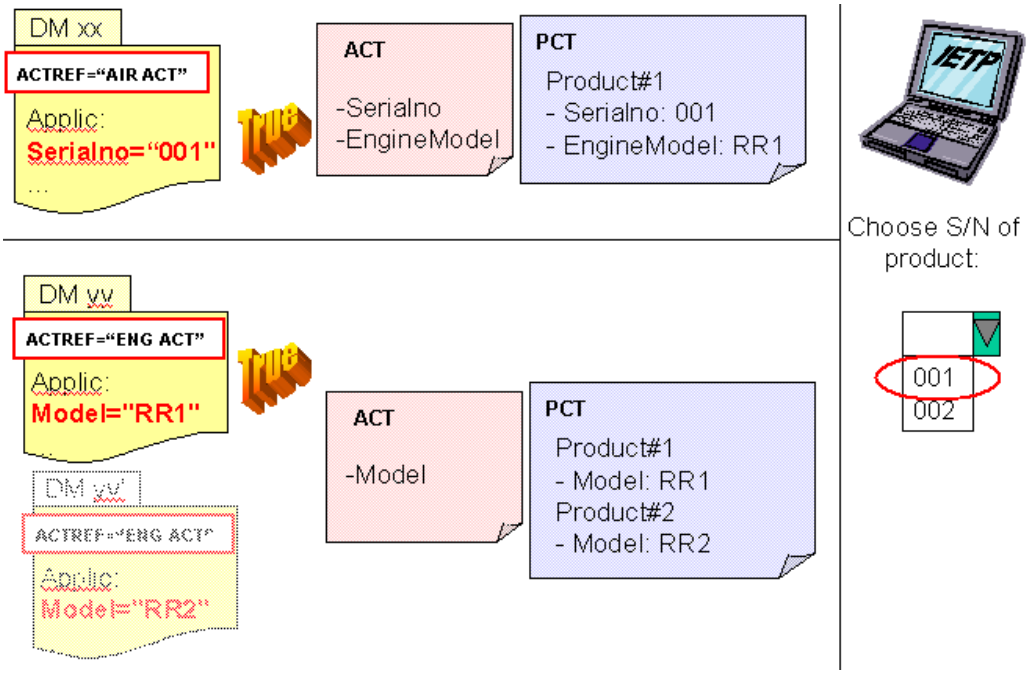
```
<dmodule>
<identAndStatusSection>
<dmAddress>DMC-ACT catalog</dmAddress>
<dmStatus>
...
<responsiblePartnerCompany>AIR data
```

```
provider</responsiblePartnerCompany>
...
</dmStatus>
...
<content>
<applicCrossRefTableCatalog>
<productDefinitionRelationship>
<externalAssert applicPropertyIdent="engineModel"
applicPropertyType="prodattr">
<applicCrossRefTableRef>
<dmRef>DMC-AIR-AAA-XX-XX-XX-00AA-00WA-A</dmRef>
</applicCrossRefTableRef></externalAssert>
<associate associationType="extref">
<externalAssert applicPropertyIdent="model"
applicPropertyType="prodattr">
<applicCrossRefTableRef>
<dmRef>DMC-ENG-AAA-XX-XX-XX-00AA-00WA-A</dmRef>
</applicCrossRefTableRef></externalAssert></associate>
</productDefinitionRelationship>
</applicCrossRefTableCatalog>
</content>
</dmodule>
```

6.3 Alias

The use of an alias product definition relationship supports a consistent filtering of the CSDB: it provides the capability to the end user to filter supplier data modules according to an integrator product attribute via the IETP.

Fig 3 shows an example of use of alias product definition relationships: the IETP is able to filter the integrator and supplier data modules against one applicability attribute.



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Fig 3 Filter the integrator and supplier data modules against one applicability attribute

Basically, an alias product definition relationship provides an equivalence between two applicability attributes or two applicability attribute values defined by different parties. For example, the product attribute "engineModel" as defined by the aircraft data provider is equivalent to the product attribute model as defined by the engine data provider.

In such a case, the integrator must identify the applicability attribute or applicability attribute value subject to the alias in its own ACT data module using the attribute `aliasFlag`.

Then the integrator must create a corresponding product definition relationship in its ACT catalog data module. This product definition relationship provides the association between the integrator applicability attribute or applicability attribute value and the equivalent supplier applicability attribute or applicability attribute value. The product association type must be set to "`alias`" value.

6.4 Examples

6.4.1 Engine ACT data module

```
<dmodule>
<identAndStatusSection>
<dmAddress>DMC-ENG-AAA-XX-XX-XX-00AA-00WA-A</dmAddress>
<dmStatus>
...
<responsiblePartnerCompany>ENG data
provider</responsiblePartnerCompany>
...
</dmStatus>
...
<content>
<applicCrossRefTable>
<productAttributeList>
<productAttribute id="model"/>
</productAttributeList>
</applicCrossRefTable>
</content>
</dmodule>
```

6.4.2 Aircraft ACT data module

```
<dmodule>
<identAndStatusSection>
<dmAddress>DMC-AIR-AAA-XX-XX-XX-00AA-00WA-A</dmAddress>
<dmStatus>
...
<responsiblePartnerCompany>AIR data
provider</responsiblePartnerCompany>
...
</dmStatus>
...
<content>
<applicCrossRefTable>
<productAttributeList>
<productAttribute id="engineModel" aliasFlag="1"/>
</productAttributeList>
</applicCrossRefTable>
</content>
</dmodule>
```

6.4.3 ACT catalog data module

```
<dmodule>
<identAndStatusSection>
<dmAddress>DMC-ACT catalog</dmAddress>
<dmStatus>
...
<responsiblePartnerCompany>AIR data
provider</responsiblePartnerCompany>
...
</dmStatus>
...
<content>
<applicCrossRefTableCatalog>
<productDefinitionRelationship>
<externalAssert applicPropertyIdent="engineModel"
applicPropertyType="prodattr">
<applicCrossRefTableRef>
<dmRef>DMC-AIR-AAA-XX-XX-XX-00AA-00WA-A</dmRef>
</applicCrossRefTableRef></externalAssert>
<associate associationType="alias">
<externalAssert applicPropertyIdent="model"
applicPropertyType="prodattr">
<applicCrossRefTableRef>
<dmRef>DMC-ENG-AAA-XX-XX-XX-00AA-00WA-A</dmRef>
</applicCrossRefTableRef></externalAssert></associate>
</productDefinitionRelationship>
</applicCrossRefTableCatalog>
</content>
</dmodule>
```

Chapter 4.15

Information management - Learning information

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Chap 4.15.3	Learning information - Building SCORM content package modules
Chap 4.15.4	Learning information - Updating SCORM content package modules
SCORM 2004	SCORM 2004 4th Edition

1 General

In S1000D, the support for managing learning information reflects how the information is structured and managed in accordance with Sharable Content Object Reference Model (SCORM). The incentive is to use a CSDB for managing learning information with same degree of control as applied to the technical publications.

2 Content

The objects dedicated for learning information management, include:

- a learning data module that contains information for the development of learning content. Refer to Chap 3.9.5.2.13.
- a Sharable Content Object (SCO) content data module that contains the learning content information, primarily by referencing reused content segments from other CSDB objects. Refer to Chap 3.9.5.2.17. This data module exists to correspond to the SCO defined in the SCORM 2004 model.
- an aggregation object, the SCORM content package module, enabling aggregations of information into packages of learning information corresponding to the SCORM content package defined in the SCORM 2004 model.

The content section of the SCORM content package module is similar to the publication module in the sense that it contains references to data modules in the order and hierarchical structure the content is delivered. Even though it is not a requirement, a SCORM content package module would normally reference SCO content data modules, thus specifying an order and a structure of the learning content delivered.

Chap 4.15.1 gives the structure of the SCORM content package module. Chap 4.15.2 defines the SCORM content package module code. Building the SCORM content package module is described in Chap 4.15.3 and updating is described in Chap 4.15.4.

2.1 Key distinctions between the use and intention of SCORM content package modules in S1000D and SCORM

Several efforts have been made to harmonize selected S1000D and SCORM functions. One harmonization strategy centers on providing an aggregation object similar to the S1000D publication module to support the collection of learning content. In S1000D this object is called the “SCORM content package module”. In advance of the following chapters, it is important to clarify and distinguish between the descriptor SCORM content package module in the S1000D context, and a SCORM content package in the Learning Management System (LMS) context.

2.1.1 SCORM content package module in the S1000D context

The SCORM content package module operates as a file aggregation tool in the learning content development and assembly process. It is used for the express purpose of organizing references to data modules in a CSDB developed and selected for a pre-determined learning product. It contains no attributes that would make it a runtime environment and does not have to interface with external applications.

2.1.2 SCORM content package in the learning management system context

The SCORM content package descriptor in the LMS context is distinct from the S1000D context. The SCORM content package module used in an LMS contains code that helps track a learner’s progress through a course. It sends requests to a LMS through a pre-defined communication protocol. In essence, the SCORM content package in the LMS context is part of a runtime environment which serves, displays, and sequences learning content to a learner during self-directed training. It is designed to interface with external applications.

2.2 The SCORM content package module and the LMS

The SCORM content package module in S1000D is built and managed as an aggregation tool in a common source database. In employing SCO content data modules (refer to Chap 3.9.5.2.17) it mirrors the relationship between files and SCO in actual SCORM content package that is compiled for use in an LMS. In order to prepare it for a LMS, the SCORM content package module in S1000D requires a mapping and a transformation to the native aggregation model referenced in SCORM.

Chapter 4.15.1

Learning information - SCORM content package module

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Chap 3.9.5.3	Data modules - Applicability
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Chap 7.4.2	Generation of publications - Publication module and SCORM content package Schema
IEEE Std 1484.12.1-2002	Standard for Learning Object Metadata
SCORM 2004	SCORM 2004 4th Edition

1 General

S1000D supports the aggregation of content used for learning, training, and performance products. The mechanism is executed by the coordinated use of two schemas:

- the SCORM Content Package Module (SCPM)
- the SCO content data module. This chapter describes how the SCPM operates. The SCO data module is described in Chap 3.9.5.2.17.

1.1 Scope

The SCPM is used to define the hierarchical structure of learning events within a course or learning product. The structure and naming of the elements in this Schema, reflect the structure and naming conventions required by a typical Learning Management System (LMS).

1.2 Purpose

The SCORM content package module can aggregate a complete learning event (eg, a course) or it can aggregate a learning event subset (eg, a lesson) that can then be referenced by other SCORM content package modules that are aggregated together to form a complete learning event. The structure of a SCORM content package module is project design decision.

The SCORM content package module has two purposes:

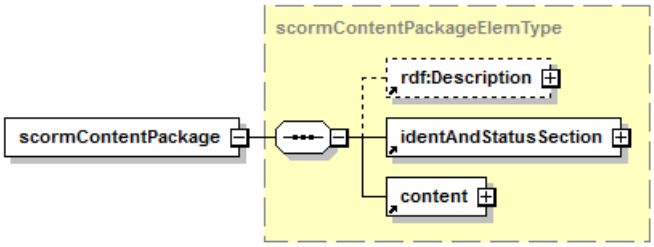
- Aggregation and structure of training and maintenance modules
- Reusability of technical information

The SCORM content package module is used to aggregate training modules and maintenance modules to describe a complete learning event or single learning product.

2 Content of the SCORM content package module

Description: The element <scormContentPackage> contains two major element wrappers: the element <identAndStatusSection> describes training life cycle and configuration information; the element <content> contains pointers to SCO content information which aggregates data modules used in a product deliverable.

Markup element: <scormContentPackage>



ICN-1654N-S1000D0047-001-01

Fig 1 Element <scormContentPackage>

Attributes:

– id (O), the identifier of the markup element. Refer to Chap 3.9.5.2.1.2.

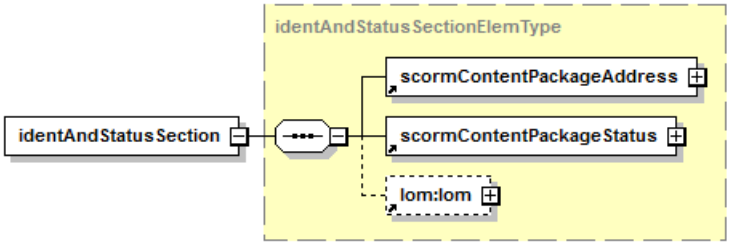
Child elements:

– <identAndStatusSection>. Refer to Para 2.1.
– <content>. Refer to Para 2.2.

2.1 Identification and status section

Description: The element <identAndStatusSection> contains the identification information required to name and control the SCORM content package module. It also provides the status information on the security and quality of the overall SCORM content package module.

Markup element: <identAndStatusSection>



ICN-1654N-S1000D0048-001-01

Fig 2 Element <identAndStatusSection>

Attributes:

– None

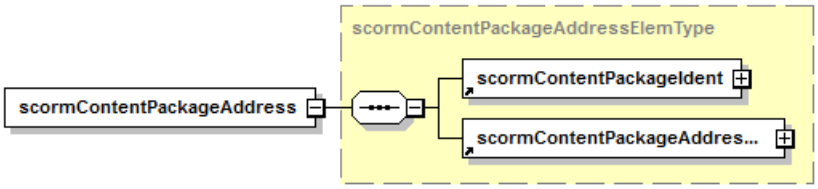
Child elements:

– <scormContentPackageAddress>. Refer to Para 2.1.1.
– <scormContentPackageStatus>. Refer to Para 2.1.2.
– <lom>. Refer to Para 2.1.3.

2.1.1 SCORM content package module address

Description: The element <scormContentPackageAddress> contains the identification, title and issue details of the SCORM content package module.

Markup element: <scormContentPackageAddress>



ICN-1654N-S1000D0049-001-01

Fig 3 Element <scormContentPackageAddress>

Attributes:

– None

Child elements:

– <scormContentPackageIdent>. Refer to Para 2.1.1.1.
– <scormContentPackageAddressItems>. Refer to Para 2.1.1.3.

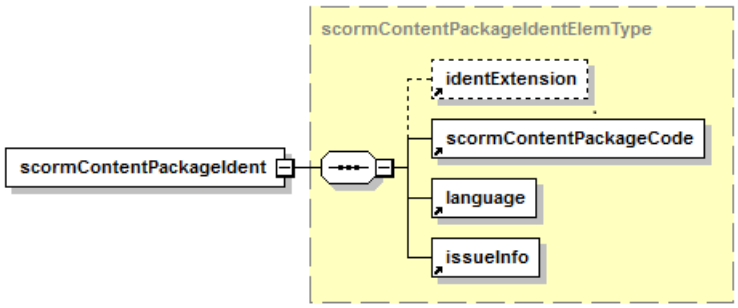
Markup example:

```
<scormContentPackageIdent>
<scormContentPackageCode modelIdentCode="S1000DBIKE"
scormContentPackageIssuer="AH019"
scormContentPackageNumber="00001"
scormContentPackageVolume="00"/>
<language countryIsoCode="US" languageIsoCode="en"/>
<issueInfo inWork="00" issueNumber="001"/>
</scormContentPackageIdent>
```

2.1.1.1 SCORM content package module identification

Description: The element <scormContentPackageIdent> contains the unique identification of the SCORM content package module.

Markup element: <scormContentPackageIdent>



ICN-1654N-S1000D0050-001-01

Fig 4 Element <scormContentPackageIdent>

Attributes:

– None

Child elements:

– <identExtension> the additional parameters needed to establish a unique identification of a SCORM content package module in those cases when SCORM content package module code, issue and in-work numbers together with the language and country

are insufficient to form a universally unique identity. This element establishes a producer unique subdomain for identification. Refer to Chap 4.12.

- <scormContentPackageCode>. Refer to Para 2.1.1.2.
- <language>. Refer to Chap 3.9.5.1.
- <issueInfo>. Refer to Chap 3.9.5.1.

2.1.1.2 SCORM content package module code

Description: The element <scormContentPackageCode>contains the SCORM content package module code that forms part of the unique identifier of the SCORM content package module.

Markup element: <scormContentPackageCode>

Attributes:

- modelIdentCode (M). Refer to Chap 4.3.1.
- scormContentPackageIssuer (M). Refer to Chap 4.15.2.
- scormContentPackageNumber (M). Refer to Chap 4.15.2.
- scormContentPackageVolume (M). Refer to Chap 4.15.2.

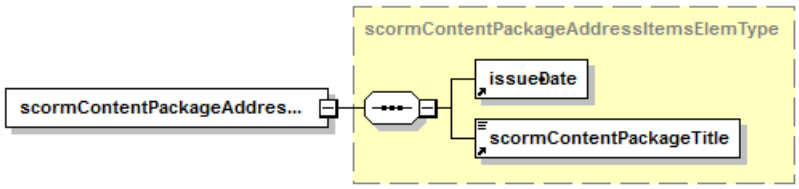
Child elements:

- None

2.1.1.3 SCORM content package module address items

Description: The element <scormContentPackageAddressItems> contains information that is supplementary to the SCORM content package module identification but not part of the unique identifier.

Markup element: <scormContentPackageAddressItems>



ICN-1654N-S1000D0051-001-01

Fig 5 Element <scormContentPackageAddressItems>

Attributes:

- None

Child elements:

- <issueDate>. Refer to Chap 3.9.5.1.
- <scormContentPackageTitle>. Refer to Para 2.1.1.4.

Markup example:

```
<scormContentPackageAddressItems>
<issueDate day="12" month="01" year="2010"/>
<scormContentPackageTitle>
S1000D BIKE learning sample
</scormContentPackageTitle>
</scormContentPackageAddressItems>
```

2.1.1.4 SCORM content package module title

Description: The element <scormContentPackageTitle> contains the title of the SCORM content package module.

Markup element: <scormContentPackageTitle>

Attributes:

– None

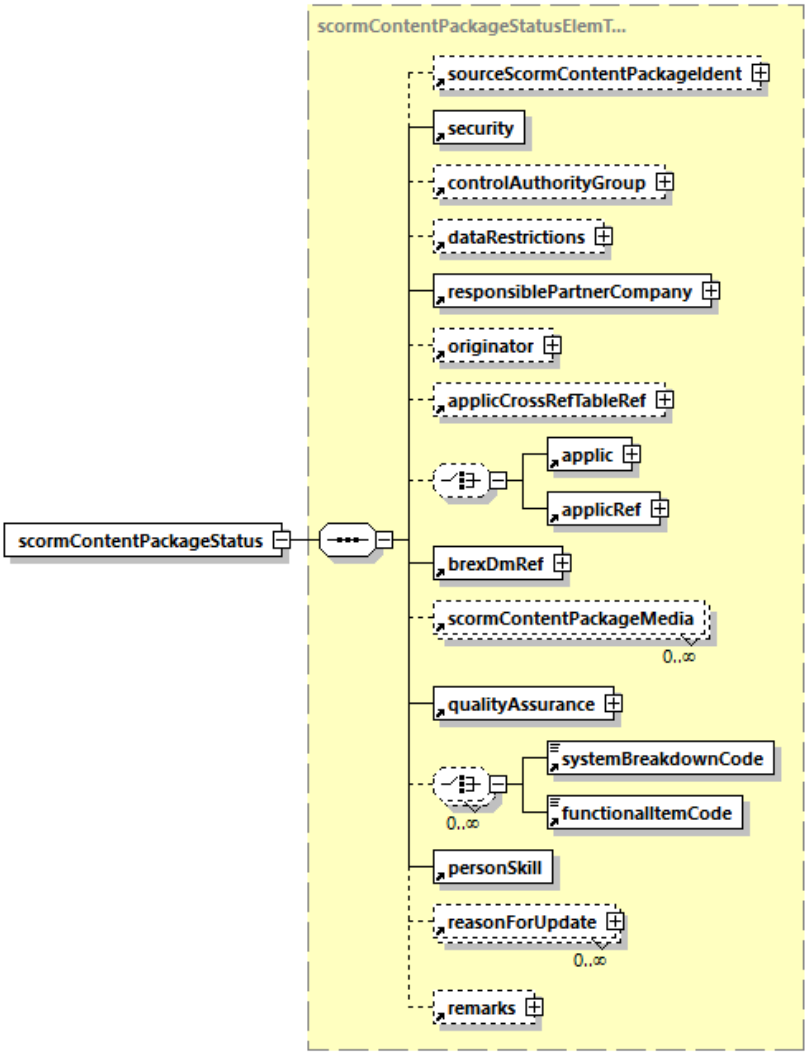
Child elements:

– None

2.1.2 SCORM content package module status

Description: The element <scormContentPackageStatus>contains the status information of the SCORM content package module.

Markup element: <scormContentPackageStatus>



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Fig 6 Element <scormContentPackageStatus>

Attributes:

- issueType (O). Refer to Chap 3.9.5.1.
- controlAuthorityRefs (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

- <sourceScormContentPackageIdent>. Refer to Para 2.1.2.1.
- <security>. Refer to Chap 3.9.5.1.
- <controlAuthorityGroup>. Refer to Chap 3.9.5.1.
- <dataRestrictions>. Refer to Chap 3.9.5.1.
- <responsiblePartnerCompany>. Refer to Chap 3.9.5.1.
- <originator>. Refer to Chap 3.9.5.1.
- <applicCrossRefTableRef>. Refer to Chap 3.9.5.3.
- <applic>. Refer to Chap 3.9.5.3.
- <scormContentPackageMedia>. Refer to Para 2.1.2.2.
- <qualityAssurance>. Refer to Chap 3.9.5.1.
- <systemBreakdownCode>. Refer to Chap 3.9.5.1.
- <functionItemCode>. Refer to Chap 3.9.5.1.
- <personSkill>. Refer to Chap 3.9.5.1.
- <reasonForUpdate>. Refer to Chap 3.9.5.1.
- <remarks>. Refer to Chap 3.9.5.1.

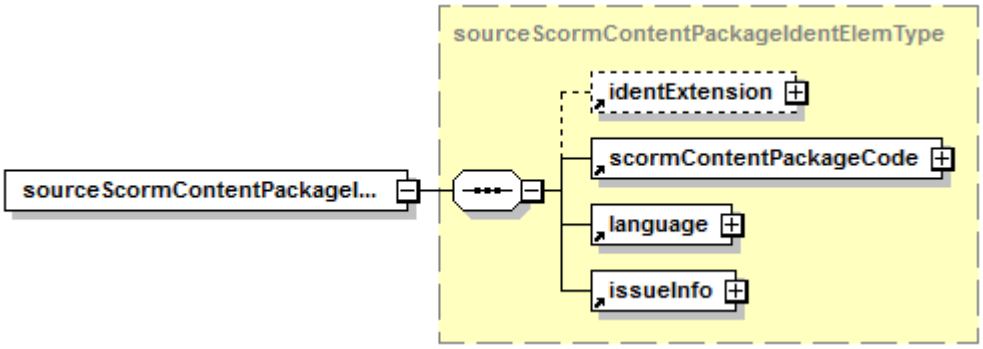
Markup example:

```
<scormContentPackageStatus>
<security securityClassification="01"/>
<responsiblePartnerCompany enterpriseCode="AH019"/>
<originator enterpriseCode="AH019"/>
<brexDmRef>
...
</brexDmRef>
<scormContentPackageMedia scormContentPackageMediaCode="DKS:1"
scormContentPackageMediaType=""/>
<qualityAssurance>
<unverified/>
</qualityAssurance>
<personSkill skillLevelCode="sk01"/>
</scormContentPackageStatus>
```

2.1.2.1 Source SCORM content package module identification

Description: The element <sourceScormContentPackageIdent> contains the identification information of the source SCORM content package module on which the SCORM content package module is based.

Markup element: <sourceScormContentPackageIdent>



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Fig 7 Element <sourceScormContentPackageIdent>

Attributes:

– None

Child elements:

– <identExtension>. Refer to Chap 3.9.5.1.
– <scormContentPackageCode>. Refer to Para 2.1.1.2.
– <language>. Refer to Chap 3.9.5.1.
– <issueInfo>. Refer to Chap 3.9.5.1.

2.1.2.2 SCORM content package module media

Description: The element <scormContentPackageMedia> contains the description of the media on which the SCORM content package module is delivered.

Markup element: <scormContentPackageMedia>

Attributes:

– scormContentPackageMediaType (M), the media type (eg, paper, CD-ROM, DVD, online)
– scormContentPackageMediaCode (M), the media identification (eg, label)
– volumeNumber (O), the volume of the media defined by two numeric characters. It is used when the information given needs to be separated into several volumes due to media restrictions. It must correspond with the element <scormContentPackageVolume> within the SCORM module code.
– mediaLocation (O), the location of the media.

Child elements:

– None

Markup example:

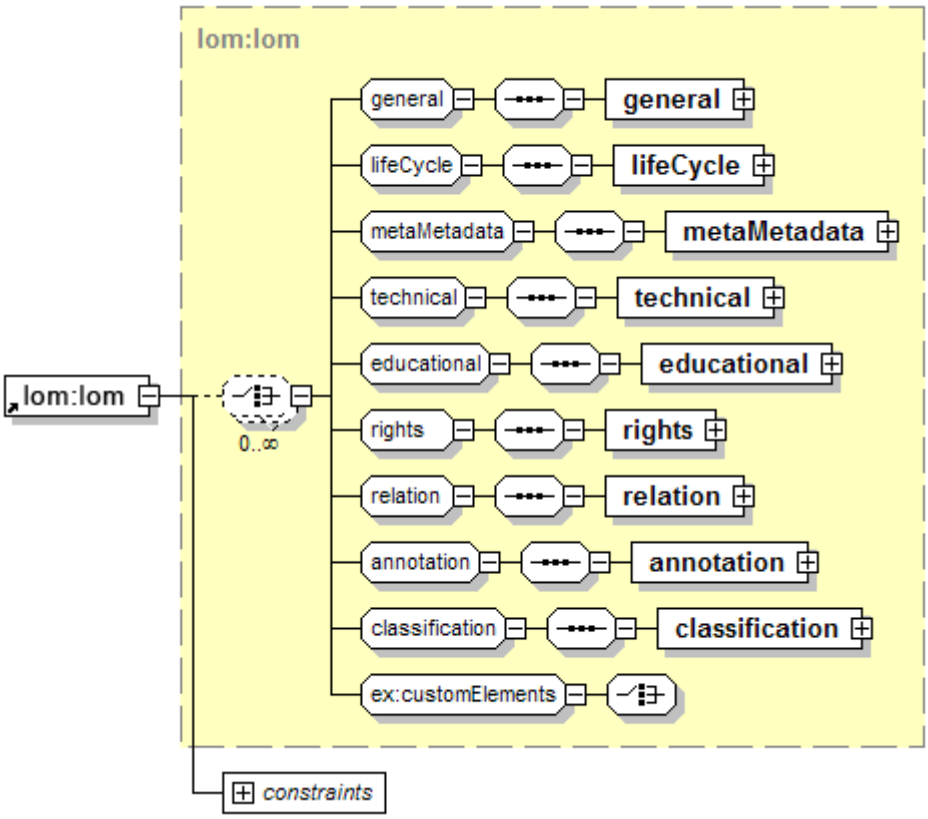
```
<scormContentPackageMedia scormContentPackageMediaCode="DKS:1"
scormContentPackageMediaType="CD"/>
```

2.1.3 Learning object metadata

Description: The element <lom> contains a set of metadata for describing learning content, including element names, definitions, data types, and field lengths as defined in the IEEE Standard for learning object metadata, which is a part of SCORM 2004. The inclusion of the

LOM in the SCPM allows learning content developers to add metadata about the learning content references within the SCORM content package module.

The LOM, at this level, is used to describe metadata about the SCORM content package module. This is described in detail in the Content Aggregation Model (CAM) in SCORM 2004.



ICN-83007-0000000047-001-01

Fig 8 Element <lom>

Markup element: <lom>

Attributes:

– None

Child elements:

– Refer to the SCORM CAM documentation for this information at SCORM 2004.

Markup example:

```
<lom:lom>
<lom:general>
<lom:identifier>
<lom:entry>S1000D-SCORM-BIKE-SAMPLE</lom:entry>
</lom:identifier>
<lom:title>
<lom:string>
S1000D/SCORM Bike Sample
</lom:string>
</lom:title>
```

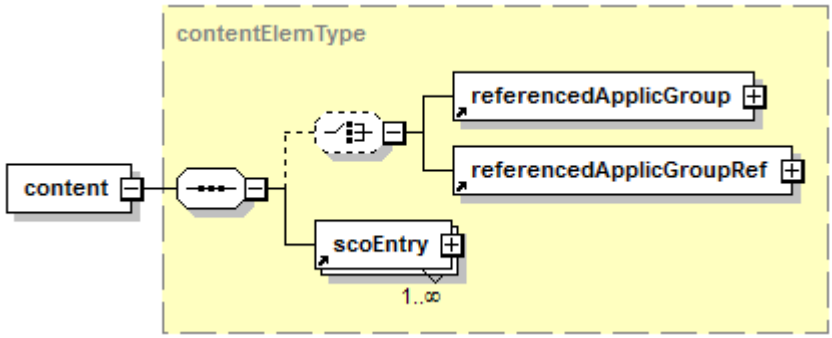
```
<lom:description>
<lom:string>
Sample courseware consisting based on the S1000D Bike sample
technical data implementing the S1000D version 4.2 Learning
schema markup.
</lom:string>
</lom:description>
<lom:keyword>
<lom:string>
S1000DBIKE
</lom:string>
</lom:keyword>
<lom:keyword>
<lom:string>
s1000d learning schema
</lom:string>
</lom:keyword>
</lom:general>
<lom:lifeCycle>
<lom:version>
<lom:string language="en">1.0</lom:string>
</lom:version>
<lom:status>
<lom:source>LOMv1.0</lom:source>
<lom:value>final</lom:value>
</lom:status>
</lom:lifeCycle>
<lom:metaMetadata>
<lom:identifier>
<lom:catalog>GUID</lom:catalog>
<lom:entry>3X157197F-7BD0-4F5C-BF57-CD3C8BA242</lom:entry>
</lom:identifier>
<lom:metadataSchema>LOMv1.0</lom:metadataSchema>
<lom:metadataSchema>SCORM_CAM_v1.3</lom:metadataSchema>
</lom:metaMetadata>
</lom:lom>
```

2.2 Content section

Description: The element <content> contains all the references to technical information required to build a learning deliverable.

Throughout this paragraph, the acronym SCO is used in various elements. There is a difference between the term SCO in SCORM and how it is used in S1000D. A SCO in SCORM is a single, reusable learning object that is able to launch a request to an LMS during a learning event. In S1000D, a SCO is the collection of aggregated technical information assembled during content production prior to being compiled into a SCORM package. The S1000D SCORM content package module does not communicate with an LMS. The naming similarities are intentional so to align the process of aggregating content to the structure of the content used during a runtime learning event.

Markup element: <content>



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Fig 9 Element <content>

Attributes:

– `controlAuthorityRefs` (O), the control authority information by referencing the element <controlAuthority>. Refer to Chap 3.9.5.1.

Child elements:

– <referencedApplicGroup>. Refer to Chap 3.9.5.3.
– <referencedApplicGroupRef>. Refer to Chap 3.9.5.3.
– <scoEntry>. Refer to Para 2.2.1.

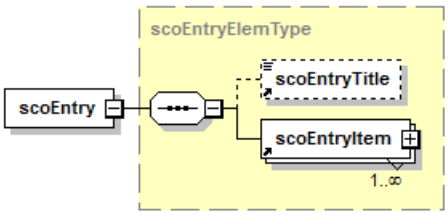
2.2.1 SCO entry

Description: The element <scoEntry> contains the title and references to the data modules that comprise the content of a learning event. It also contains LOM information to describe the referenced content. It is the central element for a SCORM content module package and can be defined recursively. This allows SCORM content package module structures in variable depth.

Note

SCO entry element relationship to the Instructional Management System (IMS) manifest is that the element <scoEntry> can be used to represent a "flat" listing of corresponding SCORM SCO type resources. When nested, it can be used to represent a more complex, recursive data structure translating to a course Table of contents that can be displayed by a LMS. Nesting SCO entry elements allows for hierarchical data representation of course structures. Hierarchical representations of course structures can be used in XSL transformation processes to direct output of SCPM data to corresponding XML structures found in the IMS/SCORM manifest "resources" and "organizations" structures.

Markup element: <scoEntry>



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Fig 10 Element <scoEntry>

Attributes:

– scoEntryType (O), the type of SCO entry (eg, SCO, asset). This attribute can have one the following values:

  • "scot01" thru "scot99". Refer to Chap 3.9.6.1.

  The use of attribute scoEntryType indicates the need to transform the content of the element <scoEntry> to a corresponding data structure within an IMS/SCORM manifest.

Child elements:

– <scoEntryTitle>. Refer to Para 2.2.1.1.
– <scoEntryItem>. Refer to Para 2.2.1.2.

Markup example:

The following example provides data representation of the Drive Train unit of the S1000D Bike learning sample content. In this example, multiple occurrences of the element <scoEntry> are nested to provide data structures that can be used to represent a content Table of contents for the Bike steering system training module. In the SCORM, a "content module" is a term used to refer to a grouping of thematically related SCO within the organizations section of an IMS/SCORM manifest.

The recursive structure of the sample XML can be output to the organizations section of an IMS manifest through custom XSL transformation processes. The organizations section of the IMS manifest typically provides the LMS the data needed for the presentation of the courseware Table of contents.

The optional scoEntryType attribute is used to further distinguish the use of SCO entry elements in the example. The value "scot01" is used to reference a SCO type resource. The element <dmRef> points to SCO Content type data modules. SCO content data modules are aggregations of the content references for the content files comprising a single SCO.

```
<scoEntry>
<scoEntryTitle>Module 4 - Drive train</scoEntryTitle>
<scoEntryItem>
<scoEntry scoEntryType="scot01">
<scoEntryTitle>Drive train description</scoEntryTitle>
<scoEntryItem>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA4" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="041" infoCodeVariant="A" itemLocationCode="T"
learnCode="T10" learnEventCode="B" />
<language countryIsoCode="US" languageIsoCode="en" />
</dmRefIdent>
</dmRef>
</scoEntryItem>
</scoEntry>
</scoEntryItem>
<scoEntryItem>
<scoEntry scoEntryType="scot01">
<scoEntryTitle>Drive train maintenance</scoEntryTitle>
```

```
<scoEntryItem>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA4" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="041" infoCodeVariant="A" itemLocationCode="T"
learnCode="T2G" learnEventCode="C" />
<language countryIsoCode="US" languageIsoCode="en" />
</dmRefIdent>
</dmRef>
</scoEntryItem>
</scoEntry>
</scoEntryItem>
<scoEntryItem>
<scoEntry scoEntryType="scot01">
<scoEntryTitle>Assessment</scoEntryTitle>
<scoEntryItem>
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA4" subSystemCode="0" subSubSystemCode="0"
assyCode="00" disassyCode="00" disassyCodeVariant="AA"
infoCode="041" infoCodeVariant="A" itemLocationCode="T"
learnCode="T88" learnEventCode="E" />
<language countryIsoCode="US" languageIsoCode="en" />
</dmRefIdent>
</dmRef>
</scoEntryItem></scoEntry>
</scoEntryItem></scoEntry>
```

2.2.1.1 SCO entry title

Description: The element <scoEntryTitle> contains the title of the SCO entry within the SCORM content package module.

Markup element: <scoEntryTitle>

Attributes:

– None

Child elements:

– None

2.2.1.2 SCO entry item

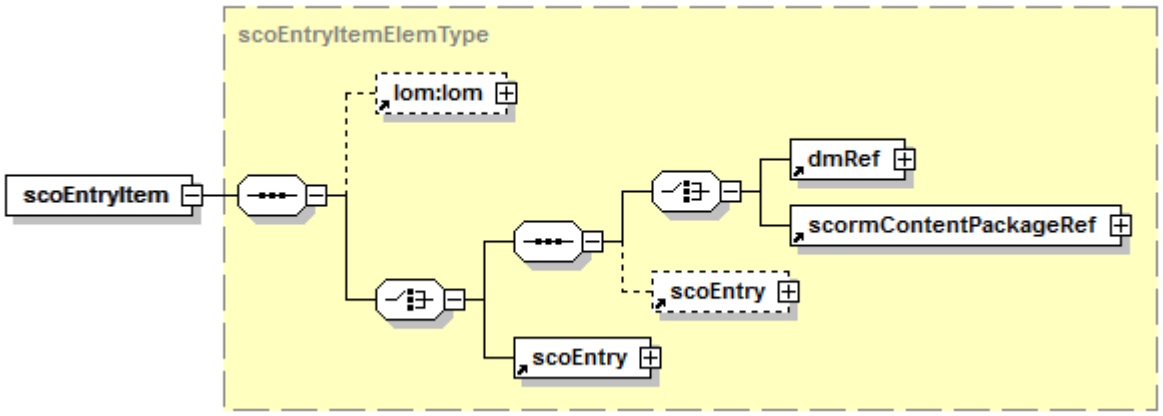
Description: The element <scoEntryItem> contains a reference to a data module or to another SCPM that comprises the content of a learning event. It also contains LOM information to describe the referenced content. As shown in the example below, the element <scoEntry> can be nested within the element <scoEntryItem> in order to define the hierarchical structure of the course or learning event.

A SCO entry references the data modules to another SCPM or sub SCO entry definitions that contain the required content. References can be made to any type of content data module within the element <scoEntryItem>.

Note

References to SCO content data modules can be used to reference aggregations of content data modules corresponding to SCOs. Use of the SCO content data module will improve reuse potentials of SCO aggregations within SCPM structures. Refer to Chap 3.9.5.2.17.

Markup element: <scoEntryItem>



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Fig 11 Element <scoEntryItem>

Attributes:

– None

Child elements:

– <lom>. Refer to Para 2.1.3.
– <dmRef>. Refer to Chap 3.9.5.2.1.2.
– <scormContentPackageRef>. Refer to Chap 3.9.5.2.1.2.
– <scoEntry>. Refer to Para 2.2.1.

Chapter 4.15.2

Learning information - Coding SCORM content package modules

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Table 1 References

Chap No./Document No.	Title
Chap 4.3.1	Data module code - Model identification code
Chap 7.5.1	Information interchange - File based transfer

1 General

The Shareable Content Object Reference Model (SCORM) content package module code is the standardized and structured identifier of a SCORM content package module or a final deliverable learning product.

2 Content

2.1 SCORM content package module code

Description: The element <scormContentPackageCode> contains the SCORM content package module code. The code is used to manage SCORM content package modules in the CSDB, to retrieve them, or to gain access to them in a learning environment. The SCORM content package module code is also used to refer to the SCORM content package modules from, for example, lists of applicable learning products, data modules and other SCORM content package modules.

The SCORM content package module code comprises up to 26 alphanumeric characters and is built up as shown in Table 2. The minimum length is 14 characters.

YY - YYYYY - YYYYY - NN (14 characters)

thru

YYYYYYYYYYYYYY - YYYYY - YYYYY - NN (26 characters)

Table 2 SCORM content package module code

Breakdown	Rule
Model identification code	2 thru 14 uppercase alphanumeric characters
Issuing authority	5 uppercase alphanumeric characters
Number of the SCORM content package module	5 uppercase alphanumeric characters
Volume number	2 numeric characters

Markup element: <scormContentPackageCode>

Attributes:

- modelIdentCode (M). Refer to Table 2 and Para 2.1.1.
- scormContentPackageIssuer (M). Refer to Table 2 and Para 2.1.2
- scormContentPackageNumber (M). Refer to Table 2 and Para 2.1.3.
- scormContentPackageVolume (M). Refer to Table 2 and Para 2.1.4.

Child elements:

- None

2.1.1 Model identification code

Description: The model identification code is given in the SCORM content package module code by the highlighted characters as follows:

YY - YYYYY - YYYYY - NN (14 characters)

thru

YYYYYYYYYYYYYY - YYYYY - YYYYY - NN (26 characters)

The model identification code is contained in the attribute modelIdentCode. Refer to Chap 4.3.1.

2.1.2 Issuing authority

Description: The CAGE code of the issuing authority of the SCORM content package module is given in the SCORM content package module code by the highlighted characters as follows:

YY - **YYYYY** - YYYYY - NN (14 characters)

thru

YYYYYYYYYYYYYY - **YYYYY** - YYYYY - NN (26 characters)

The CAGE code of the issuing authority is contained in the attribute scormContentPackageIssuer.

Note

The CAGE code used in this attribute must be a registered CAGE code.

2.1.3 Number of the SCORM content package module

Description: The number of the SCORM content package module is given in the SCORM content package module code by the highlighted characters as follows:

YY - YYYYY - **YYYYY** - NN (14 characters)

thru

YYYYYYYYYYYYY - YYYYY - **YYYYY** - NN (26 characters)

The issuing authority assigns the number of the SCORM content package module. The number is a unique alphanumeric identifier depending on the model identification code (attribute `modelIdentCode`) and the issuing authority (attribute `scormContentPackageIssuer`).

The number of the SCORM content package module is contained in the attribute `scormContentPackageNumber`.

2.1.4 Volume of the SCORM content package module

Description: The volume of the SCORM content package module is given in the SCORM content package module code by the highlighted characters as follows:

YY - YYYYY - YYYYY - **NN** (14 characters)

thru

YYYYYYYYYYYYY - YYYYY - YYYYY - **NN** (26 characters)

This attribute is used in cases where a SCORM content package module has to be separated into volumes without assigning a new number. The default value is "`00`" if only one volume exists.

The volume of the SCORM content package module code is contained in the attribute `scormContentPackageVolume`.

2.2 Use of hyphens

The SCORM content package module code must be presented with hyphens [-] in the positions as shown above and without spaces in between. The hyphens delimit the contents of the codes, as shown, but are not included within the population of the SCORM content package module code elements. This rule applies also to cases where the SCORM content package module code is given as a single string.

2.3 Example of the SCORM content package module codes

Examples of SCORM content package module codes:

- J1-S3627-04567-01
- J1-S3627-39835-11

Example of extended SCORM content package module codes:

- SF518-USER001-J1-S3627-04567-01
- SF518-USER001-J1-S3627-39835-11

Note

For clarification, for example when publication module codes and SCORM content package module codes are presented it can be useful to add the prefix "SMC-" or "SME-" to the code.

The output media, contained in the status section of the SCORM content package module, can be added if required by the project (eg, when it is delivered on different media). In this case, the following abbreviations are recommended:

- CD = CD-ROM
- W = Web URL
- DVD = Digital Versatile Disc

Example of SCORM content package module codes:

- J1-S3627-04567-01-W
- J1-S3627-39835-11-DVD

The media must not be printed or be used as a reference.

Note

Refer to Chap 7.5.1 for file naming conventions.

Chapter 4.15.3

Learning information - Building SCORM content package modules

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2.1.1 Status information 1
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References

Table 1 References

Chap No./Document No.	Title
Chap 3.9.5.1	Data modules - Identification and status section
Chap 4.15.1	Learning information - SCORM content package module

1 General

The SCORM content package module allows the building of the learning product to be independent of the end user presentation software. The preparation of the SCORM content package module is an authoring process.

2 Content

2.1 SCO construction

2.1.1 Status information

The status section gives the identification elements required to address and control the SCORM content package module as defined in Chap 4.15.1. The elements of the status section are similar to the elements of the status section of the data module as defined in Chap 3.9.5.1.

2.1.2 Content information

The content of the SCORM content package module is primarily built of data modules extracted from the CSDB.

The structure of the SCORM content package module is defined by the SCORM content package module entries. These can be recursively defined and give the navigation requirements for the LMS.

Each SCORM content package module entry can have a description of the content and references to one or more elements of the following type:

- data module
- other SCORM content packages

The generation of a SCORM content package module facilitates a top-down design for the structure of the learning product. The structure can be defined at an early stage of a project prior to population of the content.

3 Markup examples

There are two examples for the SCORM content package module construction. These examples are provided to show the two ways a SCORM content package module can be employed:

- as a description of a full learning event (eg, lesson)
- as a description of a single learning product or a collection of learning products that are not describing a full learning event

3.1 SCORM content package module as a full learning event

The following XML markup example represents a valid SCORM content package module fragment where the SCORM content package module contains a collection of learning products that, together, make up a complete learning event such as a lesson.

Note

This example illustrates how a single SCORM content package can describe a full learning event (one or more learning products that make up a course or lesson). The Identification and status section gives all the identification elements required to address and control the SCORM content package module.

```
<scormContentPackage><identAndStatusSection>
<scormContentPackageAddress>
<scormContentPackageIdent>
<scormContentPackageCode modelIdentCode="DEE1B"
scormContentPackageNumber="01132"
scormContentPackageIssuer="C0419"
scormContentPackageVolume="00"/>
<language countryIsoCode="US" languageIsoCode="en"/>
<issueInfo inWork="00" issueNumber="003"/>
</scormContentPackageIdent>
<scormContentPackageAddressItems>
<issueDate day="01" month="08" year="2008"/>
<scormContentPackageTitle>Air vehicle maintenance training -
Landing gear system</scormContentPackageTitle>
</scormContentPackageAddressItems>
</scormContentPackageAddress>
<scormContentPackageStatus>
<security securityClassification="01"/>
<responsiblePartnerCompany
enterpriseCode="C0419"></responsiblePartnerCompany>
<brexDmRef>
<dmRef>
<dmRefIdent>
<dmCode assyCode="0000" disassyCode="00"
disassyCodeVariant="AAA" infoCode="022" infoCodeVariant="A"
```

```
itemLocationCode="A" modelIdentCode="MODELIC"
subSubSystemCode="0" subSystemCode="0" systemCode="A00"
systemDiffCode="AAAA" />
</dmRefIdent>
</dmRef>
</brexDmRef>
<scormContentPackageMedia scormContentPackageMediaCode="DKS:1"
scormContentPackageMediaType="CD-ROM"/>
<qualityAssurance>
<firstVerification verificationType="tabtop"/>
</qualityAssurance>
<personSkill skillLevelCode="sk01"/>
</scormContentPackageStatus>
<!--The LOM at this level is used to insert metadata about the
SCORM content package module. If the SCORM content package
module describes a single learning product, then this is the
only place where the LOM might be referenced. If the SCORM
content package module is a collection of learning products used
to describe a full learning event, then there can be a LOM
reference here for the learning event and then additional LOM
references at the individual learning product level to describe
those products.-->
<lom:lom>
<lom:general>
<lom:identifier>
<lom:entry>3D16197F-4BA0-4F5C-BF57-CD3C8BA61148</lom:entry>
</lom:identifier>
<lom:title>
<lom:string>Air vehicle maintenance training - Landing gear
system</lom:string>
</lom:title>
<lom:description>
<lom:string>Air vehicle maintenance training - Landing gear
system</lom:string>
</lom:description>
<lom:keyword>
<lom:string>Air vehicle maintenance training, Landing gear
system</lom:string>
</lom:keyword>
</lom:general>
<lom:lifeCycle>
<lom:version>
<lom:string language="en">2007.06.17.12.12.15.737</lom:string>
</lom:version>
<lom:status>
<lom:source>LOMv1.0</lom:source>
<lom:value>final</lom:value>
</lom:status>
</lom:lifeCycle>
<lom:metaMetadata>
<lom:identifier>
<lom:catalog>GUID</lom:catalog>
```

```
<lom:entry>3D16197F-4BA0-4F5C-BF57-CD3C8BA61148</lom:entry>
</lom:identifier>
<lom:metadataSchema>LOMv1.0</lom:metadataSchema>
<lom:metadataSchema>SCORM_CAM_v1.3</lom:metadataSchema>
</lom:metaMetadata>
</lom:lom>
</identAndStatusSection>
<content>
<!--This is a reference to one learning product used to make up
the courseware.-->
<scoEntry>
<scoEntryTitle>Parts of the landing gear</scoEntryTitle>
<!--Since this SCORM content package module is a collection of
learning products used to make up a full learning event, there
might be another LOM reference here for this individual
product.-->
<scoEntryItem>
<lom:lom>
<lom:general>
<lom:identifier>
<lom:entry>3D16197F-4BA0-4F5C-BF57-CD3C8BA61148</lom:entry>
</lom:identifier>
<lom:title>
<lom:string>Landing gear system - Parts of the landing
gear</lom:string>
</lom:title>
<lom:description>
<lom:string>Air vehicle maintenance training - Landing gear
system</lom:string>
</lom:description>
<lom:keyword>
<lom:string>Air vehicle maintenance training, Landing gear
system, components</lom:string>
</lom:keyword>
</lom:general>
<lom:lifeCycle>
<lom:version>
<lom:string language="en">2007.06.17.12.12.15.792</lom:string>
</lom:version>
<lom:status>
<lom:source>LOMv1.0</lom:source>
<lom:value>final</lom:value>
</lom:status>

</lom:lifeCycle>
<lom:metaMetadata>
<lom:identifier>
<lom:catalog>GUID</lom:catalog>
<lom:entry>3D16197F-4BA0-4F5C-BF57-CD3C8BA61148</lom:entry>
</lom:identifier>
<lom:metadataSchema>LOMv1.0</lom:metadataSchema>
<lom:metadataSchema>SCORM_CAM_v1.3</lom:metadataSchema>
</lom:metaMetadata>
```

```
</lom:lom>
<dmRef>
<dmRefIdent>
<dmCode systemDiffCode="AAAA" infoCode="921" subSystemCode="5"
modelIdentCode="MODELIC" infoCodeVariant="A"
disassyCodeVariant="AAA" subSubSystemCode="0"
itemLocationCode="A" assyCode="0000" systemCode="A53"
disassyCode="00"/>
</dmRefIdent>
</dmRef>
</scoEntryItem>
<!--This is a reference to another SCORM content package
module.-->
<scoEntry>
<scoEntryItem>
<scormContentPackageRef>
<scormContentPackageRefIdent>
<scormContentPackageCode modelIdentCode="DEE1B"
scormContentPackageIssuer="C0419"
scormContentPackageNumber="01135"
scormContentPackageVolume="00"/>
<language countryIsoCode="US" languageIsoCode="en"/>
<issueInfo inWork="00" issueNumber="005"/>
</scormContentPackageRefIdent>
<scormContentPackageRefAddressItems>
<issueDate day="01" month="08" year="2008"/>
<scormContentPackageTitle>Air vehicle maintenance training -
Landing gear system (supplemental
package)</scormContentPackageTitle>
</scormContentPackageRefAddressItems>
</scormContentPackageRef>
</scoEntryItem>
</scoEntry>
</content>
</scormContentPackage>
```

3.2 SCORM content package module describing one or more SCO

The following XML markup example represents a valid SCORM content package module fragment where the SCORM content package module contains one or more learning products. The learning products can be referenced by another SCO.

Note

This example illustrates how SCORM content package module can be used to describe a single learning product or several products in learning event (lesson). The Identification and status section gives all the identification elements required to address and control the SCORM content package module.

```
<scormContentPackage<identAndStatusSection>
<scormContentPackageAddress>
<scormContentPackageIdent>
<scormContentPackageCode modelIdentCode="DEE1B"
scormContentPackageNumber="01132"
scormContentPackageIssuer="C0419"
```

```
scormContentPackageVolume="00"/>
<language countryIsoCode="US" languageIsoCode="sx"/>
<issueInfo inWork="00" issueNumber="003"/>
</scormContentPackageIdent>
<scormContentPackageAddressItems>
<issueDate day="01" month="08" year="2008"/>
<scormContentPackageTitle>Air vehicle maintenance training -
Landing gear system</scormContentPackageTitle>
</scormContentPackageAddressItems>
</scormContentPackageAddress>
<scormContentPackageStatus>
<security securityClassification="01"/>
<responsiblePartnerCompany
enterpriseCode="C0419"></responsiblePartnerCompany>
<brexDmRef>
<dmRef>
<dmRefIdent>
<dmCode assyCode="0000" disassyCode="00"
disassyCodeVariant="AAA" infoCode="022" infoCodeVariant="A"
itemLocationCode="A" modelIdentCode="MODELIC"
subSubSystemCode="0" subSystemCode="0" systemCode="A00"
systemDiffCode="AAAA" />
</dmRefIdent>
</dmRef>
</brexDmRef>
<scormContentPackageMedia scormContentPackageMediaCode="DKS:1"
scormContentPackageMediaType="CD-ROM"/>
<qualityAssurance>
<unverified/>
</qualityAssurance>
<personSkill skillLevelCode="sk01"/>
</scormContentPackageStatus>
<!--The LOM at this level is used to insert metadata about the
SCORM content package module. Since the SCORM content package
module is not describing a full learning event, this is the only
place where the LOM might be referenced.-->
<lom:lom>
<lom:general>
<lom:identifier>
<lom:entry>3D16197F-4BA0-4F5C-BF57-CD3C8BA61148</lom:entry>
</lom:identifier>
<lom:title>
<lom:string>Air vehicle maintenance training - Landing gear
system</lom:string>
</lom:title>
<lom:description>
<lom:string>Air vehicle maintenance training - Landing gear
system</lom:string>
</lom:description>
<lom:keyword>
<lom:string>Air vehicle maintenance training, Landing gear
system</lom:string>
```

```
</lom:keyword>
</lom:general>
<lom:lifeCycle>
<lom:version>
<lom:string language="en">2007.06.17.12.12.15.737</lom:string>
</lom:version>
<lom:status>
<lom:source>LOMv1.0</lom:source>
<lom:value>final</lom:value>
</lom:status>
</lom:lifeCycle>
<lom:metaMetadata>
<lom:identifier>
<lom:catalog>GUID</lom:catalog>
<lom:entry>3D16197F-4BA0-4F5C-BF57-CD3C8BA61148</lom:entry>
</lom:identifier>
<lom:metadataSchema>LOMv1.0</lom:metadataSchema>
<lom:metadataSchema>SCORM_CAM_v1.3</lom:metadataSchema>
</lom:metaMetadata>
</lom:lom>
</identAndStatusSection>
<content>
<!--This is a reference to one learning product used to make up
the courseware.-->
<scoEntry>
<scoEntryTitle>Parts of the landing gear</scoEntryTitle>
<scoEntryItem>
<dmRef>
<dmRefIdent>
<dmCode systemDiffCode="AAAA" infoCode="921" subSystemCode="5"
modelIdentCode="MODELIC" infoCodeVariant="A"
disassyCodeVariant="AAA" subSubSystemCode="0"
itemLocationCode="A" assyCode="0000" systemCode="A53"
disassyCode="00"/>
</dmRefIdent>
</dmRef>
</scoEntryItem>
<scoEntryItem>
<scoEntry>
<!--This is an example of how a reference is made to another
SCORM content package module. This would be done in cases where
the SCORM content package module is being used to reference one
learning product or a collection of learning products, but the
SCORM content package module does not make up a full learning
event.-->
<scoEntryTitle>Landing gear hydraulics</scoEntryTitle>
<scoEntryItem>
<scormContentPackageRef>
<scormContentPackageRefIdent>
<scormContentPackageCode modelIdentCode="DEE1B"
scormContentPackageIssuer="C0419"
scormContentPackageNumber="01135"
```

```
scormContentPackageVolume="00"/>
<language countryIsoCode="US" languageIsoCode="en"/>
<issueInfo inWork="00" issueNumber="005"/>
</scormContentPackageRefIdent>
<scormContentPackageRefAddressItems>
<issueDate day="01" month="08" year="2008"/>
<scormContentPackageTitle>Air vehicle maintenance training -
Landing gear system (supplemental
package)</scormContentPackageTitle>
</scormContentPackageRefAddressItems>
</scormContentPackageRef>
</scoEntryItem>
</scoEntry>
</scoEntryItem>
</scoEntry>
</content>
</scormContentPackage>
```

Chapter 4.15.4

Learning information - Updating SCORM content package modules

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 5.3.1.1	Common requirements - Front matter

1 General

Updates of learning products can be prepared as complete SCORM content package modules, including all referenced elements, or partly by updating the constituent SCORM content package modules and the referenced changed elements. The update of a learning product must be reflected in the front matter data modules (eg, Change record or Highlights). Refer to Chap 5.3.1.1.

Updating of SCORM content package modules includes the element <issueInfo> in the element <scormContentPackageIdent> and attribute issueType in the element <scormContentPackageStatus> and follows the same rules as of data modules. Refer to Chap 3.9.5.1.

Chapter 4.16

Information management - Content specific data and quantity data

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.2.11.6	Common information repository - Enterprise information
Chap 3.9.5.2.11.10	Common information repository - Functional and/or physical areas
Chap 3.9.6.2	Attributes - Fixed values
Chap 4.13.1	Optimizing and reuse - Common information repository concept

1 General

This chapter describes the concept of managing content specific data and quantity data inside data modules. Managing content specific data inside data modules can be supported by the use of the Common Information Repository (CIR) implemented as CIR data modules or as internal databases in the CSDB. Refer to Chap 4.13.1.

Data modules can contain two types of specific information:

– Content specific data

  - Technical information objects such as circuit breakers, access points and consumables. These elements can have a dedicated CIR.
  - Paragraph significant data (data with a significant meaning) such as training level, manufacturer code, lubricant. These elements do not have a dedicated CIR.

– Quantity data (ie, numerical data such as torque value or weight)

The principle of managing content specific data and quantity data, is to use content specific markup in order to identify the technical information or numerical data.

This markup enables the information to be processed and specific display features.

For example, tagging of access points allows potential functionalities such as:

– Query the data for all access points identified in the paragraphs of a data module (or of a set of data modules)
– Query the data for all data modules where a given access point is identified
– Get further information on a given access point, such as equipment that can be accessed, enclosing zone, fastener used for a panel, man hours needed for opening the panel, etc. Refer to Para 2.1.1.2.

In this sentence from a descriptive data module: "The access door 311AB allows setting the switch to…", the string "311AB" is a distinct identifier of the access point. The following markup example shows tagging which expresses this information and therefore allows the functionalities described above:

```
<para>The access door <accessPointRef accessPointNumber="311AB"/>
allows setting the switch to...</para>
```

Distinct tagging can also facilitate (eg, via the implementation of a circuit breaker consistency check) a check that circuit breakers opened at the beginning of a maintenance task are closed at the end of the task. In the following sentence: "Close the following circuit breakers: 68WV, 12WV.", the string "68WV" is a distinct identifier of the circuit breaker and the action to perform is to close this circuit breaker. The following tagging explicitly expresses this information:

```
<para>Close the following circuit breakers: <circuitBreakerRef
circuitBreakerNumber="68WV" circuitBreakerAction="close"/>,
<circuitBreakerRef circuitBreakerNumber="12WV"
circuitBreakerAction="close"/></para>
```

2 Content specific data and quantity data

2.1 Content specific data

2.1.1 Technical information objects

2.1.1.1 Object types

The technical information objects (content specific data which can have a dedicated CIR data module) correspond to the following objects (refer to Chap 4.13.1):

– **Functional items** (element <`functionalItemRef`>), used to uniquely identify an item performing a function in a given system at a given position. Refer to Chap 3.9.5.1.
– **Circuit breakers** (element <`circuitBreakerRef`>), used to uniquely identify a device used to properly break an electrical circuit or to inactivate an electrical function. Refer to Chap 3.9.5.2.1.9.
– **Parts** (element <`partRef`>), used to uniquely identify an item of the Product, forming part of an assembly or subassembly, which is not normally broken down further. Refer to Chap 3.9.5.2.1.10.

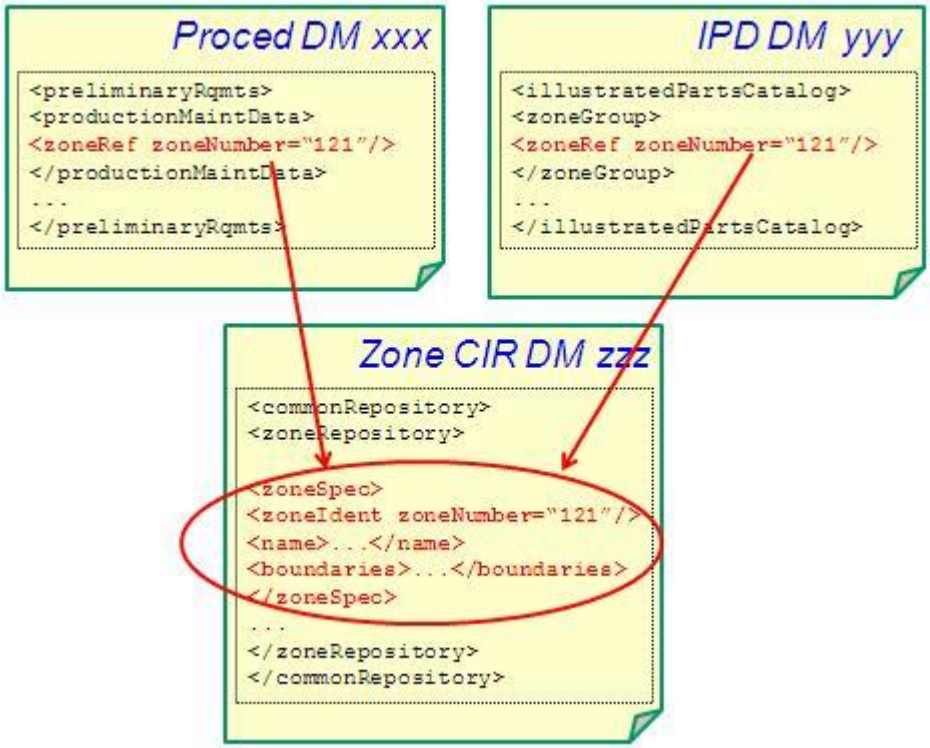
- **Zones** (element <zoneRef>), used to uniquely identify a structural area of the Product. Refer to Chap 3.9.5.2.1.10.
- **Access points** (element <accessPointRef>), used to uniquely identify an access point to be opened to gain access to the equipment. Refer to Chap 3.9.5.2.1.10.
- **Support equipment** (element <toolRef>), used to uniquely identify any support equipment, including standard and special tools required to correctly accomplish a given action, task or procedure. Refer to Chap 3.9.5.2.1.9.
- **Enterprises** (element <enterpriseRef>), used to identify a company with the CAGE code. Refer to Chap 3.9.5.2.11.6.
- **Supplies** and **supply requirements** (elements <supplyRef> and <supplyRqmtRef>), used to uniquely identify both the consumable products and their use conditions (consumable requirement and use conditions). It covers any consumables (such as oils, greases, paints), materials (gasket sheet, sheet metal) and expendables (such as O-rings, gaskets, tab washers) required to correctly accomplish a given action, task or procedure. Refer to Chap 3.9.5.2.1.9.
- **Functional and/or physical areas** (element <functionalPhysicalAreaRef>), used to identify the systems, subsystems etc, which compose the Product functional and/or physical breakdown. Refer to Chap 3.9.5.2.11.10.
- **Controls and indicators** (element <controlIndicatorRef>), used to uniquely identify any control or indicator required to correctly accomplish a given action, task or procedure. Refer to Chap 3.9.5.2.1.10.

2.1.1.2 Relation between content specific data and CIR data modules

2.1.1.2.1 Principle

As described in Chap 4.13.1, a project or an organization can decide to manage the detailed information associated with content specific data in dedicated CIR data modules. The types of information that can be managed in this way are listed in Para 2.1.1.1.

The main advantage of this architecture (content specific data tagged inside data modules and the use of CIR data modules) is that detailed technical information is stored in a controlled manner and easily shared across the whole project. This allows an optimized method of organizing technical information.



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Fig 1 Content specific data elements referencing detailed information in CIR data module

In the example given in Fig 1, content specific data elements reference detailed information in the zones CIR data module.

2.1.1.2.2 Reference methods

To enable referencing between content specific information and CIR data modules, two reference methods can be used as described in Chap 4.13.1:

- **Implicit references:** the reference is resolved by using **only the attribute values** of the identifier of the considered information type element
- **Explicit references:** the reference is resolved by **both** referring to the corresponding **CIR** data module **and the attribute value** of the identifier of the considered information type element. An alternative to use the attribute value of the identifier is to use the attribute `referredFragment` on the element <`dmRef`>.

2.1.1.3 Object properties stored within a data module

For some technical information objects, it is possible to add some of the object properties at the place where it is marked-up in data modules.

It contributes to the readability especially when delivering self-contained data modules. Usually, it is possible to add a name or a short name.

For each type of technical information object, refer to the element description in order to know which properties can be stored within data modules.

Business rule decision point BRDP-S1-00403 - Technical information object properties to be included in the data module at delivery:

- Decide which properties associated to the technical information objects (eg, names, short names) to store within the data module when delivered.

2.1.2 Paragraph significant data

The paragraph significant data consists of many other pieces of information which can be marked up within the element <inlineSignificantData>. Its attribute significantParaDataType specifies the type of data. Data types listed below can be extended according to the project or the organization needs:

- ammunition
- instruction disposition
- lubricant
- maintenance level
- manufacturer code
- manufacturers recommendation
- modification code
- qualification code
- training level
- control or indicator value

The definitions and use of the paragraph significant data elements are given in Chap 3.9.5.2.1.10.

2.2 Quantity data

The quantity data element provides the capability to identify a portion of a paragraph as being a quantity (numerical value and unit of measure). The exact meaning of the quantity data element can be specified using a set of pre-defined S1000D values, or extended to support specific program needs.

The quantity data element also provides the ability to define numerical values to a very precise level and includes capabilities such as:

- specifying a unit of measure chosen from the quantity unit of measure attribute list given in Chap 3.9.6.2
- grouping values and tolerances together and managing unit of measure accordingly

The quantity data element <quantity> is described in Chap 3.9.5.2.1.10.

Chapter 5

Information sets and publications

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Chap 5.1	Information sets and publications - General	S1000D-A-05-01-0000-00A-040A-A	All
Chap 5.2	Information sets and publications - Information sets	S1000D-A-05-02-0000-00A-040A-A	All
Chap 5.2.1	Information sets - Common information sets	S1000D-A-05-02-0100-00A-040A-A	All
Chap 5.2.1.1	Common information sets - Crew/Operator information	S1000D-A-05-02-0101-00A-040A-A	All
Chap 5.2.1.2	Common information sets - Description and operation	S1000D-A-05-02-0102-00A-040A-A	All
Chap 5.2.1.3	Common information sets - Maintenance information	S1000D-A-05-02-0103-00A-040A-A	All
Chap 5.2.1.3.1	Maintenance information - Maintenance procedures	S1000D-A-05-02-0103-01A-040A-A	All
Chap 5.2.1.3.2	Maintenance information - Fault isolation	S1000D-A-05-02-0103-02A-040A-A	All
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Chap 5.2.1.3.5	Maintenance information - Storage	S1000D-A-05-02-0103-05A-040A-A	All
Chap 5.2.1.4	Common information sets - Wiring data	S1000D-A-05-02-0104-00A-040A-A	All
Chap 5.2.1.5	Common information sets - Illustrated parts data	S1000D-A-05-02-0105-00A-040A-A	All
Chap 5.2.1.6	Common information sets - Maintenance planning information	S1000D-A-05-02-0106-00A-040A-A	All
Chap 5.2.1.7	Common information sets - Mass and balance information	S1000D-A-05-02-0107-00A-040A-A	All
Chap 5.2.1.8	Common information sets - Recovery information	S1000D-A-05-02-0108-00A-040A-A	All
Chap 5.2.1.9	Common information sets - Equipment information	S1000D-A-05-02-0109-00A-040A-A	All

Chapter	Data module title	Data module code	Applic
Chap 5.2.1.10	Common information sets - Weapon loading information	S1000D-A-05-02-0110-00A-040A-A	All
Chap 5.2.1.11	Common information sets - Cargo loading information	S1000D-A-05-02-0111-00A-040A-A	All
Chap 5.2.1.12	Common information sets - Stores loading information	S1000D-A-05-02-0112-00A-040A-A	All
Chap 5.2.1.13	Common information sets - Role change information	S1000D-A-05-02-0113-00A-040A-A	All
Chap 5.2.1.14	Common information sets - Battle damage assessment and repair information	S1000D-A-05-02-0114-00A-040A-A	All
Chap 5.2.1.15	Common information sets - Illustrated tool and support equipment information	S1000D-A-05-02-0115-00A-040A-A	All
Chap 5.2.1.16	Common information sets - Service bulletins	S1000D-A-05-02-0116-00A-040A-A	All
Chap 5.2.1.17	Common information sets - Material data	S1000D-A-05-02-0117-00A-040A-A	All
Chap 5.2.1.18	Common information sets - Common information and data	S1000D-A-05-02-0118-00A-040A-A	All
Chap 5.2.1.19	Common information sets - Training	S1000D-A-05-02-0119-00A-040A-A	All
Chap 5.2.1.20	Common information sets - List of applicable publications	S1000D-A-05-02-0120-00A-040A-A	All
Chap 5.2.1.21	Common information sets - Maintenance checklists and inspections	S1000D-A-05-02-0121-00A-040A-A	All
Chap 5.2.2	Information sets - Air specific information sets	S1000D-A-05-02-0200-00A-040A-A	All
Chap 5.2.2.1	Air specific information sets - Use of generic information sets	S1000D-A-05-02-0201-00A-040A-A	All
Chap 5.2.2.2	Air specific information sets - Structure repair information	S1000D-A-05-02-0202-00A-040A-A	All
Chap 5.2.2.3	Air specific information sets - Cross servicing information	S1000D-A-05-02-0203-00A-040A-A	All
Chap 5.2.2.4	Air specific information sets - Engine maintenance information	S1000D-A-05-02-0204-00A-040A-A	All
Chap 5.2.2.5	Air specific information sets - Power plant build-up information	S1000D-A-05-02-0205-00A-040A-A	All
Chap 5.2.2.6	Air specific information sets - Engine standard practices	S1000D-A-05-02-0206-00A-040A-A	All
Chap 5.2.2.7	Air specific information sets - Aircrew information	S1000D-A-05-02-0207-00A-040A-A	All

Chapter	Data module title	Data module code	Applic
Chap 5.2.3	Information sets - Land/sea specific information sets	S1000D-A-05-02-0300-00A-040A-A	All
Chap 5.2.3.1	Land/sea specific information sets - Crew/Operator descriptive information	S1000D-A-05-02-0301-00A-040A-A	All
Chap 5.2.3.2	Land/sea specific information sets - Crew/Operator operation information	S1000D-A-05-02-0302-00A-040A-A	All
Chap 5.2.3.3	Land/sea specific information sets - Crew/Operator sequential operation information	S1000D-A-05-02-0303-00A-040A-A	All
Chap 5.2.3.4	Land/sea specific information sets - Crew/Operator fault detection, isolation and resolution information	S1000D-A-05-02-0304-00A-040A-A	All
Chap 5.2.3.5	Land/sea specific information sets - International, national and regulatory scheduled check information	S1000D-A-05-02-0305-00A-040A-A	All
Chap 5.3	Information sets and publications - Publications	S1000D-A-05-03-0000-00A-040A-A	All
Chap 5.3.1	Publications - Common requirements	S1000D-A-05-03-0100-00A-040A-A	All
Chap 5.3.1.1	Common requirements - Front matter	S1000D-A-05-03-0101-00A-040A-A	All
Chap 5.3.1.2	Common requirements - Technical content	S1000D-A-05-03-0102-00A-040A-A	All
Chap 5.3.1.3	Common requirements - Illustrated parts data	S1000D-A-05-03-0103-00A-040A-A	All
Chap 5.3.1.4	Common requirements - Component maintenance publications	S1000D-A-05-03-0104-00A-040A-A	All
Chap 5.3.2	Publications - Air specific publications	S1000D-A-05-03-0200-00A-040A-A	All
Chap 5.3.2.1	Air specific publications - Aircrew information	S1000D-A-05-03-0201-00A-040A-A	All
Chap 5.3.2.2	Air specific publications - Cross servicing guide	S1000D-A-05-03-0202-00A-040A-A	All
Chap 5.3.3	Publications - Land/sea specific publications	S1000D-A-05-03-0300-00A-040A-A	All

Chapter 5.1

Information sets and publications - General

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Chap 5.2	Information sets and publications - Information sets
Chap 5.3	Information sets and publications - Publications

1 General

This chapter contains common and specific rules for information sets and publications for the Product.

It is based on the following definitions:

- An information set is the required information in a defined scope and depth (author view) in form of data modules managed in the CSDB. A project data module requirements list lists all required data modules for that project.
- A publication is the compilation and publishing of information for a customer. This can be an IETP, a paper publication compiled from data modules or a publication containing legacy data.

A publication can be a subset of or equal to an information set, but it can also be a superset of several Information sets or parts of them.

Requirements for Information sets are given in Chap 5.2 and for publications in Chap 5.3.

Throughout these chapters, examples of maintenance data module coding are given. For the sake of brevity, these examples are limited to 17 and 37 character coding. The project or the organization must adapt their data module coding strategies to suit their needs and not necessarily restrict themselves to either 17 or 37 character coding.

Data module coding examples are also given for training data modules. With the addition of the learn code and the learn event code, these examples are limited to 21 and 41 character coding. The project or the organization must adapt their data module coding strategies to suit their needs and not necessarily restrict themselves to either 21 or 41 character coding.

Chapter 5.2

Information sets and publications - Information sets

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Chap No./Document No.	Title
Chap 5.2.1	Information sets - Common information sets
Chap 5.2.2	Information sets - Air specific information sets
Chap 5.2.3	Information sets - Land/Sea specific information sets

1 General

This chapter references chapters that provide general and specific guidance for the preparation and coding of the following:

- Common information sets, refer to Chap 5.2.1
- Air specific information sets, refer to Chap 5.2.2
- Land/Sea specific information, refer to Chap 5.2.3

Chapter 5.2.1

Information sets - Common information sets

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Chap 5.2.1.2	Common information sets - Description and operation
Chap 5.2.1.3	Common information sets - Maintenance information
Chap 5.2.1.4	Common information sets - Wiring data
Chap 5.2.1.5	Common information sets - Illustrated parts data
Chap 5.2.1.6	Common information sets - Maintenance planning information
Chap 5.2.1.7	Common information sets - Mass and balance information
Chap 5.2.1.8	Common information sets - Recovery information
Chap 5.2.1.9	Common information sets - Equipment information
Chap 5.2.1.10	Common information sets - Weapon loading information
Chap 5.2.1.11	Common information sets - Cargo loading information
Chap 5.2.1.12	Common information sets - Stores loading information
Chap 5.2.1.13	Common information sets - Role change information
Chap 5.2.1.14	Common information sets - Battle damage assessment and repair information
Chap 5.2.1.15	Common information sets - Illustrated tool and support equipment information
Chap 5.2.1.16	Common information sets - Service bulletins
Chap 5.2.1.17	Common information sets - Material data

Chap No./Document No.	Title
Chap 5.2.1.18	Common information sets - Common information and data
Chap 5.2.1.19	Common information sets - Training
Chap 5.2.1.20	Common information sets - List of applicable publications
Chap 5.2.1.21	Common information sets - Maintenance checklists and inspections

1 General

The complete production process involves agreeing the purpose, scope and depth of the technical information, establishing the business rules for data module coding, generating a data module requirements list, producing and publishing the data modules. Information sets are provided to assist the generation part of the process.

2 Common information sets

The following chapters provide the rules for the preparation and coding of common information sets.

General and specific guidance are given in the following chapters:

- Crew/Operator information, refer to Chap 5.2.1.1
- Description and operation, refer to Chap 5.2.1.2
- Maintenance information, refer to Chap 5.2.1.3
- Wiring data, refer to Chap 5.2.1.4
- IPD, refer to Chap 5.2.1.5
- Maintenance planning information, refer to Chap 5.2.1.6
- Mass and balance information, refer to Chap 5.2.1.7
- Recovery information, refer to Chap 5.2.1.8
- Equipment information, refer to Chap 5.2.1.9
- Weapon loading information, refer to Chap 5.2.1.10
- Cargo loading information, refer to Chap 5.2.1.11
- Stores loading information, refer to Chap 5.2.1.12
- Role change information, refer to Chap 5.2.1.13
- Battle damage assessment and repair information, refer to Chap 5.2.1.14
- Illustrated tool and support equipment information, refer to Chap 5.2.1.15
- Service bulletins, refer to Chap 5.2.1.16
- Material data, refer to Chap 5.2.1.17
- Common information and data, refer to Chap 5.2.1.18
- Training, refer to Chap 5.2.1.19
- Common information sets - List of applicable publications, refer to Chap 5.2.1.20
- Common information sets - Maintenance checklists and inspections, refer to Chap 5.2.1.21

Chapter 5.2.1.1

Common information sets - Crew/Operator information

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Chap 5.2.2.7	Air specific information sets - Aircrew information
Chap 5.2.3	Information sets - Land/Sea specific information sets

1 General

This chapter contains references to the chapters for preparation and coding of data modules for crew/operator information.

2 Crew/Operator information

It covers the rules for the preparation of information needed to provide crew/operators with the necessary degree of understanding of the Product and its systems and the procedures to operate the Product, its system and equipment to their full potential under normal and failure modes. Unnecessary theory and superfluous engineering detail which is not of direct concern to the crew/operators must be excluded. Duplicated information concerning procedures, techniques or any other material contained in other documents (air vehicle, land or sea system equipment publications, regulations or official publications) should be avoided. Performance information can be included.

The requirements for the preparation of this information are given in the following chapters:

- Air vehicles, refer to Chap 5.2.2.7
- Land/Sea Systems, refer to Chap 5.2.3

Chapter 5.2.1.2

Common information sets - Description and operation

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6 Unit level illustration - Example 9
7 Unit level illustration - Example 10
8 Block schematic diagram - Example 12
9 Simplified schematic diagram - Example 13
10 Detailed schematic diagram - Example 15

References

Table 1 References

Chap No./Document No.	Title
Chap 3.9.2	Authoring - Illustration rules and multimedia
Chap 8.4	SNS information and learn codes - Information codes

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for the Product Description and Operation (D&O) information and related schematic diagrams.

1.2 Scope

It covers the rules for the preparation of information which will enable skilled maintenance personnel to understand the construction, function, operation and control of a system, subsystem, sub-subsystem, and unit of the Product. The information must include the identification and location of related systems and maintenance overviews of training significant items.

The requirements for the preparation of schematic diagrams which are provided to illustrate the entire Product and some component circuits are also covered. The schematic diagrams must portray a system in sufficient detail to supplement fault isolation and understanding of the system operation by maintenance personnel.

1.3 Standards and definitions

The standards and definitions given in this chapter are applicable with no exceptions.

2 Description and operation

2.1 Introduction

2.1.1 Function, data and description

The purpose of these data modules (IC 0YY) must explain the location, build-up and function of a complete system and its subsystems. Description of components must be included to understand their construction and functioning to the extent necessary for the adequate performance of maintenance functions. For simple systems, IC 040 (Description of how it is made and its function) must not be subdivided. The information must be presented so that it is understandable to the mechanic trainee and must be in a form suitable for training. It must be written in clear, logical, easy-to-read style and be well illustrated.

Systems must be described to reflect the levels of breakdown, indicated by the SNS. The levels are indicated by:

- System **YY**-00-00 (6 characters)
- System Y**YY**-00-0000 (9 characters)

This level includes the purpose of the system and subsystems and its functional scope and interrelation to sub-subsystems as well as to other systems.

- Subsystem YY-**Y**0-00 (6 characters)
- Subsystem YYY-**Y**0-0000 (9 characters)

This level includes a description of the function, operation and control of the subsystem and the general purpose and scope of function of the major components within the subsystem. Information about the components location must also be given. Interrelations to other sub-subsystems or systems must be included. In simple systems, where no breakdown in subsystems is required, the above mentioned can be covered under "System".

- Sub-subsystem YY-Y**Y**-00 (6 characters)
- Sub-subsystem YYY-Y**Y**-0000 (9 characters)

This level includes a description of the function, operation and control of the sub-subsystem and the general purpose and scope of the function of the major components within the sub-subsystem. Information about the components location must also be given. Interrelations to

other sub-subsystems or systems must be included. If no breakdown in sub-subsystems is required, the above mentioned can be covered under "Subsystems".

- Assembly YY-YY-**YY** (6 characters)
- Assembly YYY-YY-**YYYY** (9 characters)

This level includes a detailed description of the function, operation and control of the individual major components or assemblies including tests. It also includes adjustments which affect the performance of the unit and special maintenance practices or handling procedures when applicable. Interrelations to other units must be included. The scope of coverage must be in accordance with the requirements of the maintenance concept of the Product.

Peculiarities of individual systems, subsystems, or sub-subsystems, can dictate minor changes in this style of presentation, but it must be followed as closely as possible.

Location information for all components must be prepared at the appropriate system, subsystem or sub-subsystem level in a standardized presentation preferably including the following:

- Component index. A listing of the related components cross references to the subsystem or sub-subsystem as appropriate.
- Access/Area identification. An illustrated listing of the access openings/locations indicating the means and location for gaining access to the indexed components. The component index and access/area identification illustration can be combined or presented separately.
- Component location/identification. Illustrations of the indexed components showing their physical location relative to known structural or system features. Components such as circuit breakers or fuses need not be illustrated provided that the panel location is illustrated and component references are listed. Component location/identification and access/area identification illustrations can be combined.

For details on the information codes, refer to Chap 8.4.

2.2 Operation

These data modules (IC 1YY) provide all the necessary procedures to operate the Product. The procedures include data on the necessary controls and indicators, pre- and post-operation procedures, operation and emergency procedures.

For details on the information codes, refer to Chap 8.4.

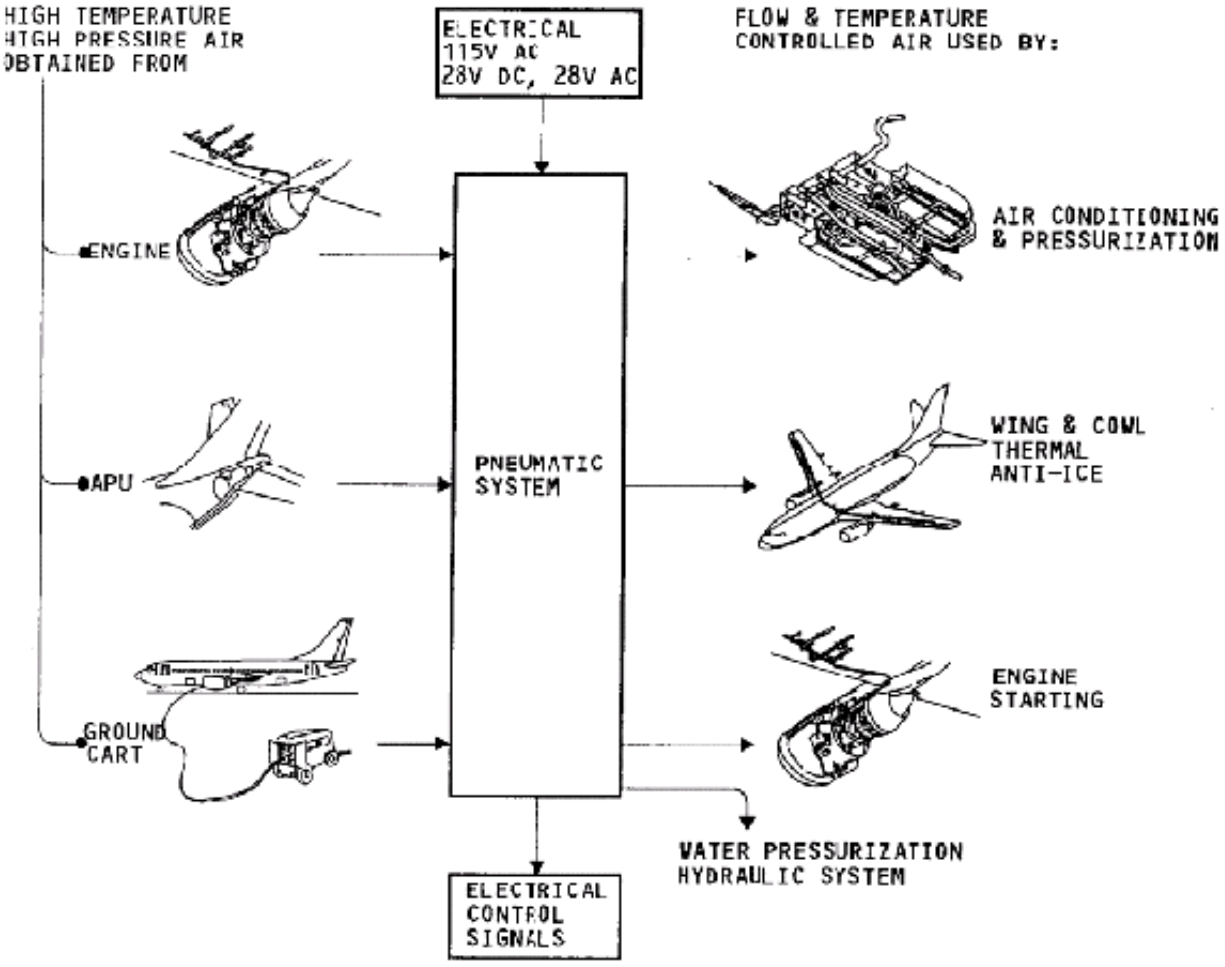
2.3 Illustrations

2.3.1 Presentation

Illustrations must be used as the primary source of information transfer. They must be developed uncluttered with limited information/learning points and presented in a self-explanatory style. The information breakdown must follow the whole-part-whole concept. Refer to Chap 3.9.2.

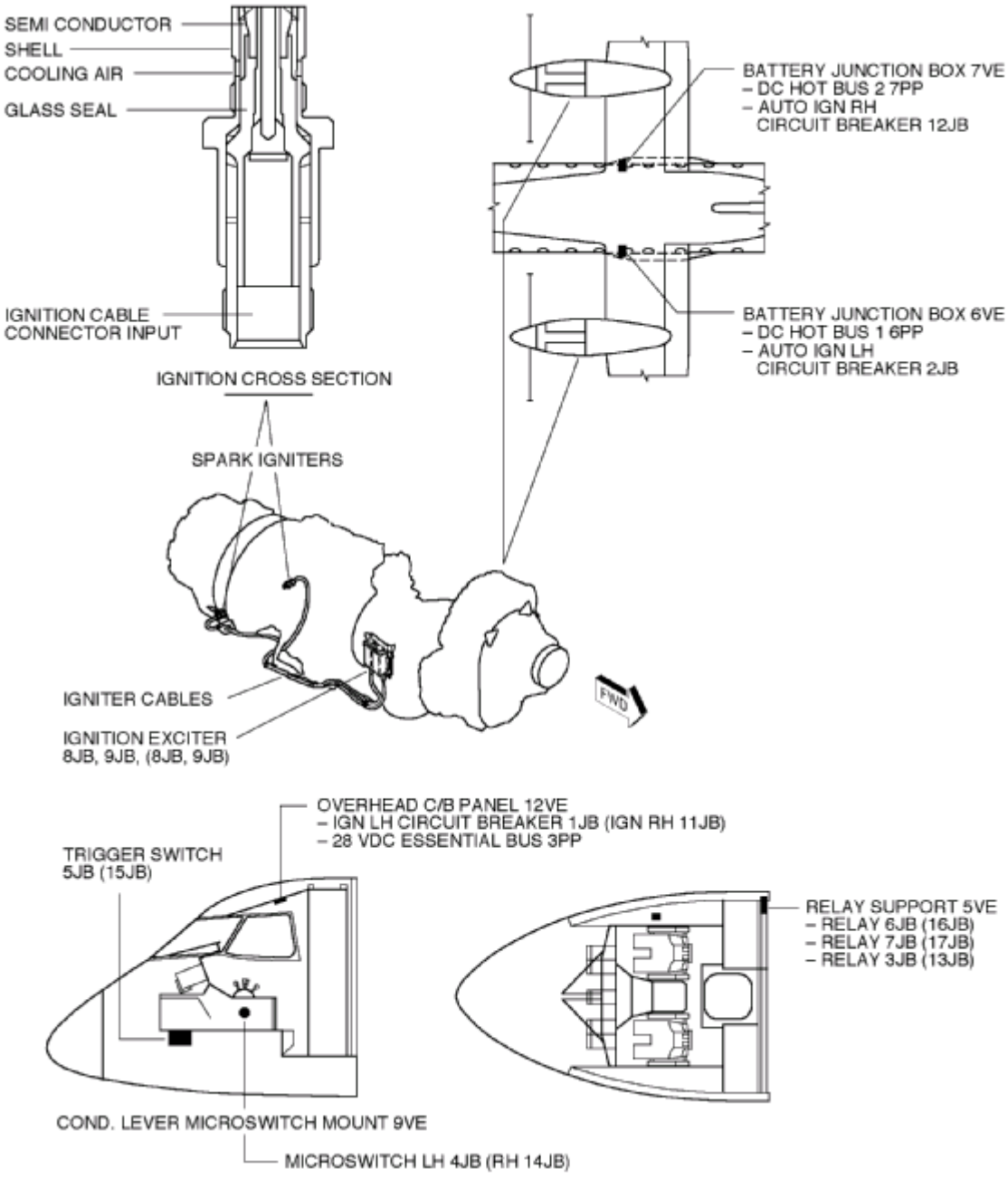
2.3.2 Illustration types

Acceptable types of illustrations are shown in the examples Fig 1 thru Fig 7.



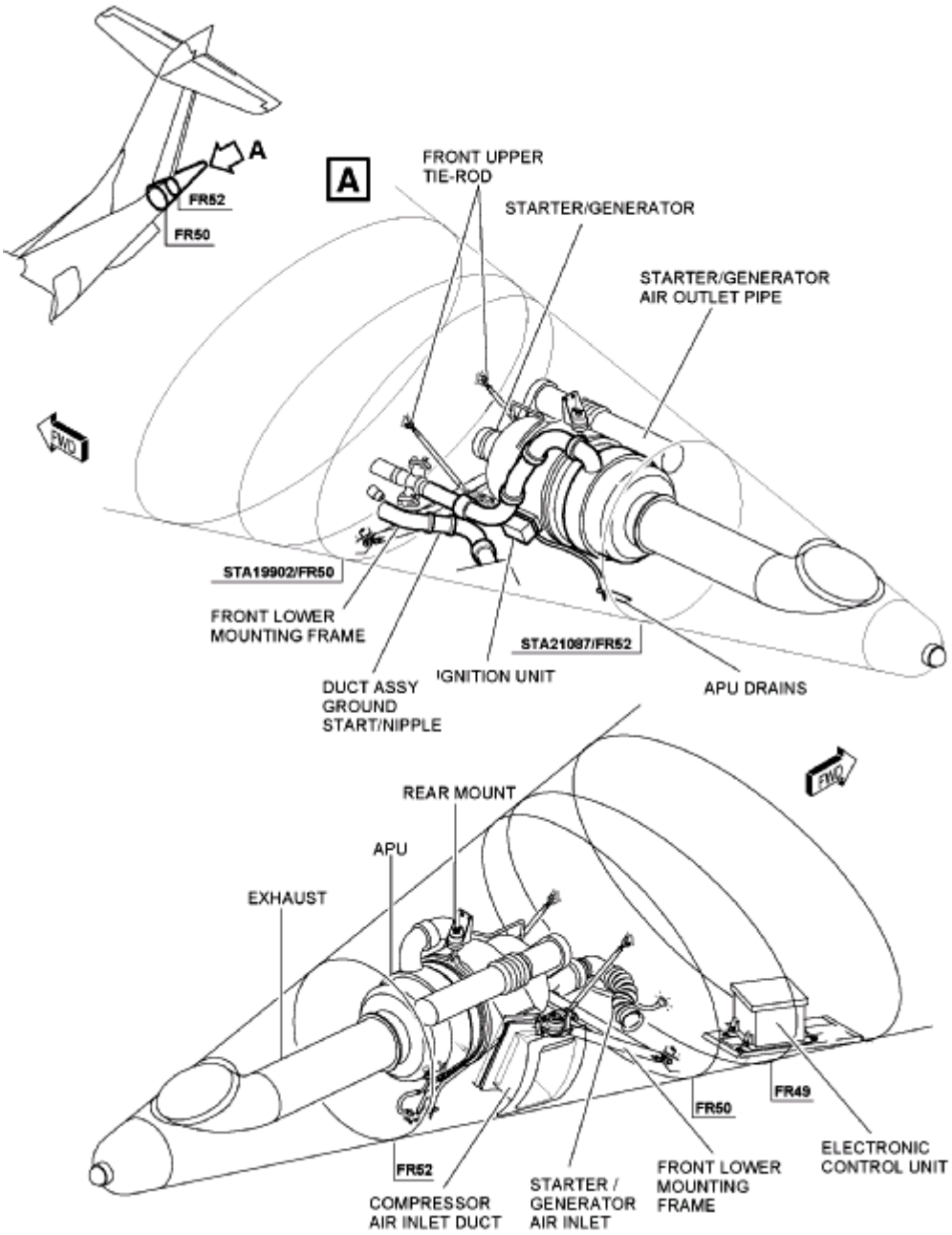
ICN-AE-A-050201-A-D0216-00003-A-001-01

Fig 1 System level illustration - Example



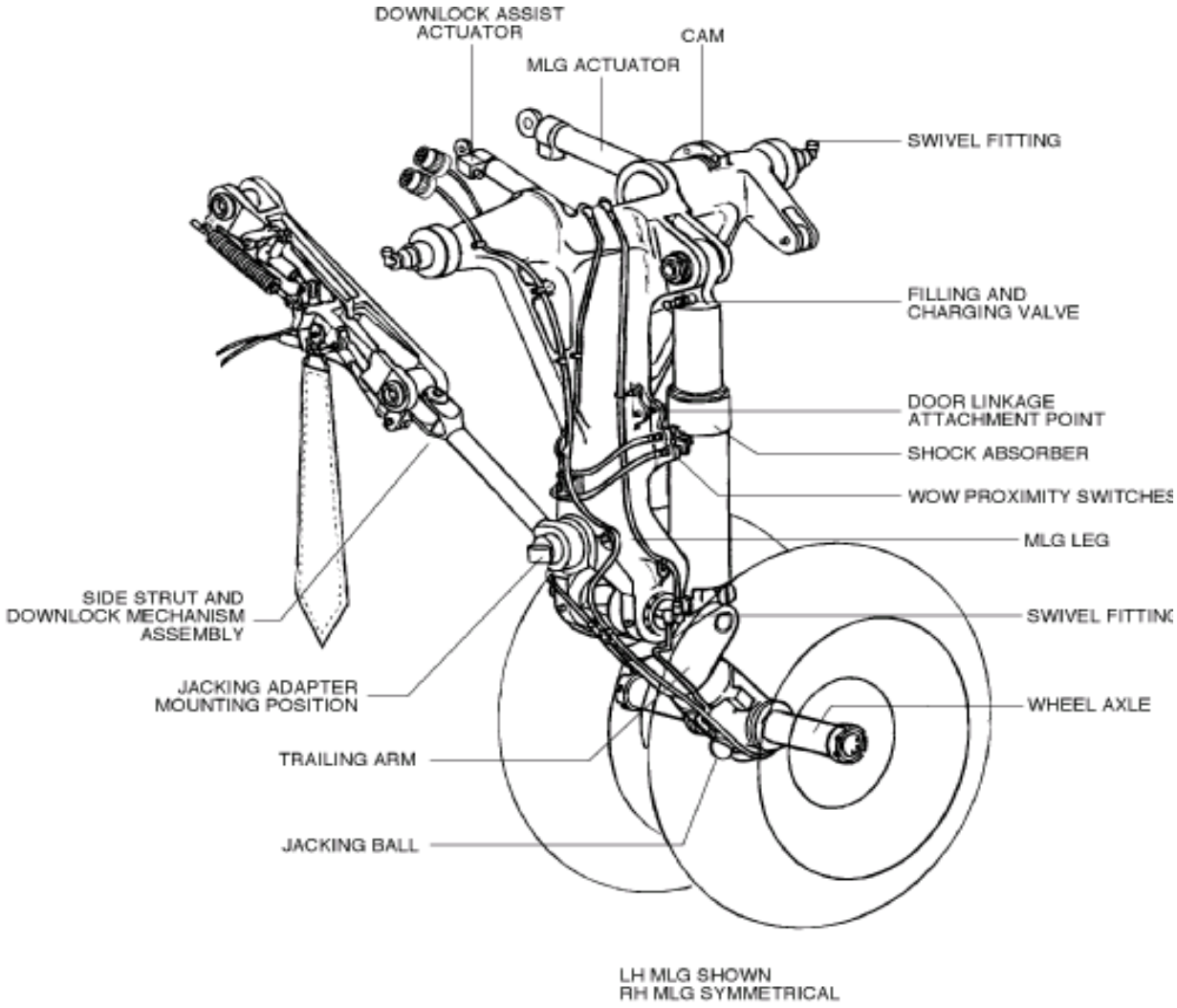
ICN-AE-A-050201-A-D0216-00004-A-001-01

Fig 2 System level illustration - Example



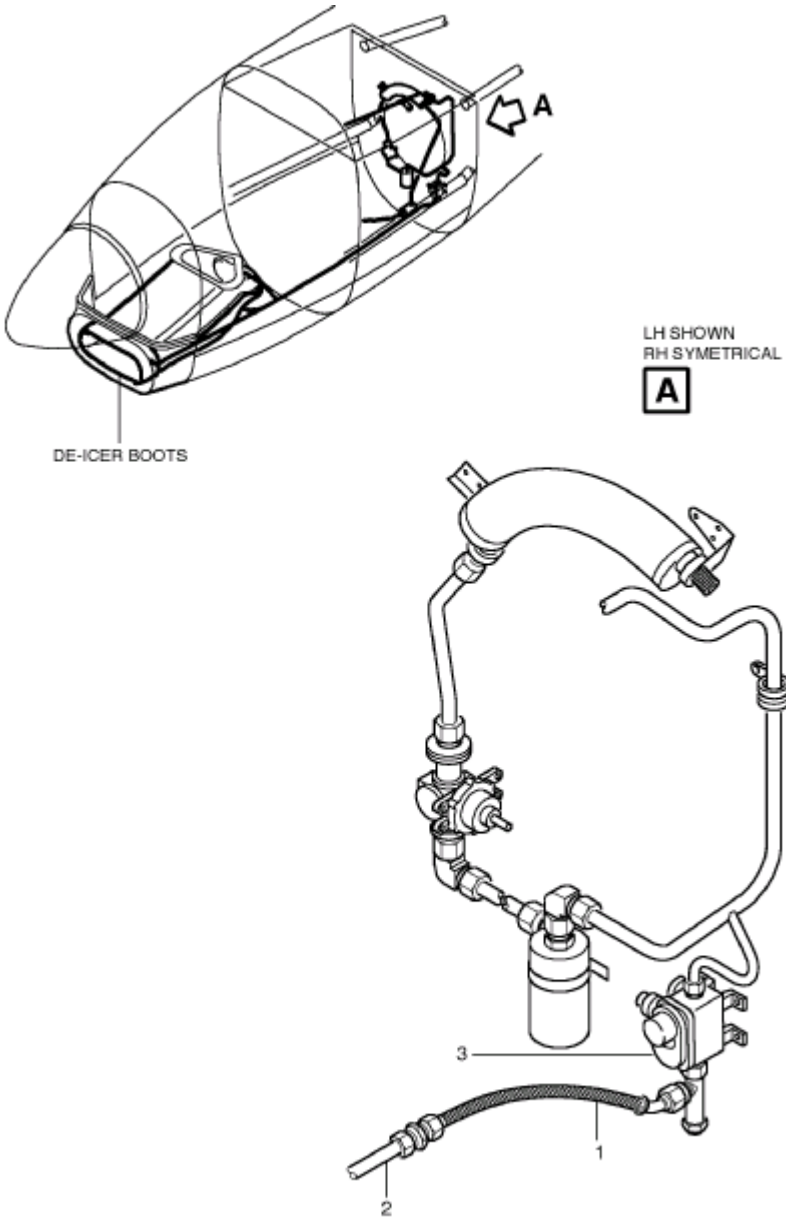
ICN-AE-A-050201-A-D0216-00005-A-001-01

Fig 3 Subsystem level illustration - Example



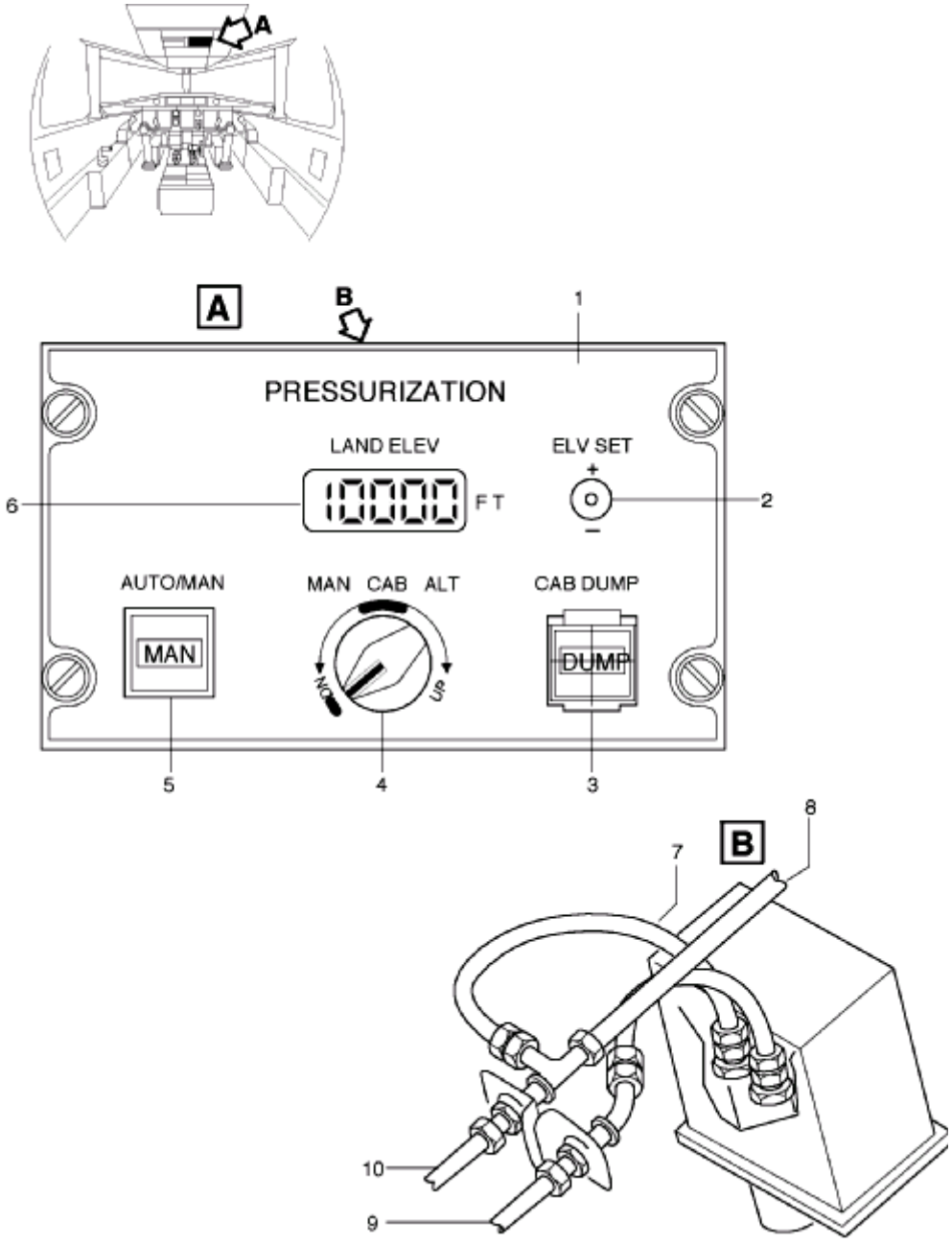
ICN-AE-A-050201-A-D0216-00006-A-001-01

Fig 4 Sub-subsystem level illustration - Example



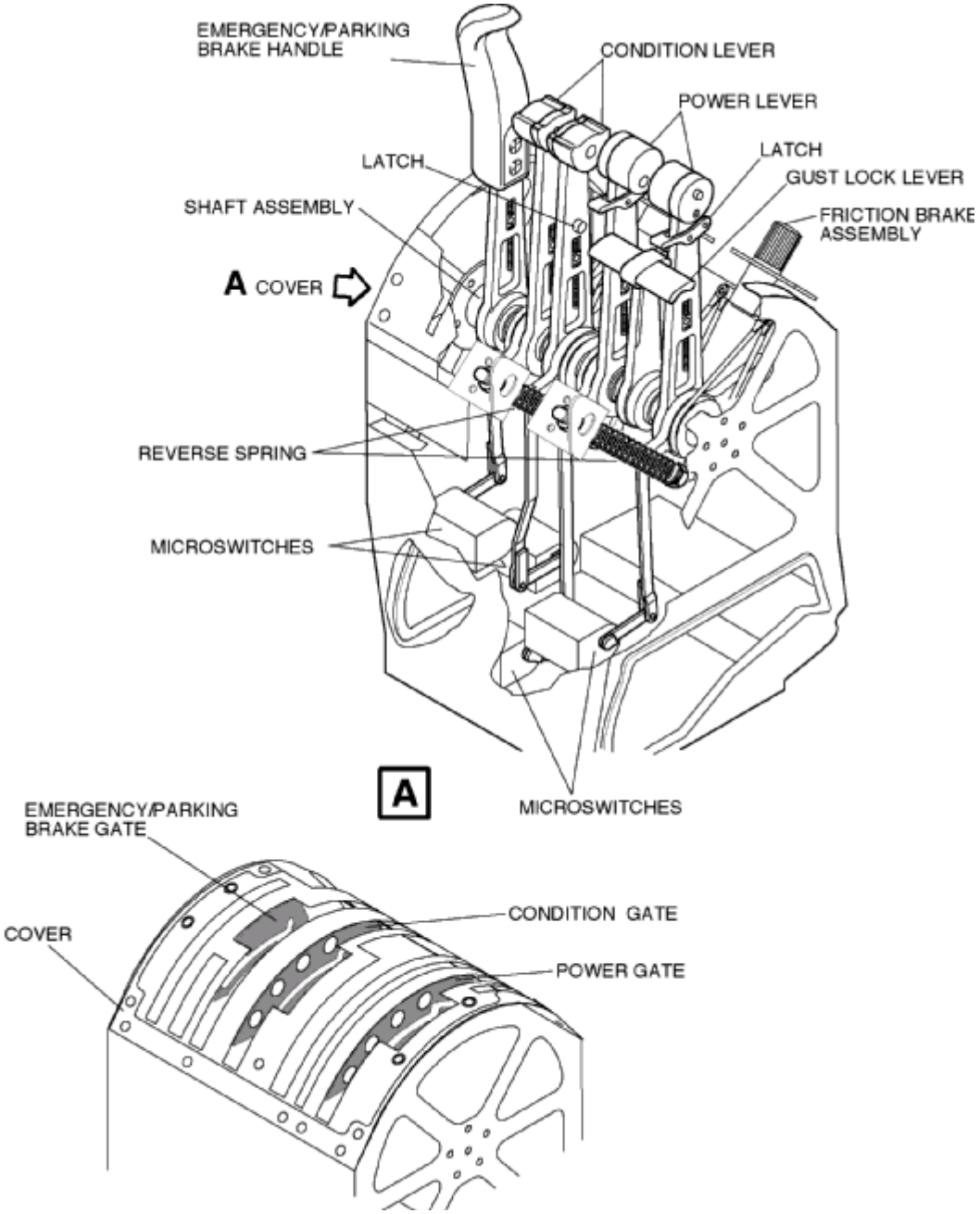
ICN-AE-A-050201-A-D0216-00007-A-001-01

Fig 5 Sub-subsystem level illustration - Example



ICN-AE-A-050201-A-D0216-00008-A-001-01

Fig 6 Unit level illustration - Example



ICN-AE-A-050201-A-D0216-00009-A-001-01

Fig 7 Unit level illustration - Example

2.3.3 Schematic diagrams

Schematic diagrams data modules must be provided for all circuits of the Product.

The schematic diagrams must show the direction of flow through a system and the relationship of the components comprising the system. Every effort must be made to obtain the most logical presentation of information by showing signal or supply flow from left to right and/or top to bottom. Schematic diagrams of electro-mechanical systems, such as hydraulic, pneumatic, fuel, etc, must be drawn showing the mechanical and electrical relationships in an integrated presentation.

If necessary, the flow through pipelines must be identified by different patterns. Units and components of the system being presented must be outlined and identified by name and/or equipment identification and location. Splitting of black boxes on schematics must be held to a minimum.

Complex subsystems, sub-subsystems and/or functions and their interconnections will require more than one level of schematic as noted below:

First level	Block schematic diagrams (have broad scope but little depth)
Second level	Simplified schematic diagrams (have schematic symbols but do not show individual wires)
Third level	Detail schematic diagrams (show all components, applicable wiring, functional interfaces and give sufficient detail for maintenance)

Data modules must be coded:

YY-A-**SS**-**YY**-**YY**-NNY-054A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**YSS**-**YY**-**YYYY**-**NN**YYY-054A-A (37 characters)

Where:

- "**SS**", the system to which data and information are applicable. Refer to Chap 8.2. "00" is used if data and information are applicable to the Product as a whole.
- "**SS-YY-YY"/"YSS-YY-YYYY**" is the SNS the schematic diagram is related to.
- "**NN**" is a sequential number starting from "00", if more than one data module is needed.

2.3.3.1 Block schematic diagrams

The block schematic must be used in the descriptive portion to simplify complex circuits. Non-specialist personnel should be able to obtain an understanding of the function and operation of the system, subsystem, or sub-subsystem. The block schematic is useful to show the arrangement of system components and current/signal flow through the system. It should be considered a training aid, supplementing the circuit description, without requiring extensive electrical background on the part of the reader or trainee. In general, the function of a particular system component is indicated without stating how this is accomplished.

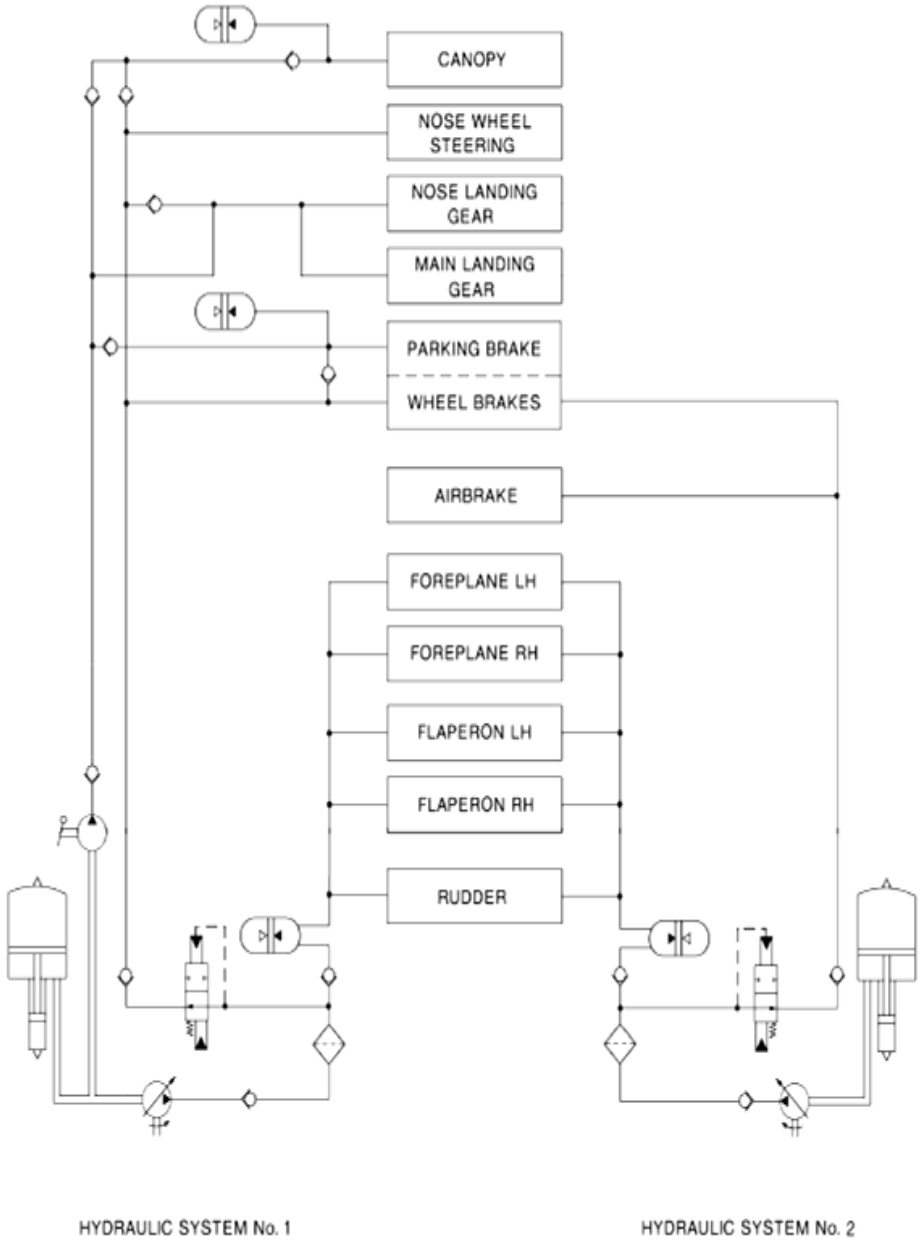
The primary purpose of the block schematic diagram must provide a rapid understanding of the major replacement items and their interrelationship. Signal flow information is limited to primary functions and does not include control, inhibiting, interlocking, etc.

The block schematic diagrams must only consist of one figure for the depicted system, subsystem or sub-subsystem.

Unit or component representation will generally be limited to rectangular shapes with restricted use of symbols and pictorial drawings.

Block schematic diagrams data modules must be prepared for each system except those instances where one or two subsystems comprise the entire function.

For an example of a block schematic diagram, refer to Fig 8.



ICN-AE-A-050201-A-D0216-00010-A-001-01

Fig 8 Block schematic diagram - Example

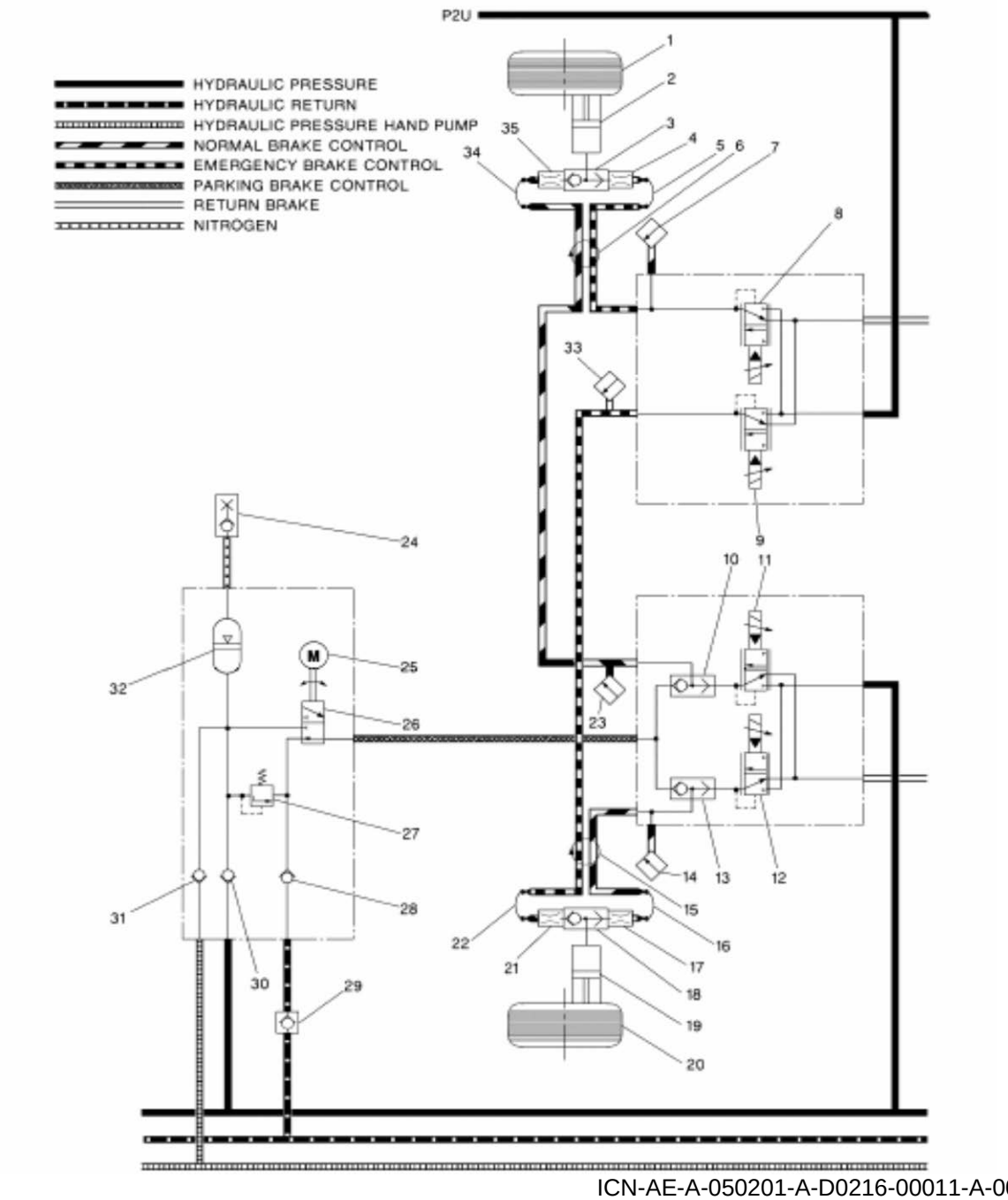
2.3.3.2 Simplified schematic diagrams

The simplified schematic is in the same category as Para 2.3.3.1 but must be broader in scope. A simplified circuit must be presented without regard to unit location in the air vehicle, land or sea system, but electrically accurate, to allow a clear presentation of the overall circuit. This type of schematic is valuable in showing the simplified electrical operation of the system, subsystem, or sub-subsystem components and their interconnections. It can be used for training to allow a more detailed understanding of the operation of the system. The primary purpose of simplified schematic diagrams must supplement the block of detail schematic diagrams to provide a better understanding of the performed function, or functions.

Simplified schematic diagrams data modules are normally prepared for systems, subsystems or sub-subsystems where the complexity is such that detail schematic diagrams do not enable easy understanding of the system.

Simplified schematic diagram data modules can consist of more than one figure.

For an example of a simplified schematic diagram, refer to Fig 9.



ICN-AE-A-050201-A-D0216-00011-A-001-01

Fig 9 Simplified schematic diagram - Example

2.3.3.3 Detail schematic diagrams

The detail schematic diagrams must be used to depict electronic systems and components which use logic or two-state devices in their construction. It must be designed to aid the

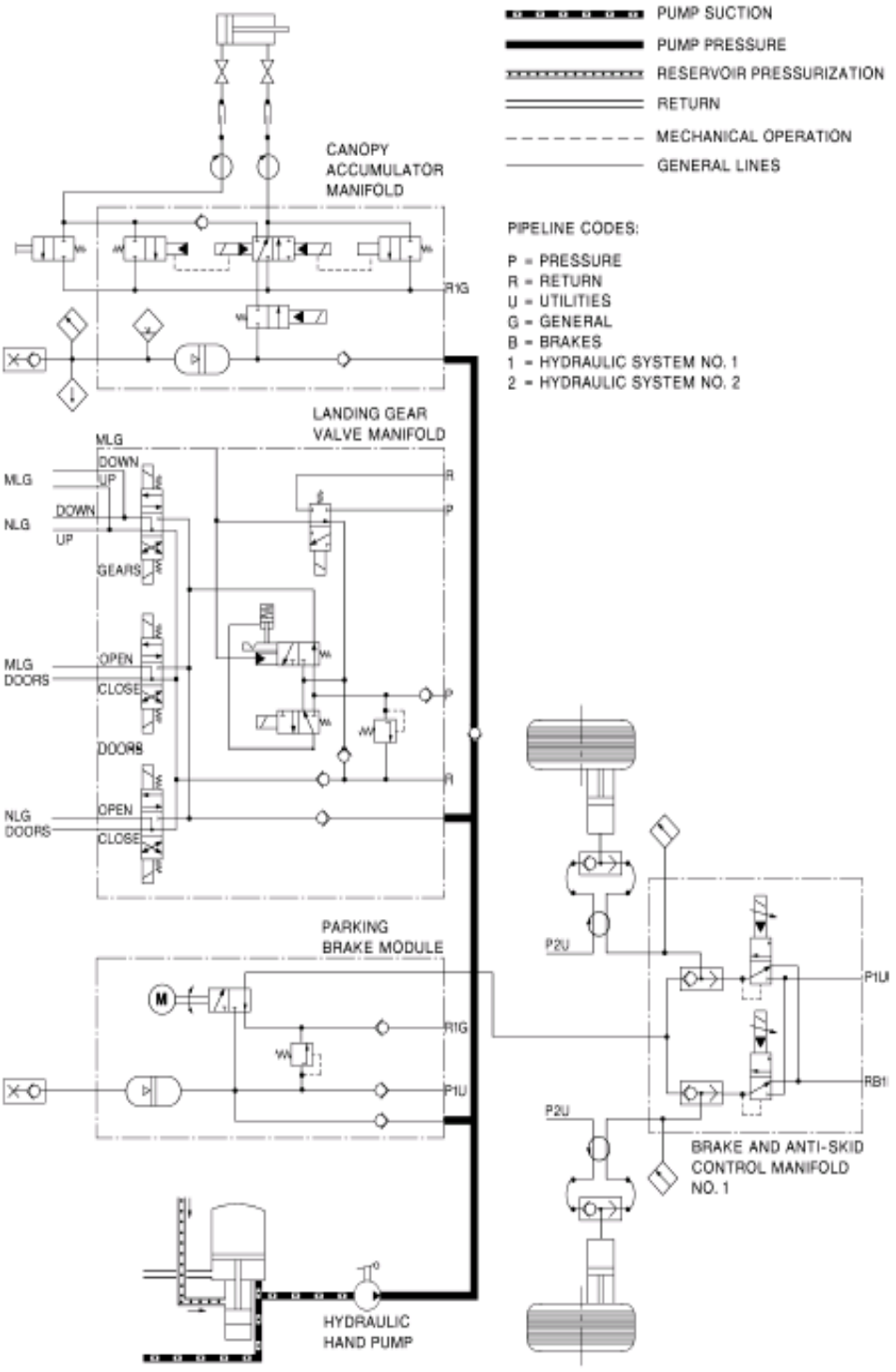
understanding of the function and operation of a circuit without showing the physical construction.

The primary purpose of the detail schematic diagrams must provide sufficient information for subsystem maintenance.

Detail schematic diagram data modules must be prepared for systems, subsystems, sub-subsystems and/or functions if required by its complexity.

Detail schematic diagram data modules can consist of more than one figure.

For an example of a detail schematic diagram, refer to Fig 10.



ICN-AE-A-050201-A-D0216-00012-A-001-01

Fig 10 Detailed schematic diagram - Example

Chapter 5.2.1.3

Common information sets - Maintenance information

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Chap 5.2.1.3.2	Maintenance information - Fault isolation
Chap 5.2.1.3.3	Maintenance information - Non-destructive testing
Chap 5.2.1.3.4	Maintenance information - Corrosion control
Chap 5.2.1.3.5	Maintenance information - Storage

1 General

This chapter contains the references to the chapters for preparation and coding of data modules of information required for the on-equipment maintenance on the Product.

2 Maintenance information

They cover the rules for the information which enable skilled personnel to perform maintenance tasks on systems and its installed components of the Product. The detailed specifications are referenced in the chapters below:

- Maintenance procedures, refer to Chap 5.2.1.3.1
- Fault isolation, refer to Chap 5.2.1.3.2
- Non-destructive testing, refer to Chap 5.2.1.3.3
- Corrosion control, refer to Chap 5.2.1.3.4
- Storage, refer to Chap 5.2.1.3.5

Chapter 5.2.1.3.1

Maintenance information - Maintenance procedures

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Chap 5.2.2.2	Air specific information sets - Structure repair information
Chap 5.2.2.6	Air specific information sets - Engine standard practices
Chap 8.2	SNS, information codes and learn codes - Maintained SNS, General
Chap 8.3	SNS, information codes and learn codes - Example SNS
Chap 8.4	SNS, information codes and learn codes - Information codes

1 General

1.1 Purpose

This chapter specifies the rules and gives guidance for the preparation and coding of data modules for the Product maintenance procedures.

1.2 Scope

It covers the requirements for the preparation of information which will enable skilled maintenance personnel to carry out maintenance tasks on the Product and its installed components. The information must be given to enable personnel to:

- connect and disconnect test equipment and power supplies
- use any required special tool and support equipment
- maintain and service the Product and its systems/components
- perform tests which will show whether systems and components meet their minimum acceptable performance standards
- rectify failures
- remove and install all systems/components in a minimum amount of time

1.3 Standards and definitions

The standards and definitions given in this chapter are applicable with no exceptions.

2 Content

2.1 Introduction

If required, the introduction data modules contain explanations of the purpose, scope, structure, special format and use of the technical content of the Information set. They also contain necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-00-00-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-000-00-0000-**NN**AAA-018Y-A (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different information sets.

2.2 General maintenance procedures

2.2.1 Air vehicles, systems 00 thru 20 and 51, 60 and 70

For air vehicles, normally the following systems are applicable to maintenance procedure data modules:

- 00 - Product - General
- 06 - Dimensions and areas
- 07 - Lifting, shoring, recovering and transporting
- 09 - Handling and maneuvering
- 10 - Parking, mooring, storing and return to service
- 11 - Placards and markings
- 12 - Servicing
- 18 - Vibration and noise analysis and attenuation
- 20 - Standard practices - Airframe systems

System 51, Standard practices - Structures, System 60, Standard practices - Propeller/rotor and System 70, Standard practices - Engine, can also be included, although the main part of this information is covered in other information sets (eg, in the Structure Repair (SR) information set, refer to Chap 5.2.2.2, and in the Engine Standard Practices (ESP) information set, refer to Chap 5.2.2.6).

2.2.2 Land and sea products, systems 00 thru 19

For land and sea products, the systems 00 thru 19 must be used where appropriate.

Land and sea applications utilize the SNS as defined in their specific program, but follow the information code examples within this chapter.

2.2.3 Breakdown of information

Applicable systems must normally be broken down into subsystems/sub-subsystems outlined in the SNS.

Example: System 09 "Handling and maneuvering" contains the subsystems "General", "Handling" and "Maneuvering". The subdivision of the information into data modules must follow applicable information code headings.

2.2.4 Data module coding

Guidelines for the information content of these systems are given in the detailed definitions of the SNS subsystems/sub-subsystems listed in Chap 8.2 and Chap 8.3.

Data modules must be coded:

YY-Y-YY-YY-YY-00Y-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-00YYY-YYYY-A (37 characters)

2.3 Systems

2.3.1 Applicable systems

2.3.1.1 Air vehicles

Information on air vehicles must be covered, as applicable, in the following systems:

- System 21 - Environmental control

thru

- System 99 - Electronic warfare

except systems 51, 60 and 70

2.3.1.2 Land and sea products

For land and sea products, applicable systems can be determined by the project or the organization.

Business rule decision point BRDP-S1-00404 - Applicable systems for land and sea products:

- Decide the applicable systems for land and sea products.

2.3.2 Data module coding

Basically, the information breakdown must be structured in accordance with the data module code. Refer to Chap 4.3.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-YYYY-A (37 characters)

The following paragraphs give details on the information to be covered, as applicable, for each system.

2.3.3 Servicing

For details on servicing information (IC 2YY). Refer to the information code definitions given in Chap 8.4.

Servicing procedure data modules must include those procedures that are normally required as a result of other maintenance actions. These servicing procedures must be self-contained, if possible, and can be either routine or restorative in nature.

2.3.4 Examinations, tests and checks

For detailed information on examinations, tests and checks (IC 3YY). Refer to the information code definitions given in Chap 8.4.

Tests vary in complexity and stringency depending on the conditions under which a unit functions or was replaced. It is not intended that a complex functional test of a complete system with attendant narrow tolerances be performed if the replaced unit reactivates the system and operates within the confines of a go-no-go specification. To avoid duplication of test procedures, maintenance procedures must reference a test only if the major test procedure is so unitized that the individual assembly/unit test can be called out without overlap, and accomplishment does not require completion of the overall test. In this case, specific start and stop instructions must be given.

2.3.5 Disconnect, remove and disassemble procedures

For detailed information on disconnect, remove and disassemble procedures (IC 5YY), refer to the information code definitions given in Chap 8.4.

These procedures which describe the removal of a component, assembly, subassembly, unit, combination of parts, etc, from the Product must clearly give the step-by-step operation in a logical work flow sequence, as necessary, to gain access to and subsequently remove the desired hardware. Where necessary, attention must be drawn to variations of remove procedures with regard to future installation of the same or a replacement item.

A list of required material, tools, fixtures, or support equipment must be listed in tabular form at the beginning of the procedure. Any prerequisite procedures (required conditions), such as "Open access panel xyz", to be performed prior to a particular removal or deactivation task, must be given or appropriately referenced. Panel opening instructions must reference the panel number. All measurements or values to be documented prior to an individual task must be listed at the beginning of the applicable step.

2.3.6 Repairs and locally make procedures and data

For detailed information on repairs and locally make procedures (IC 6YY). Refer to the definitions given in Chap 8.4.

These procedures must consist of detailed step-by-step repair processes and specifications in a logical work flow sequence, as required, to restore a worn or damaged part to serviceable condition. The repair procedure must show the level of restoration required for the specified level of maintenance. Excluded are repairs contained in the SR information set. Each repair data module must be self-contained and must include basic information such as, but not limited to:

- views of the basic condition/location for all areas of restoration
- data such as pertinent finish, reference dimensions, flow rate
- special dimensional instructions

– inspection requirements necessary to determine the integrity of the repair. If a test is required following the repair, the specific test required must be referenced.

2.3.7 Assemble, install and connect procedures

For detailed information on assemble, install and connect procedures (IC 7YY). Refer to the information code definitions given in Chap 8.4.

These procedures must describe the installation of a component, assembly, subassembly, unit, combination of parts, etc, and interrelated parts in the Product. If applicable, the procedures must also describe any post installation operations that must be rectified such as closing panels. The procedures must clearly describe the step-by-step operations in a logical work flow sequence, as necessary, to install the basic and the access hardware, if applicable.

All measurements or values (eg, special torques values) must be provided within the step-by-step text without reference to other sections.

The procedures must be accompanied by appropriate illustrations depicting the use of required tools or equipment. Each illustration must have its parts numerically highlighted (callout), with the step-by-step instructions referencing these numbers.

If a test is required as part of installation or reactivation, the specific test must be included or referenced.

Chapter 5.2.1.3.2

Maintenance information - Fault isolation

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1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for the Product Fault Isolation (FI) information.

1.2 Scope

It covers the rules for the preparation of FI information which will enable skilled personnel to analyze reports provided by:

- the monitoring systems of the Product
- the crew/operators and/or maintenance personnel
- the result of post mission inspections

According to the level of accuracy of the data, the analysis must be followed by:

- an inspection, check and/or test
- a corrective action
- or a fault isolation procedure

The FI information contains the following topics:

- Isolated, detected, observed and correlated fault lists
- Fault isolation procedures, text and diagrams
- Fault isolation task supporting data
- Fault code index (derived information)
- Maintenance message index (derived information)

1.3 Standards and definitions

1.3.1 Standards

The standards given in this chapter are applicable with no exceptions.

1.3.2 Definitions

The following definitions and those stated in Chap 9.2 must be used as appropriate.

- **Built in test (BIT):** An integrated capability of the mission system or equipment which provides an automated test capability to detect, diagnose, or isolate failures. A BIT is designed as an integrated part of the electronics system design. BIT functions are performed on-line by exercising devices within the electronic systems by use of software and hardware stimuli or monitoring circuits. BIT requires no external stimuli or measurement equipment to perform its functions.
- **Corrective action:** A maintenance process which makes a fault and its cause cease to exist.
- **Correlated fault:** A set of faults that are detected, filtered and grouped by the monitoring system as a unique fault with a unique reference to a fault isolation procedure.
- **Detected fault:** A fault which is detected by the monitoring system and is then automatically stored.
- **Fault:** Malfunction, impairment, or abnormal condition of the Product.
- **Fault code:** A code which uniquely identifies a fault in the FI information set.
- **Fault description:** A phrase which concisely describes a fault. For monitored faults and status messages, the fault description is the fault name as it appears on the display screen.

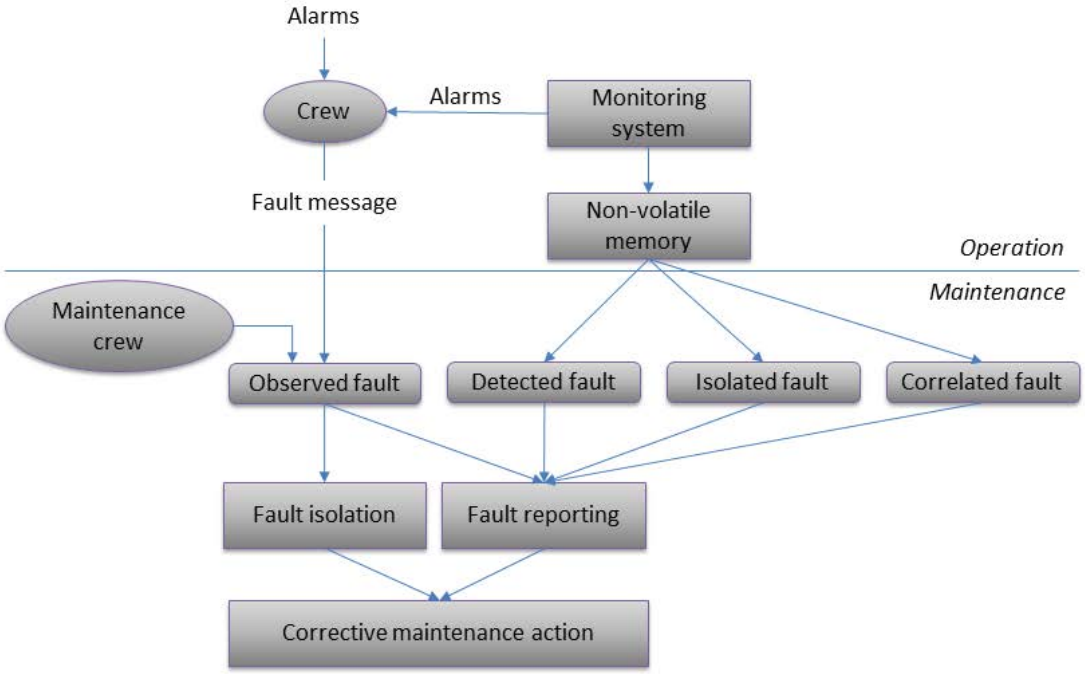
- **Fault isolation procedure:** The systematic process of identifying a malfunctioning element in the Product and determining the actions necessary to restore the system to its normal condition. Fault isolation procedure and troubleshooting are equivalent terms.
- **Isolated fault:** A fault which is detected and isolated by the monitoring system.
- **Maintenance message:** A message produced by an on-board maintenance computer to aid in determination of corrective action, but which is not normally made available for review by the crew.
- **Observed fault:** A fault detected by the crew or maintenance crew.
- **Symptom:** Event or phenomenon which reveals a fault.

2 Fault isolation

2.1 General

Faults are classified as follows (refer to Fig 1):

- isolated fault
- detected fault
- observed fault
- correlated fault



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Fig 1 Trouble shooting process overview - Example

2.2 Introduction

If required, the introduction data modules contain explanations of the purpose, scope, structure, special format and use of the technical content of the information set. They also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

2.3 Data modules must be coded:

YY-Y-00-00-00-NNA-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-NNAAA-018Y-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed.

The information code variant is used to distinguish between the different information sets.

Data module coding

To assist in the coding of data modules, the rules which follow must be used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-**SS-YY-00-NN**Y-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y**SS-YY-0000-NN**YYY-YYYY-A (37 characters)

Where:

- "**SS**", the system to which data and information are applicable. Refer to Chap 8.2. "00" is used if data and information are applicable to the Product as a whole.
- "**SS-YY-00**"/ "**YSS-YY-0000**" is the SNS to which the information, list or procedure is related
- "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

2.4 Isolated fault list

These data modules list all maintenance messages related to faults which can be isolated and stored by the monitoring system. The messages are sorted by the fault code and the faulty Line Replaceable Unit (LRU) at system level.

Data modules must provide the following information for each message:

- the message identification as it is displayed to the maintenance crew
- a concise and/or a more detailed description
- the LRU which detected the failure (identification, name and abbreviation)
- the faulty LRU (identification, name and abbreviation)
- the corrective action to be performed to restore the system to its normal condition

If the maintenance message contains it, the faulty Shop Replaceable Unit (SRU) will also be pointed out.

Data modules must be coded:

YY-Y-SS-YY-00-NNY-411Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-411Y-A (37 characters)

2.5 Detected fault list

These data modules list all maintenance messages related to faults which can be detected and stored by the monitoring system. The messages are sorted by fault code and potential faulty LRU at system level.

Data modules must provide the following information for each message:

- the message identification as it is displayed to the maintenance crew
- a concise and/or a more detailed description
- the LRU which detected the failure (identification, name and abbreviation)
- the list of potential faulty LRU (identification, name and abbreviation)

For each potential faulty LRU, the following information must be provided:

- the confirmation test (test or BIT description or maintenance procedure data module reference)
- if fault is confirmed for this LRU, the corrective action to be performed to restore the system to its normal condition

If the maintenance message contains it, potential faulty SRU will also be pointed out.

Data modules must be coded:

YY-Y-SS-YY-00-NNY-412Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-412Y-A (37 characters)

2.6 Observed fault list

These data modules list all symptoms related to observed faults which can be reported by crew/operators or observed by the maintenance crew. The description of symptoms must be simple and non-ambiguous. Symptoms can be related to suspected faulty LRUs. Symptoms are listed by the fault code at system level.

Data modules must provide the following information for each symptom:

- the symptom description as it appears to maintenance or operation crew (alarm description and occurrence conditions)
- the fault cause

If the fault is non-ambiguous (one LRU responsible for the fault), the fault cause provides the faulty LRU or the fault reason (eg, wiring failure, hydraulic leak on circuit 1) and the recovery action to be taken.

If the fault is ambiguous (several LRU are likely to have caused the observed symptoms), the fault cause provides information needed to isolate the failure as follows:

- the Product fault isolation procedure data module reference

or

- a list of potential faulty LRU

For each potential faulty LRU, the following information must be provided:

- the confirmation test (test or BIT description or maintenance procedure data module reference)
- if the fault is confirmed for this LRU, the corrective action to be performed to restore the system to its normal condition

Data modules must be coded:

YY-Y-SS-YY-00-NNY-413Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-413Y-A (37 characters)

2.7 Correlated fault list

These data modules list all sets of maintenance messages which have been correlated and which can be recognized by the monitoring system.

Data modules must provide the following information for each correlated fault:

- a list of messages and associated warnings/malfunctions that have been correlated and introduced through their fault code. Optionally, for each unitary fault part of the correlated fault (ie, a maintenance message or a warning/malfunction) data modules can contain:
  - a reference to the data module where the unitary fault has been introduced (eg, a "detected fault list" data module)
  - a concise and/or a detailed description of the fault
  - detection information
- isolation information for the whole correlated fault (either through a reference to an isolation procedure or through a list of potential faulty LRU)
- optional remarks

Data modules must be coded:

YY-Y-SS-YY-00-NNY-414Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-414Y-A (37 characters)

2.8 Fault isolation procedure

2.8.1 General

Each fault isolation procedure must contain all operations needed to isolate the fault and must terminate with instructions for correcting it. The fault isolation procedures are the most direct and shortest method of isolating the fault and must not include any unnecessary steps.

One isolation procedure can be used for several fault codes provided each can be adequately isolated within the one procedure.

Fault isolation must be carried out to the level of component replacement or other action capable of being accomplished on the Product (ie, wiring investigation, card replacement or adjustment).

Each data module contains the complete fault isolation procedures for each fault code even though certain information is normally associated with several different data modules. The procedures must not refer the user to another data module in order to complete the isolation.

If more than one component is involved in a given corrective action, then all components must be listed in order of fault probability.

Data modules must be coded:

YY-Y-SS-YY-00-NNY-**4XX**Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-**4XX**Y-A (37 characters)

where "**4XX**" in the information code, is a sequential number from 420 thru 428.

2.8.2 Content

The fault isolation procedure data module contains the following information:

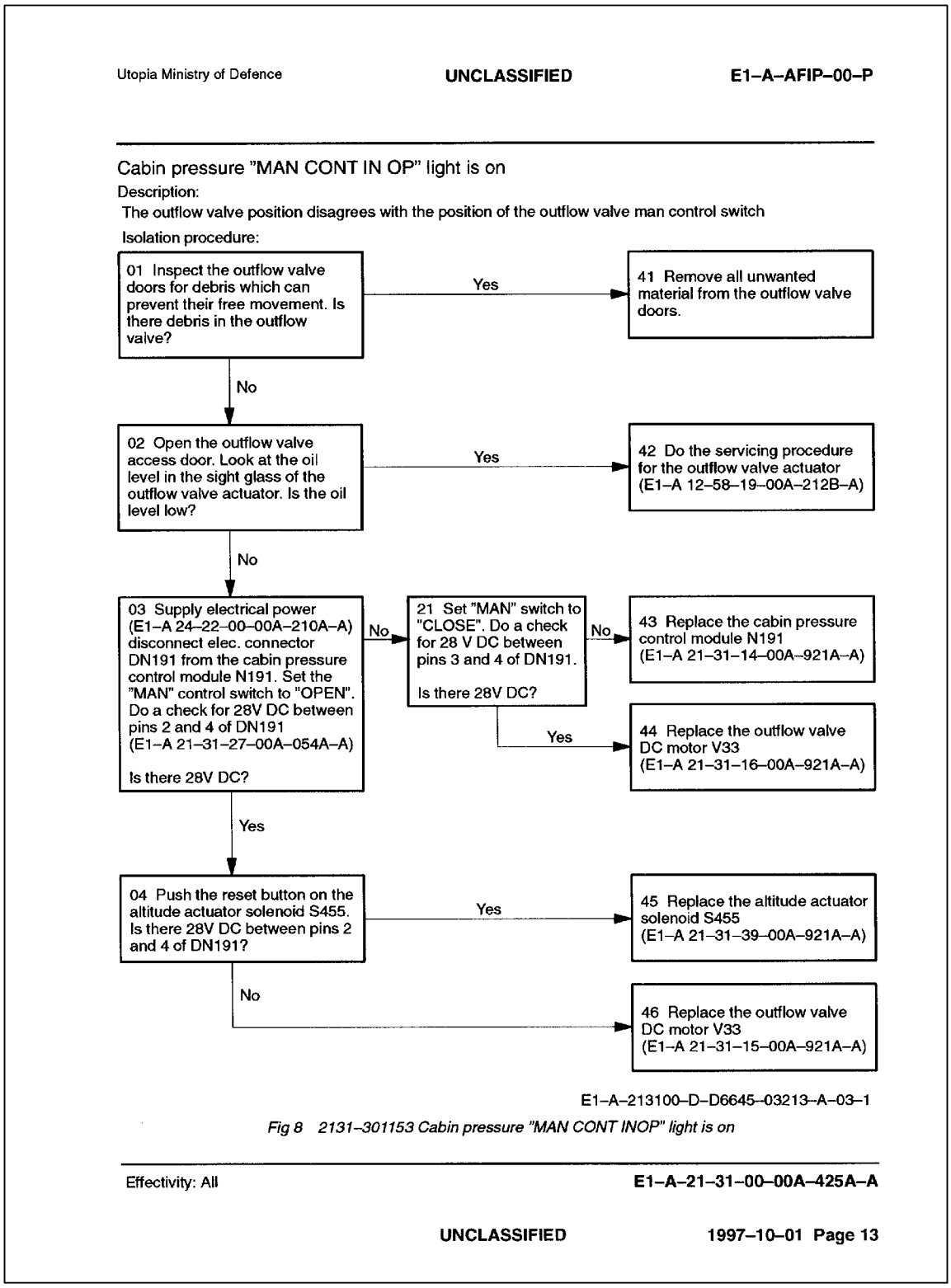
- the fault code
- the fault description - a concise and/or a more detailed description of the fault
- prerequisites - any prerequisite steps which must be performed before starting the fault isolation procedure
- the fault isolation procedure

A fault isolation procedure can be described by a fault isolation diagram (refer to Fig 2) and/or a structured sequence of isolation steps (refer to Chap 6.2.3.4).

Each isolation step contains:

- an action (What must be done?)
- followed by a question (What is the result of the action?)
- and possible answers

Each isolation step refers to another isolation step in the procedure.



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Fig 2 Fault isolation diagram - Example

2.9 Fault isolation task supporting data module

Fault isolation task supporting data modules are only produced when absolutely necessary. Whenever possible, already available data modules (eg, block diagrams, wiring diagrams, location drawings, access layout) are used instead.

Data modules must be coded:

YY-Y-SS-YY-00-NNY-430Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-430Y-A (37 characters)

2.10 Fault code index

The fault code index (refer to Table 2) is a list of all fault codes in numerical order for the applicable system. For each fault code, the fault code index gives one or more data module references (data module codes (DMC)) to fault isolation procedures.

The fault code index must contain:

- the fault code
- the fault description
- the maintenance messages
- the fault isolation data module reference

Data modules must be coded:

YY-Y-SS-YY-00-NNY-441Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-441Y-A (37 characters)

Table 2 Fault code index - Example

Fault code	Fault description	Fault isolation reference/DMC
993-01	Radio failed	JP-A-99-31-00-00A-421A-A
993-02	RW/LW failed	JP-A-99-32-00-00A-421A-A
993-03	CPU failed	JP-A-99-32-00-00A-422A-A
993-04	WARNING failed	JP-A-99-32-00-00A-423A-A
993-06	AUDIO WARNING failed	JP-A-99-35-00-00A-421A-A
993-07	NO LIBRARY loading	JP-A-99-35-00-00A-422A-A

2.11 Maintenance message index

The maintenance message index is a list of all maintenance messages in numerical order. For each maintenance message, the maintenance message index gives one or more data module references (DMC) to fault isolation procedures.

The maintenance message index must contain:

- the maintenance message
- the maintenance message text
- the fault isolation data module reference

Data modules must be coded:

YY-Y-SS-YY-00-NNY-442Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YSS-YY-0000-NNYYY-442Y-A (37 characters)

Chapter 5.2.1.3.3

Maintenance information - Non-destructive testing

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Chap 8.2	SNS, information codes, and learn codes - Maintained SNS
Chap 9.2	Terms and definitions - Terms, acronyms and subject index

1 General

1.1 Purpose

There are a number of rules and guidelines that must be considered during the preparation and coding, where appropriate, of data modules that contain Product Non-Destructive Testing (NDT) information.

1.2 Scope

Explanation is provided for the preparation of information applicable to NDT which provides instructions and guidance to skilled non-destructive testing technicians when performing non-destructive testing techniques on systems, subsystems and their items.

NDT information not only includes coverage for primary and secondary structures and proprietary items, but all NDT procedures for engines and items that can be tested "on-Product". For those Product items/equipment which have equipment manuals, "off-Product" NDT information is included in those publications. The "off-Product" NDT information for items/equipment which do not have equipment manuals is included in the NDT information set. The NDT information must contain the following topics:

- general information
- dye penetrant
- magnetic particle
- eddy current
- x-ray
- ultrasonic
- gamma-ray
- resonance frequency
- thermographic

1.3 Standards and definitions

1.3.1 Standards

The standards given in this chapter are applicable with no exceptions.

1.3.2 Definitions

The following definitions and those stated in Chap 9.2 must be used as appropriate:

- **NDT**: A group of techniques (eg, radiographic, ultrasonic) which examine items for faults without making them unserviceable.
- **NDT technicians**: Persons who have been trained in NDT of the Product and its support equipment items, and have been approved by their national military and/or civil authority.
- **Critical area**: Determination of critical areas or items is based on:
  - flight safety considerations (primary structure as defined in the Structure Repair (SR) information set and non-redundant subsystem items, the failure of which can cause loss of the Product)
  - mission essential considerations (secondary structure as defined in the SR information set and subsystem items, the failure of which degrades the ability of the Product)

- maintenance economy considerations (structure and subsystem items that require extensive or repetitive disassembly to do visual inspection of internal areas)

Note

Critical areas are not necessarily limited to structural items. All subsystem components must be analyzed for criticality.

- **Technique**: The method used for non-destructive testing (eg, X-ray, dye penetrant).
- **Test**: The performance of a technique on an item. It can comprise more than one procedure.
- **Standard heading**: The first level of captioning a test (eg, Applicability, Item description, Procedures).
- **Non-relevant indication**: An equipment response that is due to factors other than discontinuities or faults of the tested item.

2 Non-destructive testing

2.1 General requirements

The NDT information must include all instructions, procedures and techniques for the Product. NDT techniques must be developed to test critical areas of items for potential service faults (eg, cracks, corrosion, wear, deformation). NDT technique development is required whenever one or more of the following criteria are met:

- The NDT technique improves safe operation or reliability of the system or item
- A saving in maintenance costs or man hours can be realized by using NDT techniques
- Operational effectiveness or life cycle costs are favorable effected

Emphasis must be placed on development of NDT techniques that can be applied to the system or item with little or no disassembly (on-condition maintenance). If necessary, multiple NDT techniques can be developed for assembled (on-condition maintenance) and disassembled items.

Routine visual examinations including optical examinations by using a magnifying glass, a borescope or fiber optics that are normally accomplished by technicians must not be included in the NDT information but must be included in the applicable Product maintenance data modules. Special cases can be included on request of the operators based on item criticality, or based on special preparation or test technique requirements. Visual or optical examinations can be included in the NDT information when used as a confirmation procedure and to identify the test area. The examinations need not be detailed procedures.

Other techniques than those given in Para 1.2, can be included as necessary if they will provide significant improvements in inspection capability. Proposals for inclusion of techniques and equipment not presently used must be submitted to the publication authority as soon as identified. Support equipment requirements must be identified using relevant provisioning procedures.

2.2 Data module coding

To assist in the coding of NDT data modules, the following rules must be used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-**SS**-**YY**-**YY**-**YYY**-**XXX**Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y**SS**-**YY**-**YYYY**-**YYYYY**-**XXX**Y-A (37 characters)

Where:

- "**SS**", the system to which data and information are applicable. Refer to Chap 8.2. "00" is used if data and information are applicable to the Product as a whole.
- "**SS-YY-YY**"/"**YSS-YY-YYYY**", the SNS code of the item to be tested
- "**YYY**"/ "**YYYYY**", the disassembly code, which must normally be "00", but can be used if required. Refer to Chap 4.3.5 for detailed rules on the use of the disassembly code variant.
- "**XXX**", the information code:

  - 350 - Structure test
  - 351 - Test for surface cracks with dye penetrant
  - 352 - Test for surface cracks with magnetic particles
  - 353 - Test for cracks and other defects with eddy current
  - 354 - Test for cracks and other defects with X-rays
  - 355 - Test for cracks and other defects with ultrasonics
  - 357 - Gamma-ray test
  - 358 - Resonance frequency test
  - 359 - Thermographic test

The item location code must be "A".

2.3 Introduction

If required, the introduction data modules must contain an explanation of the purpose, scope, structure, special format, and use of the technical content of the information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-00-00-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-**NN**AAA-018Y-A (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

2.4 General information

General data modules must include, but not limited to:

- reference data
- general applications

In the general applications data module, short descriptions of all NDT techniques must be given. Short definitions of non-destructive testing and the primary non-destructive testing techniques (eg, fluorescent penetrant Type I, Methods B, C and D with applicable test materials, or ultrasonic angle beam, straight beam tests, with applicable search units or manual/automatic eddy current tests with applicable probes) must also be included. The intention of these paragraphs is to provide general information.

Warnings, cautions and notes must be included related to:

- the needs of skilled NDT technicians
- the authorization to adjust equipment settings to obtain the necessary response
- radiation hazard warnings

2.5 Non-destructive testing techniques

The NDT data modules must have the standard headings given in Para 2.6. Specific information requirements for each technique is given in Para 2.7.

2.6 Tests

Each test must be a self-standing data module and must include a title and the following headings:

1 Applicability

2 Tools, equipment and materials

3 Item description

4 Preparation and cleaning

5 Test equipment adjustment

6 Procedures

7 Indication evaluation

8 Acceptance and rejection standards

9 Restoring the Product

2.6.1 Title

The data module title must contain the name of the item to be tested. The name of the item must be that given in the appropriate illustrated parts breakdown.

2.6.2 Applicability:

- Identify and locate affected part or parts, using the methods described in Chap 3.4.
- Provide part number, serial number, Product series model number and/or any other necessary identifiers to show the complete applicability of the procedure.

2.6.3 Tools, equipment and materials:

- Give the minimum acceptable performance standards for instruments, equipment and materials required to perform the procedure.
- If instruments, equipment and/or materials cannot be given by minimum performance standards, then list all manufacturer's units and/or products approved.
- If only one manufacturer's unit or product is approved, this must be listed with the reason why it is the only one.
- List the fixtures, probes, transducers, reference standards and special tools required to perform the procedure and provide drawings for items that can be made locally by the operator. Include recommended sources for any special materials.
- Describe the type of viewing light and/or lighting conditions required.
- Indicate the film size, type and container to be used for X-ray and gamma-ray procedures.

2.6.4 Item description

The first section must describe and identify the item to be tested. The following information must be provided in the text and/or the illustration.

When the testing techniques are sensitive to surface condition, the text must include the material, the heat treatment condition, the method of manufacturing (eg, casting, forging, extrusion, sheeting), surface treatments, coatings, finishes. The backup procedure, if required, must be stated.

A concise statement or summary of purpose, or function, of the item including the direction and type of loads must be included when these factors have an effect on the test procedure.

The second section must be a description of the probable fault and its cause. The location of the fault must be shown on the illustration.

Symbols that must be used to represent NDT techniques and which provide detail in illustrating test procedures must be shown in the List of symbols. Wherever possible, the symbol for the primary and confirmation method must be placed adjacent to the area to be inspected in the next higher assembly illustration.

2.6.5 Preparation and cleaning:

- List the requirements for access to the part or area to be checked
- Specify whether the electrical power must be on or off
- Specify any special work stands required
- List any requirements for fluid removal (eg, fuel, water, hydraulic fluid) from the area to be checked
- Specify any special cleaning requirements
- Specify any surface coating removal requirements
- Include all necessary warnings and cautions (eg, radiation hazard protection)

2.6.6 Test equipment adjustment

The test equipment adjustment information for this heading is derived from the different test procedures specified in Para 2.7.

2.6.7 Procedure

The procedural information for this heading is described in the different test procedures specified in Para 2.7.

Each test must, if necessary, specify a confirmation (backup) test procedure by another means to verify the initial case where the initial test results do not provide incontestable data to determine the serviceability of the tested item.

It is desirable to perform the confirmation procedure by a technique employing direct visual examination (optical, magnetic particle or dye penetrant) when the initial procedure is done by an instrument technique (X-ray, gamma-ray, ultrasonic, resonance frequency or eddy current), provided it does not result in extensive disassembly. In those cases where direct examination techniques require considerable disassembly, the use of a different instrument technique is the preferred means of confirmation. In isolated cases, it can be necessary to disassemble for visual confirmation in order to provide the necessary information for determination of item serviceability.

2.6.8 Indication evaluation

This information is derived from the different test procedures in Para 2.7.

2.6.9 Acceptance and rejection standards

This information is derived from the different test procedures in Para 2.7.

2.6.10 Restoring the Product

If required, the information for this heading describes how to restore the Product to its ready for operate condition (ie, follow-on maintenance). Wherever possible, cross-references must be made to other existing and available information.

2.7 Specific information requirements for each technique

2.7.1 Dye penetrant technique

2.7.1.1 Test equipment adjustment

Specify the temperature restrictions, penetrant stock, developer stock, washing system, drying system, and the normal operating temperature of the applied fluids and developer.

2.7.1.2 Procedure:

- Describe any treatment for the preservation of the part or for recording a fault
- Provide acceptable industry penetrant inspection standards whenever possible
- If no acceptable industry standard exists, the following information must be provided:
  - Give the type of penetrant and sensitivity class by noting its standard or equivalent standard, and whether the penetrant is visible or fluorescent
  - List all acceptable penetrants by manufacturer's identification. Advise if any class IV penetrants are acceptable. If only one penetrant is acceptable, this must be stated and the reasons given.
  - Identify the required developer system. If only one developer is acceptable, then state why.
  - When test standards are given, provide an illustration and/or instruction that shows how to test the system sensitivity
  - Describe the acceptable method for applying the penetrant material (dip, paint brush, aerosol, etc)
  - Describe the type and acceptable characteristics of the viewing light (long wave, short wave, visible, etc) and its specifications
  - Identify the washing media required before and after applying the penetrant material
  - Describe any required mechanical stress, application fixtures by part number, or give detailed illustrations
  - Include detailed procedures for cleaning, etching and finishing. References to other documents are not permitted.
  - Describe critical washing or inspection steps where irrelevant indications can cause incorrect readings
  - Illustrate examples of anticipated faults and their possible locations
  - Describe the required lighting conditions for viewing, such as subdued light (measured value) and long wave ultraviolet light, in Angstroms, together with the appropriate filter

2.7.1.3 Indication evaluation

Describe the exact conditions by which faults must be measured.

2.7.1.4 Acceptance and rejection standards:

- Describe the fault and specify the required action
- Include actual fault limits or cross-refer to the limits section in the appropriate publication or associated data modules

2.7.2 Magnetic particle technique

2.7.2.1 Test equipment adjustment:

- Describe the exact orientation of the magnetizing coil, contact pads and magnetic poles. Include pictorial views and a schematic of the setup.
- Specify the use of residual or continuous method as applicable
- Include the formula and/or the tables for magnetizing values required for each test

2.7.2.2 Procedure:

- Provide a detail illustration of the part that shows the flux pattern and the areas of the part where irrelevant indication can occur. Also indicate where special attention is necessary due to weak flux fields. Include as many illustrations or tables indicating flux orientation type and magnitude as required.
- Describe the order of test sequences. Include in-between demagnetization operations, include alternating current (AC) or direct current (DC) for each description as required.
- Describe the anticipated fault orientation. Include a description of irrelevant indications that can confuse the inspection.
- Describe any acceptable permanent magnets which can be used instead of portable equipment to perform the procedure

- Identify and describe any induced current cores, other magnetizing aids, and special fixtures required to perform the procedure
- Specify the type and size of magnetic particles and its suspension medium (colloid)

2.7.2.3 Indication evaluation
Describe the exact standard by which the fault must be measured.

2.7.2.4 Acceptance and rejection standards:
- Describe the fault and specify required actions
- Include actual fault limits or cross-refer to the limits section in the appropriate publication or associated data modules

2.7.3 Eddy current technique

2.7.3.1 Test equipment adjustment:
- Illustrate the probe sensor position in relation to the part, and the expected fault
- Describe the scanning and indexing required
- When high speed rotating probes are used, specify requirements, if any, to mechanically hold the scanner assembly

2.7.3.2 Procedure:
- Describe the scanning motion required
- Describe the signal response expected
- Describe any fixture operation necessary to perform the procedure
- Establish the threshold, low frequency (LF), for maximum penetration on given stack-up of material
- Provide acceptable response data so that locally-manufactured reference standards can be qualified (eg, "Standard probe instrument combination must produce a 50 % meter response when lift-off compensated for 0,15 mm, and have a maximum noise level of 5 % full scale"). The reference standard must be provided by the manufacturer for special applications.
- If an oscillograph recorder is required, provide full scale response time and chart speed

2.7.3.3 Indication evaluation:
- Describe the exact condition the fault is measured by
- Include the acceptable noise level

2.7.3.4 Acceptance and rejection standards:
- Describe the fault or specify required actions
- Include actual fault limits or cross-refer to the appropriate limits section in the publication or associated data modules

2.7.4 Radiographic (X-ray/Gamma-ray) technique

2.7.4.1 Test equipment adjustment:
- Describe by diagram the source locations relative to the subject and film
- Describe the film placement relative to the parts being radio graphed and the radiation source
- Include all sizes and distances in International System (SI) units. If required, a conversion from SI units to non-SI units must also be given in brackets after the SI unit.
- Describe where to place the image quality indicator if used
- In situations where the source to film distance can be varied, specify the maximum angle of incidence that can be varied relative to the subject

2.7.4.2 Procedures:
- Specify the X-ray intensity in kV and mA and the times of exposure in minutes and/or seconds

- Illustrations must identify any necessary supports, alignment fixtures and templates, showing how these are used with the procedure
- Specify the film type in accordance with American Society for Testing Materials E-94, or equivalent. The relative film speed must also be given.
- Where a film type other than that specified is acceptable, the following statement must be included: "Alternative film speeds can be used provided they produce equal or better definition of the subject"
- Give the screen type and combination
- Specify any required penetrometer in accordance with American Society for Testing Materials or equivalent
- Whenever practical, include a reference radiograph with a sample fault
- Expose radiograph at a definite value allowing for density adjustment (+) or (-) from a specified density on film
- Describe the location on the radiograph where the density must be measured
- Describe the minimum sensitivity required

2.7.4.3 Indication evaluation:

- Describe the lighting conditions the radiograph must be viewed under
- Describe the faults anticipated and the location they will occur on the film
- Describe all necessary measuring aids such as overlays or comparators

2.7.4.4 Acceptance and rejection standards:

- Describe the fault and specify required actions
- Include actual fault limits or cross refer to the limits section in the appropriate publication or associated data modules

2.7.5 Ultrasonic technique

2.7.5.1 Test equipment adjustment:

- Illustrate the transducer position in relation to the part and the expected fault and/or the standard fault
- Describe the scanning required
- Where angle beam testing is utilized, include the complete formula for the generation of the required angles
- Describe the cause of any spurious signals that appear near the inspection window
- When very specific procedures call for the ultrasonic instrument to be operated in a particular manner, provide detailed operating instructions
- Specify requirements, if any, for reject gates or alarms
- When adjusting the amplitude of the standard signal, describe any other signal amplitude to be maintained
- Describe calibration amplitude by percent height of screen and by position, horizontal on the scope (eg, optimize the signal from the standard and adjust the instrument gain to provide an 80 % screen height standard signal at 30 % on the horizontal base line)

2.7.5.2 Procedure:

- Describe the scanning motion required
- Describe the signal response expected
- Describe any fixture operation necessary for the procedure
- List acceptable transducers by characteristics
- Identify any required amplitude blocks by type (area or distance) and reflector size
- Illustrations and text must describe the setup for required "B" and "C" scan-type presentations
- If interface materials (couplings) are required, they must be listed

2.7.5.3 Indications evaluation

Describe the exact criteria the fault must be measured by.

2.7.5.4 Acceptance and rejection standards:
- Describe the fault and specify required action
- Include actual fault limits or cross refer to the limits section in appropriate publication or associated data modules

2.7.6 Resonance frequency and thermographic techniques

2.7.6.1 Test equipment adjustment
As prescribed by industry standards.

2.7.6.2 Procedure
As prescribed by industry standards.

2.7.6.3 Indication evaluation
Describe the exact conditions the faults must be measured by.

2.7.6.4 Acceptance and rejection standards:
- Describe the fault or specify required actions
- Include actual fault limits or cross-refer to the limits section in the appropriate publication or associated data modules

Chapter 5.2.1.3.4

Maintenance information - Corrosion control

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Table 1 References

Chap No./Document No.	Title
Chap 5.2.2.2	Air specific information sets - Structure repair information
Chap 9.2	Terms and definitions - Terms, acronyms and subject index

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for Corrosion Control (CC) information.

1.2 Scope

It covers the rules for the preparation of information applicable to the Product CC which will provide instructions and guidance to personnel, at all maintenance levels, for corrosion prevention and control. With some minor changes, this detailed specification can serve as a guide for corrosion control of components and equipment.

The CC information set also includes repairs to corrosion damage which do not exceed the removal of the corrosion and the subsequent surface protection. For repairs exceeding this damage, reference is made to the air specific structural repair information set. Refer to Chap 5.2.2.2.

1.3 Standards and definitions

1.3.1 Standards

The standards given in this chapter are applicable with no exceptions.

1.3.2 Definitions

The following definitions and those stated in Chap 9.2 must be used as appropriate:

- **Corrosion prone items/areas:** Corrosion prone items/areas are those that are classified in one or more of the following:
  - Dissimilar metal contacts
  - Structural areas where moisture can collect
  - Drainage provisions
  - Magnesium alloy components
  - High strength steel (over 1200 N/mm2)
  - Environmental conditions
  - Highly stressed parts
- **Critical items/areas:** Critical items/areas are those that are classified in one or more of the following:
  - Components critical to safety of operation
  - Components essential to mission completion
  - Components difficult to repair or replace
  - Expensive components
  - Plastic parts subject to wear

2 Corrosion control

2.1 General requirements

The CC information set contains the data and procedures required by maintenance personnel for determining the location and extent of corrosion damage to the air vehicle, land or sea system and its systems, and instructions for its classification, removal and treatment.

Wherever possible, cross-references must be made to data in general corrosion control publications if these are available to the customer. Cross-reference must also be made to the data given in each of the following information sets:

- Structural Repair (SR). Instructions for repair of specific items and sealing procedures
- Air vehicle, land or sea system Maintenance Instructions (MI) for gaining access to the corrosion, cleaning, temporary protection procedures, safety precautions and list of material and equipment

- Non-Destructive Testing (NDT). Instructions for non-destructive inspection of corrosion prone and critical items/areas

The following requirements must be taken into account in the content of the CC information set:

- Safety precautions concerning the use of toxic material and the hazards associated with their use must be included
- The CC must not refer to any contractor's process and/or material specification
- Special or proprietary equipment must not be specified in the CC

2.2 Technical content

The CC information set must be arranged as follows:

2.2.1 Introduction

If required, the introduction data modules contain an explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-00-00-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-000-00-0000-**NN**AAA-018Y-A (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different information sets.

2.2.1.1 General corrosion control

These data modules must contain data on the approved material and procedures for general prevention and repair (detection, removal and/or repair and treatment) of corrosion on the Product structure and its systems. It must cover, but not be limited to, the following:

- General safety data (IC 012)
- General data on corrosion control (IC 010)
- Description of the Product corrosion control and prevention (IC 040) with data relative to:
  - Purpose of the corrosion control
  - Special material/consumables used, including corrosion preventative compounds
  - Types of corrosion
  - Factors in corrosion control
  - Corrosion preventive maintenance
  - Major structural group breakdown
  - Corrosion prone systems/components
- Cleaning and surface preparation (IC 250)
- Paint removal for corrosion control (IC 251)
- Inspection of corrosion damage (IC 310)
- Mechanical removal of corrosion (IC 258)
- Chemical corrosion removal and surface treatment (IC 258 and/or IC 640). Where applicable, specific instructions must be included for the following metallic surfaces:
  - aluminum alloys
  - magnesium alloys
  - stainless steel and nickel base alloys

- copper and copper base alloys
- titanium base alloys
- plated and phosphate surfaces

– Treatment of typical areas (IC 640)
– Corrosion prevention finish (IC 257) with data relative to application and touch-up of:

- primers
- enamels
- top-coatings

– Corrosion prevention sealant systems (IC 259)

2.2.2 Systems corrosions control

These data modules contain data on approved material and procedures for the corrosion control of specific systems/components/items such as:

– fuel system
– flight/operation controls
– landing gear/chassis
– engines
– external stores
– external markings
– hulls
– deck machinery

For each corrosion prone and critical item/area, the following corrosion control data modules must, where applicable, be produced:

– Clean/wash systems and temporarily protect specific items/areas
– Gain access to corrosion prone and critical items/areas
– Examine corrosion prone and critical items/areas, including the use of non-destructive testing
– Identify the type of corrosion
– Remove paint from corroded areas
– Evaluate corrosion damage
– Remove corrosion damage
– Repaint or touch-up the finish system after the corrosion has been removed
– Seal corrosion prone and critical items/areas
– Close access to corrosion prone and critical items/areas

2.2.3 Structure corrosion control

2.2.3.1 General

Structure corrosion control is the main aim of CC information. Each major structural component must be discussed and the data contained must be divided further to cover corrosion prone and critical items/areas, corrosion removal, material treatment, finish processes and corrosion prevention sealant processes.

For air vehicle systems, corrosion control data must be presented for each of the following major structural items:

– System 52 - Doors
– System 53 - Fuselage
– System 54 - Nacelles/pylons
– System 55 - Stabilizers
– System 56 - Windows and canopies
– System 57 - Wings

Land and sea corrosion control data must be presented dependent on the type of equipment and must utilize the appropriate system number.

2.2.3.2 Component description (IC 041)
Descriptive data modules must be given for each of the major structural items (for air vehicles, refer to Para 2.2.3.1). The data modules must also include corrosion prone and critical items/areas, and, where specific corrosion control data can be found.

2.2.3.3 Corrosion prone and critical items/areas (IC 350)
Descriptive data modules must be given for each major structural item. The data modules must include:

- location, access and inspection of corrosion prone and critical items/areas
- types of corrosion which can be found, and where it is most likely to occur
- the cause of the corrosion which can be found in each item/area
- necessary safety precautions for critical structure
- preferred inspection method and/or reference to the NDT information

2.2.3.4 Corrosion removal (IC 258)
For items/areas defined in Para 2.2.3.3, the following corrosion removal data must be given:

- factors to be considered during corrosion removal, such as safety precautions, when you use the toxic material and hazards associated with their use, and/or safety precautions when working in hazardous areas (propellant areas, fuel areas, etc)
- specific corrosion removal instructions or cross-references to general corrosion removal procedures (refer to Para 2.2.1.1)
- material removal limits or references to the structural repair information set

2.2.3.5 Material treatment and finish processes (IC 257)
These data modules must give descriptive information on the material treatment protective finish to be used and the procedures for preparation and application peculiar to the items/areas defined in Para 2.2.3.3. References to the maintenance information can be made. The original finish and alternate touch-up system must be identified for both exterior and interior surfaces of each item/area.

2.2.3.6 Corrosion prevention sealant processes (IC 259)
These data modules must give the procedures for the preparation and application of corrosion preventive sealants to the item/area. The application of sealants, which are primarily for other purposes, are contained in the structural repair information set. The identification of the sealant type and the sealing method must be included.

2.2.3.7 Special equipment and material (IC 060 and 070)
These data modules must give short descriptions of any special equipment and/or material used in the procedures mentioned in Para 2.2.3.4 thru Para 2.2.3.6.

2.3 Illustrations and tables

2.3.1 General

Illustrations and related tables must be included in the CC information with additions as necessary, to illustrate corrosion control procedures.

For specific systems (refer to Para 2.2.2), illustrations and tables must be included in the CC information to identify the corrosion prone and critical items/areas. The area of a component, which has a tendency to corrode, must be highlighted, and a location key must be used as reference in the text.

Illustrations and tables must be included in each data module for major structural items. Refer to Para 2.2.3.

2.3.2 Structural items with corrosion prone and critical items/areas

For each major structural group, one or more illustrations must be provided which identifies the structural items with corrosion prone and critical items/areas. A table must be provided with an item index of each major structural group. This table must follow the format given in Table 2. The table must show where the corrosion control information for each item can be found. The table consists of the following columns:

1 Fig/Ref: All required structural items, shown on the appropriate illustration, must be listed in this column in sequential order, starting with Fig/Ref No. 1. For variant items, the numbers 1A, 1B, 1C, etc, must be used.

2 Area/Item name and Part No.: This column gives the name and part number of the structural component. The applicable corrosion control procedures must be listed in this column for each item.

3 Corrosion control reference: This column gives the data module code of the detailed corrosion control procedure.

Table 2 Major structural group component index - Example

Fig/Ref (1)	Area/Item name and Part No. (2)	Corrosion control reference (3)
1	Component XX, P/N XXXXXXXX	
	Corrosion prone and critical item/area	E1-A-52-10-00-00A-350A-B
	Corrosion removal	E1-A-20-00-00-00A-258C-B
	Material treatment/finish system	E1-A-20-00-00-00A-257A-B
	Corrosion prevention sealant system	E1-A-20-00-00-00A-259D-B
2	Component YY, P/N YYYYYYYY	
3	.....	

2.3.3 Corrosion prone and critical items/areas

One or more illustrations must be given to identify corrosion prone and critical items/areas. These items/areas must be inspected and protected. An arrow must be used on structural illustrations to show the grain flow. The area of a component, which has a tendency to corrode, must be highlighted and a location key used to coincide with a key in the text and in the Fig/Ref No. of the corrosion control tables. Listed below are the requirements for the columns in Table 3:

1 Fig/Ref: This column contains a Fig/Ref number for each corrosion prone and critical item/area which will be the key in the illustration and the text. Critical areas can be identified with a "C" in front of this index number.

2 Name: This column gives the name of the items/areas shown in the appropriate illustration.

3 Type of corrosion: This column identifies the type of corrosion, or deterioration, anticipated such as oxidation, pitting, galvanic, flaking, etc. A detailed description of what the corrosion will look like on each specific item, based on the use/location/exposure of the item, must be included in this column, or a reference to the discussion of known corrosion problems given in the text. General statements such as "red rust" for steel parts or "white or grey powder" for aluminum parts are not adequate. Specific locations on the item, where corrosion can be expected to start, must be identified.

4 Inspection method: This column gives the preferred inspection method in a brief form. Detailed procedures must be included in the text body of the paragraph and must be referenced in the table. Where applicable, non-destructive inspection procedures must be referenced to the corresponding NDT data modules.

5 Probable cause and material specification: This column gives the probable cause of the corrosion normally encountered in the item/area, and the material types involved in the corrosion process.

Table 3 Component corrosion prone and critical items/areas - Example

Fig/Ref	Name	Type of corrosion	Inspection method	Probable cause and material specification
(1)	(2)	(3)	(4)	(5)
1	…	…	…	…
2	…	…	…	
3	…	…		
4	…			

2.3.4 Corrosion removal

A table which contains the recommended corrosion removal procedures must be given. The table must be keyed to one or more illustrations and text for the corrosion prone and critical items/areas. The table must follow the format given in Table 4 and must have the following columns:

1 Fig/Ref: This column contains a Fig/Ref number for each corrosion prone and critical item/area which will be the key in the illustration and the text. Critical areas can be identified with a "C" in front of the index number.

2 Name: This column gives the name of the items/areas shown in the appropriate illustration.

3 Recommended removal procedure: This column specifies the mechanical and chemical recommended corrosion removal procedures, in a brief form, for each corrosion prone and critical item/area. For repairs due to corrosion damage exceeding corrosion removal and treatment, the word "Repair" must be inserted, and a reference must be made to the structural repair information in the column "Specific procedures". If corrosion removal is not recommended, the word "None" must be inserted in the relevant column.

4 Specific procedures: This column includes specific corrosion removal instructions, damage limits or references where the applicable data is contained. References to general corrosion removal procedures or to the structural repair data modules must be included. Any change of material as a result of a repair must be noted, and the procedure for the new material must also be given.

Table 4 Component corrosion removal - Example

Fig/Ref	Name	Recommended removal procedure (3)		Specific procedures
(1)	(2)	Mechanical	Chemical	(4)
1	…	Repair	None	E1-A-…

Fig/Ref	Name	Recommended removal procedure (3)	Specific procedures
C2	…		
2	…		

2.3.5 Material treatment and protective finishes

One or more illustrations and a table must be given for all types of protective finish required for all areas of the structural item. The exact area must be named. The table must follow the format given in Table 5 and must be keyed to the corresponding illustrations. The area/reference name for a specific corrosion prone area must be used in the table, where applicable. Both interior and exterior areas must be shown. Protective finish application procedures in the general corrosion protective finish (refer to Para 2.2.1.1) must be referenced under the "alternate touch-up system" headings.

Table 5 Material treatment and protective finishes - Example

Fig/Ref	Name	Pretreatment	Primer	Topcoat
1	…	Exterior original finish system Alternate touch-up system		
2	…	Interior original finish system Alternate touch-up system		

2.3.6 Corrosion prevention sealant processes

A table for corrosion prevention sealant processes must be provided and must follow the format given in Table 6. This table lists the corrosion prevention sealant processes for all items/areas of the structural item with area/reference key for the specific corrosion prone area used, where applicable. Illustrations must be used as necessary. In the "Specific procedures" column, cross-references must be made to the processes described under the heading "General corrosion control" (refer to Para 2.2.1.1), and/or to the structural repair data modules.

Table 6 Component corrosion prevention sealant processes - Example

Fig/Ref	Name	Type of sealing and material	Specific procedures
1	…	…	J1-A-…
2	…		

2.3.7 Special equipment

A table must be given that lists all special equipment specified in the CC information set for corrosion inspections and control.

2.3.8 Special material

A table must be given that lists all special material specified in the CC information set for corrosion inspections and control.

Chapter 5.2.1.3.5

Maintenance information - Storage

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Table 1 References

Chap No./Document No.	Title
Chap 4.3	Information management - Data module code
Chap 4.3.5	Data module code - Disassembly code variant
Chap 9.2	Terms and data dictionary - Glossary of terms, abbreviations and acronyms

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for the Product storage information.

1.2 Scope

It covers the rules for the preparation of information applicable to the Product storage which will enable skilled personnel at all maintenance levels to store the Product, including installed systems, equipment and components, inspect them during storage and remove them from storage. It does not cover preparation and shipment of new Products before they are delivered to a using organization. It does not cover spare parts, except when stored as part of the Product.

The storage information set covers the following topics:

- general requirements for Product storage
- product storage information and procedures

1.3 Standards

The standards given in this chapter are applicable with no exceptions.

1.4 Definitions

The following definitions and those stated in Chap 9.2 must be used as appropriate.

- temporary storage: A period of storage not exceeding 90 days
- extended storage: A period of storage which exceeds 90 days

2 Storage

2.1 General requirements

Illustrations, diagrams and related tables must be included in the data modules with such additions as can be required to illustrate the Product storage operations.

The Product storage information includes an overview illustration showing location of all preservation covers, areas to be protected and tie-down points for temporary and extended storage.

Illustrations must be provided for specific Product systems which require special storage operations.

The storage information set includes procedures for processing systems for:

- temporary storage not exceeding 30 days
- temporary storage from 30 to 90 days
- extended storage (over 90 days)
- inspection and treatments during storage
- removal from storage
- if required, instructions for movement following extended storage, which includes transportation by land, sea or air

2.2 Data module coding

To assist in the codification of data modules, the rules which follow must be used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-10-30-00-**NN**A-**YYY**Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-**NN**AAA-**YYY**Y-A (37 characters)

Where:

- "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed for the same information code.
- "**YYY**", is the information code, described in Para 2.4.

The information code variant is used to distinguish between the different information sets.

2.3 Introduction

If required, the introduction data modules contain an explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They also contain any necessary information, of a general nature, which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-10-30-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-**NN**AAA-018Y-A (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00", when more than one data module is needed

The information code variant is used to distinguish between the different information sets.

2.4 Storage data modules

Storage data modules contain all data required by maintenance personnel for storage, inspection during storage and removal from storage of individual Products.

In many cases, cross-reference to existing data modules is sufficient.

The storage information set covers, but is not limited to the following types of data modules:

- general product storage information which provides definitions of types of storage
- temporary storage
- extended storage
- preservation
- removal of preservation materials
- procedures to put items into containers
- procedures to remove items from containers
- procedures to keep items serviceable in storage
- moving of stored items to another location
- preparing of items for use after storage
- acceptance of items from storage before use
- life data of items in storage
- tie-down points and strength of cables needed to secure the Product during storage

2.4.1 General Product storage information

These data modules provide information on the purpose of the Product storage information, how to use it and standards of repetitive procedures on storage. As a source of further general

information on storage, cross-references to other material are permitted. Information on the consumable materials, tools and equipment must be included with cross-references to appropriate (consolidated) lists. Definition of types of storage must be included.

Data modules must be coded:

YY-Y-10-30-00-NNA-800Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-800Y-A (37 characters)

2.4.2 Temporary storage

These data modules provide information on how to protect the Product during temporary storage up to 30 days and from 30 to 90 days. This information must contain an overview illustration and instructions which include the following:

- items which must be removed from the Product before temporary storage, such as batteries, explosive devices, safety equipment, oxygen bottles
- location of protective covers and tie-down points
- any other procedures necessary to protect the Product during temporary storage

Data modules must be coded:

YY-Y-10-30-00-NNA-800Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-800Y-A (37 characters)

2.4.3 Extended storage

These data modules provide information on how to protect the Product when stored for over 90 days. Extended storage is defined as a planned action from the first day of storage. This information must contain an overview illustration and instructions which include the following:

- items which must be removed from the Product before extended storage, such as batteries, explosive devices, safety equipment, oxygen bottles
- openings which must be sealed to prevent entry of rain, dust, birds or vermin to eliminate potential damage, corrosion and loose article hazards
- location of vent tubes or drain holes to ensure all areas of the Product are suitably ventilated
- location of acrylic windows or other surfaces which must be protected from sunlight
- general location of unpainted metal surfaces which need protection during extended storage
- any other procedure necessary to protect a specific system during extended storage

Data modules must be coded:

YY-Y-10-30-00-NNA-800Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-800Y-A (37 characters)

2.4.4 Preservation

These data modules must provide information on how to make sure the Product stays serviceable when in storage.

Data modules must be coded:

YY-Y-10-30-00-NNA-810Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-810Y-A (37 characters)

2.4.5 Preparation for transport

These data modules provide procedural information on how to prepare the Product for transport by land, sea or air.

Data modules must be coded:

YY-Y-10-30-00-NNA-811Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-811Y-A (37 characters)

2.4.6 Removal of preservation materials

These data modules provide information on the procedures necessary to remove materials and parts used to keep the Product serviceable when in storage.

Data modules must be coded:

YY-Y-10-30-00-NNA-820Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-820Y-A (37 characters)

2.4.7 Procedures to put the Product into containers

These data modules provide procedural information on how to install the Product in containers for storage or for transport by land, sea or air.

Data modules must be coded:

YY-Y-10-30-00-NNA-830Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-830Y-A (37 characters)

2.4.8 Procedures to load vehicle into another

These data modules provide procedural information on how to load a vehicle into another one for transport by land, sea or air.

Data modules must be coded:

YY-Y-10-30-00-NNA-831Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-831Y-A (37 characters)

2.4.9 Procedures to remove the Product from containers

These data modules provide procedural information on how to remove the stored Product from its containers, including the removal of material used for protection.

Data modules must be coded:

YY-Y-10-30-00-NNA-840Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-840Y-A (37 characters)

2.4.10 Procedures to unload vehicle from another

These data modules provide procedural information on how to unload a vehicle from another one after transport by land, sea or air.

Data modules must be coded:

YY-Y-10-30-00-NNA-841Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-841Y-A (37 characters)

2.4.11 Procedures to keep the Product serviceable in storage

These data modules provide procedural information on how to protect the stored Product during the time they are in storage. This includes all servicing or other periodic inspection and maintenance of the Product necessary to ensure it keeps the required level of efficiency during the time they are in storage.

Data modules must be coded:

YY-Y-10-30-00-NNA-850Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY Y10-30-0000-NNAAA-850A-A (37 characters)

2.4.12 Movement of stored Product to another location

These data modules provide procedural information on how to move the stored Product by land, sea or air. These procedures also contain information regarding packaging, crating etc. where applicable to the items being transported.

Data modules must be coded:

YY-Y-10-30-00-NNA-860Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-860Y-A (37 characters)

2.4.13 Preparation of Product for use after storage

These data modules provide information on the procedures necessary to prepare the Product for use after storage. This includes preparation for ferry after storage.

Data modules must be coded:

YY-Y-10-30-00-NNA-870Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-870Y-A (37 characters)

2.4.14 Preparation of Product for use after transport

These data modules provide information on the procedures necessary to set on condition the Product after transport by land, sea or air.

Data modules must be coded:

YY-Y-10-30-00-NNA-871Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-871Y-A (37 characters)

2.4.15 Acceptance of Product from storage before use

These data modules provide procedural information on how to accept the Product from storage before they are prepared for use.

Data modules must be coded:

YY-Y-10-30-00-NNA-880Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-880Y-A (37 characters)

2.4.16 Life data of Product in storage

These data modules identify the length of time the Product can be kept in a given storage condition and stay safe/serviceable.

Data modules must be coded:

YY-Y-10-30-00-NNA-890Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-30-0000-NNAAA-890Y-A (37 characters)

2.4.17 Tie down points and cable information

Information for tie down points and strengths of cables required to secure the Product during storage can be referenced from the maintenance procedures.

Data modules must be coded:

YY-Y10-20-YY-00A-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-20-YYYY-00AAA-YYYY-A (37 characters)

Chapter 5.2.1.4

Common information sets - Wiring data

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Table 1 References

Chap No./Document No.	Title
Chap 3.4	Information generation - Zoning and access
Chap 3.9.5.2.9.2	Wiring data - Wire
Chap 8.2	SNS, information and learn codes - Maintained SNS
Chap 9.2	Terms and definitions - Terms, acronyms and subject index

1 General

1.1 Purpose

The preparation and coding of data modules for wiring data, and the preparation of page-oriented and interactive wiring publications for the Product must follow the rules given here.

Note

An electronic copy of the wiring Schema and corresponding data module examples is available for download from the S1000D website at www.s1000d.org.

1.2 Scope

The rules for the preparation of wiring information covered here describe sufficiently the electrical circuits to enable skilled maintenance personnel to do fault isolation and maintenance of electrical systems on the Product. The specification describes the information and data that is necessary to prepare data modules for:

- Introduction. Refer to Para 2.2.1.
- Descriptive information. Refer to Para 2.2.2.
- Standard practices. Refer to Para 2.2.3.
- Wiring diagrams. Refer to Para 2.2.4.

- Numeric index
- Alphabetic index
- Electrical and electronic wiring diagrams

– Harness drawings. Refer to Para 2.2.5.

- Harness installation drawings
- Harness routing drawings
- Harness flat layout drawings

– Equipment and panel locations. Refer to Para 2.2.6.
– Electrical standard parts data. Refer to Para 2.2.7.
– Electrical equipment information. Refer to Para 2.2.8.
– Wire data. Refer to Para 2.2.9.
– Harness data. Refer to Para 2.2.10.

Additionally, special collections of wiring data, based on the data described in Para 2.2.7 thru Para 2.2.10 for easier access to the data, are described in:

– Generated data presentation. Refer to Para 2.3.

- Page-oriented wiring publications. Refer to Para 2.3.2.
- Interactive wiring publications. Refer to Para 2.3.3.

For Interactive wiring publications the following functionalities are described in Para 2.4:

– Analysis of network
– Views and filters
– Data presentation

1.3 Standards and definitions

1.3.1 Standards

The standards given in this specification are applicable with no exceptions.

1.3.2 Definitions

The following definitions and those stated in Chap 9.2 are used as appropriate:

– **Panel**: This term covers all types of panels (eg, instrument panels, circuit breaker panels and relay panels)
– **Harness**: A cable harness is an assembly of wires and/or cables with all necessary end fittings and made on or off the Product, for example, a harness for a power plant installation
– **Screen**: A device used as a shield to prevent wires from interference

1.4 Wiring Schema

The wiring Schema provides a suitable structure to describe the electrical circuits of the Product.

Note

For additional wiring information (eg, descriptive information, standard practices or harness drawings) it can be necessary to use the descriptive or procedural Schema.

The wiring Schema consists of the wiring data Schema and the wiring data description Schema.

Note

It is not mandatory to use the wiring Schema. It is also possible to prepare wiring publication in form of tables and wiring diagrams by using the descriptive Schema. In this case, the interactive wiring publication functionalities (analysis of network, views and filters, context sensitive data presentation) are not available or required.

Interactive wiring publication functionalities as described in Para 2.4 are only available if the wiring Schema is used.

1.4.1 Wiring data Schema

The wiring data Schema is used to store wiring data information, such as wire data, harness data, electrical equipment information and electrical standard parts.

1.4.2 Wiring data description Schema

For each relevant element of the wiring data Schema, an element field description is required. The wiring data description Schema describes for a project or an organization the specific configuration and usage of each element of the wiring data Schema.

The element field descriptions can be used in an interactive wiring publication application as short information or for configuring and mapping the interactive wiring publication according to the specific naming conventions of a project or an organization.

The wiring data description Schema describes every relevant element of the wiring data Schema with the following three elements:

- the element <fieldName> contains project or organization specific name conventions
- the element <descr> contains an explanatory description of the content of the element, for example, project or organization specific defined values (eg, the color of a wire can be red, yellow or green)
- the element <refs> contains the relevant reference to other data modules or technical publications for technical standard information, etc

The wiring data description data modules containing the data structure must be based on the wiring data description Schema.

Data modules must be coded:

YY-Y-YY-YY-00-00**Y**-029A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-00**YYY**-029A-A (37 characters)

where "**Y**" thru "**YYY**", in the disassembly code variant, is used if more than one data module is needed.

The explicit coding of wiring data description data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment the wiring data description data modules must be coded:

YY-Y-91-00-00-00**Y**-029A-A (17 characters)

thru

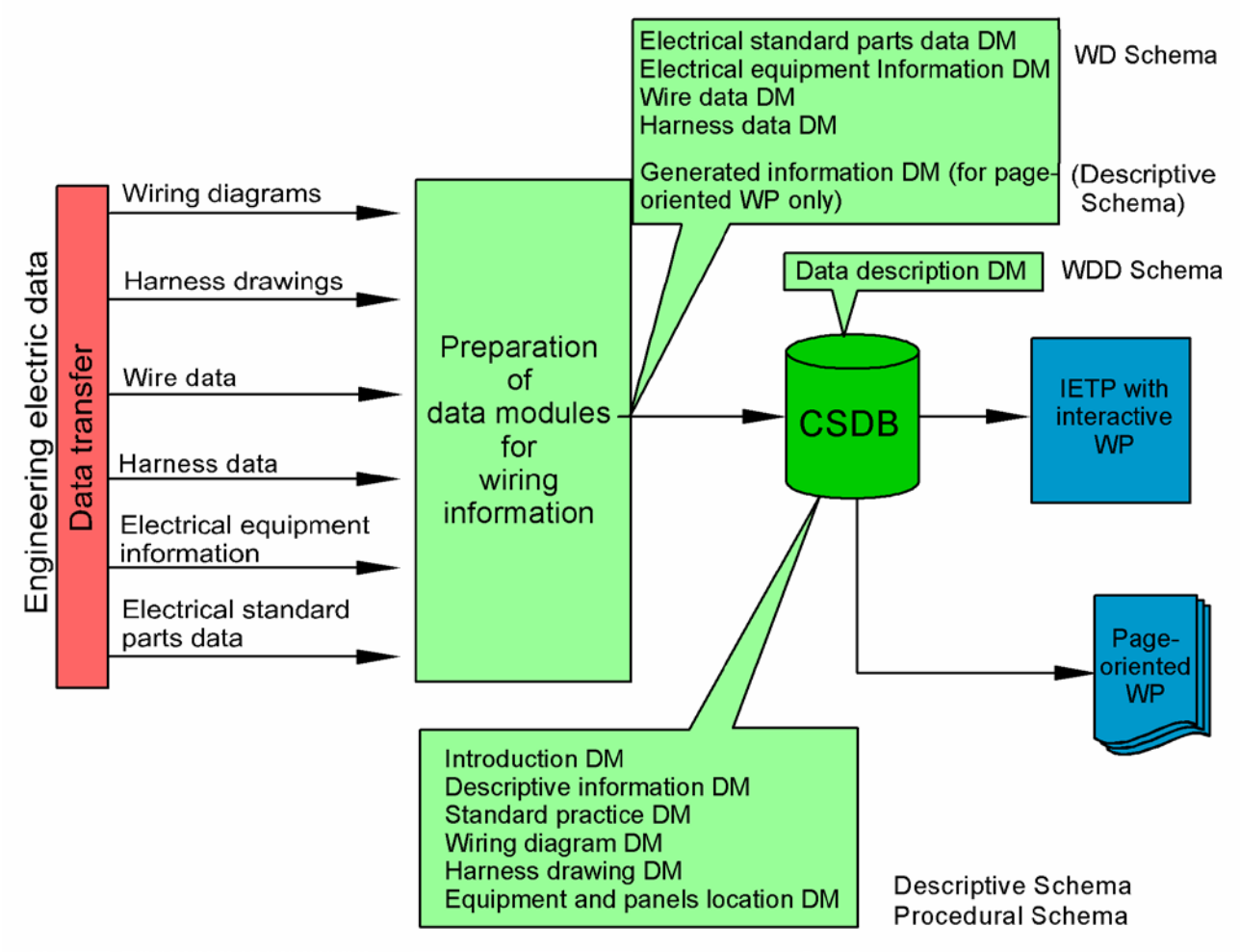
YYYYYYYYYYYYYY-YYYY-Y91-00-0000-00**YYY**-029A-A (37 characters)

Business rule decision point BRDP-S1-00405 - How to use the element field descriptions in the wiring data description Schema:

- Decide how to use the element field descriptions of the wiring data description Schema in an interactive wiring publication.

1.5 Preparation process for wiring information

Fig 1 gives an overview of the standard preparation process for wiring information. The wiring data modules are typically produced from electric engineering source data.



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Fig 1 Preparation process for wiring information

2 Wiring data

2.1 General

The complete set of data modules for wiring data is specified in Para 2.2.

The data modules are produced from such sources as electric engineering source data (eg, engineering data base, specifications, and drawings/diagrams). These form the basic information for a wiring publication, which is capable to show all electrical information.

It is recommended to use engineering source data unchanged.

2.2 Technical content

2.2.1 Introduction

If required, the introduction data modules contain explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They also contain any necessary information of a general nature, which is not detailed in any of the specific data modules.

The introduction data modules in wiring publications include, for example, an explanation of the make-up and use of the Wiring data information set. They also include an explanation of the statements giving the configuration (eg, pre-mod, post-mod) of the Product depicted on diagrams.

Data modules containing an introduction must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-YY-YY-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-**NN**AAA-018Y-A (37 characters)

where "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The information code variant must be used to distinguish between the different Information sets.

The explicit coding of introduction data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment the introduction data modules must be coded:

YY-Y-91-00-00-**NN**A-018A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-**NN**AAA-018A-A (37 characters)

Business rule decision point BRDP-S1-00406 - Use of introduction data modules for wiring publications:

- Decide whether to produce introduction data modules for wiring publications. If required, the scope of these introduction data modules must be defined.

2.2.2 Descriptive information

2.2.2.1 Electrical identification system

A description must be given of the electrical identification system used on the Product. This also includes a list of the electrical and electronic/avionic systems of the Product with their system and subsystem codes.

Data modules containing descriptive information must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-YY-YY-00-01Y-040A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-01YYY-040A-A (37 characters)

The explicit coding of data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, data modules that describe the electrical identification system must be coded:

YY-Y-91-00-00-01Y-040A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-01YYY-040A-A (37 characters)

2.2.2.2 Connection units

A description can be given for all kinds of connection units used on the Product, such as connectors, terminal boards, modular terminal boards, splices, bonding, etc. The description must be accompanied by illustrations.

Data modules containing descriptive information must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-YY-YY-00-02Y-040A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-02YYY-040A-A (37 characters)

The explicit coding of data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, data modules that describe connection units must be coded:

YY-Y-91-00-00-02Y-040A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-02YYY-040A-A (37 characters)

Business rule decision point BRDP-S1-00407 - Optional descriptive information for connection units:

- Decide whether to produce descriptive information for connection units including illustrations and tables.

2.2.2.3 Wires, harnesses and conductors

A description can be given for all types of wires and harnesses installed in the Product, such as single wires, multiple wires, shielded wires, twisted wires. The description can also include, as necessary, illustrations and tables giving wire sizes, classification, conductors and wire types, etc.

Data modules containing descriptive information must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-YY-YY-00-03Y-040A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-03YYY-040A-A (37 characters)

The explicit coding of data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, data modules that describe wires, harnesses and conductors must be coded:

YY-Y-91-00-00-03Y-040A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y91-00-0000-03YYY-040A-A (37 characters)

Business rule decision point BRDP-S1-00408 - Optional descriptive information for wires and harnesses:

- Decide whether to produce descriptive information for wires and harnesses including illustrations and tables.

2.2.3 Standard practices

These data modules must contain project or organization specific standard electrical maintenance practices and repair information, for example, for the

- termination of wires
- installation of connectors and splices
- preparation of termination points for shielding, ground straps and ground studs and harnesses

The data modules must also contain any specific maintenance practices necessary for the

- installation
- maintenance
- repair

of electrical and electronic conductors, disconnects and termination points. The information to produce the data modules can be derived from project or organization specific specifications and instruction sheets.

The data modules must also contain information about tools and equipment needed to perform the work to be done. Standard practices such as:

- continuity testing
- insulation testing
- voltage breakdown testing
- coaxial cable testing (time domain reflectometry)
- optical fiber testing
- MIL-Bus testing
- bonding testing

are produced in data module form as required

Dependent on the requirements for the Product, data modules are prepared based on the procedural or descriptive Schema.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-YYYY-Z (17 characters)

thru

YYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-YYYY-Z (37 characters)

The explicit coding of standard practices data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, standard practices data modules must be coded:

YY-Y-20-YY-YY-YYY-YYYY-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y20-YY-YYYY-YYYYY-YYYY-Z (37 characters)

Business rule decision point BRDP-S1-00409 - Wiring standard practices data modules:

– Define source and scope of wiring standard practices data modules. Decide whether to prepare standard wiring practice information as procedural or descriptive data modules.

2.2.4 Wiring diagrams

2.2.4.1 General

For a page-oriented wiring publication, wiring diagram data modules must be provided for all electrical systems of the Product.

For an interactive wiring publication, pre-prepared wiring diagrams are optional. The possibilities of an interactive wiring publication application to generate wiring diagrams according to user needs at runtime are described in Para 2.4.

A wiring diagram data module must contain all sheets of the wiring diagram of an electrical or electronic system as defined by the SNS.

Business rule decision point BRDP-S1-00410 - Wiring diagrams in an interactive wiring publication:

– Decide whether to produce wiring diagrams for an interactive wiring publication.

2.2.4.2 Numeric index (page-oriented publication)

For each system "**YY**" a numeric index must be provided, listing all diagrams and give information such as:

– Title: Title of the figure (name of diagram)
– Data module code: Referenced data module
– Fig No.: Figure number in referenced data module
– Applic: Applicability

Data modules containing numeric indexes must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-**YY**-YY-YY-00A-013A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y**YY**-YY-YYYY-00AAA-013A-A (37 characters)

The explicit coding of numeric index data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, numeric index data modules must be coded:

YY-Y-91-**YY**-00-00A-013A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-**YY**-0000-00AAA-013A-A (37 characters)

An example is given in Table 2.

Table 2 Numeric index - Example data module 1F-A-91-24-00-00A-013A-A

Title	Data module code	Fig No.	Applicability
AC generation	1F-A-91-24-20-00A-051A-A	1	All
DC generation	1F-A-91-24-30-00A-051A-A	1	All
External power	1F-A-91-24-40-00A-051A-A	1	All
AC electrical load distribution	1F-A-91-24-50-00A-051A-A	1	All
DC electrical load distribution	1F-A-91-24-60-00A-051A-A	1	Twin
DC electrical load distribution	1F-A-91-24-60-00B-051A-A	1	Single

2.2.4.3 Alphabetic index (page-oriented publication)
For each system "**YY**" an alphabetic index must be provided, listing all diagrams and give information such as:

- Title: Title of the figure (name of diagram)
- Data module code: Referenced data module
- Fig No.: Figure number in referred data module
- Applic: Applicability

Data modules containing alphabetic and alphanumeric indexes must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-**YY**-YY-YY-00A-014A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y**YY**-YY-YYYY-00AAA-014A-A (37 characters)

The explicit coding of alphabetic index data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, alphabetic index data modules must be coded:

YY-Y-91-**YY**-00-00A-014A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-**YY**-0000-00AAA-014A-A (37 characters)

2.2.4.4 Interactive wiring publication index
An interactive wiring publication application represents the wiring diagrams only in one order, either numeric (refer to Para 2.2.4.2) or alphabetic (refer to Para 2.2.4.3).

2.2.4.5 Electrical and electronic wiring diagrams
These data modules contain only wiring diagrams. The wiring diagrams (refer to Fig 2) show all:

- terminating points
- wire identification codes
- equipment identifications
- junction boxes
- shields
- internal jumpers

- ground connections
- etc

Each terminal point must be identified. At each point where a wire connects, the wire number must be indicated. Spare wires must be noted as "Spare". Wire connections between terminals and disconnect points and between electrical components must be drawn as direct as possible. Power distribution wiring diagrams must be provided for all primary and secondary busses up to and including the primary and secondary busses that feed the circuit breakers.

Data modules containing wiring diagrams must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-**YY**-**YY**-YY-**NN**A-051A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-**NN**AAA-051A-A (37 characters)

where:

- "**YY**-**YY**" is the SNS number referring to the system, subsystem and the sub-subsystem the wiring diagram is related to
- "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The explicit coding of wiring diagram data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, wiring diagram data modules must be coded:

YY-Y-91-**YY**-**YY**-**NN**A-051A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-**YY**-**YY**00-**NN**AAA-051A-A (37 characters)

An example is shown in Fig 2.

2.2.5 Harness drawings

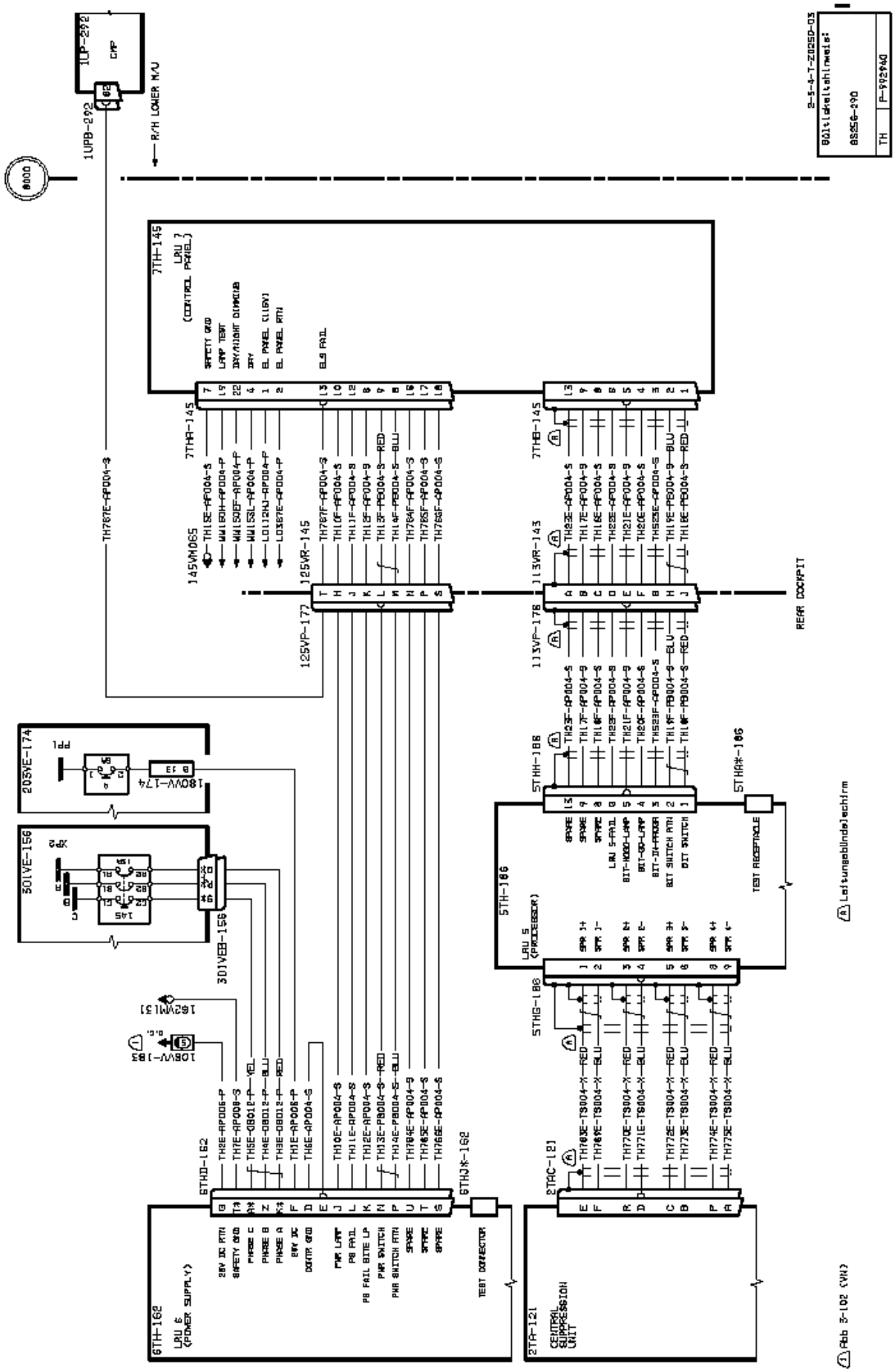
These data modules contain only the harness drawings and show, in each zone of the Product respectively across the Product the routings of harnesses naming them by the associated routes. These drawings can be simplified and route identification can be made, using perspective or orthographic views of the zone concerned, with identification to frames. Where possible, source drawings are used unchanged. As a general rule, the following types of illustrations are produced to satisfy the requirements:

- Harness installation
- Harness routing
- Harness flat layout

For detailed information of the zoning of a Product, refer to Chap 3.4.

Business rule decision point BRDP-S1-00411 - Harness routing drawings:

- Decide whether harness routing drawings are to be simplified and how their layout must look like.



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Fig 2 Wiring diagram - Example

2.2.5.1 Harness installation drawings

These data modules include illustrations. They must be produced for each major area, zone or subzone of the Product, as appropriate and must show the installation of each harness in the Product.

An example is shown in Fig 3.

Specific projects can have the requirement to produce information of harness installation as a list providing all harnesses that are installed in each of the major areas in textual form with a reference to the data modules that contain the information for each single harness routing installation within that major area. Illustrations need not be provided, where appropriate.

Data modules containing routing diagrams must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-YY-**SS**-YY-**NN**A-052A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-**SS**-YYYY-**NN**AAA-052A-A (37 characters)

where

- "**SS**" are the first two characters of the zone code. Refer to Chap 3.4.
- "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The explicit coding of harness installation drawing data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, data modules must be coded:

YY-Y-91-**SS**-00-**NN**A-052A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-**SS**-0000-**NN**AAA-052A-A (37 characters)

Business rule decision point BRDP-S1-00412 - Coding of harness installation drawing data modules:

- Decide whether to code harness installation drawing data modules by using zone information. If decided to use zone information for the coding, the structure of the data module code is possibly not appropriate. In this case, it must be decided on changes of the proposed structure for the Product (eg, population of the zone information in the unit or assembly group of the SNS instead of in the subsystem/sub-subsystem group).

Business rule decision point BRDP-S1-00413 - Harness installation information:

- Decide whether to prepare harness installation information for each major area in list form in addition to or instead of harness installation and routing drawings.

2.2.5.2 Harness routing drawings

These data modules present a single harness illustration which shows the routing of the harness across the Product and all connectors at both ends in isometric view. The clipping points that fasten the harness to the Product's structure must also be included with their identification.

Examples are shown in Fig 3 and Fig 4.

Data modules containing routing diagrams must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-YY-**SS**-YY-**NN**A-052A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-**SS**-YYYY-**NN**AAA-052A-A (37 characters)

where

- "**SS**" are the first two characters of the zone code. Refer to Chap 3.4.
- "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The explicit coding of harness routing drawing data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, data modules must be coded:

YY-Y-91-**SS**-00-**NN**A-052A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-**SS**-0000-**NN**AAA-052A-A (37 characters)

Business rule decision point BRDP-S1-00414 - Coding of harness routing drawing data modules:

- Decide whether to code harness routing drawing data modules by using zone information. If decided to use zone information for the coding, the structure of the data module code is possibly not appropriate. In this case, it must be decided on changes of the proposed structure for the Product (eg, population of the zone information in the unit or assembly group of the SNS instead of in the subsystem/sub-subsystem group).

2.2.5.3 Harness flat layout drawings

These data modules provide harness flat layout illustrations shown as plan views across the Product with their segment lengths, sleeve codes, etc. An example is shown in Fig 5.

Data modules containing routing diagrams must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-YY-YY-YY-**NN**A-052A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-**NN**AAA-052A-A (37 characters)

where "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

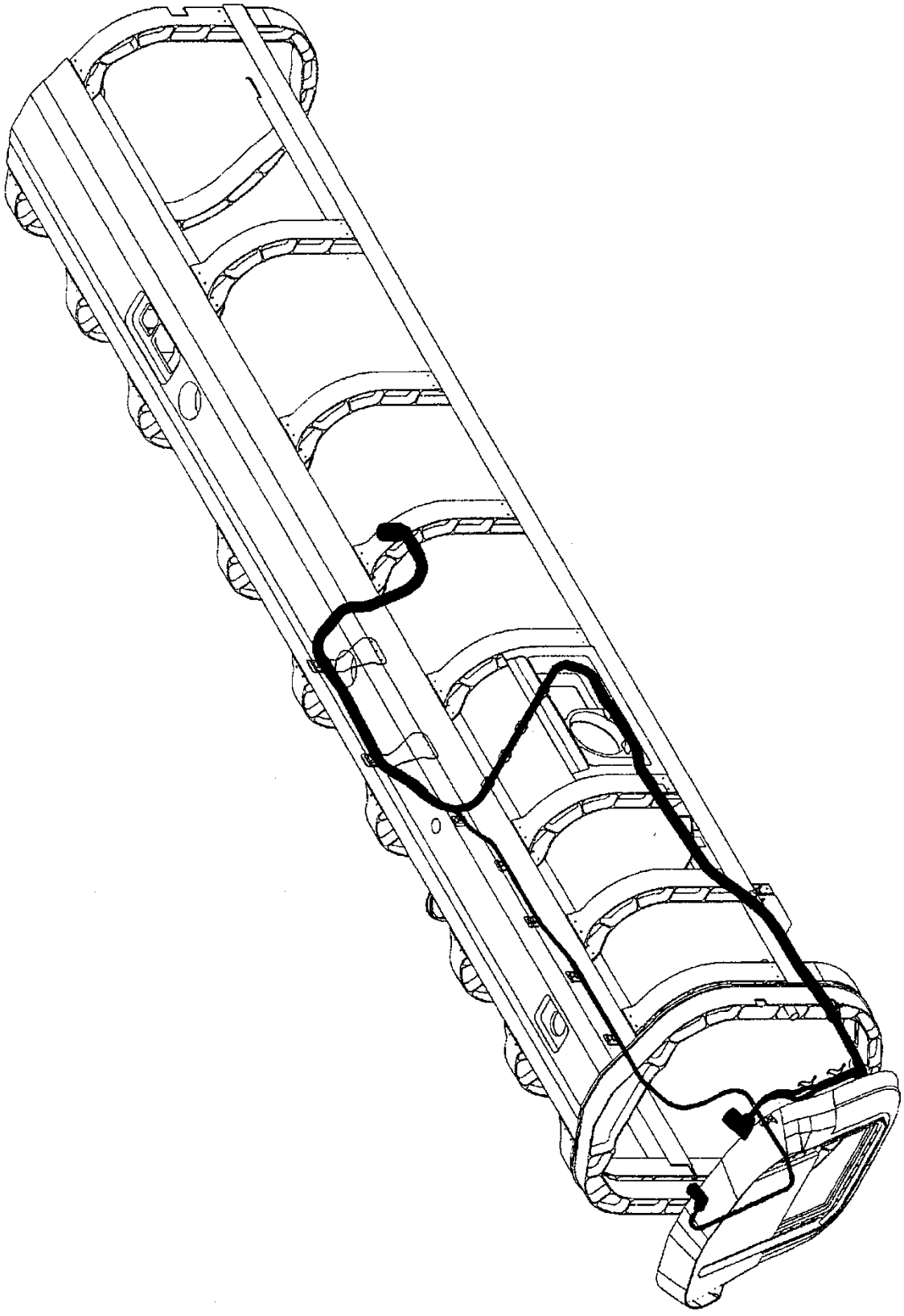
The explicit coding of harness flat layout drawing data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, harness flat layout drawing data modules must be coded:

YY-Y-91-00-00-**NN**A-052A-A (17 characters)

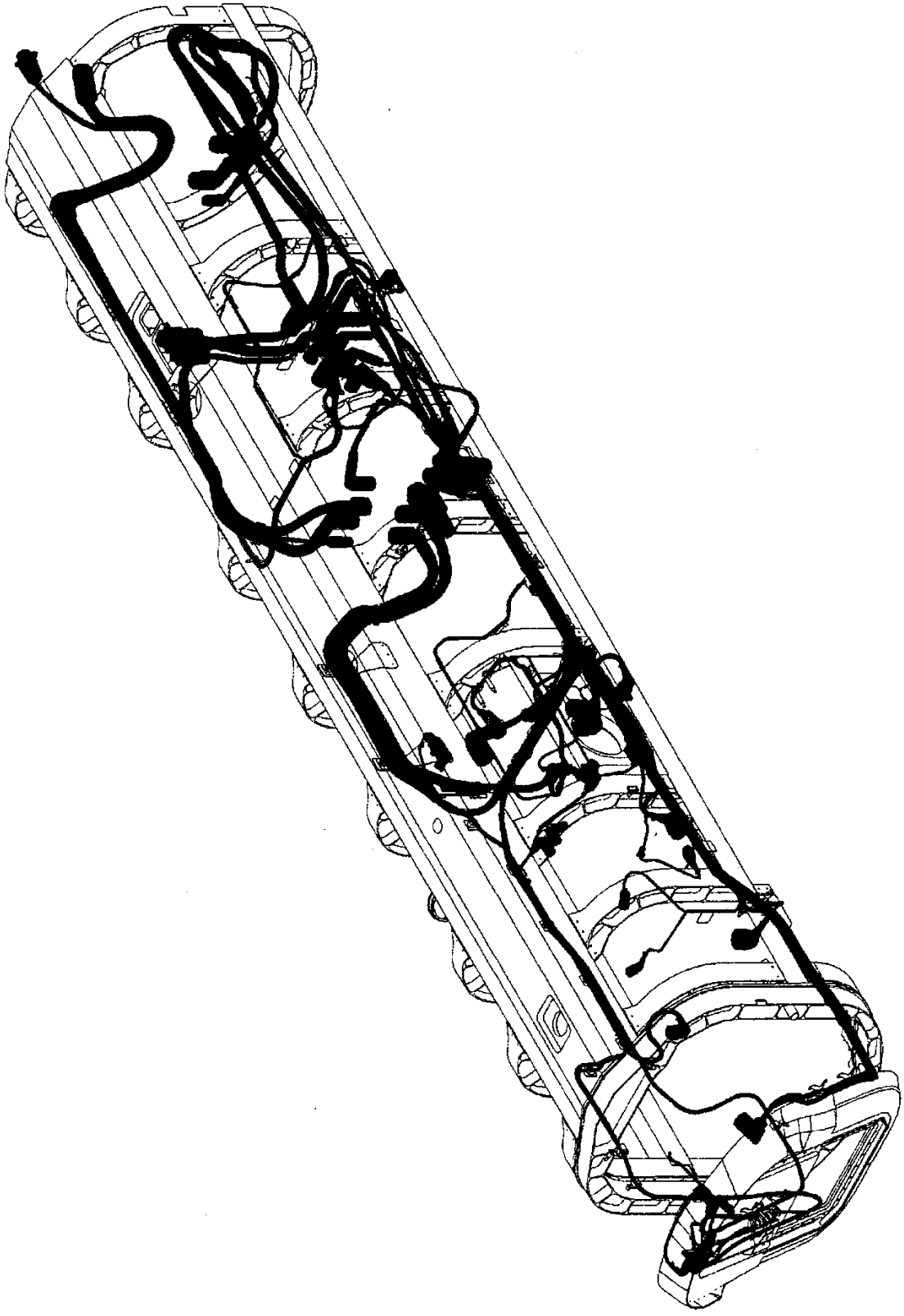
thru

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-**NN**AAA-052A-A (37 characters)



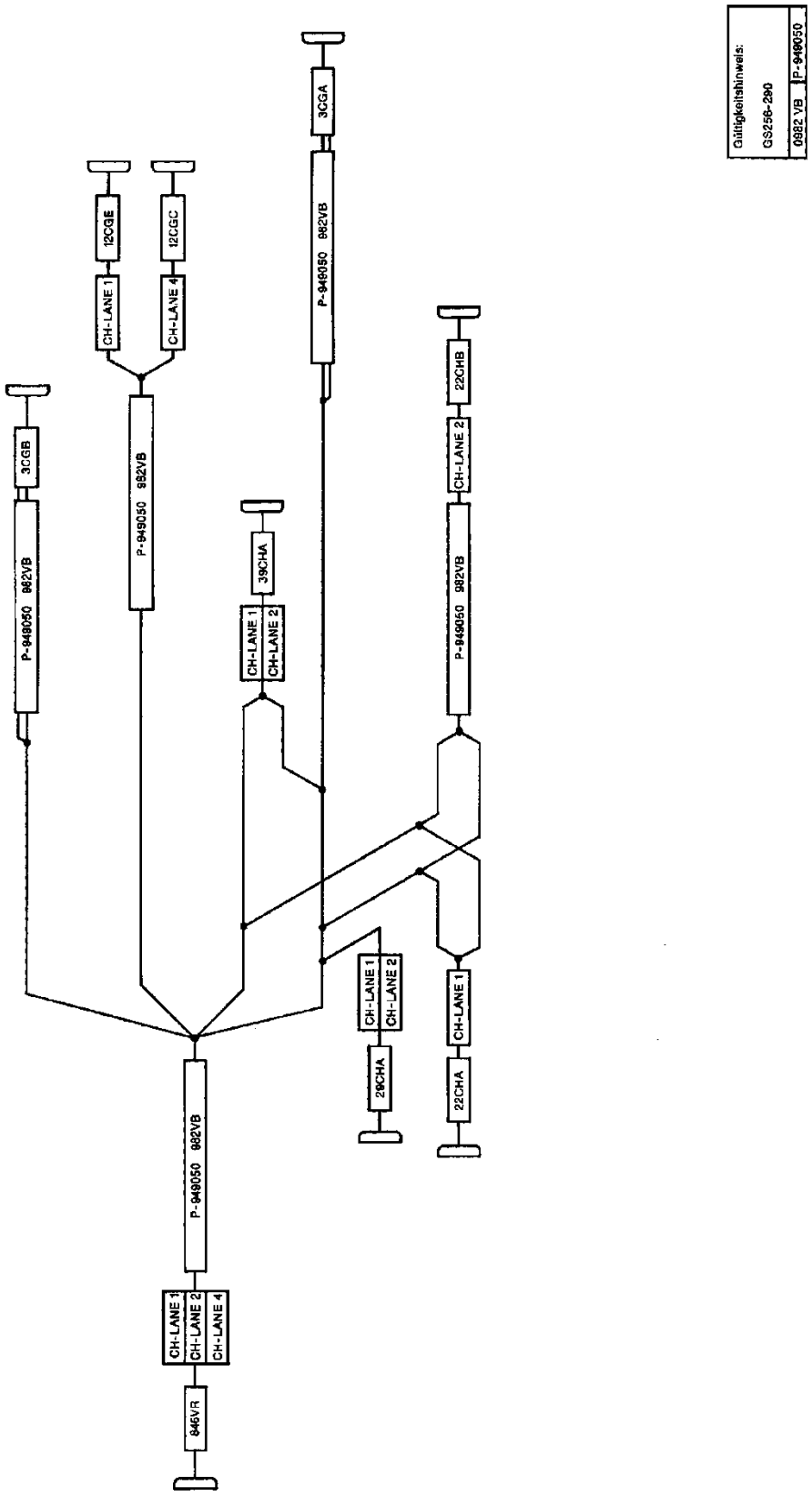
ICN-C0419-S1000D0016-001-01

Fig 3 Harness installation and routing - Example



ICN-C0419-S1000D0015-001-01

Fig 4 Harness routing - Example



ICN-C0419-S1000D0017-002-01

Fig 5 Harness flat layout - Example

2.2.6 Equipment and panel locations

The project or the organization must decide whether separate data modules containing equipment and panel location illustrations are to be produced. These illustrations (refer to Fig 6) show the locations of major electrical and electronic components or groups of components which are not contained in the location illustrations of the relevant system documentation. These locations must be identified by reference to major panels or station lines, water line and buttocks line or an equivalent locating system. The components illustrations include items such as panels, junction boxes, equipment and racks.

Data modules containing location diagrams must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-**YY**-YY-YY-**NN**A-055A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y**YY**-YY-YYYY-**NN**AAA-055A-A (37 characters)

where

- "**YY**" is the system code of the SNS
- "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The explicit coding of equipment and panel locations data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, data modules must be coded:

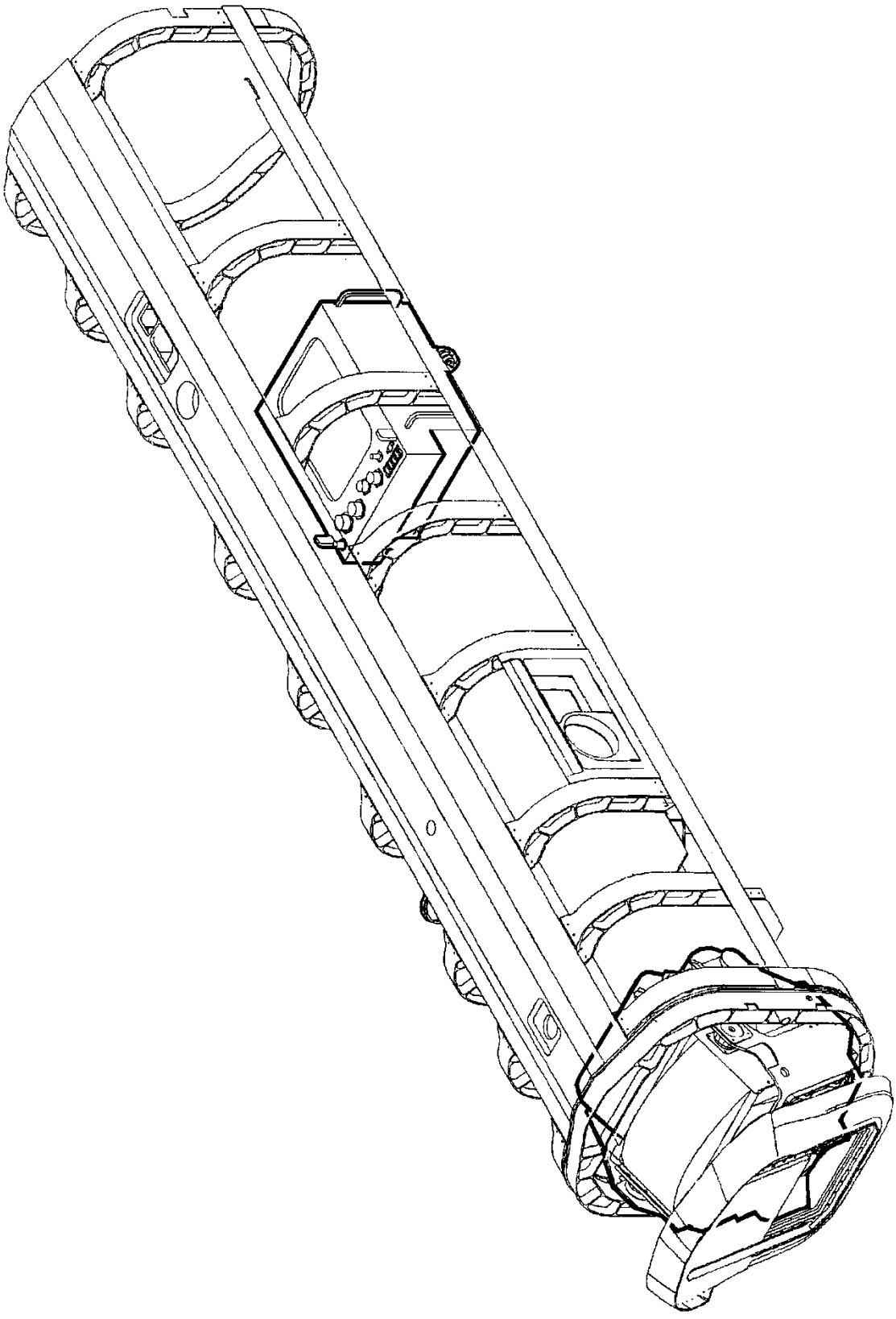
YY-Y-91-**YY**-00-**NN**A-055A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-**YY**-0000-**NN**AAA-055A-A (37 characters)

Business rule decision point BRDP-S1-00415 - Equipment and panel location drawings:

- Decide whether to produce separate data modules containing equipment and panel location illustrations.



ICN-C0419-S1000D0018-001-01

Fig 6 Equipment and panel locations - Example

2.2.7 Electrical standard parts data

The project or the organization must decide whether data modules containing electrical standard parts data are to be produced. The electrical standard parts data include an extract of the technical information for each defined standard part and is based on technical standards. Numbering is based on a general or a project or an organization specific specification number which is different to the manufacturer's part number.

Data modules containing electrical standard parts data must be prepared based on the wiring data Schema.

Data modules must be coded:

YY-Y-YY-YY-YY-**XX**A-031A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-XXAAA-031A-A (37 characters)

where "**XX**", in the disassembly code, shows the technical information as follows:

- 01 = Connectors including switches
- 03 = Distribution parts
- 04 = Wires
- 05 = Accessories
- 06 = Solder sleeves
- 07 = Shrink sleeves
- 08 = Identification sleeves
- 09 = Conduits

The explicit coding of electrical standard parts data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, standard parts data modules must be coded:

YY-Y-91-00-00-**XX**A-031A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-00-0000-**XX**AAA-031A-A (37 characters)

Business rule decision point BRDP-S1-00416 - Production of electrical standard parts data:

- Decide whether to produce data modules containing electrical standard parts data.

Table 3 Standard parts list - Connectors, Example data module 1F-A-91-00-00-01A-031A-A

Part number	Alternatives (Supplier)	Number of contacts	Accessory	Applicability
JN1003FG1004SN	STTG06RT1004SN014 (Amphenol Ltd)	4	JN1003S16JN1003K10	All
JN1003FG1606PN	STTG06RT1606PN014 (Amphenol Ltd)	6	JN1003P12JN1003K16	All
JN1003FG2235PN	STTG06RT2235PN014 (Amphenol Ltd)	100	JN1003P22JN1003K22	All

Table 4 Standard parts list - Identification sleeves, Example data module 1F-A-91-00-00-08A-031A-A

Part number	Length	Mass	Diameter min / max	Applicability
JN1009-048A	48 mm	0,0001 kg	0,8 mm / 2,4 mm	All
JN1009-095A	47 mm	0,0003 kg	4,8 mm / 9,5 mm	All
JN1009-180A	42 mm	0,0005 kg	4,8 mm / 9,5 mm	All

2.2.8 Electrical equipment information

2.2.8.1 General

For each electrical or electronic item of equipment that has electrical connections, the project or the organization must define the required equipment information. The equipment information includes plugs and receptacles, terminals, splices, ground connections, switches, relays, lights, resistors, diodes and other electrical and electronic equipment with functional item references. Functional items are also known as reference designators. The information can be reduced to a single system code.

Business rule decision point BRDP-S1-00417 - Definition of required electrical equipment information:

- Define the required information for each electrical or electronic item of equipment that has electrical connections.

2.2.8.2 Electrical equipment information

These data modules must include all relevant information that is necessary to describe the Product's equipment. An electrical equipment information data module must be produced for each zone of the Product including all equipment installed. The electrical equipment must be listed with the functional item (also known as reference designator) in alphanumeric order. Table 5 gives an example of data to be presented in electrical equipment lists.

General information must be given as an equipment list in tabular format. For an example refer to Table 6.

Table 5 Data elements in equipment lists - Example

Data element	Markup element	M/O[1]
Each electrical equipment information consists of:		
– Functional item (also known as reference designator)	<functionalItemRef>	M
– Part number	<partNumber>	O
– Equipment description	<equipDescrRef>	O
– Location	<installationLocation>	O
– Illustration (eg, reference to equipment and panel location data module). Refer to Para 2.2.6.	<illustrationRef>	O
Electrical equipment applicability:		
– Applicability of the Product	<applic> as referenced by the attribute applicRefId	O

[1] (M) Mandatory, (O) Optional

Data modules containing equipment lists must be prepared based on the wiring data Schema.

Data modules must be coded:

YY-Y-YY-**SS**-YY-**NN**A-056A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-**SS**-YYYY-**NN**AAA-056A-A (37 characters)

where

- "**SS**" are the first two characters of the zone code. Refer to Chap 3.4.
- "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The explicit coding of electrical equipment information data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, electrical equipment information data modules must be coded:

YY-Y-91-**SS**-00-**NN**A-056A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-**SS**-0000-**NN**AAA-056A-A (37 characters)

Business rule decision point BRDP-S1-00418 - Coding of electrical equipment information data modules:

- Decide whether to code electrical equipment information data modules by using zone information. If decided to use zone information for the coding, the structure of the data module code is possibly not appropriate. In this case, it must be decided on changes of the proposed structure for the Product (eg, population of the zone information in the unit or assembly group of the SNS instead of in the subsystem/sub-subsystem group).

Table 6 Equipment list - Example data module 1F-A-91-22-00-00A-056A-A

Functional item	Part number	Equipment description	Location Shown in data module	Applicability
K1	9274-6686	1F-A-24-21-01-00A-042A-C	221BL 1F-A-91-24-00-12A-055A-A	All
K2	9274-6686	1F-A-24-21-02-00A-042A-C	221BL 1F-A-91-24-00-12A-055A-A	All
K3	6042H92	1F-A-30-41-01-00A-042A-C	223AR 1F-A-91-30-00-05A-055A-A	0001 - 0012
K4	9128-1Z-C7C-4-001	1F-A-30-41-03-00A-042A-C	223AR 1F-A-91-30-00-05A-055A-A	0013 - 9999
K5	BACR-13CD3	1F-A-30-41-04-00A-042A-C	224FZ 1F-A-91-30-00-15A-055A-A	All

2.2.9 Wire data

These data modules must include all relevant information that is used, for example, in the assembly of the Product's wiring. A wire list data module must be produced for each system of the Product as defined by the SNS including all wires installed. The wires must be listed with the wire identification in alphanumeric order. Table 7 gives an example of data to be presented in wire lists.

Table 7 Data elements in wire lists - Example

Data element	Markup element	M/O[1]
For wire identification:		
– Circuit code	<circuitIdent>	O
– Wire identification number	<wireNumber>	M
– Wire section identification	<sectionIdent>	O
For wire information:		
– Harness identification	<harnessIdent>	O
– Color	<wireColor>	O
– Length	<length>	O
– EMC Code	<emcCode>	O
For wire connection (the wire connection includes the wire end information):		
– From equipment	<fromEquip>	M
– To equipment	<toEquip>	O
Each wire end information consists of:		
– Equipment identification	<functionalItemRef>	M
– Contact	<contactInfo>	O
– Screen	<screenGroup>	O
Wire applicability:		
– Applicability of the Product	<applic> as referenced by the attribute applicRefId	O
Wire traceability:		
– Traceability of the wire	<changeAuthorityDataGroup>	O

[1] (M) Mandatory, (O) Optional

Spare wires must be indicated as shown in Table 8. Wire preparation information is linked to standard practices airframe systems. Refer to Para 2.2.3.

Data modules containing wire lists must be prepared based on the wiring data Schema.

Data modules must be coded:

YY-Y-YY-YY-YY-**NN**A-057A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-**NN**AAA-057A-A (37 characters)

where "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The explicit coding of wire data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, wire data modules must be coded:

YY-Y-91-**YY**-00-**NN**A-057A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-**YY**-0000-**NN**AAA-057A-A (37 characters)

where

- "**YY**" is the system code of the SNS
- "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

Table 8 Wire list - Example data module 1F-A-91-94-00-00A-057A-A

Wire	Harness	Color	Length	Side 1:		Side 2:		Applic
				RFD	Contact	RFD	Contact	
AG0001FA	3001VB	C	1000	1AGA	A	2AGB	3	All
AG0002FA	3001VB	R	500	1AGA	B	100VR	1	All
AG0002FB	3005VB	R	1500	100VP	1	3AGC	G	All
AG0003FA	3001VB	B	500	1AGA	C	100VR	2	All
AG0003FB	3005VB	B	1500	100VP	2	3AGC	H	All
AG0004FA (Spare)	3001VB	C	1000	1AGA	STOW	2AGB	STOW	All

2.2.10 Harness data

These data modules must include all relevant information that is necessary to describe the Product's harnesses. A harness data module must be produced for the installed harnesses in each zone of the Product. The harnesses must be listed with the harness identification in alphanumeric order. Table 9 gives an example of data to be presented in harness lists.

Table 9 Data elements in harness lists - Example

Data element	Markup element	M/O[1]
Each harness information consists of:		
– Harness identification	<harnessIdent>	M
– Part number	<partNumber>	O
– Dash number	<harnessVariantIdent>	O
– Issue	<harnessVariantIssue>	O
– Illustration (eg, reference to harness drawing). Refer to Para 2.2.5.	<illustrationRef>	O
Harness applicability:		
– Applicability of the Product	<applic> as referenced by the attribute applicRefId	O

[1] (M) Mandatory, (O) Optional

Data modules containing harness lists must be prepared based on the wiring data Schema.

Data modules must be coded:

YY-Y-YY-**SS**-YY-**NN**A-058A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-**SS**-YYYY-**NN**AAA-058A-A (37 characters)

where

- "**SS**" are the first two characters of the zone code. Refer to Chap 3.4.
- "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The explicit coding of harness data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, harness data modules must be coded:

YY-A-91-**SS**-00-**NN**A-058A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-**SS**-0000-**NN**AAA-058A-A (37 characters)

Business rule decision point BRDP-S1-00419 - Coding of harness data modules:

- Decide whether to code harness data modules by using zone information. If decided to use zone information for the coding, the structure of the data module code is possibly not appropriate. In this case, it must be decided on changes of the proposed structure for the Product (eg, population of the zone information in the unit or assembly group of the SNS instead of in the subsystem/sub-subsystem group).

Table 10 Harness list - Example data module 1F-A-91-21-00-00A-058A-A

Harness identification	Part number	Issue	Routing Shown in data module	Applicability
3001VB	91223001-405	A	1F-A-91-21-00-00A-052A-A	All
3002VB	91223002-401	D	1F-A-91-21-00-01A-052A-A	All
3003VB	91223003-421	C	1F-A-91-21-00-02A-052A-A	All

2.3 Generated data presentation

2.3.1 General

Generated data presentation shows wiring information of the Product. It is based on and prepared from source data stored in the wiring data data module instances. The source data can be used to generate this information for a page-oriented wiring publication or within an interactive wiring publication.

Source data are wire data, harness data, electrical equipment information, electrical standard parts data (refer to Para 2.2) and they must include all pertinent information that is used in the assembly of the Product, junction boxes and pylons.

2.3.2 Page-oriented wiring publications

For page-oriented wiring publications, the information for generated data presentation, for example, harness wire lists, connection lists, is generated from source data, as described above, in a pre-processing. The result of the pre-processing must be stored in data modules.

Data modules must be prepared based on the descriptive Schema.

Data modules must be coded:

YY-Y-YY-YY-YY-NNA-**XXX**A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-NNAAA-**XXX**A-A (37 characters)

where

"**XXX**" is the information code, which gives the contained technical information as follows:

- 031 = Electrical standard parts data
- 056 = Equipment lists
- 057 = Wire lists
- 058 = Harness lists

Use "A", "B" thru "Z", in the information code variant, if more than one list type as shown in Para 2.3.2.1 thru Para 2.3.2.3 is needed (eg, for different sort criteria).

The explicit coding of page-oriented wiring publication data modules concerning the system, subsystem and in some cases the sub-subsystem is different for air, land and sea systems. It is based on the SNS of the Product. Maintained SNS are listed in Chap 8.2.

For air vehicle, engines and equipment, page-oriented wiring publication data modules must be coded:

YY-A-91-YY-00-NNA-**XXX**A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y91-YY-0000-NNAAA-**XXX**A-A (37 characters)

Note

The generated lists described in Para 2.3.2.1 thru Para 2.3.2.3 can contain data from different main elements of the wiring data Schema, for example, wires and harnesses. Therefore it is recommended to use the descriptive Schema to provide generated lists in page-oriented wiring publications. It is also possible to use the wiring data Schema.

Examples of generated information for a page-oriented wiring publication such as harness wire lists, connection lists and hook-up lists are given in Para 2.3.2.1 thru Para 2.3.2.3.

2.3.2.1 Harness wire lists

A harness wire list data module can be produced for the Product listing all harness conductors for each harness, in alphanumeric order and providing the following information:

- Harness identification
- Wire identification
- Harness installation and routing drawing data module where the installation and routing is shown. Refer to Para 2.2.5.1 and Para 2.2.5.2.
- Harness flat layout installation data module where the layout is shown. Refer to Para 2.2.5.3.
- Applicability of the Product

Business rule decision point BRDP-S1-00420 - Generation of harness wire list data modules:

- Decide whether and how to generate harness wire list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.

Table 11 Harness wire list - Example data module 1F-A-91-00-00-00A-057B-A

Harness identification	Part number	Routing Shown in data module	Applicability
3001VB	91223001-405	1F-A-91-21-00-00A-052A-A	All
3002VB	91223002-401	1F-A-91-21-00-01A-052A-A	All
3003VB	91223003-421	1F-A-91-21-00-02A-052A-A	All

2.3.2.2 Connection lists

A connection list data module can be produced for the Product, listing all used wires for one plug/receptacle in alphanumeric order and providing the following information:

- Plug and receptacle number
- Contact (used)
- Wire identification
- Harness identification
- Applicability of the Product

Business rule decision point BRDP-S1-00421 - Generation of connection list data modules:

- Decide whether and how to generate connection list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.

Table 12 Connection list - Example data module 1F-A-91-00-00-00A-057C-A

Connector (Mating connector)	Contact	Wire identification	Harness identification	Applicability
100VP (100VR)	A	AG0001FA	3001VB	All
100VP (100VR)	C	BD0001FA	3001VB	All
100VP (100VR)	D	BD0002FA	3001VB	0001 - 0012
100VR (100VP)	A	AG0001AA	1013VB	All
100VR (100VP)	C	BD0001AA	1013VB	All

2.3.2.3 Hook-up lists

The hook-up list data modules can comprise the following information:

- Plug and receptacle lists
- Terminal lists
- Splice lists
- Earth point lists

2.3.2.3.1 Plug and receptacle lists

These lists can comprise the following information:

- Plug and receptacle numbers
- Contact (used and unused)
- Wire identification
- To/from routing
- Location
- Wiring diagram data modules on which the plugs and receptacles are shown
- Applicability of the Product

Business rule decision point BRDP-S1-00422 - Generation of plug and receptacle list data modules:

- Decide whether and how to generate harness plug and receptacle list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.

Table 13 Plug and receptacle list - Example data module 1F-A-91-00-00-00A-057D-A

Connector	Contact	Wire identification	to RFD	Contact	Location	Applicability
100VP	A	AG0001FA	1AGA	1	231	All
100VP	B				231	All
100VP	C	BD0001FA	1BDA	A	231	All
100VP	D	BD0002FA	1BDA	B	231	0001 - 0012
100VP	D				231	0013 - 9999
100VR	A	AG0001AA	2AGB	5	135	All
100VR	B				135	All

2.3.2.3.2 Terminal lists

These lists can comprise the following information:

- Terminal number
- Contact (used and unused)
- Wire identification
- Wiring diagram data modules on which the terminal is shown
- Specific location of the terminal
- Applicability of the Product

Business rule decision point BRDP-S1-00423 - Generation of terminal list data modules:

- Decide whether and how to generate terminal list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.

Table 14 Terminal list - Example data module 1F-A-91-00-00-00A-057E-A

Terminal number	Contact	Wire identification	Wiring diagram	Location	Applicability
1001VEA	1	AG0001FA	1F-A-91-94-00-00A-051A-A	231	All
1001VEA	2	AG0001FB	1F-A-91-94-00-00A-051A-A	231	All
1001VEA	3		1F-A-91-94-00-00A-051A-A	231	All
1001VEA	4		1F-A-91-94-00-00A-051A-A	231	All
1001VEB	1	BD0011FB	1F-A-91-93-00-00A-051A-A	212	0013 - 0022
1001VEB	2	BD0011FC	1F-A-91-93-00-00A-051A-A	212	0013 - 0022

2.3.2.3.3 Splice lists

These lists can comprise the following information:

- Splice number
- Contact (used and unused)
- Wire identification
- Wiring diagram data modules on which the splice is shown
- Specific location of the splice
- Applicability of the Product

Business rule decision point BRDP-S1-00424 - Generation of splice list data modules:

- Decide whether and how to generate splice list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.

Table 15 Splice list - Example data module 1F-A-91-00-00-00A-057F-A

Splice number	Contact	Wire identification	Wiring diagram	Location	Applicability
1001VS	1	AG0001FA	1F-A-91-94-00-00A-051A-A	231	0013 - 0022
1001VS	2	AG0001FB	1F-A-91-94-00-00A-051A-A	231	0013 - 0022
1002VS		BD0011FA	1F-A-91-93-00-00A-051A-A	212	All
1002VS		BD0011FB	1F-A-91-93-00-00A-051A-A	212	All
1002VS		BD0011FC	1F-A-91-93-00-00A-051A-A	212	All

2.3.2.3.4 Earth point lists

These lists can comprise the following information:

- Earth point number
- Wire identification
- Wiring diagram data modules on which the earth point is shown
- Specific location of the earth point
- Applicability of the Product

Business rule decision point BRDP-S1-00425 - Generation of earth point list data modules:

- Decide whether and how to generate earth point list data modules for a page-oriented or an interactive wiring publication from the wiring data modules that are based on the wiring Schema.

Table 16 Earth point list - Example data module 1F-A-91-00-00-00A-057G-A

Earth point number	Wire identification	Wiring diagram	Location	Applicability
100VN	AG0001FA	1F-A-91-94-00-00A-051A-A	231	0013 - 0022
100VN	AG0001FB	1F-A-91-94-00-00A-051A-A	231	0013 - 0022
103VN	BD0011FA	1F-A-91-93-00-00A-051A-A	212	All
103VN	BD0011FB	1F-A-91-93-00-00A-051A-A	212	All
103VN	BD0011FC	1F-A-91-93-00-00A-051A-A	212	All

2.3.3 Interactive wiring publications

For interactive wiring publications, generated data presentation must be based on the wiring data data module instances as described in Para 2.2.7 thru Para 2.2.10. The information is generated by interactive wiring publication functionalities. It is therefore not part of the data exchange. No data module code is allocated. This generated information within an interactive wiring publication is described in Para 2.4.

2.4 Interactive wiring publication functionalities

The following paragraphs describe functionalities for an interactive wiring publication.

2.4.1 Analysis of network

2.4.1.1 General

When starting from selected electrical/electronic equipment a network can be generated for each connected wire following the wire segment information up to the end of the signal. All affected junction boxes can be shown. Another network can be generated for all wires and connectors/terminals between two defined equipment.

2.4.1.2 Network information

The network gives information starting with the contacts of selected electrical/electronic equipment and the wires connected to them. In accordance with the wire end information the next electrical/electronic equipment can be shown fan-shaped with the identified contacts on, for example, a terminal bus. This procedure can be repeated until the end equipment is reached. Basic information is:

- Functional item references for all shown equipment. Functional items are also known as reference designators.
- Graphic of the shown electrical/electronic equipment with contact information, wire identification, harness information and change information

2.4.1.3 Switching across electrical components

If the end equipment is a relay, switch, etc, it is possible to select a contact. All related wires to the contact can be generated.

2.4.1.4 IETP specific elements for network analysis

To increase the performance of the network analysis, additional elements are introduced for IETP purposes only. The element <wireConnectionCode> and the element <networkAnalysisCode> are part of the wiring data Schema.

The element <wireConnectionCode> contains in child elements coded information about the individual connection of a wire end, contact structure, multiple contact connections, shield information, sort information and/or layout information. For detailed information on coding refer to Chap 3.9.5.2.9.2.

The element <networkAnalysisCode> contains information about the connection parts behavior (element <connectionListClass>) taking into account the specific connection situation. Thus, the <networkAnalysisCode> information states if a desired network analysis can be achieved automatically, with manual interaction, or not at all across the respective connection part.

To provide detailed information about the equipment in an auto-generated plan of a network analysis, the element <electricalLogic> with the child elements <electricalEquipState>, <electricalEquipConnection> and <electricalStateDescr> is available.

The element <electricalEquipConnection>, a child element of the element <electricalEquipState>, describes the electrical connections of the states of equipment (eg, a relay or a switch). The attribute connectionType of the element <electricalEquipConnection> describes the type of the connection. The element <electricalStateDescr> represents, if applicable, the switch or relay position.

If applicable, the additional information can be used to show more detailed equipment symbols and to support more interactive analysis through switches and relays.

2.4.2 Views and filters

2.4.2.1 Views

Views allow to change the data presentation (eg, wire data in order of harness number, view of twisted wires, view of screened wires). It is recommended to implement all views context sensitive.

2.4.2.2 Filters

Filters reduce the presented data dependent on data fields. For example, only wires of one harness connected to an electrical equipment of a zone. This data reduction applies to all further functionalities until the filter changes.

2.4.3 Context sensitive data presentation

Context sensitive extract of basic electrical data can be displayed for all generated information and other interactive wiring publication functionalities.

Context sensitive data presentation in interactive wiring publications means that additional information is provided to the user by the wiring publication, depending on the item of the wiring that is in focus of the user.

For example, in a generated network all wires are shown with their wire identification only, equipment with the functional item (also known as the reference designator). If the user needs additional information (eg, for a specific wire) the wiring publication application provides additional information such as wire type, gauge, color, for this specific wire. The additional information can be shown when the user moves the mouse over the wire or clicks on the wire.

In generated lists it can be favorable to provide the references to data modules containing harness installation or routing drawings, wiring diagrams or preparation and finishing information, etc, as a hidden link on a pre-defined list element. For example, by clicking on the harness identification to which a wire belongs, the references to harness installation or routing drawings for this harness are shown by the wiring publication application.

Chapter 5.2.1.5

Common information sets - Illustrated parts data

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References

Table 1 References

Chap No./Document No.	Title
Chap 5.3.1.3	Common requirements - Illustrated parts data

1 General

This chapter contains a reference to the rules for the preparation and coding of data modules for IPD.

2 IPD

It covers the rules for the publication of spare parts information. By project decision, the IPD can be provided as part of another publication (eg, as part of an equipment maintenance publication) instead of the provision as a stand alone publication. In this case, an information set must be produced and integrated in the publication process. The rules for the preparation of the information set are the same as for the preparation of the IPD publication. Refer to Chap 5.3.1.3.

Chapter 5.2.1.6

Common information sets - Maintenance planning information

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Chap 3.9.5.3	Data modules - Applicability
Chap 3.9.6.1	Attributes - Project configurable values
Chap 4.3	Information management - Data module code
Chap 8.2	SNS, information codes and learn codes - Maintained SNS
Chap 9.2	Terms and definitions - Terms, acronyms and subject index
MSG-3	Operator/Manufacturer Scheduled Maintenance Development
S4000P	International specification for developing and continuously improving preventive maintenance

1 General

1.1 Purpose

The rules for the preparation and coding, where appropriate, of data modules for Maintenance Planning (MP) information are given below.

1.2 Scope

The rules for the preparation of information applicable to product maintenance planning which will enable skilled personnel to manage the maintenance of the Product are covered. Information about the necessary rules for preventive checks and maintenance (scheduled and unscheduled) are given. The MP information contains the following topics:

- time limits
- maintenance/inspection task lists
- scheduled and unscheduled checks
- acceptance and functional check flight
- maintenance allocation

The data and information are based on technical analyses using the objectives of an efficient maintenance program.

Note

The individual requirements and the frequency of applying the rules are normally derived from analyses using standard methods such as Operator/Manufacturer Scheduled Maintenance Development (MSG-3), Reliability Centered Maintenance (RCM) or those

given in the international specification for developing and continuously improving preventive maintenance (S4000P).

1.3 Standards

The standards given here are applicable with no exceptions.

1.4 Terms

The following terms and those stated in Chap 9.2 must be used as appropriate:

- Check Maintenance (CM): Manufacturers' recommended thresholds (such as periodicity or rounds fired) for inspections and maintenance checks
- Scheduled maintenance check: A maintenance check or inspection of the Product, its systems and units/assemblies dictated by a threshold or interval
- Unscheduled maintenance check: A maintenance check or inspection of the Product, its systems and units/assemblies that is dictated by special or unusual conditions not related to a threshold or interval

2 Maintenance planning information

2.1 Introduction

The introduction data modules must contain explanations of the purpose, scope, structure, special format and use of the technical content of this information set. The introduction data modules must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

The zoning arrangement of the Product is covered by reference to the relevant data module (for air vehicles: SNS 06-30-YY).

A list of terms must be included which defines conditions (eg, "excessive"), damage (eg, "crack") and other relevant terms (eg, inspection types).

Data modules must be coded:

YY-Y-05-00-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y05-00-0000-**NN**AAA-018A-A (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The information code variant is used to distinguish between the different information sets.

2.2 Data module coding

To assist in the coding of data modules, the following rules must be used in addition to those given in Chap 4.3.

2.2.1 Time limits

Data modules must be coded:

YY-Y-05-10-**SS**-**NN**A-000Y-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y05-10-**SS**00-**NN**AAA-000Y-A (37 characters)

Where:

- "**SS**", the system to which data and information are applicable. Refer to Chap 8.2. "00" is used if data and information are applicable to the Product as a whole.
- "**NN**", in the disassembly code, the subsystem (refer to Chap 8.2) if it is necessary to split the system into several subsystems (if not, use "00")

Example:

- Data and information about time limits for parts of the landing gear system (32) are coded: 1Y-A-05-10-32-00A-000A-A

2.2.2 Maintenance/inspection task lists

Data modules must be coded:

YY-Y-05-20-SS-NNA-000Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y05-20-SS00-NNAAA-000Y-A (37 characters)

Where:

- "SS", the system to which data and information are applicable. Refer to Chap 8.2. "00" is used if data and information are applicable to the Product as a whole.
- "NN", in the disassembly code, the subsystem (refer to Chap 8.2) if it is necessary to split the system into several subsystems (if not, use "00")

Example:

- Data and information about maintenance/inspection tasks of the landing gear system (32) are coded: 1Y-A-05-20-32-00A-000A-A

2.2.3 Check definitions

Data modules must be coded:

YY-Y-05-**SS**-00-**NN**A-000Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y05-**SS**-0000-**NN**AAA-000Y-A (37 characters)

Where:

- "**SS**", the inspection type:
  - "40": Scheduled check (eg, Preflight inspection). For an example, refer to Fig 1.
  - "50": Unscheduled check (eg, Inspection after hard landing)
  - "60": Acceptance and functional check flight
- "**NN**", in the disassembly code, a sequential number to identify a specific check

Example:

- The definition of a check after hard landing is coded: 1F-A-05-50-00-18A-000A-A

2.2.4 Maintenance allocation

Data modules must be coded:

YY-Y-05-**80**-00-**NN**A-916Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y05-**80**-0000-**NN**AAA-916A-A (37 characters)

Where:

"**NN**", in the disassembly code, is a sequential number to provide further breakdown, if needed

2.3 Time limits

Each data module must contain a list of equipment which is built in the specified system, and which must be replaced with serviceable equipment at the end of a number of cycles or at given time intervals, where:

- each line entry is built up from the items defined in Para 2.3.1 thru Para 2.3.5
- each item is filled up as necessary in accordance with the description given
- only one value is given for each item. If items are subject to various values, as many line entries as values are provided.

2.3.1 Equipment

The following information identifies the equipment that must be replaced:

- Name, the name of the system
- Identification number, the identification of a specific part or component (eg, the part number)
- Catalog sequence number (CSN), additional IPD that will help to identify the specific equipment
- Item sequence number (ISN), additional IPD that will help to identify the specific equipment

2.3.2 Quantity

The quantity is the total number of specific hardware installed on the next higher assembly.

2.3.3 Category

This must be defined by the project or the organization (eg, equipment replaced for safety reasons).

2.3.4 Time limit

The time limit is the elapsed time or cycle after which the equipment must be replaced. Permitted units of measure for the threshold interval are given in Chap 3.9.6.1.

2.3.5 Applicability

For applicability attributes, refer to Chap 3.9.5.3. The applicability annotation is given to each line entry in Table 2.

Table 2 Time limits - Examples

Name	Part number	CSN	Time limit	Qty	Cat	Applicability
Shock strut, LH MLG	564-POL-801		1600 FH (-50 FH + 0 FH)	1	1	Serial No. = 1
Shock strut, LH MLG	564-POL-805		2000 FH (-50 FH + 0 FH)	1	1	Serial No. = [2-5]
Mounting assy		43-22-09-000B-10C	10 FH after LDG CNG	16	2	All

2.4 Maintenance/inspection task lists

Each data module must contain a list of maintenance/inspection tasks for the specified system, which must be carried out during one or more different checks (eg, for air vehicles: Postflight inspection), where:

- each line entry is built up from the items defined in Para 2.4.1 thru Para 2.4.9
- each item is filled up as necessary in accordance with the description given
- only one value is given for each item. If items are subject to various values, as many line entries as values are provided (except items where several values are allowed)

2.4.1 Task

This provides a short description of the actions to be carried out for this task. Refer to Chap 3.9.5.2.5.

2.4.2 Preliminary requirements

This gives the preliminary requirements for this task. Refer to Chap 3.9.5.2.1.9.

2.4.3 Reference

This gives any references to a data module or publication that describes the maintenance/inspection task.

2.4.4 Name

This is the name of the system.

2.4.5 Equipment

This is information identifying the item or system.

2.4.6 Supervise

This is information about the required supervisor level.

2.4.7 Check interval/limit

This gives the time or cycles after which the task has to be performed. This item must only be used if no check interval or limit data for the check definitions are available.

2.4.8 Applicability

For applicability attributes refer to Chap 3.9.5.3. The applicability annotation is given to the whole line entry. Refer to Table 3.

Table 3 Maintenance/inspection tasks - Examples

Reference data module code	Name	Task	Check interval/Limit	Applicability
1Y-A-32-00-00-00A-240A-A	Landing gear system	Check visually		Serial No. = [GS004-GS158]
1Y-A-32-00-00-00B-240A-A	Landing gear system	Check visually		Serial No. = [GS159-GS255]
1Y-A-32-20-00-00A-240A-A	Nose landing gear	Visual examination and lubrication of contacting surface	Every 15 FH	All
1Y-A-32-43-10-00A-240A-A	Wheel brake units (LH and RH)	Ensure heat pack rotors are free to rotate		All

Reference data module code	Name	Task	Check interval/Limit	Applicability
1Y-A-32-60-10-00A-271A-A	Position and warning	Position and warning Examinations, tests and checks		Serial No. = [GS004-GS158]
1Y-A-32-60-10-00B-271A-A	Position and warning	Position and warning Examinations, tests and checks		Serial No. = [GS159-GS255]

2.4.9 Related task

This identifies a related scheduled maintenance task. Such relationships are not mandatory but provide an opportunity to gain economic advantage. The attribute `relatedTaskDescr` indicates these relationships. Refer to Table 4 for the task relationship definitions, and refer to Chap 3.9.5.2.5 for the allowed values of attribute `relatedTaskDescr`.

Table 4 Task relationship codes

Code	Description	Definition
A	After	Perform maintenance requirement AFTER related requirement is started.
B	Before	Perform maintenance requirement BEFORE related requirement.
C	Complied	Maintenance requirement is COMPLIED with related requirement.
F	Finished	Cannot finish maintenance requirement until related requirement is FINISHED.
P	Precludes	Maintenance requirement PRECLUDES related requirement.
S	Started	Cannot finish maintenance requirement until related requirement is STARTED.
W	With	Perform maintenance requirement WITH related requirement.

2.5 Scheduled and unscheduled checks

There must be one data module for each check. Each data module must consist of two parts, one part containing information about the specific check, and another part containing a list of maintenance/inspection tasks that are carried out during this check. Refer to Para 2.4.

Each data module contains the following information:

2.5.1 Limit

This gives the time, cycles or event after which the check has to be performed. Refer to Chap 3.9.5.2.5.

2.5.2 Remarks

Remarks about the check described.

2.5.3 Requirement source

Requirement source gives the source from which the requirement is derived. Refer to Chap 3.9.5.2.5.

2.5.4 Remarks

Remarks give notes and descriptions that apply to the task. Refer to Chap 3.9.5.2.5.

2.5.5 Equipment information

Gives a statement of the equipment associated with the task. For structural items that do not have an equipment number, the equipment name is used. Refer to Chap 3.9.5.2.5.

2.5.6 List of maintenance/inspection tasks

Each data module contains a list of tasks that are necessary for this check, where:

- each line entry is built up from the items defined in Para 2.5.6.1 thru Para 2.5.6.3
- each item is filled up as necessary in accordance with the description given
- only one value is given for each item. If items are subject to various values, as many line entries as values are provided

2.5.6.1 Reference

This gives any references to the data module or the publication that describes the maintenance/inspection task.

2.5.6.2 Task

This provides a short description of the actions to be carried out for this task. This item is only used if no limit data from task definitions are available.

2.5.6.3 Applicability

For applicability attributes, refer to Chap 3.9.5.3. The applicability annotation is given to the whole line entry. Applicability in check definitions need not to be the same as those in maintenance/inspection tasks.

2.6 Acceptance and pre-operational checks/acceptance and functional checks flight for air vehicles

This section consists of data modules that contain information on conditions and criteria for pre-operational checks/acceptance and functional checks flight. The data modules contain only references to the description of the specific pre-operational check/acceptance and functional check flight. The description of the check itself is not contained in these data modules.

Data concerning pre-operational checks/acceptance and functional checks flight are treated in the same way as those of other maintenance actions as described in Para 2.4 and Para 2.5 (eg, a pre-operational check/acceptance and functional check flight can be a complete check or one task of a check).

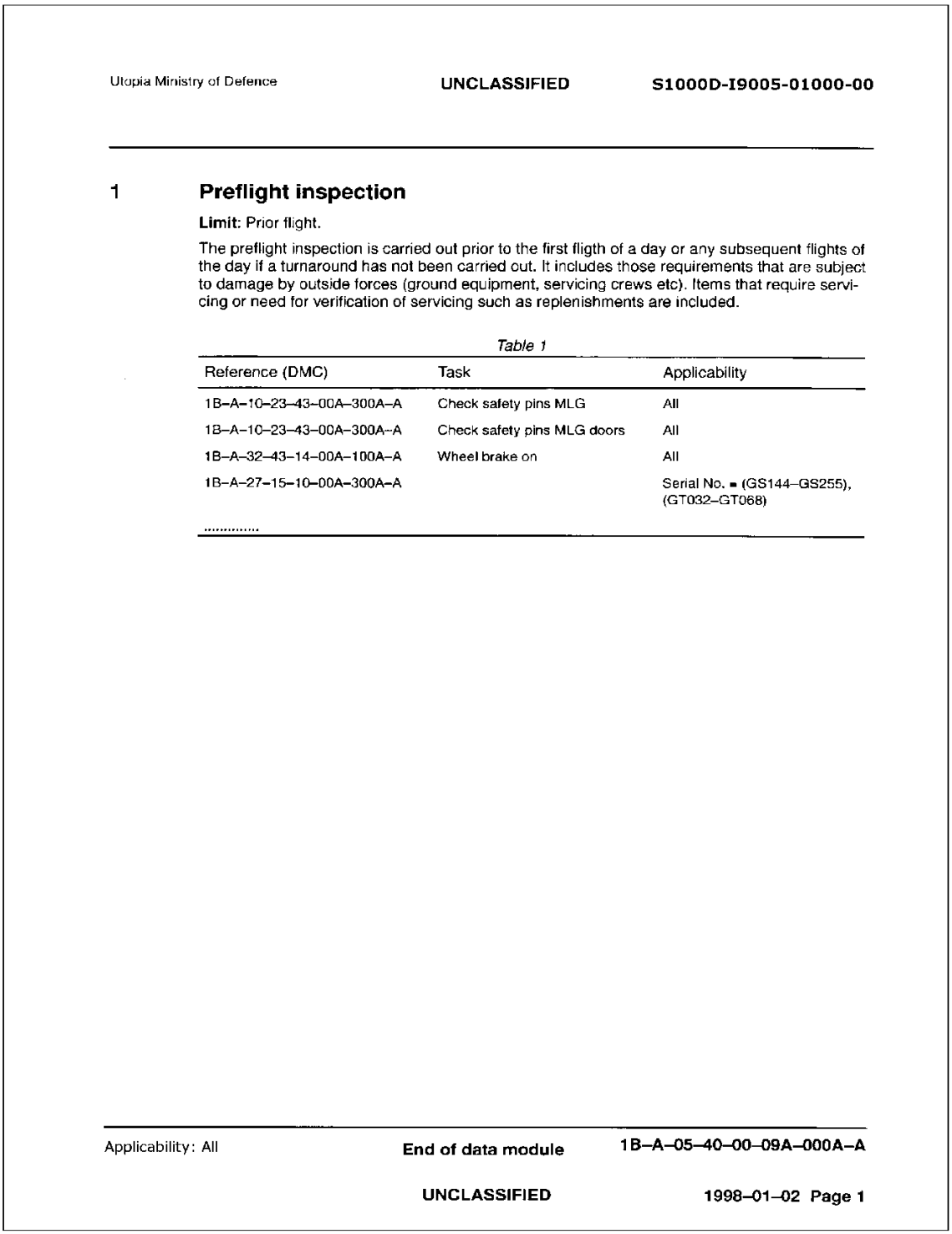
2.7 Maintenance allocation

This section consists of data modules that contain information on maintenance functions along with maintenance levels and time associated for each task.

The maintenance allocation gives the overall maintenance authority and the responsibility of the performance of maintenance functions on the identified end item or component. The maintenance functions can be grouped together. All the information necessary to build the maintenance allocation is included in the Logistics Support Analysis Record (LSAR).

The maintenance allocation also contains a list of tools and remarks.

3 Example



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1 **Preflight inspection**

Limit: Prior flight.

The preflight inspection is carried out prior to the first fligth of a day or any subsequent flights of the day if a turnaround has not been carried out. It includes those requirements that are subject to damage by outside forces (ground equipment, servicing crews etc). Items that require servicing or need for verification of servicing such as replenishments are included.

Table 1

Reference (DMC)	Task	Applicability
1B–A–10–23–43–00A–300A–A	Check safety pins MLG	All
1B–A–10–23–43–00A–300A–A	Check safety pins MLG doors	All
1B–A–32–43–14–00A–100A–A	Wheel brake on	All
1B–A–27–15–10–00A–300A–A		Serial No. = (GS144–GS255), (GT032–GT068)

.....

Applicability: All End of data module 1B–A–05–40–00–09A–000A–A

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ICN-AE-A-050201-A-D0216-00068-A-002-01

Fig 1 Check definitions - Example

Chapter 5.2.1.7

Common information sets - Mass and balance information

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1 References 1

References

Table 1 References

Chap No./Document No.	Title
None	

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for the Product Mass and Balance (MB) information.

1.2 Scope

It covers the rules for the preparation of information applicable to the Product MB which will enable skilled maintenance personnel to control the mass and balance of the Product. The MB information must contain the following topics:

- leveling and weighing - General
- mass and balance
- leveling/trimming
- weighing
- mass and center of gravity data
- standards and definitions

1.3 Standards and definitions

The standards and definitions given in this specification are applicable with no exceptions.

2 Mass and balance information

2.1 Introduction

If required, the introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-08-00-00-NNA-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y08-00-0000-NNAAA-018Y-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

2.2 Leveling and weighing - General

2.2.1 Charts, forms and records

These data modules must provide examples of charts, forms and records used for mass and balance. The following list gives a number of data modules which can be developed to record mass and balance data:

- record of mass and balance personnel
- basic mass checklist record
- weighing record
- basic mass and balance record
- loading data
- mass and balance clearance form/mass and balance manifest

Data modules must be coded:

YY-Y-08-00-1Y-00A-000A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y08-00-1Y00-00AAA-000A-A (37 characters)

2.2.2 Mass and balance computers/Automated systems

These data modules must provide information about computer programs used for the generation of mass and balance data, in lieu of the traditional mass and balance load adjusting and forms used to record the actual mass and balance status of a Product. This ensures that mass and center of gravity are within limits during all stages of operation.

These data modules must include, but are not limited to, the following information:

- objective
- calculations
- software
- program changes
- ease of operation
- computational requirements
- accuracy
- authority for use
- instruction book
- computer use restrictions
- hardware requirements

Data modules must be coded:

YY-Y-08-00-2Y-00A-000A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y08-00-2Y00-00AAA-000A-A (37 characters)

2.3 Mass and balance

2.3.1 Principles

These data modules must discuss the principal elements which are important in controlling the platform during several stages of handling (eg, maintenance, loading, taxiing, flying).

The principal elements are:

- mass
- balance
- mass and balance effects
- mass and balance control
- performance effects

Data modules must be coded:

YY-Y-08-10-1Y-00A-000A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y08-10-1Y00-00AAA-000A-A (37 characters)

2.3.2 Control (management)

These data modules must discuss all elements which are required in the mass and balance management of a Product. The requirements, procedures (and responsibilities) relative to the Product's mass and balance control system must be defined. The overall objectives of such a mass and balance control system is to provide current and correct information regarding the Product basic mass and moment, and to maintain the Product mass and center of gravity within permissible limits during all stages of handling (eg, maintenance, loading, taxiing/flying/sailing).

Such a control system must include, but is not limited to, the following elements:

- mass and balance classes
- mass and balance publications
- mass and balance flight clearance
- weighing requirements (not the weighing itself)
- mass and balance charts and forms
- ballast statements

Data modules must be coded:

YY-Y-08-10-2Y-00A-000A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y08-10-2Y00-00AAA-000A-A (37 characters)

2.4 Leveling the Product

These data modules must give all information required for the leveling/trimming of the Product.

Data modules must be coded:

YY-Y-08-20-0Y-00A-000A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y08-20-0Y00-00AAA-000A-A (37 characters)

2.5 Weighing the Product

2.5.1 Weighing

These data modules must give all information required for the weighing of the Product and must include, but are not limited to, the following elements:

- weighing equipment
- weighing accessories
- weighing procedures
- dimensions required for the center of gravity location
- projection of points on the hangar floor (air vehicles)
- taking measurement
- recording mass and dimensions
- verifying of weighing results
- weighing checklist

Data modules must be coded:

YY-Y-08-30-1Y-00A-000A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y08-30-1Y00-00AAA-000A-A (37 characters)

2.5.2 Product reports

These data modules deal with all MB data specific to a single Product. The form and style of the report can be free or specified by the project and will be made by the contractor as part of the Product delivery documents. The following data must be given:

- make, model, serial and registration identification
- actual date of weighing
- diagram identifying the Product divisions used in the breakdown of the equipment list
- record of certification weighing and all subsequent adjustments up to the time of delivery
- delivery departure mass and balance clearance form/manifest
- list of equipment and fluids to define the Product configuration, positive identification and cross-reference to the SNS, the mass and balance arm of each item
- the Product configuration clearly defined by using a check (X) for each listed item in the Product and a check (0) for each listed item not present in the Product

Data modules must be coded:

YY-Y-08-30-2Y-00A-000A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y08-30-2Y00-00AAA-000A-A (37 characters)

2.6 Mass and center of gravity data

2.6.1 Center of gravity loading calculations

These data modules must describe the principles and calculations involved in:

- calculating the most forward and most aft center of gravity conditions for a particular Product mission (within permissible limits)
- determining appropriate methods of correction for a mission whose center of gravity is found to be outside of the allowable limits

These data modules must include, but are not limited to, the following information:

- lateral and vertical center of gravity
- loading principles
- loading data
- most forward and most aft center of gravity calculations

Data modules must be coded:

YY-Y-08-40-1Y-00A-000A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y08-40-1Y00-00AAA-000A-A (37 characters)

2.6.2 Load adjuster

These data modules must provide information about the load adjuster which is used to enable the crew/operator, mechanic or loading personnel to direct load and to control the center of gravity location of the particular Product.

These data modules must include, but are not limited to, the following information:

- description of the several types of load adjusters
- loading range
- load adjuster index
- loading scales
- using the loading scales

These data modules must also include a fully worked out example of a loading problem using the load adjuster.

Data modules must be coded:

YY-Y-08-40-2Y-00A-000A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y08-40-2Y00-00AAA-000A-A (37 characters)

2.6.3 Vector diagram

- determine if the mass and center of gravity are within the allowable limits
- record the mass and center of gravity changes which occur during mission (eg, flight/sail)
- provide center of gravity controls which produce a desired center of gravity
- provide the user with a better understanding of center of gravity changes

These data modules must include, but are not limited to, the following information:

- description
- diagram construction
- diagram use

These data modules must also include a fully worked out example of a vector diagram.

Data modules must be coded:

YY-Y-08-40-3Y-00A-000A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y08-40-3Y00-00AAA-000A-A (37 characters)

Chapter 5.2.1.8

Common information sets - Recovery information

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Chap 5.2.1.11	Common information sets - Cargo loading information
Chap 5.2.1.14	Common information sets - Battle damage assessment and repair information

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for Recovery (R) information.

Scope

This chapter covers the rules for the preparation of information applicable to recovery to enable skilled maintenance personnel to recover the Product. The R information must contain the following topics:

- introduction
- survey and preparation
- stabilizing/lifting the Product
- moving the Product
- support and recovery equipment

1.2 Standards and definitions

The standards and definitions given in this chapter are applicable with no exceptions.

2 Recovery information

2.1 Introduction

The introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

It must include references to general the Product data and characteristics, such as type of Product, mass and cover, but is not limited to, the following contents:

- dimensions
- ground clearances
- jacking/lifting points
- station diagrams
- servicing point locations
- fuel tanks positions
- arrangements of payload/weapons/external stores
- strong points locations
- landing gear footprint dimension

Data modules must be coded:

YY-Y-07-00-00-NNA-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-00-0000-NNAAA-018Y-A (37 characters)

"**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

2.2 Survey and preparation

2.2.1 General and quick reference checklist

These data modules must contain the necessary administrative activities, which must be done before, or in sequence, with the recovery operation.

Data modules must be coded:

YY-Y-07-4Y-YY-**NN**A-**XXX**A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-4Y-YYYY-**NN**AAA-**XXX**A-A (37 characters)

Where:

"**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

"**XXX**", in the information code, is set to either IC 121 or IC 125 for before, or in sequence with the recovery operation.

2.2.2 Preliminary examination

These data modules must include information on how to do the initial survey of the Product damage. They must also include data on the Product structural condition, the ground condition of the crash site and their influence on the approach to the recovery problem.

Data modules must be coded:

YY-Y-07-4Y-YY-00A-311A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-4Y-YYYY-00AAA-311A-A (37 characters)

2.2.3 Damage control and safety procedures

These data modules must contain the necessary data to avoid injury to persons or additional Product damage while the recovery procedures are done. This data must cover, but is not limited to, the following actions:

- To drain all the hazardous fluids (for air vehicles, data modules must be coded YY-Y-12-10-YY-00A-220A-A)
- To de-arm canopies, ejection seats, miniature detonating cords, capsules, crash recorders, etc (for air vehicles, data modules must be coded YY-Y-95-YY-YY-00A-500A-A)
- To release all gas and hydraulic fluid pressures (for air vehicles, data modules must be coded YY-Y-12-10-YY-00A-220A-A)
- To disconnect and remove batteries (for air vehicles, data module must be coded YY-Y-24-YY-YY-00A-500A-A)

References to applicable data modules or data in the maintenance information set must be made wherever possible. Refer to Chap 5.2.1.14.

2.2.4 Mass and center of gravity

These data modules must include charts giving the changes on the mass, the moment arm and the center of gravity of the Product, while payload (eg, cargo air vehicles), weapons/external stores (eg, military air vehicles) and/or fuel are removed. Lists with the mass of all the primary removable components must also be included. References to applicable data modules or data

in the maintenance or mass and balance information sets must be made wherever possible. Refer to Chap 5.2.1.3 and Chap 5.2.1.7.

Data module must be coded:

YY-Y-08-40-YY-00A-050A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y08-40-YYYY-00AAA-050A-A (37 characters)

2.2.5 Removal of payload, weapons and external stores

These data modules must contain data on the normal and manual opening of the cargo door, the removal of payload for different configurations and type of payload, etc. For military Products, warnings on the handling of weapons/external stores and procedures for removal must also be included. Wherever possible, references to the data modules of the weapon loading or cargo loading information set must be made. Refer to Chap 5.2.1.10 or Chap 5.2.1.11.

Data modules must be coded:

YY-Y-94-10-YY-00A-520A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y94-10-YYYY-00AAA-520A-A (37 characters)

2.2.6 De-fueling

These data modules must contain illustrated de-fueling procedures (under probable circumstances), including abnormal Product attitudes, with or without the Product electrical power and for air vehicles from over-wing. All special adapters required must be listed. Fuel which cannot be removed due to various Product recovery attitudes must be listed. Cross-references to data modules of the maintenance information set must be made wherever possible. Refer to Chap 5.2.1.3.1.

Data modules must be coded:

YY-Y-12-10-YY-00A-221A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y12-10-YYYY-00AAA-221A-A (37 characters)

2.2.7 Removal of primary components

These data modules must contain the removal procedures for any primary components which are not covered by data modules of the maintenance information set. The removal of all other primary components must be cross-referred to the appropriate data modules in the maintenance, information set. Refer to Chap 5.2.1.3.1.

Data modules must be coded:

YY-Y-YY-YY-YY-00A-520A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-00AAA-520A-A (37 characters)

2.3 Stabilizing/lifting the Product

2.3.1 General

If necessary, all general data must be included in these data modules.

Data modules must be coded:

YY-Y-07-00-YY-00A-010A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-00-YYYY-00AAA-010A-A (37 characters)

2.3.2 Preparation

These data modules must contain lists of all the special equipment (eg, steel-plates, air bags) and data on such things as build-up between the air bags and the structure/surface.

Data modules must be coded:

YY-Y-07-00-YY-00A-070A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-00-YYYY-00AAA-070A-A (37 characters)

2.3.3 Stabilizing procedures

These data modules must contain data on the procedures which can be used to stabilize the Product to prevent unwanted movement during the recovery procedures.

Illustrations/tables showing the effects of the prevailing winds on the Product during the recovery must also be included.

If necessary, other data such as the tensile strength of the cables for adequate restraint must be included.

Data modules must be coded:

YY-Y-07-10-YY-00A-100A-A (17 characters)

and

YY-Y-07-20-YY-00A-100A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-10-YYYY-00AAA-100A-A (37 characters)

and

YYYYYYYYYYYYYY-YYYY-Y07-20-YYYY-00AAA-100A-A (37 characters)

2.3.4 Lifting the damaged Product

These data modules must include methods and procedures to:

- lift the Product
- position the vehicle on lifting jacks (for air vehicles, so that either the landing gear can be lowered or other means used to move the air vehicle)
- davit lifting
- vehicle slinging

For air vehicles the following damaged or collapsed landing gear cases must be considered:

- nose landing gear damaged or collapsed
- one main landing gear damaged or collapsed
- nose landing gear and one main landing gear damaged or collapsed
- all main landing gear damaged or collapsed
- nose and all main landing gear damaged or collapsed

– others (eg, air vehicle inverted)

Data modules must be coded:

YY-Y-07-30-YY-00A-100A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-30-YYYY-00AAA-100A-A (37 characters)

2.4 Moving the Product

2.4.1 General preparation

These data modules must list all special equipment or material required to move the Product.

Data modules must be coded:

YY-Y-07-40-YY-00A-061A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-40-YYYY-00AAA-061A-A (37 characters)

2.4.2 Towing, winching and dragging-off in abnormal conditions

These data modules must contain the procedures on how to attach cables and ropes. Illustrations must be given of the maximum forces permitted to apply to a landing gear or other attaching points. Towing, winching and dragging-off procedures must also be given unless they can be cross-referred to data modules in the maintenance information set. Refer to Chap 5.2.1.3.1.

Data modules must be coded:

YY-Y-07-40-YY-00A-100A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-40-YYYY-00AAA-100A-A (37 characters)

2.4.3 Transportation of the damaged Product

These data modules must include data on:

– preparing the Product for transportation
– transporting an air vehicle when landing gears are unserviceable (using flatbeds, transportation sledges, pallets, etc)
– preserving the systems/primary components for shipping
– packing of components into shipping containers
– how to make shipping containers including illustrations

Cross-references to data modules in the storage information set must be made wherever possible. Refer to Chap 5.2.1.3.5.

Data modules must be coded:

YY-Y-07-50-YY-00A-100A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-50-YYYY-00AAA-100A-A (37 characters)

2.5 Support and general recovering equipment

2.5.1 General

These data modules must include data applicable to support and general recovering equipment.

Data modules must be coded:

YY-Y-07-00-YY-00A-060A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-00-YYYY-00AAA-060A-A (37 characters)

2.5.2 Special-to-type support equipment

These data modules must list all the special-to-type support equipment and recovering equipment for the particular Product.

Data modules must be coded:

YY-Y-07-00-YY-00A-061A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-00-YYYY-00AAA-061A-A (37 characters)

2.5.3 General support and recovering equipment

These data modules must list all the general support and recovering equipment normally required during the recovery operations.

Data modules must be coded:

YY-AY-07-00-YY-00A-062A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-00-YYYY-00AAA-062A-A (37 characters)

Chapter 5.2.1.9

Common information sets - Equipment information

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1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for:

- Support Equipment (SE) Maintenance information
- Training Equipment (TE) Maintenance information
- Component Maintenance (CM) information

This chapter will use the term "equipment" to refer to all three types. Distinction between the types will only be made where necessary for understanding.

1.2 Scope

It covers the requirements for the preparation of information which will enable skilled personnel to prepare, operate and maintain SE and TE and components removed from the Product.

CM information can also be used for maintaining components removed from SE or TE when the maintenance instructions for such components are not within SE or TE data modules.

1.3 Standards

The standards given in this chapter are applicable with no exceptions.

1.4 Definitions

The following definitions and those stated in Chap 9.2 are used as appropriate.

1.5 General requirements

1.5.1 Content

The complete sets of SE, TE and CM data modules are specified in Para 2 and subsequent paragraphs. The following types of data modules and information can be included:

- Front matter and introduction. Refer to Para 2.1.
  - Security and data restrictions including regulatory, export, IP and warranty
  - Quality assurance including validation, verification and methods
  - Lists of abbreviations, terms, symbols, specification and documentation
  - General warnings, cautions and notes
  - Recommended repair stations
- Functional and technical descriptions. Refer to Para 2.1.2.
  - Description of function
  - Technical descriptions
  - Electrical and electronic data
  - Software data
  - Diagrams and schematics
- Operation
- Maintenance and servicing
- Parts information

1.5.2 Data module coding

To assist in the codification of data modules, information codes are given and supplemented by additional specific requirements and/or explanations in subsequent paragraphs in addition to the rules given in Chap 4.3.

The preferred method of data identification is to use a component specific model identification code. The code is part of the data module code and identifies the equipment to which the data applies.

To implement this method the equipment manufacturer must apply for a model identification code to identify each component or family of similar components. Refer to Chap 4.3.1.

In certain cases there can be a contractually imposed project or product specific model identification code. This is not the preferred method for CM data modules because it constrains potential multiple-use of the information.

The information codes provided are typical for equipment maintenance. Other codes can be used as necessary.

1.5.3 Basic authoring rules

- The information set can apply to variants of the basic component. Typically this is based on a single common primary part number. It is acceptable to include components with different root part numbers only when such components are very similar. Disassembly principles are discussed in Chap 3.8.
- Parts or equipment addressed must be identified by the Catalogue Sequence Number (CSN) given in the IPD data module. Refer to Chap 3.9.5.2.7.
- Standard practices must be written as data modules that can be referenced directly from the maintenance data modules
- If a record of accomplishment is required, include a sample of the required form (IC 023).
- Each list of tools, equipment, materials and consumables must include a note to allow the use of equivalent substitutes except for those materials and consumables that become a part of the equipment configuration

2 Equipment information

2.1 Front matter and introduction

2.1.1 Front matter

Front matter is required for all equipment publications. Refer to Chap 3.9.4 and Chap 5.3.1.1.

Front matter data modules can be authored by using the Descriptive Schema (refer to Chap 3.9.5.2.2) or by using The Front matter Schema which minimize manual authoring and in most cases support auto-generation of the Front matter data modules. Refer to Chap 3.9.5.2.16.

Security and data restrictions including regulatory, export, intellectual property and warranty information must be documented in accordance with Chap 3.6.

Quality assurance information including verification method and status must be documented in accordance with Chap 3.7.

Common information and data such as abbreviations, terms and definitions and symbols must be included. Chap 5.2.1.18 covers the rules for the preparation of consolidated lists of common information and data including:

- List of abbreviations - LOA
- List of terms - LOT
- List of symbols - LOS
- List of applicable specifications and documentation - LOASD

General warnings, cautions and notes that apply to the equipment or part thereof must be provided in accordance with Chap 3.9.3.

Information related to recommended repair stations or other maintenance facilities that apply to the equipment or part thereof can be provided in descriptive data modules using IC 915.

2.1.2 Introduction

The introduction data modules are authored using the Descriptive Schema (refer to Chap 3.9.5.2.2).These data modules provide statements explaining the organization, content, method for using the publication. They can include information covering the purpose, scope and revision service for the publication. They also provide necessary information of a general nature which is not detailed in any of the specific data modules such as:

- Advisement on observing the publication instructions
- Explanation of the publication arrangement and format
- Documentation of the process verifications. Refer to Chap 3.7.
- Explanation of data module code numbering
- Explanation of callouts and cross-references

2.2 Functional and technical descriptions

Functional and technical descriptions are required for all equipment.

2.2.1 General

These descriptive data modules contain a brief outline of the nature of the item. They also provide all special or important physical, electrical/electronic, mechanical and operational characteristics and parameters. Refer to Chap 3.9.5.2.2.

Wherever possible include graphics to illustrate these characteristics and parameters. As a minimum, provide one or more outline drawings of the item showing control features and connections.

Business rule decision point BRDP-S1-00427 - Level of detail to be provided in the technical descriptions in Equipment information sets:

- Decide what level of detail to provide in the functional and technical descriptions.

2.2.2 Description of function

Basic functional description information must always be provided in sufficient detail to perform the maintenance instructions provided in this Information Set. This information is to be provided in descriptive data modules using IC 040, IC 042, and/or IC 044. Other information codes can be used if applicable.

The description of function is to provide a description of how the equipment operates, not to describe "how to operate an item". Information to describe how to operate SE or TE is described in Para 2.3.3.

The function must be described accurately and, whenever possible, illustrated with applicable diagrams and/or lists enabling the user to understand and follow the procedures provided in the information set. This includes:

- A functional description of the unit and each major subassembly (modules/cards) and their physical and functional relationship to each other and the end item unit. Include block diagrams of interconnections between subassemblies where necessary.
- A description of any special operating conditions that are not normally encountered during operation of the component. Examples of special operating conditions can include extreme ice, heat and cold conditions and their effects on the operation of the component.
- Critical values and special precautions
- A general description of how the unit functions within a system can be provided. Explicit references to the unit's installation and interface within a specific system must be avoided especially where the component can be used for different applications.
- A description of any complex fluid flows, pressures, temperatures, speeds, etc, that can occur during the operation of the mechanical component
- Simplified or partial block, circuit, and logic schematics must be used liberally to support the text explanations. These diagrams are for explanatory purposes only, they do not replace the schematics and other diagrams required in Para 2.2.3.3. Reference to the detailed schematics and diagrams of Para 2.2.3.3 can also be used.
- Block diagrams used to simplify complex circuits to give an understanding of the function and operation of the system, subsystem, etc, and show the arrangement of the system components and current/signal flow through the system
- Schematic diagrams which can replace or complement a block diagram for simple items or complex items respectively. In the latter case, references must enable easy cross-reference from the block diagram to the schematic diagram and vice versa.
- When relevant, include information on material used for the construction of the unit, and warnings and cautions for the handling of dangerous materials. Include fabrication process descriptions when such descriptions are required to support maintenance of the unit.

2.2.3 Technical description

Basic technical description information must always be provided. Describe important parameters in sufficient detail to support the maintenance instructions provided in this information set. Include the following when applicable:

- Basic physical characteristics including dimensions, weight, etc
- Power requirements
- Input and output characteristics
- Contents such as lubricant or hydraulic fluid
- Description of the major subassemblies in the unit including their physical location
- Provide at least one overall, external illustration of the unit that shows and identifies major subassemblies, controls, indicators and external connection as applicable
- Provide additional cutaway, cross-sectional or plan view illustrations and diagrams as necessary for a technician to understand the basic physical arrangement of the unit in sufficient detail to perform the maintenance instructions provided in this information set
- A description of configuration differences when more than one part number is covered. Provide interchangeability and modification information if applicable.

Business rule decision point BRDP-S1-00428 - Use of Wiring Schema in Equipment information sets:

- Decide whether the Wiring data Schema and the Wiring data description Schema are to be used or not. Interactive wiring publication functionalities are only to be made available if the Wiring Schema is used. Refer to Chap 3.9.5.2.9.

2.2.3.1 Electrical and electronic data

For units that include electrical/electronic/photo electronic components include:

- A detailed explanation of the function and operation of the circuits
- A description of any complex or unusual circuits designed into the component
- Supporting diagrams of programmed devices can be included when necessary for the technician to perform the maintenance instructions
- Detailed descriptions of special or programmed integrated circuits for which manufacturer's literature would not include operational discussion for particular applications must be included
- Logic diagrams and information. Logic and timing information for industry standard or commercially available components can be provided by reference when such information is available in the public domain
- A description of any Non-Volatile Memory (NVM) in the equipment. Provide basic description of the NVM, its operation, and usage. Include the following information:
  - What information is recorded?
  - How, when and where information recorded and erased?
  - What format is used?
  - In-service functionality if applicable
  - Shop-only functionality if applicable
- A description of any self-test or condition-monitoring features built into the equipment and the capabilities of the features such as Built-In Test/Built-In Test Equipment (BIT/BITE) logic to enable the user to understand the function. Provide a basic description of the self-test, BIT/BITE function including its operation, and usage. Include the following information:
  - In-service functionality if applicable
  - Shop-only functionality if applicable
  - How, when, and where faults are reported and/or recorded and/or erased
  - What format is used to record faults

2.2.3.2 Software data

When software contributes to the functionality of the equipment, include software description information sufficient to understand the functional behavior of the component for maintenance purposes. Include the following information:

- Description of normal operation (basic architecture and basic program functions) of the programmed device
- Functional description of software modules and their relationship to the unit including input and output data and logic flow information

2.2.3.3 Diagrams and schematics

Include a complete set of circuit diagrams for the equipment or component. Where necessary, the procedures within other page blocks will refer to these diagrams.

Generally, the complexity of the component will determine what schematics and functional diagrams must be included. The method of presentation can be block diagram, simplified schematic, or complete schematic, depending upon complexity and requirements. Most CM wiring diagrams can be adequately documented using standard graphic elements. Complex equipment can require the use of the wiring data constructs and Schema. Refer to Chap 3.9.5.2.9.

The diagrams can include:

- Wiring diagrams showing the physical arrangement of components, wiring harnesses, etc. Identify the connection points, interconnections and components (IC 051 and IC 053).
- Wiring list to include all wires shown on a wiring diagram for complex components. It must be arranged in termination order and give the following information: pin number (whether used or not), wire number, reference of the wiring diagram on which they appear and to-from routine. Include the system interface connector pins and associated signals to-from the equipment or component Unused and spare wires must be identified. (IC 057 and IC 058).
- Schematic diagrams showing the electrical arrangement of circuits. If the schematic of a card or module does not contain a complete circuit, provide a separate diagram showing the complete signal flow. The diagram must show the inputs, outputs, connections between cards, and the main equipment connector. The ratings of individual parts must be shown adjacent to each part (IC 054).
- Functional items (also known as reference designators) as identified in the IPD data modules.

These diagrams must show the test and measurement points mentioned in the procedures where appropriate.

A revision reference sheet must be provided if equipment changes affect schematic and wiring diagrams. Significant configuration changes will normally require a new diagram, with identification such as serial numbers or part number to show the components affected. The purpose of the revision reference sheet is to provide a descriptive history of changes, each numbered the same as coded change arrows on the diagram. Error corrections can be listed on the reference sheet, but must not have change arrows on the diagram. Change arrows must not be removed at later revisions. Place the revision reference sheet immediately before the test point/parts location diagram. The reference sheet must:

- Explain the reason for the change and its effect on circuit operation, with details of the equipment function before and after the change
- Identify the components affected by the change with serial numbers, part numbers or other identification. Quote service bulletin numbers if applicable.

2.3 Operation

Operation is only applicable to SE and TE.

2.3.1 Controls and indicators

These data modules describe the effect of operating SE or TE devices.

The information can be arranged by indicators of a same function or by sequential order when operating the item.

2.3.2 Pre-operation procedures

These data modules must provide information and instructions to prepare SE or TE for operation. They can include information to perform pre-operation procedures such as checks and serviceability tests and other pre-operations to ensure the equipment is ready for operation.

2.3.3 Operation procedures

These data modules must provide data and information to operate SE or TE.

If automatic and manual operations are applicable to items, both procedures must be given.

Instructions are only to deal with the devices (switches, pumps, etc) to be actuated during operation. The effect of the devices is described under "Controls and indicators". Refer to Para 2.3.1.

Operation procedures must not include emergency procedures. They must be given in "Emergency procedures". Refer to Para 2.3.4.

2.3.4 Emergency procedures

These data modules must provide information dealing with special controls and switches which must be operated when emergency actions are performed.

2.3.5 Post-operation procedures

These data modules provide information and instructions to post-operate the SE or TE. The workflow of the instructions to perform post-operation procedures such as tests, de-activation of systems (eg, pressure release), servicing, checks, post-operations themselves.

2.4 Maintenance and servicing

Maintenance data modules must use the Procedure Schema (refer to Chap 3.9.5.2.3), the Fault isolation Schema (refer to Chap 3.9.5.2.4) or the Process Schema (refer to Chap 3.9.5.2.10).

Supporting diagrams must be included when necessary for the technician to perform the maintenance instructions.

Business rule decision point BRDP-S1-00429 - Level of detail to be provided in the maintenance and servicing data modules in Equipment information sets:

- Decide what level of detail to provide in the maintenance and servicing data modules.

2.4.1 Maintenance planning

Refer to Chap 5.2.1.6 for rules on preparation and coding of maintenance planning information.

2.4.2 Maintenance environment

Maintenance procedures must be specific for the maintenance environment in which they are to be performed.

- In-service maintenance covers information and procedures to perform maintenance on the equipment while in-service
- Shop or depot maintenance covers information and procedures to perform maintenance on the equipment or component in maintenance facility

2.4.3 Consolidated lists for consumables, materials, expendables, support equipment, etc

Each procedure provides a table of Support equipment, table of Consumables, materials and expendables and table of Spares for the particular work described in the procedure. When, for example, a service task or repair has to be done, it can be more convenient to have a consolidated lists for the Consumables, materials, expendables, Support equipment, etc, for the complete task. In general, if only one data module is affected the lists are included in data module content (table of Support equipment, table of Consumables, materials and expendables, etc).

Information codes for lists of consumables (IC Y01), materials (IC Y02), expendables (IC Y03), special support equipment (IC Y04), standard support equipment and tools (IC Y05) and parts (IC Y07) are given in Chap 8.4 for each of the maintenance primary codes:

- Operation
- Servicing
- Examinations, tests and checks
- Fault reports and Isolation procedures
- Disconnect, remove and disassemble procedures
- Repairs and locally make procedures and data
- Assemble, install and connect procedures
- Package, handling, storage, and transportation
- Miscellaneous

Business rule decision point BRDP-S1-00430 - Use of consolidated lists for Support equipment, Consumables, materials, expendables, etc, in Equipment information sets:

- Decide whether to use consolidated lists for Support equipment, Consumables, materials, expendables, etc.

Business rule decision point BRDP-S1-00431 - Use of equivalent substitutes in Equipment information sets:

- Decide whether to allow the use equivalent substitutes for support equipment, consumables, materials and expendables.

The following lists can be included:

List of consumables (IC Y01). This is a list of general purpose items required to maintain the equipment (eg, oils, greases, paints, varnishes, cleaning agents).

List of materials (IC Y02). This is a list of bulk materials required to maintain the Product (eg, gasket sheet, sheet metal, plastic, copper).

Lists of consumables and materials must contain the following information for each item:

- the name
- an identification
  - CSN
  - NATO stock number
  - the identification number (manufacturer code and part number)
- nominal size or amount required

Identify consumables and materials by generic names, industry standard name or by the specification number where known.

For those consumable and material items that are used as part of the maintenance procedure only and do not become part of the correctly configured unit, include a note stating that equivalent substitutes can be used.

In those instances where consumable and material items do become part of the correctly configured unit, equivalent substitute items should not normally be allowed.

Reference to the consumable material data information (refer to Chap 5.2.1.17) for dangerous items must be given under the heading "Remarks".

List of expendables (IC Y03). This is a list of parts required to be replaced during the maintenance procedure, for example, O-rings, gaskets, tab washers.

In most cases these are specific replacement parts defined by the configuration of the unit. Equivalent substitute items should not normally be allowed.

List of special support equipment and tools (IC Y04). This is a list of special equipment including special tools used during maintenance. Refer to definitions in Chap 9.2.

Lists of special equipment and tools must contain the following information for each item:

- the name
- an identification
  - CSN
  - NATO stock number
  - the identification number (manufacturer code and part number)
- its characteristics

List special equipment and tools that are suitable for performing the procedures specified in the maintenance environment specified.

If substitute equipment and tools can be used, include a note stating that equivalent substitutes can be used.

Special tools and equipment used for measuring or performing evaluations or that require calibration or adjustment to perform their function correctly must be listed. For these items also specify all appropriate physical, mechanical, electrical, and functional characteristics of the equipment, with allowable tolerances and accuracies, so the technician can select suitable equivalent equipment.

For special items that are to be made locally, include a notation "locally made" in the description or characteristics information.

The items listed can be divided into groups of items, such as:

- tools
- test and calibration equipment

List of support equipment and tools (IC Y05). This is a list of standard equipment including standard tools used during maintenance. Refer to definitions in Chap 9.2.

Lists of standard support equipment and tools must contain the following information for each item:

- the name
- an identification
  - CSN
  - NATO stock number
  - the identification number (manufacturer code and part number)
- its characteristics

Specify equipment normally considered "standard" in the maintenance environment where the procedure is to be performed. Include a Note stating that equivalent substitute equipment and tools can be used.

Tools and equipment used for measuring or performing evaluations or that require calibration or adjustment to perform their function correctly must be listed. For these items also specify all appropriate physical, mechanical, electrical, and functional characteristics of the equipment, with allowable tolerances and accuracies, so the technician can select suitable equivalent equipment.

List of software (IC Y06). This is a list of the software required.

Lists of the software must contain the following information for each item:

- the name
- an identification
  - CSN
  - NATO stock number
  - the identification number (manufacturer code and part number)
- its revision level or revision date

For test software (IC 306) include the source test specification identification and revision information.

The project or the organization must decide the use of equivalent substitutes for consumables, materials, expendables equipment and tools.

2.4.4 Servicing (IC 2YY)

For details on servicing refer to the information code definitions in Chap 8.4.

These data modules provide the procedures and data necessary to do servicing on the equipment, or component. They include procedures to fill and drain containers, procedures to bleed, prime, lubricate, clean, adjust, align, calibrate, inspect, apply surface protection and markings, etc.

The servicing can be scheduled or not scheduled.

Procedures to do servicing must provide complete instructions and methods specific to the unit or refer to industry or manufacturer standard practices when available.

For each procedure list all consumables, materials, equipment and tools required. Identify consumables materials by generic names, industry standard name or by the specification number where known. Refer to Para 2.4.3.

2.4.4.1 Cleaning (IC 25Y)

Provide specific methods and processes for cleaning the equipment or references to applicable standard practices when appropriate. Provide step-by-step procedures that follow a logical workflow sequence. Cleaning procedures must take the repairs previously applied to the item into account such as bonded, filled or brazed parts.

Cleaning procedures include procedures for surface finish removal and repair or replacement including markings.

2.4.4.2 Inspection (IC 28Y)

For each item requiring inspection including the SE, TE or component, their components, assemblies, etc, the following information must be tabled:

- description of the item
- part number

- CSN if applicable
- limit
- data module code of the procedure to be performed when the limit is reached

Limits must provide:

- the nature of the limit such as life limit, inspection intervals, time limit, shelf life
- the value and the unit (eg, 1000 starts, 2 years, 500 running hours, 15000 cycles)
- the tolerance applicable to the limit, as required

2.4.5 Examinations, tests and checks (IC 3YY)

2.4.5.1 General

For details on examinations, tests and checks (IC 3YY), refer to the information code definitions in Chap 8.4.

Tests will vary in complexity and stringency according to the conditions under which a unit functions or was replaced. The information must clearly define those examinations, test, and checks required to determine the serviceability of the equipment. Procedures must be directed toward restoring the unit to service by replacement of parts, servicing, or repairing. The minimum set of examinations, tests and checks required to determine the serviceable condition of the unit must be clearly defined.

These procedures include but are not limited to:

- Visual examinations (IC 31Y)
- Operations tests (IC 32Y)
- Test preparation (IC 33Y)
- Function tests (IC 34Y)
- Structure tests (IC 35Y)
- Checks (IC 36Y)

Refer to industry standard practices for examination, test or check procedures whenever possible.

Based on the possible results of each examination/test/check, the procedure must give the conditions for one of the following determinations:

- Acceptable for continued operation within the defined serviceable limits
- Requires additional examination/test/checks to be performed in accordance with other referenced data modules in the procedure
- Restorable by replacement of parts or servicing procedures referenced in the procedure
- Repairable in accordance with specific repair procedures referenced in the procedure
- No longer serviceable, restorable or repairable

2.4.5.2 Visual examination (IC 31Y)

These data modules provide the visual inspection methods specific for examining the items. Otherwise, referencing to standard practices is the preferred method.

Procedures must provide instructions for the examination itself and the workflow of related instructions necessary to perform examinations such as removal of harnesses or pipes for access, equipment calibration, and close-up actions

Procedures must describe the nature and maximum allowable extent of the faults to be detected and provide references to appropriate procedures for corrective action. Refer to Para 2.4.5.1.

2.4.5.3 Operation test (IC 320)

Operation tests are normally only applicable to SE and TE but can apply to certain components. They do not require test equipment other than those installed on the equipment.

These data modules include information such as:

- procedures and data to check the capability of the equipment to operate correctly before its use or its delivery
- check for freedom of movement of mechanical actions
- general operations such as actuator stroke length, voltage, current, continuity

Procedures must describe the nature and maximum allowable extent of the faults to be detected and provide references for corrective action. Refer to Para 2.4.5.1.

2.4.5.4 Test preparation (IC 33Y)
These data modules contain the procedures and data to:

- prepare the equipment and the test equipment for test
- to install/connect the item and the test equipment
- to disconnect/remove the item and the test equipment

The procedures must provide information necessary to perform all test preparation including but not limited to:

- removal of blanking
- checks of connectors
- safe to test checks to avoid damage to the item to be tested and the test equipment
- checks of connections (pneumatic, hydraulic, etc)

Test set-up diagrams must be provided or referenced for each different test set-up. Show all equipment needed (oscilloscope, flow meter, power supply, etc) to perform the supported tests and their name and part number or other identification as given in the tool and equipment lists for the procedure.

2.4.5.5 Function tests (IC 34Y)
These data modules contain tests to evaluate the equipment's condition before and after maintenance actions to determine required maintenance activities and to define the functional requirements to verify that equipment can be returned to service.

Functional test procedures must as a minimum:

- Specify special conditions applicable to the test such as climatic conditions, room temperature, relative humidity, or dust protection
- Identify the test points
- Specify locations and desired measurement range for ratings, voltages, pressures, wave shapes, etc, needed to ensure proper operating and integrity of the component
- Provide detailed timing diagrams and/or precise test sequence data for any time critical measurements. Use line drawings for wave shapes in preference to photographs, where practical.
- Include temperature-rate-rise limits or leakage limits when applicable
- Specify acceptance limits for each value/measurement

Test parameters must be directed toward determining the serviceability of the unit and determining corrective action rather than manufacturer testing for final component approval for delivery.

Complex tests must be unitized as much as possible with re-entry points and specific start and stop instructions to permit retesting certain features without having to run the complete test every time.

2.4.5.6 Automatic test (IC 342)
These data modules provide the methods and equipment specific to implementing testing on Automated Test Equipment (ATE). This type of test relies on computer based test equipment with software driven/defined test steps.

Test software must be included in the required lists for each data module. Refer to Para 2.4.3.

Related test support data for the return to service test software such as a test specification, or source code can be included or referenced as a separate document or other media.

2.4.5.6.1 Built-in test or built-in test equipment, (IC 341 or IC 342)
When the equipment design includes a BIT or BITE a procedure to run the BIT/BITE and interpret the results must be provided.

If the ATE procedures in Para 2.4.5.6 do not include the required BIT/BITE information, provide them in a separate data module. Choose IC 341 or IC 342 based on whether the required read/decode/erase procedures are manual or automatic.

The procedures must include:

- Specific instructions and equipment to read and erase/rest the BIT/BITE memory
- A translation table or listing to provide simplified English translations and interpretations of the BIT/BITE codes
- References to specific procedures to correct a fault detected by the BIT/BITE
- Information and references to guide the user to the place in the functional test or fault isolation procedures where additional examinations, tests or checks can be performed to isolate a malfunction detected by the BIT/BITE

Note
BIT/BITE function and logic must be described in the technical data and descriptions section. Refer to Para 2.2.3.1

2.4.5.6.2 Non-volatile memory, (IC 341 or IC 342)
When the equipment design includes Non-Volatile Memory (NVM) a procedure to read, interpret, and reset the NVM must be provided.

If the ATE procedures in Para 2.4.5.6 do not include the required NVM information provide them in a separate data module. Choose IC 341 or IC 342 based on whether the required read/decode/erase procedures are manual or automatic.

The procedures must include:

- Specific instructions and equipment to read and erase/rest the NVM memory
- A translation table or listing to provide simplified English translations and interpretations of the NVM codes
- References to specific procedures to correct a fault recorded in NVM
- Information and references to guide the user to the place in the functional test or fault isolation procedures where additional examinations, tests or checks can be performed to isolate a malfunction recorded in NVM

Note
NVM logic and function must be described in the technical data and descriptions section. Refer to Para 2.2.3.1

2.4.5.7 Structure tests (IC 35Y)
These data modules contain the detailed procedures needed to perform structural tests to determine the status of the parts (ie, serviceable, restorable, repairable or to be scrapped).

Specify tests required to determine the condition of the component. Describe the methods, techniques, and equipment required (eg, tests with dye penetrate (IC 351), magnetic particles (IC 352), eddy current (IC 353)).

Only procedures specific to the item must be described. Refer to industry standard practices for the test procedures whenever possible. Illustrations must be provided to indicate the critical areas to be tested and to locate and to identify defects. Defects can be coded and the procedure must refer to these codes whenever those defects are mentioned.

Procedures must describe the nature and maximum allowable extent of the faults to be detected and provide references to appropriate procedures for corrective action. Refer to Para 2.4.5.1 and Para 2.4.5.2.

If different levels of acceptable serviceability exist they must be covered.

2.4.5.8 Checks (IC 36Y)

These data modules contain the detailed procedures needed to perform those checks necessary to determine the status of the parts with regard to their design data and tolerances including any in-service allowances (ie, serviceable, restorable, repairable or to be scrapped).

Specify those and checks required to determine the condition of the component. Describe the methods, techniques, and equipment required (eg, visual check, under magnifying glass, measure with a micrometer). Refer to industry standard practices for examination, test or check procedures whenever possible. Refer also to visual examination in Para 2.4.5.1.

Only procedures specific to the item must be described. Refer to industry standard practices for the measurement or other procedures whenever possible. Illustrations must be provided to indicate the areas to be measured or where the check is made.

When measurement devices must be attached or installed to perform the check (eg, pressure, voltage, flow, leakage or other checks) include a set-up diagram showing where the measurement is made and how the measuring equipment is installed.

Any systematic or as-required measurements must be located on an illustration as simple as possible for easy reading. If dimensions, tolerances and clearances are coded on the illustration, their values must be given on a separate table.

Procedures must describe the workflow of the instructions necessary to be performed to check the item.

Permissible in-service/service-wear tolerances and clearances must be provided.

Procedures must describe the nature and maximum allowable extent of the faults or the pass/fail condition to be detected and provide references to appropriate procedures for corrective action. Refer to Para 2.4.5.1 and Para 2.4.5.2.

If different levels of acceptable serviceability exist they must be covered.

Measurements, clearances and torques which are specific to assembly procedures are not to be mentioned in check procedures.

2.4.5.9 Supplemental data and information

Supplemental information and data provided to support specific examinations, tests or checks can be included in the specific data module it supports or in a separate data module. Separate data modules provided for this purpose can use the same information code as the specific procedure they support and must be referenced in that procedure. This information can include underlying test specifications, re-useable test code, material specifications, etc.

2.4.6 Fault isolation procedures (IC 4YY)

These data modules contain the procedures required to detect malfunctions in the item and to isolate the faulty component or part in order to proceed with its replacement or repair.

In most instances faults, failures and related corrective actions will be covered in the required examinations, tests and checks described in Para 2.4.5 however in some instances additional fault isolation procedures can be required to isolate the fault. When provided, fault isolation procedures are to be complementary to the examinations, tests and checks of Para 2.4.5.

These procedures are also used to provide additional fault determination instructions as necessary to support fault reporting features such as BIT, BITE, fault recording and storage in NVM features, and other sources of fault reporting. Refer to Para 2.2.3.1 for a BIT/BITE logic and functional information. Refer to Para 2.4.5.6.1 for a description of the procedures to use BIT/BITE features. Refer to Para 2.4.5.6.2 for a description of the procedures to use NVM features.

These procedures must be arranged in such a manner that they will progressively isolate and identify each assembly, subassembly or parts. Each fault isolation procedure must contains all operations needed to isolate the fault and must terminate with instructions for correcting it.

Include information for responding to fault codes and maintenance messages including lists of fault codes and maintenance messages with references to the applicable fault isolation or corrective procedure.

When the fault isolation procedures require additional examinations, tests, or checks, these procedures are to be provided in accordance with Para 2.4.5 and referenced in the fault isolation procedure.

Servicing or repair procedures to be performed during the fault isolation process must refer to relevant data modules or to standard practices, except if they are simple (eg, fuse change, filling a reservoir). In these instances the applicable instructions can be given at the applicable step in the fault isolation procedure.

2.4.7 Disconnect, remove and disassemble procedures (IC 5YY)

These data modules contain information to disconnect remove and disassemble an item. They must contain instructions for the disconnection, removal and disassembly of a given piece of equipment or item. All measurement and/or values that are documented prior to an individual action being performed must be described in the applicable step in the instructions. Instructions for features that require special attention such alignment or matched set must be included.

Provide the workflow of the instructions as necessary to gain access with the minimum of disturbance, to disconnect and/or remove other serviceable items and subsequently remove the given item. No unnecessary actions must be carried out such as opening of permanent joints, unsoldering of connections, unless required for maintenance of the item.

Other procedures required prior to disassembly such as cleaning, examination, test, check must be referenced.

If the use of special equipment and tools is not self-explanatory, data modules must provide or reference the data and information for their utilization.

Procedures can be supported by illustrations or sequence charts as required.

2.4.8 Repair instructions (IC 6YY)

These data modules contain detailed repair processes and data required to restore a worn or damaged part to serviceable condition.

Repairs are activities that restore a unit to an approved serviceable condition that is different from the original approved configuration. For instance welding a crack, or build-up and machining of a worn shaft, are "repairs" because the configuration of the resulting part is

different from the original approved configuration. Note that such repairs and altered configurations must still be supported by approved engineering data.

Replacement of a worn bearing, bushing or shaft with an original configuration part or an approved alternate part is not a "repair". These are maintenance activities because they restore the unit to an originally approved configuration and are accomplished using the routine assembly/disassembly procedures.

Inspection (refer to Para 2.4.4.2), examination, test and check (refer to Para 2.4.5) and fault isolation procedures (refer to Para 2.4.6), must identify and quantify the extent of damage to be corrected.

The extent of the damage can be categorized as repairable damage, or non-repairable damage requiring the replacement of the equipment using IC 661 "Permitted damage".

For equipment, most repair procedures will fall under the following information codes:

- Temporary repair procedure (IC 662)
- Standard repair procedure (IC 663)
- Special repair procedure (IC 664)

Temporary repairs, or repairs with life limitations, must be avoided where possible.

Preliminary actions refer to the steps necessary to gain access or prepare the equipment to a state of readiness for the repair activity and must be included in the element <preliminaryRqmts> of the data module.

Each repair procedure must include illustrations as required to support the procedure. Include illustrations to show specific areas and locations and proximity to features or related items.

Repair procedures must not change the interchangeability of the repaired part or of the assembly when repaired with a repair size part such as a sleeve or a piston in a component. Refer to defined special repair parts such as oversize/undersize parts by part number. Repair parts must be listed in the IPD data module. Refer to Para 2.5.

The procedures and data to locally make items, parts, or equipment must be provided using IC 670.

Repair procedures must include complete work instructions, or reference standard procedures, to perform the described repair. These can include machining, welding, soldering, or other workshop procedures, processes, and specifications as applicable. Include all dimensions, tolerances, finish requirements, chamfers, edge radii, and plating necessary to perform the repair.

Only procedures specific to the item or specific repair procedure must be provided, otherwise, refer to standard practices.

Each repair must be identified. This identifier is not to be changed or reused. A reference between the identifier and the data module code of the procedure to perform the repair must be provided. This identifier will provide a reference to be recorded in the maintenance history of the unit. Some projects can require that the repair identifier be marked on the unit. In this instance repair instructions must include a work step to correctly mark the unit. Simple "How to mark" instructions for the repaired parts must be included in the procedure for simple marking, otherwise refer to relevant data modules or standard practices. This is particularly important for equipment that can be installed on different versions of higher equipment.

If several repairs are applicable to the same part, a table can be provided to select the sequence of instructions so that they are not duplicated unnecessarily. This table must be a data module.

2.4.9 Assemble, install and connect procedures (IC 7YY)

These data modules must provide instructions for the assembly, installation and/or connection of the equipment or item. Provide the workflow of the instructions as necessary to assemble, install and/or connect the item including all related instructions and procedures such as checks, assembling, storage fluid replacement, and closing up.

Assembly fits and clearances, adjustments and torque values must be given in the applicable steps. Instructions for features that requires special attention such alignment or matched sets must be included.

If the use of special equipment and tools is not self-explanatory, data modules must provide or reference the data and information for their utilization.

Procedures must be supported by illustrations or flow charts as required.

Provide the step-by-step instructions necessary to secure each part that must be locked when installed on the equipment. Illustrations must be provided to allow the user to visually identify the parts to be locked and the method to be used. Simple locking requirements and procedures can be provided at the applicable procedure step. Complex locking procedures can be provided in separate data module using IC 712.

Procedures for all calibration or tests which cannot be performed after final assembly or which are easier to perform during assembly must be referenced at the applicable step.

Procedures for programming, loading data or installing software that is part of the equipment's configuration must be provided at the applicable assembly step. These instructions can be provided as a separate procedure when appropriate (IC 750 or IC 752). In this case reference to this separate programming or software loading procedure must be given at the applicable step.

Procedures for loading operational or functional software which are not part of the defined configuration of the equipment must be provided as a separate data module (IC 750 or IC 752) and referenced after the unit is completely assembled and configured.

2.4.10 Storage procedures and data

Include storage instructions when appropriate. Storage information must include storage time limits for life limited parts and procedures to keep equipment serviceable while in storage. Refer to Chap 5.2.1.3.5 for preparing data modules for storage information.

2.5 Parts information

Provide at least one IPD data module for any equipment or component that has replaceable component, assemblies, subassemblies or parts. Refer to Chap 3.9.5.2.7.

Business rule decision point BRDP-S1-00432 - Level of detail to be provided in the IPD data modules in Equipment information sets:

- Decide what level of detail to provide in the IPD data modules.

Chapter 5.2.1.10

Common information sets - Weapon loading information

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1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for Weapon Loading (WL) information.

1.2 Scope

This chapter covers the rules for the preparation of information applicable to Product Weapon loading which will enable skilled personnel to load and offload munitions and to check the armament systems which are used to control/fire/release. The WL information must contain the following topics:

- basic information
- supplementary information
- loading procedures
- offloading procedures
- loading and offloading procedures checklists
- integrated combat turnaround procedures
- integrated combat turnaround procedures checklists
- cross servicing checklists

1.3 Standards and definitions

1.3.1 Standards

The standards given in this chapter are applicable with no exceptions.

1.3.2 Definitions

The following definitions and those stated in Chap 9.2 must be used as appropriate.

- Accessory: An item which is required to mate the munitions to the Product and which remains as an integral part of the system (eg, pylon, missile launcher and adapter, multiple ejector racks).
- Singular: In this specification the expression "The context of all steps must be singular" means that even if more than one identical action (such as checking that multiple safety pins are fitted) could take place, each action must be a separate step. Do not use a plural step such as "Verify all safety pins are fitted".
- Plural: Similarly to the definition of singular, the expression "The context of all steps must be plural" means that the steps must contain those identical actions applicable to more than one item (such as performing a no-volt test at both holders).

2 Weapons loading information

2.1 General

The complete set of weapons loading data modules is specified in Para 2.2.

2.2 Technical content

2.2.1 Introduction

If required, the introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-14-40-00-**NN**A-018Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-40-0000-**NN**AAA-018Y-Z (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

2.2.2 Data module coding

To assist in the codification of data modules, the rules which follow must be used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-**14-4Y**-**SS**-**NN**Y-YYYY-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y**14-4Y**-**SS**00-**NN**YYY-YYYY-Z (37 characters)

Where:

- "**14-4Y**", are the codes given in Chap 8.2.1.
- "**SS**", in the unit or assembly code, identifies the store number. "00" identifies all stores, "01" store No. 1, "02" store No. 2, etc.
- "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

2.2.3 Basic information

The basic information includes the following descriptions.

2.2.3.1 General

All equipment and munitions, for which loading and offloading procedures information are required, must be described in sufficient detail for loading and offloading purposes.

2.2.3.2 Product description

These data modules must contain descriptive information showing how the concerned Product's systems are made. Their function within the context of munitions loading/offloading must be provided for

- the Product controls
- munitions release or control systems
- any other equipment of direct concern to the loading crews, such as pylons, light and heavy duty ejector release units, adapters

Data modules must be coded:

YY-Y-14-41-00-NNA-040A-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-41-0000-NNAAA-040A-Z (37 characters)

2.2.3.3 Munitions description

These data modules must contain descriptive information regarding how the munitions is made and its function must be provided for all types of munitions and their components approved for loading on the Product. The fuse compatibility for each fused munitions must be shown, specifically identifying those authorized for prefusing and retention of fuse on the munitions while offloading.

Data modules must be coded:

YY-Y-14-41-SS-NNA-040A-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-41-SS00-NNAAA-040A-C (37 characters)

2.2.3.4 Support equipment (information set) description
These data modules must contain descriptive information regarding how the support equipment is made and its function must be provided for testers, handling and loading or offloading equipment listed in the required support equipment in the loading/offloading procedures.

Data modules must be coded:

YY-Y-YY-YY-YY-00A-040A-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-00AAA-040A-C (37 characters)

2.2.4 Supplementary information
The supplementary information must contain, as a minimum, the following. Additional information can be defined by the project or the organization.

2.2.4.1 General safety requirements
These data modules must contain general safety requirements pertinent to preparation, handling, loading and offloading of munitions.

Data modules must be coded:

YY-Y-14-42-SS-NNA-012A-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-012A-Z (37 characters)

2.2.4.2 Product controls and indicators
These data modules must illustrate those controls and indicators of the Product used by the loading crew.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-110Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-110Y-A (37 characters)

2.2.4.3 Product preparation
These data modules must contain all steps required to prepare the basic Product for functional or no-volt tests and munitions loading. A standardized set of steps must be used for all individual munitions loading procedures.

Data modules must be coded:

YY-Y-14-42-00-NNA-330Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-42-0000-NNAAA-330Y-A (37 characters)

2.2.4.4 Emergency procedures
These data modules must contain emergency procedures related to the authorized munitions and the Product loaded with these munitions; they consist of actions to be taken if munitions are involved in a fire. Procedures must be preceded by a brief explanation of actions to be accomplished by the loading crew. Information containing emergency procedures must be adequately marked and the words "Emergency procedures" must be included in the title.

Data modules must be coded:

YY-Y-14-42-SS-NNA-140Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-140Y-Z (37 characters)

2.2.4.5 Installed accessory preparation
These data modules must contain all procedures to prepare each installed munitions accessory (eg, racks, launchers, pods) for functional tests. It must also contain those procedures required to prepare the accessories for loading the munitions.

Data modules must be coded:

YY-Y-14-42-SS-NNA-330Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-330Y-A (37 characters)

2.2.4.6 Functional tests
These data modules must contain all functional test procedures applicable to the control/release and jettison system or mechanisms for the munitions.

Data modules must be coded:

YY-Y-14-42-SS-NNA-340Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-340Y-A (37 characters)

2.2.4.7 No-volt tests
These data modules must contain all necessary procedures to perform no-volt test of stores control/release and jettison systems or mechanisms for the munitions.

Data modules must be coded:

YY-Y-14-42-SS-NNA-369Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-369Y-A (37 characters)

2.2.4.8 Standard procedures
These data modules must contain general information which is applicable to more than one procedure, operation or step (eg, checking a multi-meter for proper operation, grounding procedures, marking of impulse cartridges).

Each procedure must be assigned an individual data module. The information code must be applicable to the context of the procedure.

Data modules must be coded:

YY-Y-14-42-SS-NNA-YYYY-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-42-SS00-NNAAA-YYYY-Z (37 characters)

2.2.5 Loading procedures

2.2.5.1 General procedures

A general data module must be prepared for every authorized munitions, group of munitions, or combination of munitions as applicable. Each one of these data modules must list, in the correct sequence of operations, all the data modules which form a complete loading procedure. The titles of these general data modules must identify the applicable munitions (eg, "Bombs, general purpose, 500-pound MK82 - Snakeye I").

Data modules must be coded:

YY-Y-14-43-SS-NNA-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720Y-A (37 characters)

2.2.5.2 Detailed procedures

Detailed loading procedures must be prepared as given in Para 2.2.5.2.1 thru Para 2.2.5.2.9.

Data modules must be coded:

YY-Y-14-43-SS-NNA-720Y-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-720Y-C (37 characters)

2.2.5.2.1 Munitions preparation

These data modules must include procedures required to inspect and prepare each munitions, including any applicable component. They must include procedures required to assemble and install authorized fuses prior to munitions loading. Procedures must be included to verify the safety of each fused munitions. The context of all steps must be singular.

2.2.5.2.2 Cartridge installation prior to loading

These data modules must include procedures required to install cartridges in those components that must have cartridges installed prior to loading the munitions.

The following steps are applicable:

1 Do required no-volt tests.

2 Do a test on impulse cartridges for serviceability.

3 Install impulse cartridges.

The context of all steps must be plural.

2.2.5.2.3 Loading

These data modules must include procedures required to load the munitions. The context of all steps must be singular.

2.2.5.2.4 Fusing

These data modules must include procedures required to test the prefused munitions and install those fuses that are not authorized to be installed prior to loading munitions. The context of all steps must be singular.

2.2.5.2.5 Postloading

These data modules must include procedures required to ensure the safety and electrical compatibility of the munitions and its accessories. The context of all the steps must be plural.

2.2.5.2.6 *Cartridge installation after loading*
These data modules must include procedures required to install cartridges that must be fitted only after loading the munitions. The following steps are applicable:

1 Do required no-volt tests.

2 Do a test on impulse cartridges for serviceability.

3 Install impulse cartridges.

The context of all steps must be plural.

2.2.5.2.7 *Postloading inspection*
These data modules must include procedures which ensure that all necessary safety devices have been removed or installed as required, bombs and fuses are installed properly, and fuse safety devices have been removed or installed as required. The context of all steps must be plural.

2.2.5.2.8 *Delayed operation or alert*
These data modules must include procedures required to make safe the Product components, munitions and impulse cartridges when the Product is placed on delayed operation or alert. The context of all steps must be plural.

2.2.5.2.9 *Immediately prior to launch*
These data modules must include procedures required to place the safe Product in a launch configuration. The context of all steps must be plural.

2.2.5.3 Specific safety requirements
These data modules must contain all specific safety requirements pertaining to the munitions loading procedures.

Data modules must be coded:

YY-Y-14-43-SS-NNA-012A-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-012A-Z (37 characters)

2.2.5.4 List of tools and support equipment
These data modules must list the special tools and support equipment that are required to accomplish the requirements of the loading procedures and the offloading procedures. Refer to Para 2.2.5 and Para 2.2.6.

Data modules must be coded:

YY-Y-14-43-SS-NNA-060A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-43-SS00-NNAAA-060A-A (37 characters)

2.2.6 Offloading procedures

2.2.6.1 General
A general data module must be prepared for every authorized munitions, or group of munitions, as applicable. Each one of these data modules must list, in the correct sequence of operations, all the Data Modules which form a complete offloading procedure. The titles of these general Data Modules must identify the applicable munitions (eg, "Bomb", general purpose, 500-pound MK82 - Snakeye I").

Data modules must be coded:

YY-Y-14-44-SS-NNA-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520Y-A (37 characters)

2.2.6.1.1 *Making safe*
These data modules must include essential procedures required to make the Product munitions safe and to install the required safety devices. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-44-SS-NNA-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-720Y-A (37 characters)

2.2.6.1.2 *Pre-offloading*
These data modules must include procedures required to make the Product's munitions safe for offloading. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-44-SS-NNA-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520Y-A (37 characters)

2.2.6.1.3 *Fuse removal*
These data modules must include procedures required to make safe and to remove fuse or fuses from the munitions. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-44-SS-NNA-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520Y-A (37 characters)

2.2.6.1.4 *Removal of cartridges*
These data modules must include procedures required to remove cartridges from the munitions. The context of all steps must be singular.

Data modules must be coded:

YY-Y-14-44-SS-NNA-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520Y-A (37 characters)

2.2.6.2 Offloading
These data modules must include procedures required to offload the munitions from the Product. The context of all steps must be singular.

Data modules must be coded:

YY-Y-14-44-SS-NNA-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520Y-A (37 characters)

2.2.6.3 Post-offloading
These data modules must include information on post-offloading actions, such as fitting pylon sole plates, installing dummy cartridges, etc. The context of all steps must be singular.

Data modules must be coded:

YY-Y-14-44-SS-NNA-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520Y-A (37 characters)

2.2.7 Loading and offloading procedure checklists

2.2.7.1 General
The loading and offloading procedure checklists must contain specific safety requirements derived from the original loading/offloading procedures.

Any procedural step that applies only to a specific munitions Product configuration or accessory must be prefixed for identification. Torque values, preset dimensions, orifice identifiers, etc, included in the original procedure must be placed in the checklist.

Paragraph headings used in the checklist must be presented as in the original procedure.

2.2.7.2 Detailed requirements
All required steps must be included for Product preparation and no-volt tests. Steps for other procedures must be kept to a minimum. Steps considered routine actions on the entire Product during loading and offloading procedures and within the capabilities of a trained technician can be omitted. Redundant actions/checks must be omitted. However, to assure maximum safety, separate procedures for each fuse combination must be included under appropriate subordinate headings, when applicable.

Steps must be shortened by the elimination of excess words and by the use of abbreviations so that one-line entries can be utilized to the greatest extent possible, but still be written to ensure ease of reading and interpretation. Steps must follow the same order as they appear in the original procedure and must be numbered in sequence. Warnings and cautions in the original procedure must be included in the checklist. Notes can be included if considered necessary.

Illustrations must be included, if directed by the project.

2.2.7.3 Coding of loading and offloading procedure checklists
The checklist data modules must have the same data module code as its "original" procedure except for the subsection number which must be "5".

Examples, loading procedure:

- "Original" data module code - 1K-A-14-44-03-01A-720A-A
- Checklist data module code - 1K-A-14-45-03-01A-720A-A

2.2.8 Integrated combat turnaround procedures

2.2.8.1 General
The integrated combat turnaround procedures are used by qualified personnel to service, maintain and load/offload munitions on the Product under combat or combat training,

turnaround conditions. Procedures must be preceded by a brief explanation of actions to be accomplished by the turnaround crew.

2.2.8.2 Precautionary information

2.2.8.2.1 General safety requirements

These data modules must contain safety requirements which apply Product servicing, munitions-loaded Product loading and offloading of munitions.

Data modules must be coded:

YY-Y-14-46-SS-NNA-012A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-012A-A (37 characters)

2.2.8.2.2 Emergency procedures

These data modules must be adequately marked and the words "Emergency Procedures" must be included in the title. They must contain all applicable emergency procedures. When more than one type of munitions is included and withdrawal distances differ, emergency procedures data modules must be provided for each type of munitions.

Data modules must be coded:

YY-Y-14-46-SS-NNA-140Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-140Y-A (37 characters)

2.2.8.3 Pre-positioning and munitions preparation

The pre-positioning and munitions preparation data modules must contain information covering tool and support equipment, pre-positioning/inspection and munitions preparation.

2.2.8.3.1 List of tool and support equipment

These data modules must list the special tools and support equipment that are required to accomplish an integrated combat turnaround (excluding firefighting and refueling equipment).

Data modules must be coded:

YY-Y-14-46-SS-NNA-060A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-060A-A (37 characters)

2.2.8.3.2 Pre-positioning/inspection

These data modules must include the specific requirements for items which need to be positioned and inspected. All steps must be singular.

Data modules must be coded:

YY-Y-14-46-SS-NNA-310Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-310Y-A (37 characters)

2.2.8.3.3 Munitions preparation

These data modules must include munitions and pre-loaded launcher inspections for serviceability and safety prior to the Product loading. All steps must be singular.

Data modules must be coded:

YY-Y-14-46-SS-NNA-720Y-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-720Y-C (37 characters)

2.2.8.4 Product servicing/munitions loading and offloading

2.2.8.4.1 Cursory inspection

These data modules must include, as a minimum, the requirement to ensure the Product is secured/safe, operator/ground crew communication has been established, the Product is operational and ammunitions/fuel requirements have been determined prior to Product preparation. All steps must be plural.

Data modules must be coded:

YY-Y-14-46-SS-NNA-280Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-280Y-A (37 characters)

2.2.8.4.2 Product preparation

These data modules must include all procedures to ensure the Product is serviceable and is prepared for munitions loading/unloading.

Data modules must be coded:

YY-Y-14-46-SS-00A-330Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-00AAA-330Y-A (37 characters)

2.2.8.4.3 Munitions offloading

These data modules must include the requirements to make safe, to remove fuses and to offload munitions from the Product. All steps must be singular.

Data modules must be coded:

YY-Y-14-46-SS-NNA-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-520Y-A (37 characters)

2.2.8.4.4 Gun loading

These data modules must contain gun loading procedures.

Data modules must be coded:

YY-Y-14-46-SS-NNA-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-720Y-A (37 characters)

2.2.8.4.5 Final cockpit/crew station preparation

These data modules must include all the procedures to prepare the cockpit/crew station for the Product servicing/munitions loading. These procedures can include towing and positioning of the Product, if applicable. All steps must be singular.

Data modules must be coded:

YY-Y-14-46-SS-00A-120Y-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y14-46-SS00-00AAA-120Y-A (37 characters)

2.2.8.4.6 *Product servicing/munitions preparation*
These data modules must include all the procedures for tank installation, refueling, servicing and loading of munitions. All steps must be singular.

Data modules must be coded:

YY-Y-14-46-SS-NNA-720Y-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-720Y-A (37 characters)

2.2.8.4.7 *Final Product preparation*
These data modules must include procedures to ensure safety devices have been removed or installed as required, tools and equipment have been removed, and the Product is ready for operating. All steps must be plural.

Data modules must be coded:

YY-Y-14-46-SS-NNA-720Y-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-720Y-A (37 characters)

2.2.8.4.8 *Immediately prior to launch*
These data modules must include all steps required to place the Product in a launch configuration.

Data modules must be coded:

YY-Y-14-46-SS-NNA-720Y-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y14-46-SS00-NNAAA-720Y-A (37 characters)

2.2.9 **Integrated combat turnaround procedure checklists**
The integrated combat turnaround checklists must meet the requirements detailed in Para 2.2.8. except as specifically noted below.

Paragraph headings used in the checklist must be presented the same as in the integrated combat turnaround procedures.

Data modules must be coded:

YY-Y-14-44-SS-NNA-520Y-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y14-44-SS00-NNAAA-520Y-A (37 characters)

2.2.10 **Cross servicing checklists**
2.2.10.1 General
The cross servicing checklists must include the servicing procedures of the Product which enable the Product to carry out its operational mission.

The checklists must contain emergency procedures and loading/offloading procedures. Steps must be numbered in sequence under each heading.

All the abbreviations appearing in the checklist, together with the meaning of each, must be listed in alphabetical order.

Illustrations must convey location, if applicable, and dimensional data with tolerance information. The illustrations must be limited to the equipment upon which the tasks must be performed, plus sufficient surroundings to allow a technician to easily locate the equipment item.

Procedural steps that are applicable to a specific item must be prefixed for identification.

2.2.10.2 General safety requirements
These data modules must contain all general safety requirements necessary for preparation, handling, loading and offloading of munitions.

Data modules must be coded:

YY-Y-14-48-SS-NNA-012A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-012A-A (37 characters)

2.2.10.3 Emergency procedures
These data modules must contain emergency procedures related to munitions loaded Product.

Data modules must be coded:

YY-Y-14-48-SS-NNA-140Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-140Y-Z (37 characters)

2.2.10.4 Product general arrangement
These must contain the Product general arrangement in an illustrated form, showing the location of panels and switches used by loading crews.

Data module codes must be coded:

YY-Y-14-48-00-NNA-110Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-0000-NNAAA-110Y-A (37 characters)

2.2.10.5 Product preparation
These data modules must include procedures which must be accomplished for munitions loading. The steps must give procedures for preparation of the Product and installed accessories for loading and a no-volt check for munitions/accessories as required. A configuration chart depicting authorized loading configuration for the specific munitions will be shown. The steps must include details to make safe any munitions item which might be on the Product prior to no-volt checks, (eg, Make safe missile motors, Disconnect missile igniter cables).

Data modules must be coded:

YY-Y-14-48-00-NNA-330Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-0000-NNAAA-330Y-A (37 characters)

2.2.10.6 List of tools and support equipment
These data modules must list the special tools and support equipment that are required to accomplish munitions loading.

Data modules must be coded:

YY-Y-14-48-SS-NNA-060A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-060A-A (37 characters)

2.2.10.7 Specific safety requirements
These data modules must contain all specific safety requirements pertaining to the munitions loading procedures of the specific munitions.

Data modules must be coded:

YY-Y-14-48-SS-NNA-012A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNA-012A-A (37 characters)

2.2.10.8 Loading procedures

2.2.10.8.1 Munitions preparation
These data modules must include procedures for each single munitions and pre-loaded accessory, it must include steps required to assemble and install authorized fuses prior to munitions loading. Procedures must be included to verify the safety of each fused munitions. The context of all steps must be singular.

Data modules must be coded:

YY-Y-14-48-SS-NNA-720Y-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720Y-C (37 characters)

2.2.10.8.2 Cartridge installation prior to loading
These data modules must include steps required to check and install impulse cartridges in those accessories that must have cartridges installed prior to loading munitions. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-48-SS-NNA-720Y-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720Y-C (37 characters)

2.2.10.8.3 Loading
These data modules must include steps required to load the munitions. The context of all steps must be singular.

Data modules must be coded:

YY-Y-14-48-SS-NNA-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720Y-A (37 characters)

2.2.10.8.4 Fusing

These data modules must include steps required to test pre-fused munitions and/or install those fuses that are not authorized to be installed prior to loading munitions. The context of all steps must be singular.

Data modules must be coded:

YY-Y-14-48-SS-NNA-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720Y-A (37 characters)

2.2.10.8.5 Cartridge installation

These data modules must include procedures required to test impulse cartridges for serviceability and to properly install cartridges in all accessories as required. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-48-SS-NNA-720Y-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720Y-C (37 characters)

2.2.10.8.6 Post-loading inspection

These data modules must include steps required to ensure that accessory safety devices are installed. Bombs and fuses are installed as required and fuse safety devices have been removed or installed as required. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-48-SS-NNA-720Y-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720Y-C (37 characters)

2.2.10.9 Offloading procedures

2.2.10.9.1 Making safe

These data modules must include essential steps required to make safe the Material/munitions and the installed associated safety devices. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-48-SS-NNA-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-720Y-A (37 characters)

2.2.10.9.2 Pre-offloading

These data modules must include procedures required to make the Product safe for offloading. All steps required making the Product/munitions safe must be repeated in these procedures. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-48-SS-NNA-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-520Y-A (37 characters)

2.2.10.9.3 *Fuse removal*
These data modules must include procedures required to make safe and to remove the fuses from the munitions. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-48-SS-NNA-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-520Y-A (37 characters)

2.2.10.9.4 *Offloading*
These data modules must include procedures required to offload the munitions from the Product. The context of all steps must be singular.

Data modules must be coded:

YY-Y-14-48-SS-NNA-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-48-SS00-NNAAA-520Y-A (37 characters)

Chapter 5.2.1.11

Common information sets - Cargo loading information

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Chap 8.2	SNS information and learn codes - Maintained SNS, General

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for the Product Cargo Loading (CL) information.

1.2 Scope

It covers the rules for the preparation of information applicable to cargo loading which will enable skilled personnel to do the load planning and the loading/offloading of the Product equipped for carrying cargo. The CL information must contain the following topics:

- Cargo
- The Product-general
- Load planning
- Loading/Offloading

1.3 Standards and definitions

The standards and definitions given in this chapter are applicable with no exceptions.

2 Cargo loading information

2.1 General

2.1.1 Introduction

If required, the introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-14-20-00-NNY-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-20-0000-NNYYY-018Y-A (37 characters)

where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

2.1.2 Data module coding

To assist in the codification of data modules, the rules which follow must be used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-14-2X-00-NNY-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-2X-0000-NNYYY-YYYY-A (37 characters)

where:

- "14-2X", the codes are given in Chap 8.2. According to the nature of the information given, the CL information is further subdivided into subsections as follows:
  - 14-20 - Cargo
  - 14-21 - Product general
  - 14-22 - Load planning
  - 14-23 - Loading/Offloading procedures
- "NN", the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

2.2 Technical content

2.2.1 Cargo

These data modules must give a general description of cargo planning, loading and offloading and provide an introduction to the successive information.

Data modules must be coded:

YY-Y-14-20-00-NNY-040Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-20-0000-NNYYY-040Y-A (37 characters)

2.2.2 The Product general

These data modules must provide the general data required for loading/offloading of the Product. Information must include, but is not limited to, the following context:

- General
- Dimensions and areas
  - compartment sizes and layout
  - door sizes
- Location and strength of tie-down points
- Safety precautions.

Data modules must be coded:

YY-Y-14-21-00-NNY-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-21-0000-NNYYY-YYYY-A (37 characters)

2.2.3 Load planning

These data models must provide the data required for planning the loading and offloading of the Product, and the distribution of cargo mass in the compartments of the Product. Information must include, but is not limited to, the following context:

- General
- Compartment loading:
  - General description
  - Maximum allowed floor loads
  - Maximum allowed integrated loading
  - Maximum package dimensions
- Equipment required to load/offload the cargo:
  - General (description)
  - Types of lashing devices
  - Types of containers/pallets etc
  - Conveyance systems - latches, splitters, guides etc
  - Types of tie down devices
- Center of gravity limits:
  - Operation (eg, takeoff, flight and landing)
  - Tipping limits
  - Determination of the center of gravity location
  - Permissible range of container/pallet load center of gravity
- Mass and balance limits
- Methods of stowing and securing:
  - General
  - Bulk loading
  - Required restraint
  - Effective restraint
  - Required number of tie down devices
  - Container/pallet loading:
    - Operation of conveyance systems/pallet loading systems equipment

- Maximum pallet loads
- Securing the pallet load

Data modules must be coded:

YY-Y-14-22-00-NNY-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-22-0000-NNYYY-YYYY-A (37 characters)

2.2.4 Loading/Offloading

These data modules must provide the data required for carrying out the loading and offloading. Information must include, but is not limited to, the following context:

- preparation of the Product for loading/offloading
- door operating instructions
- installation of lashing devices
- installation of tie down devices
- conveyance system operating instructions
- loading and securing containers/pallets etc
- loading ramp operating instructions
- examples of loading techniques

Data modules must be coded:

YY-Y-14-23-00-NNY-160Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-23-0000-NNYYY-160Y-A (37 characters)

Chapter 5.2.1.12

Common information sets - Stores loading information

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Chap 8.2	SNS information and learn codes - Maintained SNS, General
Chap 9.2	Terms and definitions - Terms, acronyms and subject index

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for Product Stores Loading (SL) information.

1.2 Scope

It covers the rules for the preparation of information applicable to stores loading which will enable personnel, who can be unfamiliar with the specific Product, to safely load or offload non-munitions stores (such as external fuel tanks, reconnaissance packs, etc) which form part of the configuration of the Product. The SL information must contain the following topics:

- basic information
- supplementary information
- loading procedures
- offloading procedures
- loading and offloading procedures checklists

1.3 Standards and definitions

1.3.1 Standards

The standards given in this chapter are applicable with no exceptions.

1.3.2 Definitions

The following definitions and those stated in Chap 9.2 must be used as appropriate:

- Singular: In this specification the expression "The context of all steps must be singular" means that even if more than one identical action (such as checking that multiple safety pins are fitted) could take place, each action must be a separate step. Do not use a plural step such as "Verify all safety pins are fitted".
- Plural: Similarly to the definition of singular, the expression "The context of all steps must be plural" means that the steps must contain those identical actions applicable to more than one item (such as performing a no-volt test at both holders).

2 Stores loading information

2.1 Introduction

If required, the introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-14-30-00-NNY-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-30-0000-NNYYY-018Y-A (37 characters)

Where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different information sets.

2.2 Data module coding

To assist in the codification of data modules, the rules which follow must be used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-14-3X-SS-NNY-YYYY-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-3X-SS00-NNYYY-YYYY-Z (37 characters)

Where:

- "14-3X", the codes given in Chap 8.2. According to the nature of the information given, the store loading information is further subdivided into subsections as follows:
  - 14-31 - Basic information
  - 14-32 - Supplementary information
  - 14-33 - Loading procedures
  - 14-34 - Offloading procedures
  - 14-35 - Loading and offloading procedure checklists
- "SS", in the subject code, identifies the store number. "00" identifies all stores, "01" store No. 1. "02" store No. 2 etc.
- "NN", in the Disassembly code, is a sequential number starting from "00", if more than one data module is needed. For instance, in a loading procedure, the following data modules could apply to "Store 04": Store preparation (DC 01), Cartridge installation (DC 02), Store loading (DC 03), Post loading (DC 04), etc.
- "Z" is the item location code. Refer to Chap 4.3.8.

2.3 Basic information

2.3.1 General

All equipment and stores, for which loading and offloading procedures information are required, must be described in sufficient detail for loading and offloading purposes.

2.3.2 Product description

These data modules must contain descriptive information showing how the concerned Product systems are made. Their function within the context of stores loading/offloading must be provided for:

- Product controls
- stores release or control systems
- any other equipment of direct concern to the loading crews, such as pylons, light and heavy duty ejector release units, adapters

Data modules must be coded:

YY-Y-14-31-00-NNY-040Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-31-0000-NNYYY-040Y-A (37 characters)

2.3.3 Stores description

These data modules must contain descriptive information regarding how the store is made and its function must be provided for all types of stores and their components approved for loading on the Product.

Data modules must be coded:

YY-Y-14-31-SS-NNY-040Y-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-31-SS00-NNYYY-040Y-C (37 characters)

2.3.4 Support equipment description

These data modules must contain descriptive information regarding how the support equipment is made and its function must be provided for testers, handling and loading or offloading equipment listed in the "Tools and equipment lists" in the loading/offloading procedures.

Data modules must be coded:

YY-Y-AA-YY-YY-00Y-040Y-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YAA-YY-YYYY-00YYY-040Y-C (37 characters)

2.3.5 Supplementary information

This must contain, as a minimum, the following. Additional information can be defined by the project or the organization

2.3.6 General safety requirements

These data modules must contain general safety requirements pertinent to preparation, handling, loading and offloading of stores.

Data modules must be coded:

YY-Y-14-32-SS-NNY-012Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNYYY-012Y-Z (37 characters)

2.3.7 Product controls and indicators

These data modules must illustrate those controls and indicators of the Product used by the loading crew.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-110Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-110Y-A (37 characters)

2.3.8 Product preparation

These data modules must contain all procedures required to prepare the basic Product for functional or no-volt tests and stores loading. A standardized set of steps must be used for all individual stores loading procedures.

Data modules must be coded:

YY-Y-14-32-00-NNY-330Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-32-0000-NNYYY-330Y-A (37 characters)

2.3.9 Emergency procedures

These data modules must contain emergency procedures related to the authorized stores and the Product loaded with these stores. The data modules consist of actions to be taken if stores are involved in a fire, for example. Procedures must be preceded by a brief explanation of actions to be accomplished by the loading crew. Information containing emergency procedures must be adequately marked and the words "Emergency procedures" must be included in the title.

Data modules must be coded:

YY-Y-14-32-SS-NNY-140Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNYYY-140Y-Z (37 characters)

2.3.10 Installed accessory preparation

These data modules must contain all procedures to prepare each installed store accessory (eg, light/heavy duty ejector release units, pods, for functional tests). It must also contain those procedures required to prepare the accessories for loading the stores.

Data modules must be coded:

YY-Y-14-32-SS-NNY-330Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNYYY-330Y-A (37 characters)

2.3.11 Functional tests

These data modules must contain all functional test procedures applicable to the control/release and jettison system or mechanisms for the stores.

Data modules must be coded:

YY-Y-14-32-SS-NNY-340Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNYYY-340Y-A (37 characters)

2.3.12 No-volt tests

These data modules must contain all necessary procedures to perform no-volt test of stores control/release and jettison systems.

Data modules must be coded:

YY-Y-14-32-SS-NNY-369Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNYY-369Y-A (37 characters)

2.3.13 Standard procedures

These data modules must contain general information which is applicable to more than one procedure, operation or step (eg, checking a multi-meter for proper operation), Product grounding procedures, marking of impulse cartridges.

Each procedure must be assigned an individual data module. The information code must be applicable to the context of the procedure.

Data modules must be coded:

YY-Y-14-32-SS-NNY-YYYY-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-32-SS00-NNYY-YYYY-Z (37 characters)

2.4 Loading procedures

2.4.1 General

A general data module must be prepared for every authorized store, group of stores, or combination of stores as applicable. Each one of these data modules must list, in the correct sequence of operations, all the data modules which form a complete loading procedure. The titles of these general data modules must identify the applicable store or stores (eg, "Conformal long range fuel tank with externally mounted infrared reconnaissance pack").

Data modules must be coded:

YY-Y-14-33-SS-NNY-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNYY-720Y-A (37 characters)

2.4.1.1 Stores preparation

These data modules must include procedures required to inspect and prepare each store, including any applicable component. Procedures must be included to verify the safety of each store. The context of all steps must be singular.

If separate data modules are needed these must be coded:

YY-Y-14-33-SS-NNYA-720Y-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNYY-720Y-C (37 characters)

2.4.1.2 Cartridge installation prior to loading

These data modules must include procedures required to install cartridges in those components that must have cartridges installed prior to loading the stores.

The following steps are applicable:

1 Do required no-volt tests.

2 Do a test on impulse cartridges for serviceability.

3 Install impulse cartridges.

The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-33-SS-NNY-720Y-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNYYY-720Y-C (37 characters)

2.4.1.3 Loading
These data modules must include procedures required to load the stores. The context of all steps must be singular.

Data modules must be coded:

YY-Y-14-33-SS-NNY-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNYYY-720Y-A (37 characters)

2.4.1.4 Post loading
These data modules must include procedures required to ensure the safety and electrical compatibility of the stores and its accessories. The context of all the steps must be plural.

Data modules must be coded:

YY-Y-14-33-SS-NNY-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNYYY-720Y-A (37 characters)

2.4.1.5 Post loading inspection
These data modules must include procedures which ensure that all necessary safety devices have been removed or installed as required, and which verify that stores are installed properly. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-33-SS-NNY-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNYYY-720Y-A (37 characters)

2.4.1.6 Immediately prior to launch
These data modules must include procedures required to place the air vehicles in a launch configuration. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-33-SS-NNY-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNYYY-720Y-A (37 characters)

2.4.2 Specific safety requirements

These data modules must contain all specific safety requirements pertaining to the stores loading procedures.

Data modules must be coded:

YY-Y-14-33-SS-NNY-120Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNYYY-120Y-A (37 characters)

2.4.3 List of tools and support equipment

These data modules must list the special tools and support equipment that are required to accomplish the requirements of the loading procedures and the offloading procedures. Refer to Para 2.4 and Para 2.5.

Data modules must be coded:

YY-Y-14-33-SS-NNY-060Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-33-SS00-NNYYY-060Y-A (37 characters)

2.5 Offloading procedures

2.5.1 General

A general data module must be prepared for every authorized store, or group of stores, as applicable. Each one of these data modules must list, in the correct sequence of operations, all the data modules which form a complete offloading procedure. The titles of these general data modules must identify the applicable store or stores (eg, "Conformal long range fuel tank with externally mounted infrared reconnaissance pack").

Data modules must be coded:

YY-Y-14-34-SS-NNY-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-34-SS00-NNYYY-520Y-A (37 characters)

2.5.1.1 Pre-offloading

These data modules must include procedures required to prepare the Product stores for offloading. The context of all steps must be plural.

Data modules must be coded:

YY-Y-14-34-SS-NNY-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-34-SS00-NNYYY-520Y-A (37 characters)

2.5.1.2 Removal of cartridges

These data modules must include procedures required to remove cartridges from stores. The context of all steps must be singular.

Data modules must be coded:

YY-Y-14-34-SS-NNY-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-34-SS00-NNYYY-520Y-A (37 characters)

2.5.2 Offloading

These data modules must include procedures required to offload the stores from the Product. The context of all steps must be singular.

Data modules must be coded:

YY-Y-14-34-SS-NNY-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-34-SS00-NNYYY-520Y-A (37 characters)

2.5.3 Post-offloading

These data modules must include information on post-offloading actions, such as fitting pylon sole plates, installing dummy cartridges, etc. The context of all steps must be singular.

Data modules must be coded:

YY-Y-14-34-SS-NNY-520Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-34-SS00-NNYYY-520Y-A (37 characters)

2.6 Loading and offloading procedure checklists

2.6.1 General

If loading and offloading procedure checklists are required by the project, the following apply:

- The loading and offloading procedure checklists must contain specific safety requirements derived from the original loading/offloading procedures.
- Any procedural step that applies only to a specific store, Product configuration, or accessory must be prefixed for identification. Torque values, preset dimensions, orifice identifiers, etc, included in the original loading procedure must be placed in the checklist.
- Paragraph headings used in the checklist must be presented as in the original procedure.

2.6.2 Detailed requirements

All required steps must be included for the Product preparation and no-volt tests. Steps for other procedures must be kept to a minimum. Steps considered routine actions on the Product during loading and offloading procedures and within the capabilities of a trained technician can be omitted. Redundant actions/checks must be omitted. However, to assure maximum safety, separate procedures must be included under appropriate subordinate headings, when applicable.

Steps must be shortened by the elimination of excess words and by the use of abbreviations so that one-line entries can be utilized to the greatest extent possible, but still be written to ensure ease of reading and interpretation. Steps must follow the same order as they appear in the original procedure and must be numbered in sequence. Warnings and cautions in the original procedure must be included in the checklist. Notes can be included if considered necessary.

Illustrations must be included if directed by the project.

2.6.3 Coding of loading and offloading procedure checklists

The checklist data modules must have the same data module code as its "original" procedure except for the section number which must be "35".

Examples:

- "Original" data module code - 1K-B-14-34-03-01A-720A-A
- Checklist data module code - 1K-B-14-35-03-01A-720A-A

Chapter 5.2.1.13

Common information sets - Role change information

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Chap 8.2	SNS, information and learn codes - Maintained

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for Product Role Change (RC) information.

1.2 Scope

It covers the rules for the preparation of information applicable to Product Role change which will enable skilled maintenance personnel to change the role of the Product.

The RC information set must cover the following topics:

- Change of role - General
- Role change lists
- Role change procedures
- First installation procedures

1.3 Standards and definitions

The standards and definitions given in this chapter are applicable with no exceptions.

2 Role change information

2.1 Introduction

If required, the introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-16-00-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y16-00-0000-**NN**AAA-018Y-A (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The information code variant is used to distinguish between the different information sets.

2.2 Data module coding

To assist in the codification of data modules, the rules which follow must be used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-**16-XX**-00-**NN**A-**YYY**-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y**16-XX**-0000-**NN**AAA-**YYY**Y-Z (37 characters)

Where:

- "**16-XX**", the codes are given in Chap 8.2. According to the nature of the information given, the role change information is further subdivided into subsections as follows:
  - 16-00 - Change of role - General
  - 16-11 - Role change lists
  - 16-12 - Role change procedures
  - 16-13 - First installation procedures
- "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.
- "**YYY**", in the information code, must be those given below.

Note

Where data modules are already written they can be reused as part of a procedure to achieve the change of role, rather than writing new data modules with an SNS of 16-12-YY.

2.3 Change of role - General

These data modules must contain the definition of each role. All the components and equipment necessary to make up the required configuration must be listed. The special support equipment and/or specific materials necessary to carry out the change of role must also be included.

Data modules must be coded:

YY-Y-16-00-00-NNA-**XXX**Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y16-00-0000-NNAAA-**XXX**Y-Z (37 characters)

Where "**XXX**", in the information code, must be:

- 000 - General
- 060 - Support equipment, tools and software
- 070 - Consumables, material and expendables

2.4 Role change lists

These data modules must detail the different roles of the Product and must list, in a logical sequence, the procedures to be done to achieve the desired configuration (refer to Table 1). Each list must contain the references to the relevant role change procedures in System 16-12 (eg, passenger-to-freighter, strike-to-trainer). Each role must be illustrated.

For Products with a large number of roles (eg, military air vehicle with multiple-mission roles), the work packages must be listed in matrix format (refer to Table 3). All of these roles must be illustrated.

Data modules must be coded:

YY-Y-16-11-00-NNA-000A-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y16-11-0000-NNAAA-000A-Z (37 characters)

Table 2 Role change list - Passenger-to-freighter, example

Role change procedures	Data module
Preparation	F9-A-16-12-00-00A-000A-A
Removal of curtains and curtain rails	F9-A-16-12-00-01A-000A-A
Removal of cabin attendant seats equipment stowages	F9-A-16-12-00-02A-000A-A
Removal of partitions	F9-A-16-12-00-03A-000A-A
Removal of passenger seats	F9-A-16-12-00-04A-000A-A
Removal of carpets	F9-A-16-12-00-05A-000A-A
Removal of galley and toilet	F9-A-16-12-00-06A-000A-A
Removal of non-textile floor covering	F9-A-16-12-00-07A-000A-A
Removal of passenger service units	F9-A-16-12-00-08A-000A-A
Removal of overhead stowage compartments	F9-A-16-12-00-09A-000A-A
Removal of overhead stowage compartments supports	F9-A-16-12-00-10A-000A-A
Installation of cargo handling system	F9-A-16-12-00-11A-000A-A
Installation of the winch	F9-A-16-12-00-12A-000A-A
Adjustment/test and close-up	F9-A-16-12-00-13A-000A-A

2.5 Role change procedures

These data modules must contain the individual procedures to cover all changes from any role to any other role. Preparation, removal, installation, adjustment and test are examples of procedures to be included.

Cross-references to applicable data modules or data in the Product maintenance, weapon loading or stores loading information sets must be made, wherever possible. Data on those items to be reused, discarded or stored must also be included.

Data modules must be coded:

YY-Y-16-12-00-NNA-**XXX**A-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y16-12-0000-NNAAA-**XXX**A-Z (37 characters)

Where "**XXX**", in the information code, must be:

- 120 - Preparation
- 270 - Adjustment
- 300 - Test
- 500 - Removal
- 700 - Installation

Table 3 Role change matrix to configuration "A", example

Data module	Description	B	C	D	E	F	G	H	I
G6-A-16-12-00-00A-120A-A	Preparation	X	X	X	X		X		
G6-A-YY-YY-YY-YYA-500A-A See note	Remove passenger seats	X		X	X	X		X	X
G6-A-16-12-00-10A-500A-A	Remove overhead stowage compartment supports		X	X		X	X	X	
G6-A-16-12-00-17A-700A-A	Install protective covers	X		X		X		X	
G6-A-16-12-00-26A-700A-A	Install ZZZZ	X	X		X	X		X	
G6-A-16-12-00-43A-700A-A	Install VVVVV	X	X	X	X		X	X	

Note

In this example, the procedure for the removal of the passenger seats is written as an existing procedure, where the SNS (YYY-YY-YY) is the SNS for the passenger seats.

2.6 First installation procedures

These data modules must detail all procedures necessary to prepare units for the first installation, ie where assemblies must be assembled from delivered items and thereafter removed/installed as a complete unit.

Data modules must be coded:

YY-Y-16-13-00-NNA-710Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y16-13-0000-NNAAA-710Y-Z (37 characters)

Chapter 5.2.1.14

Common information sets - Battle damage assessment and repair information

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References

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Chap No./Document No.	Title
Chap 3.9.5.2.9.3	Wiring data - Harness
Chap 3.9.5.2.11.4	Common information repository - Zones
Chap 4.3	Information management - Data module code
Chap 9.2	Terms and data dictionary - Glossary of terms, abbreviations and acronyms

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for Battle Damage Assessment and Repair (BDAR) information. Rules for preparation of page-oriented BDAR Publications (BDARP) and interactive BDARP are also given.

1.2 Scope

It covers the rules for the preparation of specific-to-type information applicable to Product battle damage assessment and repair, which will enable skilled maintenance personnel to assess and repair the Product. These data must sufficiently describe the information and data necessary to:

- mark the damaged zones or items
- access to the damaged area
- assess the damage
- decide on the action to be carried out (to repair, to isolate, to leave in damage state) taking its impact on the operation/mission into account
- repair or isolate items
- ensure, as required, the efficiency of the actions (function tests)
- be fully aware of the content of the battle damage repair kit

1.3 Standards and definitions

1.3.1 Standards

The standards given in this chapter are applicable with no exceptions.

In addition the following guidelines must be used:

- To identify data and information which are common on different positions, the information code variant must be used and the title of the data module must describe the position
- The item subject to BDAR data/information must use the same hardware coding as used in other data modules in the CSDB as defined in Chap 4.3

In exceptional cases where the data/information cannot be allocated to a defined hardware, then system code 00-90 must be used, especially for first identification and assessment of zones, which contain more than one hardware system (where "system" could be the product frame for example).

1.3.2 Definitions

The following definitions and those stated in Chap 9.2 must be used as appropriate:

- **Alternative material** - Material which can be used for the battle damage repair of an item and which has an ultimate tensile strength equal to or greater than the original
- **As received damage** - Designates battle damage on a specific Product in the original condition
- **Battle Damage Repair (BDR)** - The repair of battle damage on the Product within a maximum elapsed time defined by the project or the organization in order to restore it to a condition which will allow it to fulfill the requirements of at least one mission (operation, for example, for air vehicle a ferry flight)
- **Battle damage repair kit** - A kit containing tools, test equipment, expendables, materials, etc, necessary to perform BDR in autonomous conditions on a battlefield
- **Cleaned out damage** - Designates battle damage on the Product that has been trimmed to a regular shape
- **Component function ability, imperative** - The function of a component is imperative if its destruction or isolation prohibits any utilization of the product frame or engine
- **Component function ability, optional** - The function of a component is optional if its destruction or isolation does not affect the operation of the product frame or engine. It can however affect the information shown to the operator (eg, oil pressure indication).
- **Component function ability, performance** - The function of a component is performance if its destruction or isolation implies restrictions on the performance of the product frame or engine or one of their systems
- **Fire or overheat damage** - Damage caused by burning combustibles, hot gas leakage and/or burning munitions
- **Minimum undamaged edge distance** - The minimum acceptable distance between the edge of the damage area and the nearest load input point, for instance the centerline of the nearest integral rib or fastener line
- **Structural damage, category 1** - Damage on load bearing items that can be tolerated and cannot be repaired or replaced in BDR conditions. This damage is less than the specified limit and has no effect on the ability of the Product to complete at least one mission. Tolerated damage requires only clean-out or stop drilling of cracks.
- **Structural damage, category 2** - Damage on load bearing items that must be repaired or replaced when damage exceeds the specified limit
- **Structural damage, category 3** - Damage on items that are not loads bearing but which need repair for aerodynamic reasons or to seal the structure
- **Structural damage limit, penetration** - Damage caused by penetration of a projectile
- **Structural damage limit, fragmentation** - Damage caused by the explosion of a missile or shrapnel
- **Substitute material** - A material which has less ultimate tensile strength than the original but which can be used for the BDR of an item by adapting it
- **Product frame** - Term designating the whole Product without engine

2 Battle damage assessment and repair information

2.1 Technical content

2.1.1 General requirements

The BDAR information is intended for battlefield/combat environments. Therefore it must be self-standing. There must be no reference to other publications, other than a general BDR publication and no requirement for special tools or special support equipment. BDR must be supported by a BDR kit. Refer to Para 2.1.9.

Additional information for wiring harnesses can be given. Refer to Para 2.1.5.7.

In this chapter:

- the information is applicable to the entire Product unless it is required for the product frame or engine specifically
- "**SS**" represents the coding of a zone in a data module (zone for a product frame, assembly/module for an engine)

2.1.2 Introduction

The introduction data modules contain explanations of the purpose, scope, structure, special format and use of the technical content of the BDAR information set. They also contain any necessary information of a general nature that is not detailed in any of the specific data modules.

Example content of an introduction data module:

- The zone concept used for the product frame and engine
- How to find data/information in the BDAR publication
- How to use the BDAR publication

Use of illustrations and/or diagrams is preferred. Refer to Fig 1.

The introduction must be prepared in three separate data modules:

1 Information common for product frame and engine

2 Information specific for the product frame

3 Information specific for the engine

This allows the publication to be separated into product frame and engine BDAR information if required by the project or the organization. A note must be given in the introduction.

Business rule decision point BRDP-S1-00433 - Separation of product frame and engine BDAR information in the BDARP:

- Decide whether to separate the BDARP into product frame and engine BDAR information.

If a general BDR publication is jointly used with the BDAR publication, its reference and purpose must be given in the introduction.

Data modules must be coded:

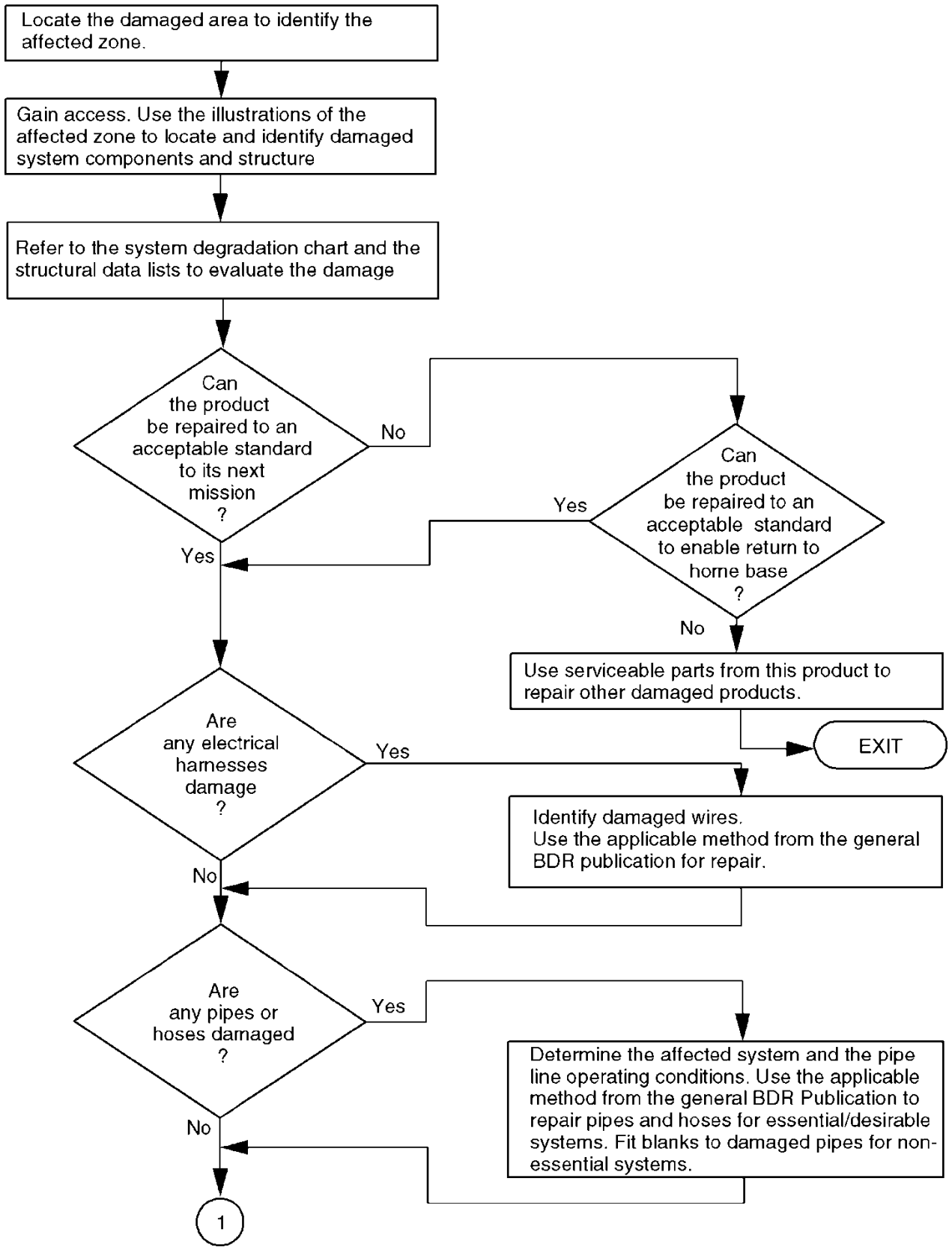
YY-Y-00-90-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-**NN**AAA-018Y-A (37 characters)

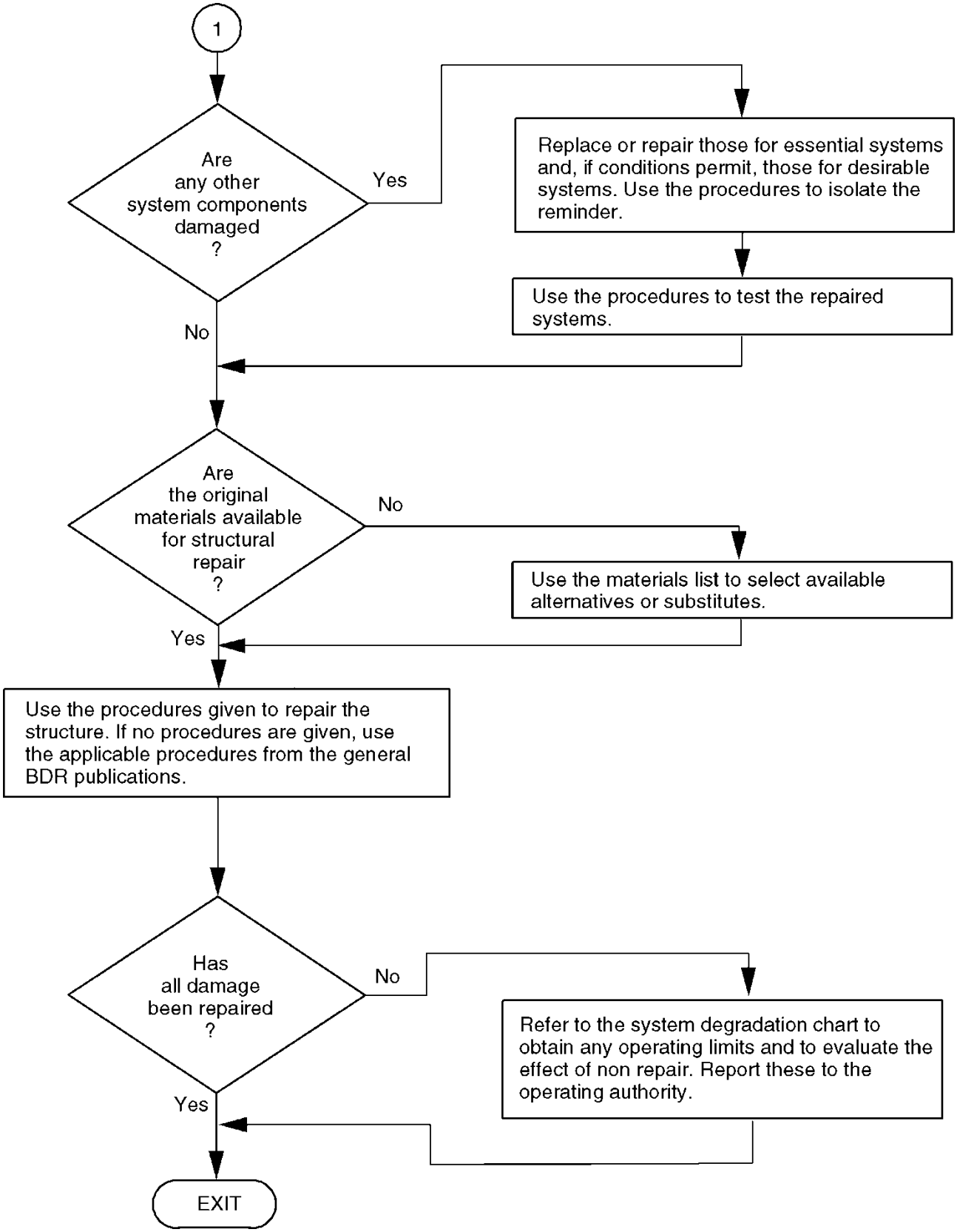
where "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The information code variant is used to distinguish between the different publications.



ICN-S3627-S1000D0355-002-01

Fig 1 Flow chart on "How to use the page-oriented publication" (Sheet 1 of 2)



ICN-S3627-S1000D0356-002-01

Fig 1 Flow chart on "How to use the page-oriented publication" (Sheet 2 of 2)

2.1.3 Damage repair symbol marking

Note

If the content described under this heading is available in an existing general BDR publication, BDAR procedures refer to the relevant data modules contained in the general BDR publication.

Damage repair symbol marking data modules (information code 681) provide the rules and symbols that must be used to clearly mark the damaged zones, areas, components and parts. The information is further broken down into marking of structure and marking of systems as follows.

2.1.3.1 Marking of structures

These data modules describe the symbols, codes and colors that must be used to mark the structure of the product frame or the engine, the category of damage (refer to Para 2.1.5.2) and the type of action to be performed on the damaged area following the damage assessment.

Data modules must be coded:

YY-Y-00-90-00-00A-681A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-00AAA-681A-A (37 characters)

2.1.3.2 Marking of systems

These data modules describe:

- the tags, stickers and their colors
- the symbols and codes

These are used to mark a system or a component and the action that must be performed following the damage assessment.

Data modules must be coded:

YY-Y-00-90-00-00A-681B-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-00AAA-681B-A (37 characters)

2.1.4 Identification of damaged hardware

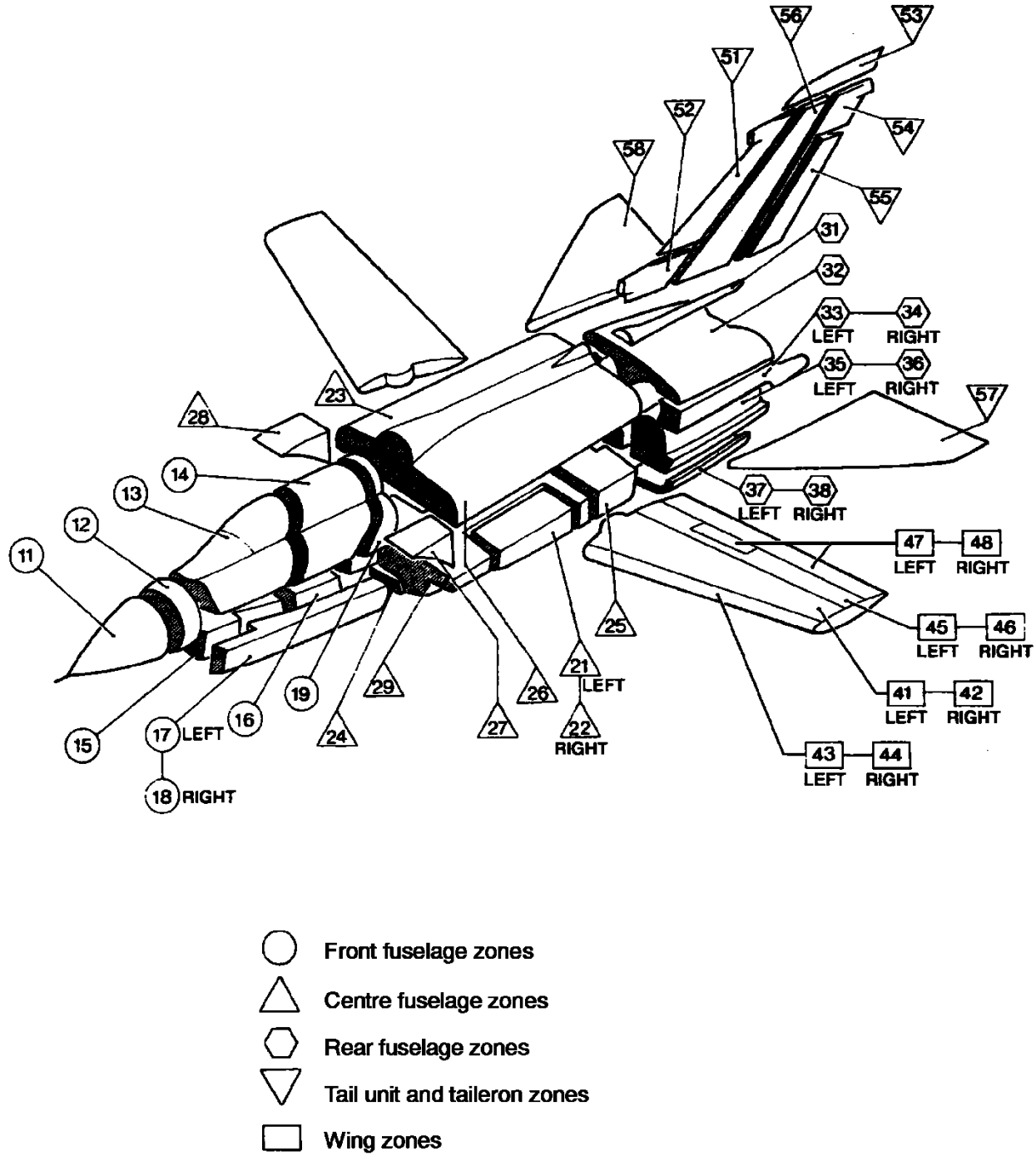
These data modules (information code 682) provide a precise identification of damaged hardware (structure, system, harness) and a reference to a data module that provides damage assessment data.

This heading provides data and information to identify:

- product frame zones
- product frame systems
- engine assemblies and/or modules
- product frame and engine components
- product frame and engine wiring harnesses

2.1.4.1 Identification of product frame zones

Data modules must be provided showing the zoning arrangement and giving the zone numbers of the Product depending on the configuration, if applicable. Related tables in each of these data modules give the zone identifier (description) and the data module code for more information on the single zones. Refer to Chap 3.9.5.2.11.4.



ICN-S3627-S1000D0357-001-01

Fig 2 Identification of air vehicle system frame zones - Example

Table 2 Identification of zones

Zone No.	Description	Data module
21	Left main landing gear compartment	YY-A-00-90-00-21A-682A-A
22	Right main landing gear compartment	YY-A-00-90-00-22A-682A-A
23	Center fuselage	YY-A-00-90-00-23A-682A-A
24	Left fuselage	YY-A-00-90-00-24A-682A-A
25	Right fuselage	YY-A-00-90-00-25A-682A-A
26	Upper fuselage	YY-A-00-90-00-26A-682A-A
...		

Data modules must be coded:

YY-Y-00-90-00-00**A**-682A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-00**AAA**-682A-A (37 characters)

where "**A**" or "**AAA**", in the disassembly code variant, can be used to provide different data modules depending on the product configuration

2.1.4.2 Identification of product frame systems

Separate data modules must be provided for each zone. Each data module contains the data module code for description of significant structure in this zone. A related table contains for each zone, its zone number, its description and the data module code for identification of systems in this zone. Refer to Chap 3.9.5.2.11.4.

Table 3 Identification of systems

Zone 21 - Left main landing gear compartment		
System	**Applicable**	**Data module**
Landing gear system and arrester hook	X	YY-A-00-90-YY-SSA-682A-A
Flight control system	X	YY-A-00-90-YY-SSA-682A-A
Propulsion system	X	YY-A-00-90-YY-SSA-682A-A
Secondary and emergency power system		
Environmental system		
Electrical system	X	YY-A-00-90-YY-SSA-682A-A
Hydraulic system		
Fuel system	X	YY-A-00-90-YY-SSA-682A-A
Oxygen system		
Escape system and canopy		
Interphone and communications system		

Zone 21 - Left main landing gear compartment		
System	**Applicable**	**Data module**
Defensive aids system		
Miscellaneous utilities	X	YY-A-00-90-YY-SSA-682A-A
…		

Data modules must be coded:

YY-Y-00-90-00-**SS**A-682A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-**SS**AAA-682A-A (37 characters)

2.1.4.3 Identification of engine assemblies and/or modules
Data modules must be provided consisting of a three-quarter front view illustration showing the engine assemblies/modules depending on the engine configuration, if applicable. An illustration in each of these data modules gives the assembly/module number, its identification and the data module code where the damage assessment data of the given hardware is provided. Refer to Chap 3.9.5.2.11.4.

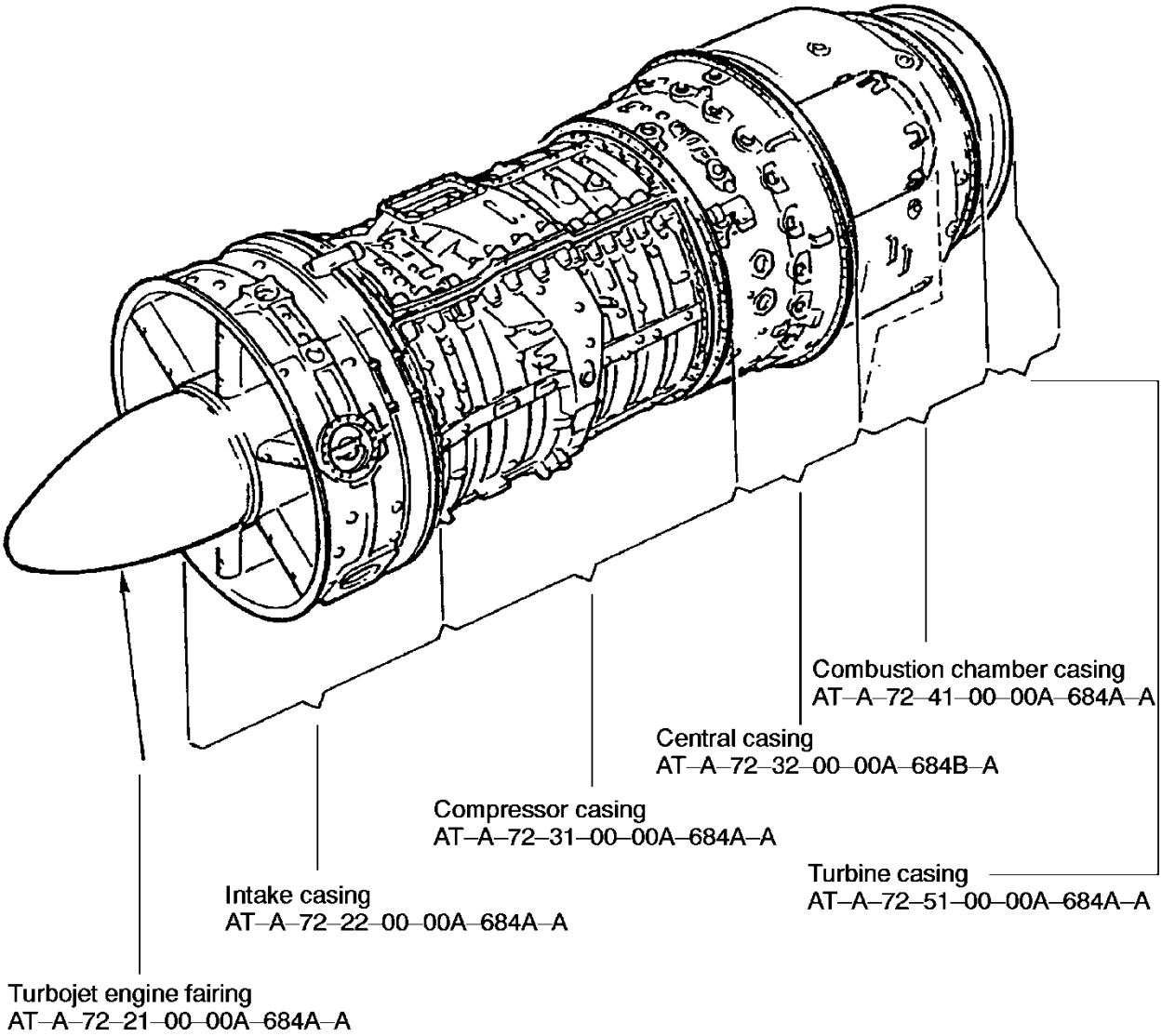
Data modules must be coded:

YY-Y-72-00-00-00**A**-682A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y72-00-0000-00**AAA**-682A-A (37 characters)

where "**A**" or "**AAA**", in the disassembly code variant, can be used to provide different data modules depending on the product configuration



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Fig 3 Identification of engine assemblies/modules - Example

2.1.4.4 Identification of components

Illustrations must show all the components identified by an item number according to their location on the product frame or the engine. A location view indicates, as required, the area of the product frame or the engine subject to the illustration.

A related table must provide for each component (example only):

- Name
- Data module code providing the damage assessment data
- The presence, if any, of a power supply to the component
- The system to which it is related

The last two items are used to support and confirm the recognition of the component itself.

Table 4 Identification of components - Example

Item No.	Name	Data module applicable to the main system	Related systems
1	AB Fuel pump	YY-A-73-13-01-00A-684A-A	O
2	Oil cooler	YY-A-79-24-01-00A-684A-A	F
3	AB overload SV	YY-A-73-13-03-00A-684A-A	E
4	AB Fuel filter	YY-A-73-13-02-00A-684A-A	D
5	Secondary oil filter	YY-A-79-22-02-00A-684A-A	
6	Emergency regulation electrical actuator	YY-A-73-12-04-00A-684A-A	E
7	Oil pressure switch	YY-A-79-23-01-00A-684A-A	E
8	Main oil filter	YY-A-79-22-01-00A-684A-A	
9	Tacho-generator	YY-A-74-11-01-00A-684A-A	
10	Accessory support	YY-A-79-21-01-00A-684A-A	A D
11	HP oil pump	YY-A-79-21-02-00A-684A-A	
12	Oil distributor	YY-A-79-21-03-00A-684A-A	
13	N stop corrector	YY-A-75-31-01-00A-684A-A	
14	6 bar starting SV	YY-A-73-21-04-00A-684A-A	E
15	80 bar by-pass SV	YY-A-73-21-07-00A-684A-A	E
16	Main pressuring and dump valve	YY-A-73-11-05-00A-684A-A	D
17	Overboard drain valve	YY-A-73-12-06-00A-684A-A	D
18	HV Ignition box	YY-A-74-11-01-00A-684A-A	
19	AB Ignition SV	YY-A-73-13-02-00A-684A-A	E
20	Oil de-aerator	YY-A-79-21-11-00A-684A-A	
21	Main fuel pump	YY-A-73-11-01-00A-684A-A	
22	Oil pressure filling adapter	YY-A-79-21-09-00A-684A-A	D

Item No.	Name	Data module applicable to the main system	Related systems
23	Drain valve (Combustion chamber)	YY-A-73-31-01-00A-684A-A	D

Key to "Related systems" Table 4:

- E = Electric power
- F = Fuel
- O = Oil
- A = Air
- D = Drain

If a component occurs in more than one system (eg, oil, fuel) the data module code of the damage assessment must be given in the table for one of them (eg, fuel system). The relation with the other systems must be indicated with a key in the table.

Data modules for the product frame must be coded:

YY-Y-00-90-**YY**-00A-682A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-90-**YY**00-00AAA-682A-A (37 characters)

where "**YY**" corresponds to the system as defined in the SNS used for the Product

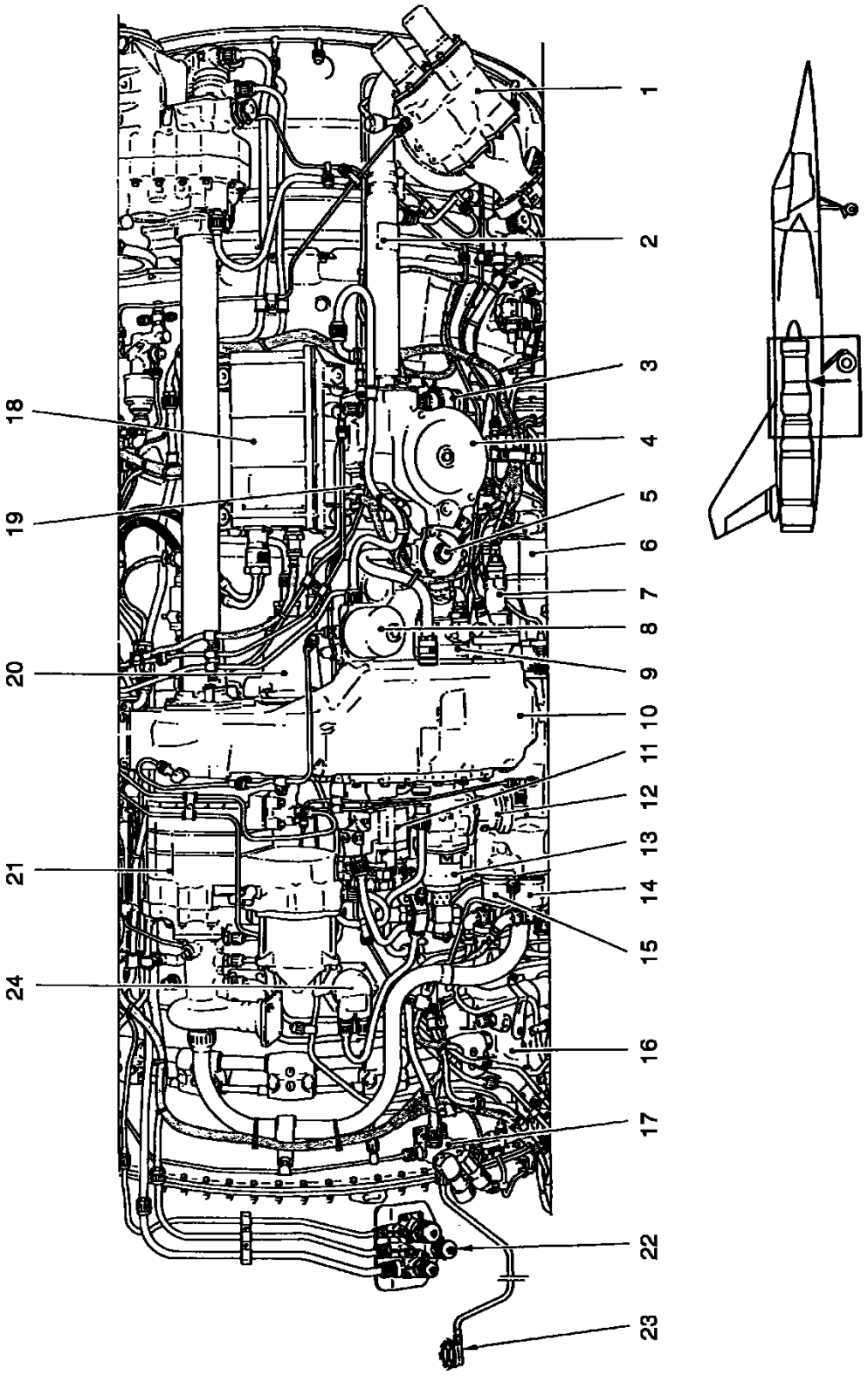
Data modules for the engine must be coded:

YY-Y-**YY-YY-YY**-00A-682A-B (17 characters)

thru

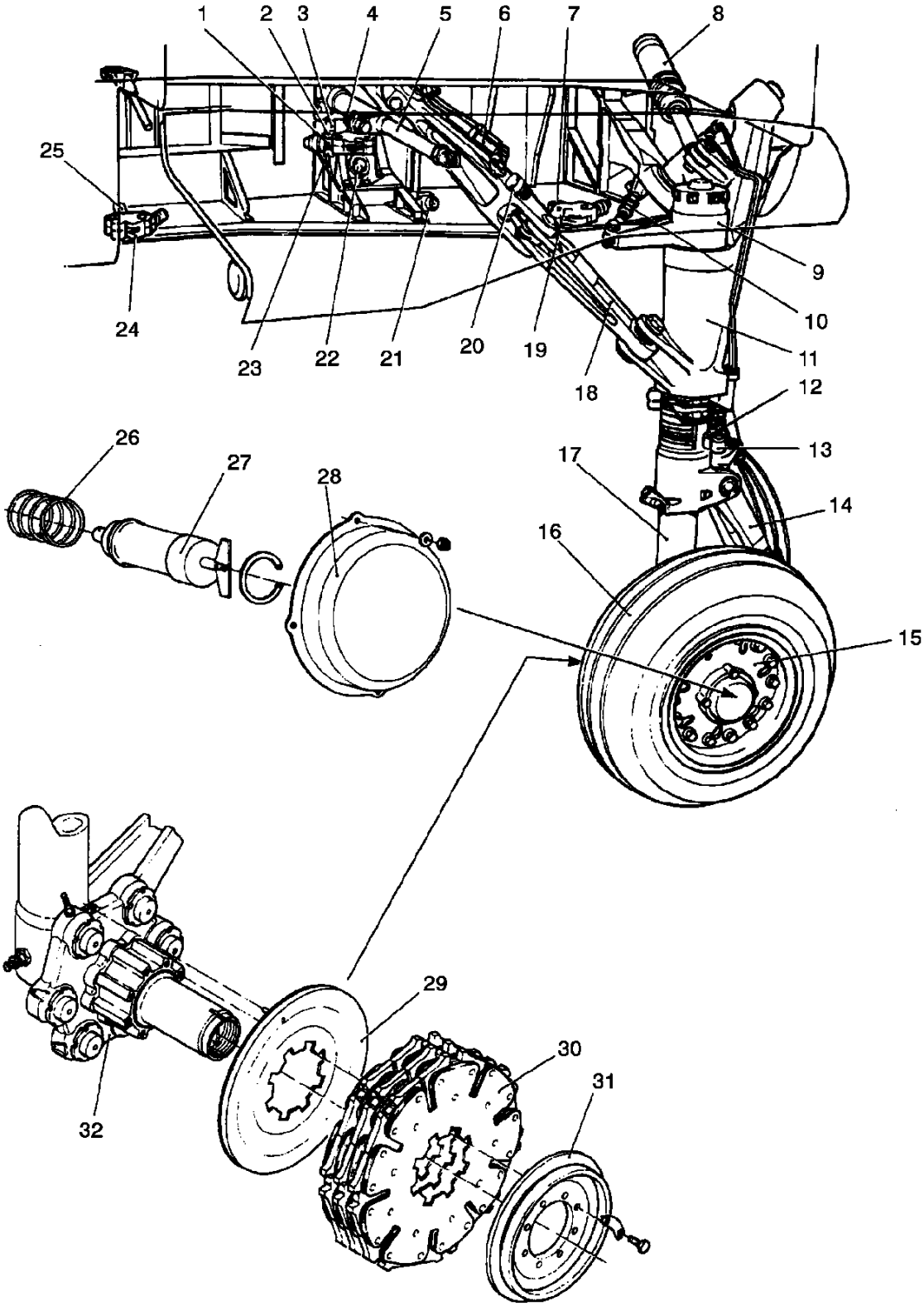
YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY**-00AAA-682A-B (37 characters)

where "**YY-YY-YY**" or "**YYY-YY-YYYY**" corresponds to the SNS used for the Product



ICN-S3627-S1000D0359-001-01

Fig 4 Identification of engine components - Example



ICN-S3627-S1000D0360-001-01

Fig 5 Identification of air vehicle system frame components - Example

2.1.4.5 Identification of wiring harnesses
These data modules contain:

- the principle and standard procedures to identify harnesses
- information necessary to identify harnesses, their bundles and connectors

Note

If the principle and standard procedures described under this heading are available in an existing general BDR publication, BDR procedures must refer to the relevant data modules contained in the general BDR publication.

2.1.4.5.1 Identification
The number of illustrations required will be dependent on the given harness. For example:

- Harness and its attachments mounted on the hardware. Refer to Fig 6.
- Description of the harness components. Refer to Chap 3.9.5.2.9.3.
- Schematic diagrams (harness, leads, etc)

Data modules must be coded:

YY-Y-**YY-YY-YY**-00A-682A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY**-00AAA-682A-A (37 characters)

where "**YY-YY-YY**" or "**YYY-YY-YYYY**" corresponds to the SNS used for the Product

2.1.4.5.2 Identification principle
As electrical circuits are complicated, it is recommended to provide, as an identification principle, the method of identifying the wiring from the detected damaged area (eg, the routing, splits, the components reached).

Illustrations and/or diagrams must describe the identification principle.

Data modules must be coded:

YY-Y-**YY-YY-YY**-00A-682A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY**-YY-YYYY**-00AAA-682A-A (37 characters)

where "**YY-YY-YY**" or "**YYY-YY-YYYY**" corresponds to the SNS used for the Product

2.1.4.5.3 Standard identification procedures
These data modules provide the general procedures to be applied when identifying a damaged harness in order to:

- prevent possible damage to the component it is connected to
- identify leads by means of continuity measurement

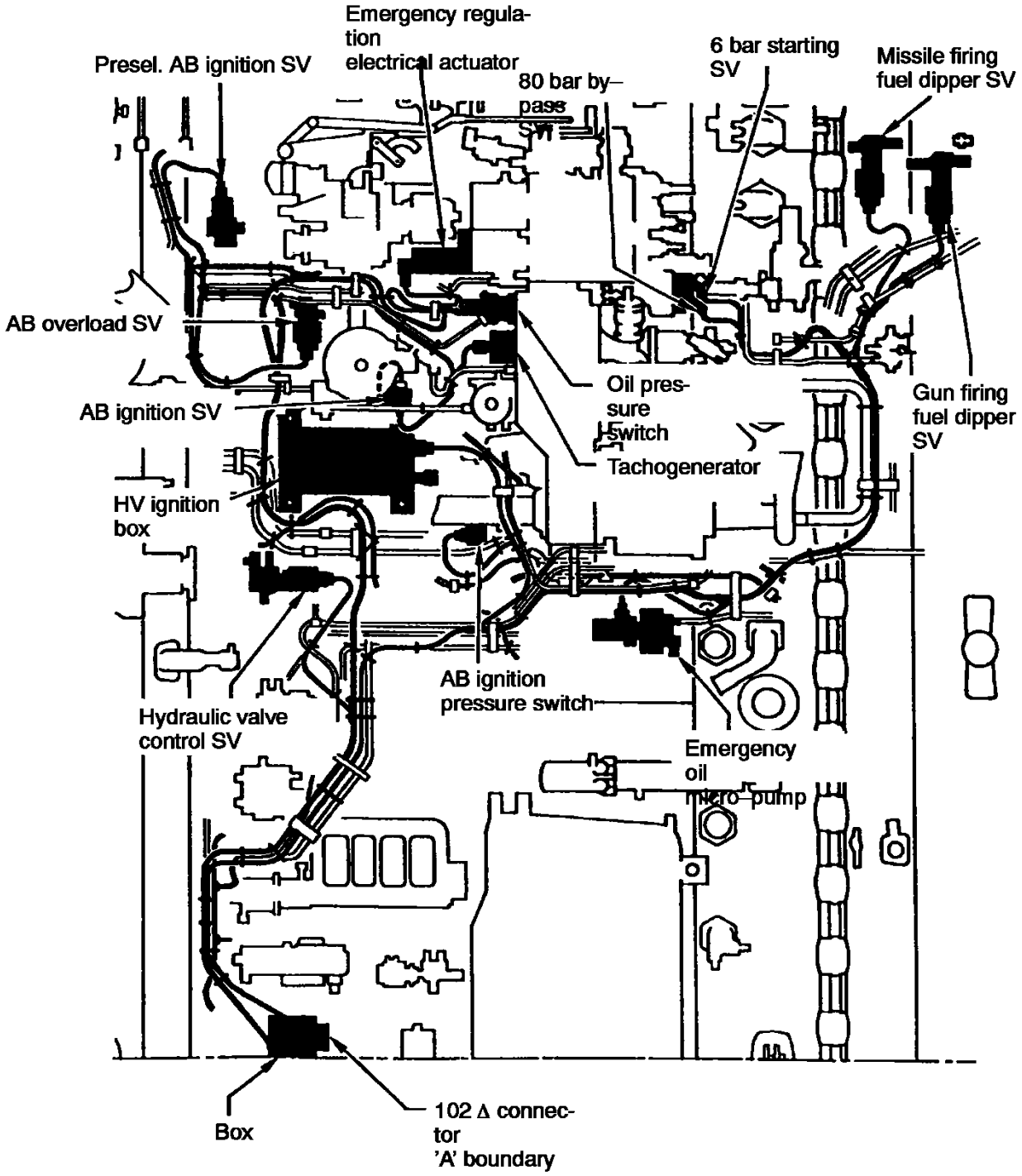
Data modules must be coded:

YY-Y-**YY-YY-YY**-00A-682A-A (17 characters)

thru

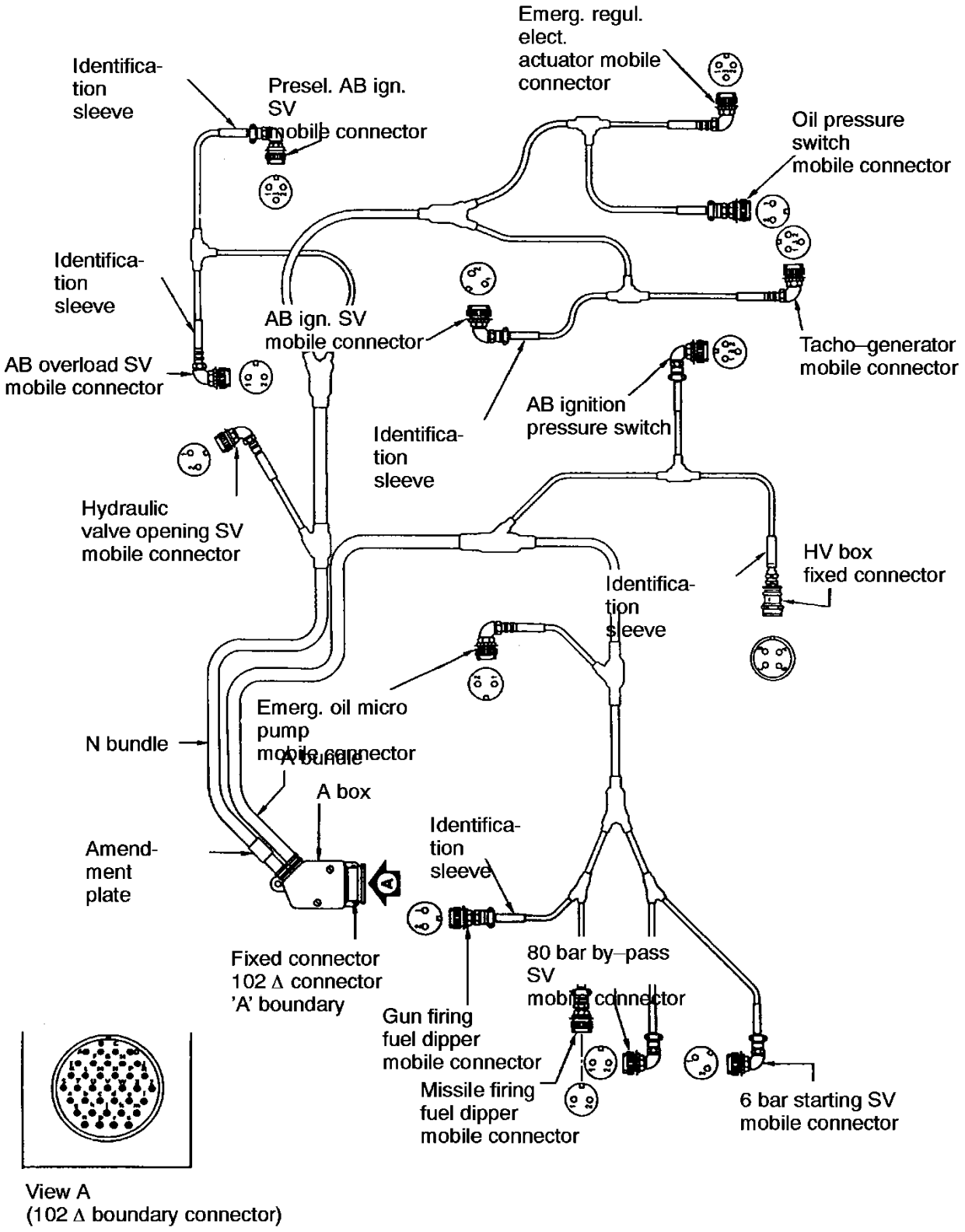
YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY**-00AAA-682A-A (37 characters)

where "**YY-YY-YY**" or "**YYY-YY-YYYY**" corresponds to the SNS used for the Product



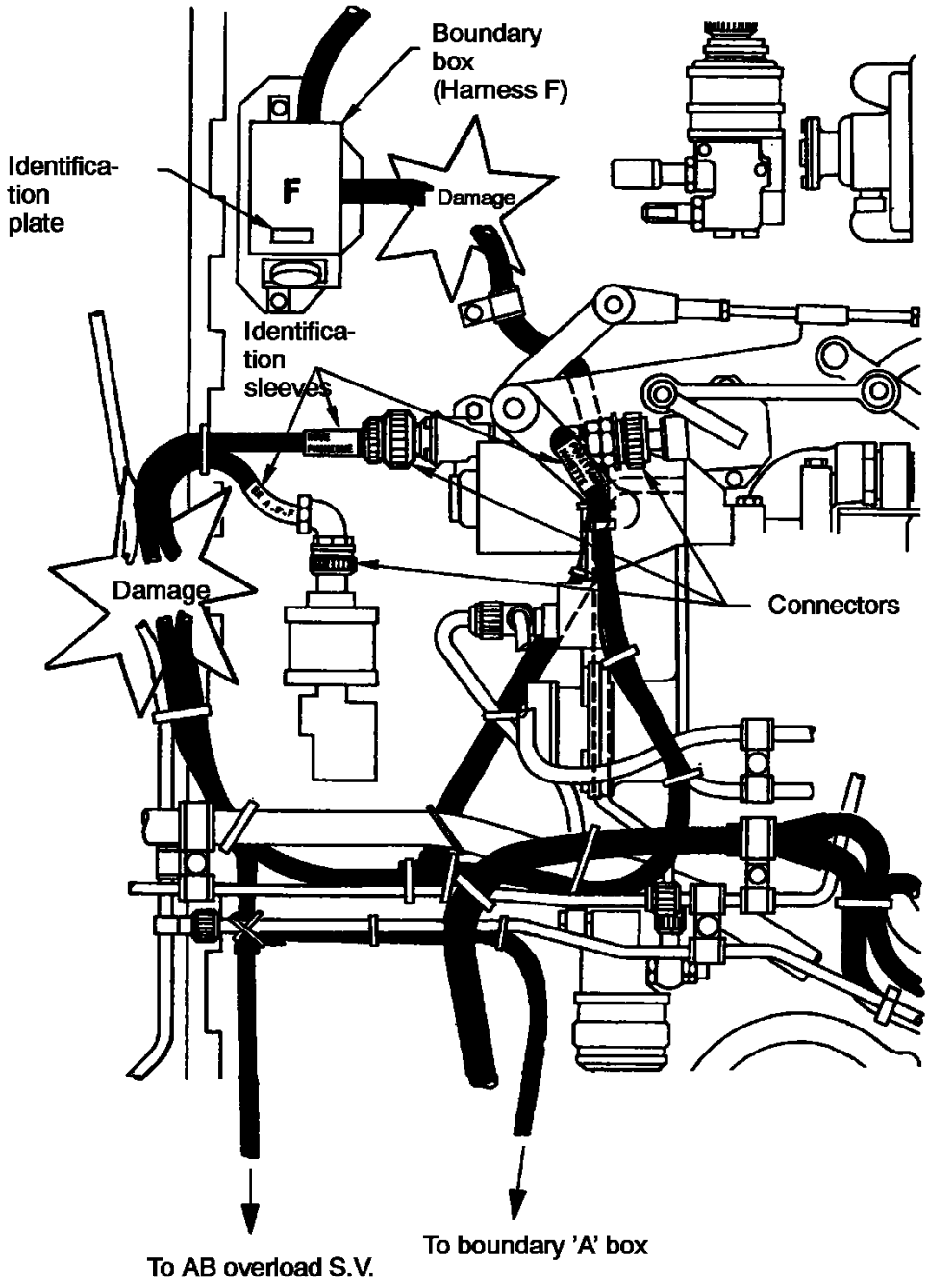
ICN-S3627-S1000D0361-001-01

Fig 6 Identification of harness items



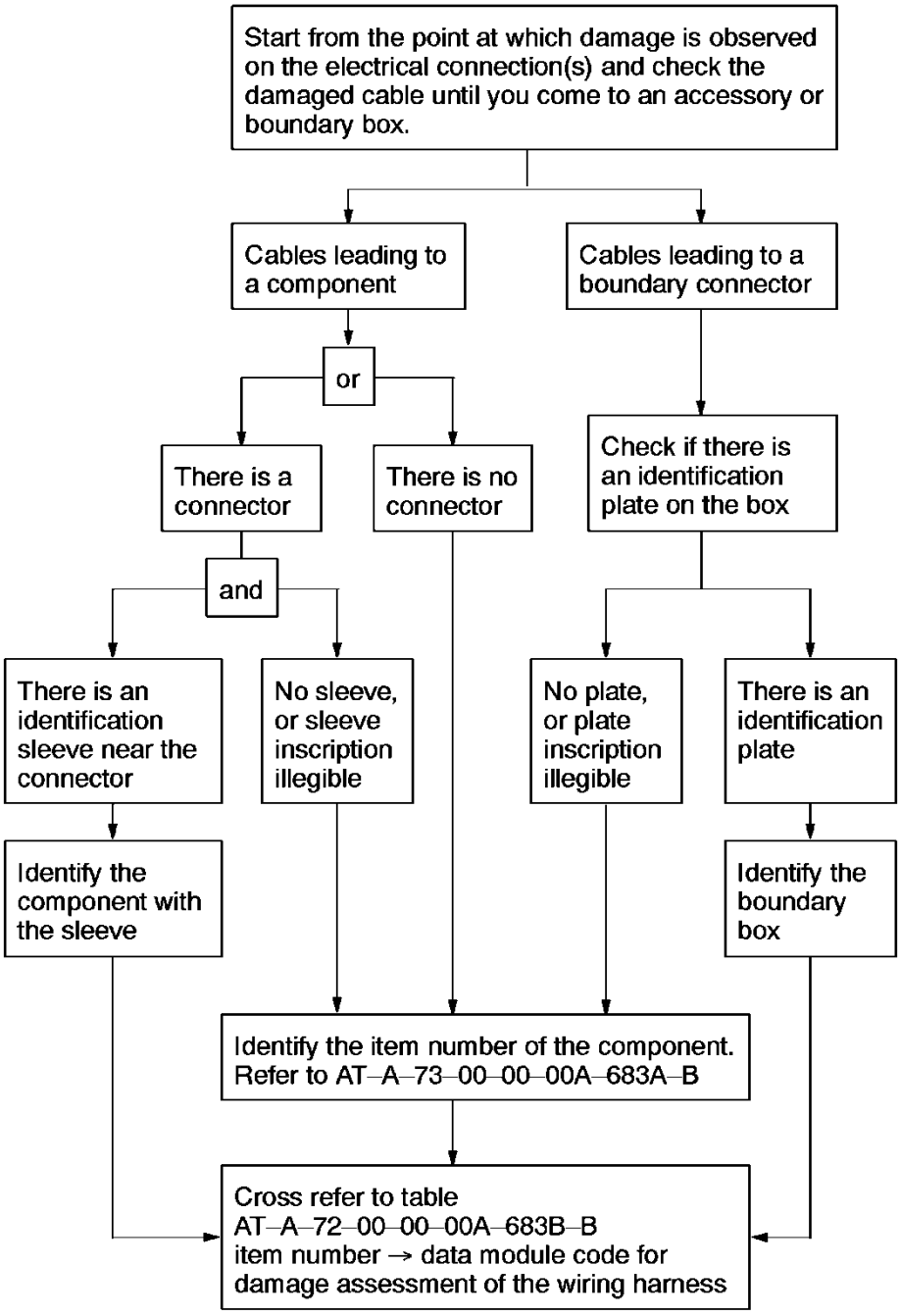
ICN-S3627-S1000D0362-001-01

Fig 7 Identification of harness components



ICN-S3627-S1000D0363-001-01

Fig 8 Identification principle for damaged harnesses - Illustration



ICN-S3627-S1000D0364-001-01

Fig 9 Identification principle for damaged harnesses - Diagram

2.1.5 Damage assessment

2.1.5.1 General

These data modules (information code 683) provide, for a damaged and identified item (zone, component, etc), the necessary data and information:

- to establish the effect of the item on the product frame or engine operation
- if the item can be left damaged without repair or isolation
- whether it can be repaired and/or isolated
- for the relevant action that must be applied
- for the consequences of the actions on the product frame or engine utilization (mission, limitation, etc)

Note

If the project or the organization decides to create separate data modules for the last listed information, their data module code must follow the rule given in this paragraph, but the information code must be 684 (Utilization degradation). Refer to Para 2.1.5.3.

2.1.5.2 Structural damage categories

For assessment purposes structural damages must be given in three categories (refer to Para 1.3.2):

- Category 1 items must be highlighted (in red if color is useable)
- Category 2 items must be highlighted (in yellow if color is useable)
- Category 3 items are not highlighted (normally shown only for reference)

2.1.5.3 Structural damage limits categories

For assessment purposes structural damage limits must be given for penetration, fragmentation and fire and overheat.

2.1.5.3.1 Structural damage limits, penetration

The limits for penetration damage must be given in terms of maximum permitted hole diameter and minimum undamaged edge distance.

Where possible, penetration damage limits are shown on an illustration of the structure as a number - in a circle - representing the maximum permitted hole diameter in mm. In cases where the limits for "as received" damage differ from those for "cleaned out" damage (refer to Para 1.3.2), the "as received" limit must be additionally shown as a number in inverted commas.

Where it is not possible to include the limits on the illustration or when the limits are complex, they must be included in a data list or given as notes.

2.1.5.3.2 Structural damage limits, fragmentation

The limits for fragmentation damage must be given in terms of maximum permitted diameter of the damage area, maximum diameter of any hole, maximum number of holes in the damaged area and minimum undamaged edge distance. Where the limits for "as received" damage differ from those for "cleaned out" damage, this must be stated.

2.1.5.3.3 Structural damage limits, fire and overheat

The limits for fire and overheat damage must be given in terms of critical temperature indication (level of temperature), conductivity, ultimate tensile strength and hardness.

2.1.5.4 Component function ability

The importance of a component regarding the product frame and engine operation must be given in three categories. Refer to Para 1.3.2.

2.1.5.5 Damage assessment of structures

These data modules provide for each zone of the product frame or assembly/module of the engine a list of their significant structures.

This list must contain:

- the identification of the significant structure
- the data module code where its damage assessment data is given. Illustrations support this list as required.

Data modules for the Product must be coded:

YY-Y-00-90-00-**SS**A-683Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-**SS**AAA-683Y-A (37 characters)

Data modules for the engine must be coded:

YY-Y-72-**SS**-00-00A-683Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y72-**SS**-0000-00AAA-683Y-A (37 characters)

Tables provide damage assessment data for each significant structure. They must contain:

- its name (M)
- its damage category (M). Refer to Para 2.1.5.2.
- damage limits (M). Refer to Para 2.1.5.3.
- the level of temperature (critical temperature) attained in utilization (O)
- the original material and its alternatives or substitute that can be used in repair and are contained in the BDR kit (O). Refer to Para 2.1.9.
- the data module code (information code 684) where repair ability and/or tolerated damages are provided. If a significant structure cannot be repaired and/or no damage is tolerated, "non-repairable" and/or "no damage tolerated" must be recorded in the table.

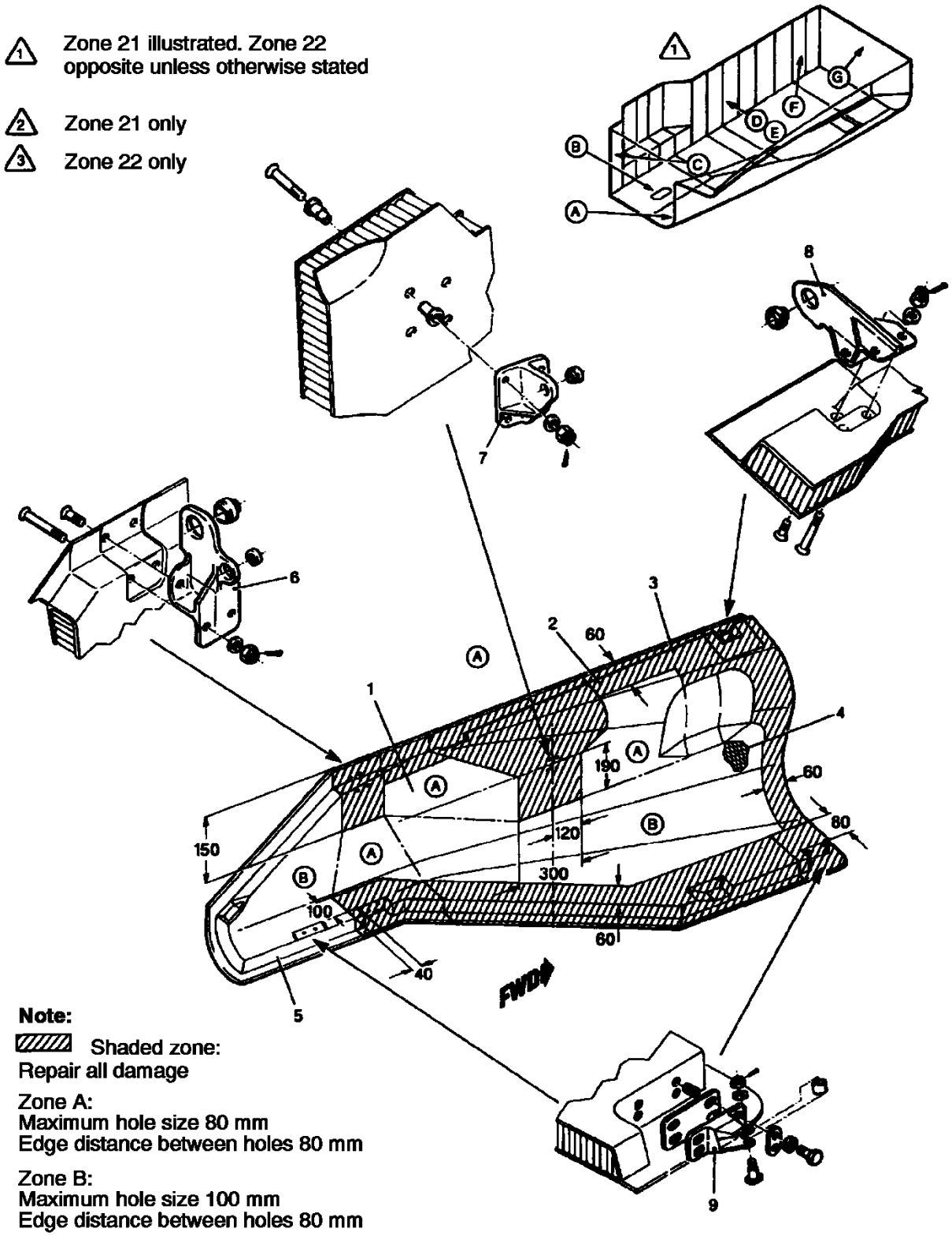
Data modules for significant structures must be coded:

YY-Y-**YY-YY-YY-YYY**-683Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYYYY**-683Y-A (37 characters)

where "**YY-YY-YY-YYY**" or "**YYY-YY-YYYY-YYYYY**" corresponds to the coding of the structure as used in the product breakdown



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Fig 10 Damage assessment of significant structures - Example

2.1.5.6 Damage assessment of components and parts
These data modules provide the data and information necessary for:

- assessment of the damage to components and parts of each system (eg, pipes)
- determination of the possible actions to be carried out on each of these items
- evaluation of the effect of these actions on the product frame or engine operation

Note
Wiring harnesses are covered in Para 2.1.5.7.

The necessary illustrations with the identification of the items (callout with the item number) must be provided for each system.

Related tables for parts and components containing the following information must be provided:

1 Description (for parts)

- Item number (M)
- Physical and maximum operational characteristics (O)

2 Name (of component)

- Name (M)

3 Repair ability

- Data module code of the procedure to repair the component. If a component is not repairable then state "Not repairable". (M)

4 Function category

- Category of the component (M). Refer to Para 2.1.5.4.

5 Isolation

- Data module code of the procedure to isolate the component. If isolation is not applicable then state "Not applicable". (M)

6 Special operation instruction

- Particular operation instruction due to repair and/or isolation of a component must be given. If no subsequent limitation occurs then state "No limitation". (M)

Note
This last information must not be included in "damage assessment" if the project or the organization decides to create it separately as "degradation data". Refer to Para 2.1.6.

Table 5 Damage assessment - Example of table for piping

Description						
Pipe (1)	**Dia (1)**	**Max pressure (1)**	**Repair ability (3)**	**Function category (4)**	**Isolation (5)**	**Special operating instructions (6)**
C1	6 mm	2 bar	YY-A-73-13-18-00A-684A-B	Imperative (T.S. pump E drain)	Not applicable	No limitation
C2	6 mm	2 bar	YY-A-73-13-15-00A-684A-A	Imperative (T.S. pump E supply)	Not applicable	No limitation

Description						
Pipe (1)	**Dia (1)**	**Max pressure (1)**	**Repair ability (3)**	**Function category (4)**	**Isolation (5)**	**Special operating instructions (6)**
C3	6 mm	2 bar	YY-A-73-13-16-00A-684A-B	Imperative (T.S. pump E supply)	Not applicable	No limitation
C4	6 mm	2 bar	YY-A-73-12-10-00A-684A-A	Imperative (T.S. pump E supply)	Not applicable	No limitation
C5	6 mm	5 bar	YY-A-73-12-12-00A-684A-B	Performance (Hydr. valve opening SV return)	YY-A-73-12-12-00A-686A-A	Flight without AB
C6	6 mm	50 bar	YY-A-73-12-15-00A-684A-A	Performance (Hydr. valve opening SV supply)	YY-A-73-12-15-00A-686A-B	Flight without AB

Table 6 Damage assessment - Example of table for components

Name (2)	Repair ability (3)	Function category (4)	Isolation (5)	Special operating instructions (6)
AB fuel pump	Not repairable	Performance	YY-A-73-13-01-00A-686A-A	Flight without AB
AB fuel control unit	Not repairable	Performance	YY-A-73-13-10-00A-686A-B	Flight without AB
Upstream manifolds	Not repairable	Performance	YY-A-73-13-12-00A-686A-A	Flight without AB
Burner rings	Not repairable	Performance	YY-A-73-13-13-00A-686A-B	Flight without AB
Hydraulic accumulator	Not repairable	Performance	YY-A-73-12-08-00A-686A-A	Slow power lever movements
Main pressuring and dump valve	Not repairable	Imperative	Not applicable	Flight prohibited
Two -flow injector	Not repairable	Imperative	Not applicable	Flight prohibited

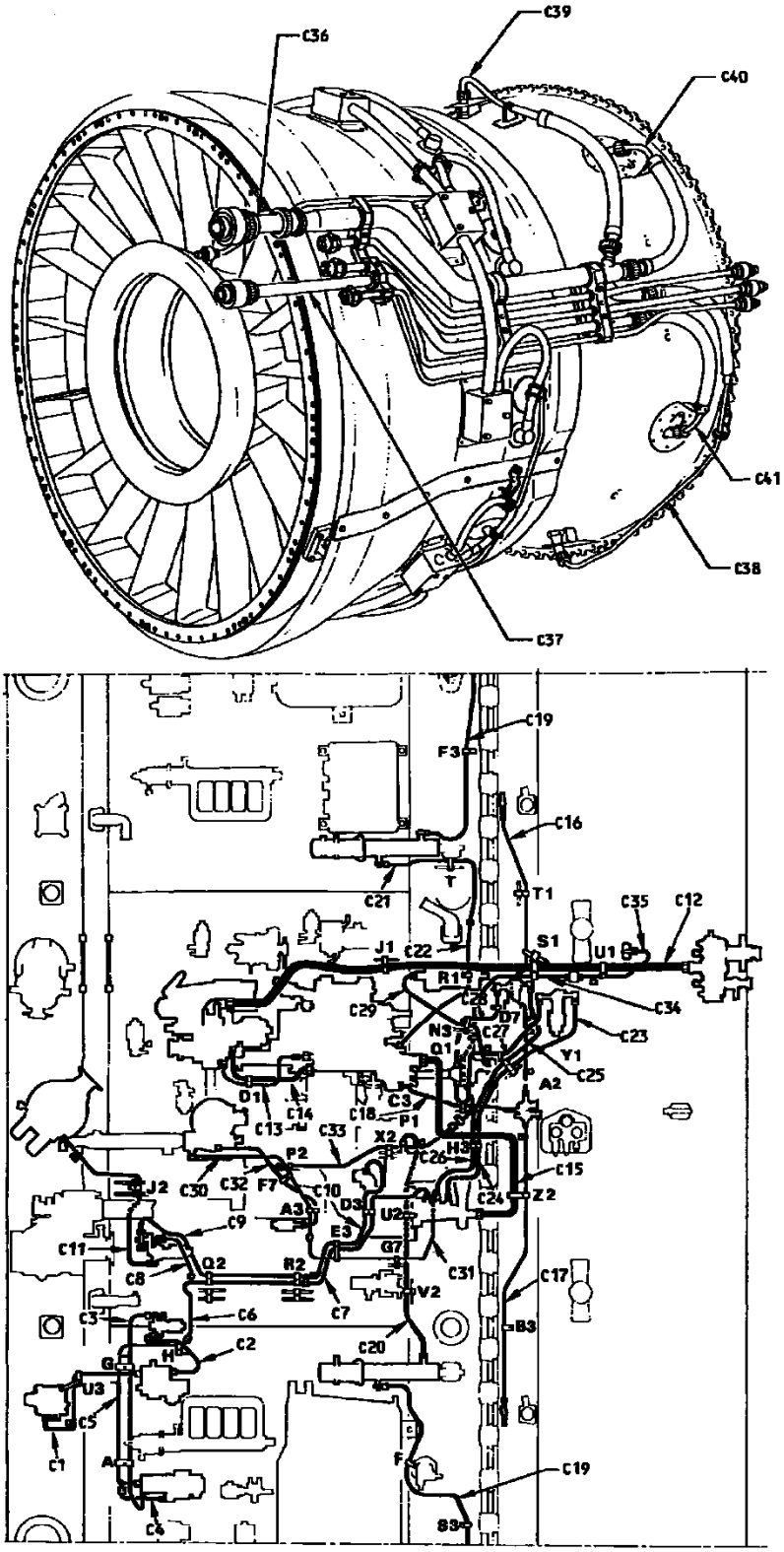
Data modules must be coded:

YY-Y-**YY-YY-YY-YYY**-683Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYYYY**-683Y-Z (37 characters)

where "**YY-YY-YY-YYY**" or "**YYY-YY-YYYY-YYYYY**" corresponds to the coding of the component or part as used in the product breakdown



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Fig 11 Damage assessment of systems - Example

2.1.5.7 Damage assessment of wiring harnesses
Tables must be used in accordance with the definition given in Para 2.1.5.6 except for the column "Description" which contains:

- the description of the harness (M)

followed by:

- the "from/to" for each bundle of the harness (eg, from over speed control SV to 103D connector) (M)

Table 7 Damage assessment - Example of table for harnesses

Description (2)	Repair ability (3)	Function category (4)	Isolation (5)	Special operating instructions (6)
Wiring harness (103 Δ boundary connector)				
Connections:				
Over speed control SV → 103 Δ connector	YY-A-73-13-33-00A-684A-A	Performance	YY-A-73-13-33-00A-686A-A	Limited performance
T4 control override SV → 103 Δ connector	YY-A-73-12-13-00A-684A-B	Performance	YY-A-73-12-13-00A-686A-B	De-energizing the T4 control override SV involves de-energizing the auxiliary pressure reducer. Limited performance (flight with raw T4) Avoid operation at rpm between 7200 and 7800
Fuel chopper SV → 103 Δ connector	YY-A-75-31-07-00A-864A-A	Imperative	Not applicable	Flight prohibited
Nozzle opening SV → 103 Δ connector	YY-A-79-21-05-00A-684A-B	Imperative (emergency regulation)	Not applicable	If you switch to emergency regulation, monitor T4 temperature. Gun firing can result in compressor stall or engine rich flameout. To be used in "relight in flight" configuration.
Engine control amplifier → 103 Δ connector ("N" regulation)	YY-A-73-12-09-00A-684A-A	Performance and imperative	Not applicable	Flight prohibited
Pulse probe → 103 Δ connector (with or without R1 extension cable)	YY-A-74-12-11-00A-684A-B	Imperative	Not applicable (Replace with F wiring harness)	No limitation

Data modules must be coded:

YY-Y-**YY-YY-YY-YYY**-683Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYYYY**-683Y-Z (37 characters)

where "**YY-YY-YY-YYY**" or "**YYY-YY-YYYY-YYYYY**" corresponds to the coding of the harness as used in the product breakdown

2.1.6 Utilization degradation

The damage assessment (refer to Para 2.1.5) includes the utilization degradation. However if the project or the organization decides to isolate them, they must be tabulated (information code 684). For each system or component (if data differ between them) the table provides the consequences on the utilization (eg, mission, operating limitations) of the product frame or the engine with the non-repaired damage or following the action done on damaged hardware.

Business rule decision point BRDP-S1-00434 - Separate data modules for utilization degradation in BDAR information sets:

– Decide whether to prepare separate data modules for degradation information, or to include this information in the damage assessment data modules.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-684Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-684Y-Z (37 characters)

where "**YY-YY-YY-YYY**" or "**YYY-YY-YYYY-YYYYY**" corresponds to the coding of the damaged hardware as used in the product breakdown

2.1.7 Repair and isolation procedures

Repair (information code 685) and isolation (information code 686) procedures use the hardware making up the BDR kit. Refer to Para 2.1.9.

The procedures must be broken down as given in the following paragraphs.

2.1.7.1 Standard procedures

Standard procedures provide the methods not specific to the product frame or the engine (eg, repair of pipes, wires, normal isolation).

Data modules for repair must be coded:

YY-Y-YY-YY-YY-YYY-685Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-685Y-Z (37 characters)

Data modules for isolation must be coded:

YY-Y-YY-YY-YY-YYY-686Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-686Y-Z (37 characters)

where "**YY-YY-YY-YYY**" or "**YYY-YY-YYYY-YYYYY**" corresponds to the coding of the damaged hardware as used in the product breakdown

Note

If the content described under this heading is available in an existing general BDR publication, BDR standard procedures must refer to the relevant data modules contained in the general BDR publication.

2.1.7.2 Repair of structures

These data modules provide the procedures specific to product frame or engine structures, otherwise refer to standard procedures. Refer to Para 2.1.7.1.

Tolerances, if any, must be given in the procedure.

Illustrations must be used wherever possible to describe the procedures. Text is used only to complete the understanding of the illustrations.

Data modules must be coded:

YY-Y-**YY-YY-YY-YYY**-685Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYYYY**-685Y-A (37 characters)

where "**YY-YY-YY-YYY**" or "**YYY-YY-YYYY-YYYYY**" corresponds to the coding of the structure as used in the product breakdown

2.1.7.3 Repair of components and parts

These data modules provide the procedures specific to the systems (including electrical), otherwise refer to standard procedures. Refer to Para 2.1.7.1.

The procedures must be described step by step. Illustrations support the procedures as required.

Data modules must be coded:

YY-Y-**YY-YY-YY-YYY**-685Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYYYY**-685Y-A (37 characters)

where "**YY-YY-YY-YYY**" or "**YYY-YY-YYYY-YYYYY**" corresponds to the coding of the component or part as used in the product breakdown

2.1.7.4 Isolation of systems and components

These data modules provide step-by-step procedures to isolate damaged portions of a system or of one of its damaged components.

Illustrations and/or diagrams support the procedures as required.

Data modules must be coded:

YY-Y-**YY-YY-YY-YYY**-686Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYYYY**-686Y-A (37 characters)

where "**YY-YY-YY-YYY**" or "**YYY-YY-YYYY-YYYYY**" corresponds to the coding of the damaged hardware as used in the product breakdown

2.1.8 Function test after battle damage repair

Function test after battle damage repair (information code 687) procedures must be given to ensure that repaired systems can fulfill the requirements of the mission. These procedures must be designed to take only a minimum of time. If available, full use must be made of on-board test facilities.

If the isolation or repair involves limitations in operating instructions of the product frame or the engine, it must be noted in the procedure to inform the crew/operator of the limitations.

Data modules must be coded:

YY-Y-**YY-YY-YY-YYY**-687Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-YYYYY**-687Y-A (37 characters)

where "**YY-YY-YY-YYY**" or "**YYY-YY-YYYY-YYYYY**" corresponds to the coding of the hardware as used in the product breakdown

2.1.9 Battle damage repair kit

A list of the hardware contained in the BDR kit (for the definition, refer to Para 1.3.2) must be provided. Items as shown below are subdivided into:

- support equipment and tools
- materials
- expendables
- consumables

The relevant data to be given for each kind of hardware must be defined by the project or the organization.

Data modules must be coded:

YY-Y-00-90-00-00**A**-688A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-90-0000-00**AAA**-688A-A (37 characters)

where "**A**" or "**AAA**", in the disassembly code variant, can be used to provide different data modules depending on the product configuration

2.2 Generated information

2.2.1 General

Generated information is based on and must be prepared from source data stored in the BDARP data modules. The source data can be used to generate this information within a page-oriented BDARP as well as within an interactive BDARP.

Source data are:

- structure items
- system components
- system parts
- harness data
- material data

These source data include all pertinent information that is used for assessment and degradation.

Generated information within an interactive BDARP is described in Para 2.3. Examples of generated information for a page-oriented BDARP such as zone-oriented and/or system-oriented breakdown, mission related breakdown etc, are given below.

Specific projects can have reduced or expanded requirements with regard to the given content of the lists. Generated data are not part of the data exchange. Therefore no data module code is allocated.

2.2.2 Structure item list

A structure item list must be produced for the material frame or engine based on each assigned zone, in numerical order, providing the following information:

- name
- part number
- zone
- applicability
- damage category
- damage Limit
- material

2.2.3 System part list ordered by zone

A system part list must be produced for the product frame or the engine based on each effected zone, in system numbering order, providing the following information:

- pipe description
- pipe identification
- pipe diameter
- maximum working temperature
- system breakdown code or Functional item code
- part number
- zone
- applicability
- degradation information
- material

2.2.4 System part list ordered by system

A system part list must be produced for the product frame or the engine based on each effected system, providing the information as shown in Para 2.2.3.

2.2.5 System component list ordered by zone

A system component list must be produced for the product frame or the engine based on each effected zone, in system numbering order, providing the following information:

- name
- reference designator
- system breakdown code
- part number
- zone
- applicability
- degradation information

2.2.6 System component list ordered by system

A system component list must be produced for the product frame or the engine based on each affected system, providing the information as shown in Para 2.2.5.

2.3 Interactive BDARP functionalities

The following paragraphs describe the possible functionalities for an interactive BDARP.

Business rule decision point BRDP-S1-00435 - Interactive BDARP:

- Decide whether to produce an interactive BDARP and define the required functionalities.

2.3.1 Assessment protocol function

2.3.1.1 General

During an assessment of the product frame or the engine, important information will be recorded to allow quick decision for further actions required regarding the damaged hardware.

2.3.1.2 Assessment protocol information

The assessment protocol provides information depending on a performed assessment as follows:

- lists all damages for each affected zone
- lists damages (for structure items), which need no repair
- lists damages (for structure items), which cannot be repaired, replacement only
- lists damages (for structure items), which must be repaired, including reference to the required procedure
- lists system part and component information for each affected system

Another list provides degradation information ordered by component function ability and associated mission. Isolation information, special operation instruction and reference to the required function tests must be given.

2.3.2 Direct entry

2.3.2.1 System parts and components

The direct entry functionality allows direct access to information about the damaged hardware. If the assessor knows the unique identifier of a damaged hardware, for example the reference designator of a system component, it is not necessary to navigate to the damaged hardware via the normal information access. This is because there is identification of the zone using the zone illustrations, identification of the required system from the associated table to get reference to the system component illustration, identification on the illustration of the damaged component and the associated table and at least get reference to the degradation information.

2.3.2.2 Harnesses

Direct entry of a harness number will show all available information including degradation information to that harness. If the project documentation contains an interactive wiring publication and more information is required (eg, wiring information on the damaged harness), the interactive BDARP can be linked to the interactive wiring publication to provide further detailed information.

2.3.3 Context sensitive data presentation

Context sensitive extract of basic information and additional details must be displayed for all generated information and other interactive functionalities.

Chapter 5.2.1.15

Common information sets - Illustrated tool and support equipment information

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References

Table 1 References

Chap No./Document No.	Title
Chap 5.2.1.5	Common information sets - Illustrated parts data
Chap 5.2.1.9	Common information sets - Equipment information

1 General

1.1 Purpose

The preparation and coding of Illustrated Tool and Equipment (ITE) information data modules must follow the rules contained here.

1.2 Scope

It covers the rules for the preparation of information for the identification and use of Support Equipment (SE) and special tools, in the following just called equipment, to:

- maintain and operate on the ground, the air vehicle, land or sea system engine, airborne equipment and nominated assemblies in accordance with the agreed upon maintenance plan
- carryout general functions on the Product, for example, tow, moor, park

Note

The ITE information set normally contains the equipment for on-air vehicle, land or sea system maintenance but its use can be extended to other levels of maintenance if required by the project.

2 Illustrated tool and support equipment information

2.1 General requirements

The ITE information set must contain the following types of data modules:

- introduction
- alphanumeric index and lists
- equipment information

2.2 Introduction

The introduction data modules contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

An explanation of the presentation of each of the following must be given:

- the alphanumeric index
- how each equipment entry is presented

Where applicable, references can be made to the appropriate equipment information set.

Data modules must be coded:

YY-Y-00-00-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-**NN**AAA-018Y-A (37 characters)

where "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed

The information code variant is used to distinguish between the different Information sets.

2.3 Alphanumeric index and lists

The index and the lists can be divided in separate data modules for each chapter/system.

Data modules must be coded:

YY-Y-**SS**-00-00-00A-**XXX**A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y**SS**-00-0000-00AAA-**XXX**A-A (37 characters)

where

- "**SS**" identifies the system of the first or major use of the equipment. When only one data module is used, "**SS**" must be "00".
- "**XXX**", the information code:
  - 014 - Alphanumeric index
  - 061 - Special SE and tools
  - 062 - Standard SE and tools
  - 063 - Government supplied SE and tools
  - 064 - Locally made SE and tools

2.3.1 Alphanumeric index

The alphanumeric index data module must list all the equipment included in the ITE data modules. The table consists of the following columns. Refer to Table 2:

1 Part No.: The part number of the equipment must be as given in the IPD. The arrangement must start with the letters A thru Z followed by the numerals 0 thru 9.

2 CAGE code: Identifies the supplier or design authority by its CAGE code

3 Name: The name of the equipment as given in the IPD. The identifying noun or keyword must always be first, followed by the necessary adjectives, for example, "Tool, spring compression".

4 Used in procedure/data module code: The data module code of the procedure where each equipment is required

2.3.2 Support equipment and tools

As a complement to the alphanumeric index one or more of the following support equipment and tools data modules can be included:

- Special SE and tools
- Standard SE and tools
- Government supplied SE and tools
- Locally made SE and tools

The lists are presented with the same table as for the alphanumerical index. Refer to Table 2. The examples in Table 2 use 17 character data module coding.

Table 2 Alphanumeric index - Example of data module E1-A-72-00-00-00A-014A-A

Part No. (1)	CAGE code (2)	Name (3)	Used in procedure/data module code (4)
HU24857	K0680	Clamp	E1-A-72-32-40-00A-510A-A E1-A-72-32-40-00A-730A-A
HU24939	K0680	Segments	E1-A-72-41-00-00A-500A-A E1-A-72-41-00-00A-700A-A
HU24947	K0680	Gauge, slip	E1-A-72-00-50-00A-520A-A E1-A-72-00-50-00A-720A-A E1-A-72-00-41-00A-920A-A E1-A-72-00-50-00A-600A-A
HU25092	K0680	Clamp	E1-A-72-41-20-00A-520A-A
HU25281	K0680	Cutter, hydraulic	E1-A-72-32-30-00A-920A-A
HU25306	K0680	Hand wheel	E1-A-72-32-30-00A-920A-A

Part No. (1)	CAGE code (2)	Name (3)	Used in procedure/data module code (4)
HU25322	K0680	Cutter	E1-A-72-32-30-00A-920A-A
HU25445	K0680	Rig, flow	E1-A-72-32-10-00A-640A-A

2.4 Equipment information

2.4.1 General

For each item of equipment, a separate data module must be allocated.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-066A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-066A-A (37 characters)

2.4.2 Presentation of the equipment entries

Equipment information data modules must give the following data:

- Title: The identifying noun or keyword must always be first, followed by the necessary adjectives. The same wording as given in the description column of the alphanumerical index must be used.
- Application: A brief description of the equipment to enable the user to readily understand what it is used for. Related tools or equipment needed to do the task must also be given.
- Dimensions: For large equipment, their dimensions must be given to assist the user to handle the equipment.
- Mass: For heavy equipment, the mass must be given to assist the user to handle the equipment.
- Parts list: A standard tabular presentation must be used to give parts information on the equipment. Equipment, which the user can repair or replace parts on, must have a parts breakdown given in this table. Equipment which the user cannot repair or replace parts on must only have data on the SE or special tool itself.
- For complex equipment (if the parts list exceeds one page) a reference can be made to the detailed parts data module. Refer to Chap 5.2.1.9 Equipment Maintenance Information and Chap 5.2.1.5 IPD information.
- An illustration: The table must be followed by the necessary illustrations showing the equipment and, wherever possible, its location if in use.

The parts list table must consist of the following columns. Refer to Fig 1, Fig 2 and Fig 3:

1 Fig ref: The figure number followed by the item number of the part on the illustration. The numbers are separated by a dash (eg, "1-3" is Fig 1 and Item No. 3).

2 Part number: The part number of the equipment and, if applicable, the part number of the parts which can be repaired or replaced

3 Name: The number of the equipment and its parts

4 Units per assembly: The number of units required for the next higher assembly

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Tool, fuel tank water drain

Support equipment and tool data

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1 Application

To drain water from the air vehicle fuel tanks through the drain valves.

2 Dimensions

Not applicable.

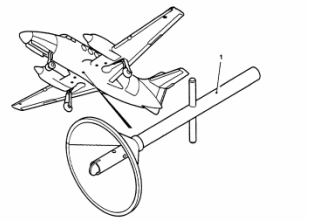
3 Mass

Not applicable.

4 Parts list

Table 1 Tool, fuel tank water drain

Fig ref	Part number	Name	Units per assy
1-1	037132P401	Tool, fuel tank water drain	1



ICN-F9-A-EB2810-D-P1632-00039-A-01-1

Fig 1 Tool, fuel tank water drain

Effectivity: All **F9-A-EB-28-1000-16A-066A-A**

End of data module

Unclassified **2006-10-02 Page 1**

ICN-AE-A-050201-G-S3627-00403-A-01-1

Fig 1 Simple equipment ITE data module - Example

Utopia Ministry of Defence | Unclassified | F9-M1234-IETM0-00-P

Adapter assembly, engine hoist

Support equipment and tool data

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1 Application

Used to remove the engine from the air vehicle and to keep it in horizontal and vertical plane..

2 Dimensions

1895 mm x 890 mm x 1105 mm.

3 Mass

65 kg.

4 Parts list

Table 1 Adapter assembly, engine hoist

Fig ref	Part number	Name	Units per assy
1-1	037132P401	Adapter assembly, engine hoist	-
1-2	037132P403	• Arch assembly	1
1-3	037132P405	• Link assembly	1
1-4	SP113N8	• Pin, headed, 13 mm diam	1
1-5	SP112N	• Washer, plain	1
1-6	SG90G8	• Pin, split 3 mm diam, 25 mm long	1
1-7	P90E5	• Pin, split 1 mm diam, 127 mm long	2
1-8	SP113E8	• Pin, headed 6 mm diam	2
1-9	SP112E	• Washer, plain	2
1-10	037132P409	• Rod assembly, retaining	1
1-11	037132P429	•• Fork end, LH thread	1
1-12	037132P423	•• Fork end, RH thread	1
1-13	A102QP	•• Nut, lock 16 mm diam	1
1-14	037132P431	•• Nut, adjusting	1
1-15	037132P427	Ring, adapter	1

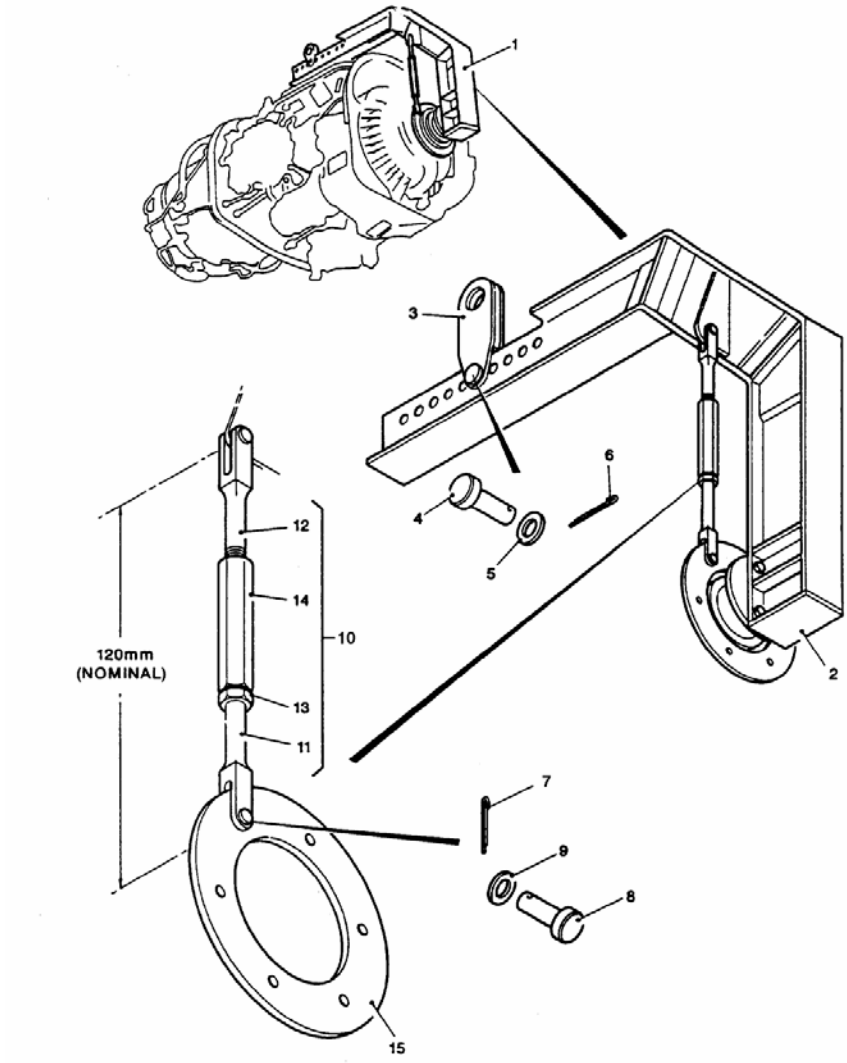
Effectivity: All | F9-A-FB-71-00-02A-066A-A

Unclassified | 2006-10-02 Page 1

ICN-AE-A-050201-G-S3627-00404-A-01-1

Fig 2 Equipment ITE data module with illustrated parts list - Example page 1

Utopia Ministry of Defence | Unclassified | F9-M1234-IETM0-00-P



ICN-F9-A-EF7100-C-G1394-00214-A-02-1

Fig 1 Adapter assembly, engine hoist

Effectivity: All | F9-A-FB-71-00-02A-066A-A

End of data module

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ICN-AE-A-050201-G-S3627-00405-A-01-1

Fig 3 Equipment ITE data module with illustrated parts list - Example page 2

Chapter 5.2.1.16

Common information sets - Service bulletins

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Chap 3.9.5.3	Data modules - Applicability

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Chap 3.9.5.2.15.2	Service bulletin data module - Material information
Chap 4.3	Information management - Data module code
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1 General

1.1 Scope

This chapter covers two different categories of information: the preparation of the information set containing collections of several Service Bulletins (SB) and the preparation of the information set of data modules that constitute an individual SB.

1.1.1 Collections of several Service bulletins

The information for a collection of several SB must contain the following topics:

- Introduction. Refer to Para 2.1.2.1.
- Numerical index. Refer to Para 2.1.2.2.
- Cross-reference index. Refer to Para 2.1.2.3.
- Individual Service bulletins. Refer to Para 2.2.

1.1.2 Individual Service bulletin

This covers the rules for the preparation of SB information to apply a modification, a special and/or temporary inspection to an in-service Product or part of the Product. Refer to Para 2.2.

1.2 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for SB information sets.

1.3 Standards and definitions

The standards and definitions given in this chapter are applicable with no exceptions.

2 Service bulletin content

2.1 Collections of several Service bulletins

2.1.1 General

This category of SB information set is made up of a collection of several individual SB.

2.1.2 Technical content

2.1.2.1 Introduction

This data module, introduction, must give:

- the purpose and scope of the SB publication
- the organization of the SB publication
- abbreviations and terms

Data modules must be coded:

YY-Y-YY-YY-00-**NN**A-018Y-D (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-**NN**AAA-018Y-D (37 characters)

Where "**NN**" in the disassembly code is a sequential number starting from "00" if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

2.1.2.2 Numeric index
This data module must give a numerical index of all effective SB.

Table 2 Numeric index

Service bulletin DMC	Title	Date
YY-A-72-21-00-05A-930A-C	Engine - Fan frame Replacement of oil supply tube	1994-12-21
…		
…		
YY-A-72-21-00-06A-930A-A	Engine - Fan frame Deletion of safety Wire	1995-02-10
…		

Data modules must be coded:

YY-Y-YY-YY-00-00A-013A-D (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-00AAA-013A-D (37 characters)

2.1.2.3 Cross-reference index
This data module must give a cross-reference index of all effective SB.

Table 3 Cross-reference index

Title	Service bulletin DMC	Date
Engine - Fan frame Replacement of oil supply tube	YY-A-72-21-00-05A-930A-C	1994-12-21
Engine - Fan frame Deletion of safety Wire	YY-A-72-21-00-06A-930A-A	1995-02-10
…		

Data modules must be coded:

YY-Y-YY-YY-00-00A-013B-D (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-00AAA-013B-D (37 characters)

2.2 Individual Service bulletin content

2.2.1 General

A SB provides a single source to notify the customers of the following types of recommendations:

- Modifications to the Product or part of the Product, including embedded software, which affect performance, improve reliability, increase safety of operation, provide improved economy or facilitate maintenance or operation.
- Substitution of one part with another superseding part when it is not completely interchangeable both functionally and physically or when change is considered to be sufficiently urgent or critical that special scheduling or record of accomplishment will be required.
- Special inspection/check to determine if the Product or part of the Product is in safe operating condition.
    - One-time inspection/check to detect a flaw or manufacturing error
    - Special inspection/check required to be performed until a corrective action (modification) can be taken. The modification information can be issued as a revision of the SB which transmits the inspection instructions.
    - Special checks of an urgent nature, such as pressure check, functional checks, etc, required to detect an incipient failure
- Replacement of one part with another part or addition of an alternate part even though these parts are completely interchangeable both functionally and physically.
- Substitution of one embedded software program by another which change component function and the part number of the programmed memory device, requiring a record of accomplishment.
- Conversion from one model to another.
- Changes affecting the interchangeability of parts.
- Reduction of existing life limits or establishment of first time life limits for components.
- Changes affecting characteristics of the product that can have an impact on the operation of the product.
- Evaluation of a part temporarily installed on the product. The SB can describe the initial installation of the part to be evaluated, removal for evaluation and the reinstallation of original part to return on initial product configuration.
- At the direction of the manufacturer, a SB will be used to transmit other types of information considered to be important enough for a record of accomplishment to appear in the SB file (eg, approved oils).

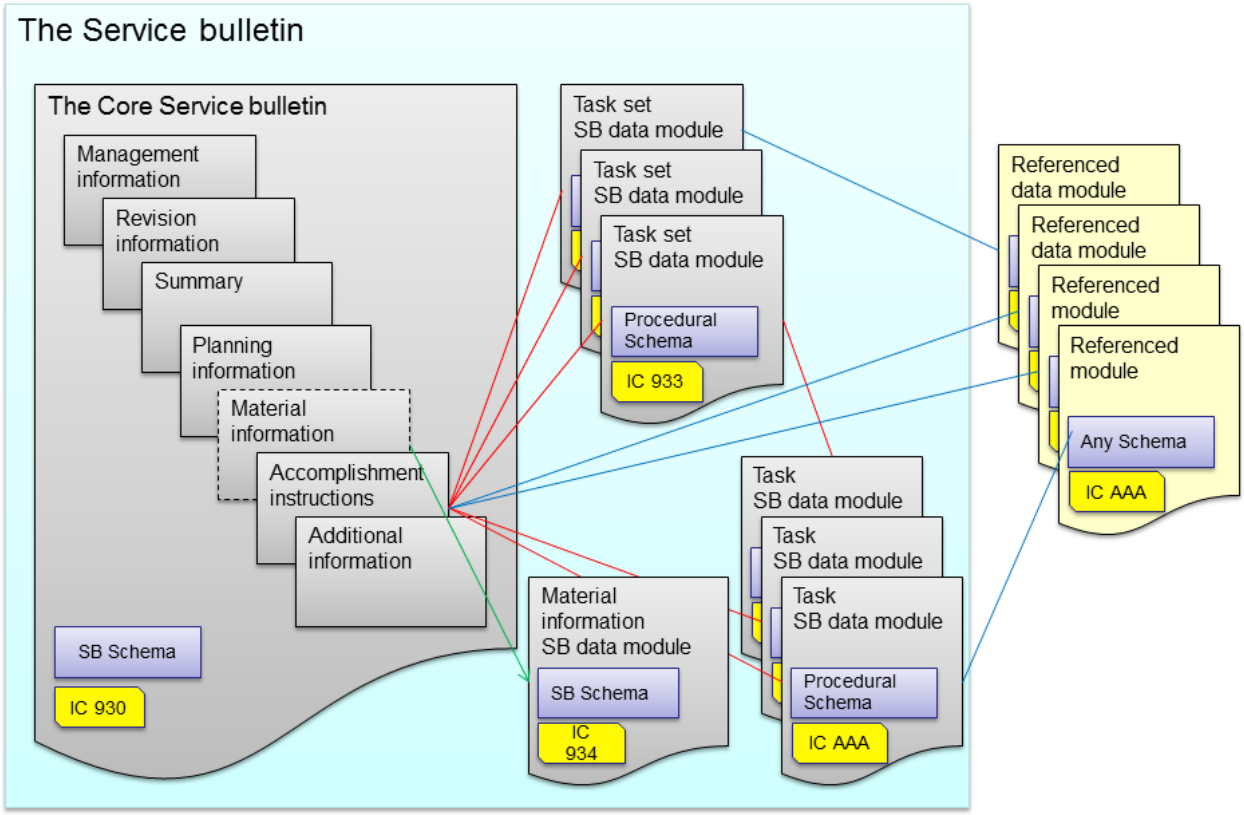
A SB once issued must not be cancelled. In case the original intent of the SB becomes invalidated, a revision to the original SB, or a new SB, must be issued for the purpose of restoring the units already modified to the original or preferred configuration. If a new SB is issued that supersedes the original SB, then a revision to the invalidated SB can also be issued in order to stop progression of its accomplishment.

SB must not be used to cover routine recommended inspections/checks, standard repairs, or revisions to maintenance practices or shop procedures.

2.2.2 Technical content

A SB consists of a package of data modules with the following information:

- A core SB (supported by the SB data module)
- Optional material information (if not included in the core SB data module)(supported by the SB data module)
- Optional tasks and/or task sets (if not included in the core SB data module) (supported by - the procedural data module). Refer to Fig 1.



ICN-S3627-S1000D0616-001-01

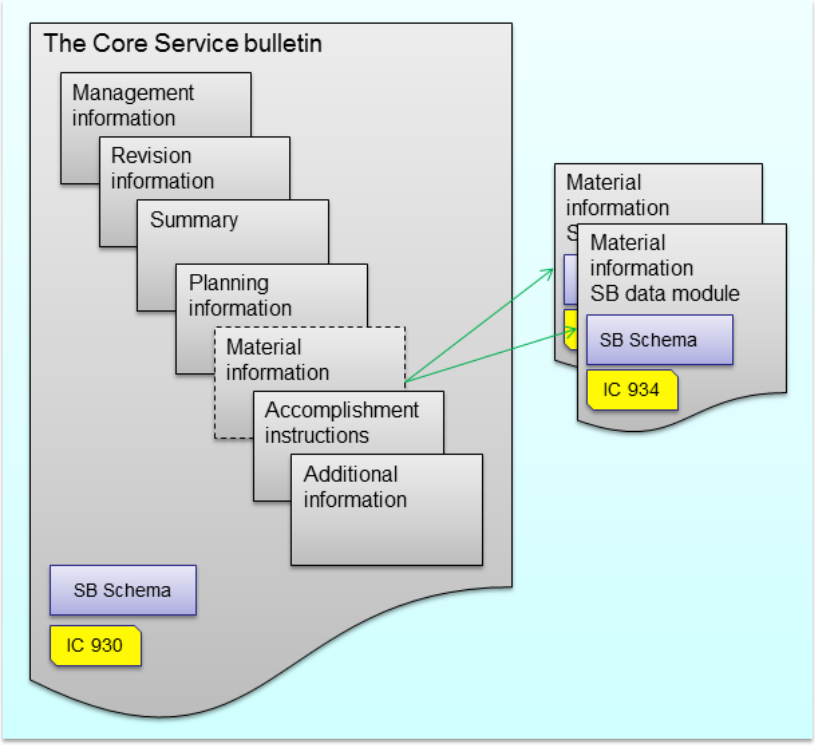
Fig 1 SB divided into a set of data modules.

The SB can refer to already existing data modules for maximum reuse of information (the "yellow background" data modules). These data modules are not seen as being a part of the SB and have thus a "normal" data module code.

2.2.2.1 Material information

Business rule decision point BRDP-S1-00436 - Use of external material information in Service bulletins:

– Decide whether material information must be a part of the "core" SB data module or if it can (depending on the volume) be presented in one or more referenced separate SB data modules. Refer to Fig 2.



ICN-S3627-S1000D0617-001-01

Fig 2 The Core SB data module with external material information.

2.2.2.2 Accomplishment instruction

If they are not simple ones, the detailed accomplishment instructions are given in one or more separate data modules, marked as "Task set SB data module/Task SB data module" in the illustrations. Refer to Fig 1.

Note

Simple one means simple check SB or SB without material involved in accomplishment. Accomplishment Instructions involving more than three levels of hierarchy or illustrations must refer to procedural data module(s) for the detailed instructions.

Accomplishment instruction can from its content make references to already existing data module (marked as "Referenced data module").

All referenced data modules must be listed in the reference table of the SB ("Table 1 References") the same way they are in other data modules. If the Material Information is delivered as a separate data modules (one or more) these must also be included in the listing.

The data module belonging to the SB ("Task set SB data module" and/or "Task SB data module" and "Material Information data module" if delivered in separate data module) can be listed in the Management information paragraph defining the boundaries of the SB. The Core SB is assumed to be part of the SB but is not specifically listed in its own Management information paragraph.

2.2.3 Data module coding

To assist in the codification of data modules, the rules which follow can be used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-**SS-SS-MM**-**NN**Y-**YYY**Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**YSS-SS-MMMM**-**NN**YYY-**YYY**Y-Z (37 characters)

Where:

– "**SS-SS**" or "**YSS-SS**", the system and subsystem/sub-subsystem are the ones already used, for the same assembly/part in the CSDB.

Note

Y is the material item category code if used.

– "**MM**" or "**MMMM**" in the unit or assembly, is a sequential number of the Service bulletins, starting from "01" or "0001" used to differentiate the various SB which can be applied on the same system and subsystem/sub-subsystem.

Note

MM and MMMM allows for alphanumeric characters. Refer to Chap 4.3.3.

– "**NN**", in the disassembly code
- for task, task set and material information data modules which are part of a specific SB this is a sequential number starting from "01"
- for all other SB, use populate it normally. Refer to Chap 4.3.4.

– "**YYY**", in the information code must be:

- 930 - Service bulletin core data module
- 933 - Accomplishment procedure - Task set procedural data module for the SB
- 934 - Material information data module
- Any information code - Task procedural data module

Note

There will be no conflict with component SB issued by a component manufacturer as the components are recommended to have their own model identification code.

Identification of revisions follows the standard S1000D revision mechanism as described in Chap 3.5.

Data modules developed for the specific SB must use standard data module codes with the SNS and information codes assigned using S1000D basic rules.

Example 1:

The third SB applicable to the low turbine shaft of an engine (72-54-00):

– YY-A-72-54-03-00A-930A-C

Example 2:

The second task set belonging to the twelfth SB to the low turbine shaft of an engine (72-54-00):

– YY-A-72-54-12-02A-933A-C

Example 3:

The material information data module belonging to the fourth SB to the low turbine shaft of an engine (72-54-00):

– YY-A-72-54-04-00A-934A-A

Example 4:

A set of data modules representing a core SB (IC 930) applicable to spoilers installed on wings (57-70), with a separate material information data module (IC 934) and two separate task set data modules (IC 933). Specific installation (IC 720) and removal (IC 520) task SB data modules are also delivered with the SB. The project for this example decided to use a four digit unit or assembly (sequence number). The SB is aimed for accomplishment at workshop level with the first task set with to item location code A (YYYY-A-57-70-0001-01A-933A-A) to be fulfilled on object:

– YYYY-A-57-70-0001-00A-930A-C
– YYYY-A-57-70-0001-01A-934A-C
– YYYY-A-57-70-0001-01A-933A-A
– YYYY-A-57-70-0001-02A-933A-C
– YYYY-A-57-70-0001-01A-720A-C
– YYYY-A-57-70-0001-01A-520A-C

2.2.4 Service bulletin types

There are two types of SB: Alert and Standard.

Business rule decision point BRDP-S1-00437 - Treatment of alert and standard Service bulletins:

– Decide whether or not to allow classifying Service bulletins as Alert.

2.2.4.1 Alert Service bulletins

Alert SB must be issued to mitigate matters requiring urgent attention and must be limited to items affecting safety of the product's users. Alert SB must be classified by populating the element <`productSafety`> with the attribute `safetyLabel` containing the value of "`alert`". Refer to Chap 3.9.5.1.

2.2.4.2 Standard Service bulletins

Standard SB must be issued when a SB is required but an Alert SB is not required. Standard SB can be indicated by populating the element <`productSafety`> with the attribute `safetyLabel` containing the value of "`standard`". Refer to Chap 3.9.5.1.

2.2.5 Compliance recommendation

Compliance recommendation specifies the SB priority for business planning.

Compliance recommendation is based on compliance categories:

The compliance categories can be:

– Service bulletin must be accomplished

  Used for SB that are mandated or that the manufacturer expects will be mandated by regulators.

- Service bulletin recommended to be accomplished to prevent significant operational disruptions

  For SB that are not in the category above. Significant operational disruptions can include extensive repairs, in-flight turn back/ diversions, aborted takeoff, in-flight shutdown and major delays.

- Service bulletin to introduce improvements

  For SB that are not in the categories above. Improvements can include passenger comfort, reliability, environmental improvement, operational improvement, economics and product life extension.

- Service bulletin for convenience or option

  For SB that are not in the categories above.

The manufacturer must include a compliance category in the SB. Compliance category must be given in the SB Management Information topic "Compliance". Refer to Para 2.2.6.1.1. The SB Compliance category must also be given in the Planning information topic "Compliance". Refer to Para 2.2.6.4.5.

Business rule decision point BRDP-S1-00438 - Service bulletin compliance categories:

- Decide whether to use the four compliance categories or to define others.

2.2.6 Core Service bulletin

The core SB includes the following main topics and structure:

- Management information
- Revision information
- Summary
- Planning information
- Material information
- Accomplishment instructions
- Additional information

Refer to Chap 3.9.5.2.15.

The content of the Core SB will consist of the following main topics:

2.2.6.1 Management Information

Information that is useful and/or required by end users and/or regulatory authorities to manage the process of utilizing a SB. The information given in this paragraph is semantically organized in order to allow automatic processing/extraction. Refer to Chap 3.9.5.2.15.1. This information can be referenced from the planning information main topic.

The list of information that is present in the SB management information is:

- compliance. Refer to Para 2.2.6.1.1
- Service bulletin task type. Refer to Para 2.2.6.1.2
- list of product modifications. Refer to Para 2.2.6.1.3
- Service bulletin impacts. Refer to Para 2.2.6.1.4
- list of concurrent Service bulletins. Refer to Para 2.2.6.1.5
- Service bulletin accomplishment limit. Refer to Para 2.2.6.1.6
- Service bulletin estimated time, duration and external time required. Refer to Para 2.2.6.1.7
- original Service bulletin issue date. Refer to Para 2.2.6.1.8
- approval identifier. Refer to Para 2.2.6.1.9
- list of Service bulletin approved data modules. Refer to Para 2.2.6.1.10

- replaced Service bulletin. Refer to Para 2.2.6.1.11
- project specific properties. Refer to Para 2.2.6.1.12

2.2.6.1.1 Compliance

A code delineating which of the four available compliance categories is applicable to this SB.

2.2.6.1.2 Service bulletin task type

SB task types "categorize" a SB by its main activity. When a SB accomplishes multiple task types, the primary or most relevant one can be selected here. The following values are allowed:

- Modification - used when the main activity described in the SB is to modify the product
- Inspection - used when the main activity described in the SB is to inspect the product
- Repair - used when the main activity described in the SB is to repair the product.
- Evaluation - used when the main activity described in the SB is to evaluate item or function on the product or the full product itself.
- Administrative - used when the SB is issued to provide information to customer and that no work has to be performed on the product

2.2.6.1.3 List of product modifications

A "design change" defined by the manufacturer and implemented (embodied) before or after product delivery installed with the SB. List the manufacturer's internal tracking numbers for product changes that are being described in the SB. An optional classification of the modification can be associated to each product modification, to describe the regulatory or approval impacts of the modification.

2.2.6.1.4 Service bulletin impacts

The impacts of the SB on the product can be various. The project or the organization can define their own impacts. The impacts can include:

- Impact on weight and balance: Indicates if the SB has a significant impact on product weight. Indicates if the SB has a significant impact on product balance. For weight a value (including + or -) and unit of measure must be included. This structure can include applicability to address different results for different product instances.
- Impact on electrical load AC and DC: Indicates whether the SB has an impact on product alternative current load. Indicates whether the SB has an impact on product direct current load. The values of electrical Load increase or decrease for the whole product (+ or -, including unit of measure) can be included. This structure can include applicability to address different results for different product instances.
- Impact on publications: maintenance or operational: This must be populated when incorporation of this SB also requires operators to modify their maintenance or operational publications.
- Impact on Electrical Structure Network (ESN) load: Indicates whether the SB has an impact on the load of Electrical Structure Network that supports the return of the current on relevant products. The values of electrical Load increase or decrease for the whole product (+ or -, including unit of measure) can be included. This structure can include applicability to address different results for different product instances.

Business rule decision point BRDP-S1-00439 – Minimum impact on weight in Service bulletins:

- Decide the threshold for minimum impact on weight that must be reported in a Service bulletin.

Business rule decision point BRDP-S1-00440 - Minimum impact on balance in Service bulletins:

- Decide the threshold for minimum impact on balance that must be reported in a Service bulletin.

Business rule decision point BRDP-S1-00441 - Minimum impact on electrical load to be reported in Service bulletins:

– Decide the threshold for minimum impact on electrical load that must be reported in a Service bulletin.

Business rule decision point BRDP-S1-00442 – Definitions and use of maintenance and operational publications in Service bulletins:

– Decide on the precise definitions of "maintenance publications" and "operational publications" and whether to separate them into different listings in the Impact on publications.

2.2.6.1.5 *List of concurrent Service bulletins*
Optional list of SB and Modifications which must be accomplished before or simultaneously with the current one and a list of SB and Modifications which must not be accomplished before the current one, based on applicability.

2.2.6.1.6 *Service bulletin accomplishment limit*
Optional information related to interval, threshold, time limit to perform the SB. This topic informs the customer when he must accomplish the SB: for inspection SB, the limit (Flight Cycle, Flight hours, etc) not to exceed, the grace period after issuance of the SB, the repetitive interval between two inspections if necessary.

2.2.6.1.7 *Service bulletin estimated time, duration and external time required*
A global view of how important the SB is in term of resources for the customer. Multiple values can indicate different options to complete the SB and returned to service. External time required is a Y/N flag, plus an optional list of references to procedures that are not included in SB estimated time and SB duration (eg, Vendor SB), to other procedures outside of the control of the manufacturer. Use applicability to address different results for different product instances.

2.2.6.1.8 *Original Service bulletin issue date*
The date of the first issue of this SB.

2.2.6.1.9 *Approval identifier*
Optional identifier given by a manufacturer’s approval authority.

2.2.6.1.10 *List of Service bulletin approved data modules*
Optionally used to clearly define which data modules are within the (approved) SB. Refer to the data modules with "blue background" in Fig 1.

2.2.6.1.11 *Replaced Service bulletin*
Optionally used in the case where an SB is no longer valid and is replaced by another one. The reference to the SB replacing this SB is placed here.

2.2.6.1.12 *Project specific properties*
Metadata for SB specific to a project or an organization. The properties are mainly flags that give characteristics of the SB. For example, a project or an organization might want to indicate whether or not the SB affects passenger comfort, reliability of the product or the life structure of the product. Refer to Chap 3.9.5.2.15.1.

2.2.6.2 Revision information
This main topic must include the revision history and reason for change associated to a SB issue.

For example, "This section transmits Issue 002 to Service bulletin 747-21-15." Each SB dataset (paper or digital) must contain the latest issue number, the original date of issue and the date of the latest issue

Note

Different releases of SB will be referred to using the issue number of the core SB data module for that SB.

The revision information main topic can:

- Indicate whether or not additional work is required if operators complied with a previous issue of the SB. If additional work is required, the additional work must be described.
- Contain a comprehensive summary of the reason for the revision
- List the dates and numbers of all previous issues

The revision information main topic can contain a history of previous issue's reasons. The revision information can also contain instruction concerning filing of the SB issue.

2.2.6.3 Summary

The Summary must give an overview of the SB but must not contain sufficient information to perform the work of the SB.

The content of the Summary paragraph is intended to be descriptive content.

The Summary can contain but is not limited to:

- The reason of the SB/Background
- Action/Description/Nature of the work (on product, on components)
- A general evaluation of impacted airworthiness items as well as benefits
- A global assessment of commercial items / material information
- Compliance
- Industry Support Information
- Applicability of the SB
- Concurrent requirements
- Global estimation of workload and elapsed time to accomplish the SB
- General illustration showing where the work has to be done

2.2.6.4 Planning information

This main topic must contain the information required to permit the operator to determine if the SB has to be applied to its component and to plan its accomplishment.

All mandatory topics must be present in the SB even when not necessary for that SB. In such a case the content must be marked as "No information". Refer to Chap 3.9.5.2.15.

The information can be presented under the following headings:

2.2.6.4.1 Applicability

Specifies the product to which the SB is applicable. Lists model, part numbers and serial numbers, or otherwise clearly identified product affected, when not specified in the status section of the data modules.

A SB number must apply to one model or product type only. The product must be identified using a manufacturer's unique identification number.

This paragraph can be mainly derived from the applicability statement as described in Chap 3.9.5.3.

This topic can also contain details on how serial numbers or product identifiers can be grouped by configurations when several product configurations are described in the SB. The definition of these configurations can be detailed to ease SB preparation.

As applicable, paragraphs must be included beneath the applicability to state the production introduction by product serial number or equivalent unique identifier.

2.2.6.4.2 *Concurrent requirements (Previous modifications)*
Use this topic to describe known previous modifications to parts affected by the SB. Normally, only the SB which introduced the last change of part number affected by the modification will be listed, if this part has not yet been introduced in the logistic system, such as IPD.

When applicable state if other SB, or portions thereof, must be accomplished in conjunction with or prior to accomplishment of the subject SB. When applicable state if other SB must not be accomplished prior to accomplishment of the subject SB. The evolution of the relevant parts can be included here.

This topic can reference the topic List of concurrent SB. Refer to Para 2.2.6.1.5.

2.2.6.4.3 *Reason*
Provides sufficient facts to assist the operator in determining the applicability to, or effect on, his operation. This information must be prepared in quantitative terms to permit the operator's evaluation as follows:

- Objective - State immediate effect the new part will have
- Problem and effect - State problem with present part, what has happened and/or what might happen if the problem is not resolved
- Solution - State how the new part or procedure will alleviate the problem

2.2.6.4.4 *Description*
Provides a brief but complete statement outlining what the SB does.

2.2.6.4.5 *Compliance*
This is the compliance category of the SB (refer to Para 2.2.5) and also the compliance recommendation to the operator for incorporation of the SB including accomplishment limits (refer to Para 2.2.6.1.6).

In establishing these recommendations due consideration has to be given to availability of personnel and materials as well as the normal maintenance periods of the product. Limits if specified in hours, cycles, calendar time, etc, must be justified by the technical facts. Language such as "at the earliest opportunity where personnel and facilities are available" or "at the next suitable planned maintenance period" is preferable.

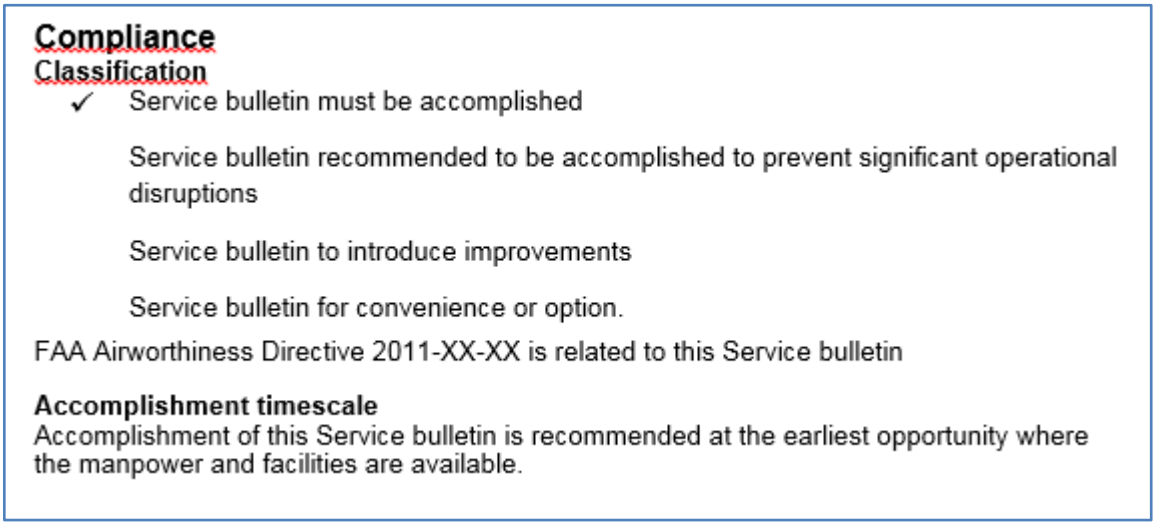
These recommendations must be supported by the detailed reasons for issuance of the SB. Where alternate methods of compliance are known, they must be included. If no alternate methods of compliance are known at the time of issuance, language must be included to allow operators to use alternative means of compliance acceptable to the manufacturer.

For category "Service bulletin must be accomplished" the manufacturer must recommend accomplishment before XX hours, YY cycles, a specific date and/or interval.

For other categories, the manufacturer can provide a recommendation for accomplishment. The compliance recommendation and the method and rate of implementation will be consistent, yet sufficiently flexible so as not to impede the orderly and safe operation of individual operator's product.

If the manufacturer is aware the SB is associated with regulatory action, a statement to that effect must be included. Available details of that action can be provided.

An example of presentation is given in Fig 3.



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Fig 3 Compliance - Display example

2.2.6.4.6 *Approval (commercial application)*
If approval is required this approval must be stated.

2.2.6.4.7 *Manpower*
Provides an estimate of man hours required to accomplish the intent of the SB.

In cases where the SB can be accomplished in independent portions, the estimated man hours required must be detailed separately for each portion.

When appropriate, man hours can be illustrated by a chart to help customers to assess the workload and elapsed time necessary to accomplish the SB. It must be provided as a complement and not as replacement of figures.

2.2.6.4.8 *Weight and balance*
The total increase or decrease in weight will be provided if the thresholds stated by the project or the organization are equaled or exceeded for the Product. Refer to Para 2.2.6.1.4.

The total change to balance or center of gravity will be provided if the thresholds stated by the project or the organization are equaled or exceeded for the Product. Refer to Para 2.2.6.1.4.

If the change to weight or balance is below thresholds specified by the project or the organization the statement "Not affected" or "Not changed" will be used. In cases where the SB is separated into phases and the product can be returned to service between phases, weight and balance data must be provided for each phase.

2.2.6.4.9 *Electrical load data*
The total to electrical loads will be provided if the thresholds stated by the project or the organization are equaled or exceeded for the Product (refer to Para 2.2.6.1.4. If there is no effect, state "Not changed".

2.2.6.4.10 *Software accomplishment summary*
If the SB involves any change to product software, include the information here. The information must support software change approval by providing the required traceability of the change history.

2.2.6.4.11 *Referenced documentation*
State sources of information used in preparation of the SB such as other SB, engineering drawings, government regulatory body directives, maintenance procedures and illustrated parts data, supplier documents, etc. This list must encompass all references made in any data module that is part of the SB.

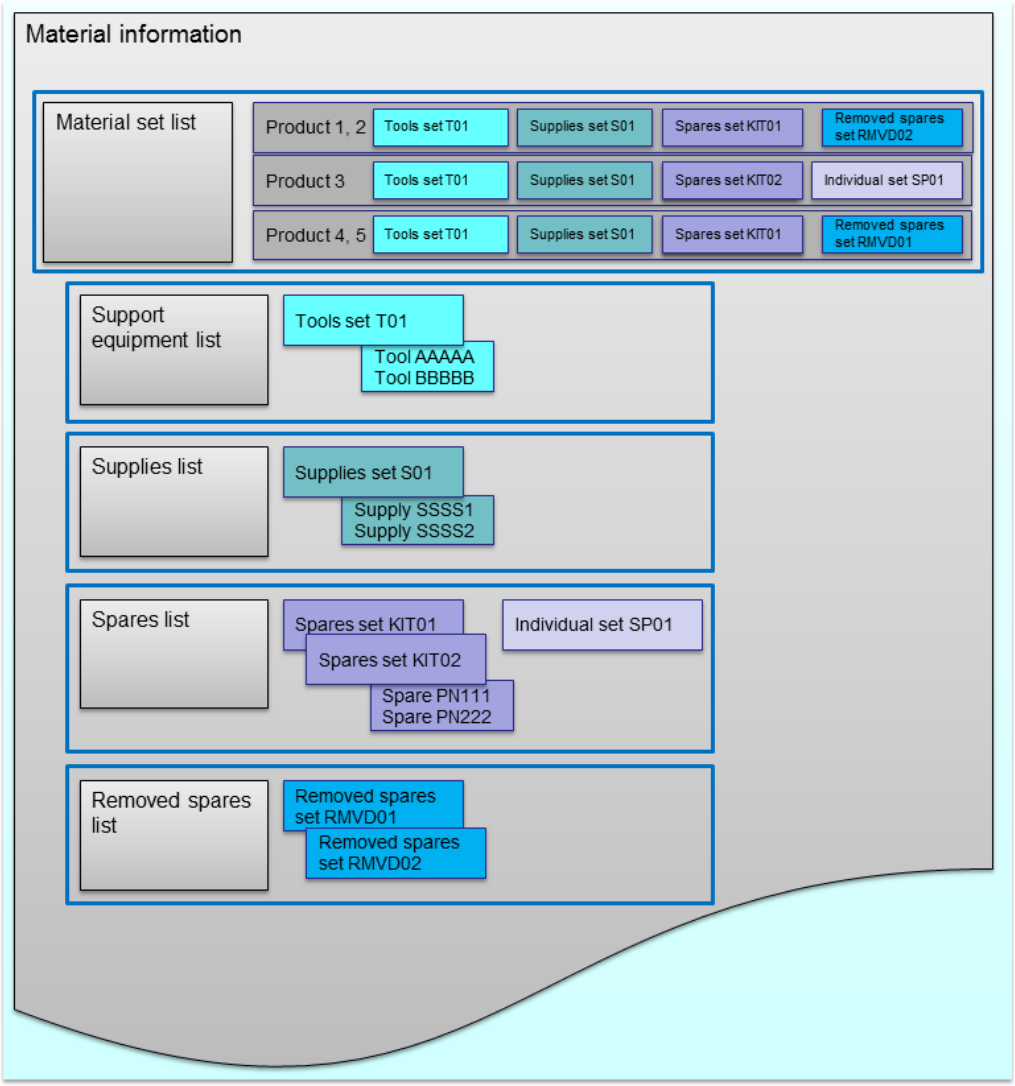
2.2.6.4.12 *Documentation affected*
A list of documents (such as data modules, technical publications and operational manuals) which have been or will be revised as a result of the SB.

2.2.6.4.13 *Industry support information*
In cases where concessions must be granted, the information must be included in this paragraph.

2.2.6.5 Material information
Furnishes the operator with necessary information needed for planning and procurement. The Material information main topic can be delivered within the core SB data module or in one or several dedicated data modules depending on the volume of the Material information and the project or the organization decision. When Material information is delivered as an individual data module, it will inherit the data module code from the core SB except for the information code which must be IC 934. In that latter case, the Material information main topic of the core SB data module (IC 930) contains one or several references to the Material information data modules (IC 934). Refer to Chap 3.9.5.2.15.2.

The Material Information main topic is divided in five topics according to the material necessary for SB accomplishment. Refer to Fig 4. The topics are:

- materials sets list. Refer to Para 2.2.6.5.5
- support equipment set or Individual and external Support equipment. Refer to Para 2.2.6.5.1
- supplies set or Individual and external Supplies. Refer to Para 2.2.6.5.1
- spares set or Individual and external Spares. Refer to Para 2.2.6.5.1
- removed or modified Spares (set or item). Refer to Para 2.2.6.5.6



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Fig 4 Organization of SB Material Information.

2.2.6.5.1 Topics dedicated to new materials

Three major topics are defined for description of new material installed or used to accomplish the SB:

- Support equipment set list (tools)
- Supplies set list (consumables)
- Spares set list (new parts)

Each of these three topics can be organized:

- by set of items (spare or supply or support equipment). A set of items can represent the physical kit concept. Refer to Para 2.2.6.5.2.
- by individual item. Refer to Para 2.2.6.5.3.

These topics can also refer to additional documentation when additional items to use within the SB are described in a referenced data module or external publication. Refer to Para 2.2.6.5.4.

2.2.6.5.2 *Set of items content description*
Each set of items can be defined by the following associated properties:

- A type (eg, spare set, support equipment set, supply set)
- An identifier and an Issue number of the set
- A textual description of the set
- If the set of items is procurable or not
- If the set of items is provided by the customer or not
- A standard list of attributes attached to the set (eg, applicability, change marking)
- Name and short name of the set of items
- A list of items (eg, spares, supplies, support equipment). For each item, associated information can be described in the same way as if it was delivered as an individual item. Refer to Para 2.2.6.5.3.
- Procurement information associated to the set of items (eg, price, availability, supplier, industry support information)
- Link to the relevant accomplishment instruction where the set of items is used
- Other information relevant to the new part (eg, reference to new maintenance procedure)
- Optional list of notes related to the set of items

2.2.6.5.3 *Individual item content description*
When the material is delivered as individual item (outside any kit), the following information can be supplied:

- A type (eg, spare set, support equipment set, supply set)
- If the individual item is procurable or not
- If the individual item is provided by the customer or not
- The standard list of attributes must be attached to the set (eg, applicability, change marking)
- the item identifier
- quantity of item (eg, present in the set or necessary to accomplish the SB)
- Reference to one or several drawings where the item is represented and associated item identifier in the drawing
- Procurement information associated to the individual item (eg, price, availability, supplier, industry support information)
- Link to the relevant accomplishment instruction where the item is used
- Other information relevant to the new part (eg, reference to new maintenance procedure)
- Optional list of references to note related to the item

2.2.6.5.4 *Reference to other documentation (external material set)*
It is possible to add references to other data modules where support equipment, supplies or spares are mentioned and are applicable to the SB. The reference to other documentation can be addressed as a set of information. So, similar properties than for a set of material can be associated to the reference to other documentation.

Properties associated to the reference:

- A type (eg, spare, tool or support equipment)
- An identifier and an Issue number of the set of the reference
- If the items referenced in the documentation are procurable or not
- If the items referenced in the documentation are provided by the customer or not
- The standard list of attributes must be attached to the set (eg, applicability, change marking)
- References to a data module, publication module or external publication
- Optional textual content

2.2.6.5.5 *Topic dedicated to material set list*
A material set list describes the grouping of:

- spares sets, support equipment sets or supplies sets
- individual spares, supplies or support equipment
- references to other documentation

This topic is mainly designed to provide a single place where to define the full list of references to material (material set or individual items or external documentation) applicable to a set of product. One list of material refers to one or several spare/supply/support equipment set or individual item which is defined once in the topics described in Topics dedicated to new materials (refer to Para 2.2.6.5.1). These spare/supply/support equipment sets or individual items or external documentation can be referenced from several material lists if they are applicable to several groups of products. Reference to removed material set or individual removed material can also be made from the lists of material.

If this topic is not used (marking it as "not relevant"), applicability of each necessary set or individual item can be directly set at spare/supply/support equipment set or item level.

Each material set list is defined by the following properties associated to the material set:

- An identifier and an issue number of the material set list
- If the material set list is procurable or not
- If the material set list is provided by the customer or not
- The standard list of attributes must be attached to the material set (eg, applicability, change marking)
- Name and short name of the material set list
- A list of references (with quantity necessary per product and potential note) to:
  - spare set, supply set, support equipment set definition
  - references to individual spare, individual supply, individual support equipment definition
  - references to other documentation necessary for the SB accomplishment
  - references to removed set of material or individual removed material definition
- Procurement information associated to the material set list (price, availability, supplier, industry support information)

Note

Material set list can refer to other material set list to create hierarchy (top kits, sub kits).

2.2.6.5.6 Topic dedicated to removed or modified material

List the removed or modified parts and their relation with the new parts that replace them. The removed or modified part can be organized by set of parts or by individual part.

A list of removed parts can be managed and described within set of removed parts. A set of removed parts can be defined with the following information:

- A type of removed part set
- An identifier and an issue number of the removed part set
- The standard list of attributes must be attached to the set (applicability, change marking, etc)
- Name and short name of the set of removed parts
- A list of removed parts (spares). For each part, associated information can be given in the same way as if it was delivered as an individual item. Refer to Para 2.2.6.5.2.
- Industry support information related to the removed set of parts
- Link to the relevant accomplishment instruction where the removed set of parts is used
- Other information relevant to the removed part (eg, reference to new maintenance procedure)
- Optional list of notes related to the set of removed parts

When the removed spares are described as individual items, the following information can be supplied:

- Identification and quantity of removed spare. Qualification of the removed spare can be given as retained, discarded or modified.
- Reference to drawing and identification of the item on the drawing
- Property of the removed spare subject to a project or an organization decision
  - support codes: alphabetical codes used to determine parts availability. Examples of codes:
    - A = Old parts will no longer be supplied
    - B = Old parts will be supplied until inventory is depleted
    - C = Old parts will be supplied until 1996-03-31
    - D = Old parts will be supplied for a product not modified by this SB
    - E = Old parts will be supplied, and can be used for other locations
  - Indicating whether the removed spare is potentially present on customer shop and how it must be processed after SB embodied (to discard, to send back to supplier, to modify, etc)
- Interchange information (new spare installed, interchangeability, drawing reference of the new spare). Information related to the replacing part can be:
  - Simple reference of the replacing spare without inter-changeability/mixability condition. The drawing/illustration as well as the graphic item of the replacing part can be referenced
  - Reference of the replacing spare with inter-changeability/mixability condition. The interchangeability condition has to be compliant with the definition given in part technical repository and reuse the same model if necessary
  - Reference of the replacing spare with specific SB inter-changeability/mixability condition (temporary interchangeability/mixability condition)
  - Reference to modified (altered) part that has been removed, modified and re-installed on the product
- Industry support information for the removed spare
- Link to the relevant accomplishment instruction where the spare is used
- Optional list of references to note related to the removed spare

2.2.6.6 Accomplishment instructions

The main topic "Accomplishment instructions" contains the step by step procedures (refer to Fig 1) for accomplishing the intent of the SB. For complex procedures, these can be broken down into a hierarchy of task sets (refer to Fig 1) and procedures.

The SB task set is an approved set of working instructions that must be completed before the product can be operated (refer to Chap 9.2). The types of SB task sets can include modification, inspection, repair, evaluation, and administrative (list not exhaustive). Within a SB task set, the following topics can be present: General information, Job set-up, Procedure, Test and Job close-up.

The SB procedure is a part of a SB task set. A SB task set is broken down into SB procedures that contain working instruction to do in a zone, by a person with indicated skill, using dedicated material set (kit). There are several types of SB procedures (eg, removal, installation, test). The SB procedure can be considered as a basis for Job-card production. A SB procedure can be done simultaneously with other SB procedures.

The accomplishment instructions (in the core SB) will be a high level set of hierarchically arranged steps, primarily referring to data modules. The steps are not intended to contain the detailed instructions/procedures themselves. However, in the case where no illustrations are

required and no parts are consumed it can be possible to include a simple procedure directly in the core SB without using any referenced procedural data modules.

2.2.6.7 Additional information

The optional main topic Additional information can include additional information to support SB procedures or instructions (eg, inspection techniques, supplemental pricing information, equipment information or revisions to tables of limits).

Additional information can also contain a chart depicting like production components (eg, part, combination of parts, subassemblies or units) vs modification bypass relationships and the relationship of the different SB raised against these like components.

This main topic is descriptive and can be split into several topics.

Chapter 5.2.1.17

Common information sets - Material data

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Table 1 References

Chap No./Document No.	Title
Chap 4.3	Information management - Data module code

1 General

1.1 Purpose

The preparation and coding of Material Data (MD) information data modules must follow the rules contained here.

1.2 Scope

The rules covered here enable skilled personnel to order, store and use materials/products. The MD information must contain the following topics:

- Introduction
- Material data sheets
- List of suppliers
- Numerical index
- Alphabetical index
- List of hazardous material

The material data information provides a single source of information for all products needed for maintenance. Any information set can refer to the material data information set. The procedures described in these publications will refer to a product per its data module code.

1.3 Standard and definitions

The standards and definitions given in this chapter are applicable with no exceptions.

2 Material data

2.1 General

The complete set of MD data modules is specified in Para 2.2.

2.2 Technical content

2.2.1 General requirements

The material data information set is made up of individual data sheets for all material or products. Each data sheet is the subject of the data module.

2.2.2 Introduction

If required, the introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They are also to contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-00-50-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-50-0000-**NN**AAA-018Y-A (37 characters)

where "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The information code variant is used to distinguish between the different information sets.

2.2.3 Data module coding

To assist in the codification of data modules, the rules which follow must be used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-00-50-**SS-NN**A-**XXX**A-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-50-**SS**00-**NN**AAA-**XXX**A-C (37 characters)

where

– "**SS**", in the subsystem/sub-subsystem code, must be used as follows:
  - 00 - Products/Material used for complete air vehicle, land or sea system
  - 20 - Products/Material used for the complete system without engine
  - 70 - Products/Material used for engine

  "20" and "70" are optional

– "**NN**", in the disassembly code, is a sequential number starting from "01"
– "**XXX**", in the information code, must be "077" for any consumables except dangerous ones which will be coded "074"

Examples:

Hydrochloric acid 36%	YY-A-00-50-00-01A-074A-C
Sulphuric acid, pure	YY-A-00-50-00-14A-074A-C
Alumina 60 mesh	YY-A-00-50-70-01A-077A-C
Accelerator BZ	YY-A-00-50-20-25A-077A-C

2.2.4 Material data sheet

All products are identified by a separate data module.

These data modules must give technical data on the products. They are also to present sufficient information on each product such as alternatives or substitutes.

The data modules must furthermore give the purchasing agent necessary information to obtain the material/product with the minimum of difficulties. They are also to assist the stock clerk in storage of the product.

Listed below are the requirements for the eleven entries of a material data sheet.

Note

If an entry is not fulfilled, "None" must be stated.

1 Material identification name: It is the common name that best identifies the material/product. This is usually the brand name or generic name.

2 Identifier Number (IN): It is assigned for the material/product by the project. It is used to referencing in procedures. Once assigned, the IN is not to be used for any other product or material. If a product or a material becomes unavailable for procurement, the IN must be cancelled and never used again for another product or material.

3 Description: It provides any other information on the material/product to aid their identification. Its function, such as cleaning agent, lubricating coating, and the form or state of product such as paste, liquid, gas, etc, is also to be stated.

4 Trade name: It consists of the usual name of a material/product given by the manufacturer.

5 Supplier trade name code: All data sheets must have at least one supplier listed. It is preferred to have several. Suppliers are identified by their trade name code to simplify the list in the data sheet.

6 Specification references: It lists any known international or national specifications which can define the material/product, or to which the product is usually manufactured (eg, North Atlantic Treaty Organization (NATO) stock number, USA spec, UK spec).

7 Storage information: Storage conditions of the material/product are provided, such as temperature limits, shelf life limitation. If normal storage is acceptable the information section will include the following statement: "Standard".

8 Packaging information: This information is provided to assist both the purchasing agent and the stock clerk. Package sizes, shape, etc, should be indicated. Packaging data will be that used by the supplier listed in the data sheet at time of issue of the sheet.

9 Transportation information: This information is provided to assist both the purchasing agent and the stock clerk. Data must include color codes when they exist and helpful information relative to any restrictions or problems related to transporting the material/product from supplier to the user. It is also to carry the classifications according to risk such as "harmful", "inflammable", "combustible", "poisonous" and the flash points of inflammable substances. Hazardous classes must be given in accordance with regulations such as International Air Transport Association (IATA) regulations.

10 Specification requirements/General characteristics: It provides the appropriate data to aid the procurement and/or identification of the material/product. The data can be general, or in some cases, data shown can relate to both specification requirements and general characteristics.

11 Disposal information: It provides the information required to ensure the proper procedures are identified to dispose of the hazardous waste and environmental pollutants in an environmentally acceptable manner.

Data modules are coded as given in Para 2.2.2.

Examples of data sheets with data relative to a chemical product and an abrasive product are given in Fig 1 and Fig 2.

2.2.5 List of suppliers

This data module must give a list of suppliers. The list can be deduced from the data modules previously defined. For each supplier, in alphabetic order, this list must give the information described in Table 2, as available.

Table 2 List of suppliers

Trade code address	Supplier code	Identifier number	Material identification name
Turco	XXXXX	IN 1001	Nitric acid
Turco France 35 imp. Industrie F91200 Athis-Mons		IN 1027	Descaler
…			

Data modules must be coded:

YY-Y-00-50-00-00A-019A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y00-50-0000-00AAA-019A-A (37 characters)

2.2.6 Numeric index

This data module must give a numeric index of all identifier numbers. This index can be deduced from the data modules previously defined. For each identifier number, in alphanumeric order, this list must give the information described in Table 3.

Table 3 Numeric index

Identifier number	Material identification name
IN 2034	Alodine
IN 2333	Accelerator BZ
…	

Data modules must be coded:

YY-Y-00-50-00-00A-013A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-50-0000-00AAA-013A-A (37 characters)

2.2.7 Alphabetic index

This data module must give an alphabetic index of all Material identification names. This index can be deduced from the data modules previously defined. For each material/product, in alphabetic order, this list must give the information described in Table 4.

Table 4 Alphabetic index

Material identification name	Identifier code
Accelerator BZ	IN 2333
Alodine	IN 2034
…	

Data modules must be coded:

YY-Y-00-50-00-00A-014A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-50-0000-00AAA-014A-A (37 characters)

2.2.8 List of hazardous material

Hazardous materials will be listed in a separate data module "List of hazardous materials" per potential hazard class given by IATA regulations. Refer to Table 5.

Table 5 Hazard classes

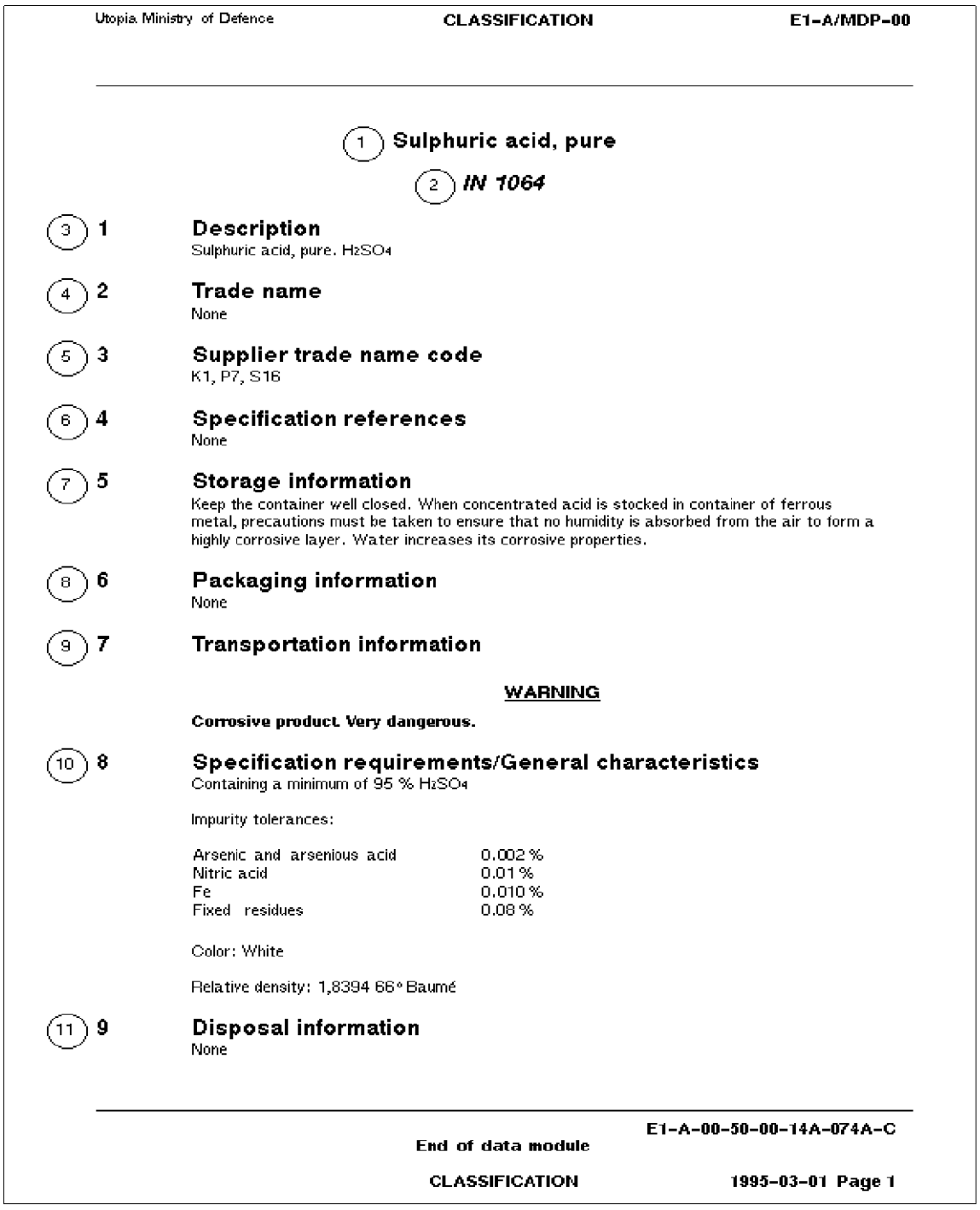
Class	Potential hazard
1	Explosive
2	Compressed gases
3	Flammable liquids

Data modules must be coded:

YY-Y-00-50-00-00A-016A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-50-0000-00AAA-016A-A (37 characters)



Utopia Ministry of Defence CLASSIFICATION E1-A/MDP-00

(1) **Sulphuric acid, pure**

(2) ***IN 1064***

(3) **1 Description**
Sulphuric acid, pure. H_2SO_4

(4) **2 Trade name**
None

(5) **3 Supplier trade name code**
K1, P7, S16

(6) **4 Specification references**
None

(7) **5 Storage information**
Keep the container well closed. When concentrated acid is stocked in container of ferrous metal, precautions must be taken to ensure that no humidity is absorbed from the air to form a highly corrosive layer. Water increases its corrosive properties.

(8) **6 Packaging information**
None

(9) **7 Transportation information**

WARNING

Corrosive product. Very dangerous.

(10) **8 Specification requirements/General characteristics**
Containing a minimum of 95 % H_2SO_4

Impurity tolerances:

Arsenic and arsenious acid	0.002 %
Nitric acid	0.01 %
Fe	0.010 %
Fixed residues	0.08 %

Color: White

Relative density: 1,8394 66° Baumé

(11) **9 Disposal information**
None

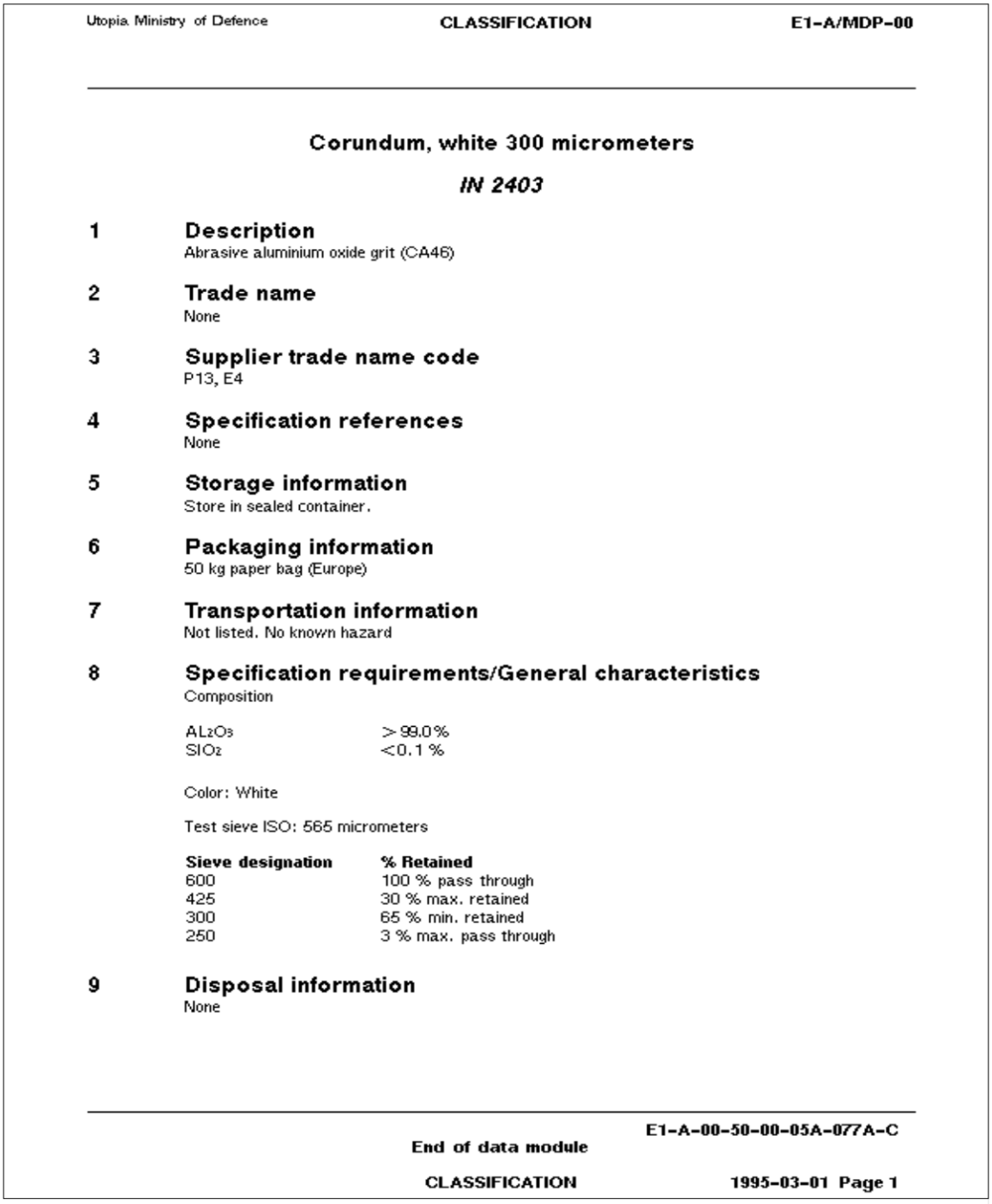
E1-A-00-50-00-14A-074A-C

End of data module

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Fig 1 Data sheet - Example, Chemical product



Utopia Ministry of Defence CLASSIFICATION E1-A/MDP-00

Corundum, white 300 micrometers

IN 2403

1 Description
Abrasive aluminium oxide grit (CA46)

2 Trade name
None

3 Supplier trade name code
P13, E4

4 Specification references
None

5 Storage information
Store in sealed container.

6 Packaging information
50 kg paper bag (Europe)

7 Transportation information
Not listed. No known hazard

8 Specification requirements/General characteristics
Composition

AL_2O_3	> 99.0 %
SIO_2	< 0.1 %

Color: White

Test sieve ISO: 565 micrometers

Sieve designation	% Retained
600	100 % pass through
425	30 % max. retained
300	65 % min. retained
250	3 % max. pass through

9 Disposal information
None

E1-A-00-50-00-05A-077A-C

End of data module

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Fig 2 Data sheet - Example, Abrasive product

Chapter 5.2.1.18

Common information sets - Common information and data

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2 LOT - Example 5
3 LOS - Example 6
4 List of applicable specifications and documentation (LOASD) - Example 7

References

Table 1 References

Chap No./Document No.	Title
None	

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding of data modules for Common Information and Data (CID) information.

1.2 Scope

It covers the rules for the preparation of consolidated lists of common information and data. The CID information contains one or more of the following:

– List of Abbreviations (LOA) - IC 005

- List of Terms (LOT) - IC 006
- List of Symbols (LOS) - IC 007
- List of Applicable Specifications and Documentation (LOASD) - IC 00V (alternative IC 017)

1.3 Standards and definitions

The standards and definitions given in this chapter are applicable with no exceptions.

2 Common information and data

2.1 Technical content

2.1.1 General requirements

The CID consists of the compiled lists given in Para 1.2. The abbreviations, terms, symbols, applicable specifications and documentation are derived from the introduction data modules prepared for each information set. If the project does not prepare individual LOA, LOT, LOS and LOASD for each information set, the lists in the CID have to be prepared from scratch.

2.1.2 List of abbreviations

Non-standard abbreviations used in the information set are listed in a list of abbreviations. The list must be presented as an informal table with the abbreviations in alphabetic order together with the full wording. Refer to Fig 1.

Data modules must be coded:

YY-Y-00-00-00-00A-005Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-005Y-Z (37 characters)

The information code variant is used to distinguish between its use in different Information sets.

2.1.3 List of terms

Non-standard terms used in the information set are listed in a list of terms. The list must be presented as an informal table with the terms in alphabetic order together with the amplification of their meaning. Refer to Fig 2.

Data modules must be coded:

YY-Y-00-00-00-00A-006Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-006Y-Z (37 characters)

The information code variant is used to distinguish between its use in different Information sets.

2.1.4 List of symbols

Non-standard symbols used in the information set are presented in a list of symbols. The list must be presented as an informal table with the symbol together with the explanation of their meaning. Refer to Fig 3.

Data modules must be coded:

YY-Y-00-00-00-00A-007Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-007Y-Y (37 characters)

The information code variant is used to distinguish between its use in different Information sets.

2.1.5 List of applicable specifications and documentation

Specifications and documents which are necessary to read or follow when using the information set are presented in a list of applicable specifications and documentation. The list must be presented as an informal table. Refer to Fig 4.

Data modules must be coded:

YY-Y-00-00-00-00A-00VY-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00AAA-00VY-Z (37 characters)

The information code variant is used to distinguish between its use in different Information sets.

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List of abbreviations

HP	High pressure
HPS1	Hydraulic pressure system 1
HPS2	Hydraulic pressure system 2, Emergency system
LLW	Low level, warning
LPW	Low pressure, warning
PI1	Pressure indicator HPS1

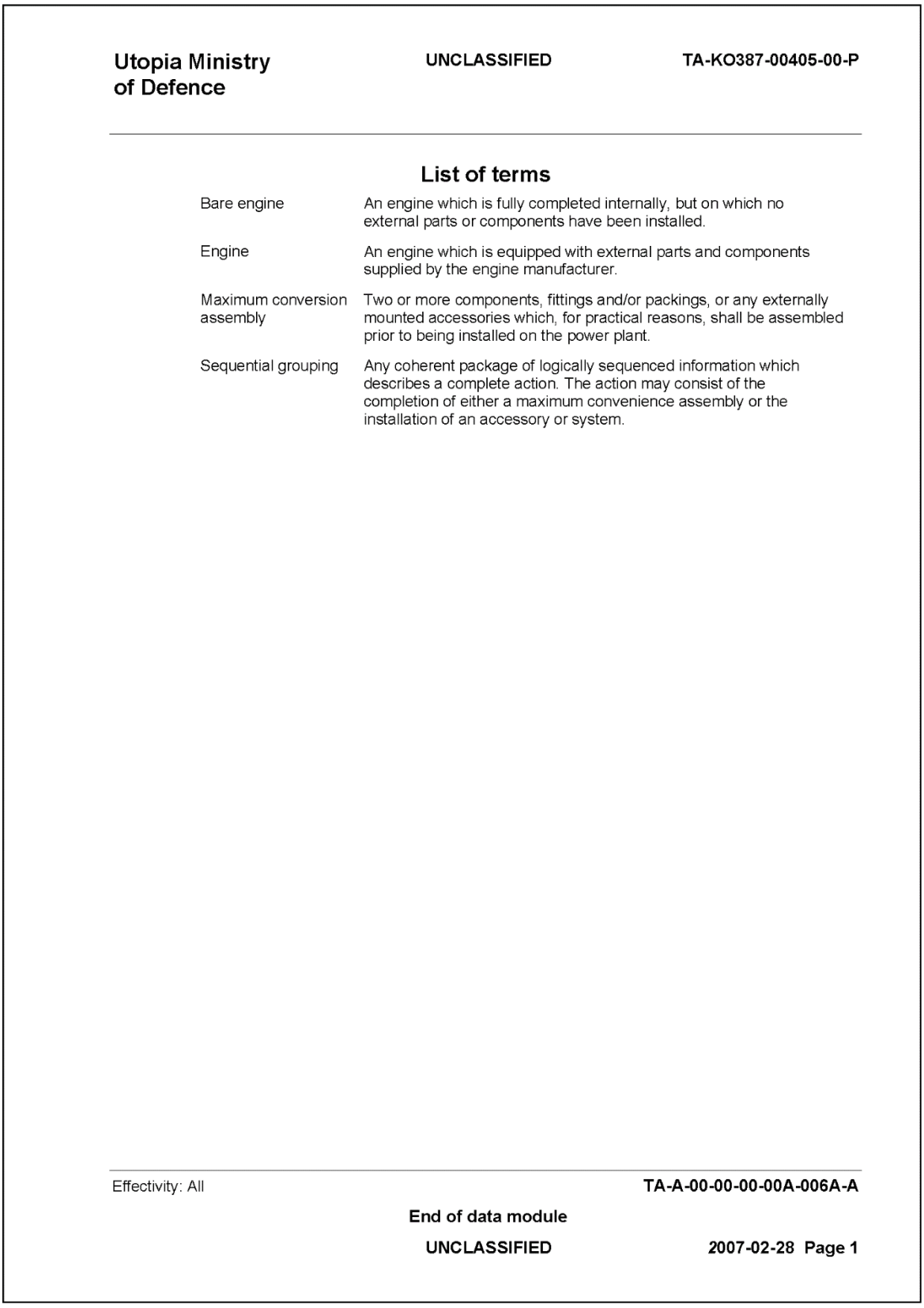
Effectivity: All | TA-A-00-00-00-00A-005A-A

End of data module

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ICN-AE-A-050201-G-S3627-00420-A-002-01

Fig 1 LOA - Example



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List of terms

Bare engine	An engine which is fully completed internally, but on which no external parts or components have been installed.
Engine	An engine which is equipped with external parts and components supplied by the engine manufacturer.
Maximum conversion assembly	Two or more components, fittings and/or packings, or any externally mounted accessories which, for practical reasons, shall be assembled prior to being installed on the power plant.
Sequential grouping	Any coherent package of logically sequenced information which describes a complete action. The action may consist of the completion of either a maximum convenience assembly or the installation of an accessory or system.

Effectivity: All | TA-A-00-00-00-00A-006A-A

End of data module

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ICN-AE-A-050201-G-S3627-00421-A-002-01

Fig 2 LOT - Example

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List of symbols

a_1	Distance 1 in m
a_2	Distance 2 in m
d_t	Diameter in mm
n_1	Pump speed HPS1 in rpm
n_2	Pump speed HPS2 in rpm
n_d	Pump speed, difference n_2 - n_1
	Warning. Laser beam
	Warning. Magnetic field
	No access for persons with pacemakers

Effectivity: All **TA-A-00-00-00-00A-007A-A**

End of data module

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ICN-AE-A-050201-G-S3627-00422-A-002-01

Fig 3 LOS - Example

Utopia Ministry of Defence | UNCLASSIFIED | TA-KO387-00405-00-P

List of applicable specifications and documentation

ISO 7010:2003(E)	Graphical symbols - Safety colours and safety signs - Safety signs used in workplaces and public areas
ST/SG/AC.10/C.4/2001/30/Add.1	Graphical symbols, safety identification, signs, shapes, symbols and colours, comprehensibility. Transmitted by the International Standardization Organization (ISO). Addendum 1
ISO 3864-1:2002(E)	Graphical symbols - Safety colours and safety signs - Part 1:Design principles for safety signs in workplaces and public areas
DEF-STAN 00-60 Part 0	INTEGRATED LOGISTIC SUPPORT PART 0: APPLICATION OF INTEGRATED LOGISTIC SUPPORT (ILS)

Effectivity: All | TA-A-00-00-00-00A-00SA-A

End of data module

UNCLASSIFIED | 2007-02-28 Page 1

ICN-AE-A-050201-G-S3627-00423-A-002-01

Fig 4 List of applicable specifications and documentation (LOASD) - Example

Chapter 5.2.1.19

Common information sets - Training

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Chap 3.9.5.2.17	Content section - SCO content data module
Chap 3.9.7	Authoring - Human performance technology and training
Chap 4.3.8	Data module code - Item location code

Chap 4.3.9	Data module code - Learn code
Chap 4.3.10	Data module code - Learn event code
Chap 4.11	Information management - Process data module
Chap 4.15.1	Learning Information - SCORM content package module

1 General

1.1 Purpose

The preparation and coding of training information data modules must follow the rules contained here.

1.2 Scope

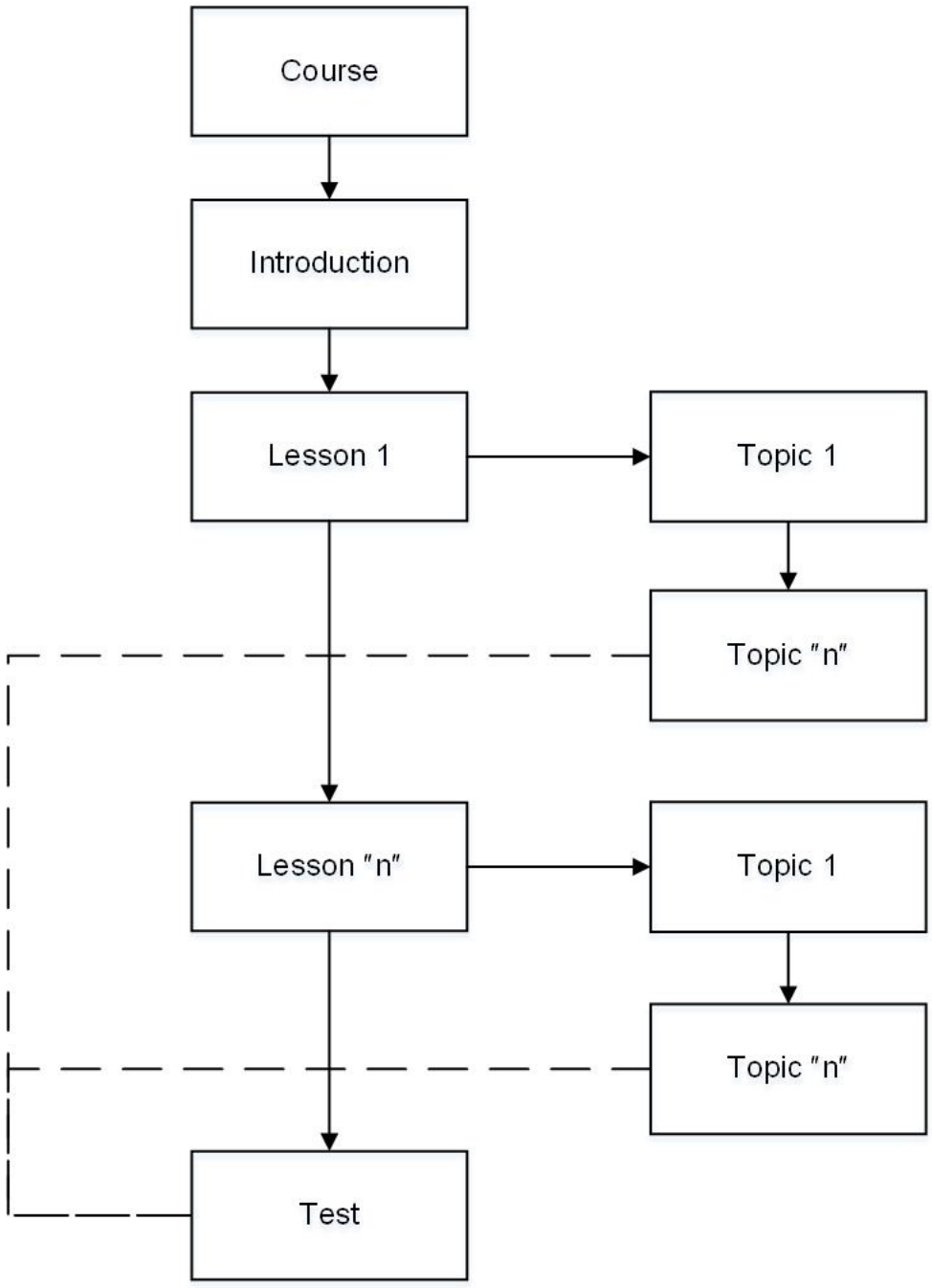
Planning and content of training information is covered here. The information set described in the chapter is intended as a generic information set and it is acknowledged that different projects will have different requirements.

Data modules produced using this information set must cover the requirements for the preparation of information applicable to training, which will enable personnel to be trained on the Product to a suitable level, as specified by the project. This chapter uses the following elements as a general example of training content:

Note

The elements can be single or multiple. Refer to Fig 1.

- course
- introduction
- module (optional aggregation)
- lesson
- topic
- test
- …



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Fig 1 Training information set content

1.3 Standards and definitions

1.3.1 Standards

The standards given in this chapter are applicable with no exceptions.

1.3.2 Definitions

The following definitions are given for training information in data modules:

- **Planning** - Definition of information needed to for lesson planning
- **Course** - Related series of lessons

- **Lesson** - Instructional aggregate consisting of multiple topics with one terminal learning objective
- **Topic** - Smallest instructional unit associated with one enabling learning objective
- **Terminal Learning Objective (TLO)** - A TLO is a primary, measurable objective that defines the knowledge or skill a learner must master to successfully complete a lesson
- **Test** - Knowledge check through testing. Method of test can be a scenario, practice etc, and will be dependent on the project.
- **Enabling Learning Objective (ELO)** - An ELO is a subordinate objective that supports the achievement of a TLO. An ELO defines the skills a learner must master to successfully complete a topic.

1.4 Data module codes for training data modules

The item location code for training data module is set to "T", for those projects that either have legacy training data modules or have no requirement to be Shareable Content Object Reference Model (SCORM) conformant and they do not use learn code and/or learn event code.

Project that have a requirement to be SCORM conformant use the learn code and/or learn event code. Refer to Chap 4.3.9 and Chap 4.3.10.

The item location code for SCORM conformant training data module is set to "T" when the information is purely training information. When operation and/or maintenance data modules are integrated in a training event and used in conjunction with learn and/or learn event code, the item location code of those training data module must have the same value "A", "B", "C" or "D" as the referenced operation and/or maintenance data module. Refer to Chap 4.3.8.

2 Training

2.1 Planning information

Planning information describes learning needs and goals, instructional design models, task analyses, learning taxonomies, and other information necessary to the lesson planning process.

This is an essential part of the process of defining training information. Refer to Chap 3.9.7.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-YYYY-Z-YYYA (21 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-YYYY-Z-YYYA (41 characters)

2.2 Training information

Training data modules contain only information that is specific to training. Any procedures that are already written, or planned to be written, as maintenance data modules must be presented as a link from the training data modules. Refer to Chap 3.9.5.1 and Chap 3.9.5.2.1.2.

2.2.1 Introduction

The introduction data modules contain an explanation of the purpose, scope, structure, special format and use of the technical content.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-018Y-Z-YYYA (21 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-018Y-Z-YYYA (41 characters)

2.2.2 Course

The method of course delivery must be agreed to within a project. This can be met several ways utilizing SCORM to create a compliant package or using a SCORM content package.

The SCORM content package coding methodology utilized will depend on the course delivery mechanism. Refer to Chap 4.15.1.

2.2.3 Module

A course module is an optional aggregate consisting of multiple lessons and multiple TLO. A SCORM content package is used to describe the course module.

The course module data module(s) specify:

- course module introduction
- course module objective

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-YYYY-Z-YYYA (21 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-YYYY-Z-YYYA (41 characters)

2.2.4 Lesson

A module lesson is an instructional aggregate consisting of multiple topics with one TLO. A TLO is a primary, measurable objective that defines the knowledge or skill a learner must master to successfully complete a lesson. The format and construct of the lessons will be agreed to within the project. A SCORM content package can be used to describe the lesson. Refer to Chap 4.15.1. The lesson data modules specify:

- lesson introduction
- lesson objective

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-YYYY-Z-YYYA (21 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-YYYY-Z-YYYA (41 characters)

Note

The above data module coding must be used for those data modules that specifically contain training information only. Maintenance data modules that are being repurposed for training must be coded in the normal way for maintenance data modules and are not changed for use in training.

2.2.5 Topic

The lesson topic is the smallest instructional unit associated with one ELO, which is a subordinate objective that supports the achievement of a TLO. A SCORM content package can be used to describe the lesson. Refer to Chap 4.15.1.

The format and construct of the topics will be agreed to within the project. The topic data module(s) specify:

- topic introduction
- topic objective
- topic content that is not contained in maintenance data modules
- maintenance data modules

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-YYYY-Z-YYYA (21 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-YYYY-Z-YYYA (41 characters)

Note

The above data module coding must be used for those data modules that specifically contain training information only. Maintenance data modules that are being repurposed for training must be coded in the normal way for maintenance data modules and are not changed for use in training.

2.2.6 Test and sequencing

Testing and sequencing uses the process data module. For details on the specific use of this data module type, the state table and logic engine, refer to Chap 4.11. Alternatively testing and sequencing can be based on other means supported by the learning information functionality of S1000D. Refer to Chap 3.9.5.2.13, Chap 3.9.5.2.17 and Chap 4.15.1.

2.2.6.1 Test

This aspect will cover knowledge checks, practice sessions, assessment and feedback through testing. The method of testing can be scenario based, practice based, etc, and will be as agreed to within the project. The format and construct of the tests will be agreed within the project. The test data modules specify:

- knowledge check
- practice sessions
- assessment
- feedback

Note that within some projects that this information can be interactive and integrated into a higher level LMS. In these cases the project will decide on the integration and feedback mechanisms.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-YYYY-Z-YYYA (21 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-YYYY-Z-YYYA (41 characters)

Note

The above data module coding must be used for those data modules that specifically contain training information only. Maintenance data modules that are being repurposed for training must be coded in the normal way for maintenance data modules and are not changed for use in training.

2.2.6.2 Sequencing

The sequencing through data modules is achieved using the process data module.

2.2.6.3 Example constructs

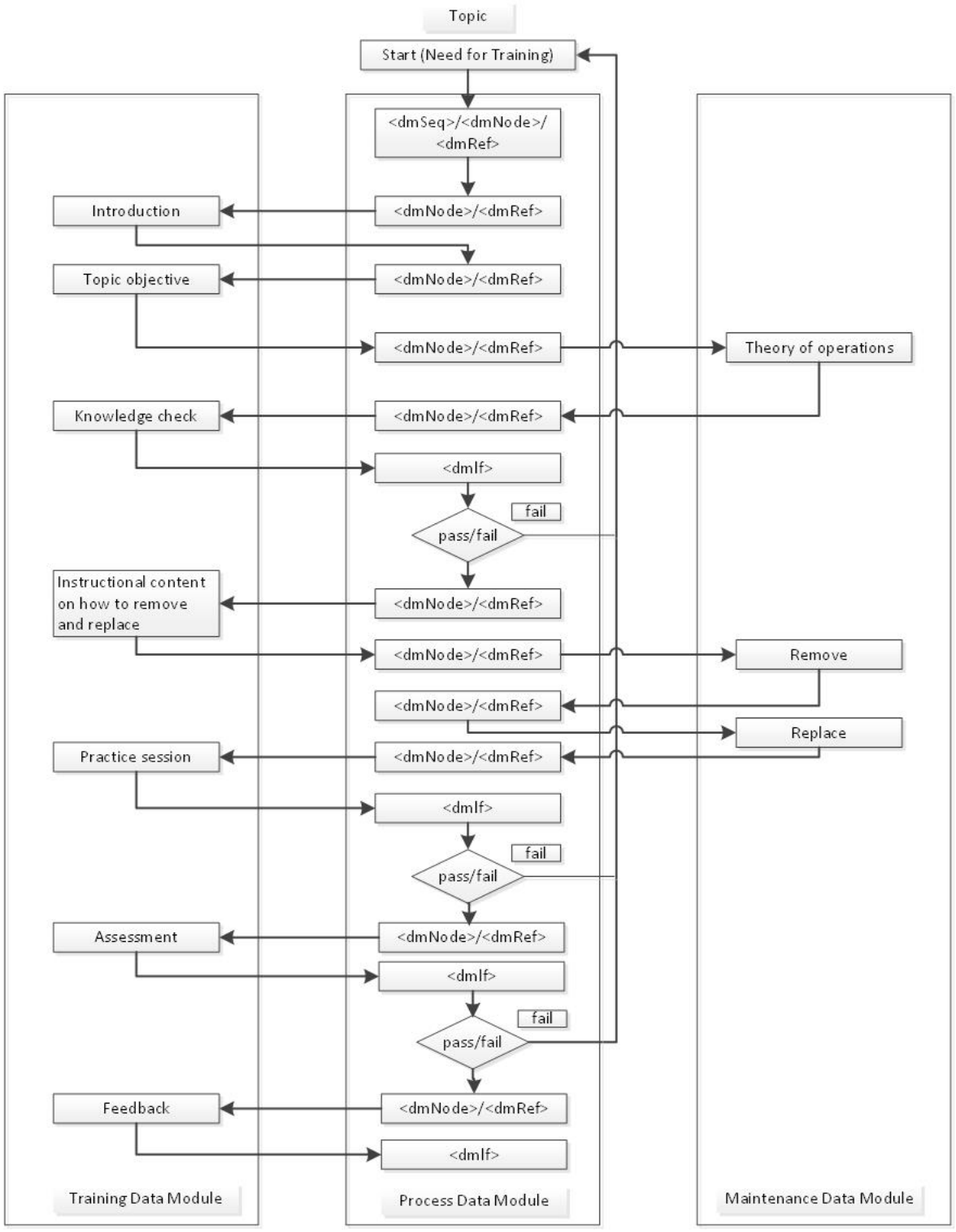
Fig 2 shows an example topic construct that utilizes training and maintenance data. The example shows the possible flow of information, question points and the possible feedback/return paths. These are identified in four types:

- Sequencing, using the process data module

- Traversal to a maintenance data module after training content has been delivered via a training data module
- Return to the practice session data module after test. This would be invoked by establishing pass/forwarding criteria within the process data module.
- Feedback to the user

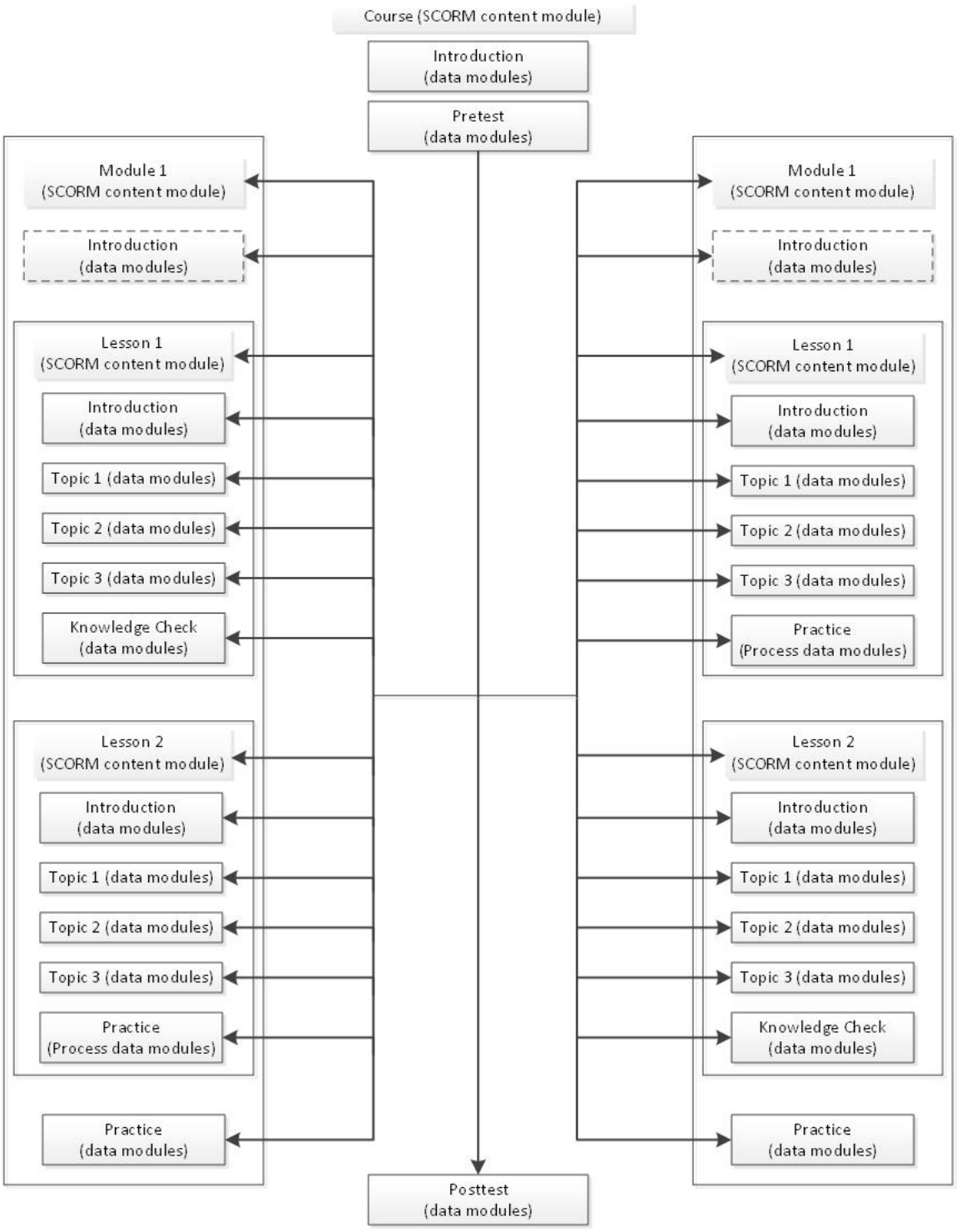
The decision boxes in Fig 2 represent the IF expression within the process data module.

Fig 3 shows an example course construct that utilizes the SCORM content package to "build" the course.



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Fig 2 Example - Topic construct



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Fig 3 Example - Course construct

Chapter 5.2.1.20

Common information sets - List of applicable publications

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Chap 3.9.5.2.16	Content section - Front matter
Chap 4.3	Information management - Data module code
Chap 4.9.1	Publication management - Publication module
Chap 5.3.1.2	Common requirements - Technical content

1 General

1.1 Purpose

The rules for the preparation and coding of the List of Applicable Publications (LOAP) information are given below.

1.2 Scope

The rules for the preparation of information for listing the applicable publications and other documents including individual data modules (not included in any of the technical publications) to enable the users to select the publications they require for planning, and to maintain, operate and support the Product are covered.

The LOAP is a publication which lists all technical publications and documents included in the technical publication package for a Product, a project or a part thereof. It is commonly used as a customized contractual document and during the delivery phase of the initial publication package. The LOAP is also frequently used during the in-service phase by the end users as well as administrators to have a configured overview of the publications and documents contracted for.

SCORM content package modules, SCO content data modules and learning data modules must not be listed in the LOAP.

Note

During the in-service phase, the LOAP can become a consolidated LOAP including publications and documents produced and delivered by the contractor and other organizations.

The LOAP information set includes front matter data modules and one or more publication list data modules. It can also include an introduction data module.

For automatic population based on a publication module or for authoring as detailed in Para 2.2, the publication list data modules can use:

– the front matter Schema (with the attribute `frontMatterType` set to the value "`fm05`" Publication list data modules), refer to Chap 3.9.5.2.16 for details

or

– the descriptive Schema

As an alternative to deliver a LOAP according to Para 2.2, a publication module can be used. In this case, the receiver of the information can produce the publication list data modules by using the front matter Schema (attribute value "`fm05`") or integrate the data into an IETP.

Business rule decision point BRDP-S1-00445 - Use of a set of publication list data modules or a publication module for the LOAP:

– Decide whether to use a set of publication list data modules or a publication module to list the applicable publications and other documents including individual data modules.

Business rule decision point BRDP-S1-00446 - Schema to use for the publication list data modules of the LOAP:

– Decide whether to use the front matter Schema or the descriptive Schema for the publication list data modules.

Business rule decision point BRDP-S1-00447 - One consolidated or several separate publication list data modules for the LOAP:

– Decide whether to deliver the publications and documents listed in one data module/publication module (with one or more lists presented as tables) or as separate data modules/publication modules (eg, by operational publications or maintenance publications).

2 List of applicable publications

2.1 Standards and definitions

The standards and definitions given in this chapter are applicable with no exceptions.

2.2 Content

2.2.1 General

The LOAP must contain front matter as required and one or more publication list data modules (refer to Para 2.2.2.2) listing the references to all applicable publication modules, data modules, legacy technical publications or documents for the Product, the project or a part thereof as agreed with the customer.

Note

An alternative to creating individual data modules including front matter is to use the publication module. Refer to the respective business rule decision point in Para 1.2.

The information in the publication list data modules can be grouped (eg, by operational, maintenance, equipment, support equipment, training equipment publications). The listing must be in alphanumeric sequence of the publication code, or equivalent, which is the entry to all lists. The listing can include unpublished publications or documents.

Business rule decision point BRDP-S1-00448 - Inclusion of unpublished publications and documents in the LOAP:

– Decide whether to include publications and documents those are not published.

Note

When used as a contractual document, all publications and documents, published or not, must be included.

2.2.2 Technical content

2.2.2.1 Introduction

The introduction data module must provide information as specified in Chap 5.3.1.2. It must be coded:

YY-Y-00-40-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-40-0000-**NN**AAA-018Y-A (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed

The information code variant is used to distinguish between the different information sets.

2.2.2.2 Data module coding

To assist in the coding of data modules, the rules which follow must be used in addition to those given in Chap 4.3.

Data modules for publication lists must be coded:

YY-Y-00-40-00-**NN**A-014A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-40-0000-**NN**AAA-014A-A (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed

2.2.2.3 Publication list data modules

The referenced publications and documents are listed in one or more publication list data modules using the front matter or the descriptive Schema. The publication list data modules include one or more lists presented as tables. Refer to Table 2. The content of each entry is given in Para 2.2.2.4. When using the front matter Schema, refer to Chap 3.9.5.2.16 for details.

2.2.2.4 Populating the publication list data modules
Each entry in a publication list data module must include:

– **publication code** - the publication module code given in Chap 4.9.1 or any other relevant publication or document code or number

  It is recommended to markup the entry as element <pmRef>, element <externalPubRef> or element <dmRef> when using the descriptive Schema.

  Note
  In case of individual data modules, the data module code is used as entry in the table. Refer to the example given in Table 3.

– **title** - the title of the publication or document. For equipment publications, the manufacturer's part number or reference number can, by project decision, be given as additional information.

– **issue identifier** - either or both of:

  - Issue number - the issue number of the publication or document
  - Issue date - the issue date of the publication or document

– **security classification** - the security classification/confidentiality of the complete publication as given in Chap 3.9.5.1

  Note
  If the publication is distributed for example on a CD-ROM, the security classification must correspond to the highest classified information on the entire CD-ROM.

– **publisher** - the company name or the CAGE code of the responsible company for the complete publication or document

– **media information** - gives information on which type of media the publication or document is available and its identifier (code) if different from the publication or document code

Each entry can also include:

– **language** - the language in which the publication or document is written

Business rule decision point BRDP-S1-00449 - Markup of the publication entry as a link in the LOAP:

– Decide whether to markup the publication entry as a link when using the descriptive Schema.

Business rule decision point BRDP-S1-00450 - Include the manufacturer's part number or reference number in the LOAP:

– Decide whether to include and present the manufacturer's part number or reference number.

Business rule decision point BRDP-S1-00451 - Use of language in the LOAP:

– Decide whether to include and present the language of the publication or document in the entries.

The column headers in the examples given below must be used.

Table 2 shows an example of a publication list for aircrew publications. Example data module code of the list: 1B-A-00-40-00-01A-014A-A.

Table 3 shows an example of a publication list for maintenance publications. Example data module code of the list: 1B-A-00-40-00-02A-014A-A.

Table 4 shows an example of a publication list for engine publications. Example data module code of the list: 1B-A-00-40-00-03A-014A-A.

Table 5 shows an example of a publication list for component and support equipment publications. Example data module code of the list: 1B-A-00-40-00-05A-014A-A.

Table 2 Aircrew publications - Example

Publication code	Title	Issue date Issue No.	Publisher Security classification	Media information
1B-D9460-00001-00	Aircrew manual, Batch 1	2003-09-04	C0419 Restricted	CD-ROM
1B-D9460-00002-00	Flight crew checklist	2003-09-04	C0419 Restricted	Paper

Table 3 Maintenance publications - Example

Publication code	Title (Language)	Issue date Issue No.	Publisher Security classification	Media information
1B-D9460-00105-00	Air vehicle maintenance planning (English)	2003-09-04	C0419 Restricted	CD-ROM 1B-D9460-00100-00-CD[1]
1-D9460-00128-00	Air vehicle maintenance (English)	2003-09-04	C0419 Restricted	CD-ROM 1B-D9460-00100-00-CD[1]
1B-D9460-01001-00	IPD - Air vehicle (English)	2003-09-04	C0419 Unclassified	CD-ROM 1B-D9460-00100-00-CD[2]
1B-D9460-01001-00	IPD - Air vehicle (English)	2003-09-04	C0419 Unclassified	Paper 1B-D9460-01001-00-P[2]
F2-A-12-00-00-00A-200A-A	Servicing - No-step areas	2002-10-04	C0419 Unclassified	Paper[3]

1 These publications are included in an air vehicle publication.
2 This IPD is published on a CD and as a paper version.
3 This document is a data module. The only reference is the data module code.

Table 4 Engine publications - Example

Publication code	Title	Issue date Issue No.	Publisher Security classification	Media information
1B-D9460-00504-00	Engine manual	2003-09-04 002	D3309 Restricted	CD-ROM 1B-D3309-0004
1B-D9460-00508-00	IPD - Engine	2003-09-04 011	D3309 Unclassified	CD-ROM 1B-D3309-0008

Table 5 Component and support equipment publications - Example

Publication code	Title (Language)	Issue date Issue No.	Publisher Security classification	Media information
1B-D9460-02009-00	Component maintenance - Battery BATT-0045-A0073[1]	2003-09-04	C0419 Restricted	CD-ROM 1B-D9460-02000-00-CD[2]
1B-D9460-05017-00	Support equipment - Tire removal rig / 9567-223000-001 (English)	2003-09-04	C0419 Restricted	CD-ROM
GAF T.O. 14Q1-1RUS2-1-3	Anti-G-Hose / ACME-004-BA34X02	1951-05-24	K0999 Unclassified	Paper L7001214741

1 The manufacturer's part number or reference number can be added by project decision.
2 This publication is included in an engine component publication distributed on a CD.

3 Examples

3.1 Using the Front matter Schema

The following example gives a complete LOAP when using the front matter Schema (content of Table 4 and Table 5).

```
<content>
<frontMatter>
<frontMatterList frontMatterType="fm05">
<issueInfo issueNumber="003" inWork="00"/>
<issueDate year="2011" month="10" day="01"/>
<frontMatterSubList>
<title>Engine publications. Example</title>
<frontMatterPmEntry>
<pmRef>
<pmRefIdent>
<pmCode modelIdentCode="1B" pmIssuer="D9460" pmNumber="00504"
pmVolume="00"/>
<issueInfo issueNumber="002" inWork="00"/>
</pmRefIdent>
<pmRefAddressItems>
<pmTitle>Engine manual</pmTitle>
```

```
<issueDate year="2003" month="09" day="04"/>
<security securityClassification="02"/>
<responsiblePartnerCompany enterpriseCode="D3309"/>
<pubMedia pubMediaType="CD-ROM" pubMediaCode="1B-D3309-0004"/>
</pmRefAddressItems>
</pmRef>
</frontMatterPmEntry>
<frontMatterPmEntry>
<pmRef>
<pmRefIdent>
<pmCode modelIdentCode="1B" pmIssuer="D9460" pmNumber="00508"
pmVolume="00"/>
<issueInfo issueNumber="011" inWork="00"/>
</pmRefIdent>
<pmRefAddressItems>
<pmTitle>IPD - Engine</pmTitle>
<issueDate year="2003" month="09" day="04"/>
<security securityClassification="01"/>
<responsiblePartnerCompany enterpriseCode="D3309"/>
<pubMedia pubMediaType="CD-ROM" pubMediaCode="1B-D3309-0008"/>
</pmRefAddressItems>
</pmRef>
</frontMatterPmEntry>
</frontMatterSubList>
<frontMatterSubList>
<title>Component and support equipment publications. Example
</title>
<frontMatterPmEntry>
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pmVolume="00"/>
</pmRefIdent>
<pmRefAddressItems>
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</pmTitle>
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<security securityClassification="02"/>
<responsiblePartnerCompany enterpriseCode="C0419"/>
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pubMediaCode="1B-D9460-02000-00-CD"/>
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</pmRef>
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<frontMatterPmEntry>
<pmRef>
<pmRefIdent>
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pmVolume="00"/>
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</pmRefIdent>
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001</pmTitle>
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<security securityClassification="02"/>
<responsiblePartnerCompany enterpriseCode="C0419"/>
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```

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</externalPubTitle>
</externalPubRefIdent>
<externalPubRefAddressItems>
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<security securityClassification="01"/>
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</externalPubRef>
</frontMatterExternalPubEntry>
</frontMatterSubList>
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<para>The manufacturer's part No. or reference No. can be added by
project decision.</para>
</footnote>
<footnote>
<para>This publication is included in an Engine component publication
distributed on a CD.</para>
</footnote>
</frontMatterList>
</frontMatter>
</content>
```

3.2 Using the descriptive Schema

The following example gives a publication list data module for maintenance publications when using the descriptive Schema (content of Table 3).

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<colspec colnum="2" colname="C2" colwidth="1.56*"/>
<colspec colnum="3" colname="C3" colwidth="0.63*"/>
<colspec colnum="4" colname="C4" colwidth="0.64*"/>
<colspec colnum="5" colname="C5" colwidth="0.83*"/>
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<entry><para>Title</para></entry>
<entry rowsep="1"><para>Issue date</para></entry>
<entry rowsep="1"><para>Publisher</para></entry>
<entry><para>Media information</para></entry>
</row>
<row rowsep="1">
<entry colname="C2"><para>(Language)</para></entry>
<entry colname="C3"><para>Issue No.</para></entry>
```

```
<entry colname="C4"><para>Security classification</para></entry>
</row>
</thead>
<tbody>
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<pmRefIdent>
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</pmRefIdent>
</pmRef>
</para>
</entry>
<entry><para>Air vehicle maintenance planning</para></entry>
<entry><para>2003-09-04</para></entry>
<entry><para>C0419</para></entry>
<entry><para>CD-ROM</para></entry>
</row>
<row>
<entry colname="C2"><para>(English)</para></entry>
<entry colname="C4"><para>Restricted</para></entry>
<entry colname="C5"><para>1B-D9460-00100-00-CD</para></entry>
</row>
<row>
<entry>
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</pmRef>
</para>
</entry>
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<entry><para>2003-09-04</para></entry>
<entry><para>C0419</para></entry>
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</row>
<row>
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<row>
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```

```
pmVolume="00"/>
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</pmRef>
</para>
</entry>
<entry><para>IPD - Air vehicle</para></entry>
<entry><para>2003-09-04</para></entry>
<entry><para>C0419</para></entry>
<entry><para>CD-ROM</para></entry>
</row>
<row>
<entry colname="C2"><para>(English)</para></entry>
<entry colname="C4"><para>Unclassified</para></entry>
<entry colname="C5"><para>1B-D9460-01001-00-CD</para></entry>
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<pmRefIdent>
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pmVolume="00" />
</pmRefIdent>
</pmRef>
</para>
</entry>
<entry><para>IPD - Air vehicle</para></entry>
<entry><para>2003-09-04</para></entry>
<entry><para>C0419</para></entry>
<entry><para>Paper</para></entry>
</row>
<row>
<entry colname="C2"><para>(English)</para></entry>
<entry colname="C4"><para>Unclassified</para></entry>
<entry colname="C5"><para>1B-D9460-01001-00-P</para></entry>
</row>
<row>
<entry>
<para>
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<dmRefIdent>
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subSystemCode="0" subSubSystemCode="0" assyCode="00"
disassyCode="00" disassyCodeVariant="A" infoCode="200"
infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
</para>
</entry>
<entry><para>Servicing - No-step areas</para></entry>
<entry><para>2002-10-04</para></entry>
<entry><para>C0419</para></entry>
```

```
<entry><para>Paper</para></entry>
</row>
<row>
<entry colname="C4"><para>Unclassified</para></entry>
</row>
</tbody>
</tgroup>
</table>
</description>
</content>
```

3.3 Using the publication module Schema

The following example gives a complete LOAP when using the publication module Schema (content of Table 2, Table 3, Table 4 and Table 5).

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pmVolume="00"/>
</pmRefIdent>
<pmRefAddressItems>
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<issueDate day="04" month="09" year="2003"/>
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</pmEntry>
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<pmRefIdent>
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pmVolume="00"/>
</pmRefIdent>
<pmRefAddressItems>
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<issueDate day="04" month="09" year="2003"/>
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<enterpriseName>C0419</enterpriseName>
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</pmEntry>
<pmEntry>
```

```
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<pmRefIdent>
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<enterpriseName>C0419</enterpriseName>
</responsiblePartnerCompany>
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CD"/>
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</pmRef>
<pmRef>
<pmRefIdent>
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pmVolume="00"/>
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<pmRef>
<pmRefIdent>
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<pmRefAddressItems>
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<issueDate day="04" month="09" year="2003"/>
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infoCodeVariant="A" itemLocationCode="A"/>
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pmVolume="00"/>
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</pmRefIdent>
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```
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Example</pmEntryTitle>
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<pmRefIdent>
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pmVolume="00"/>
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<pmRefAddressItems>
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</pmTitle>
<issueDate day="04" month="09" year="2003"/>
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</pmRefAddressItems>
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</pmRef>
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pmVolume="00"/>
</pmRefIdent>
<pmRefAddressItems>
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</pmTitle>
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</pmRefAddressItems>
<behavior linkActuate="onRequest"/>
</pmRef>
<externalPubRef>
<externalPubRefIdent>
<externalPubCode>GAF T.O. 14Q1-1RUS2-1-3</externalPubCode>
<externalPubTitle>Anti-G-Hose / ACME-004-BA34X02
</externalPubTitle>
</externalPubRefIdent>
<externalPubRefAddressItems>
<externalPubIssueDate day="24" month="05" year="1951"/>
<security securityClassification="01"/>
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<enterpriseName>K0999</enterpriseName>
</responsiblePartnerCompany>
<pubMedia pubMediaType="Paper" pubMediaCode="L7001214741"/>
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</externalPubRef>
</pmEntry>
</pmEntry>
</pmEntry>
</content>
```

Chapter 5.2.1.21

Common information sets - Maintenance checklists and inspections

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Chap 4.3	Information management - Data module code
Chap 8.2	SNS information and learn codes - Maintained SNS - General
Chap 9.2	Terms and data dictionary - Glossary of terms, abbreviations and acronyms
S4000M	International specification for developing scheduled maintenance programs

1 General

1.1 Scope

This chapter covers the rules for the preparation of information applicable to Maintenance checklists and inspection which will enable skilled personnel to perform required checks and services of the Product. It contains information about the necessary requirement for preventive checks and maintenance. The information contains the following topics:

- Preventive maintenance checks and services
- Checking unpacked equipment conditions
- Preventive maintenance inspections
- Special inspections

The data and information are based on technical analyses using the objectives of an efficient maintenance program.

1.2 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for Maintenance checklists and inspection information.

1.3 Definitions

The following definitions and those stated in Chap 9.2 must be used as appropriate.

- **Preventive Maintenance Checks and Services (PMCS):** Periodic inspection and maintenance at scheduled intervals to ensure that the equipment and its components remain mission capable and in good operating condition. In aircraft, checks are required of mandatory safety-of-flight items. Lubrication is part of PMCS.

2 Maintenance checklists and inspections

2.1 Introduction

If required, the introduction data modules contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

A list of terms can be included which defines conditions (eg, excessive), damage (eg, crack) and other relevant terms (eg, inspection types).

Data modules must be coded:

YY-Y-05-00-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y05-00-0000-**NN**AAA-018Y-A (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

2.2 Data module coding

To assist in the codification of data modules the rules which follow must be used in addition to those given in Chap 4.3.

2.2.1 Preventive maintenance checks and services

Data modules must be coded:

YY-Y-05-10-**SS**-**NN**A-200Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y05-10-**SS**00-**NN**AAA-200Y-A (37 characters)

Where:

- "**SS**", the system to which data and information are applicable. Refer to Chap 8.2.
- "**NN**", the subsystem if it is necessary to split the system into several subsystems, if not, use "00". Refer to Chap 8.2.

Example:

- Data and information about PMCS for parts of the landing gear, system 32, is coded: 1Y-A-05-10-32-00A-200A-A

2.2.2 Checking unpacked equipment conditions

Data modules must be coded:

YY-Y-05-20-**SS**-**NN**A-870Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y05-20-**SS**00-**NN**AAA-870Y-A (37 characters)

Where:

- "**SS**" is the system to which data and information are applicable. Refer to Chap 8.2.
- "**NN**" is the subsystem if it is necessary to split the system into several subsystems (if not, use "00"). Refer to Chap 8.2.

Example:

- Data and information about Checking unpacked equipment conditions of the landing gear, system 32, is coded: 1Y-A-05-20-32-00A-870A-A

2.2.3 Preventive maintenance inspections

Data modules must be coded:

YY-Y-05-**XX**-00-**NN**A-310Y-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y05-**XX**-0000-**NN**AAA-310Y-A (37 characters)

Where:

– "**XX**" gives the inspection type:

- 40 - Scheduled check (eg, Preflight inspection).
- 50 - Unscheduled check (eg, Inspection after hard landing)
- 60 - Acceptance and functional check flight

– "**NN**" is a sequential number to identify a specific check.

Example:

– The definition of a Check after hard landing is coded: 1F-A-05-50-00-18A-000A-A

2.2.4 Special inspections

Data modules must be coded:

YY-Y-05-**XX**-00-**NN**A-310Y-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-Y05-**XX**-0000-**NN**AAA-310Y-A (37 characters)

Where:

– "**XX**" gives the inspection type:

- 40 - Scheduled check (eg, Preflight inspection).
- 50 - Unscheduled check (eg, Inspection after hard landing)
- 60 - Acceptance and functional check flight

– "**NN**" is a sequential number to identify a specific check.

Example:

– The definition of a Check after hard landing is coded: 1F-A-05-50-00-18A-000A-A

2.3 Preventive maintenance checks and services

The PMCS data module are prepared and based upon the principles of the analysis for the scheduled maintenance program (according to S4000M, Reliability Centered Maintenance (RCM) logic, etc) and includes PMCS information, periodic lubrication instruction and applicable scheduled corrosion inspections.

– Each line entry is built up from the items defined below
– Each item is filled up as necessary in accordance with the description given
– Only one value is given for each item. If items are subject to various values, as many line entries as values are provided

2.3.1 Item number

Item numbers are assigned to the PMCS procedures. The PMCS procedures are arranged in a logical sequence requiring minimum time and motion on the part of the persons performing

them, and are arranged to minimize the interference between persons performing the checks simultaneously on the same end item.

2.3.2 Intervals

The designated interval (eg, "Before", "During", "After", "Weekly") when each check is to be performed are included. Procedures done first or most frequently (eg, "before" checks and services) appear prior to "During" and "After" checks and services. When more advantageous to the user, intervals are subgrouped by crewmembers. The "core" PMCS intervals which can be used are as follows:

- Before
- During
- After
- Daily
- Weekly
- Monthly
- Quarterly
- Semiannually
- Annually
- Periodic
- Intermediate (Aviation only)
- Man-hour/day (Aviation only)
- Phased (Aviation only)
- Other

2.3.3 Duration or man-hours

When specified by the acquiring activity, duration or man-hours that are required to complete all prescribed lubrication services must be included. Man-hours must be stated to the nearest 10th of an hour.

2.3.4 Equipment

Information identifying the item or system to be checked is identified in as few words as possible to clearly identify the item. Usually the common name (eg, bumper, gas can and mounting bracket, front axle) will be enough.

2.3.5 PMCS Procedure

The procedure by which each check is to be performed, as well as any information required to accomplish each check or service, including lubrication, appropriate tolerances, adjustment limits, and instrument gage readings is provided. Illustrations are prepared to identify the location or the process of the task being performed and must be integrated with the procedures. Whenever replacement or repair is recommended, the maintenance task is included or the applicable maintenance data module is referenced. Any periodic/scheduled lubrication procedures required for the equipment are included in the PMCS procedures.

2.3.6 Equipment not ready or available

A brief statement of the condition ("Equipment not available if it is malfunctioning") that would cause the equipment to be less than fully ready to perform its assigned mission is provided. If the procedure contains detail steps the statement is placed opposite the applicable task.

2.4 Checking unpacked equipment conditions

Instructions can be prepared for a condition check of the shipment (including that of pallets, containers, boxes, and legibility of markings). The information lists each item of a component by location that requires inspection. The information can be contained in tabular format.

- Each line entry is built up from the items defined below.
- Each item is filled up as necessary in accordance with the description given.

- Only one value is given for each item. If items are subject to various values, as many line entries as values are provided (except items where several values are allowed)

2.4.1 Location
The location includes a short description describing the location of the item being inspected.

2.4.2 Equipment item
Information identifying the item that requires inspection stated in as few words as possible. Usually the common name (eg, bumper, gas can and mounting bracket, front axle) is enough.

2.4.3 Equipment item
Information identifying the item that requires inspection is stated in as few words as possible. Usually the common name (eg, bumper, gas can and mounting bracket, front axle) is enough.

2.4.4 Action
For each item listed, an inspection action is provided and, when needed, a reference can be made to an associated data module. Each component item can require multiple actions and subordinate actions to describe the inspection requirements. Each first level action can provide a separate reference to a data module for further details on an inspection or an action to be taken.

2.4.5 Remarks
Any additional remarks are included in the remarks section.

2.5 Preventive maintenance services inspections

A data module can be developed for each specific inspection interval (eg, daily, intermediate, periodic, 10 h/14 day, 30 h/42day), as applicable to the aircraft. Inspection checklists are divided by areas of the aircraft (eg, nose, fuselage, tail). All items requiring inspection must be listed in the logical sequence of inspection that would require a minimum of time and motion on the part of the individual performing the inspection. The checklist data can be contained in a table.

Each data module contains the following information:

- Sequence number. Refer to Para 2.5.1.
- Work area. Refer to Para 2.5.2.
- Procedures. Refer to Para 2.5.3.
- Task duration. Refer to Para 2.5.4.

2.5.1 Sequence number
Each inspection must be assigned a sequence number.

2.5.2 Work area
If applicable, each inspection can be assigned a work area.

2.5.3 Procedures
All procedures required to perform each of the required inspections are captured. When an inspection item is not to be performed during each inspection, the interval/frequency must be stated within in the procedure (eg, Perform only every 2nd inspection).

2.5.4 Task duration
The time required perform the inspection task must be captured.

2.6 Special inspections

Items that qualify for special inspections (eg, hard landings, sudden stoppage, over speed) are included. These inspections are grouped under specific aircraft areas. A line drawing of the

aircraft or accessory showing sequence for inspection by area is included. The area identified must include all surfaces, materials, components, and equipment pertaining to that specific location. The following inspection data entries must be included, as applicable, and can be presented in tabular format.

2.6.1 Zone

Zone must include area name and number.

2.6.2 Item number

Inspection number must be captured.

2.6.3 Interval

The designated interval when inspections are to be performed is captured for the purpose of creating columns to identify when each inspection should be performed.

2.6.4 Equipment item

Information identifying the item that requires inspection is stated in as few words as possible.

2.6.5 Inspection procedure

All procedures required to perform each of the required inspections are captured. When an inspection item is not to be performed during each inspection, the interval/frequency must be stated within in the procedure (eg, Perform only every 2nd inspection).

Chapter 5.2.2

Information sets - Air specific information sets

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Chap 5.2.2.2	Air specific information sets - Structure repair information
Chap 5.2.2.3	Air specific information sets - Cross servicing information
Chap 5.2.2.4	Air specific information sets - Engine maintenance information
Chap 5.2.2.5	Air specific information sets - Power plant build-up information
Chap 5.2.2.6	Air specific information sets - Engine standard practices
Chap 5.2.2.7	Air specific information sets - Aircrew information

1 General

This chapter provides the references for the preparation and coding of air specific Information sets.

2 Air specific information sets

Guidance is given in the following chapters:

- Use of generic information. Refer to Chap 5.2.2.1.
- Structure repair information. Refer to Chap 5.2.2.2.
- Cross servicing information. Refer to Chap 5.2.2.3.
- Engine maintenance information. Refer to Chap 5.2.2.4.
- Power plant build-up information. Refer to Chap 5.2.2.5.
- Engine standard practices information. Refer to Chap 5.2.2.6.
- Aircrew information. Refer to Chap 5.2.2.7.

Chapter 5.2.2.1

Air specific information sets - Use of generic information sets

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Table 1 References

Chap No./Document No.	Title
Chap 5.2.1	Information sets - Common information sets
Chap 5.2.2.2	Air specific information sets - Structure repair information
Chap 5.2.2.7	Air specific information sets - Aircrew information

1 General

The generic information sets specified in Chap 5.2.1 are also applicable to air vehicles. Specific rules for air vehicles are stated in the corresponding locations in the Chap 5.2.2.2 thru Chap 5.2.2.7.

Chapter 5.2.2.2

Air specific information sets - Structure repair information

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4 Structure component identification - Example 5

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Table 1 References

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Chap 5.2.1.3.4	Maintenance information - Corrosion control
Chap 5.2.1.14	Common information sets - Battle damage assessment and repair information
Chap 8.2.5	Maintained SNS - Air vehicle, engines and equipment

1 General

1.1 Purpose

The preparation and coding of Air vehicle Structure Repair (ASR) information data modules must follow the rules contained here.

1.2 Scope

The rules covered here enable skilled personnel to assess and repair damage. Battle Damage Assessment and Repair (BDAR) information is covered in Chap 5.2.1.14.

In accordance with the SNS (refer to Chap 8.2.5), the breakdown of the ASR information must be as follows:

- System 51 Standard practices - Structures
- System 52 Doors
- System 53 Fuselage
- System 54 Nacelles/Pylons
- System 55 Stabilizers
- System 56 Windows and canopies
- System 57 Wings

1.3 Standards and definitions

The standards and definitions given in this chapter are applicable with no exceptions.

2 Structure repair information

2.1 General

Repairs due to corrosion damage must be included where necessary. Identification, classification and removal of corrosion are part of the Corrosion Control (CC) information set. Refer to Chap 5.2.1.3.4.

Instructions for one time (ferry) flight repairs, temporary repairs and critical area repairs include information on flight restrictions to be imposed (if applicable) until such time as permanent repairs have been completed.

Illustrations, diagrams and related tables are included in the information with such additions as can be required to illustrate detailed repair of the air vehicle.

The ASR information set includes an overview illustration of each major structure group. Index numbers identify all items in the group which can be repaired, or where a repair is done by replacement. A complementary table also lists the items and gives such information as figure number, index number, description, material specification and gauge (thickness), and cross references to where repair limits and repair schemes can be found.

Standard repair illustrations are provided. Such illustrations show the materials and dimensions of repair items, the types, sizes, pitch and edge distances of fasteners etc. Further illustrations are included of specific repairs.

Illustrations are included for the major structural components (wing, stabilizer, etc) which will provide contour data and dimensions necessary for the construction of locally made templates, support fixtures, and repair jigs for use in repairing the principal components. Where applicable, contour data include the list of contour and master dimension drawings or links to design information.

Illustrations of structural repair kits (and explanation of the use of each kit) are provided, when applicable.

2.2 Technical content

2.2.1 Introduction

If required, the introduction data modules contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-00-00-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-000-00-0000-**NN**AAA-018Y-A (37 characters)

where "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed

The information code variant is used to distinguish between the different information sets.

2.2.2 Standard practices - Structures

For system 51, this information covers, but is not limited to, the following contents:

2.2.2.1 General description of air vehicle structure

Using information code 041, these data modules describe the air vehicle, such as:

- type of construction
- special materials used
- classification of damage
- types of repair
- major structural group breakdown

2.2.2.2 Aerodynamic smoothness requirements

Using information code 361, these data modules give information on aerodynamic smoothness requirements for the air vehicle and permissible contour variations, gaps and mismatch data.

2.2.2.3 Clean-up of dents, cracks and scratches

Using information code 649, these data modules give information on negligible and/or minor dents, cracks, scratches and the description of the surface treatment after their repair.

2.2.2.4 Airframe sealing

Using information code 259, these data modules give information on all areas requiring sealing, type of seal required in each area, sealing procedures to be used, etc. General fuel tank sealing is described separately.

2.2.2.5 Pressure check

Using information code 362, these data modules give information on special pressure testing of sealed compartments wherever such testing will be required after repair to check for leakage or structural integrity.

Note

General pressure testing is included within the maintenance information set. Refer to Chap 5.2.1.3.

2.2.2.6 Materials

Using information code 072, these data modules give the following information:

- Description of materials including extrusions, formed sections, sheet, sealants, adhesives and special materials used in air vehicle repair. Where possible, permissible alternatives are given.
- Materials to be covered such as:
  - Metallic: Steel, aluminum alloys, titanium alloys, nickel-based alloys, copper, lithium etc
  - Non-metallic: Protective coating materials, sealants and related products, fiber reinforced materials, miscellaneous materials, etc, as far as they are not contained in the list of consumable materials
- Material identification and conversion table

Alternatives for metallic and non-metallic materials are given. These are presented in tabular form with table headings as shown in Table 2. An example of a note belonging to the table is also given.

Table 2 Extruded rubber standard sections - Example

Original design material		Alternative material		Other usable material	
Specification	**User nation**	**Specification**	**User nation**	**Specification**	**User nation**
XXXXX	FRG	XXXXX	UK	YYYYY	US
		XXXXX	IT	TTTTT	UK
		XXXXX	SP	ZZZZZ	IT
				WWWWW	SP
				VVVVV	FRG
				TTTTT	NL

Note

Commercial semi-finished produce name: Sealing profile, DTD 5583 Grade 50.
Delivery state: Dimensions see Fig 1, Detail A.
Method of retention: Integral buttons.

2.2.2.7 Fasteners
Using information code 078, these data modules describe all fastener types, materials and sizes and give procedures for fastener installation and removal including preparing the hole. For replacement of fasteners, alternative fastener types and sizes are given.

Installation and removal of Heli-coil wire thread inserts are described.

2.2.2.8 Support of air vehicle for repair
Using information code 670, these data modules give information on support of adjacent air vehicle structure during repair to prevent structure deformation.

2.2.2.9 Alignment/Symmetry check procedures
Using information code 272, these data modules give information on measuring of the air vehicle structure after special events and repair of primary structure.

2.2.2.10 Control surface rebalancing
– Using information code 271 (if applicable), these data modules give information on requirements and procedures for balancing of control surfaces.

2.2.2.11 Standard repairs
Using information code 663, these data modules give information on typical repairs. Which are those, considered applicable to more than one major structure group (system 52 thru 57), for example skin patches, extrusion repairs, honeycomb type structures, formed structure repairs, special material repairs, metal-to-metal bonding, repair of fittings and replacement of bushings and bearings and other standard repairs as welding, heat treatments, forming. This information includes precautions necessary to prevent damage by drilling into hidden structures and building in assembly stresses.

2.2.3 Major structural components of the air vehicle

2.2.3.1 General
The systems 52 thru 57 contain the information of the major structural components. Each major structural component is broken down to system/subsystem level and the information then divided into:

– Identification

- Damage evaluation
- Repair information
- Inspection information

The major structural components are the following:

- Doors, as system 52
- Fuselage, as system 53
- Nacelles/Pylons, as system 54
- Stabilizers, as system 55
- Windows and canopies, as system 56
- Wings, as system 57

2.2.3.2 Identification

Using information code 041, these data modules identify the materials used in the manufacture of the major assemblies. Illustrations and text concerning the air vehicle structure include concise description, material and significant drawing numbers. Where applicable, material information clearly defines the final heat treatment condition.

For typical structure component identification a tabular form is used. Table 3 gives an example.

Table 3 Structure component identification - Example

Item (1)	Description (2)	Material specification (3)	Thickness (mm) (4)	Repair limits/remarks (5)
1				
2				
2A				
3				

Table description:

1 **Item** - All required items, shown on the appropriate illustration, are listed in this column, in sequential order, beginning with Item 1. For the addition of new items, numbers 1A, 1B, 1C, etc, can be used.

2 **Description** - This column contains the exact description of structural components shown in the appropriate illustrations

3 **Material specification** - All information concerning the type of materials (metallic and non-metallic) and, if available, the appropriate production methods (machined, chemically etched, welded etc) are given here

4 **Thickness (mm)** - Information concerning the maximum thickness of structural components, made from sheet material, is given in this column

5 **Repair Limits/Remarks** - This column gives the repair limits by reference to that part of information where the repair limits are given. If the item cannot be repaired but must be replaced, then the word "Replace" is inserted.

For existing specific or general repairs refer to the corresponding information.

For recommendation to replace the item refer to the information that tells you how to replace it.

2.2.3.3 Damage evaluation
Using information code 661, these data modules give the following information:

2.2.3.3.1 Negligible damage
Damage or distortion that is permitted to exist as it is, or can be corrected by simple repair methods such as blending a scratch, removing a dent, stop drilling a crack etc, without placing restrictions on flight.

2.2.3.3.2 Negligible damage limits
The negligible damage limits are defined. If necessary, graphs or suitable illustrations can be used.

2.2.3.3.3 Repairable damage
Damage which exceeds negligible limits but is not great enough to require repair by replacement is classified repairable. Repairable damage is further classified into standard repair schemes and specific repair schemes.

2.2.3.4 Inspection criteria
Using information code 284, these data modules give the criteria for the following inspections:

- Preliminary external and internal inspection for skin buckles, deformation, etc
- Detailed visual inspection for obvious damage areas, including information about critical points and access. Inspection methods and techniques, such as:
  - fire or heat damage (inspection using testers and discoloration of paintwork)
  - corrosion damage
  - pressure testing for strength or leaks
  - delaminated structure
- For inspections after hazardous incidents (eg, excessive g, heavy landings, lightning strikes, emergency stop with the arrestor hook) and for inspections for corrosion, cross references are made to the air vehicle maintenance and the corrosion control information sets or associated data modules
- Identification of those areas requiring the design authority to produce a repair scheme
- Identification of the non-destructive inspection method to be used to determine the extent of damage, and reference to the applicable non-destructive inspection information

2.2.3.5 Classification of structure
Using information code 667, these data modules give the classification of structural items. Structural items must be classified into primary and secondary structure. Specific repair information as given in Para 2.2.3.6.3 must refer to this classification.

2.2.3.6 Repairs
2.2.3.6.1 General
Using information codes 600, 662, 663, 664 and 665, sufficient information is given to enable the operator to carry out permissible repairs. One-time flight repairs (fly-in repairs), temporary repairs and specific repairs are shown for each major part or component, when applicable.

2.2.3.6.2 Standard repairs and application
Refer to Para 2.2.2.11.

2.2.3.6.3 Special repair procedure
Using information code 664, these data modules give complete repair procedures and show compliance with all relevant design requirements.

Illustrations of the members or components showing where the various types of repairs must be employed are given. The areas where each type must be used are indicated by shading or other appropriate means. When a combination of two or more repairs will weaken or over-stiffen the member above the safe limit, the combination is indicated and a caution is given to prohibit

such a combination. All specific repairs are identified by drawing, document or other reference number, as applicable.

Contour data and dimensions necessary for the construction of templates and repair jigs for use in repairing the principal components are provided at the end of each section.

Where a repair procedure involves more than one structural element, the repair must be contained under the subject with the lowest assigned subject number.

Wherever possible, standard parts are specified for use in repair or replacement. References in the information to these parts are made by the applicable part number.

2.2.3.6.4 *Temporary repairs*
Using information code 662, these data modules give complete repair procedures for a repair which fully restores the load carrying capacity of the structure, but is not necessarily aerodynamically smooth, nor able to satisfy fatigue considerations or interchangeability requirements. The temporary repair is replaced with a permanent repair at the earliest opportunity.

2.2.3.6.5 *Fly-in repairs*
Using information code 665, these data modules give complete repair procedures for a repair which restores a structural member to its load bearing capacity sufficiently so that the air vehicle can be flown to either a maintenance depot or the manufacturer for permanent repairs to be carried out.

2.2.3.6.6 *Procedures for replaceable structure assemblies*
These data modules contain replacement procedures, with complementary illustrations if necessary, for those structural component assemblies, subassemblies or items required to be replaced within the agreed upon repair policy and where a procedure is deemed necessary. Some of these replacement procedures can be covered in the air vehicle maintenance information set or associated data modules.

2.2.3.6.7 *Inspection and testing after repairs*
These data modules give the procedures for the inspections and tests (eg, pressure tests), if required after repair, (if appropriate by cross reference to the corresponding air vehicle maintenance information set or associated data modules).

2.2.3.6.8 *Structure inspection*
Using information code 285, these data modules give the structure inspections for allowable damage limits. Using information code 286, these data modules give the structure inspections for repair.

Chapter 5.2.2.3

Air specific information sets - Cross servicing information

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Chap 5.2.1.2	Common information sets - Description and operation
Chap 5.2.1.3	Common information sets - Maintenance information

Chap 5.2.1.6	Common information sets - Maintenance planning information
Chap 8.2.5	Maintained SNS - Air vehicle, engines and equipment
STANAG Number 3430	North Atlantic Treaty Organization (NATO) - Standardization Agreement for Air vehicle cross-servicing guide
IEC Publication 60617	Graphical symbols for diagrams

1 General

1.1 Purpose

The preparation and coding of Air vehicle Cross-Servicing Guide (ACSG) information data modules must follow the rules contained here.

1.2 Scope

The rules covered here enable personnel, who can be unfamiliar with the specific Product, to safely service the air vehicle.

The detailed specification incorporates all the North Atlantic Treaty Organization (NATO) Standardization Agreement (STANAG) Number 3430 at Edition 7. Separate reference to the STANAG is therefore not necessary.

Air vehicle cross-servicing can be divided into two categories as follows:

- **Stage A cross-servicing**: The servicing of an air vehicle on airfields/ships. The servicing includes refueling, replenishment of fluids and gasses, drag chutes if applicable, starting facilities and ground handling.
- **Stage B cross-servicing**: The servicing of an air vehicle on airfields/ships which enables the air vehicles to be flown on an operational mission. The servicing includes all Stage A services plus the loading of weapons and/or film/video tapes and the replenishment of chaff or flares. This includes the processing and interpretation of any exposed film/video tapes from the previous mission.

The air vehicle cross-servicing guide must contain sufficient detailed information to permit the airfield/ship personnel to follow the correct procedure to cross-service the air vehicle without having to make reference to other national manuals. Detachable or reproducible checklists suitable for flight line use must be included whenever deemed appropriate.

1.3 Topics covered in a cross-servicing guide

The air vehicle cross-servicing guide must contain the following topics:

- Leading particulars
- Air vehicle handling, launching and recovery
- Replenishment, servicing points, engine starting and cooling
- Inspection and servicing procedures
- Main systems
- Armament
- Locally-manufactured items
- Glossary

When a topic does not apply the data module code and title must be included followed by the words "Not applicable".

1.3.1 Minimum services required for air vehicle cross-servicing

1.3.1.1 Stage A

The following services must be provided by those airfields/ships which have been assigned Stage A operational air vehicle cross-servicing requirements:

- Appropriate, fully maintained documentation
- Fuel, oil and lubricants in such quantities to ensure an adequate supply for servicing of air vehicles to enable them to return to their assigned base
- Adaptors to permit the use of available equipment in servicing specified types of air vehicle
- Facilities for replenishing gaseous and liquid oxygen
- Engine starting facilities
- Shelters to protect air vehicles being cross-serviced. When there are insufficient shelters, the priority for aircraft protection will be determined by the local operational commander.
- Facilities for towing and maneuvering air vehicles, including placing in shelters
- Trained ground crews to perform specified cross-servicing activities, including the recovery, drying, repacking and re-installation of drag chutes
- External power to enable navigation system stabilization

Note

Safety pins will be carried in air vehicles on all flights for all items which require pinning after flight. Items which are not normally carried on air vehicles must be pre-positioned by the home nation or locally manufactured by the host airfield/ship.

1.3.1.2 Stage B

The following services must be provided by those-airfield/ships which have been assigned Stage B operational air vehicle cross-servicing requirements:

- All services required for Stage A cross-servicing including sufficient quantities of replenishment materials to meet projected operational air vehicle cross-servicing requirements.
- Appropriate, fully maintained, air vehicle weapons loading schedules.
- Special arming tools, instructions, and equipment, necessary to prepare specified types of air vehicles for operational use as necessary.
- Fitting instructions and supplies of jettisonable fuel tanks for specified air vehicles.
- Ground handling equipment necessary for bomb loading, rocket installation, etc. Operational stores (ammunition, bombs, rockets, mines, torpedoes, sonobuoys, underwater sound charges, magnetic tape, chaff, flares, film, video tapes, etc) of types and quantities needed to meet the operational air vehicle cross-servicing requirements.
- Sufficient trained weapon loading teams to meet projected operational air vehicle cross-servicing requirements.
- Facilities for film processing and interpretation.
- Personnel trained in processing and interpretation, and in the uploading and downloading of the appropriate reconnaissance vehicles.

1.3.2 Responsibilities of air vehicle captains

Air vehicle captains must:

- ensure that all cross-servicing actions have been completed by checking the signatures of the responsible crew chief in the appropriate documents, by visual inspection and by preflight pilot's check
- brief the ground crew on duties and signals expected/desired in pre-departure activities.
- sign the appropriate acceptance documents on the completion of the air vehicle cross-servicing
- sign the appropriate fogy for services not provided free of charge, if applicable

1.4 Standard and definitions

The standards and definitions given in this specification are applicable with no exceptions.

2 Cross-servicing Information

2.1 General

2.1.1 Introduction

If required, the introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-00-00-00-NNY-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-NNYYY-018Y-A (37 characters)

where "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed

The information code variant is used to distinguish between the different information sets.

2.1.2 List of abbreviations

This data module must give a list of all the abbreviation followed by the word, word combination, expression or phrase abbreviated.

Data modules must be coded:

YY-Y-00-00-00-00Y-005Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00YYY-005Y-A (37 characters)

2.1.3 List of technical terms

This data module must give a list, in alphabetical order, of the technical terms used in the ACSG both lists must be presented in. Data modules must be coded:

Data modules must be coded:

YY-Y-00-00-00-00Y-006Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00YYY-006Y-A (37 characters)

2.1.4 List of symbols

This data module must give a list of all symbols (information code 007), and their meanings, used in the ACSG. If a recognized international standard for symbols (eg, IEC Publication 60617) is used, this must be stated. Any symbols not from an agreed upon standards list must be defined in a data module with information code 007. Any symbols from a recognized standard can reference the definition in the respective publication.

Data modules must be coded:

YY-Y-00-00-00-00Y-007Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00YYY-007Y-A (37 characters)

2.1.5 List of warnings

This data module must give a list of all standard warnings applicable to the ACSG as a whole (eg, those warnings associated with dangerous electrical voltages or with hazardous materials such as asbestos, beryllium, and polytetrafluoroethylene). Warning applicable to particular maintenance procedural information (eg, to release nitrogen pressure before disconnecting a pipe) must be included within the procedure, immediately before the operation/step where the danger exists. For further information on warnings, refer to Chap 3.9.3.

Data modules must be coded:

YY-Y-00-00-00-00Y-012Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00YYY-012Y-A (37 characters)

2.1.6 List of applicable specifications and documentation

This data module must give a complete list of all specifications and documentation (eg, NATO Standards) which have been cross-referred to in the ACSG.

Data modules must be coded:

YY-Y-00-00-00-00Y-00VY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00YYY-00VY-A (37 characters)

2.2 Technical content

2.2.1 Leading particulars

Where possible, cross references must be made to existing descriptive data modules. Refer to Chap 5.2.1.2.

2.2.1.1 General description and operation of the air vehicle

These data modules must include a brief description of the air vehicle, its operation, and any relevant information enabling a distinction to be made between the different Marks or Models of the air vehicles covered by the ACSG.

Data modules must be coded:

YY-Y-00-00-00-**NN**Y-040Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-**NN**YYY-040Y-A (37 characters)

2.2.1.2 Safety charts

These data modules must include safety charts must be a tabular presentation, illustrated where necessary, to inform personnel of the avoidable hazards associated with the air vehicle, including all non-apparent hazards such as inter-related functions of systems, seat and canopy ejection systems and other cartridge operated devices. The safety charts must not replace or duplicate specific cautions and warnings included wherever applicable throughout the ACSG. The column headings of the safety charts must be as follows:

1 Servicing

2 Operation

3 Precautions

4 Remarks

Data modules must be coded:

YY-Y-00-00-00-00Y-012Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00YYY-012Y-A (37 characters)

2.2.1.3 Danger areas
This data module on danger areas must include such danger areas as:

- auxiliary power unit and engine running danger areas
- high power radio transmission
- microwave radiation hazards
- area swept by guns and weapons

Data modules must be coded:

YY-Y-00-00-00-00Y-012Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00YYY-012Y-A (37 characters)

2.2.1.4 Walkways
These data modules must include illustrations showing the permitted walkways on the air vehicle.

Data modules must be coded:

YY-Y-12-00-00-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y12-00-0000-**NN**YYY-010Y-A (37 characters)

2.2.1.5 Dimensions and weight data
These data modules must show a three view (top, front and side) line illustrations of the air vehicle, showing the principal overall dimensions, and a tabular presentation of the air vehicle dimension and weight.

Data modules must be coded:

YY-Y-YY-**YY**-YY-**NN**Y-030Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-**YY**-YY-0000-**NN**YYY-030Y-A (37 characters)

where "YY-**YY**" or "YYY-**YY**", is 06-10 and 08-40

2.2.1.6 Access and inspection openings diagrams
These data modules must give illustrations showing only those openings used in cross-servicing.

Data modules must be coded:

YY-Y-06-40-00-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y06-4000-0000-NNYYY-010Y-A (37 characters)

2.2.1.7 Interior arrangements of compartments
These data modules must give illustrations showing the compartment arrangement as necessary for servicing, rescue and firefighting.

Data modules must be coded:

YY-Y-06-30-40-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y06-30-0000-**NN**YYY-010Y-A (37 characters)

2.2.1.8 Radio and radar equipment essential for flight
These data modules must give information on the radio and radar equipment which is essential for flight, presented in illustration and tabular form and covering:

- type of equipment
- location
- identification
- frequency and function
- power source
- circuit breaker or fuse amperage

Data modules must be coded:

YY-Y-YY**-YY**-YY-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY**-YY**-YY-0000-**NN**YYY-010Y-A (37 characters)

where "YY**-YY**" or "YYY**-YY**", is 23-00 and 34-00

2.2.1.9 Armament installation
These data modules must give information on which is necessary to permit servicing of air vehicle which on arrival has armaments installed. Air vehicle safety requirements prohibit servicing of air vehicle having installed explosive armament except during controlled exercises, therefore brief instructional procedures and related safety precautions must be included when applicable. Full consideration must be given to the fact that standard handling equipment will, in most cases, not be available.

Data modules must be coded:

YY-Y-12-00-00-**NN**Y-012Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y12-00-0000-**NN**YYY-012Y-A (37 characters)

2.2.2 Air vehicle handling, launching and recovery
Note
Where possible, cross references must be made to existing maintenance procedural data modules. (Refer to Chap 5.2.1.3).

2.2.2.1 List of handling equipment requirements
This data module must, in tabular form, list all the handling equipment and tools needed to do the instructions given in the ACSG. The list must be so designed as to permit the assembly of the equipment must be identified by an item number. The item number must be used in the text

and the illustrations whenever equipment is referred to in text or on illustrations. Sufficient information must be given, including drawings of attachment points, etc, for the items to be made by an NATO or Partnership for Peace (PfP) nation. The drawing must be contained in the topic "Locally-manufactured items" of the ACSG. Refer to Para 2.2.7. All equipment normally carried on the air vehicle must be included and so identified.

The data module must be coded:

YY-Y-00-00-00-00Y-060Y-A (17 characters)

thru

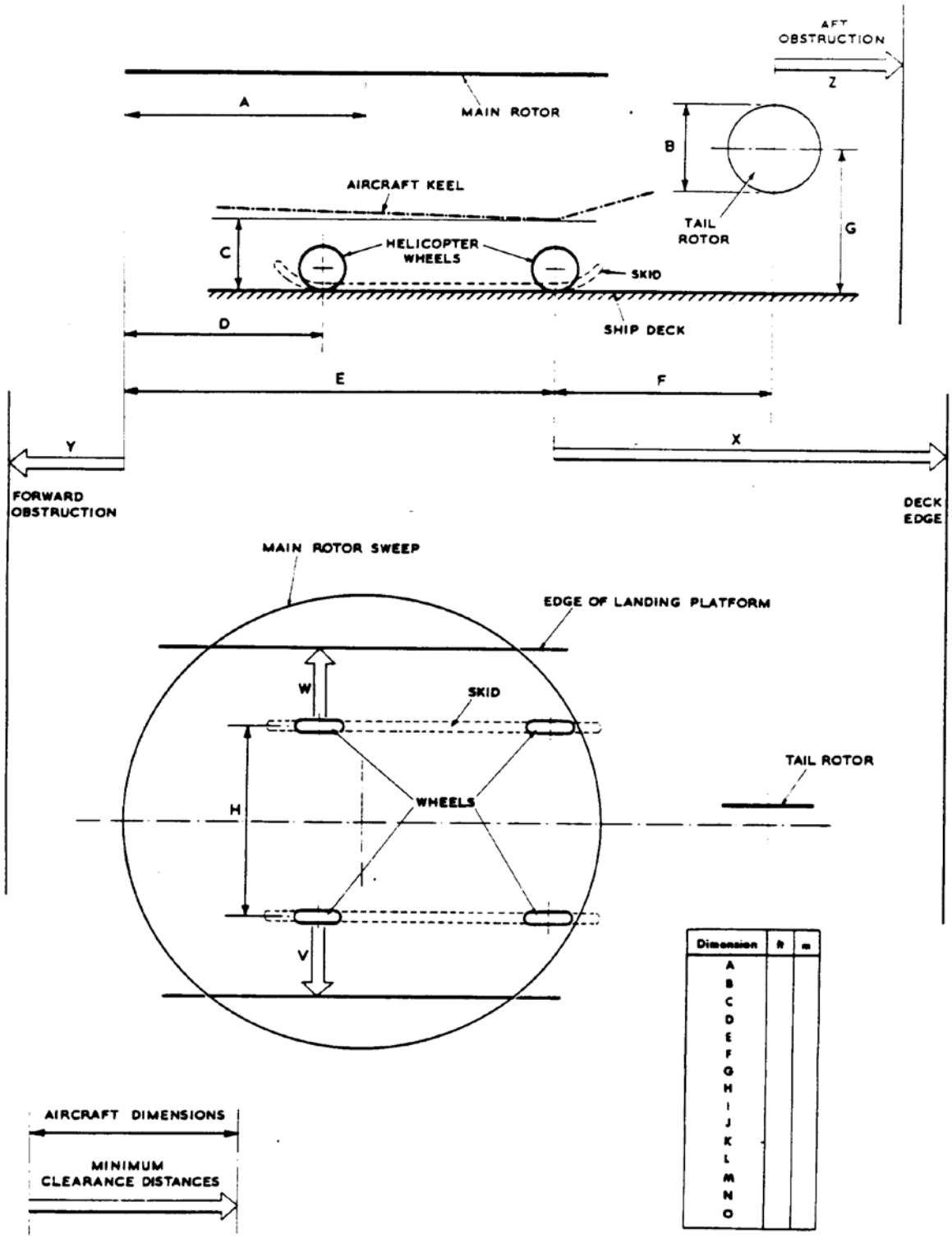
YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00YYY-060Y-A (37 characters)

2.2.2.2 Performance parameters for launching and recovery of air vehicles

– The maximum and minimum field take-off gross weights, distances and velocities must be given in the following format:

  - Field take-off distances to lift off: **ft/m at** and **lb/kg gross weight**
  - Field take-off velocity at lift off: **kt/km/h at** and **lb/kg gross weight**

– For carrier borne air vehicles, give the address of the appropriate national authority from which launch and arresting information can be obtained. Also give the recommended performance parameters, illustrated where necessary, for take-off and recovery on landing platforms of ocean-going vessels and escorts. Particular emphasis must be given to clearance areas required. These must be presented as shown in Fig 1.



ICN-AE-A-05020203-A-D0216-00039-A-001-01

Fig 1 Helicopter clearance requirements

2.2.2.3 Handling safety chart
These data modules must give all warnings and cautions specifically related to air vehicle handing, crash removal, and approaching the air vehicle immediately after landing. The handling safety chart must be presented in tabular form.

Data modules must be coded:

YY-Y-YY-**YY**-YY-**NN**Y-012Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-**YY**-0000-**NN**YYY-012Y-A (37 characters)

where "YY-**YY**" or "YYY-**YY**", is 07-40 and 09-10

2.2.2.4 Air vehicle overturn danger chart
These data modules must give information on the air vehicle overturn imminence with respect to gross weight, sea state and ship roll axis. The information must be presented in tabular form.

Data modules must be coded:

YY-Y-10-20-00-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-20-0000-**NN**YYY-010Y-A (37 characters)

2.2.2.5 Methods of grounding
These data modules must give detailed procedures and requirements for grounding the air vehicle.

Data modules must be coded:

YY-Y-00-10-00-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-10-0000-**NN**YYY-010Y-A (37 characters)

2.2.2.6 Towing and winching
These data modules must give procedures and equipment for both forward and, if permitted, backward towing and winching. Illustrations must be used where necessary. Details of sheltering the air vehicle in hardened shelters must be given. The maximum force to be applied during normal towing or winching must be specified to ensure that the correct shear pins can be fitted to the tow bar, when applicable.

Data modules must be coded:

YY-Y-09-10-00-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y09-10-0000-**NN**YYY-010Y-A (37 characters)

2.2.2.7 Deck securing and picketing (mooring)
These data modules must give illustrations and if necessary data, of the approved method of deck securing and picketing (mooring).

Data modules must be coded:

YY-Y-10-20-00-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-20-0000-**NN**YYY-010Y-A (37 characters)

2.2.2.8 Nose, wing, fin and rotor blade folding and unfolding
These data modules must give procedures for folding and unfolding the nose, wings, rudder, fin and rotor blades. Any special precautions necessary when external stores are installed must also be given.

Data modules must be coded:

YY-Y-10-00-00-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y10-00-0000-**NN**YYY-010Y-A (37 characters)

2.2.2.9 Gust locking procedures
These data modules must give illustrations, incorporating if necessary procedures, for locking and unlocking movable surfaces.

Data modules must be coded:

YY-Y-00-30-00-**NN**Y-**YYY**Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-30-0000-**NN**YYY-**YYY**Y-A (37 characters)

where "**YYY**" are the information codes:

- 520 - Remove procedures
- 720 - Install procedures

2.2.2.10 Safety devices and protective covers
These data modules must give illustrations, incorporating if necessary procedures, to remove and install safety devices and protective covers. Whenever possible, substitute methods for protective covers must be given.

Data modules must be coded:

YY-Y-00-30-00-**NN**Y-**YYY**Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-30-0000-**NN**YYY-**YYY**Y-A (37 characters)

where "**YYY**" are the information codes:

- 520 - Remove procedures
- 720 - Install procedures

2.2.2.11 Emergency access and crew evacuation
These data modules must give illustrations showing the areas concerned, and the methods of gaining emergency access to those areas for crew evacuation. Details of the crew harness release must be included on the illustrations.

Data modules must be coded:

YY-Y-95-00-00-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y95-00-0000-**NN**YYY-010Y-A (37 characters)

2.2.2.12 Firefighting

These data modules must give illustrations showing information to help fighting fires. The illustrations must include the location of all combustible materials in tanks, reservoirs, lines, etc. The information is intended to help NATO and PfP standard fire-fighting techniques, by giving all such data which is specific to the air vehicle.

Data modules must be coded:

YY-Y-00-00-00-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-**NN**YYY-010Y-A (37 characters)

2.2.2.13 Slinging and hoisting

These data modules must give illustrations, procedures and data on:

- the method of slinging and hoisting the air vehicle
- the location of the center of gravity
- the minimum hook height necessary to complete the lift
- the air vehicle attitude limits (angular displacement from level) that precludes the use of the sling
- all relevant safety precautions
- and pre hoisting procedures (eg, removal of external stores, folding rotors or wings

Data modules must be coded:

YY-Y-07-30-00-**NN**Y-000Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-30-0000-**NN**YYY-000Y-A (37 characters)

2.2.2.14 Jacking

These data modules must give illustrations, procedures and data on:

- the location, and if necessary the installation, of the jack pads
- the maximum jacking weight of the air vehicle
- the minimum capacity of the jack required at each jacking point
- the distance from the ground to the jack pad with the tires deflated and the landing gear shock struts fully compressed
- the distance from the ground to the jack pad with the landing gear shock struts fully extended and a 51 mm (2 in.) clearance beneath a correctly inflated tire

Data modules must be coded:

YY-Y-07-10-00-**NN**Y-000Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y07-10-0000-**NN**YYY-000Y-A (37 characters)

2.2.3 Replenishment, servicing points, engine starting and cooling

Note

Where possible, cross references must be made to existing maintenance procedural data modules. Refer to Chap 5.2.1.3.

2.2.3.1 Servicing and drain points

These data modules must give illustrations identifying every point on the air vehicle requiring replenishment or drawing. NATO symbols and code numbers must be used as appropriate.

Data modules must be coded:

YY-Y-12-00-00-**NN**Y-000Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y12-00-0000-**NN**YYY-000Y-A (37 characters)

2.2.3.2 List of consumables
This data module must give a list of consumable materials with acceptable and emergency alternatives. The list must be presented in tabular form. The materials must be identified by the appropriate NATO stock numbers and also by appropriate important specifications.

The data module must be coded:

YY-Y-00-00-00-00Y-070Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y00-00-0000-00YYY-070Y-A (37 characters)

2.2.3.3 Types of replenishment connections for charging main vehicles
These data modules must give details of the type of coupling or fitting. If the connection is not to a NATO standard, manufacturing drawings must be given. Alternatively, manufacturing drawings can be replaced by a list of foreign sources which will supply details of the connection. These sources must be available to all other NATO nations subscribing to STANAG 3430, Responsibilities for air vehicle cross-servicing.

Data modules must be coded:

YY-Y-12-10-00-**NN**Y-060Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y12-10-0000-**NN**YYY-060Y-A (37 characters)

2.2.3.4 Capacity of systems and methods of replenishment or charging
These data modules must give all capacities and procedures for replenishment or charging. Sufficient data must be given to enable other nations to determine the servicing requirements.

Data modules must be coded:

YY-Y-12-10-00-**NN**Y-200Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y12-10-0000-**NN**YYY-200Y-A (37 characters)

2.2.3.5 Lubricating charts and symbols
These data modules must identify all items requiring preflight or daily lubrication and give sufficient illustrations to enable identification of all such lubrication points. A chart must be given identifying the symbols used for the periodicity (eg, preflight, daily) and the method of application (eg, by hand, brush, oil can, power gun, flexible extension).

Data modules must be coded:

YY-Y-12-20-00-**NN**Y-240Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y12-20-0000-**NN**YYY-240Y-A (37 characters)

2.2.3.6 External hydraulic power application
These data modules must give illustrations containing the procedure on how to apply external hydraulic power to the air vehicle hydraulic system. Requirements for normal and maximum pressure, normal and maximum flow rates, maximum fluid temperature, and minimum filtration, must also be given.

Data modules must be coded:

YY-Y-29-20-00-**NN**Y-100Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y29-20-0000-**NN**YYY-100Y-A (37 characters)

2.2.3.7 External electrical power application
These data modules must give illustrations containing procedures, complete with the appropriate safety precautions, on how to apply external electrical power to the air vehicle electrical system. Requirements for voltage and frequency regulation, current type and magnitude, phase and power factor for both servicing and engine start, must also be given.

Data modules must be coded:

YY-Y-24-20-00-**NN**Y-100Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y24-20-0000-**NN**YYY-100Y-A (37 characters)

2.2.3.8 External pneumatic power application
These data modules must give illustrations containing procedures on how to apply external pneumatic power to the air vehicle pneumatic systems. Requirements for nominal pressure, flow, temperature, and engine start time must also be given.

Data modules must be coded:

YY-Y-36-00-00-**NN**Y-100Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y36-00-0000-**NN**YYY-100Y-A (37 characters)

2.2.3.9 Engine starting
These data modules must give illustrations and necessary data required by the ground crew to help the pilot start the air vehicle's engines.

Data modules must be coded:

YY-Y-71-00-00-**NN**Y-100Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-**NN**YYY-100Y-A (37 characters)

2.2.3.10 External air conditioning requirements
These data modules must give illustrations containing the procedure to supply conditioned air to compartments or garments. Requirements for mass flow, temperature, pressure, filtration, maximum permissible moisture content and dehumidification following cooling, must also be given.

Data modules must be coded:

YY-Y-21-00-00-**NN**Y-100Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y21-00-0000-**NN**YYY-100Y-A (37 characters)

2.2.3.11 Drag chutes
These data modules must give illustrations and procedures for packing and stowing the drag chutes.

Data modules must be coded:

YY-Y-32-80-00-**NN**Y-700Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y32-80-0000-**NN**YYY-700Y-A (37 characters)

2.2.4 Inspection and servicing procedures
Where possible, cross references must be made to existing maintenance procedural and planning data modules. Refer to Chap 5.2.1.3 and Chap 5.2.1.6.

2.2.4.1 Access and inspection procedures
These data modules must give illustrations to show how access is obtained to enable inspection procedures to be done efficiently.

Data modules must be coded:

YY-Y-06-40-00-**NN**Y-010Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y06-40-0000-**NN**YYY-010Y-A (37 characters)

2.2.4.2 Inspection
These data modules must give details of post-flight, preflight and turn-around inspections for an air vehicle staying up to 48 hours. Also given must be:

- all precautions necessary whilst doing the inspections
- required entries in the air vehicle's servicing forms
- inspections to be done immediately after landing (which are therefore only applicable to post-flight and turn-around inspections) such as checking the engine oil level within 15 minutes of engine shut down

The inspections must cover the air vehicle being service in, or out, of a hardened shelter.

For the presentations of post-flight, preflight and turn-around inspections, refer Chap 5.2.1.6.

Data modules must be coded:

YY-Y-12-20-00-**NN**Y-281Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y12-20-0000-**NN**YYY-281Y-A (37 characters)

2.2.5 Main system
These data modules must give only the information concerning the main systems, and their control, which is essential for safety of flight and is necessary for doing minimum essential servicing not covered elsewhere in the ACSG. Applicable testing must be given following the recommended servicing.

Data modules must be coded:

YY-Y-YY-**YY**-YY-**NN**Y-**YYY**Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-**YY**-0000-**NN**YYY-**YYY**Y-A (37 characters)

where:

- "**YY-YY**" or "**YYY-YY**", the codes are given in Chap 8.2.5.
- "**YYY**" are the information codes:
  - 282 - Unscheduled inspections
  - 283 - Special regular inspections
  - 284 - Special irregular inspections
  - 300 - Examinations, tests and checks

2.2.6 Armament - Non-nuclear munitions

These data modules must include unloading procedures for all non-nuclear munitions, including all relevant safety precautions, and any essential information on non-nuclear munitions relevant for cross-servicing.

Data modules must be coded:

YY-Y-14-40-00-**NN**Y-**YYY**Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y14-40-0000-**NN**YYY-**YYY**Y-A (37 characters)

where "**YYY**" are the information codes:

- 500 - Disconnect, remove and disassemble procedures
- 700 - Assemble, install and connect procedures

2.2.7 Locally-manufactured items

These data modules must contain a list and manufacturing drawings of all items which can be manufactured locally to enable servicing to be done. The drawings must contain sufficient information on the materials needed to enable suitable alternatives to be selected.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-064Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-064Y-A (37 characters)

Chapter 5.2.2.4

Air specific information sets - Engine maintenance information

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Chap 5.2.2.6	Air specific information sets - Engine standard practices
Chap 9.2	Terms and definitions - Terms, acronyms and subject index

1 General

1.1 Purpose

This chapter contains the detailed specification for preparation and coding, where appropriate, of data modules for Engine Shop Maintenance (ESM) information.

1.2 Scope

This detailed specification covers the requirement for the preparation of information applicable to engine shop maintenance which will enable skilled personnel to perform the maintenance of the basic engine and a limited maintenance on its components.

1.2.1 Engine shop maintenance information

The ESM information must contain the following topics:

1 Description of how are made and the functions, where appropriate, of basic engines, modules, assemblies and their components. Definitions are given in Para 1.3.2.

2 Technical data and information needed to gain access to and to maintain the previous hardware and a maximum number of parts that remain with the engine when it is removed from the air vehicle.

3 Fault isolation on the systems on-the-engine.

4 Data and information required to perform the maintenance of the components on the engine or off-the-engine. In this case, the maintenance must be limited, otherwise procedures to maintain the removed component must be provided as component maintenance information. Refer to Chap 5.2.1.9.

The maintenance of items such as brackets, standoff's connecting the components to the basic engine, module or assembly is part of the ESM information.

Note

This detailed specification is also applicable to airborne auxiliary power plants (SNS 49-00).

1.2.2 Engine base maintenance information

The Engine Base Maintenance (EBM) information provides the same kind of information as the ESM but the depth of the maintenance is limited.

1.2.3 Engine depot maintenance information

The Engine Depot Maintenance (EDM) information provides the information of the ESM described in Para 1.2.1, item 4 excluded.

Note

Because EBM and/or EDM are extractions of ESM, the rest of this detailed specification deals only with ESM unless otherwise mentioned.

1.3 Standards and definitions

1.3.1 Standards

The standards given in this specification are applicable with no exceptions.

1.3.2 Definitions

The following definitions and those stated in Chap 9.2 are used as appropriate.

– **Basic engine**: Those units and items which are used:

- to induce and convert fuel/air mixture into thrust/power
- to transmit power to the propeller shaft, if any, and accessory drives
- to supplement the function of other defined systems external to the engine
- to control and direct the flow of internal lubrication

The nacelle and the reverser are excluded.

– **Basic module or assembly**: Module or assembly which make up respectively a basic modular or non-modular engine. Within this definition, a basic module or assembly has no installed components.

– **Lists of consumables and material**: These lists cover several data modules. They must contain for each item the following elements (refer to Fig 2):

- The code number of the item
- Its supplier code
- Its description

Reference to the material data information (refer to Chap 5.2.1.17) for dangerous items must be given under the heading "Remarks".

Note

If these lists cover only one data module, they are provided in its data module content. Refer to Chap 3.9.5.2.

– **Lists of special support equipment, tools and software**: These lists cover several data modules. They must contain for each item the following elements. Refer to Fig 3:

- The code number of the item
- Its part number and its manufacturer code
- Its description

For special items locally made, the mention "locally made" must be indicated under the heading of the list "Remarks".

Note

If these lists cover only one data module, they are provided in its data module content. Refer to Chap 3.9.5.2.

– **Lists of standard support equipment and tools**: These lists cover several data modules. They must contain for each item the following elements. Refer to Fig 4:

- The code number of the item
- Its description
- Its characteristics (so as the operator can select and use the equipment of its choice)

They can be divided into nature of items, for example:

- tools
- test and calibration equipment

Note

If these lists cover only one data module, they are provided in its data module content. Refer to Chap 3.9.5.2.

– **Major module**: Assembly of several modules managed as an entity (eg, a core engine)
– **Major part**: Significant item, part, subassembly or assembly to which a disassembly code and variant are given
– **Part Identifier (PI)**: Code defined by the manufacturer identifying an item in a procedure and on the relevant figures (callout). To have an easier reading of the procedures, it is recommended to give the part identifier a group of numbers (eg, rotables PI 300, expendables PI 600). If major parts are listed, their part identifiers must be the disassembly code and its variant.
– **Parts list**: List covering several data modules. It provides the user with information on items (eg, parts, subassemblies, collections of associated parts) which are identified in the procedures. The parts list (refer to Fig 5) must indicate for each item:

- the part identifier
- its part number and its manufacturer code
- its name

Additional information defined by the project or the organization can be provided as required under the heading of the parts list "Remarks" (eg, modification number applicable to the item). Parts lists can be supported by illustrations as required. Each item must be identified on the illustration by its part identifier.

Note

If these lists cover only one data module, they are provided in its data module content Refer to Chap 3.9.5.2.

Business rule decision point BRDP-S1-00452 - Additional information in parts lists for engine maintenance information sets:

– Decide whether to indicate additional information under the heading of the parts list "Remarks" (eg, modification number applicable to the item).

Utopia Ministry of Defence CLASSIFICATION

STEP	PROCEDURE
100	HOW TO PREPARE THE LP TURBINE-DISK BEFORE THE INSTALLATION OF THE STAGE 2 TURBINE BLADES (Fig. 1) (Fig. 2)
101	Install the plate (Ref. No. 2) on the module 6 blade installation-fixture (M0734).
102	Put the module 6 blade installation-fixture (M0734) around the stage 2 LP turbine-disk (08). This disk is on the disk support (M0742) in position on the multi-purpose workstand (M0085).
103	Adjust the plate (M0734) (Ref. No. 2) at 10 mm from the top edge of the stage 2 LP turbine-disk (08) with the adjustment posts and a depth gauge.
104	Find the recess No. 1 of the stage 2 LP turbine-disk (08). NOTE : The recess No. 1 is between the 2 spherical marks.
110	HOW TO INSTALL THE STAGE 2 TURBINE-BLADES (Fig. 3)
111	Get the stage 2 turbine-blade (06) No. 1 which is in its case in the module 6 blade storage crate (M0139).
112	Install the stage 2 turbine-blade (06) No. 1 in the recess No. 1 of the stage-2 LP turbine disk (08). The leading edge must be up. NOTE : Use degrip oil (P0636) to make the installation easier.
113	Install the 66 other stage 2 turbine blades (06) in the specified position sequence. Install a sealing plate (301) between 2 blades. NOTE : The installation occurs in the COUNTERCLOCKWISE DIRECTION WHEN YOU LOOK AT THE FRONT FACE of the stage 2 LP turbine-disk (08).
114	Operate the adjusting posts (Ref. No. 4) and regularly lower the plate (M0734) (Ref. No. 2). When the plate lowers, the 67 stage 2 turbine blades (06) also lower slowly (Fig. 1). NOTE : Push the sealing plates. NOTE : Lightly hit with a plastic mallet the blade roots one after the other to make sure they are in the correct position.
115	Continue with the installation of the stage 2 turbine-blades (06) until they are against the stage 2 turbine blade-retainer (07).

Effectivity: All

CLASSIFICATION

ICN-S3627-S1000D0110-A-001-01

Fig 1 Job instruction - Example

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Engine

Lists of consumables and material

Table 1 List of consumables and material

Code	Supplier code	Name	Remarks
P0167	F3512	SF3 Diluants	Refer to DSM
P0219	FA268	Hymolar AO32M	

Effectivity: All | C2-A-72-00-00-00A-901A-A

End of data module

Unclassified | 2006-10-02 Page 1

ICN-S3627-S1000D0406-A-001-01

Fig 2 List of consumables and material - Example

Utopia Ministry of Defence | Unclassified | C2-KO387-72205-02-P

Engine

Lists of special SE, tools and software

Table 1 List of special SE, tools and software

Code	Manufacturer code	Part number	Name
M0351	F0301	853-202-050-0	Fitting guide and tooling bolts
M0307	F0301	853-200-799-0	Bearing protective bushing
M0364	F0301	853-202-239-0	Guide pin

Effectivity: All | C2-A-72-00-00-00A-904A-A

End of data module

Unclassified | 2006-10-02 Page 1

ICN-S3627-S1000D0407-A-001-01

Fig 3 List of special support equipment, tools and software - Example

Utopia Ministry of Defence | Unclassified | C2-KO387-72205-02-P

Engine

Lists of standard SE and tools

Table 1 List of standard SE and tools

Code	Name	Characteristics
E0207	AC motor	Power supply: 115 V, 400 Hz No-load: 9500 rpm Starting torque: 160 cm/dN min
E0227	Stabilized DC power supply unit	DC output voltage adjustable from 0 to 32 V Max output; 0,5 A Stability with respect to supply voltage +/- 2 mV for supply variation of + 10 %. Stability with respect to temperature +/- 1 mV/°C from -10 to 60 °C.

Effectivity: All | C2-A-72-00-00-00A-904A-A

End of data module

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ICN-S3627-S1000D0408-A-001-01

Fig 4 List of standard support equipment and tools - Example

Utopia Ministry of Defence | Unclassified | C2-KO387-72205-02-P

Engine

Parts list

Table 1 Parts list

Part identifier	Manufacturer code	Part number	Name	Remarks
01A	F0301	303-230-603-0	Seal, Stage 1 turbine nozzle guide assy vane	
02A	F0301	303-185-605-0	Spool, outer air cooling	
03A	F0301	303-175-605-0	Ring, support, outer, front, Stage 1 turbine nozzle guide	
04A	F0301	303-190-303-0	Support assy, outer Stage 1 turbine nozzle guide	
05A	F0301	303-175-103-0	Support, inner, front Stage 1 turbine nozzle	
		303-176-106-0	Support, inner, front Stage 1 turbine nozzle	M 364
06A	F0301	303-184-705-0	Support assy, inner, rear Stage 1 turbine nozzle	
07A	F0301	303-180-006-0	Vane assy Stage 1 turbine nozzle	
301A	F0111	22236TD050014	Bolt, double, hexagon head	
301B	F0111	22236TJ050014	Bolt, double, hexagon head	M43/4
304A	F0111	22236TJ050018	Bolt, double, hexagon head	
305A	F0301	650-301-501-0	Nut, double hexagon, self locking	
306A	F0301	303-197-701-0	Angle segment Stage 1 turbine nozzle guide vane assy	
307A	F0111	33326TT040039	Nut, captive	
601A	F0301	303-197-901-0	Strip, sealing, outer, vane	
602A	F0301	303-197-801-0	Strip, sealing, inner, vane	

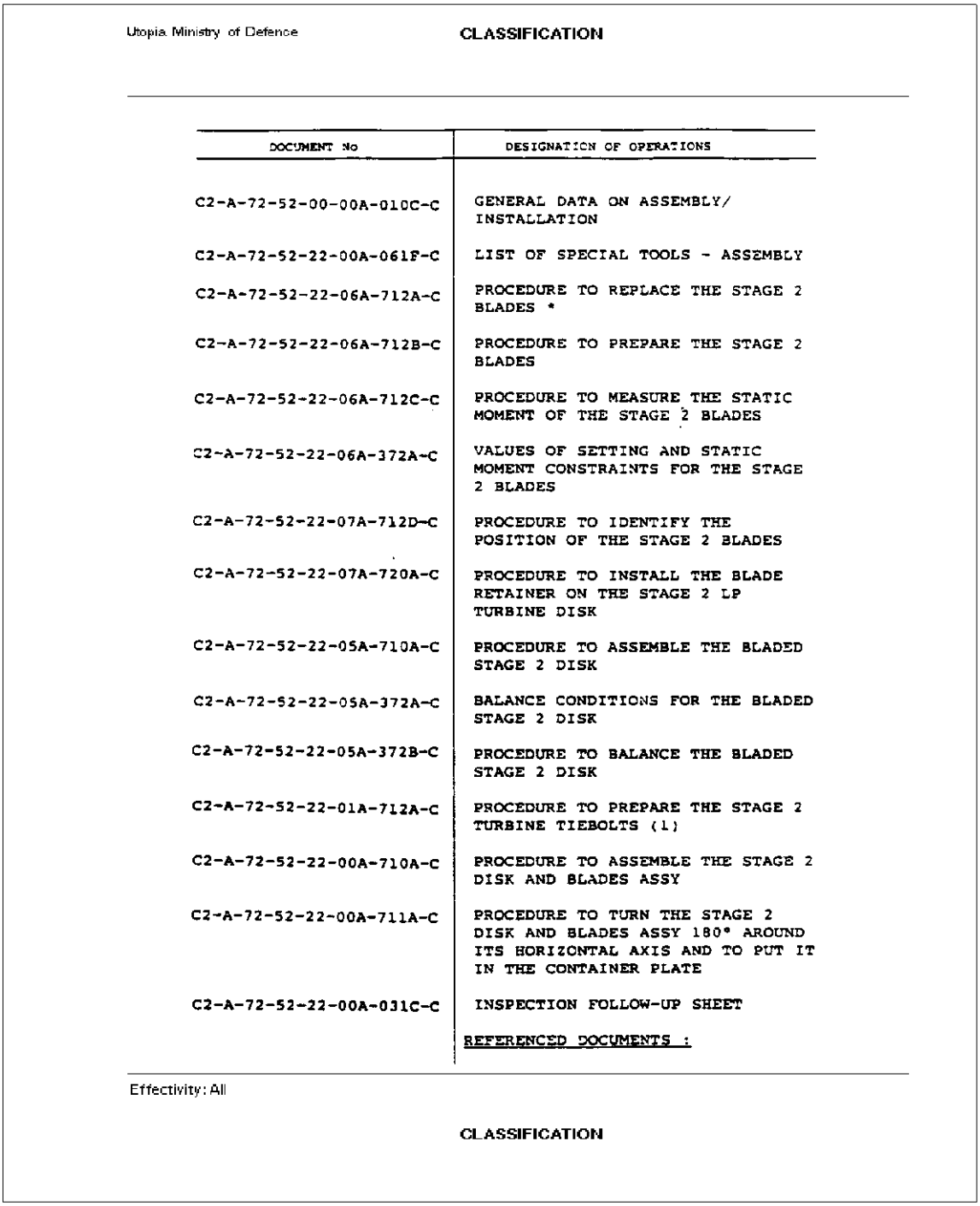
Effectivity: All | C2-A-72-00-00-00A-904A-A

End of data module

Unclassified | 2006-10-02 Page 1

ICN-S3627-S1000D0409-A-001-01

Fig 5 Parts list - Example



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DOCUMENT No	DESIGNATION OF OPERATIONS
C2-A-72-52-00-00A-010C-C	GENERAL DATA ON ASSEMBLY/ INSTALLATION
C2-A-72-52-22-00A-061F-C	LIST OF SPECIAL TOOLS - ASSEMBLY
C2-A-72-52-22-06A-712A-C	PROCEDURE TO REPLACE THE STAGE 2 BLADES *
C2-A-72-52-22-06A-712B-C	PROCEDURE TO PREPARE THE STAGE 2 BLADES
C2-A-72-52-22-06A-712C-C	PROCEDURE TO MEASURE THE STATIC MOMENT OF THE STAGE 2 BLADES
C2-A-72-52-22-06A-372A-C	VALUES OF SETTING AND STATIC MOMENT CONSTRAINTS FOR THE STAGE 2 BLADES
C2-A-72-52-22-07A-712D-C	PROCEDURE TO IDENTIFY THE POSITION OF THE STAGE 2 BLADES
C2-A-72-52-22-07A-720A-C	PROCEDURE TO INSTALL THE BLADE RETAINER ON THE STAGE 2 LP TURBINE DISK
C2-A-72-52-22-05A-710A-C	PROCEDURE TO ASSEMBLE THE BLADED STAGE 2 DISK
C2-A-72-52-22-05A-372A-C	BALANCE CONDITIONS FOR THE BLADED STAGE 2 DISK
C2-A-72-52-22-05A-372B-C	PROCEDURE TO BALANCE THE BLADED STAGE 2 DISK
C2-A-72-52-22-01A-712A-C	PROCEDURE TO PREPARE THE STAGE 2 TURBINE TIEBOLTS (1)
C2-A-72-52-22-00A-710A-C	PROCEDURE TO ASSEMBLE THE STAGE 2 DISK AND BLADES ASSY
C2-A-72-52-22-00A-711A-C	PROCEDURE TO TURN THE STAGE 2 DISK AND BLADES ASSY 180° AROUND ITS HORIZONTAL AXIS AND TO PUT IT IN THE CONTAINER PLATE
C2-A-72-52-22-00A-031C-C	INSPECTION FOLLOW-UP SHEET
	REFERENCED DOCUMENTS :

Effectivity: All

CLASSIFICATION

ICN-S3627-S1000D0115-A-001-01

Fig 6 Work sheet - Example

2 Engine maintenance information

2.1 General

The complete set of ESM data modules is specified in Para 2.2, Para 2.3 and Para 2.4.

The ESM information must contain the following topics:

- information for the engine depending on its design concept: modular or non-modular
- information for its systems

Descriptions of these topics are given in the following paragraphs.

2.1.1 Content for a modular engine

The ESM must provide as required the following information:

- for the engine
  - Description and operation of the engine as a whole
  - Procedures
    - to remove Quick Engine Change (QEC)
    - to breakdown an engine into major modules and/or modules
    - to build up a desired engine from major modules and/or modules
    - to install the QEC
    - to test the engine
- for major modules
  - Description and operation of the major modules
  - Procedures
    - to breakdown major modules into modules
    - to build up major modules from modules
    - to test major modules if required
    - to store them
- for modules
  - Description and operation of the modules
  - Procedures
    - to undress modules (removal of components, piping, harnesses, etc)
    - to disassemble basic modules into subassemblies and/or parts
    - to maintain disassembled basic modules
    - to build up and dress modules
    - to test modules if required
    - to store them

Note

Actions on modules or components installed on an engine are provided in the procedures of the relevant item.

2.1.2 Content for a non-modular engine

The ESM must provide as required the following information:

- for the engine
  - Description and operation of the engine as a whole
  - Procedures

  - to undress the engine (removal of QEC, components, piping, harnesses, etc)
  - to breakdown the basic engine into assemblies (ie, compressors, combustion chamber)
  - to build up a desired basic engine from assemblies
  - to dress it
  - to test the engine
  - to store it

- for assemblies

  - Description and operation of the assemblies
  - Procedures

    - to disassemble assemblies into subassemblies and/or parts
    - to maintain disassembled assemblies
    - to build up assemblies
    - to store them

Note

Actions on assemblies or components installed on the engine are provided in the procedures of the relevant item.

2.1.3 Content for the systems

This heading is applicable to modular or non-modular engines.

The following information must be provided as required for the different systems:

- Description and operation of the systems and their components
- Procedures

  - for testing or fault isolating components on or off-the-engine
  - to maintain the systems and their components

The maintenance of components given here above must be limited otherwise they must be subject to Component Maintenance (CM) information sets (Chap 5.2.1.9).

The content of the topics dedicated to:

- Engines (Para 2.1.1 and Para 2.1.2) must be provided in accordance with Para 2.2.
- Components (Para 2.1.3) must be provided in accordance with the paragraph Equipment information of Chap 5.2.1.9.

2.2 Technical content

2.2.1 General requirements

The technical content provides two categories of information:

- Technical data and descriptions. Refer to Para 2.3.
- Maintenance procedures. Refer to Para 2.4.

2.2.2 Data module coding

To assist in the codification of data modules, information codes (IC) are given and supplemented by additional specific requirements and/or explanations in subsequent paragraphs in addition to the rules given in Chap 4.3.

2.2.3 Introduction

If required, the introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They must also

contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-72-00-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y72-00-0000-**NN**AAA-018Y-A (37 characters)

where "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed

The information code variant is used to distinguish between the different Information sets.

2.3 Technical data and descriptions

2.3.1 Technical data

These data modules must contain a brief outline of the nature of the item. They must also provide all special or important physical, electrical/electronic, mechanical and operational characteristics and performances. These characteristics and performances must be supported by illustrations as required.

Critical values and special precautions must be provided.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-030A-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-030A-B (37 characters)

2.3.2 Description of how it is made and its function

These data modules must contain description of how an item is made and its function when the item requires limited information.

The information must be given in accordance with Para 2.3.3 and Para 2.3.4.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-040A-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-040A-B (37 characters)

2.3.3 Description of how it is made

These data modules must provide the user with the means of becoming familiar with the item and of locating the main assemblies, modules, components or parts complying with the maintenance concept applied in the procedures. It is also to include interrelationship between subsystems.

Attention must be drawn to manufacturing or adjustment procedures (eg, rotation in one direction only).

Illustrations must support the description so as to simplify, shorten or make it easier to understand. They must describe the main elements and parts which have a particular importance.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-041A-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-041A-B (37 characters)

2.3.4 Description of function

These data modules must provide the user with information and data to explain how the item functions.

Function is not to provide "how to operate an item".

Function must be described accurately and, whenever possible, illustrated with any of the following functional diagrams and/or lists enabling the user to understand and follow the fault isolation procedures:

- Block diagram used to simplify complex circuits to facilitate fault isolation. It allows understanding the function and operation of the system, subsystem, etc. It shows the arrangement of the system components and current/signal flow through the system. The test and measurement points as well as terminal points mentioned in the procedures must be represented.
- Schematic diagram which can replace block diagram for simple items or complete it for complex items when required. In the latter case, references must enable to cross-refer easily from the block diagram to the schematic diagram and vice versa.
- Wiring diagram provided to identify the terminal points, interconnections and components in order to easily detect any fault in the item.
- List of all wires shown on a wiring diagram for complex components. It must be arranged in termination order and give the following information: pin number (whether used or not), wire number, reference of the wiring diagram on which they appear, to-from routine and applicability. Unused and spare wires must be identified.
- Circuit diagram for visual identification of components on the item.

All input/output signals must be identified.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-042A-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-042A-B (37 characters)

2.4 Maintenance

All the Work Sheets (WS) provided as required must only define the mandatory workflow to perform a work. Any other use of a WS in this annex is excluded (eg, work management in the workshop).

2.4.1 Setting-up of parts lists

Parts lists (Para 1.3.2) are set up as required for maintenance procedures and are relative to a given SNS.

Depending on the complexity of the item, the project or the organization will define which level of detail is applicable to the SNS. An example of setting-up parts lists is given hereafter.

Example:

Parts lists decided for the engine as model identification code JE:

- for the engine as a whole JE-A-72-00-00-00A-075A-D
- for the inlet casing module JE-A-72-21-00-00A-075A-D

– for the LP compressor module JE-A-72-31-00-00A-075A-D

2.4.2 Setting-up of other lists

The other lists (Para 1.3.2) must be dedicated lists. They are set up for a given SNS, except for Repair (IC 600) for which procedures are related to individual parts. In this case, lists set up for the IC 600 are applicable to the couple SNS-disassembly code and variant.

Example:

Dedicated list and its coding:

– List of special support equipment and tools to assemble the LP compressor JE-A-73-31-00-00A-704A-C where, in IC 704, the primary code "7" indicates "Assemble" and "04" the list of special support equipment and tools (used when assembling).

2.4.3 Servicing

These data modules must contain:

– Job Instructions (JI) for the servicing itself
– As required, WS for the workflow of the instructions necessary to perform servicing such as drain of storage fluid (IC 228), filling oil (IC 212), bleeding (IC 231)

Clean and apply surface protection (IC 250) must provide the methods specific to the items, otherwise, the preferred method is by referencing to engine standard practices.

Paint and varnish removals must be included in cleaning. Cleaning procedures must take the repairs previously applied to the item into account such as bounded or brazed parts.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-2YYY-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-2YYY-B (37 characters)

2.4.4 Examinations, tests and checks

2.4.4.1 Visual examinations

These data modules must provide the methods specific for examining items, otherwise, the preferred method is by referencing to engine standard practices.

Procedures must provide:

– JI for the examination itself such as borescope examination
– As required, WS for the workflow of the instructions necessary to perform examinations such as removal of harnesses or pipes for access, equipment calibration, close-up actions

Based on the results of visual examinations, the following status must be given in the procedure:

– Acceptance for continued operation
– Complementary checks to be performed in accordance with referenced data module in the procedure
– Repairable in accordance with repair procedures referenced in the procedure
– No longer serviceable or repairable

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-31YY-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-31YY-B (37 characters)

2.4.4.2 Test preparation

These data modules must contain the procedures and data to be carried out on an item, its assemblies or components before installation/connection on and/or removal from test bench or test equipment.

The procedures must provide:

- JI for simple tests preparation
- As required, WS for the workflow of the instructions necessary to perform tests preparation such as removal of blanking, checks of connectors, checks of short circuits to avoid damage of the test bench, checks of connections (pneumatic, hydraulic, etc)

If there is more than one test, each individual test must have its own test preparation.

If insulation tests are required, they must precede the function tests.

When test assembly diagrams are required, they must indicate all the standard equipment needed (oscilloscope, flow-meter, power supply, etc) with their name or their code given in the list of standard equipment. Refer to Para 1.3.2.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-33YY-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-33YY-B (37 characters)

2.4.4.3 Function tests

These data modules contain tests to evaluate as required the operational efficiency and integrity of an engine, modules or components after maintenance actions.

Function tests must provide:

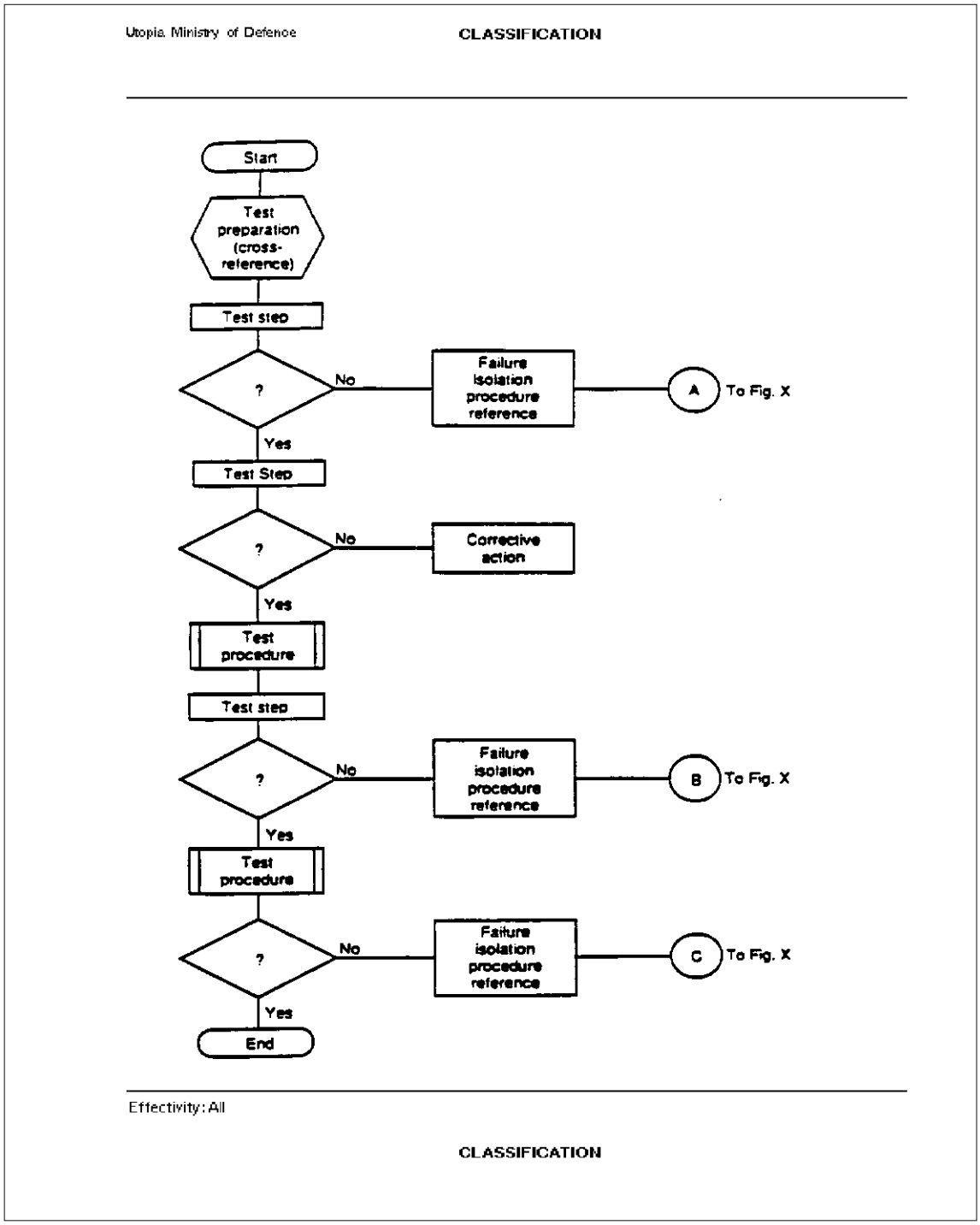
- JI describing the tests and providing acceptance limits
- As required, WS or charts (Fig 7 and Fig 8) for the workflow of the instructions necessary to perform function tests and to close up such as test preparation, calibrating, servicing

Special conditions applicable to the test must be specified and their characteristics given (eg, climatic conditions, room temperature, relative humidity, max speed and direction of the wind).

To minimize the amount of engine running necessary to perform the tests after several maintenance actions (eg, a module replacement, work on the oil system and adjustment of a fuel component), a matrix can be provided to select the sequence of JI so that the appropriate level of test is applied.

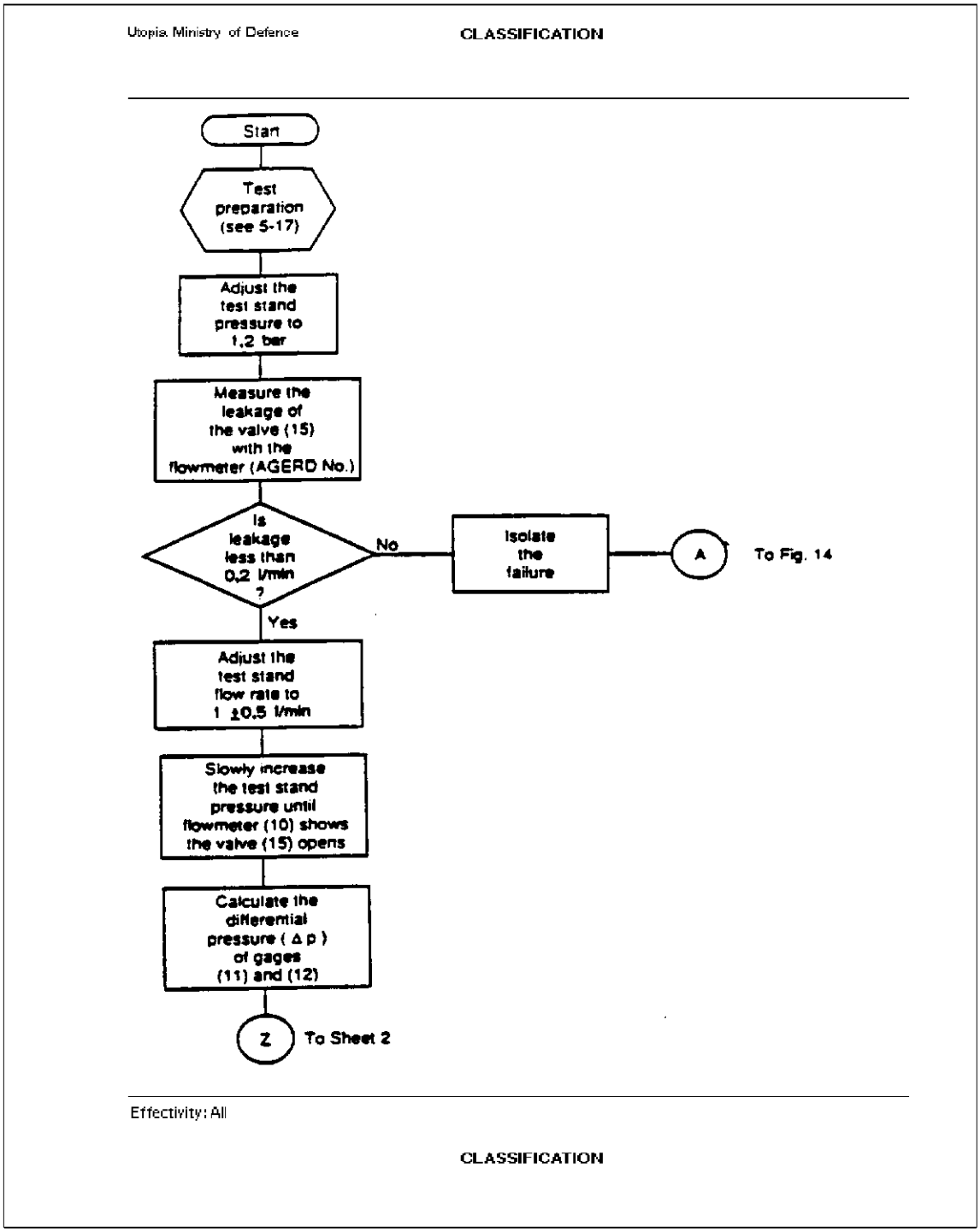
For items requiring a complex environment, the procedure must give at the applicable step the code of the standard equipment contained in the relevant list. Refer to Para 1.3.2.

The various power sources must be indicated with their characteristics and tolerances.



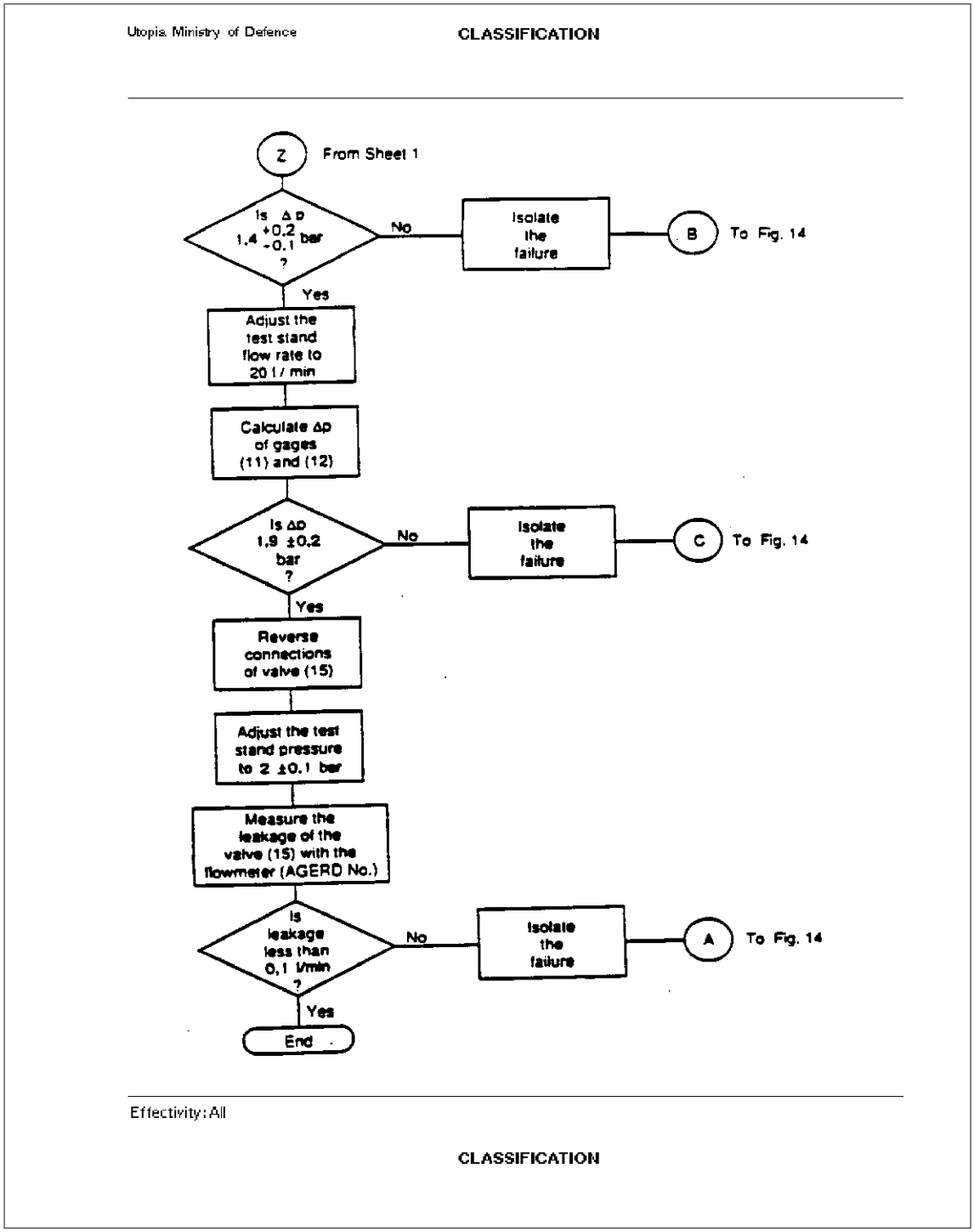
ICN-S3627-S1000D0116-A-001-01

Fig 7 Testing, basic principle - Example



ICN-S3627-S1000D0117-A-001-01

Fig 8 Testing - Example (Sheet 1 of 2)



ICN-S3627-S1000D0118-A-001-01

Fig 8 Testing - Example (Sheet 2 of 2)

2.4.4.4 Structure tests, checks

These data modules must contain the detailed procedures needed to determine the status of parts (ie, repairable), to be scrapped, serviceable. Refer also to visual examination Para 2.4.4.1.

The different levels of serviceability must be covered where acceptability standards depending on the maintenance process exist (eg, blade checks in-situ or as disassembled part).

The procedures must provide:

- JI for structure tests or for checks such as dye penetrant test (IC 351), check of an actuator stroke length (IC 361)
- As required, WS for the workflow of the instructions necessary to be performed to check the item

Only procedures specific to the item must be described, otherwise, refer to engine standard practices.

Illustrations must be used to indicate critical stress zones, to locate and to identify defects. Defects can be coded and the procedure must refer to these codes whenever those defects are mentioned. Refer to Fig 9.

Any systematic or as-required measurements must be located on an illustration as simple as possible for easy reading. If dimensions, tolerances and clearances are coded on the illustration, their values must be given on a separate table. Refer to Fig 10.

Permissible in-service/service wear tolerances and clearances must be provided.

Based on the known results of the structure test or of the check, the following status of the item must be given in the procedure:

- Acceptance for continued operation
- Repairable in accordance with repair procedures which must be referenced in the JI
- No longer serviceable or repairable

Measurements, clearances and torques which are specific to assembly procedures must not be mentioned in check procedures but in the relevant content (eg, ensuring assembly clearance by machining a spacer to length).

Data module for **structure tests** must be coded:

YY-Y-YY-YY-YY-YYY-35YY-B (17 characters)

thru

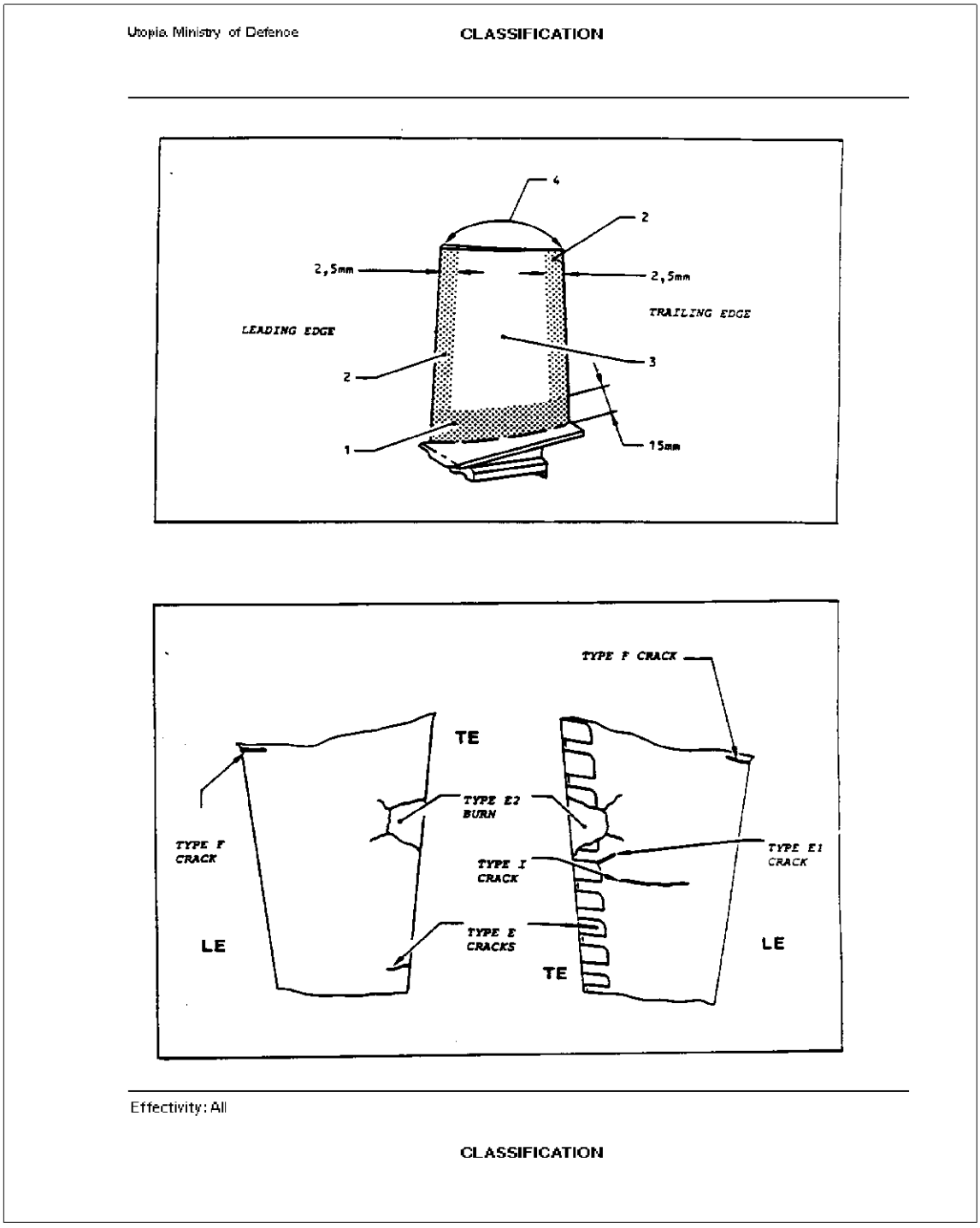
YYYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-35YY-B (37 characters)

Data module for **checks** must be coded:

YY-Y-YY-YY-YY-YYY-36YY-B (17 characters)

thru

YYYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-36YY-B (37 characters)



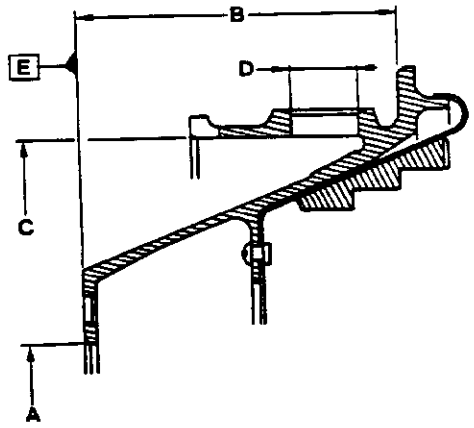
ICN-S3627-S1000D0119-A-001-01

Fig 9 Illustration of defects - Example

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ITEM IDX	DIM REF.	CAT	MIN. ACC.	MAX. ACC.	CRITERIA	DECISIONS	REQTS
06	A	1	350	350,14	If not in the limits	Not permitted Keep the part	
	B	1	67,2	67,25	If more than 67,25	Not permitted Refer to Work Instruction 72-51-00-10Y-361A	
	C	1	448	448,07	If not in the limits	Not permitted Keep the part	
	D	1	14,5	14,54	If not in the limits	Not permitted Keep the part	



Effectivity: All

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ICN-S3627-S1000D0120-A-001-01

Fig 10 Dimensions checks, table and illustrations - Example

2.4.5 Fault isolation procedures

These data modules must contain the procedures required to detect presumed malfunctions in the item and to isolate the faulty component or part in order to proceed with its replacement or repair.

Fault isolation must make possible to detect the faulty item in order to:

- remove it without systematic disassembly. However removals can result in the possible disassembly of peripheral parts
- make any adjustments in situ required by repair or replacement of an items
- carry out overall testing of subassemblies or items after repair.

The content must be written essentially as a function of the following criteria:

- Clear specification of values and tolerances applicable to in-service item
- Rapid fault isolation in order to minimize the item turn-around time
- Limiting of repair work to the absolute minimum

The procedures must be provided in form of JI. They must be arranged in such a manner that they will progressively isolate and identify each assembly, subassembly or parts.

Whenever possible, fault isolation procedures must make maximum use of built-in self-test features and must require a minimum of test equipment and repair tools. If Built-In Test Equipment (BITE) is installed, specific procedures of the BITE must be provided and precede the detailed performance test procedure.

JI is preferably to be presented by flow charts (Fig 11 and Fig 12) except where tabular forms, descriptive language or any combination of these three forms as well as computer language presentation is more appropriate.

A single combined testing and fault isolation is not permissible.

Procedures must be provided using a test point/location method of testing rather than tests used by the manufacturer for item specification approval. These methods must identify the minimum test points/locations and must indicate the range for input and output parameters such as flow rate, pressures, ratings, voltages, wave shapes, etc, needed to insure the proper functioning and integrity of the item. Time constants to be observed between the application of an input parameter and the measurement of its output, or between two steps of the procedures must be clearly indicated.

The choice of the procedure to be used is essentially governed by the design of the item.

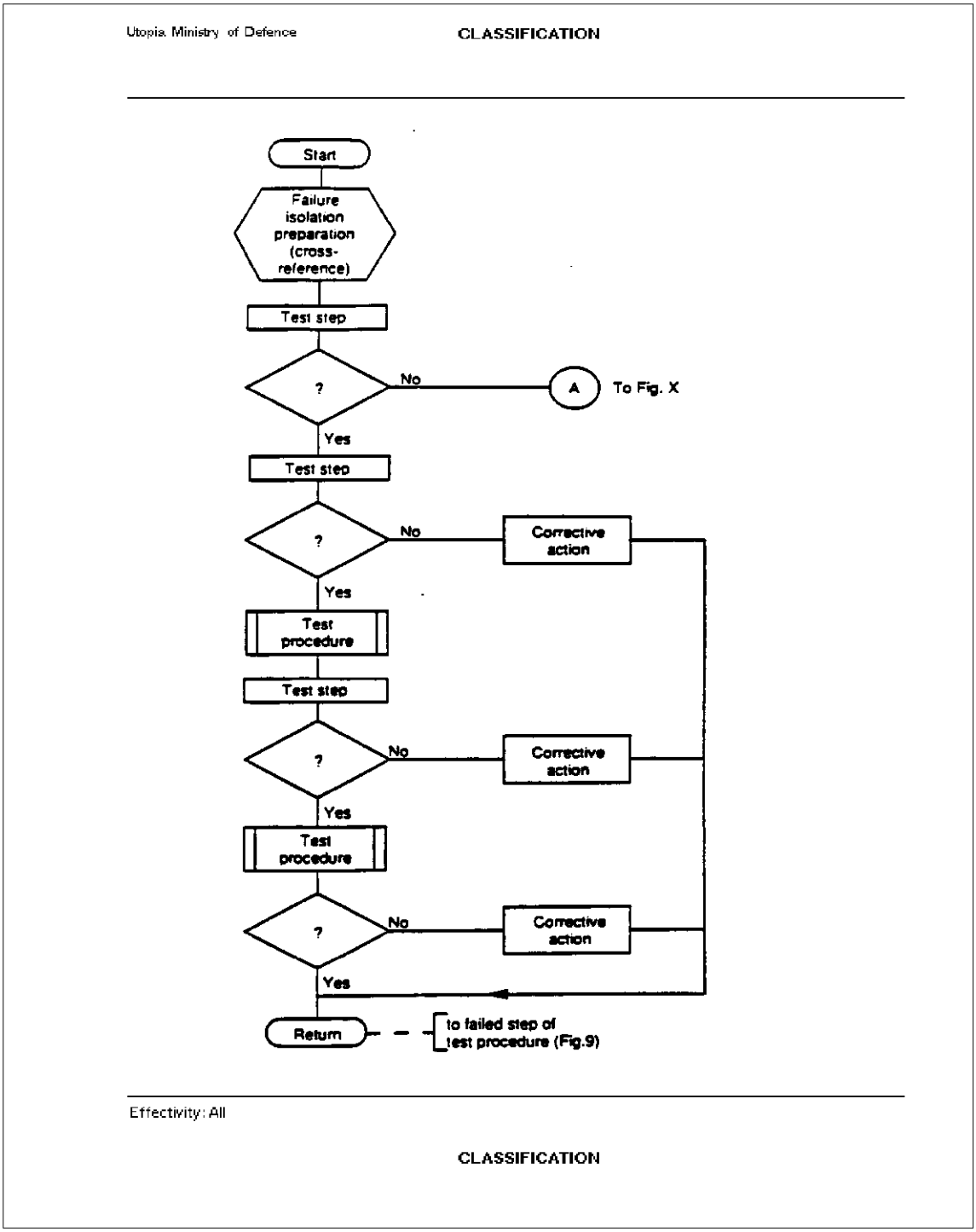
Repairs to be done during the fault isolation process must refer to relevant data module or to engine standard practices, except if they are simple (eg, fuse change). In this case, repair information must be given at the applicable step in the procedure.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-4YYY-B (17 characters)

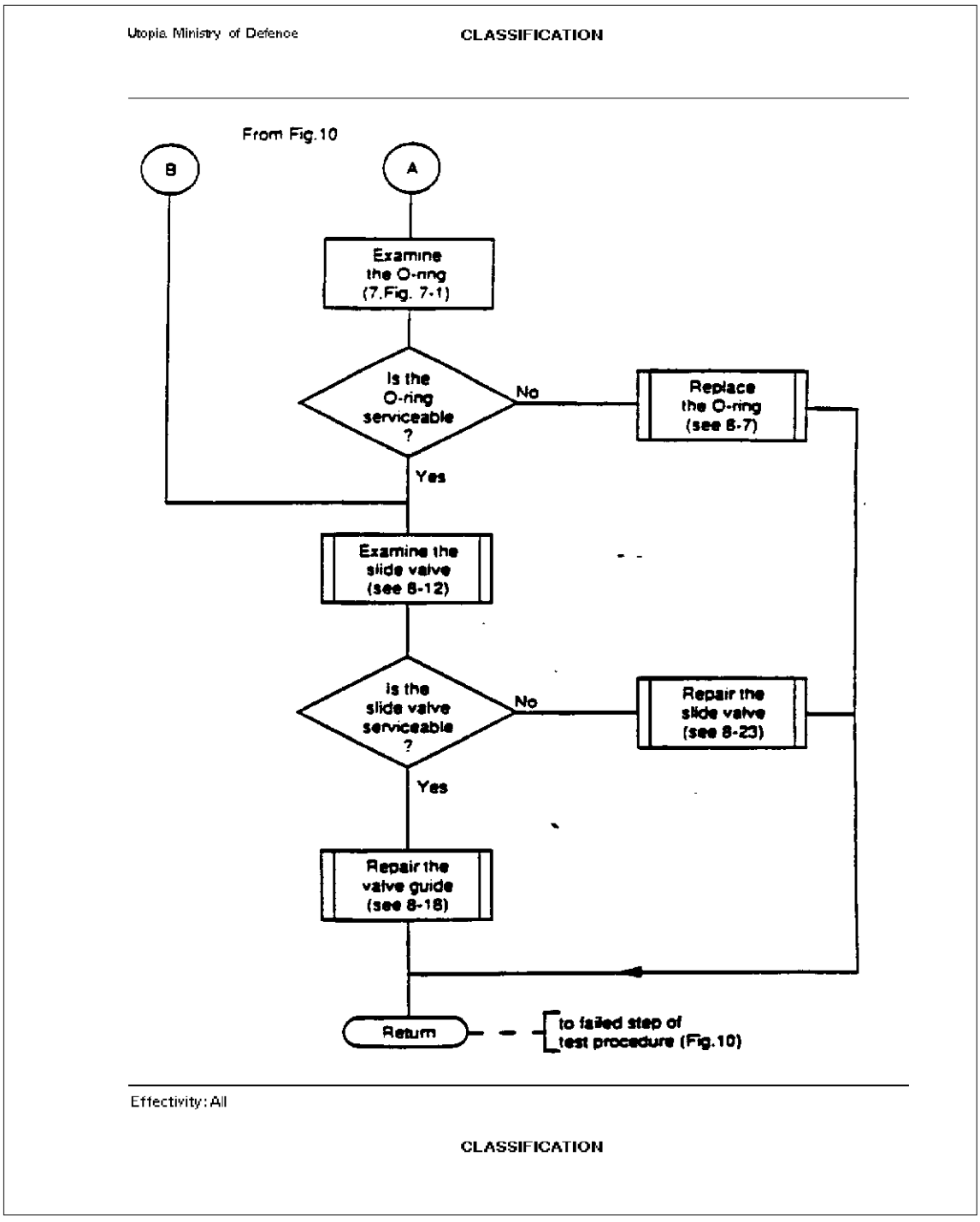
thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-4YYY-B (37 characters)



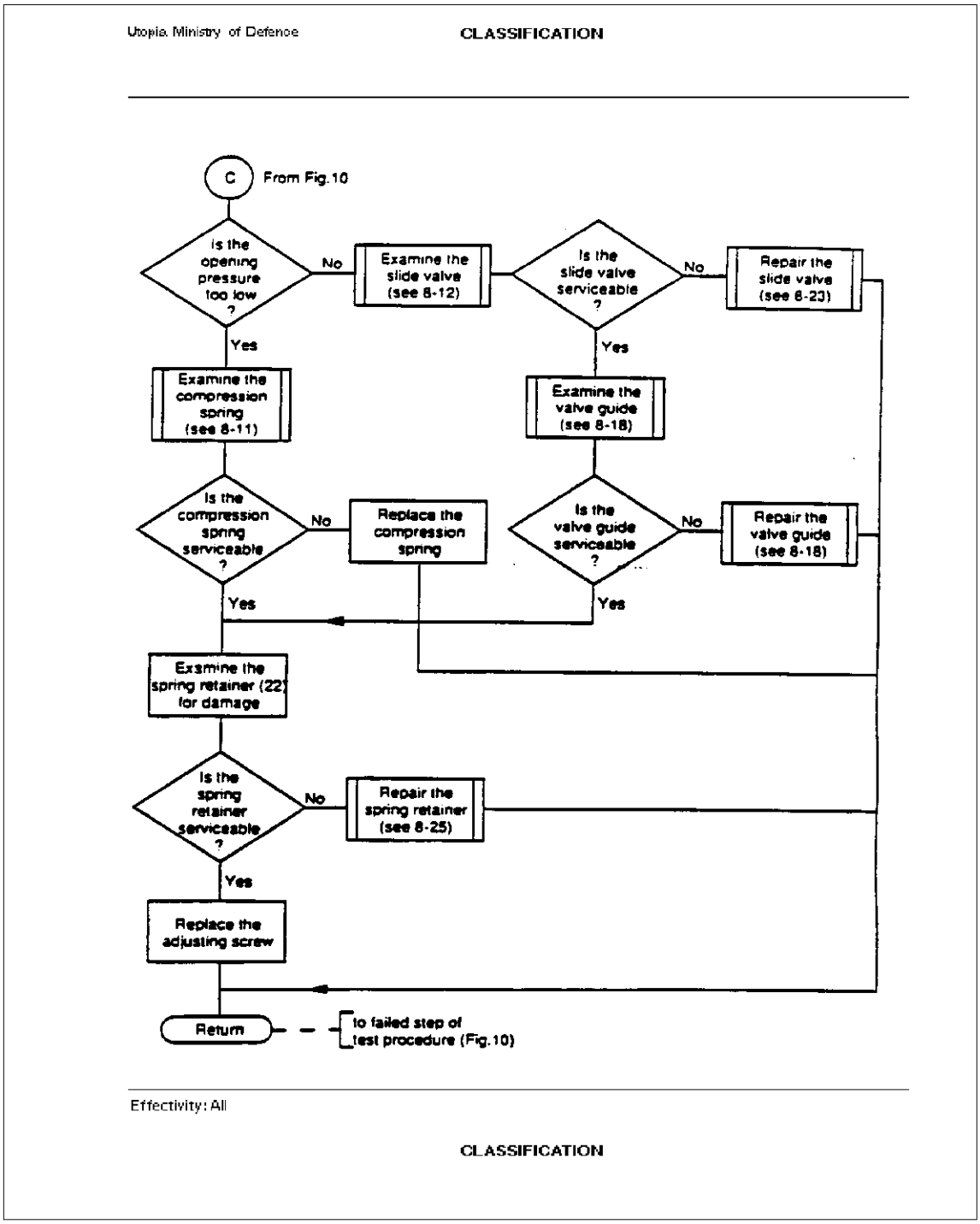
ICN-S3627-S1000D0121-A-001-01

Fig 11 Fault isolation - Basic principle



ICN-S3627-S1000D0122-A-001-01

Fig 12 Fault isolation - Example (Sheet 1 of 2)



ICN-S3627-S1000D0123-A-001-01

Fig 12 Fault isolation - Example (Sheet 2 of 2)

2.4.6 Disconnect, remove and disassemble procedures

These data modules must contain:

- JI for the disconnection, removal or disassembly itself of a given item. All measurement and/or values that must be documented prior to an individual action being performed must be provided in the applicable step in the JI. Matched set must be indicated.
- As required, WS for the workflow of the instructions necessary to gain access with the minimum of disturbance, to disconnect or remove other serviceable items and subsequently remove the given item. No unnecessary actions must be carried out such as opening of permanent joints, unsoldering of connections, etc.

Cleaning of items before any disassembling must be referenced.

Procedures can be supported by illustrations or sequence charts as required.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-5YYY-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-5YYY-B (37 characters)

2.4.7 Repair and locally make procedures and data

These data modules must contain detailed repair processes and data required to restore a worn or damaged part to serviceable conditions.

The process applied to a part is not to change the interchangeability

- of the repaired part

thru

- of the assembly repaired with a repair size part

Each repair must be identified. This identifier is not to be changed or reused. A cross reference must be provided between the identifier and the data module code of the procedure to perform the repair.

If several repairs are applicable to the same part, a table can be provided to select the sequence of JI so that the instructions are not duplicated unnecessarily. Refer to Fig 13. This table must be subject of a data module.

The procedures must provide:

- JI for the repair itself of the item. It must include illustrations, drawings, machining specifications, dimensions, etc, as required for carrying out work correctly
- As required, WS for the workflow of the instructions necessary to perform the repair

Only procedures specific to the item must be provided, otherwise, refer to engine standard practices (Chap 5.2.2.6).

Repair parts must be listed in the parts list set up in accordance with Para 2.4.1. The procedure must refer to the part identifier whenever those parts are mentioned.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-**6XX**Y-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-**6XX**Y-B (37 characters)

where "**6XX**" indicates the IC 610 thru IC 659

Procedures must state where repaired parts must be marked.

"How to mark" on the repaired parts must be included in the procedure for simple marking, otherwise, it must refer to engine standard practices or relevant data module.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-691Y-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-691Y-B (37 characters)

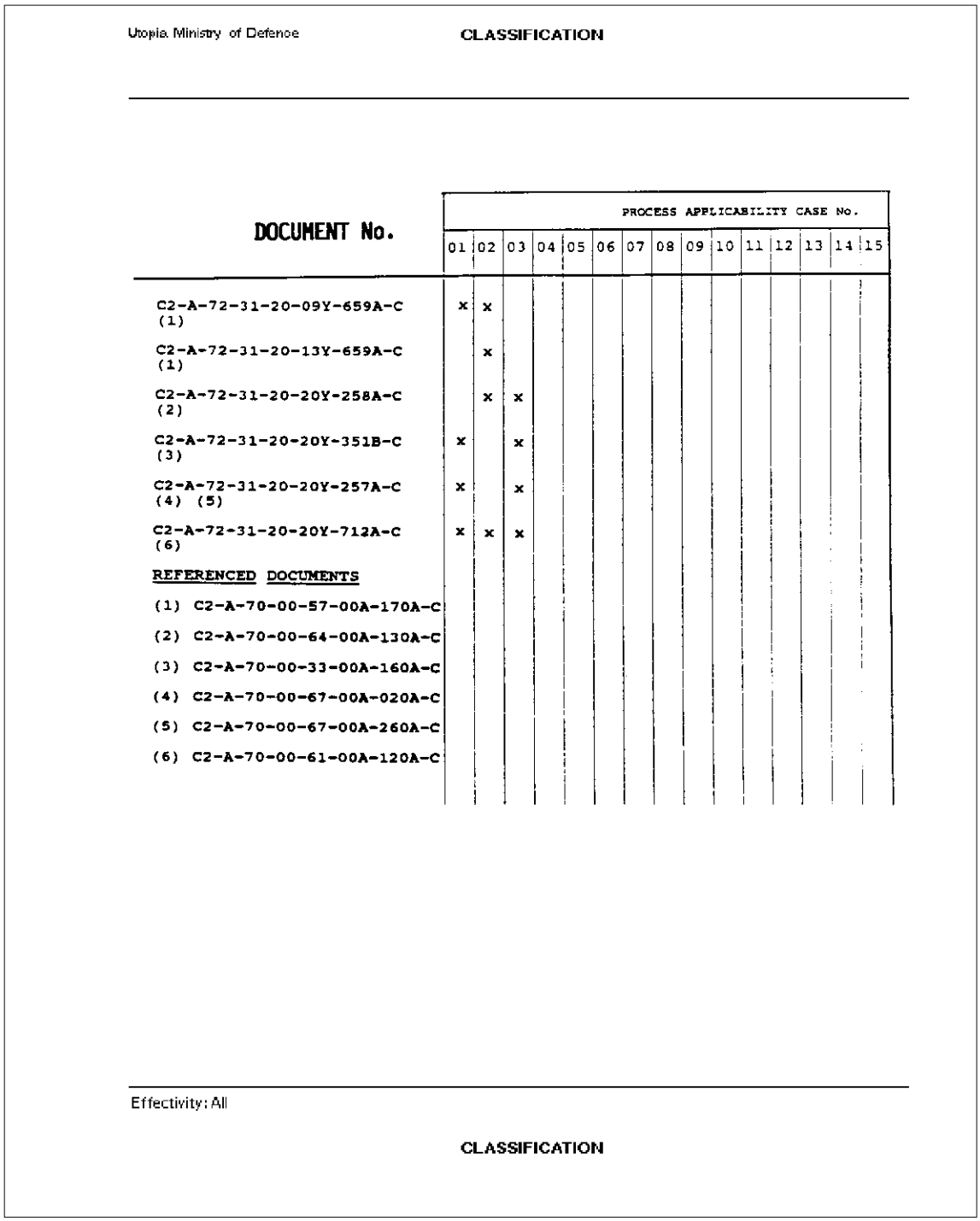
If parts can be locally manufactured, procedures must provide all dimensional data, materials, processing and QA data.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-670Y-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-670Y-B (37 characters)



Utopia Ministry of Defence

CLASSIFICATION

DOCUMENT No.	PROCESS APPLICABILITY CASE No.													
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
C2-A-72-31-20-09Y-659A-C (1)	x	x													
C2-A-72-31-20-13Y-659A-C (1)		x													
C2-A-72-31-20-20Y-258A-C (2)		x	x												
C2-A-72-31-20-20Y-351B-C (3)	x		x												
C2-A-72-31-20-20Y-257A-C (4) (5)	x		x												
C2-A-72-31-20-20Y-712A-C (6)	x	x	x												

REFERENCED DOCUMENTS

(1) C2-A-70-00-57-00A-170A-C

(2) C2-A-70-00-64-00A-130A-C

(3) C2-A-70-00-33-00A-160A-C

(4) C2-A-70-00-67-00A-020A-C

(5) C2-A-70-00-67-00A-260A-C

(6) C2-A-70-00-61-00A-120A-C

Effectivity: All

CLASSIFICATION

ICN-S3627-S1000D0124-A-001-01

Fig 13 Repair table - Example

2.4.8 Assemble, install and connect procedures

These data modules must provide:

- JI for the assembly, installation or connection itself of the item
- As required, WS for the workflow of the instructions necessary to have the desired assembled, installed or connected item such as checks, assembling, storage fluid replacement, closing up areas opened to get access

Assembly fits and clearances, adjustments and torque values must be given in the applicable steps. Matched set must be detailed.

Procedures must be supported by illustrations or flow charts as required.

If the use of special tools is not self-explanatory, data modules must provide data and information for their utilization.

Only special locking procedures must be described. They must be provided at the applicable step.

However, if an item (eg, a component) requires complex or numerous locking operations, a separate procedure could be given in accordance with Para 2.4.9 Locking procedures. In this case, reference to this relevant locking procedure must be made in the assembly procedure.

Calibration or tests which cannot be performed after final assembly or which are easier to perform during assembly must be given at the applicable step.

Steps which are not to be accomplished:

- until after testing
- until after item installation on the engine, a module, etc, must be clearly indicated. Instructions to put on a tag on the item specifying the incompletion of the tasks must be mentioned in the procedure

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-7YYY-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-7YYY-B (37 characters)

2.4.9 Locking procedures

These data modules are applicable to items requiring complex or numerous locking operations.

JI must provide step-by-step instructions necessary to secure that each part is locked on the item.

Illustrations must be provided to allow the user to visually identify the parts to be locked. Each part must be listed. This list must enable the user to record that each locking operation has been correctly carried out (eg, signature, stamp).

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-712Y-B (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-712Y-B (37 characters)

2.4.10 Storage procedures and data

These data modules must provide:

- JI for the storage and the removal of storage itself of an item
- As required, WS for the workflow of the instructions necessary to perform the work

The procedures must provide the detailed instructions:

- to apply preservation when packing an item and to remove this preservation when unpacking it such as wrapping, blanking, consumable spraying. Data and instructions relative to air pressurization, humidity, temperature control, etc, must be provided.

  Data modules for preservation packing applying must be coded:

  YY-Y-YY-YY-YY-YYY-81YY-B (17 characters)

  thru

  YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-81YY-B (37 characters)

  Data modules for preservation packing removing must be coded:

  YY-Y-YY-YY-YY-YYY-82YY-B (17 characters)

  thru

  YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-82YY-B (37 characters)

- to put in or remove from a container an item.

  Data modules for putting in from a container must be coded:

  YY-Y-YY-YY-YY-YYY-830Y-B (17 characters)

  thru

  YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-830Y-B (37 characters)

  Data modules for removing from a container must be coded:

  YY-Y-YY-YY-YY-YYY-840Y-B (17 characters)

  thru

  YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-840Y-B (37 characters)

- to extend the shelf lives.

  Data modules must be coded:

  YY-Y-YY-YY-YY-YYY-85YY-B (17 characters)

  thru

  YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-85YY-B (37 characters)

- to transport items installed in containers. Only special handling must be provided.

  Data modules must be coded:

  YY-Y-YY-YY-YY-YYY-86YY-B (17 characters)

  thru

  YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-86YY-B (37 characters)

– to prepare an item removed from storage before introduction into service. These procedures must provide the required workflow of instructions necessary to prepare the item such as:

  - Build-up of the item from several other items removed from storage
  - Replacement of storage fluids, filling, etc
  - Tests applicable when preparing the item. These tests must be specific tests to prepare the item, otherwise they must be referred to the relevant test (eg, function test Para 2.4.4.3)

  Data modules must be coded:

  YY-Y-YY-YY-YY-YYY-87YY-B (17 characters)

  thru

  YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-87YY-B (37 characters)

– to decide, after the checks of the condition of storage of an item and its physical integrity when remove from storage:

  - if it is acceptable to be prepared before introduction into service
  - what maintenance actions must be taken depending on the condition of the container, of blanking, etc.

  This information can be given in the form of textual description, table or flow charts. Refer to Fig 14.

  Data modules must be coded:

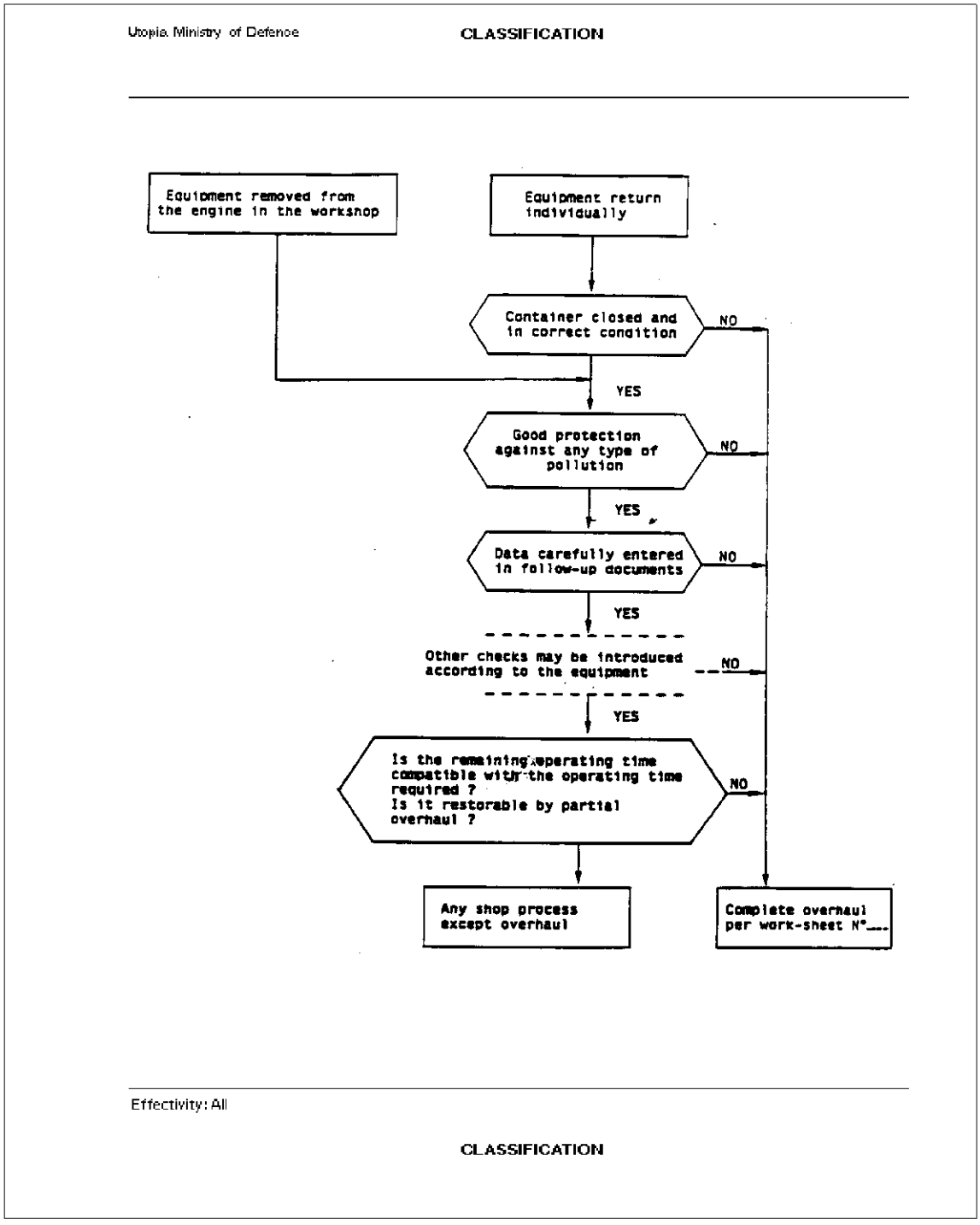
  YY-Y-YY-YY-YY-YYY-88YY-B (17 characters)

  thru

  YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-88YY-B (37 characters)

  Note

  On-condition maintenance cannot be applied to an item subject to this type of maintenance if it is removed from a damaged container.



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Fig 14 Removal from storage - Example of incoming checks

2.4.11 Data of items in storage

Shelf lives and Inspection Intervals when in storage must be listed.

The list must contain:

- The description of the item
- Its manufacturer code and part number
- The shelf life or Inspection Interval (value and unit)
- The data module code of the procedure to be performed when limits are reached

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-89YY-B (17 characters)

thru

YYYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-89YY-B (37 characters)

Chapter 5.2.2.5

Air specific information sets - Power plant build-up information

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Table 1 References

Chap No./Document No.	Title
Chap 4.3	Information management - Data module code
Chap 9.2	Terms and definitions - Terms, acronyms and subject index

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for Power Plant Build-up (PPB) information.

1.2 Scope

It covers the rules for the preparation of information applicable to power plant build-up which will enable skilled personnel to equip a bare engine delivered by the manufacturer for installation on the air vehicle by the addition or transfer of parts and components. The PPB information must contain the following:

- Description and indexes
- Accessory assembly
- Power plant build-up

1.3 Standards and definitions

1.3.1 Standards

The standards given in this chapter are applicable with no exceptions.

1.3.2 Definitions

The following definitions and those stated in Chap 9.2 are used as appropriate.

- **Bare engine**: An engine which is fully completed internally, but on which no external parts or components have been installed.
- **Engine**: An engine which is equipped with external parts supplied by the engine manufacturer.
- **Sequential grouping**: Any coherent package of logical sequenced information which describes a complete action. The action can consist of the completion of either a maximum convenience assembly or the installation of an accessory or system.
- **Maximum convenience assembly**: Two or more components, fittings and/or packings, or any externally mounted accessories which, for practical reasons, must be assembled prior to being installed on the power plant.

2 Power plant build-up information

2.1 Data module coding

To assist in the codification of data modules, information codes are given and supplemented by additional specific requirements and/or explanations in subsequent paragraphs in addition to the rules given in Chap 4.3.

In this chapter "NN", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

2.1.1 Introduction

If required, the introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-71-00-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-**NN**AAA-018Y-A (37 characters)

The information code variant is used to distinguish between the different Information sets.

2.1.2 General description of the power plant

The engine description data modules will provide the following information:

1 Bare engine configuration and engine configuration

2 Zoning and location of the various attachment points, captive nuts, flanges, etc

3 List of equipment items to be installed on the bare engine

4 List of equipment items to be installed on the bare engine at delivery

5 List of equipment items calling for a maintenance action (servicing, test, etc), once the engine has been built-up

Data modules must be coded:

YY-Y-71-00-00-**NN**A-000A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-**NN**AAA-000A-A (37 characters)

2.1.3 Special tools, fixtures and equipment

Special tools and equipment required to carry out the power plant build-up must be listed giving information such as. Refer to Table 2.

- Name
- Part number
- Manufacturer code (CAGE code)
- Usage

Data modules must be coded:

YY-Y-71-00-00-**NN**A-061A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-**NN**AAA-061A-A (37 characters)

Table 2 Table of special tools, fixtures and equipment - Example

Name	Part No.	CAGE	Usage
Engine accessory hoist	196k4005-501	51563	Support CSD or generator
Nose cowl sling	196k4009-1	51563	Hoist nozzle cowl
Nozzle dolly	196k4003-1	51563	Support exhaust nozzle
Exhaust plug support	196k4008-1	51563	Support exhaust plug
Primary nozzle sling	196k4004-1	51563	Hoist primary nozzle
Crank wrench	196k8009-1	51563	Rotate fuel condition control

2.1.4 Vendor codes

Vendor codes must be shown for applicable vendor parts in the text to facilitate identification of the vendor. This list must be arranged in numerical sequence and give for each vendor supplying parts for PPB the following information. Refer to Table 3.

- Vendor code - CAGE code
- Name of vendor
- Address of vendor

Data modules must be coded:

YY-Y-71-00-00-**NN**A-019A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-**NN**AAA-019A-A (37 characters)

Table 3 Table of vendor codes - Example

CAGE	Vendor
C0202	Pall Filtrationstechnik GmbH Philipp-Reis-Strasse 66072 Dreieich-Sprendlingen, Germany
D2638	Elektro-Metall Expost GmbH Manchinger Strasse 1 68070 Ingolstadt, Germany
F0230	ABG-Secma SA BP 502 75725 Paris Cedex 15, France
00153	Edcliff Instruments, Inc 1711 South Mountain Avenue Monrovia, CA 91016-4256
00357	Van Dusan Aircraft Supplies Teterboro Airport, 500 Industrial Ave Teterboro, NJ 07608
00624	Aeroquip Corporation Jackson Plant, 300 S East Ave Jackson, MI 49203

2.1.5 Consumables

All consumables materials, such as lubricants, greases, etc, which are prescribed for use during emergency accessory assembly and build-up procedures must be listed by name, specification and application or use. Refer to Table 4.

Data modules must be coded:

YY-Y-71-00-00-**NN**A-017A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-**NN**AAA-017A-A (37 characters)

Table 4 Table of consumables - Example

Name	Specification	Use
Alcohol, polyvinyl	S-122	Release
Ethyl acetate	TT-E-751	Clean surface prior to dissimilar metals protection
Grease, graphite	MIL-T-5544	Lubrication of bolts
Hydraulic fluid	Aerospatiale Spec. 307.110	Hydraulic system lubricant
Liquid shim	EA934NA	Drain mast shim
Lubricant, anti-seize	MIL-L-25681	Bolts threads, high temperature
Lubricant, dry film	MIL-L-23398	Pneumatic duct couplings
Lubricant, oil	MIL-L-7808 MIL-L-23699	Engine oil system, general
Oil, lubricating molybdenum disulfide	DOD-L25681	General purpose
Petrolatum	VVP-236	Packing lubricant
…		

2.1.6 Standard practices

The standard practices must include standard torques and locking methods as well as assembly practices or processes which are new, unique or manufacturer specified for a particular application. It also includes procedures to ensure serviceability of a new converted engine such as cleaning, inspection, repair and servicing. Refer to Fig 1.

Data modules must be coded:

YY-Y-71-00-00-**NN**A-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-**NN**AAA-YYYY-A (37 characters)

4.4 Torque, standard bolts

4.4.3 Thread MJ

Torque values for standard bolts thread MJ with self locking nuts Inconel material 1380 MPa synthetique oil (μ = 0,10).

Table 13 Torque values. Standard bolts thread MJ

Thread MJ nominal size metric	Torque value Nm (1)
5 x 0.80	5.5
6 x 1.00	9
7 x 1.00	17
8 x 1.00	24
10 x 1.25	50
12 x 1.25	80

(1) The tightening torque actually obtained depends on the calibration and handling of the spanner, within an estimated plus minus 5 tolerance.

4.4.4 Thread M

Torque values for standard bolts thread M with self locking nuts Iconel material 1030 MPa, graphite mineral petrolatum (μ = 0,08).

Table 14 Torque values. Standard bolts thread M

Thread M nominal size metric	Torque value Nm (1)
5 x 0.80	8
6 x 1.00	13
7 x 1.00	24
8 x 1.25	33
10 x 1.50	75
12 x 1.50	132

(1) The tightening torque actually obtained depends on the calibration and handling of the spanner, within an estimated plus minus 5 tolerance.

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Fig 1 Standard practices - Example

2.1.7 Numeric index

The numeric index data module must consist of a complete listing of all parts required in the accessory assembly and power plant build-up data modules. All parts used must be listed by part number in alphanumeric order. The index must facilitate identifying the location of given part or accessory when only the part number is known. Refer to Table 5.

Data modules must be coded:

YY-Y-71-00-00-**NN**A-013A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-**NN**AAA-013A-A (37 characters)

Table 5 Numeric index - Example

Part number	Airline part No.	DMC	Fig ref	Units per assembly
VT-0306D		E1-A-71-00-01-06A-000A-A	5-3	1
VT-0306D		E1-A-71-00-02-12A-000A-A	4-1	Ref
VT-0306D		E1-A-71-00-02-12A-000A-A	6-9	Ref
VTA01431		E1-A-71-00-01-06A-000A-A	7-9	2
VT01433		E1-A-71-00-01-00A-000A-A	7	2
VTA01433		E1-A-71-00-02-23A-000A-A	5-6	2
VTA01431		E1-A-71-00-02-16A-000A-A	5-6A	2
VTF00090		E1-A-71-00-02-16A-000A-A	5-24	1
VTF00100		E1-A-71-00-02-16A-000A-A	5-18	1
VTF00110		E1-A-71-00-02-16A-000A-A	5-11	1
11J22-200		E1-A-71-00-02-32A-000A-A	3-4	1
12H65		E1-A-71-00-02-26A-000A-A	3-10	21
12811-11		E1-A-71-00-02-07A-000A-A	2-17	2CSD

2.2 Procedure index

Accessories and installations must be listed in the procedure index data module in alphabetical order so that the location of the desired information in the accessory assembly and power plant build-up data modules can be readily determined by the user. All accessories and installations of the accessory assembly and power plant build-up data modules must be listed in alphabetic order by keyword. Refer to Table 6.

Data modules must be coded:

YY-Y-71-00-00-**NN**A-014A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0000-**NN**AAA-014A-A (37 characters)

Table 6 Procedure index - Example

Sequential grouping	Assembly/Build-up procedure DMC	Fig
QAD kit installation - Constant speed drive	E1-A-71-00-01-19A-710A-A	4
Ring segment Installation - Outer V-groove, lower fixed	E1-A-71-00-02-10A-720A-A	2
Ring segment Installation - Outer V-groove, upper fixed	E1-A-71-00-02-10A-720A-A	3
Seal installation - Engine Flange, Lower Bifurcation	E1-A-71-00-02-10A-720A-A	5
Seal installation - Generator and constant speed drive	E1-A-71-00-02-22A-720A-A	3
Seal installation - Turbine Inlet and compressor bleed	E1-A-71-00-02-17A-720A-A	4
Seal support installation - Upper fan case, aft	E1-A-71-00-02-10A-720A-A	8
Sensor, compressor inlet total temperature	E1-A-71-00-01-08A-710A-A	3
Sensor, fuel temperature	E1-A-71-00-01-14A-710A-A	7
…		

2.3 Accessory assembly

The accessory assembly data modules must contain the following information:

- General requirements
- Procedural information

2.3.1 General requirements

These data modules must list all the accessories requiring build-up and assembly information which must be completed as a maximum convenience assembly prior to installation as part of power plant build-up. All externally mounted accessories, engine support type as well as aircraft-support type, which require completion as an assembly must be included in these data modules. The accessory assembly information must be numbered so that each sequential grouping is separated from the others by its figure number. Each sequential grouping must be detailed in its corresponding procedural data modules. When it is necessary to assemble together two or more components to facilitate power plant build-up, the resulting maximum convenience assembly must be completed in accordance with a sequential grouping which must be included in this section. This information is also to include any checking operations to be performed on the accessory assembly prior to its installation on engine. Refer to Table 7.

Data modules must be coded:

YY-Y-71-00-01-**NN**A-700Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0100-**NN**AAA-700Y-A (37 characters)

Table 7 List of accessories requiring build-up - Example

Name	Fig	Units per assy	Assembly procedure DMC
CSD oil heat exchanger	2	1	E1-A-71-00-01-04A-710A-A
Oil pressure transmitter and bracket	3	1	E1-A-71-00-01-04A-710A-A

Name	Fig	Units per assy	Assembly procedure DMC
Oil differential pressure switch	4	1	E1-A-71-00-01-04A-710A-A
Fuel pressure transmitter	5	1	E1-A-71-00-01-12A-710A-A
Nose cowl	6	1	E1-A-71-00-01-11A-710A-A
Nose cowl (Starter system)	7	1	E1-A-71-00-01-11A-710A-A
Hydraulic pump	8	1	E1-A-71-00-01-17A-710A-A

2.3.2 Procedural information

Procedural information must include the parts list with the applicable part numbers. Item numbers must be assigned in the sequence-of-build order, without gaps.

Note

Procedural information must be the necessary information in step-by-step format, to accomplish the maximum convenience assembly.

The parts required to perform each maximum convenience assembly must be listed with their item numbers, part numbers, name and units per assembly. Torque values and value tolerances, special tools and lubricants and other relevant information for the accomplishment of each step must be included in the applicable step. Vendor codes must be listed for vendor parts to facilitate identification of the vendor.

Note

Identification of each vendor code listed must be made in the Introduction data module.

The title of the procedural information must be identical to the title of the supporting illustration. The maximum convenience assembly must also be cross-referenced to Next Higher Assembly (NHA) which must be the power plant build-up sequential grouping where the installation of the maximum convenience assembly onto the power plant is accomplished. Refer to Fig 2.

The illustration must consist of a completed view of the maximum convenience assembly with views showing the exploded detail parts. The index numbers assigned to the exploded parts must correspond to the item numbers listed in the procedural information. Refer to Fig 3.

Data modules must be coded:

YY-Y-71-00-01-**NN**A-710Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0100-**NN**AAA-710Y-A (37 characters)

6 Oil pressure transmitter preassembly

6.1 Install union (10) and packing (15) lubricated with engine oil to top of transmitter (5).

6.2 Torque union to 15,3 to 16,9 Nm (135 to 150 lb in).

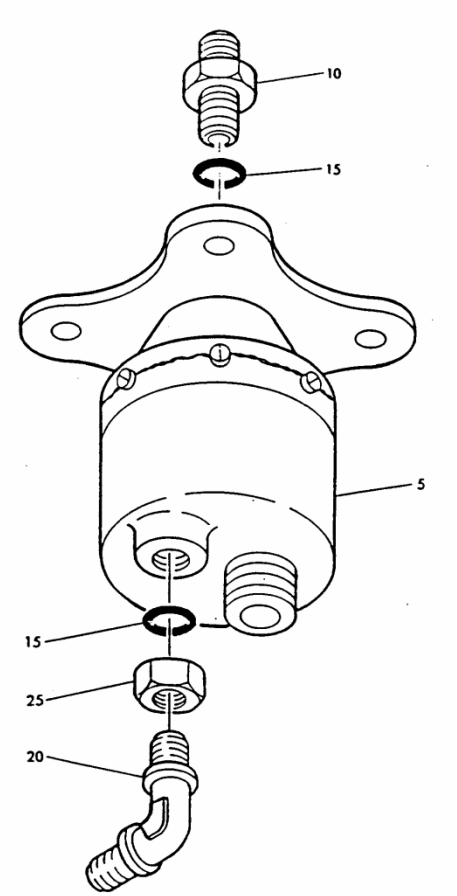
6.3 Install elbow (20) lubricated packing (15) and nut (25) in bottom of transmitter. Leave nut fingertight.

Table 6 Oil pressure transmitter assembly

Fig ref	Part number	Name	Units per assy
6-5	VT-034C	Transmitter, pressure	1
6-10	AN815-4J	Union	1
6-15	M83248-1-904	Packing (V81349)	2
6-20	AN833-4J	Elbow	1
6-25	AN924-4J	Nut	1

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Fig 2 Accessory assembly procedure - Example (Sheet 1 of 2)



E1-A-710001-C-F3352-00764-A-03-1

Fig 6 Oil pressure transmitter

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Fig 2 Accessory assembly procedure - Example (Sheet 2 of 2)

2.4 Power plant build-up

The power plant build-up information must be divided into the following parts:

- Major installation
- Attachment fittings installation
- Power plant build-up

Complete assembly information, including illustrations and step-by-step procedures for the installation of each accessory and system in a logical sequence of assembly from the bare engine to the completed power plant, must be included.

2.4.1 Major installation

Illustrations must be included which will allow leaders, with index numbers, to point out the location of the different sequential groupings. Tables must be included which will list the sequential groupings in a logical sequence of power plant build-up. This major installation of sequential groupings must be arranged with all installation data first, followed by Tables. Index numbers on the illustrations must tie the depicted installation to the corresponding name entry. Refer to Fig 4 and Fig 5.

Note

The index number must correspond with the applicable sequential grouping figure number.

Data modules must be coded:

YY-Y-71-00-02-**NN**A-720Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0200-**NN**AAA-720Y-A (37 characters)

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Table 2 Mid fan major installations

Fig ref	Name	Units per assy
1-1	Engine - JT9D-59A	1
1-2	Bracket install - LH upper fan case, flanges	1
1-3	Bracket install - LH mid fan case, flanges A, B1 and C	1
1-4	Bracket install - LH mid fan case, flanges V and W	1
1-5	Bracket install - LH lower fan case, flanges A and B1	1
1-6	Bracket install - LH lower fan case , flanges B1, C, V and W	1
1-7	Bracket install - RH upper fan case, flanges B1, C and V	1
1-8	Bracket install - RH mid fan case, flanges A and B1	1
1-9	...	
1-10	...	
1-11	...	
...	...	
...	...	
...	...	

...

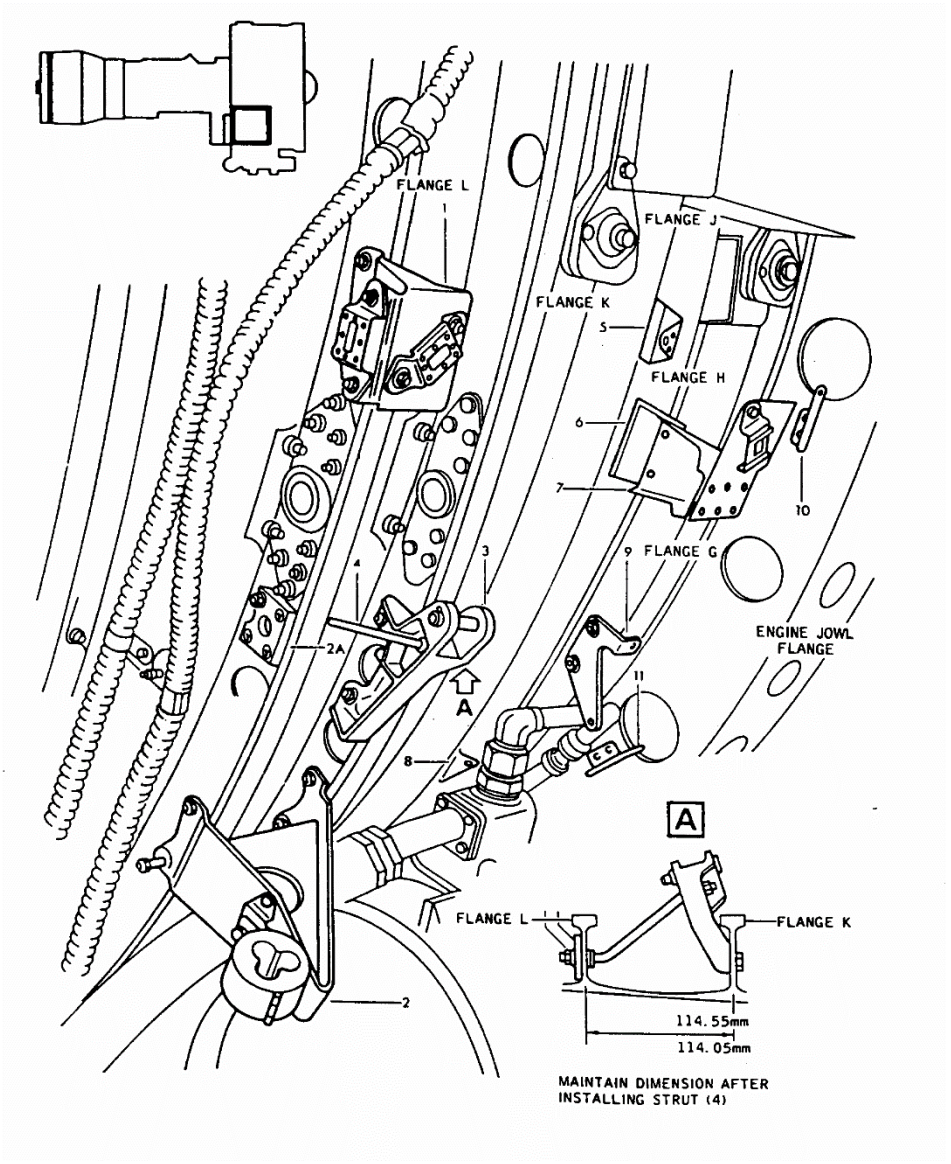
...

Effectivity: All | E1-A-71-00-02-03A-720A-A

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ICN-S3627-S1000D0412-A-001-01

Fig 3 Major installation - Example (Sheet 1 of 2)



E1-A-710002-C-F3352-02312-A-03-1

Fig 1 RH flanges G thru L

ICN-S3627-S1000D0413-A-001-01

Fig 3 Major installation - Example (Sheet 2 of 2)

2.4.2 Attachment fitting installation

Sequential groupings must be included as required to show each attachment fitting in its correct position on the engine flanges. All attachment fittings supplied by the engine and air vehicle manufacturers must be included. Each attachment fitting must be illustrated with a leader and index number. A locator drawing must be included at the top of each illustration to indicate the area being shown. All attach hardware required to secure each flange must be illustrated and indexed. There must be as many sequential groupings as necessary to show the illustration of each attachment fitting with its attachment hardware. The index numbers on the illustration of each bracket installation sequential grouping must be keyed to the corresponding parts list item numbers. The attachment fitting installed in accordance with each sequential grouping must be itemized in a logical sequence order. The parts list must consist of several columns showing the figure and item number, manufacturer's part number, open column for airline part numbers, flange location, hole location and installation configuration for each attachment fitting. Any special information must be included with the corresponding part numbers, with the procedure keyed to the parts list using the item numbers in parentheses. Refer to Fig 4.

Data modules must be coded:

YY-Y-71-00-02-**NN**A-730Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0200-**NN**AAA-730Y-A (37 characters)

...

...

Attachment fitting location, see E1-A-71-00-02-00A-730A-A Introduction.

Table 1 RH flanges G thru L

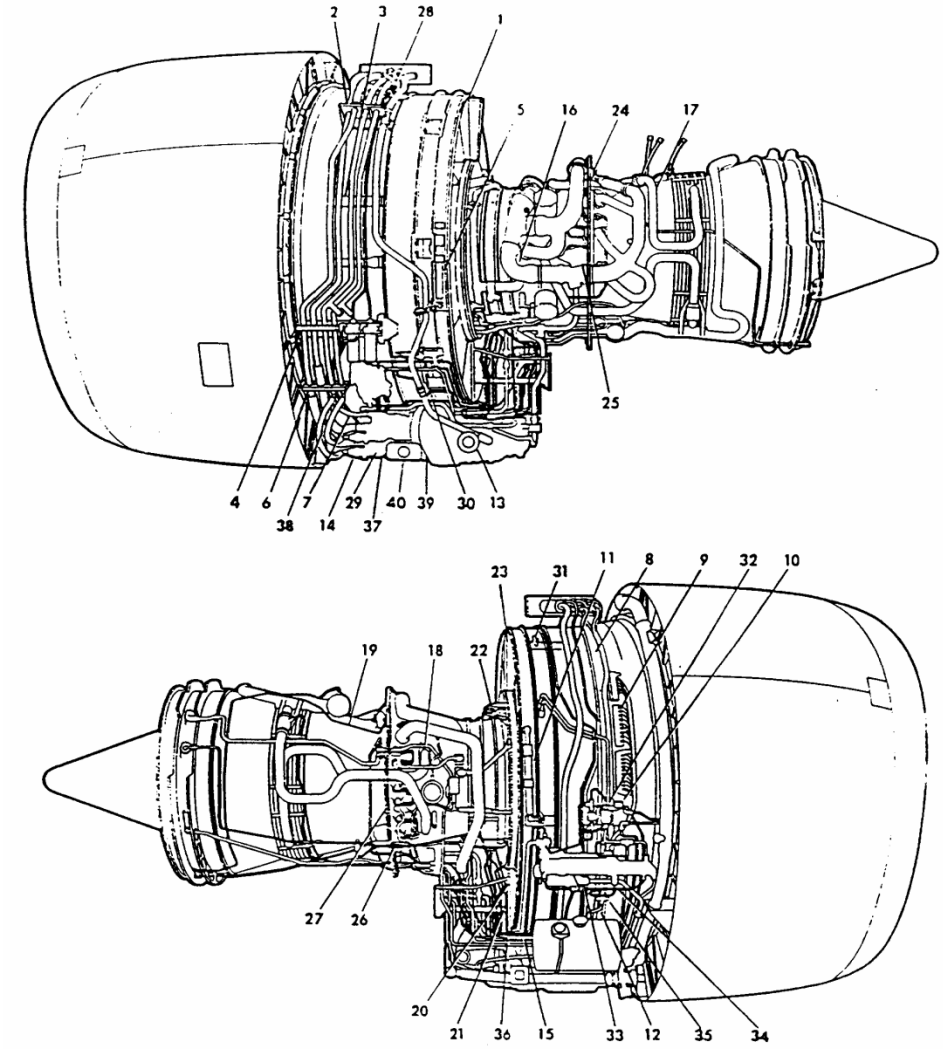
Fig ref	Part number	Name	Qty	On flange	Usage code	Hole location	Flange side	Angle faces
1-1	ASN0067-1	Bracket assy	1	L		Matched holes 4 o'clock	Aft	Aft
	NAS6103U10	Screw	1					
	NAS1252-10H	Washer	2					
	MS21042L3	Nut	1					
	NAS6103U16	Screw	1					
1-2	ASN0017-503	Support assy	1	K		Matched holes 4 o'clock	Aft	Up
	NAS6103U10	Screw	2	K-L				
	NAS1252-10H	Washer	3					
	MS21042L3	Nut	2					
	TA05KG1	Clamp	2					
1-2A	ASL0128-279	Ground plate	1	L		Matched holes 4:30 o'clock	Aft	
	NAS1306-10	Bolt	1					
	AN960-616L	Washer	2					
	MS35338-46	Washer	1					
	MS21042L6	Nut	3					
1-3	ASL0088-2-B	Bracket	...					
...	...	...						
...	...							
...								

...

ICN-S3627-S1000D0414-A-001-01

Fig 4 Attachment fitting installation - Example (Sheet 1 of 2)

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E1-A-710002-C-F3352-01765-A-01-1

Fig 1 Oil pressure transmitter

Effectivity: All | E1-A-71-00-02-03A-720A-A

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Fig 4 Attachment fitting installation - Example (Sheet 2 of 2)

2.4.3 Power plant build-up

Accessories and systems must be installed in a logical sequence of build order. A sequence grouping installation can consist of the installation of a single accessory or more than one accessory in an area being built-up, or, if the method of installation requires a complete system.

The illustrations must show the accessories, plumbing, components and associated hardware in the installed condition. For purposes of clarity, the affected parts must be illustrated in relief on the power plant by use of contrasting line weights. Detail views must be included as necessary to explode fittings, packing and other parts not exposed in the assembled view. Index numbers assigned to the exploded parts must correspond to the item numbers listed on the following parts list pages. A locator drawing must be included at the top of each illustration to indicate the particular area being shown. The procedural information for power plant build-up must be prepared in the same format and style used for the accessory build-up procedures. Installation of a maximum convenience assembly, completed in accordance with information contained in the accessory assembly data modules, must be called out in the power plant build-up data modules. These assemblies must be identified in the power plant build-up data modules by referencing the applicable figure number and, when existing, the installation part number, as listed in the accessory build-up data modules. Refer to Fig 5.

Data modules must be coded:

YY-Y-71-00-02-**NN**A-710Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y71-00-0200-**NN**AAA-710Y-A (37 characters)

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6 Pneumatic pressure regulating valve installation

See Fig 11

1 Apply solid-film lubricant to inside of coupling (10).

2 Position coupling (10) between mating flanges of valve (5) and intermediate duct assembly.

3 Rotate coupling T-bolt to bottom of duct with nut outboard and torque valve marked on coupling.

4

CAUTION

Make certain coupling T-bolts are positioned to clear thrust reverse.

5 Connect plug DV224A to pneumatic regulating valve. Make certain one interfacial seal (15) is installed in receptacle.

6 Connect plug DV224B to valve. Make certain one interfacial seal (20) is installed in receptacle

Table 1 Pressure regulating valve installation

Fig ref	Part number	Name	Units per assy
11-5	3213754-1	Valve pneumatic pressure regulating	1
11-10	34H40-60	Coupling	1
11-15	095-1008-000	Seal, Interfacial	2
11-20	094-1020-000	Seal, Interfacial	1

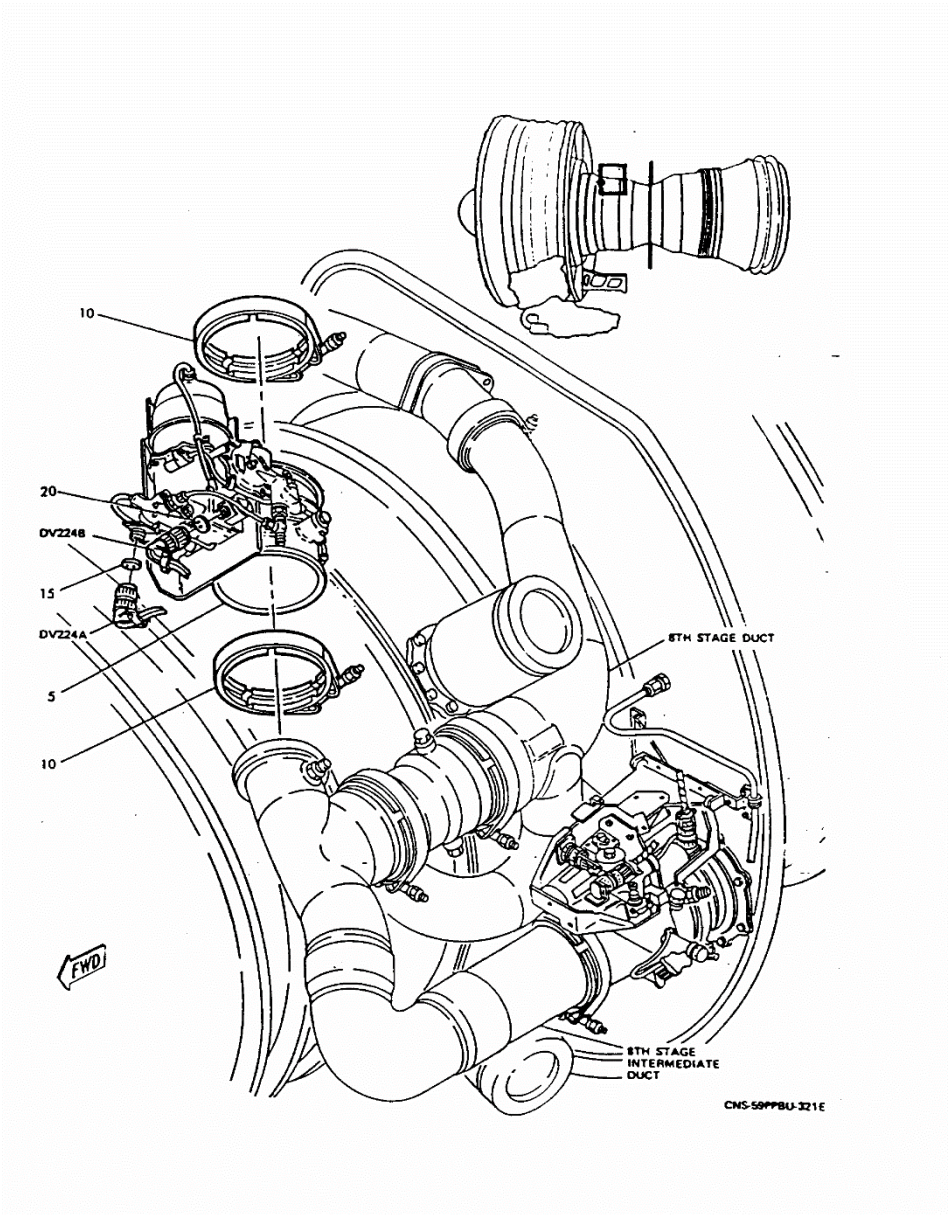
Effectivity: All | E1-A-71-00-01-21A-710A-A

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ICN-S3627-S1000D0416-A-001-01

Fig 5 Power plant build-up procedure - Example (Sheet 1 of 2)

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E1-A-710002-C-F3352-00372-A-02-1

Fig 11 Pneumatic pressure regulating valve installation

Effectivity: All | E1-A-71-00-02-21A-710A-A

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Fig 5 Power plant build-up procedure - Example (Sheet 2 of 2)

Chapter 5.2.2.6

Air specific information sets - Engine standard practices

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References

Table 1 References

Chap No./Document No.	Title
Chap 4.3	Information management - Data module code
Chap 9.2	Terms and definitions - Terms, acronyms and subject index

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for Engine Standard Practices (ESP) information.

1.2 Scope

It covers the requirements for the preparation of information applicable to engine standard practices which will enable skilled personnel to process standard procedures on engine parts. It also gives information concerning the preparation, check and regeneration of chemical solutions.

The standard practice must be referenced in the engine maintenance information, service bulletins, etc, to prevent the repetition of the detailed processes in these separate publications.

1.3 Standards and definitions

1.3.1 Standards

The standards given in this chapter are applicable with no exceptions.

1.3.2 Definitions

The following definitions and those stated in Chap 9.2 must be used as appropriate.

- **Standard practice:** A unique process used repetitively in the shop maintenance of air vehicle parts. It is a single detailed process of sequential operations to perform a specific task usually accomplished within a localized area of an engine shop.

  As a general rule, a standard practice is a complete process within itself and must not normally specify the required application of another standard practice or process, or of selected sections of another standard practice or process.

  The standard practice must only refer to material data information.

  A standard practice does not apply to only one part or group of parts. It is not a repair procedure.

  A process with a single application does not justify classification as standard practice. Such a process, however, can justify a standard practice classification when its application becomes more frequent.

- **Chemical solution:** A mixture of separate products. A data module is issued for each chemical solution. Content and numbering are defined in Para 2.6.

2 Content

2.1 General

The complete set of ESP data modules is specified in Para 2.2 thru Para 2.7 Technical content and subsequent paragraphs.

2.2 Technical content

2.2.1 General requirements

The standard practice must provide a single source for all standard processes needed in the maintenance of an engine.

2.2.2 Data module coding

To assist in the codification of data modules, the rules which follow must be used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-**70**-**SS**-**MM**-**NN**A-YYYY-C (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y**70**-**SS**-**MM**00-**NN**AAA-YYYY-C (37 characters)

Where:

- "**70**" = standard practice
- "**SS**", the section code, gives the groups of standard practice.
  "00" identifies general information and chemical solutions. "10" the first group, etc.
- "**MM**", in the subject code, is a sequential number, starting from "01", for chemical solutions and mixtures. For other groups "00" must be used.
- "**NN**", in the disassembly code, is a sequential number starting from "01". "00" is used for general information, if needed. "99" is always used for chemical solutions and mixtures.

2.2.3 Introduction

If required, the introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY–Y–70–00–00–**NN**A–018Y–A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y16-00-0000-**NN**AAA-018Y-A (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

2.3 General standard practices

Basic standard practices data module code are assigned. Refer to Para 2.7.

The general standard practice must not comply with the format of test or process standards and must not specify a detailed process.

The general standard practice must define the group and include any information pertinent to the entire group. It must not include any requirements pertinent to any specific process. It must contain general, descriptive, background information to assist the technician in processing a part.

2.4 Test standard practice

2.4.1 General

Each group of standard practices can have special test standard practices which must be classified at the beginning of the group.

The test standard practice must be used to evaluate process control and quality by indirect means. Samples are processed before or with the engine part, or in a like manner, and separately tested to evaluate the quality of the processed engine part.

The test standard practice need not comply with the format of process standards, but must specify the actual test methods and acceptability criteria. It must specify that the process applicable to the test part/specimen (Para 2.4.2) is identical to that applied on engine parts but generally must not describe the process applied.

2.4.2 Test standard practice content

The test standard practice includes two types of samples:

- Test part
- Test specimen

2.4.2.1 Test part

A test part is a reusable part to which a process is applied. Inspection results are usually compared to a reference measurement/value.

The test standard practice must define the test part, the process applied, the test method applied, and the acceptability limits.

The process, test method, and acceptability limits for the test part are usually identical to those applied to the engine part.

Each different test part must require a separate test standard practice.

2.4.2.2 Test specimen

A test specimen is a non-reusable part or sample to which a process is applied. The application and/or testing of the process usually require destruction of the specimen.

The test standard practice must define the test specimen, the process applied, the test method applied and the acceptability limits.

The process, test method, and acceptability limits for the test specimen are usually identical to those applied to the engine part.

Each different test specimen must require a separate test standard practice.

2.5 Process standard practice

2.5.1 Process standard practice content

The title of the process standard practice must identify the process in the least number of words required to distinguish one from another.

Example:

"Removal of tungsten carbide coating from titanium" is required if separate standard practices exist for removal of different coatings from different metals. Otherwise "Removal of coating" would be sufficient.

Each standard practice data module must contain the following headings:

- General
- Equipment
- Materials
- Procedure

2.5.1.1 General

This section must contain a description of the purpose of the standard practice, often only a repeat of the title when the title is very explicit. It must be a longer description, usually, when the title is brief and general.

Warnings, cautions or notes must occur in this paragraph only when they are of a general nature.

2.5.1.2 Equipment

This section must identify the general requirements or condition of equipment required for this practice. It must not usually specify the exact size, model, specification or brand name of equipment, but when a standard practice defines the procedure for specific equipment, the

specific equipment must be listed. When there are no equipment requirements, N/A must be entered.

2.5.1.3 Materials

This section must list all the chemical solutions and/or consumable products required for this practice. When there are no material requirements "N/A" must be entered.

When more than one material or group of materials is listed, each must be identified by a separate paragraph with identifier and title.

When materials are listed, they must be identified by the name and code used on the material data information and/or chemical solution description.

The standard practice process must make reference to the material data information where all products, product specifications, etc, are separately identified and controlled.

2.5.1.4 Procedure

This section must include the detailed sequential steps to accomplish the task.

When reference is made to the materials, they must be identified as in Para 2.5.1.3.

All procedure details must be included. Standard practice procedure must also include all necessary visual inspection to ensure its correct application.

2.6 Chemical solutions and mixtures information

2.6.1 Content

Information must be provided for preparation, use and regeneration of each chemical solution/mixture.

It must:

- provide the data necessary to make the initial solution
  - list of ingredients
  - initial mix quantity or concentration
  - temperature
- specify any test necessary for the solution during initial mixing and/or periodic intervals
- specify any regeneration action required

Note

If a single product requires regeneration and check action a chemical solution data module must be issued.

2.6.2 Chemical solution/mixture data module numbering

Chemical solution/mixture data modules must be numbered following the rules given in Para 2.2.2.

Example:

Alkaline permanganate	YY-A-70-00-01-99A-081A-C
Acid stripping solution	YY-A-70-00-02-99A-081A-C
...	...
...	...
Inhibited phosphoric acid	YY-A-70-00-34-99A-081A-C
Alkaline cleaner for titanium	YY-A-70-00-76-99A-081A-C

2.7 Standard practices numbering system application

The following tables give an example of a "complete" set of standard practice data modules.

2.7.1 70-00-00 General

General information - How to use information	YY-A-70-00-00-00A-040A-C
Safety instructions	YY-A-70-00-00-01A-012A-C
Conversion factors (The United States (US) and Metric)	YY-A-70-00-00-02A-017A-C
Quality of gases	YY-A-70-00-00-03A-076A-C
Water types	YY-A-70-00-00-04A-076A-C
Tool requirements	YY-A-70-00-00-05A-061A-C
Ultraviolet light test	YY-A-70-00-00-06A-340A-C
Chemical solutions	YY-A-70-00-00-99A-081A-C
Chemical mixtures	YY-A-70-00-00-99A-082A-C

2.7.2 70-10-00 Marking and masking

Marking

General	YY-A-70-10-00-00A-691A-C
Time/cycle marking of parts	YY-A-70-10-00-01A-691A-C
Test of temporary marking products	YY-A-70-10-00-02A-369A-C
Electro-chemical etch marking	YY-A-70-10-00-03A-691A-C
Vibro-pen marking	YY-A-70-10-00-04A-691A-C
Metal stamp marking	YY-A-70-10-00-05A-691A-C
Temporary marking	YY-A-70-10-00-06A-691A-C

Masking

General	YY-A-70-10-00-11A-259A-C
Masking with wax	YY-A-70-10-00-12A-259A-C
Masking with varnish	YY-A-70-10-00-13A-259A-C
Masking with plastic	YY-A-70-10-00-14A-259A-C
Masking with rubber	YY-A-70-10-00-15A-259A-C

2.7.3 70-20-00 Cleaning and coating removal

Chemical cleaning

Solvent degreasing of all materials except titanium alloys	YY-A-70-20-00-01A-251A-C
Vapor degreasing	YY-A-70-20-00-02A-251A-C
Steam cleaning	YY-A-70-20-00-03A-251A-C
Light cleaning of titanium alloys	YY-A-70-20-00-04A-251A-C
Solvent degreasing of titanium alloys	YY-A-70-20-00-05A-251A-C
Electrolytic degreasing	YY-A-70-20-00-06A-251A-C
Cleaning internal lube oil tube	YY-A-70-20-00-07A-251A-C
Light oxide removal from titanium alloys	YY-A-70-20-00-08A-251A-C
Descaling ferrous alloys	YY-A-70-20-00-09A-251A-C
Descaling martensitic alloys	YY-A-70-20-00-10A-251A-C
Oxide removal from austenitic alloys	YY-A-70-20-00-11A-251A-C
Oxide removal from aluminum alloys	YY-A-70-20-00-12A-251A-C
Heavy oxide removal from austenitic alloys and heat-resistant alloys	YY-A-70-20-00-13A-251A-C
Heavy oxide removal from titanium alloys	YY-A-70-20-00-14A-251A-C
Carbon removal from all materials except aluminum and titanium	YY-A-70-20-00-15A-251A-C
Ultrasonic cleaning	YY-A-70-20-00-16A-251A-C

Abrasive blast cleaning

Dry abrasive blast cleaning with alumina-fine	YY-A-70-20-00-21A-252A-C
Dry abrasive blast cleaning with alumina-medium	YY-A-70-20-00-22A-252A-C
Dry abrasive blast cleaning with glass-fine	YY-A-70-20-00-23A-252A-C
Dry abrasive blast cleaning with glass-medium	YY-A-70-20-00-24A-252A-C

Dry abrasive blast cleaning with fruit stones	YY-A-70-20-00-25A-252A-C
Wet abrasive blast cleaning-very fine	YY-A-70-20-00-26A-252A-C
Wet abrasive blast cleaning-fine	YY-A-70-20-00-27A-252A-C
Wet abrasive blast cleaning-medium	YY-A-70-20-00-28A-252A-C
Wet abrasive blast cleaning-coarse	YY-A-70-20-00-29A-252A-C
Removal of surface coatings	
Removal of chromium plate from steels and austenitic alloys-Electrolytic process	YY-A-70-20-00-31A-653A-C
Removal of chromium plate from steels and austenitic alloys-Chemical process	YY-A-70-20-00-32A-653A-C
Removal of copper and silver plate from steels - Chemical process	YY-A-70-20-00-33A-653A-C
Removal of copper and silver plate from steels -Electrolytic process	YY-A-70-20-00-34A-653A-C
Removal of nickel plate from steels and austenitic alloys -Chemical process	YY-A-70-20-00-35A-653A-C
Removal of acid anodize treatments from aluminum alloys -Chemical process	YY-A-70-20-00-36A-653A-C
Removal of nickel/cadmium plating from low alloy, stainless and martensitic steels - Chemical process	YY-A-70-20-00-37A-653A-C
Removal of cadmium plating from low alloy steels -Chemical process	YY-A-70-20-00-38A-653A-C
Removal of phosphating (granodizing treatment) -Chemical process	YY-A-70-20-00-39A-653A-C
Removal of chemical oxidation from aluminum alloys -Chemical process	YY-A-70-20-00-40A-653A-C
Removal of black oxide finish -Chemical process	YY-A-70-20-00-41A-653A-C
Removal of tungsten carbide thermal spray coating from titanium -Electrolytic method	YY-A-70-20-00-42A-653A-C
Removal of tungsten carbide thermal spray coating -Mechanical process	YY-A-70-20-00-43A-651A-C
Removal of cobalt, chromium, nickel, tungsten alloy thermal spray coating from nickel-base alloys -Mechanical process	YY-A-70-20-00-44A-651A-C
Removal of nickel-aluminum and Cu-Ni-In thermal spray coating except from low alloy steels -Chemical process	YY-A-70-20-00-45A-653A-C
Removal of aluminum thermal spray coating - Chemical process	YY-A-70-20-00-46A-653A-C
Removal of tungsten carbide thermal sprayed coatings from nickel or cobalt base alloys - Molten salt	YY-A-70-20-00-47A-653A-C
Removal of alumina-titanium (top coat) with Ni-Al (bond coat) thermal spray coatings except from low alloy steels	YY-A-70-20-00-48A-653A-C
Removal of plasma sprayed and tungsten carbide coating from titanium, steel, and stainless steel -Chemical process	YY-A-70-20-00-49A-653A-C
Removal of aluminum paint -Mechanical process	YY-A-70-20-00-50A-651A-C
Removal of aluminum paint -Chemical process	YY-A-70-20-00-51A-653A-C

Removal of epoxy silicone paint with aluminum pigment from all materials except titanium alloys -Chemical process	YY-A-70-20-00-52A-653A-C
Removal of polyurethane paint -Chemical process	YY-A-70-20-00-53A-653A-C
Removal of rubber masking	YY-A-70-20-00-54A-653A-C
Stripping silicone rubber from titanium and aluminum	YY-A-70-20-00-55A-653A-C
Removal of polyurethane paint with diphase products	YY-A-70-20-00-56A-653A-C
Removal of RTV 147-148 with hollow glass beads coating -Mechanical process	YY-A-70-20-00-57A-651A-C
Removal of RTV 147-148 with hollow glass beads coating -Chemical process	YY-A-70-20-00-58A-653A-C

2.7.4 70-30-00 Inspection

Hardness Measurement	
General	YY-A-70-30-00-00A-356A-C
Brinell Hardness Testing	YY-A-70-30-00-01A-356A-C
Vickers Hardness Testing	YY-A-70-30-00-02A-356A-C
Rockwell Hardness Testing	YY-A-70-30-00-03A-356A-C
Portable Rockwell Hardness Testing	YY-A-70-30-00-04A-356A-C
Fluorescent penetrant inspection	
General	YY-A-70-30-00-10A-351A-C
Test of fluorescent-penetrant process	YY-A-70-30-00-11A-390A-C
Test of fluorescent-penetrant	YY-A-70-30-00-12A-390A-C
Test of emulsifier or remover	YY-A-70-30-00-13A-390A-C
Fluorescent-penetrant inspection -Stationary water-washable	YY-A-70-30-00-14A-351A-C
Fluorescent-penetrant inspection -Stationary post-emulsifiable	YY-A-70-30-00-15A-351A-C
Fluorescent-penetrant inspection -Portable water-washable	YY-A-70-30-00-16A-351A-C
Fluorescent-penetrant inspection -Portable post-emulsifiable	YY-A-70-30-00-17A-351A-C
Fluorescent-penetrant inspection stationary -Electrostatic spraying process	YY-A-70-30-00-18A-351A-C
Magnetic particle inspection	
General	YY-A-70-30-00-20A-352A-C
Magnetic particle inspection -Symbols	YY-A-70-30-00-21A-013A-C
Test of magnetic particle inspection process	YY-A-70-30-00-22A-280A-C
Magnetic particle inspection	YY-A-70-30-00-23A-352A-C
Radiographic inspection	
General	YY-A-70-30-00-30A-354A-C
Ultrasonic inspection	
General	YY-A-70-30-00-40A-355A-C
Immersion ultrasonic inspection of engine run titanium hardware	YY-A-70-30-00-41A-355A-C
Miscellaneous inspection	
Capillary inspection of open face honeycomb structures	YY-A-70-30-00-51A-369A-C

Check of locking efficiency of swaged or riveted self-locking nuts and self-locking inserts	YY-A-70-30-00-52A-369A-C
Airflow measurement	YY-A-70-30-00-53A-363A-C
Special inspection for surface fretting or wear	YY-A-70-30-00-54A-310A-C

Eddy current inspection

General	YY-A-70-30-00-60A-353A-C
Two (2) MHz eddy current inspection of bores	YY-A-70-30-00-61A-353A-C
Five (5) MHz manual eddy current inspection of titanium alloy rotating engine hardware	YY-A-70-30-00-62A-353A-C

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Hand blending	YY-A-70-40-00-02A-655A-C
Power blending	YY-A-70-40-00-03A-655A-C

Insert installation

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Replacement of key-locked insert in aluminum alloy	YY-A-70-40-00-13A-628A-C
Replacement and installation of thread inserts	YY-A-70-40-00-14A-628A-C
Replacement of ring-locked fluid fittings	YY-A-70-40-00-15A-628A-C
Replacement of ring-locked studs	YY-A-70-40-00-16A-628A-C
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Rivet symbols/specifications	YY-A-70-40-00-21A-013A-C
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Huck bolt rivet assemblies	YY-A-70-40-00-23A-624A-C
Blind rivet assemblies	YY-A-70-40-00-24A-624A-C
Huck blind rivet assemblies	YY-A-70-40-00-25A-624A-C
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Milling	YY-A-70-40-00-32A-656A-C
Grinding	YY-A-70-40-00-33A-655A-C
Broaching	YY-A-70-40-00-34A-654A-C
Drilling	YY-A-70-40-00-35A-652A-C
Tapping	YY-A-70-40-00-36A-657A-C
Electrical discharge machining (EDM)	YY-A-70-40-00-37A-653A-C
Electro-chemical machining (ECM)	YY-A-70-40-00-38A-653A-C
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General	YY-A-70-40-00-50A-627A-C
Test specimen inspection	YY-A-70-40-00-51A-390A-C
Parts inspection	YY-A-70-40-00-52A-390A-C
Gas shielded tungsten arc welding of steels, nickel and cobalt alloys	YY-A-70-40-00-53A-627A-C

Gas shielded tungsten arc welding of titanium alloys	YY-A-70-40-00-54A-627A-C
Gas shielded tungsten arc welding of aluminum alloys	YY-A-70-40-00-55A-627A-C
Shielded metal arc welding of steels, nickel and cobalt alloys	YY-A-70-40-00-56A-627A-C
Plasma arc welding	YY-A-70-40-00-57A-627A-C
Electron beam welding	YY-A-70-40-00-58A-627A-C
Automatic welding	YY-A-70-40-00-59A-627A-C
Resistance welding	
General	YY-A-70-40-00-70A-627A-C
Test specimen inspection	YY-A-70-40-00-71A-390A-C
Parts inspection	YY-A-70-40-00-72A-121A-C
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Beam welding	YY-A-70-40-00-74A-627A-C
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High temperature furnace brazing	YY-A-70-40-00-82A-623A-C
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General	YY-A-70-40-00-90A-612A-C
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Localized heat treatment equipment approval	YY-A-70-40-00-A1A-030A-C
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2.7.6 70-50-00 Surface preparation

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Dry abrasive blast -coarse	YY-A-70-50-00-03A-649A-C
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Wet abrasive blast -medium	YY-A-70-50-00-05A-649A-C
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General	YY-A-70-50-00-10A-630A-C
Almen test of surface conditioning intensity	YY-A-70-50-00-11A-390A-C
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2.7.7 70-60-00 Coating application

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Nickel plating on steel -low stress, sulfamate type	YY-A-70-60-00-04A-647A-C
Chromium plating on high stress stainless steels and austenitic alloys	YY-A-70-60-00-05A-647A-C
Chromium plating on low stress carbon steels	YY-A-70-60-00-06A-647A-C
Silver plating on steel	YY-A-70-60-00-07A-647A-C
Diffused Ni/Cd plating on steel	YY-A-70-60-00-08A-647A-C
Cadmium plating on steel	YY-A-70-60-00-09A-647A-C
Chromium plating on aluminum and aluminum alloys	YY-A-70-60-00-10A-647A-C
Selective contact copper plating	YY-A-70-60-00-11A-647A-C
Selective contact nickel plating	YY-A-70-60-00-12A-647A-C
Selective contact silver plating	YY-A-70-60-00-13A-647A-C
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Application of a two part epoxy adhesive	YY-A-70-60-00-62A-621A-C
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Chapter 5.2.2.7

Air specific information sets - Aircrew information

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Chap 4.3	Information management - Data module code
Chap 8.2.1	Maintained SNS - Generic
Chap 9.2	Terms and definitions - Terms, acronyms and subject index

1 General

1.1 Purpose

Information data modules are prepared and codified, where appropriate, using the rules contained here.

1.2 Scope

It covers the rules for the preparation of information needed to provide aircrew with the necessary degree of understanding of the air vehicle and its systems and the procedures to

operate the air vehicle, its systems and equipment to their full potential under normal and failure modes. Unnecessary theory and superfluous engineering detail which are not of direct concern to the aircrew are excluded. Avoid including information that is a duplication of procedures, techniques or any other material contained in other documents (air vehicle/equipment publications, regulations or official publications).

Performance information must be included.

1.3 Standards, definitions, writing style and references

1.3.1 Standards

The standards given in this chapter are applicable with no exceptions.

1.3.2 Definitions

The following definitions and those stated in Chap 9.2 are used as appropriate:

- **Procedure**: A narrative description of a process that the aircrew must complete to place an air vehicle or system in a desired state.
- **Drill**: A list of actions to be carried out by the aircrew to complete a procedure.
- **Checklist**: A compilation of all drills related to the normal and emergency operation of the air vehicle.

1.3.3 Writing style

Where data modules for system description and operation are used in common for aircrew and maintainer information, they are written in the style, scope and depth appropriate to aircrew data modules.

1.3.4 References

References to any other documents are minimized. Avoid repetition of information, ensure related subject matter is adequately referenced so that the reader does not overlook important supplementary information. Such references in a data module to other modules are made by reference to the data module code.

2 Aircrew information

2.1 General

Description and operation (functioning) of the air vehicle is given in the relevant system (systems 21 and up). To present both aircrew and maintainer information at the most general level of description use the same description and operation data modules where possible. As description and operation data modules become more detailed and aircrew or maintainer orientated use different data modules.

System 15 of the SNS is reserved for the remainder of the aircrew information, to the extent that it is not covered in the various system chapters in a manner appropriate to aircrew. It is specifically arranged for the preparation of flight information (eg, flight manuals, operating data manuals and flight crew checklists).

System 05-60-YY of the SNS has been designated for the acceptance/functional check flight.

2.2 Technical content

2.2.1 Introduction

If required, the introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of the Information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-15-00-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-00-0000-**NN**AAA-018Y-A (37 characters)

where "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed

The information code variant is used to distinguish between the different information sets.

2.2.2 Description and operation of systems

2.2.2.1 Data module coding

To assist in the data modules coding, the rules which follow are used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-**YY**-**Y0**-00-00A-043A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y-**YY-Y0**-0000-00AAA-043A-A (37 characters)

where "**YY-Y0**" in general, is the bulk of aircrew information at system level, "YY-00", but can for complex systems be broken down to subsystem level, "YY-Y0".

2.2.2.2 General

Description and operation must include normal operation of systems and equipment, and, if applicable, malfunction analysis information and alternate operation. To describe all systems adequately, theory of operation of direct concern to aircrew can be included. The information provided is relevant and sufficiently detailed to enable aircrew to convert to and subsequently operate the air vehicle safely and effectively without recourse to associated engineering documents. Some systems will require separate normal and emergency operation, malfunction analysis and alternate methods of operation to provide optimum utilization of malfunctioning equipment. Each major air vehicle is covered under a major heading. If necessary, major systems are divided into subsystems and/or equipment. Each component control and indication of the major air vehicle is covered under separate subordinate headings. The name of the system is used as the primary heading and the name of each control or indication as the subordinate heading.

2.2.2.3 Description and operation

The description and operation of each air vehicle are covered in data modules as follows:

- An introductory paragraph must cover the concept of the system and explain the function of the system and how it affects or is affected by any other system. Information on the peculiarities and automatic features of the system are given regarding items such as source of power to operate the system (eg, electric or hydraulic power source) and means by which the system accomplishes its functions. Specific controls can be mentioned but, in order to maintain the general nature of this introductory paragraph, must not be discussed. In some cases (especially automatic systems) it can be advisable to explain the internal mechanization of the system, including operational moding, so that the aircrew can fully appreciate what can be expected of the system. Where appropriate, software and its effects on the system are discussed.
- Each control contributing to the operation of the system is described and its location established. The description must include the function of the control and the end result produced when the control is selected to each of its possible options. The means by which the control accomplishes the end result is stated (eg, mechanically or hydraulically). The specific action that a control actually accomplishes rather than simply stating the action it is supposed to accomplish is stated, for example, "The landing gear lever mechanically releases the up-locks and electrically positions the hydraulic selector valve" and not "the landing gear lever operates the landing gear". Any effect that this control can have on any

other system or which other systems can have on the control is stated. If operating the control requires any special technique or action, it is stated. If practical, a separate paragraph is devoted to each control and the name of the control is employed as the paragraph heading. Descriptions of controls used in normal operation of a system are listed first, followed by descriptions of those controls used as back-up to the normal controls.

- All dedicated indications and warning devices, which are part of the system, are described. This description must include location, function, power source and interpretation of the indications. If an indication is very closely related to a single control, it is described in the paragraph covering the control. A control used to set, produce or adjust an indication is covered under the indication paragraph.
- Each multifunction control must be uniquely identified by location and number, for example (STICK) (ST), BUTTON No.1(1). The function of each control can be given in chart or tabular form. The description must include all functions available for use within the subject system, any indications associated with the operation of the control and any captions/legends or changes to associated indications which can be displayed to prompt selection/deselection of the control. A description is given of the end result produced when the control is operated, both to the subject system and, where applicable, any other system. A full description of multifunction controls is given in the relevant data module.
- Each multifunction display or readout contributing to the operation of the subject system is described. This description must include the various display formats available for use within the subject system, together with pertinent display symbology and the interpretation of relevant mnemonics, graphics, color, etc. Each display is described in its "normal" configuration and also in any other selectable or automatically entered formats (including any additional or changed symbology, either by selection or automatic moding). Fault and warning conditions, which are part of an integrated system, must also be included. A full description of multifunction displays and readouts is given in the relevant data module.
- Include illustrations to illustrate all indications and controls and whenever the illustration helps to describe the operation of the equipment. All types of illustration permitted by Chap 3.9.2 can be used.

2.2.3 Flight information

The flight information data modules are used to build up the flight manual and operating data manual.

2.2.3.1 Data module coding

To assist in the data modules coding, the following rules are used in addition to those given in Chap 4.3.

Data modules must be coded:

YY-Y-**15**-**SY**-**YY**-**NN**A-**XXX**Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y**15**-**SY**-**YY**00-**NN**AAA-**XXX**Y-A (37 characters)

where:

- "**15**" = Aircrew information
- "**SY**", in the subsystem code, gives the subsystem, "00" for General, "10" for Aircraft release/Operating limitations, etc. Refer to Chap 8.2.1.
- "**Y-YY**", in the subsystem and unit or assembly code, is used for further break down by project or organization decision, except for subsystem "40", emergency procedures, which are given in Para 2.2.3.6. Where no breakdown is needed or relevant, "0-00" is used.
- "**NN**", in the disassembly code, is a sequential number starting from "00", if more than one data module is needed
- "**XXX**" is the information codes related to the data modules given in Para 2.2.3.2 thru Para 2.2.3.10

2.2.3.2 General

These data modules contain an Introduction, which gives a general overview of the salient features of the air vehicle (including leading particulars not covered elsewhere within System 15) and its intended use.

Data modules must be coded:

YY-Y-15-0Y-YY-NNA-043A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-0Y-YY00-NNAAA-043A-A (37 characters)

2.2.3.3 Aircraft release/operating limitations

These data modules cover all limitations that must be observed throughout the cleared operating envelope.

Data modules must be coded:

YY-Y-15-1Y-YY-NNA-043A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-1Y-YY00-NNAAA-043A-A (37 characters)

2.2.3.4 Flight characteristics

These data modules describe in narrative form the unique flight characteristics of the air vehicle throughout all phases of flight.

Comprehensive coverage of the handling of the air vehicle is provided throughout all phases of flight, including information such as asymmetric flight, conditions leading to departure, ground resonance and auto rotation characteristics. The recovery technique for all conditions that could be classified as out of control flight is emphasized. Detailed coverage of the technique to be employed in accomplishing operations such as taxiing, take-off, climb, instrument flight and landing are required under all configurations. All precautions to be observed during the various operations are covered.

Data modules must be coded:

YY-Y-15-2Y-YY-NNA-043A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-2Y-YY00-NNAAA-043A-A (37 characters)

2.2.3.5 Normal procedures

2.2.3.5.1 General

These data modules must contain in narrative and/or checklist form all normal procedures required to accomplish a flight. Details and discussions of the operation of the system are covered in the appropriate system chapters. The handling of installed equipment is included, if this is not satisfactorily covered in the system chapters with regard to aircrew. Checking and proper positioning of installed equipment controls can be included if neglect of these operations would affect the safety or the efficiency of the flight. Function, operation or effect of controls is repeated here only as required for emphasis. The use of warnings, cautions and notes is kept to a minimum so that their importance is not degraded.

Data modules must be coded:

YY-Y-15-3Y-YY-NNA-**XXX**Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-3Y-YY00-NNAAA-**XXX**Y-A (37 characters)

where "**XXX**", in the information code, is:

- IC 121 - Pre-operation procedures (crew)
- IC 131 - Normal operation procedures (crew)
- IC 151 - Post-operation procedures (crew)

If no breakdown of the information is needed or relevant, the information code IC 131 is used.

For flight crew checklist information codes IC 125, IC 135 and IC 155, refer to Para 2.2.4.

2.2.3.5.2 Special procedures

Procedures for air vehicles flown under special conditions, such as scramble or missions requiring intermediate operational stops, can be developed. Under these conditions, only certain items of the pre-flight, engine run-up and other applicable procedures need to be accomplished to assure a safe operation. Intermediate stops are defined as stops such as refueling, crew change or re-arming etc. A code can be developed to identify each item of a normal procedure that must be performed during the special operation, (eg, external power connected items not coded can be checked at the discretion of the aircrew, except when an air vehicle has been "cocked" for scramble).

2.2.3.5.3 Alert procedures

The addition of alert procedures must have no effect on the normal procedures. The arrangement of the normal procedures must remain unchanged and reference can be made to the alert procedures in the normal procedures. Since aircrew on alert status use the alert procedures as a master checklist, the alert procedures must include all the steps of the procedures required to operate the air vehicle under the alert concept. The alert procedures must start by referring the aircrew to the preceding normal procedures by directing them to perform the interior and exterior inspections as set forth in the normal checklist. Once the member of aircrew is in the midst of the alert checklist he must not be referred back to the normal procedures until he has completed all alert checks, even if this means repetition of an identical phase contained in the normal procedures. As found necessary, each phase of alert operation must include an explanation of the purpose of that phase. Amplification of the alert procedural entries is avoided if such amplification is already provided in the normal procedures.

2.2.3.5.4 External inspection diagrams

Diagrams covering the paths to be followed and the various checks to be made during the exterior inspection of the air vehicle are included as necessary. The paths must not pass though danger areas.

2.2.3.6 Emergency procedures

2.2.3.6.1 General

These data modules must contain in narrative and/or checklist form the procedures to be followed to meet any emergency that could reasonably be expected. Emergency operation is covered only if it affects flight safety or the ability to complete the mission. Emergency systems and equipment are described in the various system chapters. Each emergency is listed and the symptoms which can be felt or observed, together with the indications provided by the warning system and other instrumentation, are described. If applicable, multifunction display readouts giving emergency information (actions to be taken, special information) are included in a comprehensive form, as illustrations showing the layout of the electronic displays and in listed form. The effects of the emergency on air vehicle operation and handling and/or the effects on individual system operation must also be described. Include explanatory notes to cover any points in the emergency situation or in the emergency procedure, the significance of which cannot be immediately apparent to the aircrew. All precautions to be observed in coping with an emergency are discussed. Normally, combinations of emergencies are not covered because of the numerous possible combinations. Many emergencies will require some urgency in landing the aircraft. Emergency procedures requiring expedition in landing are written with full consideration of the expected time-to-failure after initial malfunction of the critical system.

Data modules must be coded:

YY-Y-15-**4Y**-YY-NNA-141Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-**4Y**-YY00-NNAAA-141Y-A (37 characters)

where "**4Y**" is:

- 41 - General
- 42 - Ground emergencies
- 43 - Take-off emergencies
- 44 - System related emergencies
- 45 - Single or multi-engine failures
- 46 - Approach/landing emergencies
- 47 - Avionic system failures
- 48 - Other emergencies or failures
- 49 - Multifunction display readouts giving emergency information

If no breakdown is needed or relevant, the information code 40 is used.

For flight crew checklist information code 145, refer to Para 2.2.4.

2.2.3.6.2 Helicopters

On helicopters some equipment malfunctions require the air vehicle to "Land immediately", others historically lead to rapid deterioration of serviceability of a critical system which in turn requires the crew to "Land as soon as possible". Other equipment malfunctions result in a less rapid deterioration of flying qualities and a less urgent requirement to land. For those malfunctions the term "Land as soon as practicable" has been designated. Therefore, these three terms are defined in the first data module within this section (data module code: YY-Y-15-41-00-01A-141A-A) and used throughout the section as general guidance where appropriate, to relate to the aircrew the degree of urgency in landing:

- "Land immediately" - An emergency will be declared and the air vehicle landed at once even if, for example, the outcome is ditching or landing in trees. The consequences of continued flight are likely to be more hazardous than those of landing at a site normally considered to be unsuitable.
- "Land as soon as possible" - An emergency will be declared and flight continued for no longer than necessary to accomplish a safe but unhurried landing at the nearest site.
- "Land as soon as practicable" - Emergency conditions are less urgent and the air vehicle is landed at the nearest aviation location or, if one is not reasonably close, at a safe landing site selected for subsequent convenience.

2.2.3.6.3 Fixed-wing air vehicles

On fixed-wing air vehicles some equipment malfunctions require the crew to "Land as soon as possible". Other equipment malfunctions result in a less rapid deterioration of flying qualities and a less urgent requirement to land. For those malfunctions the term "Land as soon as practicable" has been designated. Therefore, these two terms are defined in the first data module within this section (data module code: YY-Y-15-41-00-01A-141A-A) and used throughout the section as general guidance to relate to the aircrew the degree of urgency in landing:

- "Land as soon as possible" - An emergency will be declared and the air vehicle landed at the nearest airfield with a runway suitable for a safe landing.
- "Land as soon as practicable" - Emergency conditions are less urgent and the air vehicle is landed at the nearest airfield where it can be landed safely and practical assistance for the air vehicle type can be expected.

2.2.3.6.4 *Arrangement of emergencies*
Emergencies must, if applicable, be arranged in the following sequence:

1 **Ground emergencies**: These are the emergencies, which might occur during the aircrew manning the air vehicle until the commencement of the take-off phase.

2 **Take-off emergencies**: These are the emergencies, which might occur during the phase from take-off on the ground until airborne with the climb configuration or emergency landing configuration established.

3 **System related emergencies**: These are emergencies, which can occur during any phase of operation, therefore they must not be associated with a particular phase of operation, unless otherwise stated.

4 **Single or multi-engine failures**: These failures must include all resulting emergencies. Procedures are given to cover all phases of flight including the landing portion. Avoid, if feasible, references to other applicable drills, consolidated drills are preferred.

5 **Approach/landing emergencies**: These emergencies must include all system failures that require special procedures to accomplish the approach and landing.

6 **Avionic system failures**: These emergencies must contain information with regard to failures of the avionic system and provide procedures which can enable the crew to complete the mission successfully.

7 **Other emergencies or failures**: Any other emergency or failure appropriate to role or air vehicle type.

2.2.3.6.5 *Illustrations*
Illustrations can be added to explain emergency procedures.

2.2.3.6.6 *General emergency procedures*
In the general emergency procedures data modules (data module code: YY-Y-15-41-00-01A-141A-A), a statement of the three basic rules are included. This example statement refers:

Example:

In all emergencies, the overriding consideration must be to:

1 Maintain air vehicle control

2 Analyze the situation

3 Take proper action"

2.2.3.7 Special conditions
These data modules must provide information pertaining to the operation of air vehicles under special conditions (eg, adverse weather and climatic conditions). It is primarily narrative in nature. Presentations in the form of procedural items are used only to cover specific procedures that are characteristic of adverse weather operations.

Data modules must be coded:

YY-Y-15-5Y-YY-NNA-**XXX**Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-5Y-YY00-NNAAA-**XXX**Y-A (37 characters)

where "**XXX**", in the information code, is:

- IC 043 - Description of function attributed to crew (functional breakdown)
- IC 131 - Normal operation procedures (crew)

- IC 141 - Emergency operation procedures (crew)

2.2.3.8 Performance data

2.2.3.8.1 General

These data modules must provide the data to be used by the operators for flight planning purposes and are the best available data. They must also allow performance studies and comparisons to be made.

Data modules must be coded:

YY-Y-15-6Y-YY-NNA-030A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-6Y-YY00-NNAAA-030A-A (37 characters)

2.2.3.8.2 Fundamental elements

The base from which the operating data are calculated must have taken into account the following fundamental elements:

- The performance datum of the air vehicle must be defined
- The performance datum of the engines must be defined
- The level of performance appropriate to service use must be specified
- The criteria for scheduling the standard of performance must be specified

2.2.3.8.3 Performance datum of air vehicle

This datum must cover all phases of flight, extremes of the flight envelope, ambient conditions, air vehicle and external stores configurations for which the air vehicle must be cleared or certificated.

2.2.3.8.4 Performance datum of engines

This datum must cover all phases of flight, extremes of the flight envelope and ambient conditions for which the air vehicle must be cleared or certificated.

2.2.3.8.5 Variations from datum performance

The assumptions made to account for the variations from the datum performance of both the air vehicle and engines during the service life of the air vehicle are defined. These assumptions are applied in the calculation of the performance data presented in any output.

2.2.3.8.6 Standards of performance

Several standards of performance can be appropriate dependent on the levels of risk determined by the operational role of the air vehicle. The criteria in the standard of performance are applied, as appropriate, in the calculation of the performance data presented in the output for each standard of performance. Such standards are to be agreed upon as a project or an organization requirement.

Business rule decision point BRDP-S1-00453 - Standards of performance data in aircrew information:

- Decide on the standards of performance to be used in the calculation.

2.2.3.8.7 Phases of flight

Performance data can be required at some of the conditions or phases of flight listed below. These data must cover all phases of flight, extremes of the flight envelope, ambient conditions, air vehicle and external stores configurations for which the air vehicle must be cleared or certificated. Data must be provided with all engines operating and with one or more engines inoperative, as required.

- Take-off from dry, wet or contaminated runway surfaces
- Initial climb-out and obstacle clearance
- Hovering inside and outside the ground effect

- Flyaway, vertical or run-on landings, or other options following an engine failure in hover/ low speed flight
- Vertical climb
- Translational climb
- Net flight path profiles
- Cruising flight for maximum range and endurance or any other appropriate speed
- Supersonic flight
- Maximum altitude
- Combat and/or maneuvering flight or boundaries
- Specific excess power boundaries
- Tactical low level and/or terrain following operations
- Carrier/Ship-borne operations
- Descent
- Holding
- Approach and landing
- Overshoot and/or baulked landing
- Ferry flight information
- Flight in abnormal configurations
- Effects of, or performance with, external stores and/or underslung loads carried
- Effects of, or performance with, sand, ice, foreign object, weapon countermeasure or other engine intake protection devices fitted
- Any other appropriate conditions required

The above data can be required for:

- Normal operations
- Mission planning
- Operations from restricted sites or airfields and/or requiring steep climb-out or approach profiles
- Operations when higher than normal risks are accepted and authorized

2.2.3.8.8 Presentation

Performance data can be presented in the most appropriate form, including reference to external software using basic aerodynamic algorithms.

2.2.3.9 Role operation/Weapon system techniques

2.2.3.9.1 Descriptions

These data modules describe the armament/role system, controls and installed equipment and will be included only to the extent that they are not covered in the various system chapters in a manner appropriate to aircrew.

Data modules must be coded:

YY-Y-15-7Y-YY-NNA-043A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-7Y-YY00-NNAAA-043A-A (37 characters)

2.2.3.9.2 Safety requirements

These data modules specify all safety requirements relevant to the armament/role system fitted.

Data modules must be coded:

YY-Y-15-7Y-YY-NNA-012A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-7Y-YY00-NNAAA-012A-A (37 characters)

2.2.3.9.3 *Normal and reversionary procedures*
These data modules must contain in narrative and/or checklist form, as necessary, all normal and reversionary procedures relating to weapon delivery/role operation/equipment operation to be followed from the time the aircrew arrive at the air vehicle until they depart from the air vehicle and to an extent that it is not covered in the appropriate system chapters or in Normal procedures. Refer to Para 2.2.3.5.

Data modules must be coded:

YY-Y-15-7Y-YY-NNA-**XXX**Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-7Y-YY00-NNAAA-**XXX**Y-A (37 characters)

where "**XXX**", in the information code, is:

- IC 121 - Pre-operation procedures (crew)
- IC 131 - Normal operation procedures (crew)
- IC 151 - Post-operation procedures (crew)

If no breakdown of the information code is needed or relevant, the information code 131 is used.

2.2.3.9.4 *Emergency procedures*
These data modules must contain in narrative and/or checklist form, as necessary, all emergency procedures relating to weapon delivery/role operation not covered in the appropriate system chapters or in emergency procedures Refer to Para 2.2.3.6.

Data modules must be coded:

YY-Y-15-7Y-YY-NNA-141Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-7Y-YY00-NNAAA-141Y-A (37 characters)

2.2.3.9.5 *Weapons procedures and sample problems*
These data modules describe the weapons planning procedures and give in charts and in tabular form the data related to weapon delivery/role operations.

- **Scope**: The basis for the charts and tables and assumptions used with respect to temperature, pressure, atmospheric density etc, are discussed including appropriate reference line illustrations and definitions. The appropriate planning software program applicable to the air vehicle weapon aiming system is identified.
- **Description of charts and tables**: Sample problems for each type of delivery mode for each weapon will only be required if it is decided that it is necessary for the aircrew to be able to carry out manual calculations.

Data modules must be coded:

YY-Y-15-7Y-YY-NNA-030Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-7Y-YY00-NNAAA-030Y-A (37 characters)

2.2.3.10 Configurations
These data modules must contain the various stores configurations, including weapons, fuel tanks, and special pods carried both internally and externally and include details of the effect on weight, drag index, limitations and flight envelope where they are not covered in flight characteristics (refer to Para 2.2.3.4), performance data (refer to Para 2.2.3.8) or role operation/weapon system procedures (refer to Para 2.2.3.9) data modules.

Data modules must be coded:

YY-Y-15-8Y-YY-NNA-020A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-8Y-YY00-NNAAA-020A-A (37 characters)

2.2.4 Flight crew checklist

2.2.4.1 General

The purpose of the flight crew checklist must provide aircrew with drills for normal operation of the air vehicle, for air vehicle and system malfunctions, for emergency procedures and for special operations. Include relevant operating data to enable the air vehicle to be operated safely and effectively.

2.2.4.2 Structure

By project or organization decision the checklist can be built up according to either of the following two models:

- **Multi-data modules checklist**: A compilation of separate data modules, each containing the drills of the corresponding aircrew information data module.
- **Comprehensive checklist**: Checklist consisting of one data module, containing all necessary drills related to one section (eg, normal procedures, emergency procedures) of the aircrew information.

Business rule decision point BRDP-S1-00455 - Select model for checklist for structures in aircrew information:

- Decide which of the two models are used to structure checklists.

2.2.4.3 Data module coding

2.2.4.3.1 Multi-data modules checklist

The checklist data modules must have the same data module code as its Aircrew Information (AI) procedure data modules, except for the information code.

Example:

- AI procedure DMC-1Y-A-15-44-YY-NNA-141A-A (system related emergencies)
- Checklist DMC-1Y-A-15-44-YY-NNA-145A-A

2.2.4.3.2 Comprehensive checklist

The checklist must have a data module code with the same section/subsystem number, as the AI section/subsystem to which it relates.

Example:

- AI procedure DMC-1Y-A-15-4Y-YY-NNA-141A-A (emergency procedures, any data module)
- Checklist DMC-1Y-A-15-40-00-NNA-145A-A

2.2.4.4 Preparation

Flight crew checklist are to incorporate all drills relating to equipment operation, including those required by non-flight deck aircrew, appropriate to the specific air vehicle and role. The order of drills will be project specific. Include limitations and operating data required by the project or the organization.

2.2.4.5 Sequence of phases, actions and checks

Phases, actions and checks are arranged chronologically and designed to avoid requiring the member of aircrew to retrace his steps. Ensure all checks are made from left to right or top to bottom, except where chronology must take precedence. Group checks on the ground to

minimize control manipulation and ground operating time. Phases can be added or deleted and checks can be rearranged to other phases to provide for specific situations.

2.2.4.6 Brevity
All instructions are concise, but brevity must not be achieved at the expense of accuracy or clarity.

2.2.4.7 Order of drills
The checklist must contain the following information, other information can be added as required by projects:

- **Normal drills**: Those drills which deal with the normal operation of the air vehicle and its equipment is laid out in chronological order, starting from the time that the aircrew approach the air vehicle before flight until the time that they leave the air vehicle after engine shutdown.
- **Operating data**: As required.
- **Limitations**: As required.
- **System malfunction and emergency drills**: Single system emergency drills are written under generic headings such as "Fires", "Hydraulic system failures" etc. These drills are presented in bold face to indicate that they are drills that must be memorized. Complex emergency drills, which require actions on more than one system (eg, following an engine shutdown), must, where possible, be presented in full to prevent the need for cross reference to other drills.

Business rule decision point BRDP-S1-00456 - Order of drills in aircrew information:

- Decide whether the order of drills will be project specific. Limitations and operating data required by the project must be included.

Business rule decision point BRDP-S1-00457 - Supplementing the order of drills in aircrew information:

- Decide whether to supplement the order of drills checklist listing.

2.2.4.8 Numbering
Numbering of checks within each drill can be used as individual project requirements dictate.

Business rule decision point BRDP-S1-00458 - Numbering of checks within drills in aircrew information:

- Decide on the numbering of checks within each drill.

2.2.4.9 Emergency drills
Emergency drills must normally start with the indications of the failure.

2.2.4.10 Special checks
An asterisk [*] or obelus (dagger marking) [†] can be used to identify special checks (eg, alert or quick turn round checks). The meanings of such markings must be explained in the "Notes to Users" or at the head of the group of checks where the markings are used.

2.2.4.11 Tables
If used, tables are normally be set to the full width of the area of the checklist. Column headings are in upper and lowercase, and columns are separated by vertical lines. Horizontal lines can be used as required.

2.2.4.12 Illustrations
Illustrations must not be used, unless it is impracticable to show the data effectively in any other way.

2.2.4.13 Safety precautions
Where applicable, a summary of safety precautions are provided. The summary must precede the normal drills and must include all general precautions.

2.2.4.14 Name
The name used in the checklist modules are identical to that used in the remainder of the CSDB for the production of other aircrew information. Abbreviations, as used in other parts of the CSDB, can be used as necessary.

2.2.4.15 Warnings, cautions and notes
Warnings, cautions and notes can be used in checklist format if necessary.

2.2.4.16 Limitations
The following limitations can be incorporated within checklists:

- Airframe limitations
- Engine limitations
- Approved fuels and oils
- System limitations

2.2.4.17 Operating data
Any operating data presented must be from a validated source.

Chapter 5.2.3

Information sets - Land/Sea specific information sets

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Chap 5.2.3.2	Land/sea specific information sets - Crew/Operator operation information
Chap 5.2.3.3	Land/sea specific information sets - Crew/Operator sequential operation information
Chap 5.2.3.4	Land/sea specific information sets - Crew/Operator fault detection, isolation and resolution information
Chap 5.2.3.5	Land/sea specific information sets - International, national and regulatory scheduled check information

1 General

This chapter provides the references for the preparation and coding of land/sea specific information sets.

2 Land/sea specific information sets

These are as follows:

- Land/Sea specific information sets - Crew/Operator descriptive information. Refer to Chap 5.2.3.1.
- Land/Sea specific information sets - Crew/Operator operation. Refer to Chap 5.2.3.2.
- Land/Sea specific information sets - Crew/Operator sequential operation. Refer to Chap 5.2.3.3.
- Land/Sea specific information sets - Crew/Operator fault detection, isolation and resolution. Refer to Chap 5.2.3.4.

- Land/Sea specific information sets - International, national and regulatory scheduled check. Refer to Chap 5.2.3.5.

Chapter 5.2.3.1

Land/Sea specific information sets - Crew/Operator descriptive information

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Chap 3.9.3	Authoring - Warnings, cautions and notes
Chap 9.2	Terms and definitions - Terms, acronyms and subject index

1 General

1.1 Purpose

Land/Sea Product crew/operator descriptive information data modules are prepared and codified, where appropriate, using the rules contained here.

1.2 Scope

It the rules for the preparation of information needed to provide crew/operator with the necessary degree of understanding of the Land/Sea Product.

Unnecessary theory and superfluous engineering detail, which are not of direct concern to the crew/operator as defined by the project or the organization, must be excluded. Inclusion of information that is a duplication of descriptions or any other material contained in other documents (Land/Sea Product publications, regulations or official publications) must be avoided. Performance information must be included.

This information set is divided into two groups:

- General information
- Description

1.2.1 General information

The information must contain the general information (eg, general description, technical data, etc) of the Land/Sea Product.

1.2.2 Land/Sea Product description for the Crew/Operator

The following three different description types can be used as defined by the project or the organization:

- Functional description (predominant descriptions of functions) of the Land/Sea Product.
- Physical breakdown orientated description (descriptions of each part of a physical breakdown) of the Land/Sea Product.
- External equipment description (descriptions of components or equipment which are outside of the defined project, for example ammunition, but for which the crew/operator must be provided information) of the Land/Sea Product.

Business rule decision point BRDP-S1-00459 - Description types for Land/Sea Products for the crew/operators:

- Decide on the description types to be used: functional, physical breakdown, or external equipment.

1.3 Standards and definitions

1.3.1 Standards

The following chapters are applicable when using this chapter:

- Chap 3.4 - Zoning and access
- Chap 3.6 - Security and data restrictions
- Chap 3.7 - Quality assurance
- Chap 3.9.1 - General writing rules

- Chap 3.9.2 - Illustration rules and multimedia
- Chap 3.9.3 - Warnings, cautions and notes

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. The project or the organization must establish their own data module coding strategy, using a code length that suits the project's needs.

1.3.2 Writing style

Where data modules for Product descriptions are used in common for Land/Sea crew/operator and maintainer information, they must be written in the style, scope and depth appropriate to Land/Sea crew/operator data modules.

1.3.3 References

Reference to any other documents inside this information set must be used in a structured way. To avoid repetition of information, related subject matter must be adequately referenced. Such references in a data module to other modules must be made by reference to the data module code and title and to other technical publications by reference to their identifier.

1.3.4 Definitions

The definitions as stated in Chap 9.2 must be used as appropriate.

2 Crew/Operator descriptive information content

2.1 Introduction

The introduction data module contains explanation of the purpose, scope, structure, special format and use of the technical content of this information set. They also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-00-00-00-NNA-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A00-00-0000-NNAAA-018Y-A (37 characters)

The information code variant is used to distinguish between the different information sets.

2.2 Land/Sea Product - General

2.2.1 General description

General description must contain an overview of the whole Product with the following topics:

- Illustration and or pictures of the Land/Sea Product
- Purpose of the Land/Sea Product
- General description of construction and use of the Land/Sea Product

Data modules must be coded:

YY-Y-15-00-00-YYA-043A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-00-0000-YYAAA-043A-A (37 characters)

2.2.2 Technical data

Technical data include all necessary information about the Land/Sea Product and its components, (eg, weights and measures, performance data, limits (when they are in a descriptive manner: view-areas of the different crew-members/operators under use of optical components)).

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-033A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-033A-A (37 characters)

2.2.3 Operation areas and devices

The description of operation areas covers all different kind of structures where the Land/Sea Product is divided into functional or tactical purpose groups. Furthermore a summary of all used devices or components must be added for the above defined groups.

Data modules must be coded:

YY-Y-15-00-00-YYA-055A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-00-0000-YYAAA-055A-A (37 characters)

2.3 Land/Sea Product description

2.3.1 Technical description (functional breakdown orientated)

The functional breakdown orientated description of the Land/Sea Product covers all topics, appropriate for the Land/Sea crew/operator to realize the combine or function of more than one device or component. The goal must put the Land/Sea crew/operator in the position to understand the functionalities of the Land/Sea Product. The information must also be usable for training purposes.

Data modules must be coded:

YY-Y-15-05-YY-YYY-043A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-05-YYYY-YYYYY-043A-A (37 characters)

2.3.2 Technical description (physical breakdown orientated)

The components of the Product (if the information is necessary and on the level for the Land/Sea crew/operator) must have a description about the construction and its function in data modules as follows:

- Each control of the Product must be described and its location established.
- In some cases (especially automatic systems) it is advisable to explain the internal mechanization of the Product, so that the Land/Sea crew/operator can fully appreciate what can be expected of the Product. Where appropriate, software and its effects on the Product must be described.
- All dedicated indications and warning devices, which are part of the Product, must be described.

Illustrations must be included to illustrate all indications and controls. All types of illustrations permitted by Chap 3.9.2 can be used.

References between technical description data modules must be used if necessary (show dependency).

The information must also be usable for training purposes.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-044A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-044A-A (37 characters)

2.3.3 Technical description (independent equipment)

All equipment not covered by the model identification definition but nevertheless used at the Land/Sea Product (eg, ammunition), describe the construction and its function on crew/operator level.

Data modules must be coded:

YY-Y-15-06-00-YYY-**XXX**A-A (17 characters)

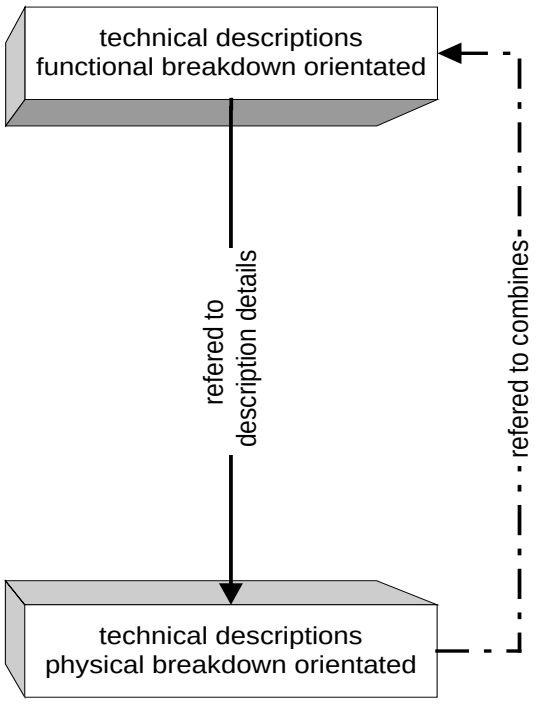
thru

YYYYYYYYYYYYYY-YYYY-Y15-06-0000-YYYYY-**XXX**A-A (37 characters)

Where "**XXX**", in the information code, is either 033 or 043

2.3.4 Content and references

The different kind of descriptions are connected by references, as shown in Fig 1, to extend the information content and usability for the Land/Sea crew/operator. The functional breakdown orientated description gives the Land/Sea crew/operator an overview, the physical breakdown orientated description and details of the individual component.



ICN-AE-A-050203-A-U8025-00001-A-001-01

Fig 1 Data and reference model descriptive information

The physical breakdown allows an implicit connection between all other information on the same breakdown.

Chapter 5.2.3.2

Land/sea specific information sets - Crew/Operator operation information

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Chap 3.9.3	Authoring - Warnings, cautions and notes
Chap 9.2	Terms and data dictionary - Glossary of terms, abbreviations and acronyms

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for crew/operator operation information.

1.2 Scope

It covers the rules for the preparation of information needed to provide land/sea crew with the operation of the land/sea Product.

This information set is divided into seven groups:

- General information
- Operation
- Operating data manual
- Operating under special conditions
- Emergency procedures
- Transportation
- Equipment stowing

1.3 Standards and definitions

1.3.1 Standards

The following chapters are applicable when using this chapter:

- Chap 3.9.1 - General writing rules
- Chap 3.9.2 - Illustration rules and multimedia
- Chap 3.9.3 - Warnings, cautions and notes
- Chap 3.4 - Zoning and access
- Chap 3.6 - Security and data restrictions
- Chap 3.7 - Quality assurance

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. The project or the organization must establish their own data module coding strategy, using a code length that suits the project or organization needs.

1.3.2 Writing style

Where data modules for Product operation are used in common for land/sea crew/operator and maintainer information, they must be written in the style, scope and depth appropriate to land/sea crew/operator data modules.

1.3.3 References

Reference to any other documents inside this information set must be used in a structured way. To avoid repetition of information, related subject matter must be adequately referenced so that the reader does not overlook important supplementary information. Such references in a data module to other modules must be made by reference to the data module code and title.

1.3.4 Definitions

The definitions as stated in Chap 9.2 must be used as appropriate.

2 Crew/Operator operation information

2.1 Introduction

The introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of this information set. They could also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-15-00-00-NNA-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-00-0000-NNAAA-018Y-A (37 characters)

Where "**NN**", in the disassembly code, is a sequential number starting from "00" if more than one data module is needed.

The information code variant is used to distinguish between the different information sets.

2.2 Land/Sea Product operation - General

The information must contain the general information (eg, general introduction into operation, conditions, performance limits) of the land/sea Product.

Data modules must be coded:

YY-Y-15-30-YY-YYY-043A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-30-YY-YYYYY-043A-A (37 characters)

2.3 Land/Sea Product operation

2.3.1 Operation (physical breakdown orientated)

The operation data modules must include all descriptions necessary to perform the operation of Product to put into operation, to operate during use or to turn off the defined Product. The operation description must be created as a step by step structure.

It must also include all preliminary requirements as a description or as a reference to the related data modules.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules must be coded:

YY-Y-YY-YY-YY-YYY-**XXX**A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-YYYY-YYYYY-**XXX**A-A (37 characters)

Where "**XXX**", in the information code, is IC 111, IC112, IC 121, IC 131, IC 141 or IC 151.

2.3.2 Operation (functional breakdown orientated)

The operation data modules must include all descriptions necessary to perform the operation of components (functional groups) to put into operation, to operate during use or to turn off the

defined components (functional groups). The operation description must be created as a step by step structure.

All dependencies between the single Product inside the defined component (functional group) must as far as the crew needs be explained or taken into consideration for the content of the data modules.

It must also include all preliminary requirements as a description or as a reference to the related data modules.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules must be coded:

YY-Y-15-**3Y**-YY-YYY-**XXX**A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-**3Y**-YYYY-YYYYY-**XXX**A-A (37 characters)

Where

- "**3Y**", in the sub-/subsystem code, is 31 thru 38
- "**XXX**", in the information code, is IC 111, IC 112, IC 121, IC 131, IC 141 or IC 151

2.3.3 Land/Sea Product operating data

These data modules must contain all data for active service that are not described in the topic land/sea Product operation.

These could be information of Product parameters in case of battle not for training use or other operation instruction only applicable under battle conditions.

Data modules must be coded:

YY-Y-15-2Y-YY-YYY-**XXX**A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-2Y-YYYY-YYYYY-**XXX**A-A (37 characters)

Where "**XXX**", in the information code, is IC 111, IC 112, IC 121, IC 131, IC 141 or IC 151.

2.4 Operating under special conditions

2.4.1 Heat conditions

These data modules must contain all relevant additional operation instructions to realize the whole functionality of the land/sea Product under higher temperature.

Data modules must be coded:

YY-Y-15-51-YY-YYY-YYYA-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-51-YYYY-YYYYY-YYYA-A (37 characters)

2.4.2 Cold conditions

These data modules must contain all relevant additional operation instructions to realize the whole functionality of the land/sea Product under lower temperature.

Data modules must be coded:

YY-Y-15-51-YY-YYY-YYYB-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-51-YYYY-YYYYY-YYYB-A (37 characters)

2.4.3 Dust conditions

These data modules must contain all relevant additional operation instructions to realize the whole functionality of the land/sea Product used in areas by an abnormal influence of dust.

An example could be the shorter period of cleaning or changing of filters, etc.

Data modules must be coded:

YY-Y-15-51-YY-YYY-YYYC-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-51-YYYY-YYYYY-YYYC-A (37 characters)

2.4.4 Recovery or tow away

These data modules must contain the detail instructions for the

- preparation and preliminary requirements of the land/sea Product for the recovery under consideration of the safety instructions
- performing of the recovery and/or the afterwards tow away of the land/sea Product under consideration of the safety instructions

Only land/sea Product specific instructions must be created. Standard practices, or other general information about recovery or tow away, which are defined in other general publications must not be included. Only references must be included.

Data modules must be coded:

YY-Y-15-52-YY-YYY-YYYA-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-52-YYYY-YYYYY-YYYA-A (37 characters)

2.4.5 Crossing of stretch water

These data modules must contain the detail instructions for the

- preparation and preliminary requirements of the land/sea Product for the crossing of stretch water under consideration of the safety instructions
- performing of the crossing of stretch water and the afterwards close up procedures of the land/sea Product under consideration of the safety instructions

Only land/sea Product specific instructions must be created. Standard practices, or other general information about crossing of stretch water, which are defined in other general publications must not be included. Only references must be included.

Data modules must be coded:

YY-Y-15-53-YY-YYY-YYYA-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-53-YYYY-YYYYY-YYYA-A (37 characters)

2.4.6 Nuclear, biological, chemical (NBC) conditions

These data modules must contain the detail instructions for the

- preparation and performing of preliminary requirements for the land/sea Product under NBC conditions
- using of the land/sea Product under NBC conditions

Only land/sea Product specific instructions must be created. Standard practices, or other general information under NBC conditions, which are defined in other general publications must not be included. Only references must be included.

Data modules must be coded:

YY-Y-15-54-YY-YYY-YYYA-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-54-YYYY-YYYYY-YYYA-A (37 characters)

2.4.7 In case of fire at the Land/Sea Product

These data modules must contain all instructions to extinguish or to suppress fire at the land/sea Product.

Data modules must be coded:

YY-Y-15-55-YY-YYY-YYYA-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-55-YYYY-YYYYY-YYYA-A (37 characters)

2.4.8 Make unserviceable or destruction of the Land/Sea Product

These data modules must contain all instructions to destroy the land/sea Product systematically in case of

- the crew/operator has been ordered to perform the make unserviceable or destruction
- the tactical situation requires the make unserviceable or destruction

The instructions could be defined in different levels of make unserviceable or destruction.

Data modules must be coded:

YY-Y-15-59-YY-YYY-YYYA-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-59-YYYY-YYYYY-YYYA-A (37 characters)

2.5 Emergency procedures

These data modules must cover all information to

- use emergency exits if necessary
- operate the faulty land/sea Product under reduced readiness to work

Data modules must be coded:

YY-Y-15-40-YY-YYY-141A-A (17 characters)

or

YY-Y-15-40-YY-YYY-145A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-40-YYYY-YYYYY-141A-A (37 characters)

or

YYYYYYYYYYYYYY-YYYY-Y15-40-YYYY-YYYYY-145A-A (37 characters)

2.6 Transportation

These data modules must describe all procedures to prepare and carry out the transportation of land/sea Product. Standard practices must only be included unless they are not described in other general publications.

It must also include all necessary safety instructions (as descriptions or as references).

The different types of transportation data modules must be coded:

- Transport by train - YY-Y-15-39-1Y-YYY-**XXX**A-A
- Transport by ship - YY-Y-15-39-2Y-YYY-**XXX**A-A
- Transport by plane - YY-Y-15-39-3Y-YYY-**XXX**A-A
- Transport on road (eg, low-loader) - YY-Y-15-39-4Y-YYY-**XXX**A-ATransport defined by project - YY-Y-15-39-**YY**-YYY-**XXX**A-A

thru

- Transport by train - YYYYYYYYYYYYYY-YYYY-Y15-39-1Y00-YYYYY-**XXX**A-A
- Transport by ship - YYYYYYYYYYYYYY-YYYY-Y15-39-2Y00-YYYYY-**XXX**A-A
- Transport by plane - YYYYYYYYYYYYYY-YYYY-Y15-39-3Y00-YYYYY-**XXX**A-A
- Transport by road - YYYYYYYYYYYYYY-YYYY-Y15-39-4Y00-YYYYY-**XXX**A-A
- Transport defined by project - YYYYYYYYYYYYYY-YYYY-Y15-39-**YY**00-YYYYY-**XXX**A-A

Where:

- "**YY**", in the unit or assembly code, is = **5Y**, **6Y**, …, for transport defined by project
- "**XXX**", in the information code, is IC 111, IC 112, IC 121, IC 131, IC 141 or IC 151

2.7 Equipment stowing

These data modules must include all necessary information for

- give the crew/operator an overview of the stowing locations
- what equipment in which number has to be stowed in the defined locations

Data modules must be coded:

YY-Y-15-04-YY-YYY-056A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y15-04-YYYY-YYYYY-056A-A (37 characters)

Chapter 5.2.3.3

Land/sea specific information sets - Crew/Operator sequential operation information

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Chap 3.9.2	Authoring - Illustration rules and multimedia
Chap 3.9.3	Authoring - Warnings, cautions and notes
Chap 9.2	Terms and definition - Terms, acronyms and subject index

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for land/sea crew/operator sequential operation list information.

1.2 Scope

It covers the rules for the preparation of information needed to provide land/sea crew/operator with the sequential operation of the land/sea Product and its subsystems in checklist form.

This information set is divided into four groups:

- General information
- Operation (sequential)
- Operating under special conditions (sequential)
- Transportation (sequential)

1.3 Standards and definitions

1.3.1 Standards

The following chapters are applicable when using this chapter:

- Chap 3.9.1 - General writing rules
- Chap 3.9.2 - Illustration rules and multimedia
- Chap 3.9.3 - Warnings, cautions and notes
- Chap 3.4 - Zoning and access
- Chap 3.6 - Security and data restrictions
- Chap 3.7 - Quality assurance

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. The project or the organization must establish their own data module coding strategy, using a code length that suits the project or organization needs.

1.3.2 References

Reference to any other documents inside this information set must be used in a structured way. To avoid repetition of information, related subject matter must be adequately referenced so that the reader does not overlook important supplementary information. Such references in a data module to other modules must be made by reference to the data module code and title.

1.3.3 Definitions

The definitions as stated in Chap 9.2 must be used as appropriate.

2 Crew/Operator sequential operation information

2.1 Introduction

The introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of this information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-15-36-00-00A-018A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-36-0000-00AAA-018A-A (37 characters)

2.1.1 Land/Sea Product sequential operation - General

The information must contain the general information (like general introduction into sequential operation lists, conditions, performance limits, etc) of the land/sea Product.

Data modules containing a description attributed to crew are coded:

YY-Y-15-36-YY-YYY-043Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-36-YYYY-YYYYY-043Y-A (37 characters)

2.1.2 Land/Sea Product sequential operation list

This data module must provide a sequential listing of the tasks. The data modules must be constructed using the inspectionDefinition branch of the schedules Schema. The attribute `taskSeqNumber` of the element <`taskItem`> must be used to capture the sequential number of the task. This list must also provide links to the listed tasks.

Data modules must be coded:

YY-Y-05-SS-00-NNY-000Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A05-SS-0000-NNYYY-000Y-A (37 characters)

Where:

- SS = 45 for a sequence of scheduled tasks
- SS = 55 for a sequence of unscheduled tasks
- SS = 65 for a sequence of "acceptance" tasks (for example hand over)
- NN defaults to "00" but if there was a sequence of sequenced tasks then NN must be set to the parent sequence

2.2 Land/Sea Product operation (sequential)

2.2.1 Preliminary requirements

The Preliminary Requirements for sequential operation data modules must include all necessary information to prepare the sequential operation of the land/sea Product to put into operation, to operate during use or to turn off the defined land/sea Product. The sequential operation description must be created as a step by step structure in checklist form.

It must include all preliminary requirements as a description or as a reference to the related data modules.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data module.

Data modules must be coded:

YY-Y-15-36-YY-YYY-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-36-YYYY-YYYYY-YYYY-A (37 characters)

2.2.2 Put into operation

The sequential put into operation data modules must include all necessary information to perform sequential put into operation activities of the Product. The sequential put into operation description must be created as a step by step structure in checklist form.

Data modules must be coded:

YY-Y-15-37-YY-YYY-125Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-37-YYYY-YYYYY-125Y-A (37 characters)

2.2.3 Operation during use

The sequential operation during use data modules must include all necessary information to perform sequential operation of the Product. The sequential operation description must be created as a step by step structure in checklist form.

Data modules must be coded:

YY-A-15-37-YY-YYY-135Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-37-YYYY-YYYYY-135Y-A (37 characters)

2.2.4 Emergency operation

The sequential emergency operation data modules must include all necessary information to perform sequential emergency operation of the Product. The sequential emergency operation description must be created as a step by step structure in checklist form.

Data modules must be coded:

YY-Y-15-37-YY-YYY-145Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-37-YYYY-YYYYY-145Y-A (37 characters)

2.2.5 Operation to turn off the defined Product

The sequential operation to turn off the defined land/sea Product data modules must include all necessary information to perform sequential operation to turn off the defined Product. The sequential operation to turn off the defined land/sea Product description must be created as a step by step structure in checklist form.

Data modules must be coded:

YY-Y-15-37-YY-YYY-155Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-37-YYYY-YYYYY-155Y-A (37 characters)

2.2.6 Close up operation

The sequential close up operation procedures data module must include all necessary information to finalize the operation after use of the defined systems or subsystems. The sequential close up operation description must be created as a step by step structure in checklist form.

Data modules must be coded:

YY-Y-15-38-YY-YYY-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-38-YYYY-YYYYY-YYYY-A (37 characters)

2.2.7 Operating data

The sequential operating data manual data modules must include all necessary information of active service that is not described in the topic land/sea Product operation. The sequential operating data manual description must be created as a step by step structure in checklist form.

Data modules must be coded:

YY-Y-15-2Y-YY-YYY-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-2Y-YYYY-YYYYY-YYYY-A (37 characters)

The values for information code are 125, 135, 145, or 155 as appropriate.

2.3 Operating under special conditions (sequential)

2.3.1 Heat, cold or dust conditions

These data modules must contain all relevant additional sequential operation instructions to realize the whole functionality of the land/sea Product under higher or lower temperature or under dust conditions.

Data modules must be coded:

YY-Y-15-51-YY-YYY-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-51-YYYY-YYYYY-YYYY-A (37 characters)

The values for information code are 125, 135, 145, or 155 as appropriate.

2.3.2 Recovery and towing

These data modules must contain all relevant additional sequential operation instructions to realize the necessary task for recovery and/or towing of the land/sea Product.

Data modules must be coded:

YY-Y-15-52-YY-YYY-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-52-YYYY-YYYYY-YYYY-A (37 characters)

The values for information code are 125, 135, 145, or 155 as appropriate.

2.3.3 Crossing of stretch water

These data modules must contain all relevant additional sequential operation instructions to realize the whole functionality of the land/sea Product before, during and after the tactical operation, crossing of stretch water.

Data modules must be coded:

YY-Y-15-53-YY-YYY-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-53-YYYY-YYYYY-YYYY-A (37 characters)

The values for information code are 125, 135, 145, or 155 as appropriate.

2.3.4 Nuclear, biological, chemical (NBC) conditions

These data modules must contain all relevant additional sequential operation instructions to realize the whole functionality of the land/sea Product before, during and after operation under NBC conditions.

Data modules must be coded:

YY-Y-15-54-YY-YYY-YYYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-54-YYYY-YYYYY-YYYY-A (37 characters)

The values for information code are 125, 135, 145, or 155 as appropriate.

2.3.5 Transportation

These data modules must describe all sequential procedures to prepare and carry out the transportation of land/sea Product.

- Transport by train - data modules must be coded: YY-Y-15-39-1Y-YYY-YYYY-A
- Transport by ship - data modules must be coded: YY-Y-15-39-2Y-YYY-YYYY-A
- Transport by plain - data modules must be coded: YY-Y-15-39-3Y-YYY-YYYY-A
- Transport on road - data modules must be coded: YY-Y-15-39-4Y-YYY-YYYY-A
- Transport defined by project - data modules must be coded: YY-Y-15-39-YY-YYY-YYYY-A

For project specific transport, definitions of the unit or assembly "YY" must be "5Y"

- Transport by train - YYYYYYYYYYYYYY-YYYY-A15-39-1Y00-YYYYY-YYYY-A
- Transport by ship - YYYYYYYYYYYYYY-YYYY-A15-39-2Y00-YYYYY-YYYY-A
- Transport by plain - YYYYYYYYYYYYYY-YYYY-A15-39-3Y00-YYYYY-YYYY-A
- Transport on road - YYYYYYYYYYYYYY-YYYY-A15-39-4Y00-YYYYY-YYYY-A
- Project specific - YYYYYYYYYYYYYY-YYYY-A15-39-YY00-YYYYY-YYYY-A

For project specific transport, definitions of the unit or assembly "YY00" must be "5Y00".

The values for information code are 125, 135, 145, or 155 as appropriate.

Chapter 5.2.3.4

Land/sea specific information sets - Crew/Operator fault detection, isolation and resolution information

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1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for land/sea crew/operator fault detection and resolution information.

1.2 Scope

It covers the rules for the preparation of information needed to provide a land/sea crew/operator with fault detection and either the resolution of the detected faults or the further activities to solve the technical problems of the land/sea Product.

This information set is divided into three groups

- General information
- Functional test (crew/operator level)
- Fault detection and resolution

1.3 Standards and definitions

1.3.1 Standards

The following chapters are applicable when using this chapter.

- Chap 3.9.1 - General writing rules
- Chap 3.9.2 - Illustration rules and multimedia
- Chap 3.9.3 - Warnings, cautions and notes
- Chap 3.4 - Zoning and access
- Chap 3.6 - Security and data restrictions
- Chap 3.7 - Quality assurance

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. The project or the organization must establish their own data module coding strategy, using a code length that suits the project or organization needs.

1.3.2 References

Reference to any other documents inside this information set must be used in a structured way. To avoid repetition of information, related subject matter must be adequately referenced, so that the reader does not overlook important supplementary information. Such references in a data module to other modules must be made by reference to the data module code and title.

1.3.3 Definitions

The definitions as stated in Chap 9.2 must be used as appropriate.

2 Crew/Operator fault detection, isolation and resolution information

2.1 Introduction

The introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of this information set. They must also contain any information of a general nature which is not detailed in any specific data modules.

Data modules must be coded:

YY-Y-15-34-00-00A-018A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-A15-34-0000-00AAA-018A-A (37 characters)

2.2 Land/Sea system crew/operator fault detection and resolution - General

The information must contain the general information (such as general introduction into land/sea crew/operator fault detection and resolution, etc) of the land/sea Product.

Data modules must be coded:

YY-Y-15-34-YY-YYA-010A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-34-YYYY-YYAAA-010A-A (37 characters)

2.3 Functional test (Crew/Operator level)

2.3.1 Functional tests (manual)

The functional test data modules must include all necessary information to prepare and perform the manual functional test of the Product by the crew/operators. It must include all necessary preliminary requirements as a description or as a reference to the related data modules. Furthermore the step-by-step description of the functional tests and if necessary the close up procedures must be included.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules containing manual functional tests for physical breakdown orientated topics must be coded:

YY-Y-YY-YY-YY-YYA-321A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-AYY-YY-YYYY-YYAAA-321A-A (37 characters)

Data modules containing manual functional tests for functional breakdown orientated topics must be coded:

YY-Y-15-35-YY-YYA-321A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-A15-35-YYYY-YYAAA-321A-A (37 characters)

2.3.2 Functional tests with built in test equipment

The functional test data modules must include all necessary information to prepare and perform the automatic or semi-automatic functional test using Built In Test Equipment (BITE) of the Product by the crew/operators. It must include all necessary preliminary requirements as a description or as a reference to the related data modules. Furthermore the step by step description of the functional tests and, if necessary, the close up procedures must be included.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules containing automatic or semi-automatic functional tests for physical breakdown orientated topics must be coded:

YY-Y-YY-YY-YY-YYA-322A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-AYY-YY-YYYY-YYAAA-322A-A (37 characters)

Data modules containing automatic or semi-automatic functional tests for functional breakdown orientated topics must be coded:

YY-Y-15-35-YY-YYA-322A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-A15-35-YYYY-YYAAA-322A-A (37 characters)

2.4 Fault detection and resolution (Crew/Operator level)

2.4.1 Fault codes, symptoms and fault tracing for detection of faulty Land/Sea Product

The fault code, symptoms and fault tracing data modules must include all necessary information to allow the detection of faults from the Product by the crew/operators. It is the basis for the follow on fault detection process and it defines an entry point to the fault detection. It must include if necessary the preliminary requirements as a description or as a reference to the related data modules. Furthermore the step by step description of the handling of the fault codes or symptoms and if necessary the close up procedures must be included.

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules must be coded:

YY-Y-15-41-YY-YYA-410A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-A15-41-YYYY-YYAAA-410A-A (37 characters)

2.4.2 Fault detection and resolution - Description

The Fault detection and resolution description data modules must include all necessary information to allow the detection of faults from the Product by the crew/operators. The descriptions could be in form of flowcharts or similar constructs with:

- descriptions of the actions inclusive the necessary preliminary requirements
- questions, if necessary with limits
- answers, probably as a selection list for the crew/operator
- measures to resolve the fault, also references to higher level of maintenance if this is not to clarify by the crew/operator (as a description or as a reference to the related data modules)

Safety conditions and instructions must be included inside the data modules or inserted as a reference to the related data modules.

Data modules must be coded:

YY-Y-15-42-YY-YYA-420A-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-A15-42-YYYY-YYAAA-420A-A (37 characters)

Chapter 5.2.3.5

Land/sea specific information sets - International, national and regulatory scheduled check information

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Chap 3.9.1	Authoring - General writing rules
Chap 3.9.2	Authoring - Illustration rules and multimedia
Chap 3.9.3	Authoring - Warnings, cautions and notes
Chap 9.2	Terms and data dictionary - Glossary of terms, abbreviations and acronyms

1 General

1.1 Purpose

This chapter contains the rules for the preparation and coding, where appropriate, of data modules for International National and Regulatory Scheduled Check (INRSC) information.

1.2 Scope

It covers the rules for the preparation of information needed to provide land approval personnel with descriptions about international national and regulatory scheduled check in checklist form of the land/sea Product.

- General Information
- Safety instructions
- Preliminary requirements and preparation of work
- Check of systems and subsystems
- Checks according law rules
- Operation tests

1.3 Standards, references and definitions

1.3.1 Standards

The following chapters are applicable when using this chapter.

- Chap 3.9.1 - General writing rules
- Chap 3.9.2 - Illustration rules and multimedia
- Chap 3.9.3 - Warnings, cautions and notes
- Chap 3.4 - Zoning and access
- Chap 3.6 - Security and data restrictions
- Chap 3.7 - Quality assurance

For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths. The project or the organization must establish their own data module coding strategy, using a code length that suits the project or organization needs.

1.3.2 References

Reference to any other documents inside this information set must be used in a structured way. To avoid repetition of information, related subject matter should be adequately referenced so that the reader does not overlook important supplementary information. Such references in a data module to other modules must be made by reference to the data module code and title.

1.3.3 Definitions

The definitions as stated in Chap 9.2 must be used as appropriate.

2 International, national and regulatory scheduled check information

2.1 Introduction

The introduction data modules must contain explanation of the purpose, scope, structure, special format and use of the technical content of this information set. They must also contain any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules containing an introduction must be coded:

YY-Y-19-00-00-NNA-018Y-A (17 characters)

thru

YYYYYYYYYYYYY-YYYY-A19-00-0000-NNAAA-018Y-A (37 characters)

Where "**NN**" in the disassembly code is a sequential number starting from "00" if more than one data module is needed.

The information code variant is used to distinguish between the different information sets.

2.2 Land/Sea Product international, national and regulatory scheduled check - General

The information must contain the general information about land/sea Product international, national and regulatory scheduled check of the land/sea Product. It must cover general descriptions of use for INRSC work.

Data modules containing general information about international, national and regulatory check must be coded:

YY-Y-19-1Y-YY-NNA-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y19-1Y-YYYY-NNAAA-018Y-A (37 characters)

2.3 Safety instructions

The information must contain the common safety instructions necessary to perform the INRSC information for land/sea Product.

Data modules containing common safety instructions must be coded:

YY-Y-19-2Y-YY-NNA-012A-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y19-2Y-YYYY-NNAAA-012A-A (37 characters)

2.4 Preliminary requirements and preparation of work

The information must contain the common preliminary requirements to perform the INRSC information for land/sea Product.

Data modules containing common preliminary requirements must be coded:

YY-Y-19-3Y-YY-YYY-300Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y19-3Y-YYYY-YYYYY-300Y-A (37 characters)

2.5 Check of systems and subsystems

The information must contain the information for INRSC information land/sea Product. It must include necessary specific preliminary requirements and all safety instructions.

The INRSC could cover the checks for the following:

- establish the technical state of the land/sea Product
- establish the combat-readiness and the necessary measures to maintain the land/sea Product

Data modules containing checks of systems and subsystems must be coded:

YY-Y-19-4Y-YY-YYY-3YYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y19-4Y-YYYY-YYYYY-3YYY-A (37 characters)

2.6 Checks according law rules

The information according law rules must contain the checks for land/sea Product. It must include necessary specific preliminary requirements and all safety instructions.

The checks according law rules could cover the following:

- the keeping of law rules for the land/sea Product
- the mandatory checks and the belonging certification of the demand for technical status

Data modules containing checks according law rules must be coded:

YY-Y-19-5Y-YY-YYY-3YYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y19-5Y-YYYY-YYYYY-3YYY-A (37 characters)

2.7 Operation tests

The information according operation tests must include practical test and checks for the safe operation of land/sea Product. It must include necessary specific preliminary requirements and all safety instructions.

Data modules containing operation tests must be coded:

YY-Y-19-6Y-YY-YYY-3YYY-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-Y19-6Y-YYYY-YYYYY-3YYY-A (37 characters)

Chapter 5.3

Information sets and publications - Publications

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Chap 5.3.1	Publications - Common requirements
Chap 5.3.2	Publications - Air specific publications
Chap 5.3.3	Publications - Land/Sea specific publications

1 General

This chapter provides rules for the preparation and coding of publications, and contains also generic requirements for the Product publications.

The required publications must be decided by the project.

This chapter contains:

- Common requirements, refer to Chap 5.3.1
- Requirements for air specific publications, refer to Chap 5.3.2
- Requirements for land/sea specific publications, refer to Chap 5.3.3

2 Purpose

The purpose of this chapter is to define the rules for the preparation and coding of publications. It also contains the generic requirements for the Product publications.

Chapter 5.3.1

Publications - Common requirements

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Chap 5.3.1.1	Common requirements - Front matter
Chap 5.3.1.2	Common requirements - Technical content
Chap 5.3.1.3	Common requirements - Illustrated parts data

1 General

The following common requirements are contained in the chapters referenced:

- List of applicable publications. Refer to Chap 5.3.1.1
- Front matter. Refer to Chap 5.3.1.1
- Technical content. Refer to Chap 5.3.1.2
- Illustrated parts data: Refer to Chap 5.3.1.3

2 Scope

General information related to one publication (eg, front matter, introduction), must be coded:

YY-Y-YY-YY-00-**NN**Y-**YYY**Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-**NN**YYY-**YYY**Y-Z (37 characters)

Where:

- "**NN**" in the disassembly code is a sequential number starting from "00" if more than one data module is needed.
- "**YYY**" in the information code is the type of information.

The third element of the SNS is always 00 or 0000, except for non-chapterized IPD (refer to Chap 5.3.1.3).

Note

Some information sets have predefined values for population of the first and second element of the SNS. These values must be used also for the equivalent publications. For example front matter data modules for storage information must have the SNS 10-30-00 or Y10-30-0000. Refer to Chap 5.2.1.3.5.

Chapter 5.3.1.1

Common requirements - Front matter

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Chap No./Document No.	Title
Chap 3.9.4	Authoring - Front matter
Chap 3.9.5.2.2	Content section - Descriptive information
Chap 3.9.5.2.16	Content section - Front matter
Chap 3.9.5.3	Data modules - Applicability
Chap 5.2.1.3.5	Maintenance information - Storage
Chap 5.3.1.3	Common requirements - Illustrated parts data
Chap 6.2.3	Page-oriented publications - Layout rules and examples

1 General

This chapter gives the rules for selection of front matter information to be included in the publications. The front matter information gives the status of a publication or volume and an overview of the contents. It also provides general data related to a publication or volume to support the user in finding information and to keep control of the content.

For explanation purposes, data module codes are shown in both 17 character and 37 character lengths.

2 Front matter

2.1 Standards and definitions

The standards and definitions given in this chapter are applicable with no exceptions.

2.2 General

The content of the front matter depends on the publication media and the content of the publication (if illustrations are included, if symbols, terms and abbreviations must be explained, etc).

Front matter information can be captured and represented by using different Schemas. Front matter data modules can use the descriptive Schema (refer to Chap 3.9.5.2.2) except ACT, CCT and PCT which have their own Schemas.

The front matter Schema minimizes manual authoring and in most cases supports auto-generation of the front matter data modules. Refer to Chap 3.9.5.2.16.

Note

Some front matter can be auto-generated and some must be authored.

Business rule decision point BRDP-S1-00426 - Schema to be used for front matter data modules:

– Decide which Schemas to be used to capture the different front matter data module types.

Chap 3.9.4 gives the basic rules and guidance for front matter information. Chap 3.9.5.2.16 describes the Front Matter (FM) Schema. Chap 3.9.5.3 details the content of the Product Cross-reference Table (PCT), the Conditions Cross-reference Table (CCT) and the Applicability Cross-reference Table (ACT).

Refer to Chap 6.2.3.1 for presentation examples of front matter for page-oriented publications.

Front matter in publications or volumes thereof can include the data modules given in Table 2 and Table 3. Chap 3.9.4 states the rules for mandatory and optional use of front matter data modules.

The order of appearance is given in Table 2 and Table 3. If a copyright data module is part of the front matter information this data module is presented immediately after the Title page.

Note

Transmittal letters, a data module that describes the content of an exchange package, are presented after any copyright data module.

Table 2 and Table 3 give the mandatory and optional front matter data modules to be included in a publication.

Business rule decision point BRDP-S1-00460 - Front matter to be included in page-oriented publications and IETP, respectively:

– Decide which front matter is to be included (mandatory or optional) in each of the page-oriented publications and in the IETP. The decisions must be based on the rules given in Chap 3.9.4.

Business rule decision point BRDP-S1-00461 - Front matter information codes:

– Decide which front matter information codes to use, the basic (eg, IC 00R) or the alternative (eg, IC 002).

2.3 Data module coding

The basic coding of front matter data modules is shown in Table 2 and Table 3.

Note

Some information sets have predefined values for population of the first and the second element of the SNS. These values must be used also for the equivalent publications. For example, front matter data modules for storage information (refer to Chap 5.2.1.3.5) must have the SNS 10-30-00 or Y10-30-0000.

Note

Non-chapterized IPD front matter data modules use the third element of the SNS as a part of the unique identifier. Refer to Chap 5.3.1.3.

In Table 2 and Table 3, "NN" in the disassembly code is a sequential number starting from "00" if more than one data module is needed.

The information code variant must be used to differentiate front matter data modules with the same SNS and information code.

Table 2 Front matter (17 character example)

Order	Title	Abbr	Data module code for the Product	Remarks
1	Title page		YY-Y-YY-YY-00-NNY-001Y-Z	For page-oriented publications only
2	Access illustration		YY-Y-YY-YY-00-NNY-004Y-Z	For IETP only
3	List of effective pages	LOEP	YY-Y-YY-YY-00-NNY-00RY-Z	For page-oriented publications only. Alt IC 002
4	List of effective data modules	LOEDM	YY-Y-YY-YY-00-NNY-00SY-Z	Alt IC 002
5	Change record	CR	YY-Y-YY-YY-00-NNY-00TY-Z	Alt IC 003
6	Highlights	HIGH	YY-Y-YY-YY-00-NNY-00UY-Z	Mandatory. Not for IPD. Alt IC 003
7	List of abbreviations	LOA	YY-Y-YY-YY-00-NNY-005Y-Z	
8	List of terms	LOT	YY-Y-YY-YY-00-NNY-006Y-Z	
9	List of symbols	LOS	YY-Y-YY-YY-00-NNY-007Y-Z	
10	Technical standard record	TSR	YY-Y-YY-YY-00-NNY-008Y-Z	Not for IPD
11	Table of contents	TOC	YY-Y-YY-YY-00-NNY-009Y-Z	
12	List of applicable specifications and documentation	LOASD	YY-Y-YY-YY-00-NNY-00VY-Z	Not for IPD

Order	Title	Abbr	Data module code for the Product	Remarks
13	List of support equipment (normally used in front matter)	LOSE	YY-Y-YY-YY-00-NNY-00BY-Z	Not for IPD
14	List of supplies (normally used in front matter)	LOSU	YY-Y-YY-YY-00-NNY-00CY-Z	Not for IPD
15	List of spares (normally used in front matter)	LOSP	YY-Y-YY-YY-00-NNY-00DY-Z	Not for IPD
16	List of illustrations (normally used in front matter)	LOI	YY-Y-YY-YY-00-NNY-00AY-Z	
17	Product cross-reference table	PCT	YY-Y-YY-YY-00-NNY-00PY-Z	
18	Conditions cross-reference table	CCT	YY-Y-YY-YY-00-NNY-00QY-Z	
19	Applicability cross-reference table	ACT	YY-Y-YY-YY-00-NNY-00WY-Z	

Table 3 Front matter (37 character example)

Order	Title	Abbr	Data module code for the Product	Remarks
1	Title page		YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-001Y-Z	For page-oriented publications only
2	Access illustration		YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-004Y-Z	For IETP only
3	List of effective pages	LOEP	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00RY-Z	For page-oriented publications only. Alt IC 002
4	List of effective data modules	LOEDM	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00SY-Z	Alt IC 002
5	Change record	CR	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00TY-Z	Alt IC 003
6	Highlights	HIGH	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00UY-Z	Mandatory. Not for IPD. Alt IC 003

Order	Title	Abbr	Data module code for the Product	Remarks
7	List of abbreviations	LOA	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-005Y-Z	
8	List of terms	LOT	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-006Y-Z	
9	List of symbols	LOS	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-007Y-Z	
10	Technical standard record	TSR	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-008Y-Z	Not for IPD
11	Table of contents	TOC	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-009Y-Z	
12	List of applicable specifications and documentation	LOASD	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00VY-Z	Not for IPD
13	List of support equipment (normally used in front matter)	LOSE	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00BY-Z	Not for IPD
14	List of supplies (normally used in front matter)	LOSU	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00CY-Z	Not for IPD
15	List of spares (normally used in front matter)	LOSP	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00DY-Z	Not for IPD
16	List of illustrations (normally used in front matter)	LOI	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00AY-Z	
17	Product cross-reference table	PCT	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00PY-Z	
18	Conditions cross-reference table	CCT	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00QY-Z	
19	Applicability cross-reference table	ACT	YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-NNYYY-00WY-Z	

Chapter 5.3.1.2

Common requirements - Technical content

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Chap 3.9.3	Authoring - Warnings, cautions and notes
Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 4.6	Information management - Comment
Chap 4.9.3	Publication and SCORM content package management - Building of publications and SCOs
Chap 5.3.1.1	Common requirements - Front matter

1 General

1.1 Purpose

This chapter contains the rules for the preparation coding, where appropriate, and compilation of data modules for the technical content of publications.

1.2 Scope

It covers the rules for the preparation and compilation of information to enable skilled personnel to access and handle the information in an efficient way in order to perform the tasks of the respective publication scope.

1.3 Standards and definitions

The standards and definitions given in this chapter are applicable with no exceptions. For the purposes of explanation, data module codes are shown in both 17 character and 37 character lengths.

2 Technical content

The technical content must consist of an introduction followed by the technical information belonging to that publication.

2.1 Introduction

The introduction data module must contain explanation of the purpose, scope, structure, special format and use of the technical content of the publication. They must also contain any necessary information of a nature which is not detailed in any of the specific data modules.

The following information must be provided or referenced:

- the purpose and scope of the publication and its subsets and if required with additional information about system/equipment effectively
- the nature and structure of the publication and its subsets
- references to general information contained in the information sets which were integrated in the publication (eg, zoning and access information)
- information about publishing authorization / certification / copy rights
- definition of used warnings, cautions and notes. Refer to Chap 3.9.3.
- explanation of the used change marks and highlights. Refer to Chap 3.9.5.2.1.1.
- information about updating and commenting. Refer to Chap 3.5, Chap 4.9.3 and Chap 4.6.
- description of headings of tables if this is not contained in general information of information sets which were integrated in the publication (eg, tables of the List of Applicable Publications (LOAP)). Refer to Chap 5.3.1.1.
- other general information which is not contained in the data modules of the technical information of the publication

The data modules must be coded:

YY-Y-YY-YY-00-**NN**A-018Y-A (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY-YY-0000-**NN**AAA-018Y-A (37 characters)

Where "**NN**" in the disassembly code is a sequential number starting from "00" if more than one data module is needed.

The information code variant is used to distinguish between the different Information sets.

2.2 Technical information

These data modules must include all information sets or parts of information set, legacy data and other data compiled for the specific publication as decided by the project or organization.

Chapter 5.3.1.3

Common requirements - Illustrated parts data

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Chap 3.9.5.1	Data modules - Identification and status section
Chap 4.3.2	Data module code - System difference code
Chap 4.3.7	Data module code - Information code variant
Chap 4.3.8	Data module code - Item location code

Chap No./Document No.	Title
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Chap 5.3.1.1	Common requirements - Front matter
Chap 6.2.3.5	Layout rules and examples - IPD publication
Chap 8	SNS, information codes and learn codes
Chap 9.2	Terms and definitions - Terms, acronyms and subject index
S2000M	International specification for material management - Integrated data processing

1 General

1.1 Purpose

Preparation and coding, where appropriate, of Illustrated Parts Data (IPD) information data modules must follow the rules contained here. Rules for preparation of digital and paper deliverables are included as well as rules for creation of data modules from a S2000M provisioning database.

The contents are based on the provisioning process given in the S2000M but can also be used for non-S2000M projects.

1.2 Scope

It covers the rules for the publication of spare parts information. These rules are in line with S2000M.

Para 2 gives the build-up and content of an IPD Publication (IPDP), page-oriented and/or interactive, which follows the common rules given in this specification. An IPD publication produced in accordance with Para 2 will be an integrated information set in a total technical publication package.

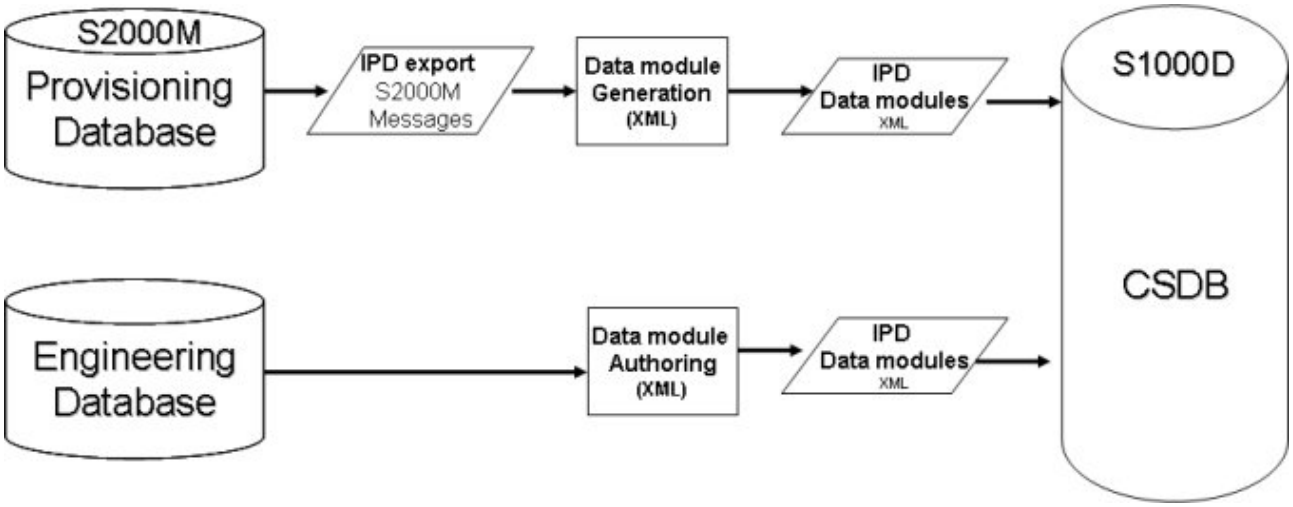
The specific functions of the IPD are:

- identification of spare parts
- identification of physical relationship of parts
- identification of the method of supply

The spare parts information in the form of data modules can be prepared from:

- a S2000M provisioning database
- engineering data for non-S2000M projects

The principles for preparing IPD information is shown in Fig 1.



ICN-S1000D-A-050303-A-F6117-00001-A-001-01

Fig 1 Preparation of the IPD data modules

By project decision, the IPD can be produced as a stand-alone publication and hence has its own publication module. For non-complex equipment (hydraulic pump, Ultra High Frequency (UHF) transmitter, etc), as the number of data modules often is low, these IPD data modules can be provided as (eg, part of the equipment maintenance publication).

Business rule decision point BRDP-S1-00462 - IPD as a standalone publication:

– Decide if the IPD must be produced as a stand-alone publication or the IPD data modules included in another publication (eg, an equipment maintenance publication including IPD).

IPD information must be prepared in the language specified by the customer. Customers' national security rules are to be considered. Refer to Chap 3.6.

1.3 Definitions

The following definitions and those stated in Chap 9.2 are used as appropriate.

– IPD **figure**: An IPD data module. The data module includes data and illustrations, one or more, relative to a system, subsystem or sub-subsystem or an assembly.
– IPD **figure number**: The running number of IPD figures (data modules) within the same Model Identification and SNS code. The IPD figure number is derived from the Catalogue sequence number (CSN).
– IPD **figure number variant**: The variant number of IPD figures. The IPD figure number variant is derived from the CSN.

2 IPD Content

2.1 General

The complete set of IPD data modules is specified in Para 2.2 and Para 2.3.

An IPD information set can be either chapterized or non-chapterized:

– A chapterized IPD information set contains data modules which have data module codes with the basic SNS, SNS, as given in Chap 8. These information sets are created either from a S2000M provisioning database or from engineering databases.
– A non-chapterized IPD information set contains only data modules which have data module codes with a specific structure in the SNS "positions". Refer to Para 2.3.2.2. Non-chapterized IPD information sets are only created from a S2000M provisioning databases.

Note

Front matter (refer to Para 2.2) and introductory data modules (refer to Para 2.3.3) must use the information code variant to give a unique data module code in the CSDB.

2.2 Front matter

For content of front matter refer to Chap 3.9.4.

For coding of front matter to a chapterized IPD refer to Chap 5.3.1 and Chap 5.3.1.1.

Front matter data modules for non-chapterized IPD must be coded:

YY-Y-**ZR-YY-YY-NN**Y-YYYY-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**ZZR-YY-YYYY-NN**YYY-YYYY-Z (37 characters)

Where:

- "**ZR-YY-YY**" or "**ZZR-YY-YYYY**". Refer to Para 2.3.2.2.
- "**NN**", in the disassembly code, is a sequential number starting from "01", if more than one data module is needed.

2.3 Technical content

2.3.1 General requirements

The IPD publication must contain the following information types:

- Introduction
- IPD data modules
- Cross-reference index. Refer to Para 2.3.5.

2.3.2 Data module coding

To assist in the codification of data modules, the following rules must be used. For system difference code, information code variant and item location code, the rules are given in Chap 4.3.2, Chap 4.3.7 and Chap 4.3.8 respectively.

Data modules for **chapterized IPD** must be coded:

YY-Y-**YY-YY-YY-NNY-XXX**A-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**YYY-YY-YYYY-NNYYY-XXX**A-Z (37 characters)

Data modules for **non-chapterized IPD** must be coded:

YY-Y-**ZR-YY-YY-NNY-XXX**A-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-**ZZR-YY-YYYY-NNYYY-XXX**A-Z (37 characters)

Where:

- "**YY-YY-YY**"/"**ZR-YY-YY**" or "**YYY-YY-YYYY**"/"**ZZR-YY-YYYY**", in the SNS code, as given in Para 2.3.2.1 (chapterized IPDP) and Para 2.3.2.2 (non-chapterized IPDP)
- "**NN**", in the disassembly code, is a sequential number starting from "01", if more than one data module is needed for the same SNS. An alpha character in the first position is allowed.

- When the data module is generated from a S2000M provisioning database this is the IPD figure number. IPD figure number is equivalent to figure number S2000M and is a part of the Catalogue sequence number (CSN).

– "**Y**" or "**YYY**", in the disassembly code variant, gives the variants of the data modules, starting with "A" or "AAA" for the initial variant

- When the data module is generated from a S2000M provisioning database this is the IPD figure number variant. IPD figure number variant is equivalent to Figure Number Variant in S2000M and is a part of the CSN. The IPD figure number variant starts with the figure "0" for the initial data module with a given SNS-number. When there is a need to produce variants (modified items) or to "insert" new data modules, the disassembly code variant is used the standard way now starting with "A" for the first variant.

– "**XXX**", the information code, is:

- 941 = IPD
- 942 = IPD cross-reference index

2.3.2.1 Parts data module coding for chapterized IPDP
"YY-YY-YY" or "YYY-YY-YYYY" must be the SNS of the described system or equipment

Examples:

SNS code 29-10-00 = Main hydraulic

– A1-A-29-10-00-0**10**-941A-D (parts data module, IPD figure number = **1**, IPD figure number variant = **0** = initial data module within 29-10-00)
– A1-A-29-10-00-0**1A**-941A-D (parts data module, IPD figure number = **1**, IPD figure number variant = **A** = new data module)
– A1-A-29-10-00-00A-942A-D (IPD cross-reference index)

2.3.2.2 Parts data module coding for non-chapterized IPDP
"**Z**R-YY-YY" or "**ZZ**R-YY-YYYY" is built up as follows:

– "**Z**" or "**ZZ**" identifies that the data module is non-chapterized
– "**R**" identifies the responsible partner company code used as a status element in the identification and status section. Refer to Chap 3.9.5.1.
– "YY-YY" or "YY-YYYY" is a unique identifier:

- When the data module is generated from a S2000M provisioning database this must be the last four digits of the initial provisioning project number "YY-YY" or "YY-YY00".
- For non-S2000M projects the unique identifier must be defined by the project (eg, to identify a component).

Examples:

– A1-A-ZD-00-35-0**10**-941A-D (parts data module, IPD figure number = **1**, IPD figure number variant = **0** = initial data module within ZD-00-35)
– A1-A-ZD-00-35-0**2A**-941A-D (parts data module, IPD figure number = **2**, IPD figure number variant = **A** = new data module)
– A1-A-ZD-00-35-00A-942A-D (IPD cross-reference index)

2.3.2.3 Data module code - Catalog sequence number
The attributes in the CSN are also used to build up the IPD data module code. The data module code attributes and the corresponding CSN attributes are given in Table 2.

Table 2 Data module code and CSN attributes

Data module code attribute	Content derived from the attributes of the element <cataogSeqNumberRef>	
	Chapterized IPD	**Non-chapterized IPD**
Model identification code - attribute modelIdentCode	Content of attribute modelIdentCode	Content of attribute modelIdentCode
System difference code - attribute systemDiffCode	Content of attribute systemDiffCode	Content of attribute systemDiffCode
System code - attribute systemCode	Content of attribute systemCode	The value "00" (and the attribute systemCode must not be used)
Subsystem code - attribute subSystemCode	Content of attribute subSystemCode	The value "0" (and the attribute subSystemCode must not be used)
Sub-subsystem code - attribute subSubSystemCode	Content of attribute subSubSystemCode	The value "0" (and the attribute subsubSystemCode must not be used)
Unit or assembly - attribute assyCode	Content of attribute assyCode	The value "00" (and the attribute assyCode must not be used)
Disassembly code - attribute disassyCode	Content of attribute figureNumber (which must always be 2 digits)	Content of attribute figureNumber (which must always be 2 digits)
Disassembly code variant - attribute disassyCodeVariant	Content of attribute figureNumberVariant, or "0" if the attribute is not present (ie, there is no figure variant)	Content of attribute figureNumberVariant, or "0" if the attribute is not present (ie, there is no figure variant)
Information code - attribute infoCode	The value "941" which indicates an IPD data module	The value "941" which indicates an IPD data module
Information code variant - attribute infoCodeVariant	The value "A"	The value "A"
Item location code - attribute itemLocationCode	Content of attribute itemLocationCode. Typically, this is the value "D"	Content of attribute itemLocationCode. Typically, this is the value "D"

2.3.3 Introduction

2.3.3.1 General

The introduction data modules must contain explanations of the purpose, scope, structure, special format and use of the technical content of the IPD publication. They must also contain a list of incorporated modifications and any necessary information of a general nature which is not detailed in any of the specific data modules.

Data modules must be coded:

YY-Y-YY**-YY-YY**-NNA-018Y-Z (17 characters)

thru

YYYYYYYYYYYYYY-YYYY-YYY**-YY-YYYY**-NNAAA-018Y-Z (37 characters)

- "YY**-YY-YY**" or "YYY**-YY-YYYY**", the introduction is relative to the whole publication, so it must be allocated according to the data module code actually used for the technical content. Refer to Para 2.3.2.
- "**NN**", the disassembly code, is a sequential number starting from "00", if more than one data module is needed

The information code variant is used to distinguish between the different information sets.

Examples:

- Chapterized IPD:
  - Aircraft: A1-A-00-00-00-00A-018A-A or SUPERAIRCRAFT1-AAAA-A00-00-0000-00AAA-018A-A
  - Engine: A1-A-00-72-00-00A-018A-A or BASICENGINE007-AAAA-A00-72-0000-00AAA-018A-A
- Non-chapterized IPD:
  - A1-A-ZD-00-35-00A-018A-A

2.3.3.2 List of incorporated modifications in IPDP

A list of incorporated modification in the introduction to each IPDP will be produced from the change record incorporated in the provisioning database.

To enable the IPDP user to determine the precise relationship of components, the IPDP is to record every configuration standard likely to be encountered. In the IPDP text, the configuration changes/modifications will be identified against line items through data elements which include:

- Interchangeability (Interchangeability codes will be set for the preceding (old) and succeeding (new) line entries)
- Usable on code Equipment
- Usable on code Assembly
- Applicability
- Model version

The change authority will be also shown for all newly introduced items (eg, Modification XXXX).

Some customers can require that, during the production of an IPDP, the contractor omit configuration standards that are superseded by modifications fully embodied in their fleets.

2.3.4 IPD modules

The items relative to an assembly are organized in IPD figures and supported with the appropriate illustration. In cases where the content of an IPD figure is complex, the illustration will be spread over several illustration sheets (eg, Fig 1 Hydraulic pump (Sheet 1 of 2), Fig 1 Hydraulic pump (Sheet 2 of 2)) in accordance with the following:

- Each illustration sheet has its own ICN
- Each IPD figure must be defined as one parts data module
- Each parts data module must include all IPD data related to one IPD figure

2.3.4.1 Parts data elements

Table 3 gives all mandatory and optional parts data elements independently of their use in page oriented or electronic IPDP. Detailed information on each element is presented in the S2000M data dictionary. Conditional data elements as defined in S2000M are also marked optional.

Note

The three-character acronyms give the text element identifier specified in S2000M.

Table 3 Parts data elements

Text element identifier	Data element name	Mandatory / Optional	Remarks
ASP	Attaching, storage or shipping part	O	
CAN	Change authority number	O	
CMK	Calibration marker	O	
CSN	Catalog sequence number	M	Position 7 thru 13 gives the Fig/Fig variant/Item/Item variant
CTL	Category 1 container location	O	
DFL	Description for location	O	
DFP	Description for part	M	
EFY	Effectivity	O	
FID	File identifier	O	
FTC	Fitment code	O	
ICN	Information control number	O	
ICY	Interchangeability	O	
ILS	Integrated logistics support number	O	
IND	Indenture	M	
IPP	Initial provisioning project number	M	
IPS	Initial provisioning project number subject	M	
ISN	Item sequence number	M	
ITY	Item type	O	
LGE	Language code	M	
MFC	CAGE code of manufacturer	M	
MFM	Select or manufacture from range	O	
MOI	Model identification code	M	
MOV	Model version	O	
NIL	Not illustrated	O	

Text element identifier		Data element name	Mandatory / Optional	Remarks
NSN		NATO stock number	O	Composite data element composed of NSC and NIN
	NSC	NATO supply class	M	
	NIN	NATO item identification number	O	
PNR		Part number	M	
PSC		Physical security pilferage code	O	
QNA		Quantity per next higher assembly	M	
QUI		Quantity per unit of issue	O	
RFD		Reference designator	O	
RFS		Reason for selection	O	
RTX		Refer to	O	
SID		Subject identification	M	Composite data element composed of MFC and PNR
SMF		Select or manufacture from identifier	O	
SMR		Source maintenance recoverability	M	
SPC		Spare parts classification	O	
SRV		Service	M	
STR		Special storage	O	
TQL		Total quantity	O	
TYP		Type of location designator	O	
UCA		Usable on code assembly	O	
UCE		Usable on code equipment	O	
UOI		Unit of issue	O	
UOM		Unit of measure	O	

2.3.4.2 Page-oriented parts data modules

The illustration must always start on a left-hand page followed by text, the detail parts list, on the right-hand page. Where either the illustration or text outnumbers the other, the additional illustrations and text must continue on both left-hand and right-hand pages.

The front page (Page 1) gives the title of the data module and if applicable the part number of the assembly or equipment. A location illustration or an illustration of the assembly or equipment can follow.

The detail parts list contains the following elements. Refer to Table 4:

1 Fig (M): The figure number and variant must appear on the first line on each text page. No other details are to appear on the same line. Where an item is listed but not illustrated on the accompanying illustration, this must be marked with a dash in this column and on the same line as the item number. Part of CSN.

2 Item (M): The item number and variants are a part of the Catalogue sequence number (CSN). Zeros in the item number must be suppressed.

3 Units per assembly/Unit of issue (O/O): The number of units required for the next higher assembly (QNA) and the code for standard unit/ quantity delivered to the customer (UOI).

4 CAGE (O): Identifies the supplier or design authority by its CAGE code (MFC).

5 Part number/NATO stock number (M/O): The part number of the item. Part numbers (PNR) exceeding the space available must be split arbitrarily with the overflow on the second line. NATO stock numbers (NSN) must be located on the line immediately below the part number and be indented two spaces from the left.

6 Description (M/O): The description column must contain the mandatory DFP together with the optional Description For Location (DFL). Additionally, supplementary information which relates to the part and its location can also appear. The layout of the description field is as follows:

- Indentation: The spacing must be one bullet per indent given by the indenture code (IND).
- Continuation lines of description must be to the same indent as the first line of the description.
- Item spacing: Words can be hyphenated when passing from one line to the next, however, an item must not be divided by page breaks. A reasonable space between items to aid legibility.
- Attaching parts: Attaching parts must be distinguished by the replacement of the indentation bullets with asterisks.
- The width of the description column must be approximately 50 mm.
- The description column is also used to convey additional information to the IPD user, such as
  - Refer to (RTX)
  - Category 1 container location (CTL)
  - Select or manufacture from identifier (SMF)
  - Select or manufacture from range (MFM)
- The additional information is to appear in the description block at the same indent level as the item to which it refers.

For detailed information refer to Chap 6.2.3.5.

7 * Usable on code assy ● Model Version (MV)/Effect(*O●O/O): Usable on code assembly (UCA) must be preceded with an asterisk and appear on the same line as the part number. Model version (MOV) and Applicability must appear on the line immediately below the Usable on code assembly. When an item is common to the entire customer's range of air vehicle, engine or equipment, in all Model versions, then they must be left blank. If different ranges and/or Model versions are applicable, then these must be shown in multiple consecutive lines in this column. The MV/Applicability must be preceded by a bullet.

8 ICY (O): Interchangeability (ICY).

Table 4 Detail parts list - Example

Fig (1)	**Item** (2)	**Units per assembly /Unit of issue** (3)	**CAGE** (4)	**Part No. NATO stock No.** (5)	**Description** (6)	*** Usable on code assy • MV/Effect** (7)	**ICY** (8)
1							
	0	REF		A11B400000	Wheels and brackets (Refer to A1-A-32-00-00-01A-941A-A Item 15)		
	1	1		A20201-43 1630-14-338-8823	• Rim, NLG (Refer to Publication reference number)		
	2	2 EA		A20249-43 1630-14-338-8823	• Rim, NLG (Refer to Publication reference number)		
	3	1		380x150-4-6 Tubeless 1630-14-338-8828	• Tire		
	5	2 EA					
	6	3 EA			• Tacho generator	*A	-1
	6	3 EA		A21521 668-14-347-0241	• Tacho generator	*B	2-
	9				•• Generator	*A	
	9				•• Generator	*B	
	10				•• Connector		
	11				•• Bracket	*A	
	11				•• Bracket	*B	

2.3.4.3 Interactive parts data modules
Each IETP parts data module must include all parts data and illustrations related to one IPD figure. The mandatory and optional elements are given in Para 2.3.4.1.

2.3.5 Cross-reference index
The following search keys must be used:

Table 5 Search keys in cross-reference index

Text element identifier	**Data element name Search key**	**Search key code (SKC)**	**Mandatory/ Optional**
PNR	Part number	P	M
NSN	NATO stock number	N	O

Text element identifier	Data element name Search key	Search key code (SKC)	Mandatory/ Optional
RFD	Reference designator	R	O
ILS	Integrated logistics support number	I	O

Each IPD page-oriented publication requires a cross-reference index ordered in alphanumeric sequence.

The following elements can be presented as given in Table 6:

Note

By project decision some of the optional data can be excluded.

1 SKC (M): Search key code from Table 5.

2 Search key (M): The part number (PNR), NATO stock number (NSN), reference designator (RFD) and the integrated logistics support number (ILS)

3 Part number (M)

4 CAGE (O): CAGE (MFC)

5 NATO stock number (O): must not be repeated if it also is the search key

6 SNS (M)

7 Fig - Item (M)

Table 6 Cross-reference index - Example

SKC (1)	**Search key** (2)	**Part No.** (3)	**CAGE** (4)	**NATO stock No.** (5)	**SNS** (6)	**Fig-Item** (7)
....	....					
R	+XF2	960-78923	F6198	5995-14-278-3448	36-10-20	04A-010
P	1322 3-355/C7-244-A5	1322 3-355/C7-244-A5601-001	D1081	1680-12-909-9595	24-10-05	03 - 025
N	1680-12-909-9595	1322 3-355/C7-244-A5601-001	D1081		24-10-05	03 - 025
N	5995-14-278-3448	960-78923	F6198		36-10-20	04A-010
....	....					
....	....					

For interactive IPDP, a cross-reference index capability must be implemented in the form of viewer search functionality using the search keys as given in Table 5. In this case it is unnecessary to generate cross-reference index data modules.

Chapter 5.3.1.4

Common requirements - Component maintenance

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Chap 3.8	Information generation - Disassembly principles
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Chap 3.9.5.2.7	Content section - Parts information
Chap 3.9.5.2.16	Content section - Front matter
Chap 5.2.1.9	Common information sets - Equipment information
Chap 5.2.1.17	Common information sets - Material data
Chap 5.2.1.18	Common information sets - Common information and data
Chap 5.3.1	Publications - Common requirements
Chap 5.3.1.1	Publications - Front matter
Chap 5.3.1.2	Publications - Technical content
Chap 6.2.3.1	Layout rules and examples - Front matter data modules
Chap 6.3.1	IETP - Output specification
Chap 9.2	Terms and definitions - Terms, acronyms and subject index

1 General

1.1 Purpose

Specific guidance for the preparation of a Component Maintenance Publication (CMP) is given.

1.2 Scope

The CMP provides a range of procedures that will enable an experienced technician who is unfamiliar with the component to restore it to a serviceable condition.

1.3 Standards

The standards given here are applicable with no exceptions.

1.4 Definitions

The following definitions and those stated in Chap 9.2 are used as appropriate.

Basic part: A part that cannot be further disassembled without destruction of its function.

Overhaul: A mandatory set of maintenance activities that are performed to restore the component to a condition as close to its originally manufactured condition. These activities are performed without regard to the initial condition of the component. This includes systematic disassembly, cleaning, inspection, maintenance and assembly. This effort includes the replacement or repair of all subassemblies or parts exhibiting any level of wear or less than original performance. It can include significant inspections, examinations, test and checks to ensure no latent faults exist. Pass/Fail criteria for inspections, examinations, test and checks are based on the manufacturing criteria for the component. The resultant component meets the same functional and time/cycle time requirements as a new component.

End item: For purposes of this chapter the term "end item" refers to the top level component, or set of components, covered by the CMP unless otherwise stated. Disassembly principles are discussed in Chap 3.8.

1.5 Requirements

1.5.1 Information set

The CMP is based on the information set described in Chap 5.2.1.9. Other information codes and schemas can be used as directed by the project or the organization.

1.5.2 Publication module

The CMP is organized into three or four main sections with subordinate topics as described in Para 1.6. The publication module Schema is used to provide the required organization and structure.

1.5.2.1 Publication module entries, sections and topics

A publication module entry at first level will be created for each section of the CMP in the order described in Para 1.6. When a topic is to be included in any section it will be created as a child publication module entry at second level under the applicable section.

Chap 3.9.6.1 provides values of attribute `pmEntryType` for this purpose.

1.5.3 Coverage

The CMP coverage can apply to a single component or to a collection of variants of the basic component. Typically this is based on a single common primary part number. It is acceptable to include components with different root part numbers only when such components are very similar.

In most cases the end item will be comprised of components that are assemblies that have constituent subassemblies and parts. In those cases where the CMP end item is itself a singular part or collection of like singular parts, certain data modules are not required. Refer to Para 1.6.

Note

A CMP which supports a singular part or collection of like singular parts is the functional equivalent of what was termed an "Abbreviated CMM" in some legacy systems (eg, civil aviation). Because of the modular nature and flexibility of S1000D there is no need to describe a unique publication to support this type of end item.

The CMP is to provide descriptions, procedures and processes to return the unit to a serviceable or other condition defined by its part number and source engineering data. Applicability references are to this end item definition.

When CMP end item variants result in differing procedures, these differences must be documented and clearly identified.

Applicability references to the used-on installation are prohibited unless mandated by project or organization decision.

1.5.4 Maintenance environment

The CMP descriptions, procedures and processes are to support component maintenance in the shop or depot maintenance environment.

1.5.5 Level of detail

The CMP and IPD descriptions, procedures and processes are to provide coverage to the "basic part" level unless the project or organization decides otherwise.

1.5.6 On-condition vs scheduled maintenance

The CMP descriptions, procedures and processes are to support on-condition maintenance. Scheduled maintenance intervals including inspections and checks for in-service units are expressly forbidden unless required for regulatory compliance or required by project or organization decision. Refer to Para 2.3.2.1.

Storage life limits and required maintenance intervals for units in storage can be included. Refer to Para 2.3.2.9.

1.5.7 Outside references and standard practices

To the extent possible, the CMP is to provide self-supporting procedures and processes. References to standard practices publications, other CMP, and generally available industry standards and process documents can be included. References to discrete, manufacturer unique, documentation are prohibited.

Standard industry practices such as procedures for magna-fluxing, riveting, plating, terminal swaging, or dye penetrant inspection need not be covered when applicable industry reference is readily available. The CMP documents only the specific requirements necessary to apply the standard to the CMP activity.

1.5.8 Task sets

To satisfy certain maintenance requirements it can be useful to organize discrete maintenance information and procedures into ordered task sets to achieve a specific end condition. Two possible uses for a task set are:

- "Return-To-Service" (RTS). This task set is to define the specific minimum set of procedures to be performed and criteria to be met to certify that the component can be safely returned to service. The purpose is to distinguish this specific set of modules from other provided maintenance procedures and to avoid performing those procedures simply because they are provided in the CMP.
- "Overhaul". This task set is to define the specific set of procedures to be performed and criteria to be met to certify that the component has been overhauled. Typically this would restore the unit to a higher standard than that required for RTS. The purpose is to distinguish this specific set of modules from other provided maintenance procedures.

Business rule decision point BRDP-S1-00464 - Use of task sets in the CMP:

- Decide whether to use task sets in the CMP.

1.5.9 Granularity

Data modules are normally to be limited to a single specific description, procedure or process. In some cases it can be acceptable to include multiple, related, simple descriptions or procedures in one data module.

For instance, multiple cleaning procedures might be included in one data module when the procedures are simple and there is no potential re-use of the included discrete procedures.

Likewise, a description of the unit's function can be provided as one, or more than one, data module depending on the complexity of the unit and any potential re-use of the descriptions.

1.5.10 Listing equipment, materials, and consumables

List the equipment required and materials to be used. Whenever possible, specify equipment, materials, and consumables normally considered "standard" in a typical shop appropriate for the technology of the component.

These items must be selected based on the specific CMP usage. Do not simply list those items used at the manufacturer facility. Likewise, parameters listed for required equipment must be based solely on the requirements of the CMP procedures.

Each list of tools, equipment, materials and consumables must include a note to allow the use of equivalent substitutes. Except that equivalent substitutes are not allowed for those materials and consumables that become a part of the defined component configuration.

1.5.11 Verification and validation

Procedures, processes and fault isolation procedures must be verified as required by Chap 3.7.

1.5.12 Records

If a record of accomplishment is required, include a sample of the required form and instructions for its use. This information can be included in either the applicable data module or the CMP introduction if the record covers more than one data module.

1.5.13 No data required for a particular topic

Para 1.6 describes the required set of data modules to be included in a CMP by topic. When there is no information to be provided under a certain topic, the project must decide whether to provide a data module that states that the topic is not required or this information is contained in the introduction or description data module. When these data modules are to be provided, the information code must be the one for the topic that isn't required (eg, if removal and installation is not required, then the information code 520, 720 or 921 must be used). These will be descriptive data modules that must contain a title that reflects the information name and a paragraph containing the words "Not applicable" or "Xxxx is not required."

Business rule decision point BRDP-S1-00465 - Use of placeholder data modules in the CMP:

– Decide whether "placeholder" data modules are required for those topics where data is not required or necessary.

1.5.14 Service bulletin accomplishment instruction

The CMP provides information and procedures to maintain components in accordance with their approved configuration, either original or properly altered. The CMP must not contain Service bulletin accomplishment instructions or any other instruction or procedure to alter or change the configuration of any component.

1.6 Content

1.6.1 Assemblies

When the CMP end items are assemblies and subassemblies, the CMP will include data modules which address the following topics in the following order:

– Front matter and introduction

- Title page
- Configuration
- Copyright statements
- Administrative and legal statements
- Safety statement

- List of effective data modules
- Change record
- Highlights
- List of abbreviations
- List of terms
- List of symbols
- Technical standard record
- Table of contents
- List of illustrations
- List of tables
- List of applicable specifications and documentation
- List of suppliers
- List of support equipment
- List of supplies
- List of spares
- Introduction

– Functional and technical descriptions

- Description of function
- Technical description
- Diagrams and schematics

– Maintenance and servicing

- Maintenance planning
- Removal and installation
- Task sets
- Servicing
- Examination, test, checks, and fault isolation
- Disassemble
- Repair
- Assemble
- Storage

– IPD

- Introduction
- Numerical index
- Equipment designator index
- Details parts data

When no information is to be provided for a topic, refer to the rules given in Para 1.5.13.

The IPD can be provided as a separate publication. Refer to Para 2.3.

1.6.2 Basic parts

When the CMP end items are themselves basic parts, the CMP will include data modules which address the following topics in the following order:

– Front matter and introduction

- Title page
- Configuration
- Copyright statements
- Administrative and legal statements
- Safety statement

- List of effective data modules
- Change record
- Highlights
- List of abbreviations
- List of terms
- List of symbols
- Technical standard record
- Table of contents
- List of illustrations
- List of tables
- List of applicable specifications and documentation
- List of suppliers
- List of support equipment
- List of supplies
- Introduction

– Functional and technical descriptions

- Description of function
- Technical description
- Diagrams and schematics

– Maintenance and servicing

- Maintenance planning
- Removal and installation
- Task sets
- Servicing
- Examination, test, checks, and fault isolation
- Repair
- Storage

When no information is to be provided for a topic, refer to the rules given in Para 1.5.13.

There is no IPD information for a basic part.

2 Content

2.1 General

The complete set CMP data modules is described in Para 2.2 and Para 2.3. The data modules are divided into Front matter and introduction, Technical content, and Illustrated parts data (IPD). Refer to Para 1.6 to determine which modules must be included.

2.2 Front matter and introduction

2.2.1 Front matter

A CMP must include a set of front matter data modules. Refer to Table 2. Except as provided for in this chapter, or as defined in project or organization requirements, front matter content for a CMP must be generally in accordance with Chap 3.9.4 and Chap 5.3.1.1 and Chap 3.9.5.2.16.

Note

The front matter data modules can use the descriptive Schema, except for ACT, CCT and PCT, or the front matter Schema.

Refer to Chap 6.2.3.1 for rules and examples of the layout of front matter in page-oriented CMP. Refer to Chap 6.3.1 for the layout of IETP.

Table 2 - Front matter content

Title	Include in page-oriented	Include in IETP
Title page	(M)	No
Configuration	(M)	(M)
Copyright statements	(O)	(O)
Administrative and legal statements	(O)	(O)
Safety statements	(O)	(O)
List of effective pages	No	No
List of effective data modules	(M)	(M)
Change record	(M)	No
Highlights	(M)	(M)
Access illustration	No	(O)
List of abbreviations	(M)	(M)
List of terms	(M)	(M)
List of symbols	(M)	(M)
Technical standard record	(M)	(M)
Table of contents	(M)	(M)
List of illustrations	(O)	(O)
List of tables	(O)	(O)
List of applicable specifications and documentation	(M)	(M)
List of suppliers	(O)	(O)
List of support equipment	(O)	(O)
List of supplies	(O)	(O)
List of spares	(O)	(O)
Product cross-reference table	(O)	(O)
Conditions cross-reference table	(O)	(O)
Applicability cross-reference table	(O)	(O)
Introduction	(M)	(M)

(M) – Mandatory
(O) – Optional (Project decision)

Business rule decision point BRDP-S1-00466 - Front matter to be used in the CMP:

– Decide what front matter data modules to be used and their content.

2.2.1.1 Title page
The title page for a CMP must contain the following information:

- Company masthead
- Company CAGE code
- Publication type ("COMPONENT MAINTENANCE PUBLICATION")
- Any data restriction information that applies to the entire publication, such as:
  - export control statement(s)
  - copyright legend/indicator
- Publication module code
- Publication issue number
- Title page data module code (if authored)
- SNS of the CMP
- Issue date

The title page must also contain the following for each product included in the CMP:

- Name of the component
- Product number (eg, part number/model/series/type)

The title page can also contain the following optional information:

- Component manufacturer's CAGE code (if different from the company CAGE code)
- Company's address, phone and fax
- Associated product identification numbers
- Component logo

2.2.2 List of Effective Data Modules (LOEDM)
The LOEDM lists all data modules in the publication in lexical order by data module code. The purpose of the LOEDM is to provide a mechanism to verify that all content is present in a publication and is current. It is not intended to aid readers in finding content. That is the purpose of the table of contents. It is recommended that this information be generated rather than authored.

2.2.3 Change Record (CR)
The CR is provided in the page-oriented publication only. It presents the revision history of the CMP.

2.2.4 Highlights
The highlights provide the user with a quick and simple list of changes that can affect maintenance.

For each data module removed or added, the highlights lists the data module code, the data module title, whether the data module was removed, revised or added, and the reason for the change.

Provide clear, concise descriptions of changes to technical information or valuable instructions in a data module. Some examples of recommended phrases are:

- "… corrected assembly procedure …"
- "… WARNING added to test procedure …"
- "… wiring diagram added …"
- "… torque values increased …"
- "… special tool procedure added …"
- "… welding repair added …"

Minor text changes, such as movement of text, typographical errors and changes to punctuation must not be included in the highlights unless they alter provided procedures or affect safety.

Special caution must be exercised to ensure that information affecting components still in-service is not removed.

2.2.5 Access illustrations

The access illustrations are included in the IETP only and are optional. These are illustrations used to navigate to data modules in the IETP. The format of these illustrations is a project or organization decision.

2.2.6 List of Abbreviations (LOA)

The LOA must be authored generally in accordance with Chap 3.9.4 and Chap 5.2.1.18 except that it must include all abbreviations used in the CMP.

2.2.7 List of Terms (LOT)

The LOT must be authored generally in accordance with Chap 3.9.4 and Chap 5.2.1.18 except that it must include all terms used in the CMP.

2.2.8 List of Symbols (LOS)

The LOS must be authored generally in accordance with Chap 3.9.4 and Chap 5.2.1.18 except that it must include all symbols used in the CMP.

2.2.9 Technical Standard Record (TSR)

The TSR lists all incorporated Service bulletins applicable to the component and indicates if the Service bulletin has been incorporated or if it had no effect. The update frequency of Service bulletins can vary by project. Service bulletins are listed in order of Service bulletin number. For each Service bulletin list the following:

- Service bulletin number
- Service bulletin title
- Service bulletin revision number
- Service bulletin date
- Issue number when incorporated or the words "No effect"

Business rule decision point BRDP-S1-00468 – Incorporating Service bulletins into the CMP:

- Decide on the updating frequency for incorporating Service bulletins into the CMP.

2.2.10 Table of Contents (TOC)

The purpose of the TOC is to contain adequate information to permit the reader to quickly and accurately locate the data modules sought. Though similar to the LOEDM, the TOC differs from the LOEDM in purpose and therefore, in presentation and content. It is recommended that this data module be generated.

The TOC contains an entry for each listed introduction and technical content data module in the CMP. The front matter data modules are not included in the TOC.

Data modules listed in the TOC are presented in order of appearance in the CMP as described in Para 1.6.

The TOC data module entries list the data module code and the data module title (<techname> - <infoname>, <infoNameVariant>).

Because each data module in a CMP starts on page one, page numbering is not useful and is therefore not required.

2.2.11 List of Illustrations and List of Tables (LOI, LOTBL)
The LOI and LOTBL list all the figures and tables in the CMP. These lists will show the illustration/table number and title.

2.2.12 List of Applicable Specifications and Documentation (LOASD)
The LOASD must be authored generally in accordance with Chap 3.9.4, Chap 5.3.1.1 and Chap 5.2.1.18. It must include a reference to the Issue of S1000D to which the CMP and data modules were produced.

2.2.13 List of Suppliers (LOSUP)
The LOSUP contains all of the enterprise identification and information for all enterprises mentioned in the CMP.

2.2.14 List of Support Equipment (LOSE)
The LOSE provides a consolidated listing of all support equipment used throughout the CMP. Refer to Chap 3.9.4.

2.2.15 List of Supplies (LOSU)
The LOSU provides a consolidated listing of all supplies used throughout the CMP. Refer to Chap 3.9.4.

Do not include any item of supply that is listed in the IPD as part of the configured end item component.

2.2.16 List of Spares (LOSP)
The LOSP contains all spare parts for the CMP end item. A LOSP can be included in the CMP when the IPD information is in a separate publication. Do not include a LOSP in the CMP when the IPD is included in the CMP. All spare parts for the CMP end item must be included in the IPD. Refer to Chap 5.3.1.3.

Discrete spare parts lists for procedures, processes, etc, must still be provided as required by the applicable Schema for that data module.

2.2.17 Product Cross-reference Table (PCT)
Including this data module is optional. Refer to Para 2.2.1.

2.2.18 Conditions Cross-reference Table (CCT)
Including this data module is optional. Refer to Para 2.2.1.

2.2.19 Applicability Cross-reference Table (ACT)
Including this data module is optional. Refer to Para 2.2.1.

2.2.20 Introduction
The introduction data module must provide a brief statement explaining the organization, content, method for using the CMP. Include information covering the purpose, scope and revision service for the publication. The introduction can also contain the following:

- Advisement on observing the publication instructions
- Explanation of the publication arrangement and format
- Documentation of the process verification. Refer to Para 1.5.11.
- Explanation of data module code numbering
- Explanation of callouts and cross-references

The introduction data module must be the last front matter data module in the publication.

2.3 Technical content
The technical content of the CMP is divided into three logical sections:

- Functional and technical descriptions
- Maintenance and servicing
- Illustrated parts data

Each section contains the applicable data modules. These data modules are to be presented in the order listed in this Para 2.3.

Refer to Chap 5.2.1.9 for requirements for the content and coding of these data modules.

2.3.1 Functional and technical descriptions

This section provides descriptive information in sufficient detail to enable the technician to perform the required procedures in the shop. The following information must always be provided:

- Description of function (M)
- Technical description (M)

The following information must always be provided if applicable to the components:

- Electrical and electronic data
- Software functional description
- Diagrams and schematics

These constitute the technical content of the publication. In a page-oriented publication, these data modules appear in the order listed and appear after the front matter data modules.

The following paragraphs give the publication requirements for this information.

2.3.2 Maintenance and servicing

These data modules provide the actual procedures and constitute the procedural content of the publication. In a page-oriented publication, these data modules appear in the order listed and appear after the front matter data modules.

2.3.2.1 Maintenance planning

The CMP is intended to provide on-condition maintenance instructions. Specific maintenance schedules must be avoided unless required for regulatory compliance.

In some instances, the project or the organization can decide to include maintenance planning information in the CMP.

Business rule decision point BRDP-S1-00470 - Inclusion of maintenance planning information in the CMP:

- Decide whether to include maintenance planning information in the CMP.

2.3.2.2 Removal and installation

The CMP is intended to provide shop level information to maintain and repair an end item that has already been removed from its installed location. The CMP procedures restore the unit to a condition suitable for re-installation wherever the component can be used.

Typically, the CMP must not include instructions for removing or installing the covered unit from its installed location. In some instances, the project or the organization can decide to include this information in the CMP.

Business rule decision point BRDP-S1-00471 - Inclusion of removal and installation information in the CMP:

- Decide whether to include removal and installation information in the CMP.

2.3.2.3 Task sets
Any required task sets are to be included in this section. Refer to Para 1.5.8.

2.3.2.4 Servicing
These data modules provide instructions for routine servicing of the component in the shop.

Instructions can include the following:

- Cleaning
- Inspection
- Remove and restore fluids and filters
- Lubrication
- Procedures to read, interpret, clear and reset or restore component memory
- Shop load component software

Typically, these procedures do not include significant disassembly or assembly requirements.

When component memory is used for recording faults, including Built-In Test (BIT), Built-In Test Equipment (BITE), refer to Para 2.3.2.5 for guidance.

Include adjustment procedures to be performed on the fully assembled component. Adjustment procedures to be accomplished on a partially assembled component are to be included in the assembly procedures.

The software loading procedures to be provided in this section are for installing software in the completely assembled component.

Adjustment and software installation to be accomplished on a partially assembled component are to be described in the assembly procedures. Refer to Para 2.3.2.7.

Cleaning procedures include procedures for surface finish removal and repair or replacement including markings.

2.3.2.5 Examination, test, check and fault isolation
This section must provide the examination, test and check procedures required to determine the condition of a component, guide maintenance and repair activities and determine if the unit can be returned to service. In some instances, fault isolation procedures can also be required to fully determine the defective subassembly or part.

The procedures must be arranged in such a manner that they will progressively isolate and identify any faults in each assembly, subassembly or parts to the level of detail required. Refer to Para 1.5.5.

A detailed Return-To-Service (RTS) test or tests must be provided. When the RTS testing requires multiple complex tests and /or additional procedures and criteria a task set must be used to collect and organize this information. Refer to Para 1.5.8.

Requirements to execute all procedures, in order, must be avoided in lengthy procedural sequences and lengthy procedures if possible. Lengthy sequences or procedures must provide discrete entry points to allow performing specific segments as necessary.

Procedures must be written according to parameters to be checked to repair the component and return it to service rather than according to manufacturing acceptance criteria or support equipment features.

When the order of performing the procedures is important, that order must be clearly explained.

All data required to perform the procedure must be contained within the procedure to avoid the necessity of referencing other areas of the publication. Set-up data including set-up diagrams for each procedure must be provided as well as any supporting diagrams necessary to perform the procedure. Refer to Para 2.3.1 for schematics and other component technical diagrams.

Projects or organizations can require including specific manufacturer's test and other test support data and its format (eg, test specifications, test source code).

Business rule decision point BRDP-S1-00472 - Inclusion of test support data in the CMP:

- Decide whether to include manufacturer's test support data and, if so, decide the format of the data.

Each procedure must contain instructions for corrective action in the event the component fails to pass that procedure. This can be a maintenance procedure or reference to additional examination, test, check or fault isolation procedure.

When the component design includes Built-In Test (BIT), Built-in Test Equipment (BITE), or Non-Volatile Memory (NVM) that records component faults, the following procedures and information must be provided:

- procedures to operate the BIT/BITE in the shop environment
- procedures to access and read the NVM
- procedures and information to translate the BIT/BITE/NVM codes and messages into human-readable form
- procedural or fault isolation modules as necessary to isolate malfunctions reported/recorded by the BIT/BITE/NVM

The BIT/BITE/NVM procedures and information will appear first in this section. Procedures to clear or reset the BIT/BITE/NVM memory must be provided in this section or in servicing. Refer to Para 2.3.2.4.

2.3.2.6 Disassembly

This section must provide instructions and procedures to completely disassemble the component in the shop environment. Procedures to disconnect and remove the component from its installed location are addressed in Para 2.3.2.2.

These procedures do not normally require opening permanent joints such as those that are riveted, soldered or welded where no useful purpose will be gained by such. When the design of the component clearly provides for opening these joints for normal replacement of defective parts then the procedures must be included.

Include a NOTE at the beginning of this section that disassembly must only be performed to the extent necessary to determine the condition of the component and/or perform the required maintenance such as replacement of a defective subassembly or part.

Provide step-by-step instructions in a logical sequence starting with a fully assembled component and sequentially progress to the level of detail required by the project or the organization. Refer to Para 1.5.5. In those instances where a specific sequence must be followed include a CAUTION to support the mandatory sequence.

Subassemblies and parts addressed must be identified by an IPD Catalog Sequence Number (CSN). Do not make statements such as "Disassemble in order of IPD CSN".

When appropriate, include instructions or references to perform required examinations, test and checks at the required step in the disassembly procedure. Refer to Para 2.3.2.5.

The user must be instructed to make notes of such items as shim and spacer locations and wiring routing for reference during re-assembly. When necessary, provide instructions to record necessary data at required steps in the disassembly procedure (eg, clearance, tolerance, shim thicknesses). If permanent records are required, refer to Para 1.5.12.

Provide procedures for using any applicable tools and equipment if not self-explanatory or that need additional instruction for these procedures.

In the case of extensive or complicated disassembly procedures, provide graphics including exploded views and supplemental illustrations to support the written procedures. A disassembly sequence chart can be included. The chart must reflect a disassembly sequence such that a specific part can be accessed with minimum disturbance to other serviceable parts in the component.

2.3.2.7 Assembly

This section must provide instructions and procedures to completely assemble the component in the shop environment. Procedures to install and connect the component in its installed location are addressed in Para 2.3.2.2.

Provide step-by-step instructions in a logical sequence starting with the lowest level of subassembly or part detail (refer to Para 1.5.5) and proceeding to the fully assembled component. In those instances where a specific sequence must be followed include a CAUTION to support the mandatory sequence.

Do not make statements such as "assemble in reverse order of disassembly".

Subassemblies and parts addressed must be identified by an IPD Catalog Sequence Number (CSN). Do not make statements such as "assemble in order of IPD CSN".

When appropriate, include instructions or references to perform required examinations, test and checks at the required step in the assembly procedure. Refer to Para 2.3.2.5 for guidance.

When necessary provide instructions to record necessary data at required steps in the disassembly procedure (eg, clearance, tolerance, shim thicknesses).

Provide procedures for using any applicable tools and equipment if not self-explanatory or that need additional instruction for these procedures.

In the case of extensive or complicated assembly procedures, provide graphics including exploded views and supplemental illustrations to support the written procedures. An assembly sequence chart can be included.

2.3.2.8 Repair

This section must provide instructions and procedures to restore a worn or damaged component to an approved serviceable configuration and condition that is different from its original. Repairs employ processes and procedures other than those for replacing assemblies, subassemblies and components in accordance with Para 2.3.2.6 and Para 2.3.2.7. Refer to Chap 5.2.1.9 for a more detailed discussion.

2.3.2.9 Storage

This section must provide instructions and procedures for storing the component, maintaining the component while in storage, and for removing the component from storage. Refer to Chap 5.2.1.9.

2.3.2.10 Illustrated Parts Data (IPD)

This section must provide illustrated parts data for those components that have replaceable subassemblies and parts. Information must be provided to the level of detail required for the CMP. Refer to Para 1.5.5.

Refer to Chap 5.2.1.9 and Chap 3.9.5.2.7 for additional information.

Chapter 5.3.2

Publications - Air specific publications

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Table 1 References

Chap No./Document No.	Title
Chap 5.2	Information sets and publications - Information sets
Chap 5.3.2.1	Air specific publications - Aircrew information
Chap 5.3.2.2	Air specific publications - Cross servicing guide

1 General

This chapter provides general and specific rules for the preparation of publications for air systems.

2 Scope

The required publications must be decided by the project or the organization. A checklist of possible publications is given here:

- List of applicable publications
  - Aircrew information
    - Flight manual
    - Aircraft operation
    - Performance data
    - Checklists
    - Quick reference manual
  - Air vehicle mass and balance
  - Maintenance
    - Air vehicle maintenance
    - Air vehicle description
    - Maintenance procedures

  - Checklists
  - Job cards
  - Air vehicle fault isolation
  - Air vehicle schematic diagrams
  - Air vehicle wiring data
  - Air vehicle maintenance planning

- Maintenance requirements
  - Checklists
  - Job cards
  - Engine standard practices
  - Engine maintenance
  - Power plant build-up
  - Equipment maintenance
  - Airborne equipment
  - Engine accessories
  - Ground support equipment
  - Training equipment

- Loading
  - Air vehicle cargo loading
  - Air vehicle weapon loading
  - Air vehicle stores loading

- Air vehicle cross servicing
- Air vehicle role change
- Air vehicle structure repair
- Air vehicle non-destructive testing
- Air vehicle corrosion control
- IPD
- Air vehicle battle damage repair
- Air vehicle recovery
- Air vehicle storage
- Illustrated tools and equipment
- Common information and data
  - Standard practices structure
  - Standard practices systems
  - Standard practices electric/electronic
  - Regulatory information

- Material data
  - Material data sheets
  - List of consumable materials
  - Time change items (TCI) data

- Service bulletins / Service information

The definition of the content of the publications should be based on the requirements of the corresponding information sets. Refer to Chap 5.2.

Subsequently some specific requirements to publications are contained in:

- Aircrew information. Refer to Chap 5.3.2.1.
- Cross servicing guide. Refer to Chap 5.3.2.2.

Chapter 5.3.2.1

Air specific publications - Aircrew information

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2 Aircrew information 1
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2.2 Flight manual 1
2.3 Operating data manual 1
2.4 Flight crew checklist 2

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Table 1 References

Chap No./Document No.	Title
Chap 5.2.2.7	Air specific information sets - Aircrew information

1 General

By project or organization decision Aircrew information can be split in the following publications:

- General description (GD)
- Flight manual (FM)
- Operating data manual (ODM)
- Flight crew checklist

2 Aircrew information

2.1 General description

The GD must contain the description (functioning) of the air system and its systems and equipment. Refer to Chap 5.2.2.7.

2.2 Flight manual

The FM must contain all specific information necessary for aircrew to perform the air system's missions. Refer to Chap 5.2.2.7.

2.3 Operating data manual

The ODM must contain performance data used by the operator for flight planning purposes. Refer to Chap 5.2.2.7.

2.4 Flight crew checklist

The flight crew checklist must contain a compilation of all drills for normal operation of the air vehicle, for air system and system malfunctions, for emergency procedures and for special operations. Refer to Chap 5.2.2.7.

Note

Supplementary information, such as operating data, can be included if essential to aircrew.

Chapter 5.3.2.2

Air specific publications - Cross servicing guide

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Table 1 References

Chap No./Document No.	Title
Chap 5.2.2.3	Air specific information sets - Cross servicing information

1 General

An Air vehicle Cross-Servicing Guide (ACSG) must enable services to be performed on air vehicle by an organization other than to which the air vehicle is assigned, according to an established operational air vehicle cross-servicing requirement, and for which there can be a charge.

2 Cross-servicing guide

The breakdown of the air vehicle cross-servicing guide must be as follows:

2.1 Section I - Leading particulars

- How to use section I
- General description and operation of the air vehicle
- Safety chart(s)
- Danger areas
- Walkways
- Dimensions and weight data
- Access and inspection openings diagrams

- Interior arrangements of compartments
- Radio and radar equipment essential for flight
- Armament installation

2.2 Section II - Air system handling, launching and recovery

- How to use section II
- List of handling equipment requirements
- Performance parameters for launching and recovery of air vehicles
- Handling safety chart
- Air vehicle overturn danger chart
- Methods of grounding
- Towing and winching
- Deck securing and picketing (mooring)
- Nose, wing, fin and rotor blade folding and unfolding
- Gust locking procedures
- Safety devices and protective covers
- Emergency access and crew evacuation
- Fire fighting
- Slinging and hoisting
- Jacking

2.3 Section III - Replenishment, servicing points, engine starting and cooling

- How to use section III
- Servicing and drain points
- List of consumable materials
- Types of replenishment connections for charging main systems
- Capacity of systems and methods of replenishment or charging
- Lubricating charts and symbols
- External hydraulic power application
- External electrical power application
- External pneumatic power application
- Engine starting
- External air conditioning requirements
- Drag chutes

2.4 Section IV - Inspection and servicing procedures

- How to use section IV
- Access and inspection procedures
- Inspection

2.5 Section V - Main systems

- How to use section V
- Main systems

2.6 Section VI - Armament

- How to use section VI
- Non-nuclear munitions

2.7 Section VII - Locally-manufactured items

- How to use section VII
- Locally-manufactured items

2.8 Glossary

2.9 Index

The index must list the subject matter of the air vehicle cross servicing guide in alphabetical order and must immediately follow the glossary and will therefore be the last element of the publication.

For further details refer to Chap 5.2.2.3.

Chapter 5.3.3

Publications - Land/Sea specific publications

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None	

1 General

This chapter provides rules for the preparation of publications for land/sea Products. The required publications must be decided by the project or organization.

2 Land/sea specific publications

2.1 Checklist

A checklist of possible publications is as shown below:

- List of applicable publications
- User reference guide or Operator's handbook
  - Crew/operator information - Description
  - Crew/operator information - Operation
  - Crew/operator information - Sequential operation
  - Crew/operator information - Fault detection, isolation and resolution
  - Crew/operator information - National checks
  - Crew/operator information - Maintenance
- Mass and Balance
- Maintenance
  - Description
  - Maintenance procedures
  - Check lists
  - Work cards

- Fault detection, isolation and resolution
- Schematic diagrams
- Wiring data
- Cross servicing
- Structure repair
- Non-destructive testing
- Corrosion control
- IPD
- Illustrated tools and equipment
- Battle damage repair

– Maintenance planning

- Maintenance requirements
- Check lists
- Work cards

– Loading and storage

- Cargo loading
- Weapon loading
- Stores loading
- Storage

– Operation

- Operation
- Role change
- Recovery

– Material data

- Material data sheets
- List of consumables/expendables

– Service bulletins

2.2 User reference guide

When producing the User reference guide or Operator's handbook, the selection of data modules will be based on the skill level, which can be set to an appropriate level that indicates that the crew/operator is also a maintainer.

Chapter 6

Information presentation and use

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Chapter	Data module title	Data module code	Applic
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Chap 6.2	Information presentation and use - Page-oriented publications	S1000D-A-06-02-0000-00A-040A-A	All
Chap 6.2.1	Page-oriented publications - Page layout, paper publications, headers and footers	S1000D-A-06-02-0100-00A-040A-A	All
Chap 6.2.2	Page-oriented publications - Typography and layout elements	S1000D-A-06-02-0200-00A-040A-A	All
Chap 6.2.3	Page-oriented publications - Layout rules and examples	S1000D-A-06-02-0300-00A-040A-A	All
Chap 6.2.3.1	Layout rules and examples - Front matter data modules	S1000D-A-06-02-0301-00A-040A-A	All
Chap 6.2.3.2	Layout rules and examples - Descriptive data modules	S1000D-A-06-02-0302-00A-040A-A	All
Chap 6.2.3.3	Layout rules and examples - Procedural data modules	S1000D-A-06-02-0303-00A-040A-A	All
Chap 6.2.3.4	Layout rules and examples - Fault information data modules	S1000D-A-06-02-0304-00A-040A-A	All
Chap 6.2.3.5	Layout rules and examples - IPD publication	S1000D-A-06-02-0305-00A-040A-A	All
Chap 6.2.3.6	Layout rules and examples - Component maintenance data modules	S1000D-A-06-02-0306-00A-040A-A	All
Chap 6.2.3.7	Layout rules and examples - Service bulletin data modules	S1000D-A-06-02-0307-00A-040A-A	All
Chap 6.3	Information presentation and use - IETP	S1000D-A-06-03-0000-00A-040A-A	All
Chap 6.3.1	IETP - Output specification	S1000D-A-06-03-0100-00A-040A-A	All
Chap 6.4	Information presentation and use - Functionality	S1000D-A-06-04-0000-00A-040A-A	All
Chap 6.4.1	Functionality - Background and explanation	S1000D-A-06-04-0100-00A-040A-A	All
Chap 6.4.2	Functionality - Functionality matrix	S1000D-A-06-04-0200-00A-040A-A	All

Chapter 6.1

Information presentation/use - Introduction

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Chap No./Document No.	Title
Chap 6.2	Information presentation/use - Page-oriented publications
Chap 6.3	Information presentation/use - Interactive electronic technical publications
Chap 6.4	Information presentation/use - Functionality

1 General

This chapter contains the guidance and rules on the presentation and use of information. The two distribution mainstreams are:

- page-oriented presentation on paper or screen
- interactive electronic presentation on screen of pre-packed IETPs

The chapter also includes a comprehensive functionality matrix for evaluation of or specifying output functionality.

2 Content

2.1 Page-oriented publications

Chap 6.2 gives the rules for the S1000D standard page-oriented presentation of publications. The chapter includes the typographical information needed to set up any type of output production environment, either using traditional production methods by word processors or using XML editors. Rules and examples of front matter, descriptions, procedures, etc, are given.

2.2 Interactive Electronic Technical Publications (IETPs)

Chap 6.3 gives the basic rules for presentation of Interactive Electronic Technical Publications (IETPs). Guidance for further interactivity is also given.

2.3 Output functionality

Chap 6.4 gives the details for output functionality that is facilitated by producing information in accordance with S1000D.

Chapter 6.2

Information presentation and use - Page-oriented publications

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Chap No./Document No.	Title
Chap 5	Information sets and publications
Chap 6.2.1	Page-oriented publications - Page layout, paper publications, headers and footers
Chap 6.2.2	Page-oriented publications - Typography and layout elements
Chap 6.2.3	Page-oriented publications - Layout rules and examples

1 General

A page-oriented publication is built up of front matter and several documents, all stored as data modules in the CSDB. The detailed specifications for the information set content and the arrangement of the documents to make a publication from the information set are given in Chap 5.

The layout in page-oriented presentations is based on the paper paradigm, which gives the possibility to present the formatted data modules on paper or on screen. Thus the page layout is composed to suit A4 and A5 (European) and A-size and 5 inch by 8 inch (US) paper sizes. For oversize pages (foldouts) A3 and B-size respectively are used. For other project specific page sizes the presentation must follow the layout given herein, in an equivalent way. Small page sizes (eg, pocket-sized manuals) can necessitate the use of smaller than typical type size.

The paper publication is the printed output from the data modules and the screen presentation is the displayed output from the data modules.

Business rule decision point BRDP-S1-00473 - Use of the S1000D standard page-oriented presentation chapters:

– Decide whether to use the S1000D standard page-oriented presentation given in Chap 6.2.2 and Chap 6.2.3 or to use any other rules for presentation to meet specific project or organization requirements. The business rules must specify all the requirements needed to contract the desired presentation.

2 Page-oriented publications

2.1 Page layout, paper publications, headers and footers

Chap 6.2.1 gives the detailed rules for the page layout of standard and oversize pages. Rules for headers and footers are detailed together with basic rules for paper publications.

2.2 Typography and layout elements

Chap 6.2.2 gives the detailed typographic rules for all layout elements used to present the XML information in the data modules to the S1000D standard page-oriented presentation.

This chapter provides the basic rules for producing formatted output using for example, XML stylesheets (written in the Extensible Stylesheet Language) or cascading stylesheets.

2.3 Layout examples

Chap 6.2.3 gives detailed rules and examples of S1000D standard presentations of front matter, descriptive, procedural, etc, data modules using the layout elements given in Chap 6.2.2.

Chapter 6.2.1

Page-oriented publications - Page layout, paper publications, headers and footers

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Table 1 References

Chap No./Document No.	Title
Chap 3.9.2.1	Illustration rules and multimedia - Illustrations, General
Chap 3.9.5.1	Data modules - Identification and status section
Chap 6.2.2	Page-oriented publications - Typography and layout elements

1 General

This chapter gives the S1000D standard page-oriented presentation page layout rules (type and image widths and heights, margins, etc) for European A4, A3 and A5 pages, and North American (ANSI) A-size, ANSI B-size and index card pages presented on paper or on screen. The typography for headers and footers is also given.

The layout examples provided are for right-hand pages. For left-hand pages (when double-sided printing) mirror images of the right-hand examples provided can be used. The page image area stays the same.

When other page sizes are used, a similar and consistent presentation layout must be used.

The typography for all other presentation elements is given in Chap 6.2.2.

Business rule decision point BRDP-S1-00474 - Use of mirrored headers and footers:

– Decide whether to use mirrored headers and footers.

2 Page layout

2.1 General

The page layout is composed to suit A4 (European 210 mm x 297 mm) and ANSI A-size (North American 8 ½ inch x 11 inch) including foldout pages in A3 (European 420 mm x 297 mm) and ANSI B-size (North American 17 inch x 11 inch) respectively. A smaller size publication is allowed using A5 (European 148,5 mm x 210 mm) or Index card (North American 5 inch x 8 inch).

The examples of text pages in A4, A5, ANSI A-size, and index card publications give the default presentation as single column pages.

Double column text is allowed by project decision. No mix of single and double column presentation in the same data module is allowed.

A3L (L = Landscape) and ANSI B-size publications are normally used for page-oriented wiring data and schematic diagram publications. For details on foldout pages refer to Para 2.6.1, Para 2.6.2 and Para 2.4.1.4.

Note

Projects can decide on other page sizes. However, using other page and paper sizes can affect the presentation and authoring, and thus the reuse of the data modules in other projects or by other customers.

Note

The A4 layout given in Fig 1 is suitable for both A4 and ANSI A-size pages. By using this layout the composed pages can be printed globally without defining "local" paper sizes.

Note

Text pages in A3L/ANSI B-size publications can be A4/ANSI A-size pages or A3L/ANSI B-size pages built up by two A4/ANSI A-size text page images.

All text must be presented with a sans serif type (eg, Helvetica, Univers, Swiss, Arial).

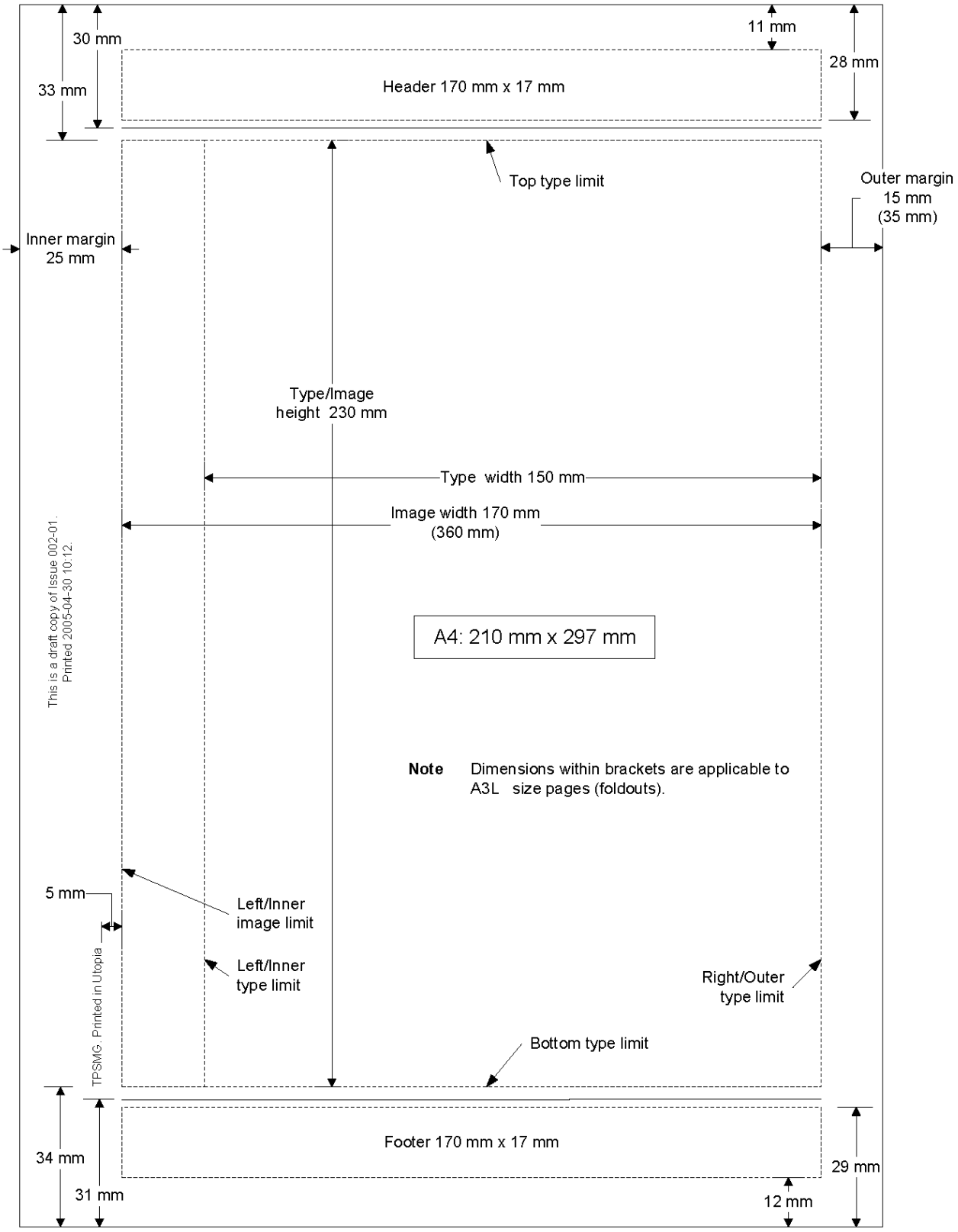
Layout sheet for A4 and A3L is shown in Fig 1 and the layout sheet for A5 is shown in Fig 2. Layout sheet for ANSI A- and ANSI B-size is shown in Fig 3 and the layout sheet for Index cards is shown in Fig 4. These sheets show margins, header and footer areas, type limits and the page image area. Location of header and footer on oversize pages is shown in Fig 5.

Business rule decision point BRDP-S1-00475 - Page size:

– Decide which page size to be used (including sizes when foldouts are allowed) per publication.

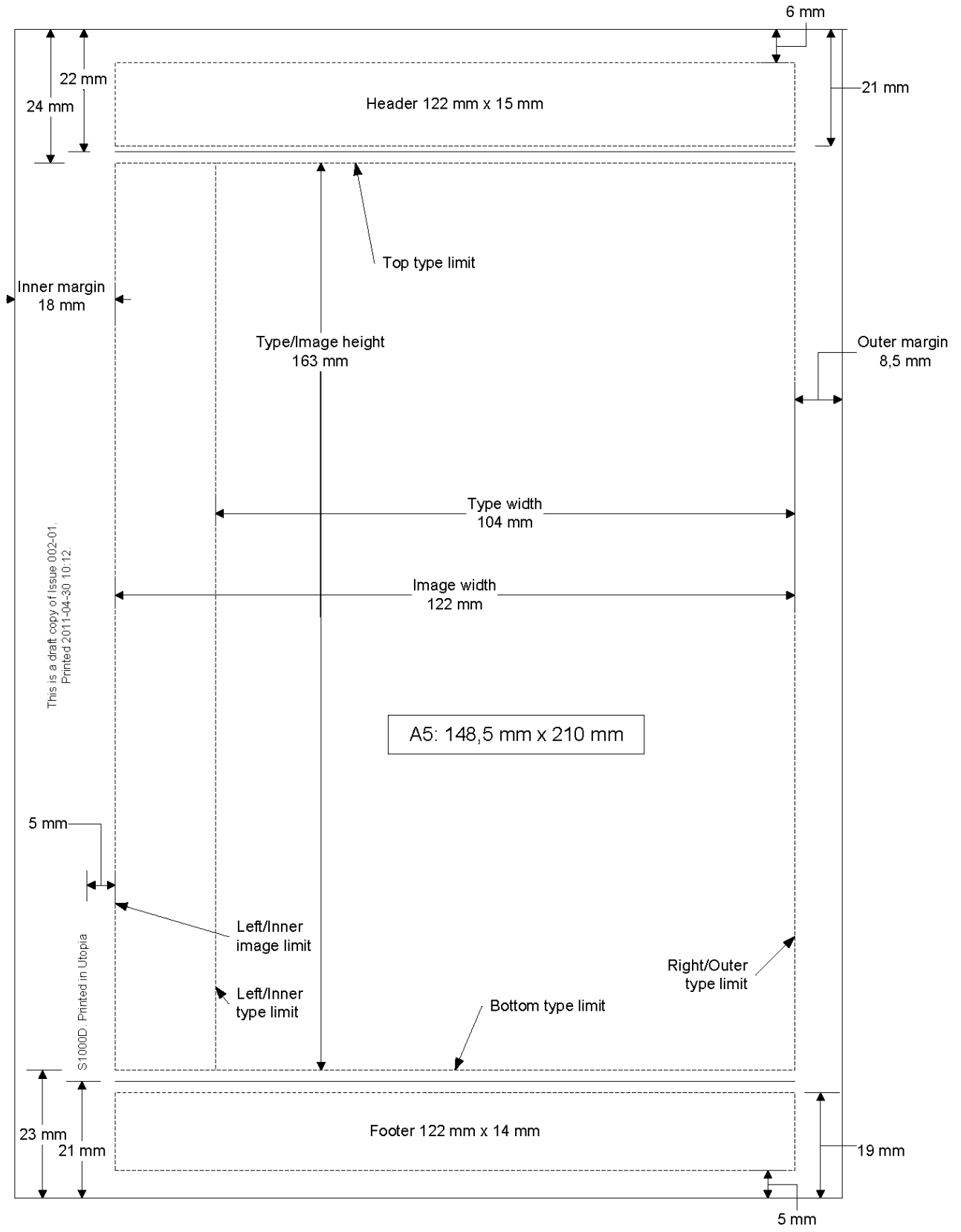
Business rule decision point BRDP-S1-00476 - Presentation of foldouts in page-oriented publications:

– Decide where (eg, interspersed or at the end of the publication) the foldouts must be located in page-oriented publications.



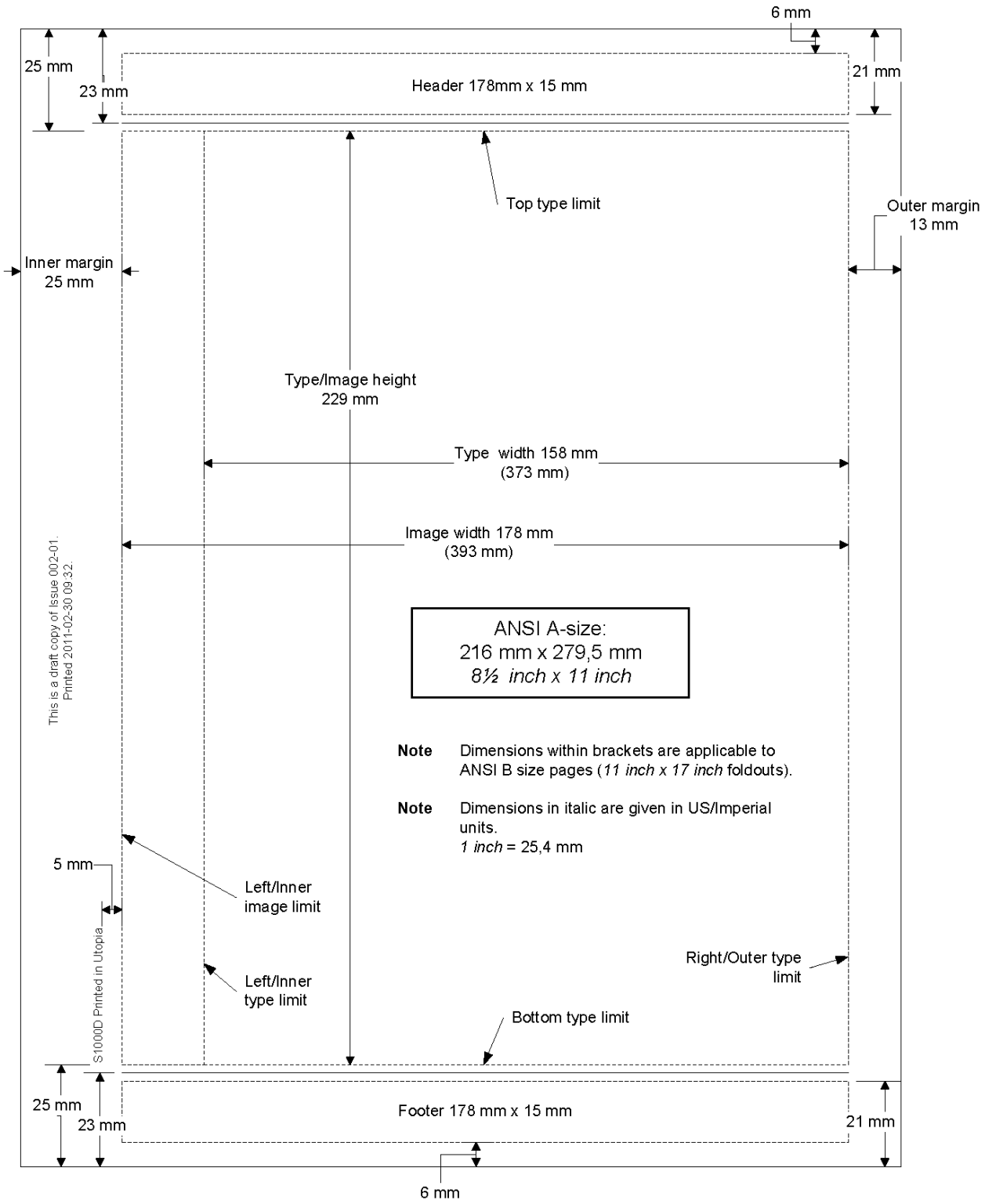
ICN-S3627-S1000D0434-003-01

Fig 1 Layout sheet for A4 and A3L



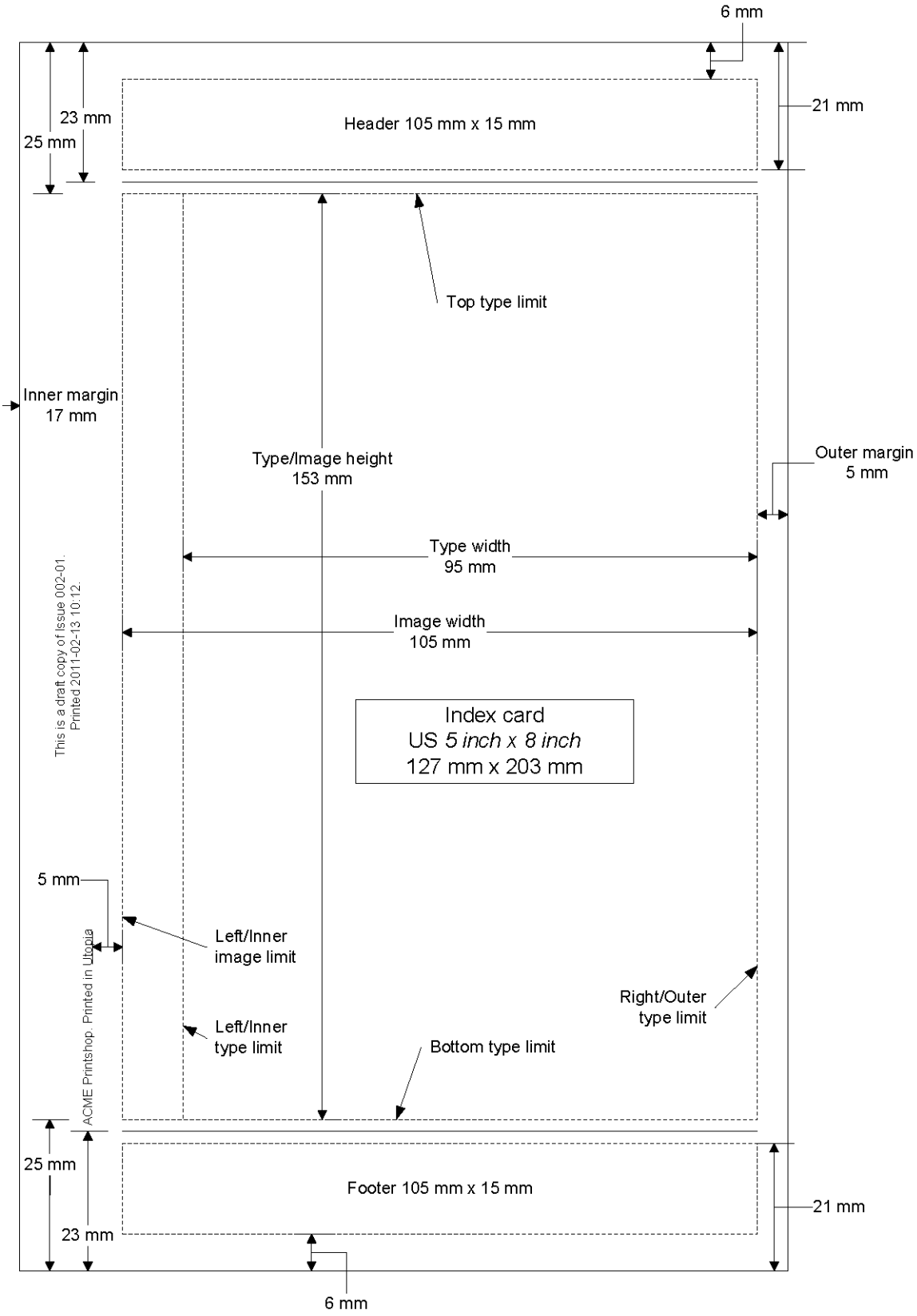
ICN-S3627-S1000D0481-002-01

Fig 2 Layout sheet for A5



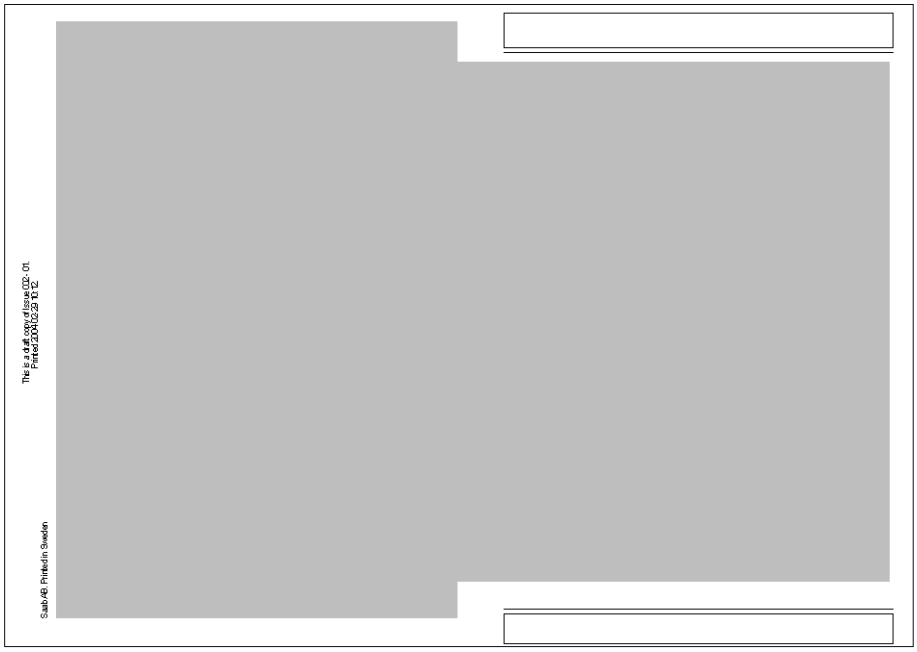
ICN-S3627-S1000D0377-002-01

Fig 3 Layout sheet for ANSI A- and ANSI B-size



ICN-S3627-S1000D0382-002-01

Fig 4 Layout sheet for Index card (5 inch x 8 inch)



ICN-AE-A-060201-G-S3627-00379-A-01-1

Fig 5 Header and footer on oversize pages

2.2 Inwork markings

When a data module in the stage of "inwork" is presented as a paper copy or PDF file, it is recommended to present its issue number and the time of printing on each page.

The issue number and its "inwork" number, derived from the attribute values in the element <issueInfo issueNumber="002" inWork="01">, separated by a hyphen to be presented in 8 pt, centered in the inner margin. Refer to Fig 1, Fig 2, Fig 3, Fig 4 and Fig 5.

Example: "This is a draft copy of Issue 002-01. Printed 2004-02-29 10:12."

Business rule decision point BRDP-S1-00477 - Presentation of inwork markings:

– Decide whether to present the inwork markings. The details must be documented.

2.3 Produced by - Printed in

Responsible for producing the page-oriented output can, by project decision, be given on each page.

The producer's name is presented in 6 pt in the margin. Refer to Fig 1, Fig 2, Fig 3, Fig 4 and Fig 5 for detailed location.

Example of "Produced by": Saab (AB)

When printed on paper for distribution, a notification on in which country the page has been printed, can be added after producer's name.

Example of "Produced by. Printed in": Saab AB. Printed in Sweden

Business rule decision point BRDP-S1-00478 - Presentation of "Produced by" - "Printed in":

– Decide whether to present the responsible producer of the page-oriented output and/or where the publication was printed.

2.4 Header and footer

The header and footer must provide a discrete identification of the page. Applicability annotation and security marking can also be included. Manufacturer's, project's or sponsor's logotype can be included in the header.

The header and footer are separated from the page image area by a black line of 1 pt width across the full image width.

Layout and typography for header and footer is shown in Fig 6 (A4 and A3) and Fig 7 (ANSI A- and B-size), Fig 8 (A5) and Fig 9 (Index card).

For left-hand pages use mirror images of the right-hand examples provided.

Font sizes given in this Para 2.4 are given for A4, A3, ANSI A- and B-size pages. Table 2, Fig 8 and Fig 9 give the font sizes for A5 and Index card pages.

2.4.1 Page identification

The page identification comprises the publication module code, the data module code, the issue date and the page number. When the publication uses applicability annotations this must be included in the page identification. Refer to Para 2.4.1.5.

2.4.1.1 Publication module code

The publication module code for the complete publication must be located in the header. The publication module code is, per S1000D standard page-oriented presentation rules, positioned in the top outside corner and presented in 11 pt bold, aligned to the outer type limit. The value is derived from <pmc> or <pme> in the publication module.

Business rule decision point BRDP-S1-00479 - Presentation of publication module code:

- Decide whether to use the S1000D standard page-oriented presentation rules for the publication module code or to create project or organization specific rules for its positioning and style within the header.

2.4.1.2 Document identifier

The document identifier, which is equal to the data module code, must be located in the footer. The data module code is, per S1000D standard page-oriented presentation rules, positioned in the top outside corner of the footer and is presented in 11 pt bold, aligned to the outer type limit.

Business rule decision point BRDP-S1-00480 - Presentation of data module code:

- Decide whether to use the S1000D standard page-oriented presentation rules for the data module code or to create project or organization specific rules for its positioning and style within the footer.

2.4.1.3 Issue date

The issue date must be located in the bottom of the footer. The issue date precedes, per S1000D standard page-oriented presentation rules, the page number by two spaces and must be presented in 11 pt bold. In the markup, it is represented in the element <issueDate> as described in Chap 3.9.5.1.

Example: 2003-05-31

Business rule decision point BRDP-S1-00481 - Presentation of issue date:

- Decide whether to use S1000D standard page-oriented presentation rules for the issue date or to create project or organization specific rules for its positioning in the bottom of the footer.

2.4.1.4 Page number

Each printed page must have a page number. The page number must be located in the footer. The page number is, per S1000D standard page-oriented presentation rules, positioned in the bottom outside corner of the footer preceded by "Page". The page number including "Page" must be presented in 11 pt bold, aligned to the outer type limit.

An A4, A5, ANSI A-size or Index card without any information within a document must have a header and footer and thus a page number, except for the last page in the document, which must have no header or footer. There is no need for marking a blank page within a document with "Intentionally left blank". A blank last page must not be marked.

Oversize pages (foldouts) are normally printed on one (right-hand) side only and placed at the end of the document. When foldouts are placed at the end of the document, page numbers must follow on from the standard size pages without regard to the blank backing pages. Where foldouts are interspersed within the document, they must be numbered only on the printed sides indicating that no pages are missing.

Recommendation: Double number the foldout pages to keep the right-hand pages throughout the publication with an odd page number (eg, 11/12, 13/14), when interspersed and printed on one (right-hand) side only.

Business rule decision point BRDP-S1-00482 - Presentation of page number:

– Decide whether to use the S1000D standard page-oriented presentation rules for the page number or to create project or organization specific rules for its positioning in the footer.

Business rule decision point BRDP-S1-00483 - Page numbering of foldout pages:

– Decide whether to use double numbering of pages when printed on one (right-hand) side only (eg, 11/12, 13/14).

2.4.1.5 Applicability annotation block

For customized page-oriented publications an applicability annotation block is presented in the inside margin of the footer on each page. The applicability must be expressed, by project decision, with serial number of the Product, with an "Applicability" code or with a human-readable expression. When a code is used, the publication must contain an explanation of the code employed in the publication.

If a publication uses applicability annotation blocks all footers must contain the text "Applicable to:" as a default heading in the applicability annotation block followed by serial numbers, codes or a human-readable expression. When the applicability includes all instances of the Product, the code "All" must be used.

The applicability annotation, code or human-readable expression in the footer is derived from the element <applic> in the Identification and status section giving the overall applicability for the data module.

The applicability annotation block, including the default heading "Applicable to:" is located in the top inside corner of the footer and must be presented in 10 pt lowercase aligned to the inner image width.

Business rule decision point BRDP-S1-00484 - Presentation of applicability annotation:

– Decide whether to use the S1000D standard page-oriented presentation rules for the applicability annotation or to create project or organization specific rules for the presentation.

2.4.2 Security marking

Each page in a publication must have a security marking except, by project decision, for unclassified publications. The marking must correspond to the highest classified information within the data module.

The classification markings must be located in both the header and the footer. The text must be presented in 11 pt bold, uppercase, and centered at top and the bottom of the page. In the markup, it is represented in the element <security> as the projects meaning of the value of the attribute securityClassification as described in Chap 3.9.5.1.

As an alternative the project can decide to present the commercial classification (value of attribute commercialClassification) and/or the national caveat (value of attribute caveat) in the header and/or footer. The project can also decide to present the security markings in sentence case (instead of in uppercase) and to exclude the presentation of security markings for unclassified publications.

The binder and the title page must be marked according to the highest classified information in the publication or volume thereof. The title page can also include other classification information represented in the element <derivativeClassification>. For each derivative classification action, this information would be identified by date of the action, source material used for the derivation, contact person and the action type (eg, classified, declassified, downgraded and/or upgraded). Refer to Chap 6.2.3.1.

Business rule decision point BRDP-S1-00485 - Presentation of security markings:

- Decide whether to present the security markings in sentence case instead of in uppercase.

Business rule decision point BRDP-S1-00486 - Presentation of commercial classification and/or caveat as security markings:

- Decide whether to use the commercial classification (value of attribute commercialClassification) and/or national caveat (value of attribute caveat) as an alternative to the security classification (value of the attribute securityClassification).

Business rule decision point BRDP-S1-00568 - Presentation of derivative classification markings:

- Decide whether to use and when to use the derivative classification (value of the <classificationAction> elements within the <classificationActionGroup> defined by the IDREF in the attribute derivativeClassificationRefId).

Business rule decision point BRDP-S1-00487 - Exclude presentation of security markings for unclassified publications:

- Decide whether to exclude the presentation of security markings for unclassified publications.

2.4.3 Safety classification

Each page in a data module with the attribute safetyLabel in the element <productSafety> set to "alert" must have "Alert" presented in the header.

The classification must be presented in 11 pt bold aligned to the bottom outer type limit. Refer to Fig 6 and Fig 7.

Business rule decision point BRDP-S1-00488 - Presentation of safety classification

– Decide whether to use the S1000D standard page-oriented presentation rules for the safety classification (attribute `safetyLabel` of the element <`productSafety`>) or to create project or organization specific rules for the presentation.

2.4.4 Logotype

Each page in a publication or each page in discrete data modules can have by project decision a logotype (manufacturer's, project's or sponsor's) located in the top outside corner of the header. The maximum height is limited by the height of the header. The element <`logo`> in element <`dmStatus`> contains the reference to the logotype.

Business rule decision point BRDP-S1-00489 - Presentation of the element <`logo`>:

– Decide whether to present any of the logotypes given in the element <`logo`> and how this element is presented (eg, size, color).

2.4.5 End of data module

The last printed page in a data module must be identified by a statement indicating the end of the data module. This statement must be either the static phrase "**End of data module**" or the dynamic phrase comprised of the words "**End of**" followed by the data module title. Projects must determine which phrase will be published.

Recommendation: It is recommended that the end of data module statement be written in 11 pt bold, placed in the footer.

Note

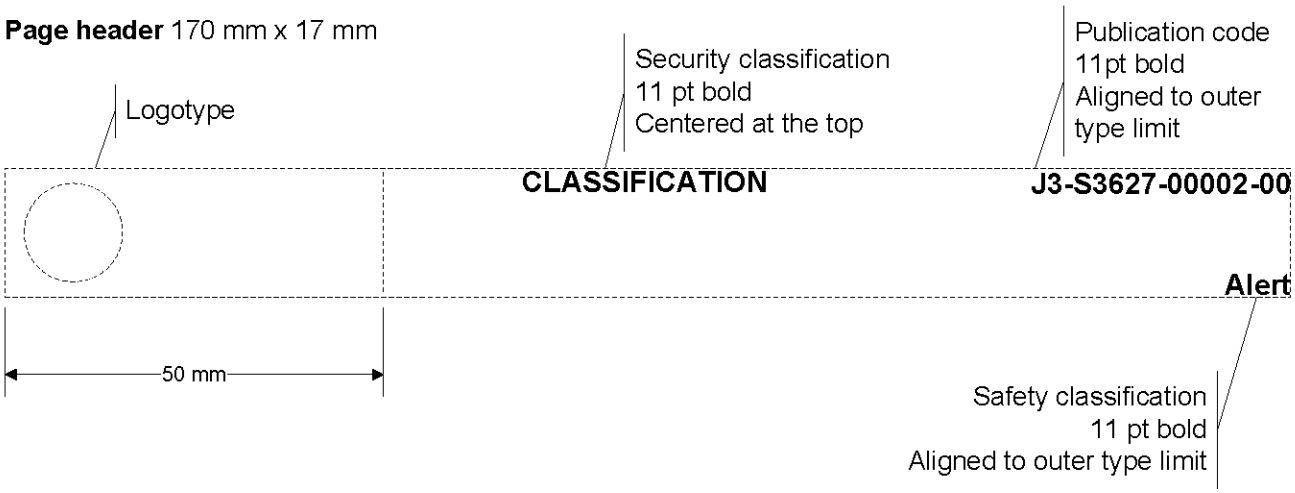
The end of data module statement is not entered in the data modules when data modules are written in an XML editor or a WYSIWYG-editor with an automatic function for generating pages.

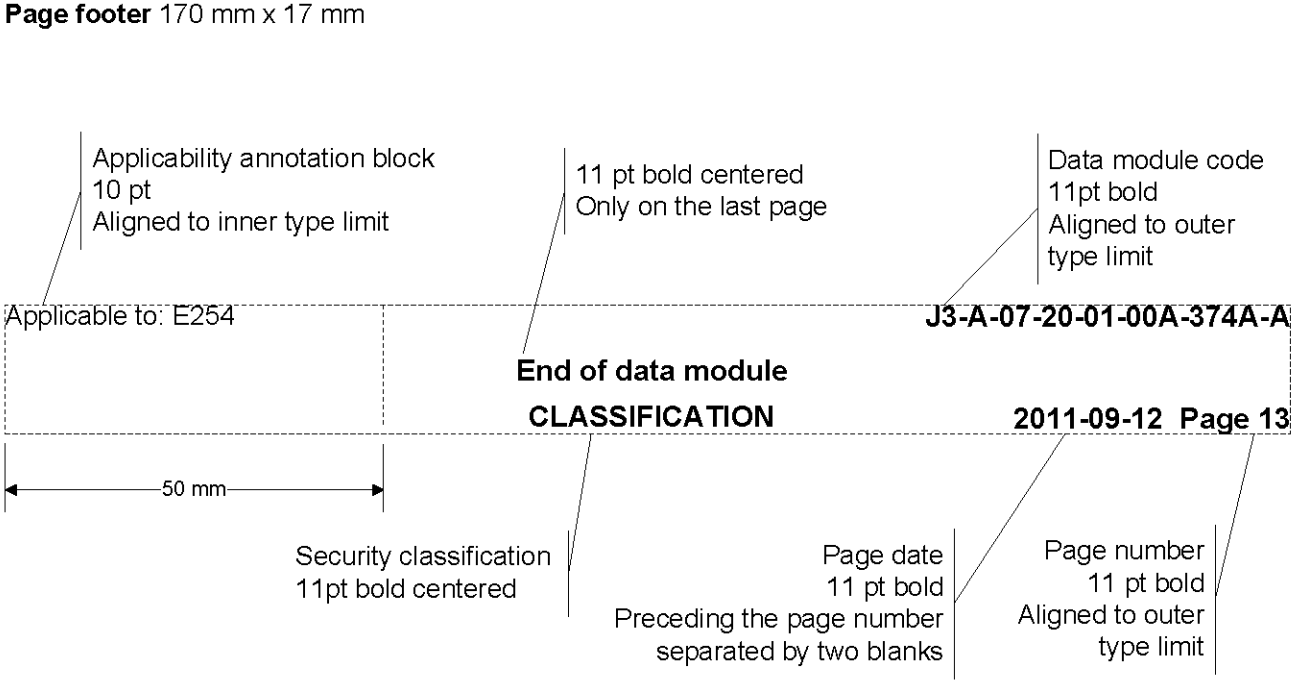
Business rule decision point BRDP-S1-00490 - Presentation of "End of data module" statement:

– Decide on the text that will be used to identify the end of a data module, either "End of data module" or "End of" followed by the data module title.

Business rule decision point BRDP-S1-00491 - Placement of the end of data module statement:

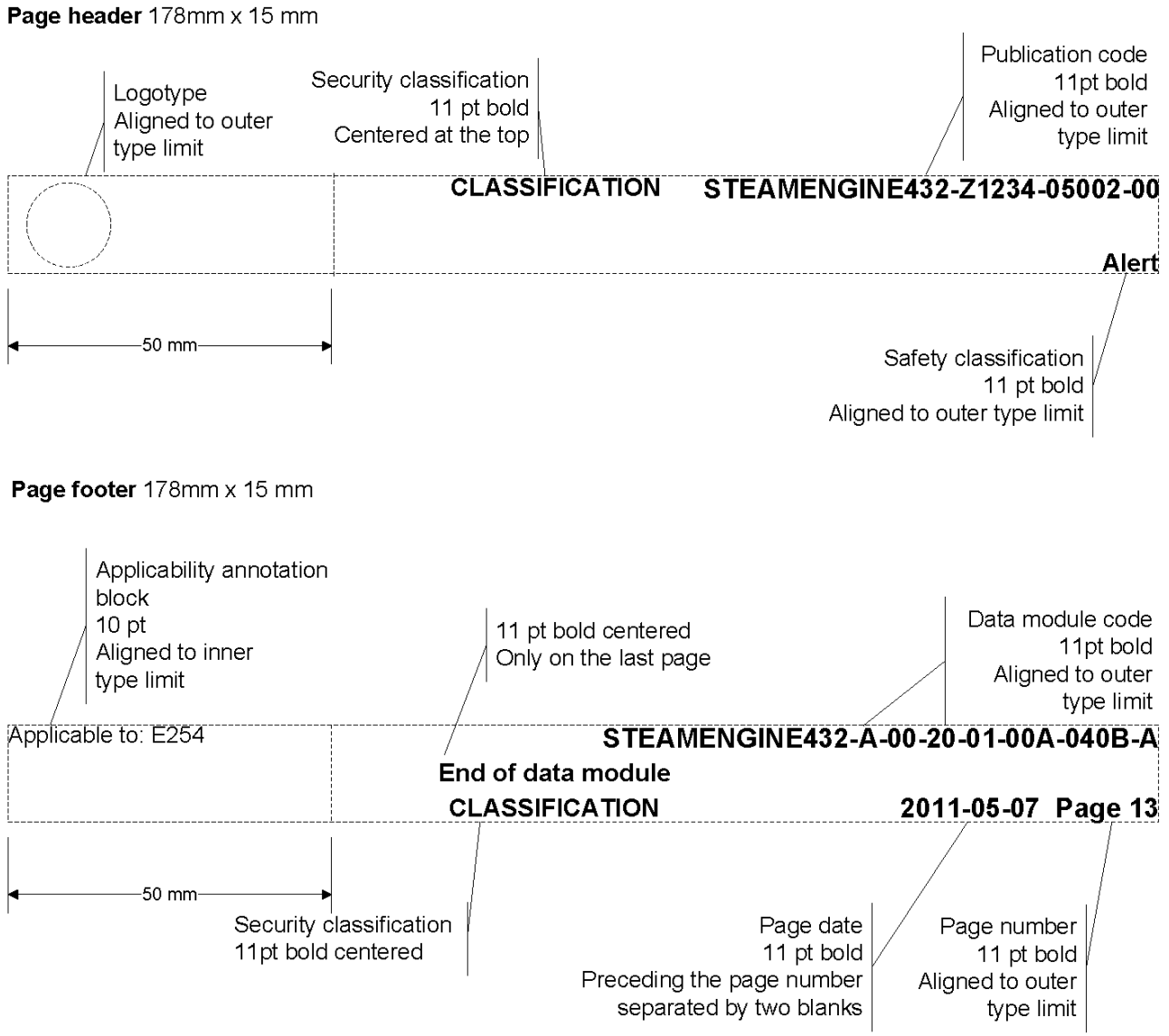
– Decide whether to present the "End of" statement in the footer or in the body of the page.





ICN-S3627-S1000D0380-002-01

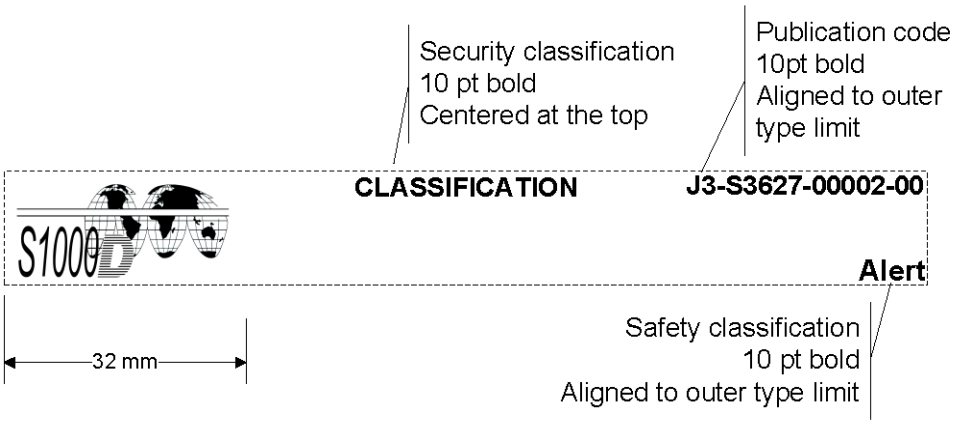
Fig 6 Layout and typography for header and footer - A4 and A3



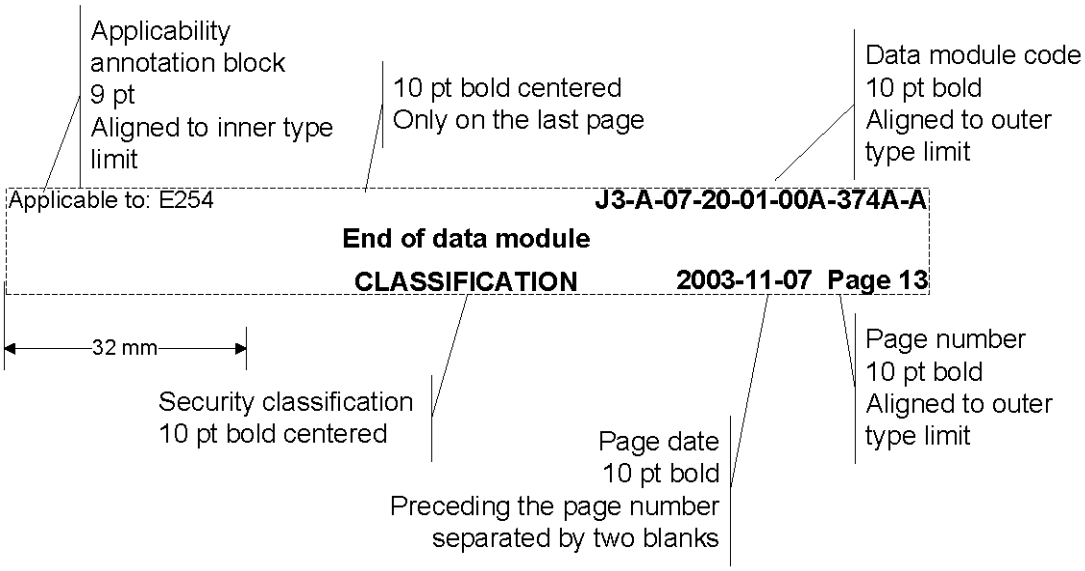
ICN-S3627-S1000D0378-002-01

Fig 7 Layout and typography for header and footer - ANSI A- and ANSI B-sizes

Page header 122mm x 15 mm



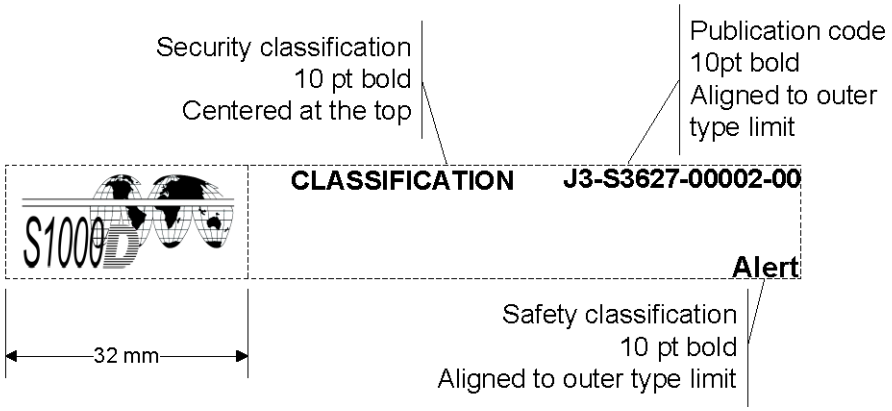
Page footer 122 mm x 14 mm



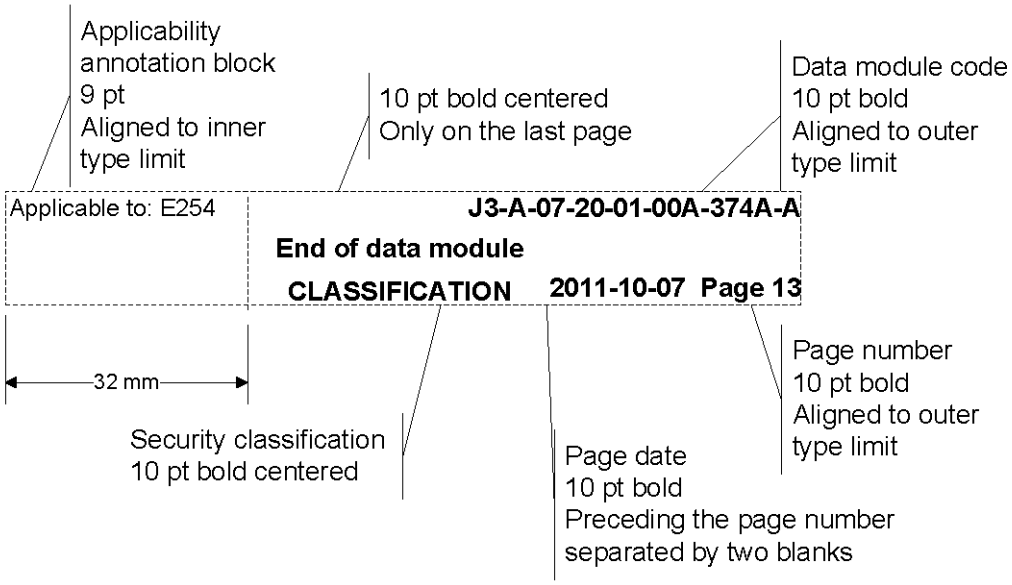
ICN-S3627-S1000D0384-002-01

Fig 8 Layout and typography for header and footer - A5

Page header 105 mm x 15 mm



Page footer 105 mm x 15 mm



ICN-S3627-S1000D0383-002-01

Fig 9 Layout and typography for header and footer - Index card (5 inch x 8 inch)

2.4.6 Elements in header and footer

The following table gives the elements creating the document header and footer.

Table 2 Elements in header and footer

Element	Character image A4, A3, ANSI A- and ANSI B-size	A5 and Index cards	Derived from
Publication code	11 pt bold	10 pt bold	<pmCode>
Data module code	11 pt bold	10 pt bold	<dmCode>

Element	Character image A4, A3, ANSI A- and ANSI B-size	A5 and Index cards	Derived from
Page date	11 pt bold	10 pt bold	<issueDate>
Page number	11 pt bold	10 pt bold	Generated by the page make-up system
Applicability annotation block	10 pt	9 pt	The interpretation of the element <applic>
Security marking	10 pt	9 pt	The interpretation of the attribute securityClassification in the element <security>
Safety classification	11 pt bold	10 pt	The interpretation of the attribute safetyLabel in the element <productSafety>
Logotype			<logo>
Inwork markings	8 pt	8 pt	<issueInfo>

2.5 Double column text

For pages produced with double column text, the columns must be equally split over the page image width with a gutter approximately six millimeters (¼ inch) wide between the columns.

The illustration size and orientation rules specified in Chap 3.9.2.1 apply to double column text pages.

Tables can be placed within a column or be spread across the full page image width.

Titles must not cross over the full page image width, except for centerheads (refer to Chap 6.2.2), full width figures, and full width tables.

Text must be presented for the reader in the way that the text flows from top to bottom "through" any page image wide illustration or table. Centerheads, because of their default placement centered across a full page, are allowed to "break" the flow. Care must be taken when determining layout and placement so that the users are not confused by an illustration that is interspersed with text.

Business rule decision point BRDP-S1-00492 - Use of double column text:

– Decide whether to use double column text, and under what circumstances. Typography for double column page layout must be documented.

2.6 Paper publications

2.6.1 Paper and printing

It is recommended to use white paper with good strength characteristics and of sufficient weight and substance to eliminate show-through when printed on both sides.

Standard paper sizes used in publications are listed in Table 3.

Note

Projects can specify other paper sizes.

Table 3 Standard paper sizes

Binder size	Paper size		Note
	Standard size	Optional oversize pages (foldouts). To be avoided.	
A5	A5	A4L	L = Landscape. Refer to Para 2.6.2.
5" by 8"	5" by 8"		Index card size
A4	A4	A3L	
A-size	A-size	B-size	ANSI sizes
A3L	A3L	-	

The standard size paper given in Table 3 is normally printed on both sides and the optional oversize papers on one side only.

Business rule decision point BRDP-S1-00493 - Double sided printing of foldout pages:

– Decide whether to use double sided printing on foldout pages.

Note

A3L paper in A3L binders are normally printed on both sides.

A form of printing must be used which results in a black image suitable for reproduction (eg, by xerography). The quality of the printed characters, lines, etc, must be uniform within the page, from page to page, and from page revision to page revision.

2.6.2 Folding

Oversize pages in a publication must be folded to present the header and the footer.

Recommendation: Place oversize pages at the end of the document.

Chapter 6.2.2

Page-oriented publications - Typography and layout elements

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Chap No./Document No.	Title
Chap 3.9.2	Authoring - Illustration rules and multimedia
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Chap 6.2.1	Page-oriented publications - Page layout, paper publications, headers and footers
Chap 6.2.3	Page-oriented publications - Layout rules and examples

Chap No./Document No.	Title
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Chap 6.2.3.3	Layout rules and examples - Procedural data modules
Chap 6.2.3.5	Layout rules and examples - IPD publication
Chap 6.3.1	IETP - Output specification

1 General

This chapter gives the rules for S1000D standard page-oriented presentation of the technical content in page-oriented publications.

These rules also apply when using double column layout. Refer to Chap 6.2.1.

As given in Chap 6.2, the project or the organization must decide whether to accept S1000D standard page-oriented presentation given in this chapter or to use any other rules for presentation to meet specific project requirements. These project specific business rules must specify the information needed to contract the desired presentation.

Note

Paragraph, step numbers, prefixes like "Para", "Table" in cross-references and "WARNING", "Note", etc, are not entered in the data modules when data modules are written in an XML editor or a WYSIWYG-editor with an automatic function for presentation. Refer to additional notes in the paragraphs below.

2 Typography and layout elements

2.1 Fonts and leading

The type font for all text elements must be of sans serif type (eg, Arial, Helvetica).

The leading between the lines for all text elements is depending of the font size. Refer to Para 2.4 and Para 2.5.

Note

Leading is the "vertical space" between the layout elements (text paragraphs, table title lines, headings, etc).

If there is an extra leading after a component and an extra leading before the following component, the resulting leading is the highest value of the two. If the leadings are the same the resulting leading between the elements is the sum of the two. Refer to Fig 4.

2.2 Live matter

Text and headings (excluding centerheads, refer to Para 2.3.2.1) must be left justified and ragged right.

2.3 Titles - Headings

2.3.1 General

In the following, "headings" are used for the different levels of titles in the data modules.

In descriptive data modules, titles must be included for the element <table> and the element <figure>. If used in the element <levelledPara>, titles must be presented on levels one thru level five.

Note

Presentation of the titles for paragraphs on level six thru level eight are not given. The use of these elements is discouraged and their use and presentation are project decisions.

In procedural, crew and fault data modules, titles must be included for the element the <table> and the element <figure>. Titles can also, by project decision, be presented for the element <proceduralStep> and the element <crewDrillStep>.

Business rule decision point BRDP-S1-00494 - Presentation of the procedural step titles from the element <proceduralStep>:

– Decide whether to present the titles for the element <proceduralStep> and to which level.

Business rule decision point BRDP-S1-00495 - Presentation of the crew drill step titles from the element <crewDrillStep>:

– Decide whether to present the titles for the element <crewDrillStep> and to which level.

Note

Presentation of the titles for steps on level six thru level eight are not given. The use of these elements is discouraged and their use and presentation are project decisions.

Business rule decision point BRDP-S1-00496 - Presentation of the document title:

– Decide whether to present the document title as a Centerhead No. 1 and a Centerhead No. 2 or as a Centerhead No. 1 only (including the elements <techName>, <infoName> and <infoNameVariant>).

Presentation of the element <levelledPara> is given in Para 2.4.

Presentation of the element <proceduralStep> and the element <crewDrillStep> is given in Para 2.5.

Presentation of list titles is given in Para 2.6.

Presentation of table titles is given in Para 2.8.

Presentation of figure titles is given in Para 2.9.

2.3.2 Typography and use

The typography and use of headings is presented in Table 2. Leadings to adjacent elements are presented in Table 3.

Table 2 Order and typography of headings

Order	Layout element	Point size/Leading	Typestyle	Live matter	Numbered
1	Centerhead No. 1	14/16 pt	Bold	Centered	No
2	Centerhead No. 2	14/16 pt	Bold, italic	Centered	No
3	Sidehead 0	14/16 pt	Bold	Left justified	No
4	Sidehead 1	14/16 pt	Bold	Left justified	Yes
5	Sidehead 2	12/14 pt	Bold	Left justified	Yes

Order	Layout element	Point size/Leading	Typestyle	Live matter	Numbered
6	Sidehead 3	10/11 pt	Bold	Left justified	Yes
7	Sidehead 4	10/11 pt	Roman	Left justified	Yes
8	Sidehead 5	10/11 pt	Italic	Left justified	Yes

Table 3 Leadings to adjacent headings and text paragraphs

Order	Layout element	Leading to next lower level of heading[1]	Leading to a follow-on text paragraph[1]	Leading text paragraph to the heading[1]	Leading table footer end line to the heading[1]
1	Centerhead No. 1	28 pt/10 mm	17 pt/6 mm	27 pt	35 pt
2	Centerhead No. 2	28 pt/10 mm	17 pt/6 mm	27 pt	35 pt
3	Sidehead 0	28 tp/10 mm	17 pt/6 mm	27 pt	35 pt
4	Sidehead 1	14 pt	15 pt	27 pt	35 pt
5	Sidehead 2	11 pt	12 pt	25 pt	34 pt
6	Sidehead 3	11 pt	11 pt	23 pt	32 pt
7	Sidehead 4	11 pt	11 pt	23 pt	32 pt
8	Sidehead 5	-	11 pt	19 pt	28 pt

1 The leadings given are the leadings between the baselines of the components

Headings must always be kept with the next element. Thus headings must not be placed at the bottom of a page.

2.3.2.1 Centerheads

Two centerheads are available, a Centerhead No. 1 and, if required, a Centerhead No. 2.

The Centerhead No. 1, which is used only once in a document, presents together with a Centerhead No. 2 the title of the document.

Centerhead No. 1 is derived from the element <techName> and Centerhead No. 2 from the optional elements <infoName> and <infoNameVariant>.

By project decision, the document title, including the elements <techName>, <infoName> and <infoNameVariant> can be presented as a Centerhead No. 1. In this case the elements <techName> and <infoName> must be separated by a hyphen [-] surrounded by spaces [ ]. When given, the elements <infoName> and <infoNameVariant> must be separated by a comma [,], followed by a space [ ].

Centerhead No. 2 is also used for "fixed text strings" (default headings), such as "References", "Preliminary requirements", "Description", "Procedure".

Note

These centerheads are not entered in the data modules when data modules are written in an XML editor or a WYSIWYG-editor with an automatic function for presentation of titles and the "fixed text strings".

2.3.2.2 Sidehead 0

Sidehead 0 must be used for the following three introductory lists in a document:

1 Table of contents

2 List of figures

3 List of tables

Note

These three sideheads and their related lists are not entered in the data modules when data modules are written in an XML editor or a WYSIWYG-editor with an automatic function for these introductory lists.

An extra leading of 12 pt is added before the first heading (Centerhead No. 2 thru Sidehead 4) after the last of the three introductory lists, giving a total of 24 pt before.

Sidehead 0 must also be also used in procedural and specialized information data modules to present default headings (eg, "Required conditions", "Required persons" in the preliminary requirements of a procedure). These sideheads are fixed text strings and auto-generated by the editing system when data modules are written in an XML editor.

The default headings for each data module type are given in Chap 6.2.3.

2.3.2.2.1 Table of contents

The mandatory table of contents must include the document title and all sideheads 1, 2 and 3. The word "Page" written in 10 pt roman, aligning the right type limit, must follow on the same line as the sidehead. In the table the number of the sideheads, the sideheads themselves and the page numbers must be written in 10/11 pt roman. The entries in the table, starting with the number, must align the left type limit. The text of the sideheads (the title) must be indented 14 mm from the left type limit. The page numbers must align the right type limit. A dotted leader must appear between the end of the sideheads and the page numbers.

An extra leading of 2 pt must be added before all Sidehead 1 in the table of contents.

By project decision, the maximum number of sidehead levels to be presented in the table of contents must be agreed. The number can vary between data module types and publications.

Business rule decision point BRDP-S1-00497 - Number of sidehead levels to be presented in the Table of contents:

– Decide whether to present more than three sidehead levels in the table of contents. The allowed number of sidehead levels must be stated in the business rules.

2.3.2.2.2 List of tables

The optional list of tables must include all table titles in the document. The presentation rules given for table of contents apply.

By project decision, the prefix "Table" can be added before the table number.

Business rule decision point BRDP-S1-00498 - Presentation of List of tables:

– Decide whether to present the List of tables.

Business rule decision point BRDP-S1-00499 - Present the prefix "Table" in the List of tables:

– Decide whether to present the prefix "Table" before the table number in the List of tables.

2.3.2.2.3 List of figures

The optional list of figures must include all figure titles in the document. The presentation rules given for table of contents apply.

By project decision, the prefix "Fig" can be added before the figure number.

Business rule decision point BRDP-S1-00500 - Presentation of List of figures:

– Decide whether to present the List of figures.

Business rule decision point BRDP-S1-00501 - Present the prefix "Fig" in the List of figures:

– Decide whether to present the prefix "Fig" before the figure number in the List of figures.

2.3.2.3 Sidehead 1 thru 5

Sidehead 1 thru Sidehead 5 are used for presentation of the titles for paragraphs of text and steps. Sidehead 1 is used for level 1, Sidehead 2 for level 2, etc. The use of Sidehead 1 thru 5, refer to Para 2.3.2 for typography.

Business rule decision point BRDP-S1-00502 - Presentation (layout) of titles:

– Decide whether to use the S1000D standard presentation rules for titles (Sidehead 1 thru Sidehead 5 or if used thru Sidehead 8) or to create project or organization specific rules such as type size, leading and justification.

Business rule decision point BRDP-S1-00503 - Presentation of the leveled para titles from the element <levelledPara> on level six thru eight:

– Decide whether to present the titles for the element <levelledPara> on level six thru eight.

2.3.2.4 Numbering of sideheads

All sideheads 1 thru 5 must be numbered with Arabic numerals separated with a period [.]. There must be no period [.] after the last digit of the number.

The number must all use the same type-size and type styles as the sidehead itself. The number must align with the left limit of the page image area. The title itself must be aligned with the left type limit.

An alternative method for labeling procedural steps is to use a mix of Arabic numerals and alphabetic labels.

Business rule decision point BRDP-S1-00504 - Use of the alternative method for labeling procedural steps at presentation:

– Decide whether to use the preferred or the alternative method for labeling procedural steps.

2.4 Paragraphs of text

One or more paragraphs of text (element <para>) can follow Sidehead 1 thru 4. Normally, only one paragraph of text runs on from Sidehead 5.

Type style size and spacing must be in accordance with best commercial practices for technical publications. It is recommended that paragraphs of text are presented in 10/11 pt font. However, by project decision, other typefaces can be used for specific implementations (ie, pocket-sized manuals). Ragged (unjustified) right-hand edge is recommended.

Business rule decision point BRDP-S1-00505 - Presentation of paragraphs of text:

– Decide whether to use the recommended presentation rules for type size, spacing and justification.

The leading between two text paragraphs (base line to base line from the last line of a paragraph to the first line of the following paragraph) must be 20 pt (equal to an extra 8 pt leading after each text paragraph).

A paragraph must not be divided due to a page-break in the way that only one single line is placed on top of the following page. At least two lines must in this case go on to the following page.

2.5 Step

When used with titles the rules for sideheads apply. Refer to Para 2.3.

When used without titles, the step number and the text from the element <para> must be presented in 10/11 pt roman. The preferred method is for the number to align at the left limit of the page image area and the text itself to align at the left type limit.

An alternative method, when used without titles, is for the labels and the text to be indented hierarchically with the left type limit.

The rules for paragraphs of text apply. Refer to Para 2.4.

For the presentations of warnings, cautions and notes within a step, refer to Para 2.10.

Example, refer to Chap 6.2.3.3.

Business rule decision point BRDP-S1-00506 - Presentation of hierarchical indented steps, when used without titles in procedural steps:

– Decide whether to use hierarchical indented steps, when used without titles.

2.6 Lists

2.6.1 General

Lists consist of two main parts, a title and the list items. The title is optional.

The list title line must be aligned to the left type limit and presented in 10/11 pt. Bold must be used for titles for random lists and sequential lists. Italic must be used for definition lists and legends.

The normal leading from a preceding headline, paragraph, list item, figure title line, table footer (closing line), last line in a warning, caution or note, etc, to the list title line must be used. The leading between the title line and the first list item must be 14 pt (equal to an extra 4 pt leading added after the title).

The basic value for list item leading is 10/11 pt. The values of the extra leadings between and after list items are given in the following paragraphs.

Note

The prefixes are not entered in the data modules when data modules are written in an XML editor or a WYSIWYG-editor with an automatic function for presentation.

2.6.2 Random lists - Unordered lists and simple lists

2.6.2.1 General

Simple lists are recognized by the value "pf01" of attribute listItemPrefix.

Unordered lists are the default lists recognized by the value "pf02" of attribute listItemPrefix. There are three levels of unordered lists, all indented with a multiple of 7 mm. Refer to default BREX rule BREX-S1-00178.

The prefixes must be consistently used and presented throughout each data module.

Recommendation: To improve readability, use and present the same set of prefixes throughout the project.

Business rule decision point BRDP-S1-00507 - Prefixes to be used for random lists at presentation:

– Decide whether to use a consistent set of prefixes for random list throughout the project.

2.6.2.2 Prefix, indents and leading in unordered lists
The following rules apply to the presentation of unordered lists (the default prefix value "pf02" is used):

– Unordered list items at level 1, start with an en-dash [–] as the prefix aligning the left type limit. The text must be indented 7 mm.
– The list items within unordered lists on all three levels must be separated by normal leading, 11 pt, giving no extra leading between the same levels of unordered list items.
– An extra leading of 8 pt must be added after the last list item on each of the three levels.

• Subunordered (level 2) list items start with a bullet [●] as the prefix indented 7 mm from the left type limit.
• The text must be indented 7 mm further (14 mm from left type limit).

– Sub-subunordered (level 3) list items starts with en-dash [–] as the prefix indented 14 mm from the left type limit. The text must be indented 7 mm further (21 mm from left type limit).
– Each list item, on any level, can consist of one or more paragraphs.

The paragraphs within a list item must be separated by an extra leading of 8 pt. This applies on all levels.

An extra leading of 8 pt must be added after the last paragraph in a list item.

2.6.2.3 Prefix, indents and leading in simple lists
Simple lists are presented just like an unordered list at level 1, but without any prefix.

2.6.3 Sequential lists - Ordered lists

2.6.3.1 General
There are two levels of ordered lists, both indented with a multiple of 7 mm.

Only one ordered list must be placed under a sidehead. One subordered list can follow each ordered list item.

Ordered lists must not be used to provide procedural step information.

2.6.3.2 Indents and leading in ordered lists
The following rules apply to the presentation of ordered lists:

1 Ordered lists must be numbered with Arabic numerals. The number, starting with "1", must align the left type limit.

2 The text must be indented 7 mm.

3 The additional leading after each list item on both levels must be the same as for text paragraphs, 8 pt.

4 There must be no period [.] after the last digit of the number.

4.1 Subordered lists must be numbered. The number must start with the number of the preceding item followed by a number starting with "1". The numbers must be separated by a period [.].

4.2 The number in subordered lists must be indented 7 mm from the left type limit. The text must be indented 7 mm further (14 mm from left type limit). The text indent can be extended in steps of 7 mm as necessary, for example if one of the numbers is wider than the character 9 (eg, 6.12, 12.6, 10.10). The indentation must be consistent within each ordered or subordered list.

Each list item, on any level, can consist of one or more paragraphs and must be separated by an extra leading of 8 pt.

5 Ordered lists can include subunordered (level 2) and sub-subunordered lists.

- Subunordered (level 2) list items can be included in ordered lists.
- The presentation rules from Para 2.6.2 must be used.
  - Sub-subunordered (level 3) list items can also be included in ordered and subordered lists.
  - Each subunordered and sub-subunordered list can consist of one or more paragraphs. The rules for leadings are given in Para 2.6.2.2.

2.6.4 Definition lists and legends

There is only one level to a definition list and to a legend.

The definition list and the legend must be aligned to the left type limit and be presented in 10/11 pt.

2.6.4.1 Indents and leading in definition lists

The presentation of a definition list is the same as for an informal table (refer to Para 2.8.2) with the following differences:

- no leading before the first row
- a leading of 8 pt between rows and paragraph within a row

Note

Column titles are allowed as in informal tables.

Two columns must be used for presentation of the term (element <`listItemTerm`>) and its definition (element <`listItemDefinition`>). The definition can consist of more than one paragraph.

If a title is used (eg, "*Definition of terms:*" in the example below) and the definition list continues on the next page, the title must be repeated followed by two spaces and the default heading "*(Continued)*" on the top of the continuation page.

The first column with the term has a width of 50 mm and the second column with the definition has a width of 100 mm.

If <`definitionListHeader`> is used to specify column titles, the column titles must be presented in 10 pt bold and underlined.

Layout example 1 - Title without column titles:

Definition of terms:

Structural damage, category 1	Damage on load bearing items that can be tolerated or cannot be repaired or replaced in BDR conditions. This damage is less than the specified limit and has no effect on the ability of the Product to complete at least one mission. Tolerated damage requires only clean-out or stop drilling of cracks.

Definition of terms:

Structural damage, category 2	Damage on load bearing items that must be repaired or replaced when damage exceeds the specified limit.
Substitute material	A material which has less ultimate tensile strength than the original, but which can be used for the BDR of an item by adapting it.

Layout example 2 - No list title with column titles:

Name	**Description**
Nomenclature	Name of the part
Part number	Number assigned to the part

2.6.4.2 Prefix, indents and leading in legends

The presentation of a legend is the same as for an informal table (refer to Para 2.8.2) with the following differences:

- mandatory use of a title (default heading)
- no leading before the first row
- having a leading of 4 pt between rows

Four columns must be used for presentation of a legend. The item numbers (element <listItemTerm>) are given in column 1 and 3 and the corresponding definition (element <listItemDefinition>) in column 2 and 4.

The columns with item number (column 1 and 3) are aligned to left type limit. The width of the item number column is 7 mm.

The column giving the definition has a width of 68 mm.

The default heading, "*Legend to Fig X:*", must be presented in front of the legend.

When a full-page legend is split on two or more pages, the item numbers (and their definition) must be presented in consecutive order on the first page and then continue on the following page. Refer to Fig 1.

If the legend continues on the next page, the default heading must be repeated followed by two spaces and the text *(Continued)* on the top of the continuation page.

Note

The default heading is not entered in the data modules when data modules are written in an XML editor or a WYSIWYG-editor with an automatic function for presentation of legends.

Refer to Fig 1 for layout example.

Legend to Fig 3:

1 Bracket assembly	16 Nut
2 Screw	17 Bar, small
3 Washer	18 Bar, big

Legend to Fig 3: (Continued)

4 Bar, even bigger	19 Screw
5 Screw	20 Nut
6 Washer	21 Washer
…	…
	29 Clamp
15 Support assy	

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Fig 1 Legend split over two pages

2.7 Footnotes

2.7.1 General

Footnotes used in regular text (inline footnotes) and in tables (table footnotes) are marked up the same way (refer to Chap 3.9.5.2.1) but presented different.

The recommended way of presenting the footnote markers is as superscripted numbers. Thus the examples below are based on that recommendation.

Projects have to decide if numbers must be superscripted or presented in parenthesis following the item.

Business rule decision point BRDP-S1-00508 - Presentation of footnote numbers:

– Decide whether to present the footnote markers as superscripted numbers (default) or as numbers presented within parenthesis.

2.7.2 Inline footnotes

Inline footnotes must be numbered (when the recommended superscripted numbers are used) in numerical order within the complete data module. If the same footnote is referenced several times within the data module, the same number must be used.

The publishing systems must present inline footnotes at the bottom of the page, or by project decision, at the end of the complete data module.

Example[1], refer to the bottom of this page.

[1] This is a footnote. It must be presented in 8/9 pt.

Business rule decision point BRDP-S1-00509 - Presentation of inline footnotes:

– Decide whether to present the inline footnotes at the bottom of the page (default) or at the end of the data module.

2.7.3 Table footnotes

Table footnotes must be numbered (when the recommended superscripted numbers are used) in numerical order within each table. If the same footnote is referenced several times the same number must be used.

The publishing system must present table footnotes at the bottom of the complete table. The table footer must not be split due to page break. At least one row of the table must follow the table footer to the next page.

By project decision, if the table breaks to a new page, the publishing system can present the relevant footnotes at the bottom of the table before the page break. The table closing line must only appear after the complete table footer.

Refer to Para 2.8.1 for font size and leading.

Refer to Para 2.8.1 for examples.

Business rule decision point BRDP-S1-00510 - Presentation of table footnotes:

– Decide whether to present the footnotes on the relevant page, if the table is split over several pages. Refer to Fig 2 and Fig 3.

2.7.4 Interactive presentation

Rules for presentation of footnotes in IETPs are presented in Chap 6.3.1.

2.8 Tables

2.8.1 Formal tables

There are two standard widths of tables, image width (attribute `pgwide` is not "`0`") and type (column) width (attribute `pgwide` value "`0`" or not specified). All tables must be presented in portrait. The text in cells of portrait tables is parallel to the text in the page header and footer.

A formal table consists of four parts, the **table title line**, the **table head**, the **table rows** and the **table footer**.

The **table title line** must be centered above the table head and be written in 10/11 pt italic. An extra leading of 12 pt must be added before the table title line and 2 pt after. The prefix "*Table*" followed by the number of the table, starting from "1" within each data module, must be separated from the title itself by two spaces.

The **table head** starts with a horizontal line, followed by the column headings written in 10/11 pt bold. An additional leading of 4 pt must be added before and after the table heading text.

The table title and table head must not be split due to a page break. Nor must a table be split with only one row on the first page.

Column references can be used to facilitate cross-reference between the text and the table columns. These numerical references must be written within brackets. Example, refer to Table 4.

The table head ends with a horizontal line.

If a table continues on the next page, the closing horizontal line must be omitted on the incomplete table. The table title line followed by two spaces and the default heading *(Continued)* and the table head must appear at the top of the continuation page.

The **table rows** entries (from element <tbody>) must be written in 10/11 pt. An additional leading of 4 pt must be added before and after each row (giving 8 pt leading between the entries or 19 pt baseline to baseline).

Lengthy tables must have a reasonable space between the table rows to aid legibility. The practice of every fifth - sixth line having extra leading is preferred. For example, the extra leading can be entered by the application adding an extra 4 pt after, for example, every fifth row.

The **table footer** starts with a horizontal line followed by any text entry or footnotes in 8/9 pt. The footnote content is indented 7 mm. An additional leading of 2 pt is added before and after each footnote. The table footer ends with a horizontal closing line.

If there are no text entries or footnotes in the table footer, only the horizontal line must be presented.

All horizontal lines must be 1/2 pt.

After the table footer, an additional leading giving the subsequent element a total leading from table closing line to its base line of:

- 28 pt - text paragraphs or list items
- 32 pt - table title lines
- 28 thru 35 pt for headings. Refer to Table 3.

Refer to Chap 3.9.5.2.1.10 for markup example of Table 4 below.

Note

Vertical lines (rules) in tables must be avoided.

Business rule decision point BRDP-S1-00511 - Presentation of vertical lines in formal tables:

- Decide whether to, in exceptional cases, allow presentation of vertical lines in formal table.

Note

The rendering of the table must be based on the elements and attributes in the XML files.

The author must apply elements and attributes as defined in Chap 3.9.5.2.1.6 in order to achieve the layout described in this chapter.

Layout example:

Table 4 Example of a column width table with footnotes

Col 1 heading (1)	Col 2 heading (2)	Col 3 heading (3)
Row 1 entry 1 has a footnote[1]	Row 1 entry 2	Row 1 entry 3
Row 2 entry 1 continues on a second line	Row 2 entry 2	Row 2 entry 3[2]
Row 3 entry 1 also has a footnote[2]	Row 3 entry 2	Row 3 entry 3

1 This is a footnote for entry 1
2 This is another footnote which is used twice

Fig 2 shows Table 4 with all footnotes at the end of the complete table.

Fig 3 shows the equivalent table with the relevant footnotes on each page.

Table 3 Example of an image width table with footnotes - Split over two pages

Col 1 heading	Col 2 heading	Col 3 heading
Row 1 entry 1 has a footnote[1]	Row 1 entry 2	Row 1 entry 3
Row 2 entry 1 continues on a second line	Row 2 entry 2	Row 2 entry 3[2]

Table 3 Example of an image width table with footnotes - Split over two pages (Continued)

Col 1 heading	Col 2 heading	Col 3 heading
Row 3 entry 1 also has a footnote[2]	Row 3 entry 2	Row 3 entry 3

1 This is a footnote for entry 1
2 This is another footnote which is used twice

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Fig 2 Table split over two pages, footnotes at the end of the table

Table 3 Example of an image width table with footnotes - Split over two pages

Col 1 heading	Col 2 heading	Col 3 heading
Row 1 entry 1 has a footnote[1]	Row 1 entry 2	Row 1 entry 3
Row 2 entry 1 continues on a second line	Row 2 entry 2	Row 2 entry 3[2]

1 This is a footnote for entry 1
2 This is another footnote which is used twice

Table 3 Example of an image width table with footnotes - Split over two pages (Continued)

Col 1 heading	Col 2 heading	Col 3 heading
Row 3 entry 1 also has a footnote[2]	Row 3 entry 2	Row 3 entry 3

2 This is another footnote which is used twice

ICN-S3627-S1000D0397-001-01

Fig 3 Table split over two pages, footnotes on the relevant page

2.8.2 Informal tables

An informal table is a table without regular table title line (no "*Table X*") and without any table header and table footer.

The table title follows the rules for titles in lists. Refer to Para 2.6.1.

The table row rules in Para 2.8.1 apply with the following differences:

- no extra leading before the first row in the table
- the additional leading after the table footer is measured from baseline to baseline

Example:

The Top-8 colors:

1 Shocking pink

2 Lavender-blue

3 Rust-brown

4 Bluish-black

5 Vivid red

6 Pastel green

7 Dirty yellow

8 Dark black

2.8.3 Tabular data modules

Data modules presenting the majority of the information in tabular format only, can have deviations from the rules for formal tables.

2.8.3.1 Front matter data modules

List of effective pages, IC 00R, List of effective data modules, IC 00S, Change record data modules, IC 00T, Highlight data modules, IC 00U, and table of contents, IC 009, have no table title lines in front of the listed data modules or list of reason for change. Refer to Chap 6.2.3.1.

2.8.3.2 IPD modules

IPD modules, IC 941, and IPD cross reference index, IC 942, have the table header starting lines omitted (and tie the table header direct to the page header line). No table title lines are used. Refer to Chap 6.2.3.5.

2.9 Figures

2.9.1 Formal figures

As the publications and documents are produced from data modules the placement of the figure is given from the data module. Normally no manual attempt to move the figure to another page, due to an automatic page break, must be done.

The illustration sizes are given in Chap 3.9.2.

A figure consists of two parts, an **illustration sheet** (or sheets) and a **figure title line** for each illustration sheet.

The normal leading from a preceding headline, paragraph, list item, table footer (closing line), figure title line, last line in a warning, caution or note, etc, to the illustration top limit must be used, for example, 8 pt after a text paragraph or figure title line.

The **illustration sheet** is placed within a predefined illustration reproduction area. The dimensions are given in Chap 3.9.2. No extra leading must be added before or after the illustration reproduction area.

The **figure title line** must be centered on the first line following the illustration bottom limit. The title must be written in 10/11 pt italic, lowercase. An extra 8 pt leading must be added after the figure title line. The abbreviation "*Fig*" followed by the number of the figure, starting from "1" within each data module, must be separated from the title itself by two spaces.

When an illustration requires several illustration sheets, *(Sheet X of Y)* must be added after the title. The default presentation mode is to use the same figure number for all illustration sheets.

As an alternative, by project decision, an individual figure number can be appended to each illustration sheet, for example:

- Fig 7.1 Computer (Sheet 1 of 2) and Fig 7.2 Computer (Sheet 2 of 2)
- Fig 2 Pump (ACDC) (Sheet 1 of 2) and Fig 3 Pump ACDC (Sheet 2 of 2)

Refer to Chap 3.9.2 for the handling of multi sheet figures.

Business rule decision point BRDP-S1-00512 - Use of the alternative individual numbering of multi sheet illustrations at presentation:

- Decide whether to use one of the alternative methods for individual numbering of multi sheet illustrations. The chosen method must be used throughout the project.

The ICN can be presented in 10 pt, right justified on the first line below the illustration reproduction area. Refer to BRDP-S1-00569.

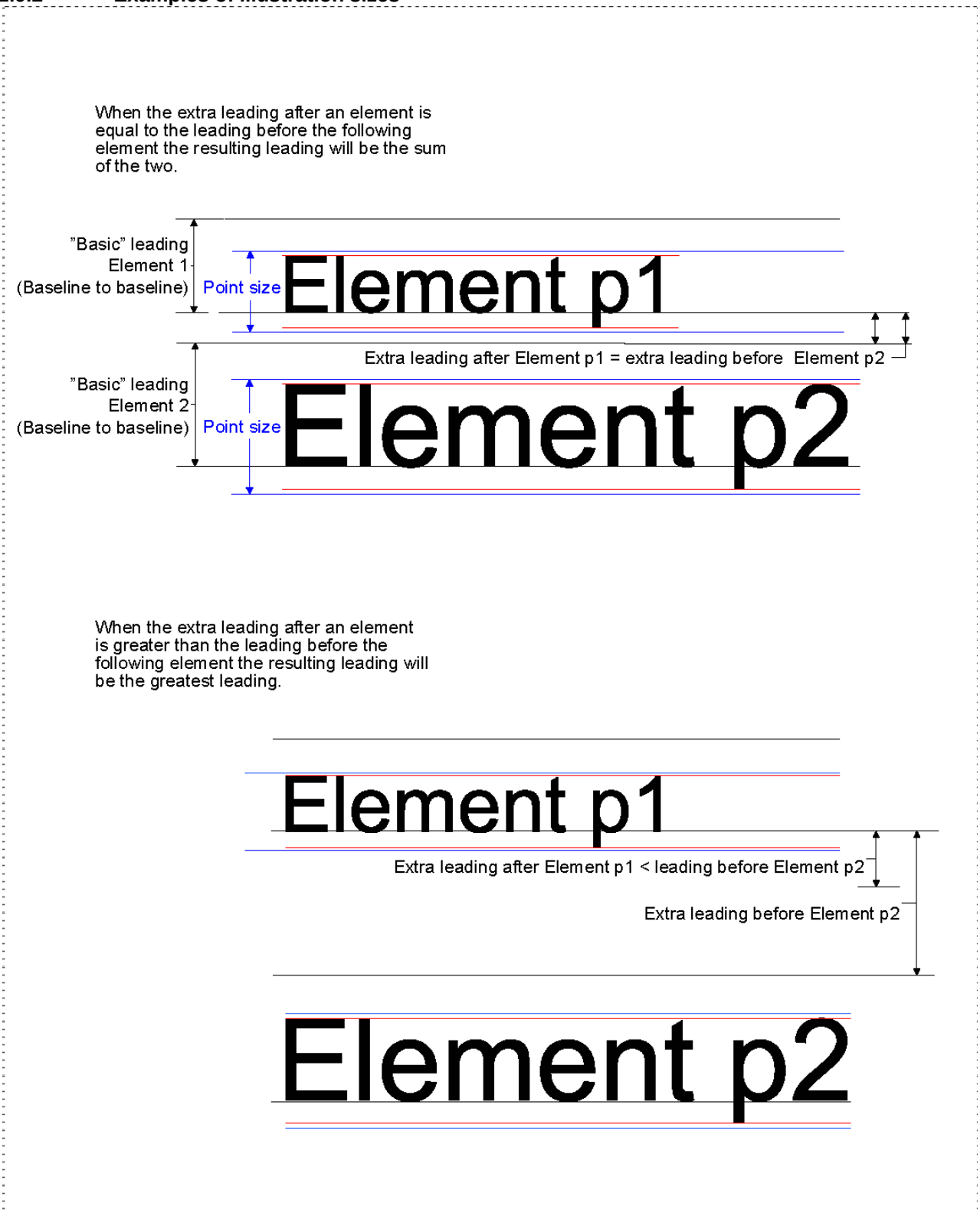
Note

The ICN for symbols (Refer to Para 2.9.3) and other data must not be presented.

Business rule decision point BRDP-S1-00569 - Presentation of ICN:

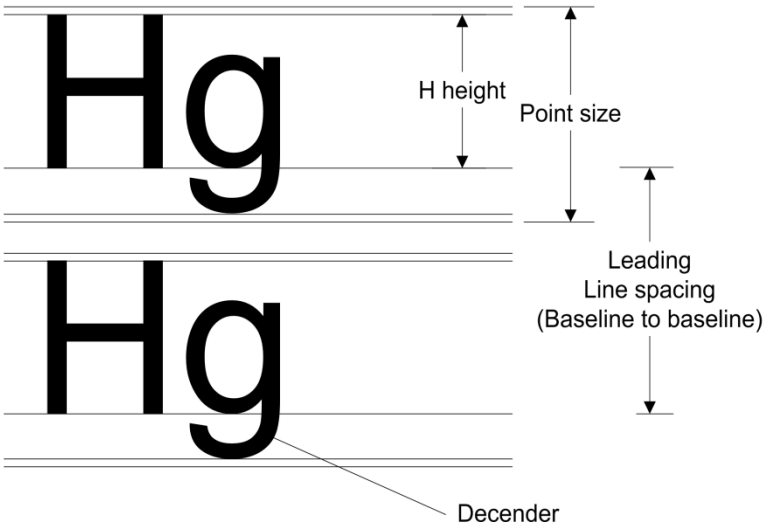
- Decide whether to present the ICN (content of attribute `infoEntityIdent`) for each illustration.

2.9.2 Examples of illustration sizes



ICN-S3627-S1000D0396-001-01

Fig 4 Flexi height illustration 170 mm x 210 mm showing extra leading after and before an element



ICN- S3627-S100D0385-002-01

Fig 5 Flexi height illustration 170 mm x 102 mm - Point size and leading



ICN-S3627-S1000D0387-001-01

Fig 6 Full page illustration 170 mm x 222 mm

2.9.3 Symbols

Symbols are illustrations presented without a figure reference line and an ICN. The symbols can be presented inline with regular text. If the symbol is taller than the current font, the leading must be adjusted to fit the height of the symbols. The symbols are normally aligned to the baseline, but can be centered between text lines if preferred.

Examples - Aligned to the baseline:

A warning can include the general warning symbol. The general warning symbol  can be omitted or substituted with other, to the warning, relevant symbols, for example .

"Click the acknowledge button , when the caution pop-up has been read and understood."

Refer to examples in Para 2.10.2.2.

2.10 Warnings, cautions and notes

2.10.1 General

The use of warnings, cautions and notes are given in Chap 3.9.3.

There are two variants of presenting warnings and cautions:

- Symbolic - symbolic frame, with or without color
- Textual - text based without color and frames

The symbolic variant is mainly aimed, but not limited, for screen display as it can include colored frames.

The textual variant is the basic variant mainly aimed for page-oriented paper presentation.

Both variants can include symbols. Refer to Para 2.9.3.

Presentation of applicability in connection with warnings and cautions, refer to Chap 6.2.3.3.

2.10.2 Warnings

2.10.2.1 Warnings - Textual

The default heading WARNING must be presented in 12/14 pt bold, uppercase underlined, centered on the width of the warning itself. The normal leading from a preceding headline, paragraph, list item, table footer (closing line), figure title line, last line in a warning, caution or note, etc, to the illustration top limit must be used. Add for example 8 pt after a text paragraph or figure title line. An extra leading of 8 pt must be added after the warning default heading.

The warning must be presented in 10/11 pt bold, lowercase. The extra leading after paragraphs and list items in a warning must be the same as for "ordinary" paragraphs and list items.

The default heading WARNING, symbols, if any, and the warning itself must not be split due to a page-break.

A warning is effective throughout the whole operational or procedural data module if it is applied in the element <description> before the first element <levelledPara> or in the element <safetyRqmts> in the element <preliminaryRqmts>.

A warning is the first information given in the step of a procedure.

The S1000D standard page-oriented presentation of warnings is to locate them inside a step/para on the first "empty" text line in the step after the step number and the title if any.

Presentation of the warning before the step/para number is allowed by project decision.

No mix of the two presentation methods is allowed.

Business rule decision point BRDP-S1-00513 - Presentation of warnings and cautions:

– Decide whether to use the alternative rule to present the warnings before the step/para number.

Note

Projects must be aware of potential hazards when allowing step numbers to follow the warning and ensure that there is a clear connection in the presentation between the warning and the associated steps.

A warning is effective to the step/para and all its substeps/subparas.

A warning must not be located between paragraphs.

A warning must be located and presented in the same way for all steps.

A warning can begin with symbols, element <symbol>. These graphics are intended to be standardized symbols. Symbols must be presented immediately after the default heading WARNING.

A warning can include:

– attention random lists, element <attentionRandomList> (one level only)
– initial symbols

The list item prefix must be a bullet.

Note

The attribute listItemPrefix in element <attentionRandomList> is given the value "pf07" by the author or the authoring application. Refer to Chap 3.9.3.

Business rule decision point BRDP-S1-00514 - Presentation of symbols in warnings and cautions:

– Decide whether to present symbols in warnings and cautions. The symbols must be standardized and documented.

Below follows the different presentations variants of warnings:

2.10.2.1.1 A warning without symbols

WARNING

When you do Step 3, make sure that the tire is fully deflated before you remove the tire.

The removal of the tire with the tire inflated is dangerous.

2.10.2.1.2 A warning with symbols, several paragraphs and a random list

WARNING



When you do Step 3, make sure that the tire is fully deflated before you remove the tire.

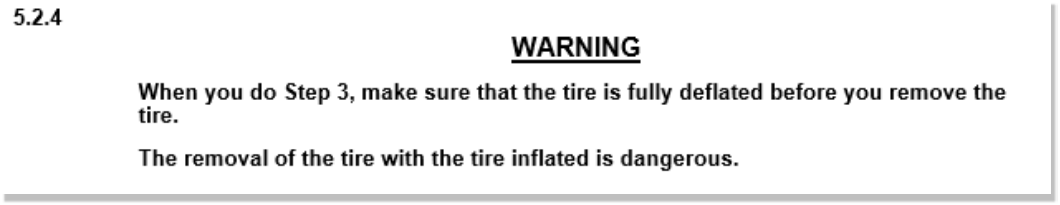
The removal of the tire with the tire inflated is dangerous.

- **Attention random list items allowed**

- **Attention random list items allowed**

2.10.2.1.3 A warning in a procedure without titles

The example below shows a warning in a procedure without a step title.



ICN-S3627-S1000D0793-001-01

Fig 7 Warning in a procedure without titles - Example

2.10.2.2 Warnings - Symbolic

The layout text elements, including leadings, are the same as for the textual warnings with the following differences:

- The default heading WARNING must not be underlined
- The warning text being centered in a symbolic warning
- An extra leading of 8 pt after the frame

The difference is in the "symbolic" frame.



The symbol  can be omitted or substituted with other relevant symbols. Refer to Para 2.10.2.1.2.

Fig 5 in Chap 6.3.1 shows a warning with an acknowledge button 

, which is used in interactive publications only.

Business rule decision point BRDP-S1-00515 - Use of symbolic presentation of warnings and cautions:

- Decide whether to use symbolic presentations of warnings and cautions.

2.10.3 Cautions

Follows the same rules as warnings given in Para 2.10.2.1 and Para 2.10.2.2 with the following differences:

- The default heading CAUTION must not be underlined
- Cautions are preceded by any warnings



2.10.4 Notes

Notes given in the beginning of a procedural step must be preceded by any warning and cautions.

The default heading Note, or Note X if more than one, must be presented in 10/11 pt bold, lowercase. The normal leading from a preceding headline, paragraph, list item, table footer (closing line), figure title line, last line in a warning, caution or note, etc, to the illustration top limit is used. Add for example 8 pt after a text paragraph or figure title line. No extra leading must be added after the default heading.

The word Note must align the left type limit when it refers to a paragraph and be indented to align the text of the list item to which it pertains. The note itself must be indented 7 mm from the left limit of the word Note and is presented in 10/11 pt, lowercase, on the following line. An extra leading of 8 pt must be added after the note.

The word **Note** or **Note X** and the note itself must not be split due to a page break.

Projects can decide on the use of numbered notes must be consistent throughout the data module starting with Note 1 for the first note in the data module.

Business rule decision point BRDP-S1-00516 - Use of numbered notes within a data module at presentation:

– Decide whether to use numbered notes within a data module.

A note can consist of one or more paragraphs. The paragraphs within a note must be separated by an additional leading of 8 pt. This applies on all levels.

The following shows the presentation of the four levels of notes:

Note

This note refers to a paragraph or a step.

This is a second paragraph to the note.

– Below follows a note to an ordered or unordered list item.

Note

This note refers to an ordered or unordered list.

- Below follows a note to a subordered or subunordered list item.

Note

This note refers to a subordered or subunordered list.

– Finally, below follow two numbered notes to a sub-subunordered list item. They are numbered just to show how it is presented. Normally use of numbered notes must be consistently done throughout the data module.

Note 1
This note refers to a sub-subunordered list.

Note 2
This is the second note to the sub-subunordered list.

A note can also include **one** undordered/random list and **one** ordered/sequential list. The latter can in turn include **one** level of unordered/random list. The layout rules for the list items (indents, leading and presentation in 10/11 pt) apply. Refer to Para 2.6.

The list item prefix must be a dash when an unordered/random list is presented in a note.

Note
The dash is derived from the attribute `listItemPrefix` in element <`attentionRandomList`> as it is given the value "`pf03`" by the author or the authoring application. Refer to Chap 3.9.5.2.1.3.

The following shows the presentation of lists in notes:

Note
This note refers to a paragraph or a step.

This is a second paragraph to the note.

- This is the first item in an unordered list (element <`attentionRandomlListItem`>) within the note. It is used for all items.
- This is the second item in an unordered list within the note. This list item includes more than one paragraph.

  This is the second paragraph (element <`attentionListItemPara`>) in the unordered list item. The same rules as for list paragraphs apply: The paragraphs within a list item must be separated by an extra leading of 8 pt.

- This is the last unordered list item in this note. An extra leading of 8 pt must be added after the last paragraph in a list item.

This is the third paragraph in the note. The note can also include **one** level only of an unordered list.

1. This is the first ordered/sequential list item (element <`attentionSequentialListItem`>) within the note. The ordered/sequential list items can include one or more paragraphs.

   The ordered/sequential lists items within a note can include **one** level only of unordered list items.

   - This is the first unordered list item (element <`attentionRandomlListItem`>) within the ordered/sequential list.

     This is the second paragraph in the unordered list within the ordered/sequential list.

   - The same rules as for list rules apply.

2. This is the last item (an ordered/sequential list item) in the note. Only one ordered/sequential list is allowed in a note.

2.11 Mathematical expressions

To Be Determined (TBD).

2.12 Highlighted text

To highlight (emphasize) a word, an expression or a sentence bold must be used as the default value. The presentation is driven by the value of the attribute `emphasisType` (eg, "`em01`").

2.13 Change marks

2.13.1 General

Change marks show the changes from the previous issue delivered to the customer.

Business rule decision point BRDP-S1-00517 - Display of change marks:

– Decide whether to display change marks.

Changes given the attribute `changeMark` is "`1`" can be identified with a change bar in the form of a vertical black line, 2 to 4 pt wide, to the left of the left type limit adjacent to the changed lines, or in the case of tabular data, against the row that contains the change.

Note

The vertical black line to the left is the default value. Any other visual representation is by project decision.

Business rule decision point BRDP-S1-00518 - Presentation of change marks:

– Decide whether to use an alternative visual presentation as change marker.

Changes to tables, figures and individual sheet of a multi-sheet figure, including their titles, are marked at the table and figure title line respectively. Projects can decide to mark individual table rows. If individual rows are change marked the table title line must not be change marked if the title is not changed.

Business rule decision point BRDP-S1-00519 - Presentation of change marking of individual table rows:

– Decide whether to present change marks for individual table rows.

When a table or a figure is part of a change marked element, the change mark for the complete element must be displayed if the display of change marks is a project requirement.

Table of contents, List of figures and List of tables in data modules must not be change marked.

Title pages, List of effective pages, List of effective data modules, Change records, Highlight pages and table of contents pages must not be change marked.

Examples of coding are given in Chap 3.9.5.2.1.1.

2.14 Control authority

The presentation of control authority is decided by the project. To help identify controlled data a symbol should be displayed to highlight the information. A yellow-colored flag note symbol is recommended for rapid visual identification of controlled information. The controlled information should be displayed in **bold** font. A mechanism must also be provided to identify the text of a Customer Originated Change (COC). It is recommended that the customer acronym be provided in the margin to identify the owner of the content.

Example 1: Airworthiness Directory

AD 2005-23-17

1. Apply grease on the headset

Example 2: Certification Maintenance Requirement

22-CMR-99

1. Install the headset

Example 3: Multiple Control Authorities

Multiple control authorities may be applied to one step. This example shows a Required Inspection Item and a Critical Design Configuration Control.

RII
28-AWL-03: CDCCL

1. Install the stem, refer to...

Example 4: Customer Originated Change

In the example below, the customer's three letter acronym (ZAP) is placed in the margin adjacent to the text to indicate that the information was provided by owner of the document.

ZAP C. Installation Test

Business rule decision point BRDP-S1-00570 - Presentation of control authority content:

- Decide how to present control authority content using the attribute `controlAuthorityRefs`.

2.15 References

References to data modules and technical publications are presented in lexical order, with data modules first, in the beginning of a data module under the default heading "References" and as inline references in the text.

When the reference is a link to the target it must be presented underlined and in blue.

2.15.1 The references table in data modules

Descriptive, procedural, fault information, maintenance planning, etc, data modules include a standardized reference table immediately following the introductory lists: Table of contents, List of tables or List of figures. The references table is presented under the default heading References (Centerhead No. 2) as Table 1 with the table title "References".

The table presents the data module code, the publication module code or a non-S1000D publication code together with the corresponding title, as given by the element <refs>, for all in the data module referenced publications and data modules. Publications not having a code are presented by the title only. This means:

- The data module reference is derived from the element <dmRef> which gives the data module code from the element <dmCode> contained in the element <dmRefIdent>.

  For projects that include the issue number (in element <issueInfo> contained in element <dmRefIdent>) in the data module reference, this will be displayed after the data module code and be preceded by the word "Issue".

  For projects that include the title of the data module (in element <dmTitle> contained in element <dmRefAddressItems>) in the data module reference, the data module title will be displayed in the second column.

  Note

  It is recommended to include the data module titles.

- The publication module reference is derived from the element <pmRef> which gives the publication code from the element <pmCode> contained in element <pmRefIdent> together with the element <pmTitle> contained in element <pmRefAddressItems>.

  For projects that include the issue date (in element <issueDate> contained in element <pmRefAddressItems>) in the publication module reference, this will be presented after the publication identifier.

- A non-S1000D publication reference is derived from the element <externalPubRef> using the element <externalPubCode> and/or the element <externalPubTitle> contained in element <externalPubRefIdent>.

No other elements and attributes on the element <refs>, than those given above, have any effect on the formatted output for page-oriented presentation.

The absence of external references within a data module will be presented with "None" in the reference table. Refer to Fig 8.

- The alternate title of publication modules (element <shortPmTitle>) and non-S1000D publications (element <shortExternalPubTitle>) must be presented in bold and underlined on a new line to differ from the presentation of the full title. Refer to Fig 9.

Detailed rules for specific data module types are given in Chap 6.2.3.

Refer to Fig 8 for examples of a table with and without references.

Business rule decision point BRDP-S1-00520 - Presentation of data module titles in the reference table:

- Decide whether to present the data module title in the reference table ("*Table 1 References*").

Business rule decision point BRDP-S1-00521 - Presentation of publication module/non-S1000D publication titles in the reference table:

- Decide whether to present the title (element <pmTitle>/<externalPubTitle>) or the short title (element <shortPmTitle>/<shortExternalPubTitle>), or both, in the reference table ("*Table 1 References*").

Business rule decision point BRDP-S1-00522 - Order of presentation of references in the reference table:

- Decide in which order the referenced document is presented in the reference table ("*Table 1 References*"): In order of appearance, alphabetical order, data modules before publications, etc.

References

Table 1 References

Data module/Technical publication	Title
S1000DBIKE-AAA-D00-00-00-00AA-258A-A	Bicycle - Other procedures to clean
S1000DBIKE-AAA-D00-00-00-00AA-041A-A Issue 004	Bicycle - Description of how it is made
S1000DBIKE-TPSMG-BMP01-00	Bicycle maintenance publication
	Biker's little red booklet - Moff's memoirs
ISBN 1-871802-04-0	

References

Table 1 References

Data module/Technical publication	Title
None	

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Fig 8 Presentation of references under the default heading "References" - Example

References

Table 1 References

Data module/Technical publication	Title/Alternate title
S1000DBIKE-AAA-D00-00-00-00AA-258A-A	Bicycle - Other procedures to clean
ISO-66891D:1887	Short introduction to the noble art of cleaning a two wheels bicycle outdoors in good weather condition **How to clean a dirty bike**

ICN-S3627-S1000D0497-002-01

Fig 9 Presentation of references under the default heading "References" when using alternate title - Example

2.15.2 Inline references

The presentation of references to data modules are done by presentation of the data module code derived from the element <dmRefIdent>. The content of the element <dmTitle> is not presented.

The presentation of references to publication modules are done by presentation of the publication module code derived from the element <pmRefAddressIdent>. The content of the element <pmTitle> or the element <shortPmTile> is not presented.

The presentation of non-S1000D references is derived from the element <externalPubCode>, the element <externalPubTitle> or the element <shortExternalPubTitle>.

Business rule decision point BRDP-S1-00523 - Inline presentation of non-S1000D publication titles:

– Decide whether to present the external publication code (element <externalPubCode>), the title (element <externalPubTitle>) or the short title (element <shortExternalPubTitle>) as the inline reference.

2.16 Cross-references

Cross-references to elements within the current data module typically display a generated prefix. Cross-references to paragraphs, steps, figures, sheets, hotspots, multimedia, multimedia objects and tables must be preceded with the prefixes "Para", "Step", "Fig", "Fig, Sheet", "Fig [ ]", "Fig", "Fig, Object" and "Table", respectively when presented. The prefix must include the number of the target (eg, the paragraph, step or figure number). These cross-references can be followed by a title by project decision.

When the cross-reference is a link to a target, it must be presented underlined and in blue.

Table 5 shows the presentation of the link related to the target type independent of the "trigger" is the target element or the attribute internalRefTargetType.

Refer to Chap 3.9.5.2.1.2 for further information on how and when to present titles as an addition to the generated prefix/text in cross-references.

Table 5 Presentation of attribute internalRefTargetType

Cross-reference to	Corresponding attribute internalRefTargetType value	Output example with generated prefix/text	Comments
<figure>	"irtt01"	Fig 1	"Fig" + space + target figure number[1]
<table>	"irtt02"	Table 4	"Table" + space + target figure number[1]
<multimedia>	"irtt03"	Fig 7	"Fig" + space + target figure number[1]
<supplyDescr>	"irtt04"	General lubricant	Text content of the child element <shortName>[2, 3]
<supportEquipDescr>	"irtt05"	Tire pressure gage	Text content of the child element <shortName>[2, 3]
<spareDescr>	"irtt06"	Inner-tube	Text content of the child element <shortName>[2, 3]
<levelledPara>	"irtt07"	Para 1.2.2	"Para" + space + target paragraph number[1]

Cross-reference to	Corresponding attribute `internalRefTargetType` value	Output example with generated prefix/text	Comments
<proceduralStep>	"irtt08"	Step 3	"Step" + space + target figure number[1]
<graphic>	"irtt09"	Fig 3, Sheet 2	"Fig" + space + target figure number + comma [,] + space + "Sheet" + space + target sheet number[4]
<multimediaObject>	"irtt10"	Fig 3, Video	"Fig" + space + target figure number + comma [,] + space + target media type attribute `multimediaType` value
<hotspot>	"irtt11"	Fig 2 [15]	"Fig" + space + target figure number + space + target hotspot attribute `referredFragment/applicationStructureName` value within square brackets[3]
<parameter>	"irtt12"	lever	The text content of the child element <parameterName>
<zoneRef>	"irtt13"	Zone 321	Text content of the child element <shortName>[2, 3] -- "Zone" + space + the content of attribute `zoneNumber`[5]
<workLocation>	"irtt14"	Nose cowl	The text content of the element <workArea>[3]

Cross-reference to	Corresponding attribute `internalRefTargetType` value	Output example with generated prefix/text	Comments
<sbmaterialSet> <sbSupportEquipSet> <sbIndividualSupportEquip> <sbExternalSupportEquipSet> <sbSupplySet> <sbIndividualSupply> <sbExternalSupplySet> <sbSpareSet> <sbIndividualSpare> <sbExternalSpareSet> <sbRemovedSpareSet> <sbIndividualRemovedSpareSet>	"irtt15"	Emergency kit	Text content of the child element <shortName>[2, 3]
<accessPointRef>	"irtt16"	Access panel 131CW	The text content of the child element <name> -- "Access" + space + the interpretation of the value of attribute accesPointTypeValue + space + attribute accessPointNumber[6]

1 + space + the content of the element <title> if the project has decided to present titles.

2 or the content of the element <name> if there is no content in the element <shortName>.

3 When the element <internalRef> is populated, **only** the textual content of this element is presented.

4 This is valid for the "basic" method (the same figure number for all sheets), refer to Chap 3.9.2.2. When any of the alternate methods are used (individual numbers on the figures): "Fig" + space + target figure number.

5 When no content is available in the element <shortName> or the element <name>.

6 When no content is available in the element <name>.

Note

Any space before and after the element <internalRef> must be inserted by the author of the data module, not added by the stylesheet. This is to ensure correct spacing for any surrounding punctuation.

Business rule decision point BRDP-S1-00097 - Presentation of the target titles in cross-references:

– Decide whether to present the target titles given in the element <title>.

Note

Presentation of the titles depends on the presentation system and its settings.

Business rule decision point BRDP-S1-00524 - Presentation of the name of spares, supplies and support equipment:

– Decide whether to present the name (element <name>) or the abbreviated alternate name (element <shortName>), as the cross-reference in the text.

2.17 Applicability

2.17.1 Placement of applicability statements in context

The human readable applicability statements must be presented in the proper context as it is critical for the user to clearly understand the validity of the statement.

The basic presentation rules are:

– An applicability statement must be presented whenever the applicability is changed.
– The S1000D standard page-oriented presentation of the applicability statement is to locate it inside a step or paragraph aligning the left type limit

  - on the first text line in the step or paragraph after the step or paragraph number and the title if any
  - on the same line as the step or paragraph number if there is no title
  - presented in 10/11 pt bold aligning the left type limit

  An alternative method is to present the applicability statement before the step or paragraph number to which it applies, is allowed by project decision.

  - presented in 10/11 pt bold aligning the left limit of the page image area

– Applicability that pertains to parent elements is also applicable to all of its child elements.

  Note

  This is built in into the XML Schemas.

Business rule decision point BRDP-S1-00525 - Use of the alternative method for presentation of applicability statements:

– Decide whether to use the preferred or the alternative method for presentation of applicability statements.

Rules for applicability markings on individual paragraphs and list items, on notes, on figures and on rows in tables will be included in a future issue of the specification.

Presentation of applicability in connection with warning, cautions and the tables in preliminary requirements, refer to Chap 6.2.3.3.

2.17.2 Examples

The following examples are derived from the same XML instance which for simplicity only uses the element <proceduralStep>. For an example where the element <proceduralStepAlts> is used, refer to Chap 6.2.3.3.

If there is no applicability set for the element the applicability is inherited from the parent element or from the overall applicability of the data module.

Recommendation: Avoid setting (duplicate) applicability to child elements if these elements have the same applicability as the parent element. Avoiding or minimizing duplication eases updating of the data modules and minimize conflicts at presentation.

The applicability given in brackets is presented to support the understanding and reading of the examples. The overall data module applicability in the examples is set to Serial Number (SN) 1-100.

The mark-up for this example is given in Chap 3.9.5.3.

Example 1 - The S1000D standard page-oriented presentation of applicability statements:

This example follows rules for the S1000D standard page-oriented presentation of applicability statements.

1	**Applicable to: 1-50** This step called A is applicable to SN: 1-50	*(applic set to* SN: *1-50)*
1.1	This step called B is applicable to SN: 1-50	*(no applic set - inherited from Step 1)*
1.1.1	**Applicable to: 1-10** This step called C is applicable to SN: 1-10	(*applic set to* SN: *1-10)*
1.1.2	**Applicable to: 11-20** This step called D is applicable to SN: 11-20	(*applic set to* SN: *11-20)*
1.1.2.1	This step called E is applicable to SN: 11-20	(*no applic set - inherited from Step 1.1.2)*
1.1.2.2	This step called F is applicable to SN: 11-20	(*no applic set - inherited from Step 1.1.2)*
1.1.2.3	This step called G is applicable to SN: 11-20	(*no applic set - inherited from Step 1.1.2)*
1.1.2.4	This step called H is applicable to SN: 11-20	(*no applic set - inherited from Step 1.1.2)*
1.1.2.5	This step called I is applicable to SN: 11-20	(*no applic set - inherited from Step 1.1.2)*
1.2	**Applicable to: 1-50** This step called J is applicable to SN: 1-50	*(no applic set - inherited from Step 1)*
2	**Applicable to: 1-100** This step called K is applicable to SN: 1-100	*(no applic set - inherited from the data module applic)*
2.1	This step called L is applicable to SN: 1-100	*(no applic set - inherited from Step 2)*
2.1.1	**Applicable to: 1-10** This step called M is applicable to SN: 1-10	(*applic set to SN: 1-10)*
2.1.2	**Applicable to: 11-20** This step called N is applicable to SN: 11-20	*(applic set to SN: 11-20)*
2.1.2.1	This step called P is applicable to SN: 11-20	(*no applic set - inherited from Step 2.1.2)*
2.1.2.2	This step called Q is applicable to SN: 11-20	(*no applic set - inherited from Step 2.1.2)*
2.1.3	**Applicable to: 21-100** This step called R is applicable to SN: 21-100	(*applic set to SN: 21-100)*
2.2	**Applicable to: 1-100** This step called S is applicable to SN: 1-100	(no applic set - inherited from Step 2)
3	This step called T is applicable to SN: 1-100	*(no applic set - inherited from the data module applic)*

Example 2 - Alternative presentation of applicability statements:

Equal to Example 1, but using the alternative presentation: Applicability statement presented before the step.

Applicable to: 1-50

1	This step called A is applicable to SN: 1-50	*(applic set to SN: 1-50)*
1.1	This step called B is applicable to SN: 1-50	*(no applic set - inherited)*

Applicable to: 1-10

1.1.1	This step called C is applicable to SN: 1-10	*(applic set to SN: 1-10)*

Applicable to: 11-20

1.1.2	This step called D is applicable to SN: 11-20	*(applic set to SN: 11-20)*
1.1.2.1	This step called E is applicable to SN: 11-20	*(no applic set - inherited)*
1.1.2.2	This step called F is applicable to SN: 11-20	*(no applic set - inherited)*
1.1.2.3	This step called G is applicable to SN: 11-20	*(no applic set - inherited)*
1.1.2.4	This step called H is applicable to SN: 11-20	*(no applic set - inherited)*
1.1.2.5	This step called I is applicable to SN: 11-20	*(no applic set - inherited)*

Applicable to: 1-50

1.2	This step called J is applicable to SN: 1-50	*(no applic set - inherited)*

Applicable to: 1-100

2	This step called K is applicable to SN: 1-100	*(no applic set - inherited from the data module applic)*
2.1	This step called L is applicable to SN: 1-100	*(no applic set - inherited from Step 2)*

Applicable to: 1-10

2.1.1	This step called M is applicable to SN: 1-10	*(applic set to SN: 1-10)*

Applicable to: 11-20

2.1.2	This step called N is applicable to SN: 11-20	*(applic set to SN: 11-20)*
2.1.2.1	This step called P is applicable to SN: 11-20	*(no applic set - inherited)*
2.1.2.2	This step called Q is applicable to SN: 11-20	*(no applic set - inherited)*

Applicable to: 21-100

2.1.3	This step called R is applicable to SN: 21-100	*(applic set to SN: 21-100)*

Applicable to: 1-100

2.2	This step called S is applicable to SN: 1-100	*(no applic set - inherited from Step 2)*
3	This step called T is applicable to SN: 1-100	*(no applic set - inherited from the data module applic)*

2.17.3 Default heading and style

The S1000D standard page-oriented presentation of the applicability is preceded by the default heading "**Applicable to:**" presented in 10/11 pt bold. If required, to highlight the default heading and applicability statement blue must be used (eg, **Applicable to: SN 1-100**).

To group and separate serial numbers, service bulletins and conditions commas [,], logical expressions ("and", "or") and full stops [.] must be used.

Examples:

Serial number, individual and ranges separated by commas, for example:

– "SN: 5-12", " SN: 001-100, 103", " SN: 001-199, 201-220, 222"

Service bulletins and modifications, for example:

– Post SB A350-A-25-10-0001A-00A-930A-C_002 and Pre SB-A350-A-25-10-0004-00A-930A-C_001
– Post SB-A350-A-25-10-0001-00A-930A-C_002. Post SB-A350-A-32-10-0014-00A-930A-A_001 and Pre SB-A350-A-25-10-0004-00A-930A-B_001.

Conditions, for example:

– Dessert operations
– SN: 101-120, Dessert conditions

Mixed, for example:

– SN: 001-050 and Post SB-A350-A-25-10-0001-00A-930A-C_002
– SN: 001-050 and Post SB-A350-A-25-10-0001-00A-930A-C_002. SN: 051-100.

Note

The full stop after "_002", in the second example, separates the two applicability statements for " SN: 001-050" and " SN: 051-100".

Business rule decision point BRDP-S1-00526 - Decide on highlighting the applicability default heading and statement at presentation:

– Decide whether to highlight (blue and bold) the default heading and applicability statement at presentation.

Chapter 6.2.3

Page-oriented publications - Layout rules and examples

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Chap 6.2.3.1	Layout rules and examples - Front matter data modules
Chap 6.2.3.2	Layout rules and examples - Descriptive data modules
Chap 6.2.3.3	Layout rules and examples - Procedural data modules
Chap 6.2.3.4	Layout rules and examples - Fault information data modules.
Chap 6.2.3.5	Layout rules and examples - IPD publication
Chap 6.2.3.6	Layout rules and examples - Compnent maintenace data modules
Chap 6.2.3.7	Layout rules and examples - Service bulletin data modules

1 General

This chapter gives the rules for and examples of S1000D standard page-oriented presentation of data modules using the layout elements given in Chap 6.2.2. It is used to build for example, XML Style Sheets (written in the XML Style Sheet Language). If a traditional authoring environment is used, it is used as the input for setting up the authoring application.

Rules and examples are given for:

- Chap 6.2.3.1 Layout - Layout rules and examples - Front matter data modules
- Chap 6.2.3.2 Layout rules and examples - Descriptive data modules
- Chap 6.2.3.3 Layout rules and examples - Procedural data modules
- Chap 6.2.3.4 Layout - Layout rules and examples - Fault information data modules.
- Chap 6.2.3.5 Layout - Layout rules and examples - IPD publication

- Chap 6.2.3.6 Layout - Layout rules and examples - Component maintenance data modules
- Chap 6.2.3.7 Layout rules and examples - Service bulletin data modules

Chapter 6.2.3.1

Layout rules and examples - Front matter data modules

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Table 1 References

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Chap 3.9.4	Authoring - Front matter
Chap 3.9.5.2.16	Content section - Front matter
Chap 3.9.5.2.16.1	Front matter - Markup examples
Chap 5.2.1.18	Common information sets - Common information and data
Chap 5.3.1.1	Common requirements - Front matter
Chap 6.2.1	Page-oriented publications - Page layout, paper publications, headers and footers
Chap 6.2.2	Page-oriented publications - Typography and layout elements

1 General

This chapter gives the rules for and examples of S1000D standard page-oriented presentations of the below listed front matter data modules.

Note

In the examples the security classification is in lowercase "by project decision".

The rules and examples in this chapter include:

- Title page - (TITLE) - IC 001
- List of effective pages - List of Effective Pages (LOEP) - IC 00R (or IC 002)
- List of effective data modules - List Of Effective Data Module (LOEDM) - IC 00S (or IC 002)
- Change record - Change Record (CR) - IC 00T (or IC 003)
- Highlights - (HIGH) - IC 00U (or IC 003)
- Technical standard record - Technical Standard Record (TSR) - IC 008
- Table of contents - Table Of Contents (TOC) - IC 009

In a future issue, rules and examples for the following cross-reference tables will be included:

- Product cross-reference table - Product Cross-reference Table (PCT) - IC 00P
- Conditions cross-reference table - Conditions Cross-reference Table - (CCT) - IC 00Q
- Applicability cross-reference table- Applicability Cross-reference Table (ACT) - IC 00W

Examples of the following front matter lists are given in Chap 5.2.1.18:

- List of abbreviations - List of Abbreviations (LOA) - IC 005
- List of terms - List of Terms (LOT) - IC 006
- List of symbols - List of Symbols (LOS) - IC 007

– List of applicable specifications and documentation - List of Applicable Specifications and Documentation (LOASD) - IC 00V

The following front matter data modules, for a given publication, can be auto generated with the publication module as base. The publication module and all data modules being included in the publication, contain all necessary data:

– Title page - TITLE
– List of effective pages - LOEP
– List of effective data modules - LOEDM
– Highlights - HIGH
– Table of contents - TOC

If properly marked up in the data modules the following front matter data modules can be auto generated based on the use of the element <acronym>:

– List of abbreviations - LOA
– List of terms - LOT

Change record, Technical standard record, List of symbols and List of applicable specifications and documentation must be authored using the Descriptive Schema.

Markup examples of front matter data modules are given in Chap 3.9.5.2.16.1. They are provided as a download package (filename of the package), which contains XML, PDF representations of the XML and PDF presentation examples of each front matter data module. The package can be downloaded from www.s1000d.org.

2 Rules and examples

2.1 General

The front matter data modules must use the basic layout and rules given in Chap 6.2.1 and Chap 6.2.2 with the following significant rules:

Note

The date in the footer is derived from the front matter data module element <issueDate> given in the element <identAndStatusSection>. Rules for data module issue dates are given in Chap 3.9.5.1.

– Only element <infoName> and, if given, element <infoNameVariant>, separated by a comma [,] followed by a space [ ], must be presented as the title. Thus the elements <infoName> and <infoNameVariant> take the place (Centerhead No. 1) of the element <techName> in the layout.
– The tables given for each front matter type must be used. Refer to, for example, Table 3 and Table 4. The project has to decide on the first and second column table header titles. For example:

  - **Document title** can be used instead of **Title** in column 1
  - **Document identifier** can be used for Column 2 (when the table also can include non-S1000D publications (<externalPubRef>)
  - **Data module code** or **Publication module code** (when the table only includes data modules or publication modules)

– The standard introductory and explanatory text paragraphs (element <reducedPara>) are presented after the title and in front of the tables. These standardized paragraphs and lists are given below for each of the front matter types.

  When using the Front matter Schema:

- the issue number and issue date (the elements <issueInfo> and <issueDate>) to be included in the standard introductory text are derived from the corresponding elements in the relevant child element (eg, <frontMatterList>) of the element <frontMatter>. The inclusion is done during the creation of the data module which means that the content of the element <reducedPara> is complete and ready for presentation.

When using the Descriptive Schema:

- the issue number and issue date (the elements <issueInfo> and <issueDate>) included in the standard introductory text are derived from the element <identAndStatusSection> of the source publication module.

– Table of contents, List of tables or List of figures of the front matter itself must not be presented
– The Reference table must not be presented
– No table title lines are used, except for Highlights

Table 2 gives the front matter, the corresponding Schema to be used and a reference to where the details are given.

Note

(M) and (O) is used to indicate whether the content/value of the element/attribute must be presented (M) or is optional (O).

Chap 3.9.4 gives an overview and the basic rules for front matter data modules and Chap 5.3.1.1 gives the rules for the data module coding.

Table 2 Front matter - Schema

Front matter	Schema	Refer to
Title page - TITLE	Front matter	Para 2.2
Table of contents - TOC	Front matter	Para 2.3
List of effective pages - LOEP	Front matter	Para 2.4.2
List of effective data modules - LOEDM	Front matter	Para 2.5
Change record - CR	Descriptive	Para 2.6
Highlights - HIGH	Front matter	Para 2.7
Technical standard record - TSR	Descriptive	Para 2.8
Product cross-reference table - PCT	PCT	
Conditions cross-reference table - CCT	CCT	
Applicability cross-reference table - ACT	ACT	
List of abbreviations - LOA	Descriptive	Chap 5.2.1.18
List of terms - LOT	Descriptive	Chap 5.2.1.18

Front matter	Schema	Refer to
List of symbols - LOS	Descriptive	Chap 5.2.1.18
List of applicable specifications and documentation - LOASD	Descriptive	Chap 5.2.1.18

2.2 Title page

The Title page rules below are based on the use of the Front matter Schema. The same presentation applies when the Descriptive Schema is used.

The information is derived from the element <frontMatterTitlePage>.

Each of the information objects must be presented left justified to the left image limit.

The layout rules are given in the list below and in Fig 1 and Fig 2.

The first line of each of the following object starts on fixed distances from the top of the page.

1 Product/Project (optional). The content from the elements <productIntroName> and/or <productAndModel>.

2 Publication/Volume title (mandatory). Content derived from the elements <pmTitle> and <shortPMTitle>.

3 Publication module code (mandatory). Content derived from the element <pmCode>.

4 Issue information (mandatory). Content derived from the element <issueInfo> (<issueNumber> in the element <frontMatterTitlePage>. The issue date given in the element <issueDate> (in the element <frontMatterTitlePage>) can be a complement to the issue number. The date is typically the same as in the footer of the Title page data module (element <issueDate> in the element <identAndStatusSection>.

The following information objects must be presented at the lower part of the Title page, starting with manufacturer's information from the very bottom. These objects expand as necessary.

5 Product illustration (optional). The illustration of the product derived from the element <productIllustration>. The height of the product illustration must be agreed.

6 Restriction information (optional). Content derived from the element <restrictionInfo>, expands upwards from the Publisher block (item 7). When the height expands available space, the information continues at the top of the following page.

The content of any populated child element is presented in the following order:

- Copyright
- Policy statement
- Data conditions

The content is presented in 8/9 pt roman, all left justified.

Note

Any text to be presented in, for example bold, must be coded with the corresponding value of the attribute emphasisType.

7 Publishing authority (mandatory). The publisher is presented under the fixed title "Publisher:" by its name from the element <enterpriseName> in the element <responsiblepartnerCompany>.

The name is given below the title "Publisher:" in 8/9 pt roman.

The publisher's logotype (optional). The logotype is derived is derived from the element <symbol> in the element <publishersLogo>. As there can be more than one logotype, the first given is used, if not otherwise stated in the business rules for the element. Refer to Chap 3.9.5.2.16.

The logotype is presented left justified below the title "Publisher:" with the publisher's name indented accordingly.

8 Manufacturer's information (optional). The information is presented under the fixed title "Manufacturer:". Typically only the following elements are used: <enterpriseName> and <businessUnitName> giving the manufacturers name and the business unit name, and the element <businessUnitAddress> giving the address.

The name and address are given below the title "Manufacturer:" in 8/9 pt roman.

Manufacturer's logotype (optional). The logotype is commonly presented and is derived from the element <symbol> in the element <enterpriseLogo>. As there can be more than one logotype, the first given is used if not otherwise stated in the business rules for the element. Refer to Chap 3.9.5.2.16.

The logotype is presented left justified below the title "Manufacturer:" with the manufacturer's name and address indented accordingly.

9 The optional barcode derived from the element <barcode>. As there can be more than one bar code, the first given is used, if not otherwise stated in the business rules for the element. Refer to Chap 3.9.5.2.16.

The following information objects are presented from the top of the page.

10 Restriction instructions (optional). Content derived from the element <restrictionInstructions> starts to fill the page from the top.

Note

Any overflow from Restriction information (copyright, etc) (item 6) will continue on top of the page before the Restriction instructions.

The content of any populated child element is presented in the following order:

- Data distribution
- Export control
- Data handling
- Data destruction
- Data disclosure
- Supersedure

The content is presented in 8/9 pt roman, all left justified.

Note

Any text to be presented in, for example bold, must be coded with the corresponding value of the attribute emphasisType.

11 Miscellaneous information - Front matter information (optional). The information is derived from the element <frontMatterInfo>. Each front matter information type is

presented with its title (<title> or the value of the attribute frontMatterInfoType) followed by a colon and the content of the element <reducedPara> starting on a new line.

Note

The content given in the element <title> takes precedence over the interpretation of the value of the attribute frontMatterInfoType.

Each of the entries is presented left justified in 8/9 pt roman proceeded by a title in 8/9 pt bold.

Note

The title must be coded with value "em01" on the attribute emphasisType.

Security classification (mandatory). The security classification of the publication is presented in the header and footer.

Note

The security classification presented on the Title page must use the element <security> given in the element <frontMatterTitlePage>.

The title page can also include other classification information represented in the element <derivativeClassification>. For each derivative classification action, this information is identified by date of the action, source material used for the derivation, contact person, and the action type (eg, classified, declassified, downgraded, upgraded).

Business rule decision point BRDP-S1-00527 - Elements and attributes to be presented on the Title page:

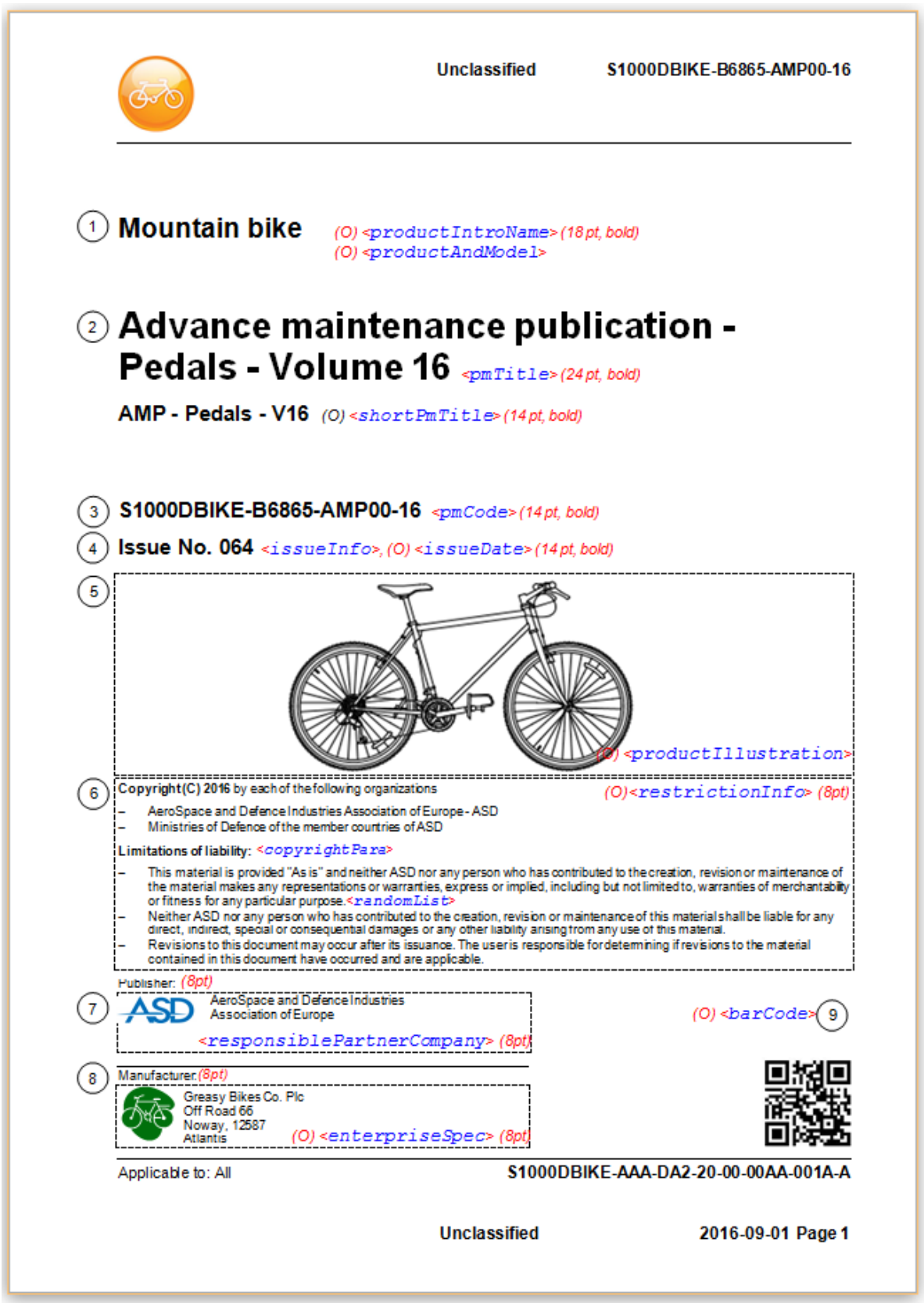
– Decide which elements and attributes to be presented on the Title page.

Note

The decisions must be coordinated/based on the decisions taken for the Business rules decision points given in Chap 3.9.4 and Chap 3.9.5.2.16.

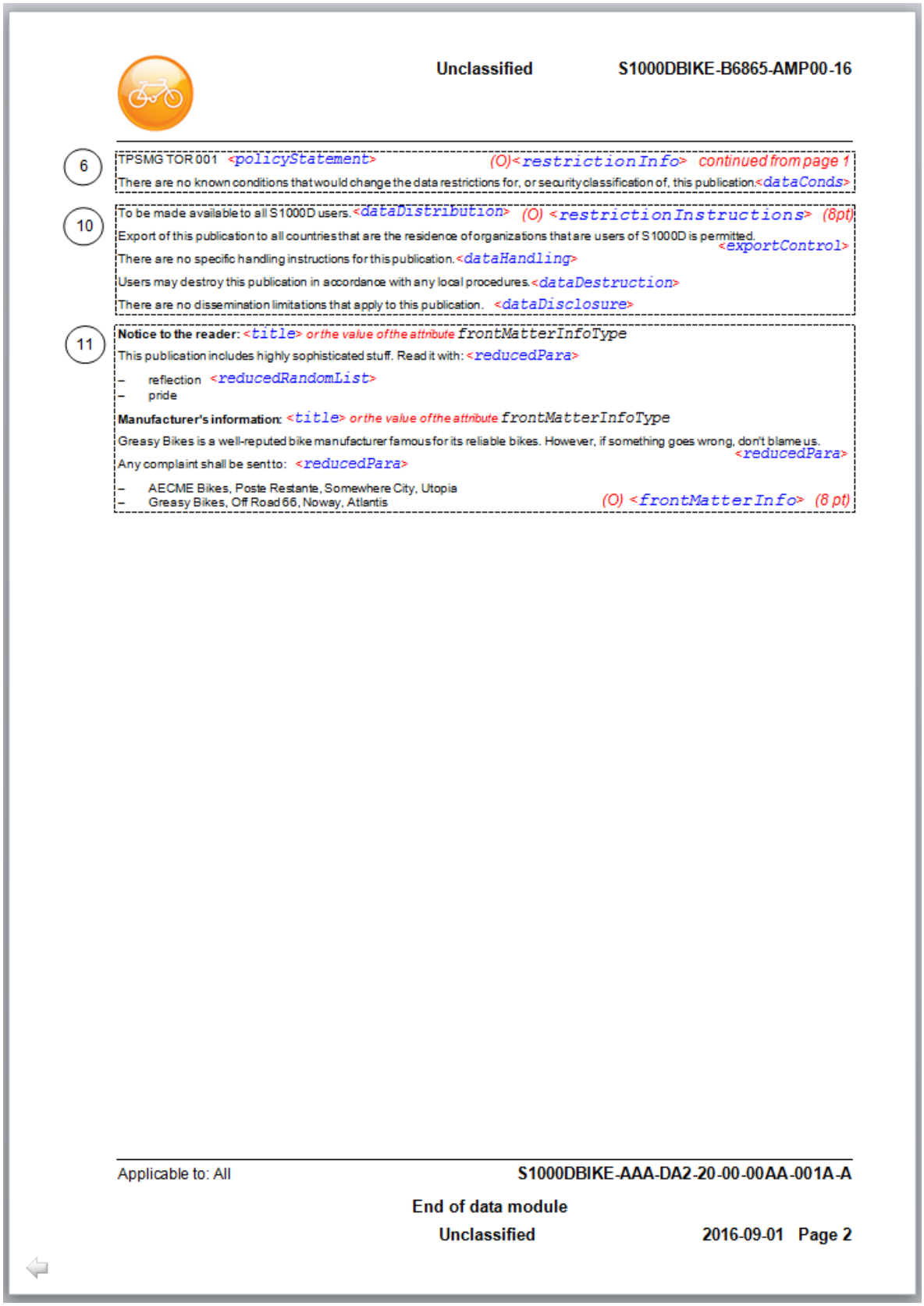
Business rule decision point BRDP-S1-00528 - Size of the product illustration on the Title page:

– Decide on the height of the product illustration on the Title page, if used.



ICN-S3627-S1000D0662-003-01

Fig 1 Layout - Title page



ICN-S3627-S1000D0663-003-01

Fig 2 Layout - Title page, continued

2.3 Table of contents

A Table of contents could be presented as a non-hierarchical (the content just listed in the order of appearance in the publication) or as a hierarchical (grouping the entries by adding titles).

Business rule decision point BRDP-S1-00529 - Elements and attributes to be presented on the Table of contents page:

– Decide which elements and attributes to be presented on the Table of contents page.

Note

The decisions must be coordinated/based on the decisions taken for the Business rules decision points given in Chap 3.9.4 and Chap 3.9.5.2.16.

Business rule decision point BRDP-S1-00571 - Number of levels in Table of contents:

– Decide on the number of levels to be presented in Table of contents.

2.3.1 Introductory paragraph

The introductory paragraph for S1000D standard page-oriented presentation is:

"The listed documents are included in issue XXX, dated YYYY-MM-DD, of this publication."

The paragraph is derived from the element <reducedPara> in the element <frontMatterTableOfContent>.

Note

The issue number and the date are included in the reduced paragraph during the production of the Table of contents data module.

2.3.2 Table of contents list entries

2.3.2.1 Table of contents - non-hierarchical

The Table of contents list, containing all entries, follows after the introductory paragraph. Each entry in the table is derived from an element <tocEntry>. The details are given in Table 3.

The project has to decide on the first and second column table header titles. For example:

– **Document title** can be used instead of **Title** in column 1
– **Document identifier** can be used for Column 2 (when the table also can include non-S1000D publications (<externalPubRef>)
– **Data module code or Publication module code** (when the table only includes data modules or publication modules)

Table 3 Table of contents entry details

Title	Data module code Publication module code	Issue date Issue No.[1]	No. of pages	Applicable to
<dmRef>:				
<techName> (M) and <infoName> (M) separated by a hyphen	<dmCode> (M) (and <identExtension> (O) if extended data module code is used)	<issueDate> (and/or attribute issueNumber)	<numberOfPages> (O)	attribute applicRefId (M)[2]
Dimension and areas - Technical data	X4-A-06-00-01-01A-030A-A	2011-11-01	3	Mk1

Title	Data module code Publication module code	Issue date Issue No.[1]	No. of pages	Applicable to
<pmRef>:				
<pmTitle> (M) and if agreed <shortPmTitle> (O)	<pmCode> (M) (and <identExtension> (O) if extended publication module code is used)	<issueDate> (and/or attribute issueNumber)	<numberOfPages> (O)	attribute applicRefId (M)[2]
Me and my steamroller	X4-S3627-SRHBK-00	1946-12-24	789	Steamrollers
<externalPubRef>:				
<externalPubTitle>(M) and if agreed <shortExternalPubTitle> (O)	<externalPubCode> (M)	<externalPublIssueDate> (and/or <externalPublIssue>)	<numberOfPages> (O)	attribute applicRefId (M)[2]
Short introduction to the life of a steamroller nerd	ISBN 978-3-16-148410-0	Initial issue	218	

1 **Issue date** and/or **Issue No.**

2 **Recommendation**: It is recommended to use/present the element <displayText> when the Table of contents data module is intended for page-oriented presentation.

Note

The TOC must not include the Title page, LOEDM, LOEP, Change Record (CR) or TOC itself.

An example of a non-hierarchical Table of contents page is presented in Fig 3 which also includes the standard introductory and explanatory text paragraph.

Note

The issue information in this example is given by the issue date.

2.3.2.2 Table of contents - hierarchical

The hierarchical Table of contents list contains, besides listing the entries as given in Para 2.3.2.1, titles for one or more groups of entries. The titles are derived from the element <title> in the elements <tocList> and <tocEntry>.

Several hierarchical levels can be presented in bold, indented or not.

An example of a hierarchical Table of contents page is presented in Fig 4 which also includes the standard introductory and explanatory text paragraph.

Note

The issue information in this example is given by the issue number. The last entry is a non-S1000D publication and only has the issue information in the form of a date, which then is presented.



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Table of contents

The listed documents are included in issue 004, dated 2016-09-01, of this publication.

Title	Data module code Publication module code	Issue date	No. of pages	Applicable to
Highlights	X4-A-00-00-00-00A-00UB-A	2016-09-01	1	All
Technical standard record	X4-A-00-00-00-00A-008A-A	2011-12-01	1	All
Steamroller - Introduction	X4-A-00-00-00-01A-018A-A	2011-12-01	4	All
Steamroller - Description	X4-A-00-00-00-00A-040A-A	2008-07-01	5	All
Steamroller - Description	X4-A-00-00-00-01A-040A-A	2011-12-01	7	Mk1
Steamroller - Description	X4-A-00-00-00-03A-040A-A	2016-09-01	8	Mk2
Product - Safety - General data	X4-A-00-20-00-01A-010A-A	2008-07-01	3	All
Product - Safety - General data	X4-A-00-20-00-02A-010A-A	2016-09-01	3	Mk1
Product - Safety - General data	X4-A-00-20-00-03A-010A-A	2011-12-01	4	Mk2
Product - Safety - General warnings and cautions	X4-A-00-20-00-01A-012A-A	2011-12-01	4	All
Dimension and areas - Technical data	X4-A-06-00-01-01A-030A-A	2011-12-01	3	Mk1
Dimension and areas - Technical data	X4-A-06-00-01-02A-030A-A	2011-12-01	3	Mk2
Publications - Description of publication package	X4-A-00-41-01-00A-040A-A	2016-09-01	14	All

Applicable to: All X4-A-00-00-00-00A-009A-A

End of data module

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Fig 3 Table of contents - Layout example



E2-B6865-EMP72-00

Table of contents

The listed documents are included in issue 016, dated 2016-10-15, of this publication.

Title	Data module code Publication module code	Issue No.	No. of pages	Applicable to
Copyright	E2-A-72-00-00-01A-021A-A	1	1	All
Highlights	E2-A-72-00-00-00A-003A-A	16	1	All
Steam engine - Introduction	E2-A-72-00-00-01A-018A-A	16	4	All
72 Engine				
72-00-00 Engine general				
Engine - Description of how it is made and its function	E2-A-72-00-00-00A-040A-D	12	5	All
Engine - Performance data	E2-A-72-00-00-00A-030A-D	16	7	All
72-10-00 Reduction gear, shaft section				
Reduction gear, shaft section - Description of how it is made and its function	E2-A-72-10-00-00A-040A-D	4	8	All
Reduction gear, shaft section - Performance data	E2-A-72-10-00-00A-030A-D	3	4	All
Engine fuel control test handbook	EFC-ZL123-ABC23-00	2011-04-21	68	Mk II

Applicable to: All

E2-A-72-00-00-00A-009A-A

End of data module

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Fig 4 Table of contents, hierarchical - Layout example

2.4 List of effective pages

When a publication includes other S1000D publications and/or non-S1000D publications, these are listed in their entirety. Refer to Table 4 for details.

Business rule decision point BRDP-S1-00530 - Elements and attributes to be presented on the List of effective pages:

– Decide which elements and attributes to be presented on the List of effective pages.

Note

The decisions must be coordinated/based on the decisions taken for the Business rules decision points given in Chap 3.9.4 and Chap 3.9.5.2.16.

2.4.1 Introductory paragraph

The introductory paragraph for S1000D standard page-oriented presentation is:

"This publication includes the following pages after insertion of issue XXX, dated YYYY-MM-DD.

C = Changed page

N = New page"

The content is derived from the element <reducedPara> in the element <frontMatterList>.

Note

The issue number and the date are included in the reduced paragraph during the production of the List of effective pages data module.

2.4.2 List of effective pages list entries

The List of effective page list, containing all entries, follows after the introductory paragraph. Each entry in the table, representing a page in a data module or an entire publication or non-S1000D publication, is derived from an element <frontMatterSubList>. The details are given in Table 4.

Note

A title (element <title>) and informative text (element <reducedPara>) can be included in the table to group entries.

Table 4 List of effective pages entry details

Data module code	Page (O)	0 (M)	Issue date Issue No.[2]	Applicable to
<frontMatterDmEntry>/<dmRef>:				
<dmCode> (M) (and <identExtension> (O) if extended data module code is used)	[3]	[4]	<issueDate> (and/or attribute issueNumber)	attribute applicRefId (O)[5]
X4-A-00-00-00-00A-001A-A	1	C	2016-09-01	All
	2	C	2016-09-01	All

Data module code	Page (O)	[0] (M)	Issue date Issue No.[2]	Applicable to
<frontMatterPmEntry>/<dmRef>:				
<pmCode> (M) (and <identExtension> (O) if extended publication module code is used)	[6]	[7]	<issueDate> (and/or attribute issueNumber)	attribute applicRefId (O)[5]
X4-S3627-SRHBK-00	-	C	1946-12-24	Steamrollers
<frontMatterExternalPubEntry>/<externalPubRef>				
<externalPubCode> (M)	[6]	[7]	<externalPublIssueDate> (and/or <externalPubl Issue>)	attribute applicRefId (O)[5]
EFC-ZL123-ABC23-00	-		2011-04-21	

1 This column gives the interpretation of the value of the attribute issueType. Refer to Para 2.4.3 for the interpretation of the values.

2 **Issue date** and/or **Issue No.**

3 The page number derived from the element <numberOfPages>.

4 The presented issue type value is the same for all pages in a data module.

5 **Recommendation**: It is recommended to use/present the element <displayText> when the Table of contents data module is intended for page-oriented presentation.

6 As publicationns or non-S1000D publications are stored in their entirety as one entry in the LOEP, no individual pages will be presented. Use a hyphen [-] or the total number of pages if the project has decided to use the element <footnoteRemarks> to store the total number of pages.

7 The presented issue type value is the same as for the complete publication or non-S1000D publication.

An example of a List of effective pages is presented in Fig 5 which also includes the standard introductory and explanatory text paragraph.

Note

The issue information in this example is given by the issue date.

2.4.3 Presentation of attribute issueType values

The following values are presented:

N = New page/data module and C = Changed page/data module on LOEP and LOEDM.

R = Remove data module and I = Insert data module to be presented on a HIGH with updating instructions.

Table 5 Attribute `issueType` values vs presented values in HIGH and LOEP/LOEDM

@issueType	HIGH	LOEP/LOEDM
new	I	N
revised	R I	C
changed	R I	C
deleted	R	Not listed in LOEP/LOEDM
status	R I	C
rinstate-status/-changed/-revised	I	N



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List of effective pages

This publication includes the following pages after insertion of issue 004, dated 2016-09-01.

C = Changed page

N = New page

Data module code	Page		Issue date	Applicable to
X4-A-00-00-00-00A-001A-A	1	C	2016-09-01	All
	2	C	2016-09-01	All
X4-A-00-00-00-00A-00RA-A	1	C	2016-09-01	All
	2	C	2016-09-01	All
	3	C	2016-09-01	All
X4-A-00-00-00-00A-00TA-A	1		2002-11-01	All
X4-A-00-00-00-00A-00UB-A	1	C	2016-09-01	All
X4-A-00-00-00-00A-008A-A	1		2011-12-01	All
X4-A-00-00-00-00A-009A-A	1	C	2016-09-01	All
X4-A-00-00-00-01A-018A-A	1		2011-12-01	All
	2		2011-12-01	All
	3		2011-12-01	All
	4		2011-12-01	All
X4-A-00-00-00-00A-040A-A	1		2008-07-01	All
	2		2008-07-01	All
	3		2008-07-01	All
	4		2008-07-01	All
	5		2008-07-01	All
X4-A-00-00-00-01A-040A-A	1		2011-12-01	Mk1
	2		2011-12-01	Mk1
	3		2011-12-01	Mk1
	4		2011-12-01	Mk1
	3		2011-12-01	Mk1
	5		2011-12-01	Mk1
	6		2011-12-01	Mk1
	7		2011-12-01	Mk1
X4-A-00-00-00-03A-040A-A	1	C	2016-09-01	Mk2

Applicable to: All X4-A-00-00-00-00A-00RA-A

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Fig 5 List of effective pages - Layout example

2.5 List of effective data modules

Business rule decision point BRDP-S1-00531 - Elements and attributes to be presented on the List of effective data modules:

– Decide which elements and attributes to be presented on the List of effective data modules.

Note

The decisions must be coordinated/based on the decisions taken for the Business rules decision points given in Chap 3.9.4 and Chap 3.9.5.2.16.

2.5.1 Introductory paragraph

The introductory paragraph for S1000D standard page-oriented presentation is:

"The listed documents are included in issue XXX, dated YYYY-MM-DD, of this publication.

C = Changed data module

N = New data module"

The content is derived from the element <reducedPara> in the element <frontMatterList>.

2.5.2 List of effective data module list entries

The List of effective data module list, containing all entries, follows after the introductory paragraph. Each entry in the table is derived from an element <frontMatterSubList>. The details are given in Table 6.

Note

A title (element <title>) and informative text (element <reducedPara>) can be included in the table to group entries.

Table 6 List of effective data module entry details

Title	Data module code Publication module code	[0] (M)	Issue date Issue No.[2]	No. of pages	Applicable to
<frontMatterDmEntry>/ <dmRef>:					
<dmTitle> (M)	<dmCode> (M) (and <identExtension> (O) if extended data module code is used)		<issueDate> (and/or attribute issueNumber)	[3]	attribute applicRefId (O)[4]
Title page	X4-A-00-00-00-00A-001A-A	N	2016-09-01	2	All

Title	Data module code Publication module code	[0] (M)	Issue date Issue No.[2]	No. of pages	Applicable to
<frontMatterPmEntry>/ <pmRef>:					
<pmTitle> (M)	<pmCode> (M) (and <identExtension> (O) if extended publication module code is used)		<issue Date> (and/or attribute issue Number)	[5]	attribute applic RefId (O)[4]
Me and my steamroller	X4-S3627-SRHBK-00		1946-12-24	789	Steamrollers
<frontMatterExternal PubEntry>/ <externalPubRef>:					
<externalPubTitle> (M)	<externalPubCode> (M)		<issue Date> (and/or attribute issue Number)	[5]	attribute applic RefId (O)[4]
Short introduction to the life of a steamroller nerd	ISBN 978-3-16-148410-0		Initial issue	218	

1 This column gives the interpretation of the value of the attribute issueType. Refer to Para 2.4.3 for the interpretation of the values.

2 **Issue date** and/or **Issue No.**

3 The number of pages is derived from the element <numberOfPages>.

4 **Recommendation**: It is recommended to use/present the element <displayText> when the Table of contents data module is intended for page-oriented presentation. This simplifies the complexity of the functionality of the page-layout application.

5 The total number of pages if the project has decided to use the element <footnoteRemarks> to store the total number of pages.

Number of pages is only given when used for page-oriented distribution.

An example of a List of effective data modules is presented in Fig 6 which also includes the standard introductory and explanatory text paragraph.

Note

The issue information in this example is given by the issue date.



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List of effective data modules

The listed documents are included in issue 004, dated 2016-09-01, of this publication.

C = Changed data module

N = New data module

Title	Data module code Publication module code		Issue date	No. of pages	Applicable to
Title page	X4-A-00-00-00-00A-001A-A	C	2016-09-01	2	All
List of effective data modules	X4-A-00-00-00-00A-00SA-A	C	2016-09-01	1	All
Change record	X4-A-00-00-00-00A-00TA-A		2002-11-01	1	All
Highlights	X4-A-00-00-00-00A-00UB-A	C	2016-09-01	1	All
Technical standard record	X4-A-00-00-00-00A-008A-A		2011-12-01	1	All
Table of contents	X4-A-00-00-00-00A-009A-A	C	2016-09-01	1	All
Steamroller - Introduction	X4-A-00-00-00-01A-018A-A		2011-12-01	4	All
Steamroller - Description	X4-A-00-00-00-00A-040A-A		2008-07-01	5	All
Steamroller - Description	X4-A-00-00-00-01A-040A-A		2011-12-01	7	Mk1
Steamroller - Description	X4-A-00-00-00-03A-040A-A	C	2016-09-01	8	Mk2
Product - Safety - General data	X4-A-00-20-00-01A-010A-A		2008-07-01	3	All
Product - Safety - General data	X4-A-00-20-00-02A-010A-A		2011-12-01	3	Mk1
Product - Safety - General data	X4-A-00-20-00-03A-010A-A		2011-12-01	4	Mk2
Product - Safety - General warnings and cautions	X4-A-00-20-00-01A-012A-A		2011-12-01	4	All
Dimension and areas - Technical data	X4-A-06-00-01-01A-030A-A		2011-12-01	3	Mk1
Dimension and areas - Technical data	X4-A-06-00-01-02A-030A-A		2011-12-01	3	Mk2
Publications - Description of publication package	X4-A-00-41-01-00A-040A-A	N	2016-09-01	14	All

Applicable to: All X4-A-00-00-00-00A-00SA-A

End of data module

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Fig 6 List of effective data modules - Layout example

2.6 Change record

2.6.1 Introductory paragraph

The introductory paragraph for S1000D standard page-oriented presentation is:

> "Make sure that the previous revisions have been incorporated.
>
> Incorporated revisions must be recorded with the date of incorporation and a signature."

An example of a Change record page is presented as Fig 7 which also includes the standard introductory and explanatory text paragraphs.



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Change record

Make sure that the previous revisions have been incorporated.

Incorporated revisions must be recorded with the date of incorporation and a signature.

Issue	Incorporated date	by (signature)	Issue	Incorporated date	by (signature)
001	2002-11-01	Initial issue	026		
002	2008-08-11	D Racula	027		
003	2011-12-21	Charlie Brown	028		
004	2016-10-04	Donald Duck	029		
005			030		
006			031		
007			032		
008			033		
009			034		
010			035		
011			036		
012			037		
013			038		
014			039		
015			040		
016			041		
017			042		
018			043		
019			044		
020			045		
021			046		
022			047		
023			048		
024			049		
025			050		

Applicable to: All

End of data module

X4-A-00-00-00-00A-00TA-A

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Fig 7 Change record - Layout example

2.7 Highlights

The issue number of the publication is presented as a Centerhead No. 2. Refer to Chap 6.2.2. The issue number (the elements <issueInfo>) is derived from the element <frontMatterList>.

There are two types of Highlights

– Highlights listing new or changed data modules with the reason for update.

  The attribute frontMatterType has the value "fm03".

– A variant of a highlight data module, "Highlights with updating instructions", for paper publications. This variant includes instructions for the updating of the publication in addition to the list of highlights. Refer to Para 2.7.3.

  The attribute frontMatterType has the value "fm04".

Business rule decision point BRDP-S1-00532 - Elements and attributes to be presented on the Highlights data modules:

– Decide which elements and attributes to be presented on the Highlights data modules.

  Note

  The decisions must be coordinated/based on the decisions taken for the Business rules decision points given in Chap 3.9.4 and Chap 3.9.5.2.16.

2.7.1 Introductory paragraph

The introductory paragraph for S1000D standard page-oriented presentation is:

"The listed changes are introduced in issue XXX, dated YYYY-MM-DD, of this publication."

The content is derived from the element <reducedPara> in the element <frontMatterList>.

2.7.2 Highlights list entries

The Highlights data module list, containing all entries, follows after the introductory paragraph. The table content is derived from the first appearance of the element <frontMatterSubList> in the data module. This element contains all the entries. The details are given in Table 7.

Table 7 Highlights data module entry details

Data module	Reason for update
<frontMatterDmEntry>/<dmRef>:	
<dmCode> (M) (and <identExtension> (O) if extended data module code is used)	<simpleRefPara> or <simplePara> in <reasonForUpdate>
X4-A-00-00-00-01A-021A-A	Copyright and data restrictions introduced

2.7.3 Highlights with updating instructions

This variant of the Highlights data module have an additional Updating instruction following the Highlights list given in Para 2.7.2.

The instruction consists of three parts:

- the title
- the updating instruction
- the listing of data modules to be removed and inserted

2.7.3.1 The title

The updating instruction starts with the default heading "Updating instruction" presented as a Centerhead No. 1. Refer to Chap 6.2.2.

The content is derived from the element <title> in the second appearance of the element <frontMatterSubList> in the data module.

2.7.3.2 The updating instruction

The instruction itself is as follows:

"Remove or insert data modules as listed in Table 1.

I = Insert data module

R = Remove data module"

The content is derived from the element <reducedPara> in the second appearance of the element <frontMatterSubList> in the data module.

2.7.3.3 The listing of data modules to be removed and inserted

The table content is derived from the second appearance of the element <frontMatterSubList> in the data module. This element contains all the entries. The details are given in Table 8.

Note

The Highlights data module with updating instructions has been populated with data based on the following rules:

- All data modules having a value given for the attribute issueType must have an entry (<frontMatterDmEntry>).
- The order to follow structure of the publication (= TOC).
- All entries with attribute issueType = "revised"/"changed"/"status" (data modules to be inserted) must be preceded by an entry with attribute issueType = "deleted" of the revised/changed/status data module (data modules to be removed).
- The elements <dmCode>, <dmTitle> and <numberOfPages>, and depending on project decision, the element <issueDate> or the element <issueInfo> are populated. The attribute applicRefId is optional.

Refer to Chap 3.9.5.2.16.

The remove-insert listing starts with the default table title line:

"*Table 1 Data modules to be removed or inserted*"

Table 8 Remove insert list entry details

Data module	Title	[0] (M)	Issue date Issue No.[2]	No. of pages [3]	Applicable to
<frontMatterDmEntry> /<dmRef>:					
<dmCode> (M) (and <identExtension> (O) if extended data module code is used)	<dmTitle> (M)[4]		<issueDate> (or attribute issueNumber)		attribute applicRefId (O)[5]
X4-A-00-00-00-00A-001A-A	Title page	R	2011-11-01	1	All
		I	2012-12-24	1	All
X4-A-00-00-00-01A-021A-A	Copyright	I	2012-12-24	1	All
X4-A-00-00-00-02A-040A-A	Steamroller - Description	R	2008-07-01	6	Mk2

1 This column gives the interpretation of the value of the attribute issueType. Refer to Para 2.4.3 for the interpretation of the values.

2 **Issue date** or **Issue No.**

3 The number of pages is derived from the element <numberOfPages>.

4 The presented title is expected to be the title of the current (updated) data module when it is substituted.

5 **Recommendation**: It is recommended to use/present the element <displayText> when the Table of contents data module is intended for page-oriented presentation.

An example of a Highlight page is presented in Fig 8.

A variant of a highlight data module is an "extended" highlight data module for paper publications which includes the procedure for updating of the publication. Refer to Fig 9.

The examples include the standard introductory and explanatory text paragraphs.

Note

The issue information in this example is given by the issue date.



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Highlights

Issue 004

The listed changes are introduced in issue 004, dated 2016-09-01, of this publication.

Data module code	Reason for update
X4-A-00-00-00-01A-001A-A	Copyright and data restrictions introduced
X4-A-00-00-00-03A-040A-A	Flywheel and piston modified
X4-A-00-41-01-00A-040A-A	New

Applicable to: All X4-A-00-00-00-00A-00UA-A

End of data module

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Fig 8 Highlights - Layout example

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Highlights

Issue 004

The listed changes are introduced in issue 004, dated 2016-09-01, of this publication.

Data module	Reason for update
X4-A-00-00-00-01A-001A-A	Copyright and data restrictions introduced
X4-A-00-00-00-03A-040A-A	Flywheel and piston modified
X4-A-00-41-01-00A-040A-A	New

Updating instruction

Remove or insert data modules as listed in Table 1.

I = Insert data module

R = Remove data module

Table 1 Data modules to be removed or inserted

Data module code	Title		Issue date	No. of pages	Applicable to
X4-A-00-00-00-00A-001A-A	Title page	R	2011-12-01	1	All
		I	2016-09-01	2	All
X4-A-00-00-00-00A-00SA-A	List of effective data modules	R	2011-12-01	1	All
		I	2016-09-01	1	All
X4-A-00-00-00-00A-00UB-A	Highlights	R	2011-12-01	1	All
		I	2016-09-01	1	All
X4-A-00-00-00-00A-009A-A	Table of contents	R	2011-12-01	1	All
		I	2016-09-01	1	All
X4-A-00-00-00-02A-040A-A	Steamroller - Description	R	2008-07-01	6	Mk2
X4-A-00-00-00-03A-040A-A	Steamroller - Description	R	2011-12-01	5	Mk2
		I	2016-09-01	8	Mk2
X4-A-00-41-01-00A-040A-A	Publications - Description of publication package	I	2016-09-01	14	All

Applicable to: All X4-A-00-00-00-00A-00UB-A

End of data module 2016-09-01 Page 1

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Fig 9 Highlights with updating procedure - Layout example

2.8 Technical standard record

2.8.1 Introductory paragraph

The introductory paragraph for S1000D standard page-oriented presentation is:

> "The following record confirms that this publication incorporates all technical changes necessitated by the following modifications listed below."

An example of a Technical standard record page is presented as Fig 10 which also includes the standard introductory and explanatory text paragraph:



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Technical standard record

The following record confirms that this publication incorporates all technical changes necessitated by the following modifications listed below.

Mod No.	ESA 65
	ESA70
	ESA3690
	ESA7174
	DT28
	DT30
	PA562
	PA569
	SE132
	TR20
	TR22
	TR23
	TR25
Service bulletin	X4-A-00-21-00-05B-930A-A
	X4-A-00-21-00-06A-930A-A
	X4-A-00-22-00-11A-930A-A
	X4-A-00-23-00-05C-930A-A

Applicable to: All X4-A-00-00-00-00A-008A-A

End of data module

Unclassified 2011-12-01 Page 1

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Fig 10 Technical standards record - Layout example

Chapter 6.2.3.2

Layout rules and examples - Descriptive data modules

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2.1 Title 2
2.2 Table of contents, List of figures and List of tables 2
2.3 References 2
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List of tables

1 References 1

List of figures

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2 Descriptive data module IC 041 Page 2 - Layout example 4
3 Descriptive data module IC 041 Page 3 - Layout example 5
4 Descriptive data module IC 042 Page 1 - Layout example 6
5 Descriptive data module IC 042 Page 2 - Layout example 7
6 Descriptive data module IC 042 Page 3 - Layout example 8

References

Table 1 References

Chap No./Document No.	Title
Chap 6.2.1	Page-oriented publications - Page layout, paper publications, headers and footers
Chap 6.2.2	Page-oriented publications - Typography and layout elements

1 General

This chapter gives the rules for S1000D standard page-oriented presentation of descriptive data modules using the layout elements given in Chap 6.2.2. If a traditional authoring environment is used, it can be used as the input for setting up the authoring application.

The following two data modules exemplify the S1000D standard presentation of descriptive data modules:

- Bicycle - Description of how it is made. S1000DBIKE-AAA-D00-00-00-0000-041A-A at issue 010. This data module belongs to the publication Description and operation with the publication module code S1000DBIKE-TPSMG-DO000-00.
- Bicycle - Description of function. S1000DBIKE-AAA-D00-00-00-0000-042A-A at issue 009. This data module belongs to the publication Description and operation with the publication module code S1000DBIKE-TPSMG-DO000-00.

2 Presentation

The descriptions use the tagging from the descriptive Schema.

The presentation of a description is built up of:

1 Data module title (M)

2 Table of contents (M), List of figures (O) and List of tables (O)

3 References (M)

4 Description (M)

The header and footer information follows the rules given in Chap 6.2.1.

2.1 Title

The title of the description is derived from the elements <techname>, <infoname> and the <infonameVariant>, and is presented following the rules for centerheads as given in Chap 6.2.2.

2.2 Table of contents, List of figures and List of tables

The introductory lists **Table of contents**, **List of figures** and **List of tables** are presented following the rules as given in Chap 6.2.2.

2.3 References

The default heading **References** is presented as a centerhead following the last of the introductory tables.

The table presents the data module code, the publication module code, the technical publication reference or any other publication code together with the corresponding title, as given by the element <refs>, for all in the data module referenced publications and data modules. Publications not having a code are presented by the title only.

If there are no references, "None" is presented in the first column.

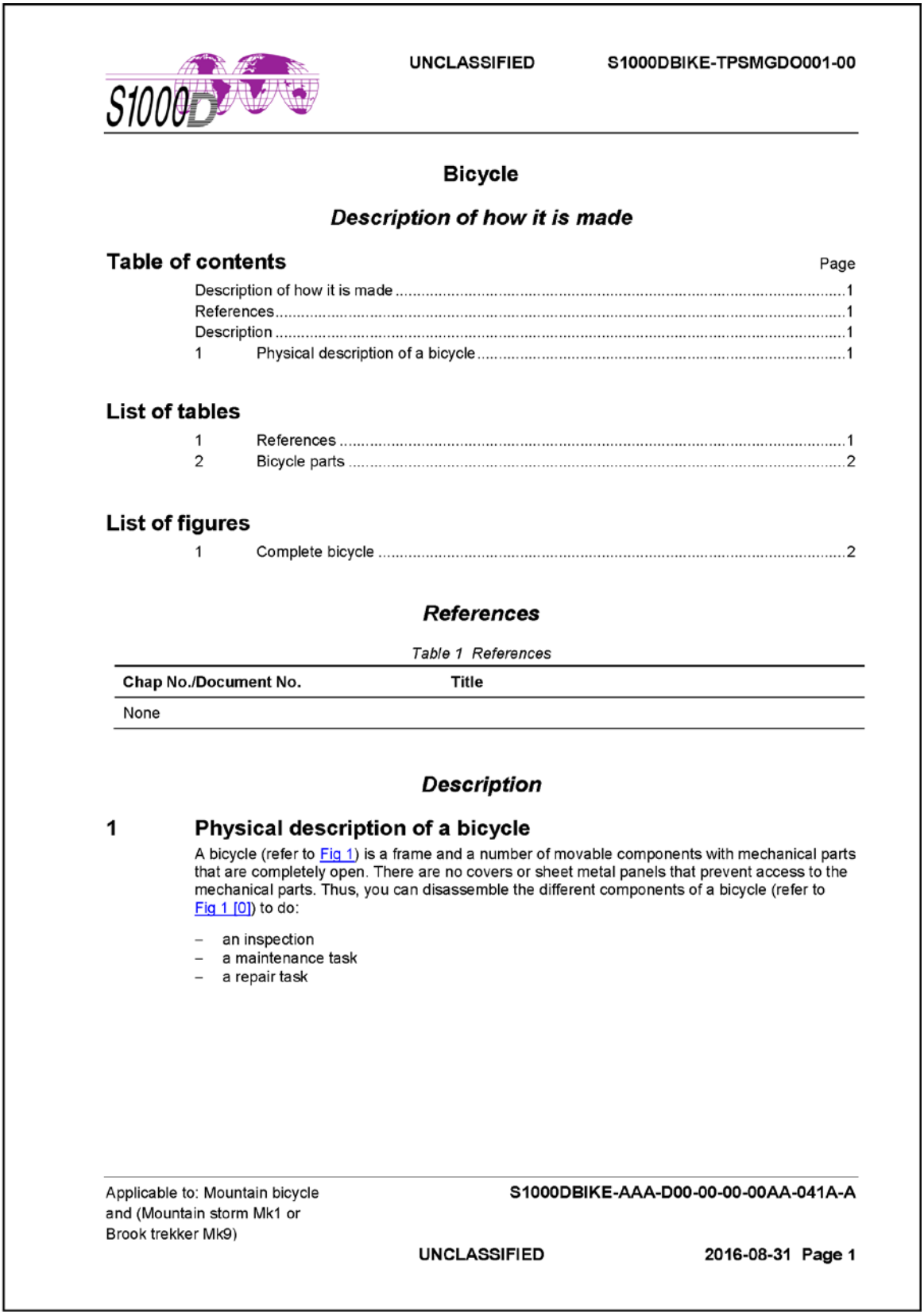
For details see Chap 6.2.2.

This table has the title "*Table 1 References*".

2.4 Description

The default heading **Description** is presented as a centerhead following the table of references.

Hereafter follows the presentation of the content, of the descriptive data module.



UNCLASSIFIED S1000DBIKE-TPSMGDO001-00

Bicycle

Description of how it is made

Table of contents

Page

Description of how it is made 1
References 1
Description 1
1 Physical description of a bicycle 1

List of tables

1 References 1
2 Bicycle parts 2

List of figures

1 Complete bicycle 2

References

Table 1 References

Chap No./Document No.	Title
None	

Description

1 Physical description of a bicycle

A bicycle (refer to Fig 1) is a frame and a number of movable components with mechanical parts that are completely open. There are no covers or sheet metal panels that prevent access to the mechanical parts. Thus, you can disassemble the different components of a bicycle (refer to Fig 1 [0]) to do:

- an inspection
- a maintenance task
- a repair task

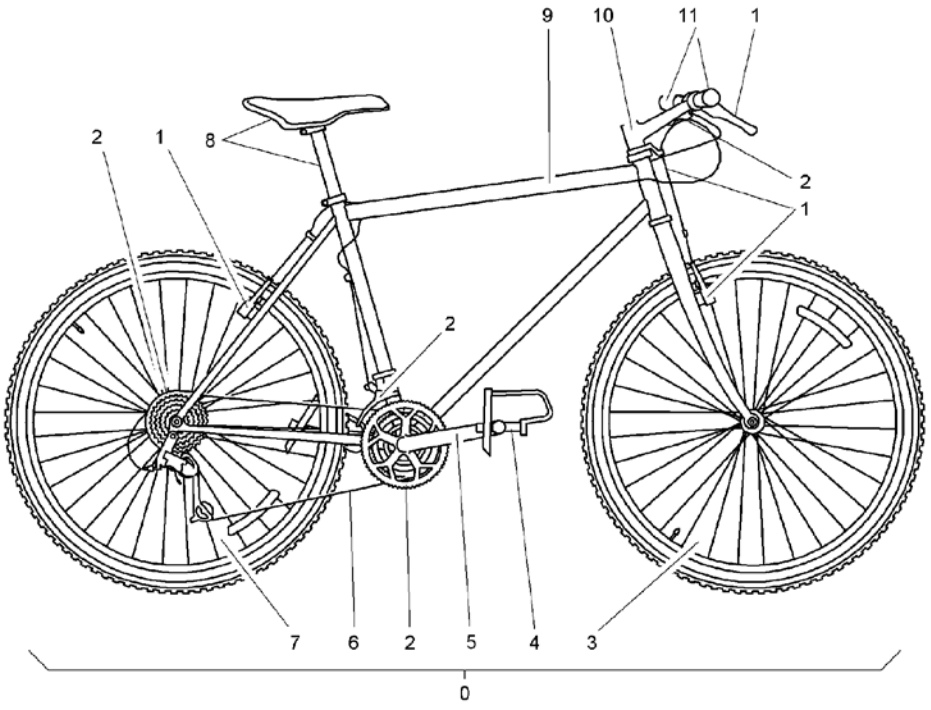
Applicable to: Mountain bicycle and (Mountain storm Mk1 or Brook trekker Mk9)

S1000DBIKE-AAA-D00-00-00-00AA-041A-A

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Fig 1 Descriptive data module IC 041 Page 1 - Layout example



ICN-C0419-S1000D0360-001-01

Fig 1 Complete bicycle

The parts that you can immediately identify on a bicycle are given in Table 2.

Table 2 Bicycle parts

Item	Refer to	Definition
Frame	Fig 1 [9]	A bicycle frame is made of metal tubes that are welded together.
Wheels		The wheels include these parts: – Hub – Spokes – Metal rim – Rubber tire
– Rear wheel	Fig 1 [7]	
– Front wheel	Fig 1 [3]	

Applicable to: Mountain bicycle and (Mountain storm Mk1 or Brook trekker Mk9)

S1000DBIKE-AAA-D00-00-00-00AA-041A-A

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Fig 2 Descriptive data module IC 041 Page 2 - Layout example

Table 2 Bicycle parts (Continued)

Item	Refer to	Definition
Seat and seat post	Fig 1 [8]	These install into the seat tube with a mechanism you can use to change the height.
Handle bars	Fig 1 [11]	A horizontal bar that attaches to the stem with grips at the ends that attach to the brake levers and the shifters.
Handle bar stem	Fig 1 [10]	This attaches the handle bar to the steering tube (head set).
Cranks	Fig 1 [5]	A lever that extends from the bottom of the bracket to the pedal.
Pedals	Fig 1 [4]	The two platforms for the feet that attach to the crank.
Chain	Fig 1 [6]	A circular set of links that connect the chain ring to the cogs on the freewheel.
Gears	Fig 1 [2]	The gears include: – Front chain ring – Rear freewheel – Front and the rear derailleur – Shift lever on the handle bars – Cables
Brakes	Fig 1 [1]	The brakes include: – Actuators on the handlebars – Brake cable – Brake calipers – Brake pads

Applicable to: Mountain bicycle and (Mountain storm Mk1 or Brook trekker Mk9)

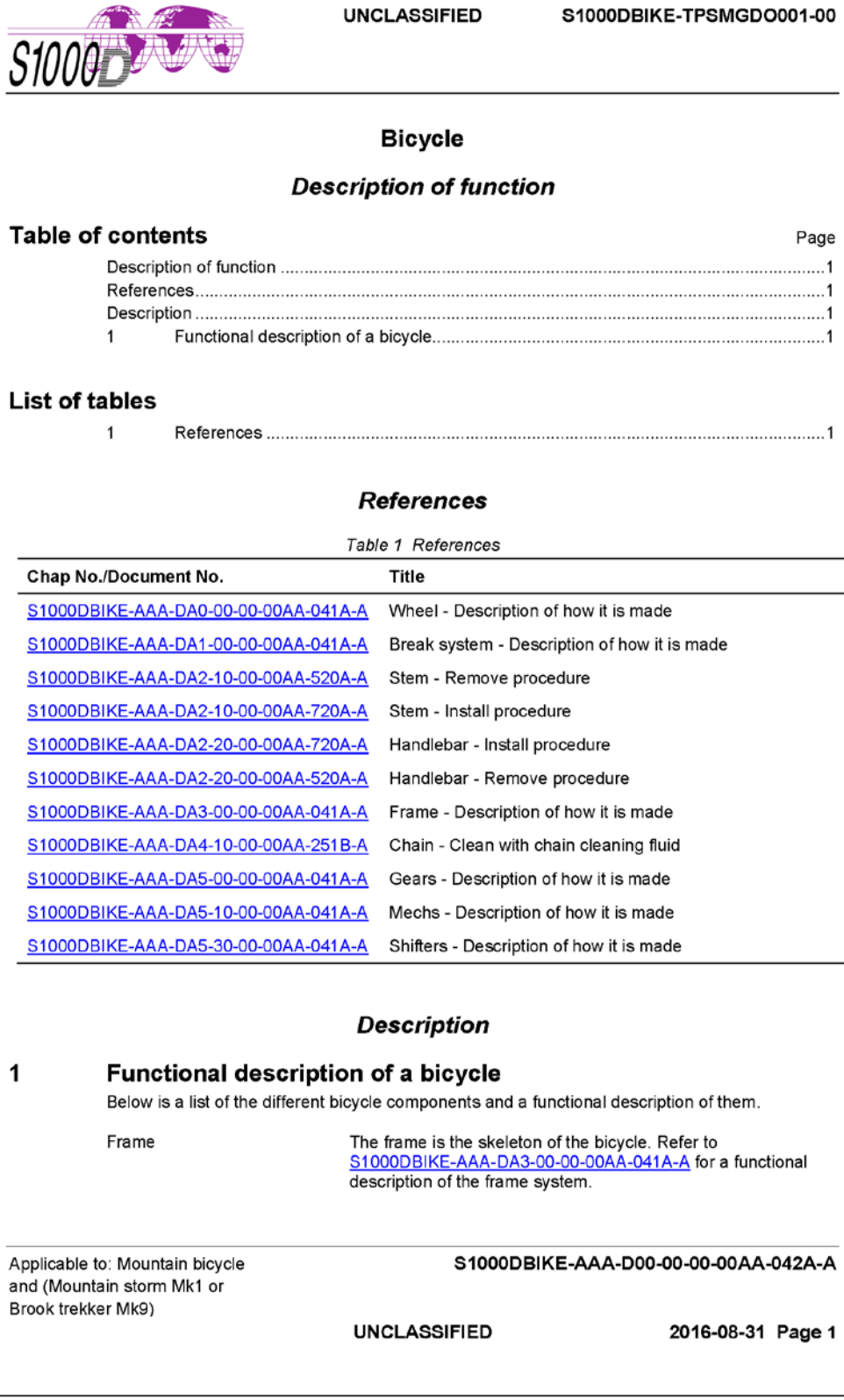
S1000DBIKE-AAA-D00-00-00-00AA-041A-A

End of data module

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Fig 3 Descriptive data module IC 041 Page 3 - Layout example



UNCLASSIFIED S1000DBIKE-TPSMGDO001-00

Bicycle

Description of function

Table of contents

Page

Description of function 1
References 1
Description 1
1 Functional description of a bicycle 1

List of tables

1 References 1

References

Table 1 References

Chap No./Document No.	Title
S1000DBIKE-AAA-DA0-00-00-00AA-041A-A	Wheel - Description of how it is made
S1000DBIKE-AAA-DA1-00-00-00AA-041A-A	Break system - Description of how it is made
S1000DBIKE-AAA-DA2-10-00-00AA-520A-A	Stem - Remove procedure
S1000DBIKE-AAA-DA2-10-00-00AA-720A-A	Stem - Install procedure
S1000DBIKE-AAA-DA2-20-00-00AA-720A-A	Handlebar - Install procedure
S1000DBIKE-AAA-DA2-20-00-00AA-520A-A	Handlebar - Remove procedure
S1000DBIKE-AAA-DA3-00-00-00AA-041A-A	Frame - Description of how it is made
S1000DBIKE-AAA-DA4-10-00-00AA-251B-A	Chain - Clean with chain cleaning fluid
S1000DBIKE-AAA-DA5-00-00-00AA-041A-A	Gears - Description of how it is made
S1000DBIKE-AAA-DA5-10-00-00AA-041A-A	Mechs - Description of how it is made
S1000DBIKE-AAA-DA5-30-00-00AA-041A-A	Shifters - Description of how it is made

Description

1 Functional description of a bicycle

Below is a list of the different bicycle components and a functional description of them.

Frame	The frame is the skeleton of the bicycle. Refer to S1000DBIKE-AAA-DA3-00-00-00AA-041A-A for a functional description of the frame system.

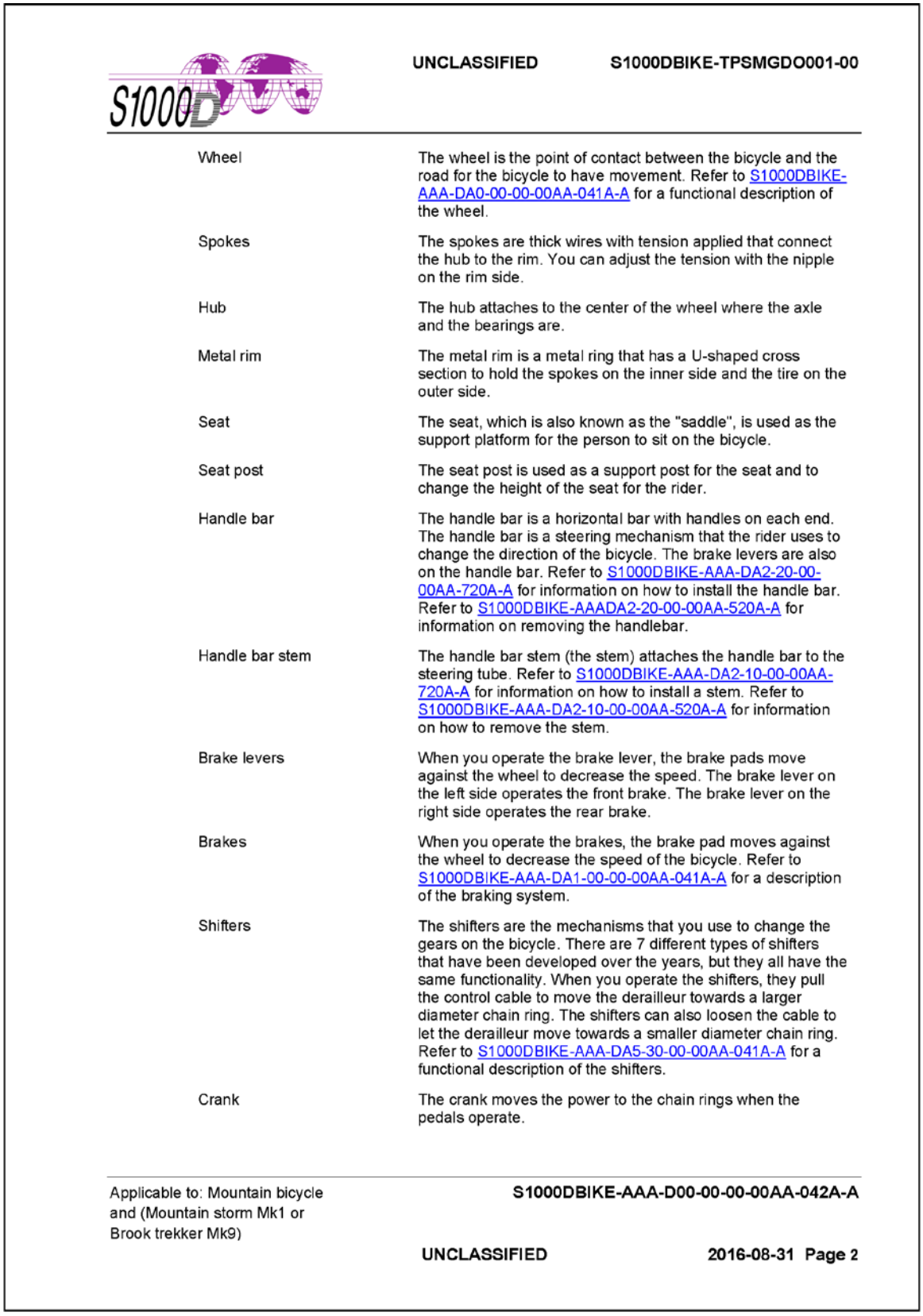
Applicable to: Mountain bicycle and (Mountain storm Mk1 or Brook trekker Mk9)

S1000DBIKE-AAA-D00-00-00-00AA-042A-A

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Fig 4 Descriptive data module IC 042 Page 1 - Layout example



UNCLASSIFIED S1000DBIKE-TPSMGDO001-00

Wheel	The wheel is the point of contact between the bicycle and the road for the bicycle to have movement. Refer to S1000DBIKE-AAA-DA0-00-00-00AA-041A-A for a functional description of the wheel.
Spokes	The spokes are thick wires with tension applied that connect the hub to the rim. You can adjust the tension with the nipple on the rim side.
Hub	The hub attaches to the center of the wheel where the axle and the bearings are.
Metal rim	The metal rim is a metal ring that has a U-shaped cross section to hold the spokes on the inner side and the tire on the outer side.
Seat	The seat, which is also known as the "saddle", is used as the support platform for the person to sit on the bicycle.
Seat post	The seat post is used as a support post for the seat and to change the height of the seat for the rider.
Handle bar	The handle bar is a horizontal bar with handles on each end. The handle bar is a steering mechanism that the rider uses to change the direction of the bicycle. The brake levers are also on the handle bar. Refer to S1000DBIKE-AAA-DA2-20-00-00AA-720A-A for information on how to install the handle bar. Refer to S1000DBIKE-AAADA2-20-00-00AA-520A-A for information on removing the handlebar.
Handle bar stem	The handle bar stem (the stem) attaches the handle bar to the steering tube. Refer to S1000DBIKE-AAA-DA2-10-00-00AA-720A-A for information on how to install a stem. Refer to S1000DBIKE-AAA-DA2-10-00-00AA-520A-A for information on how to remove the stem.
Brake levers	When you operate the brake lever, the brake pads move against the wheel to decrease the speed. The brake lever on the left side operates the front brake. The brake lever on the right side operates the rear brake.
Brakes	When you operate the brakes, the brake pad moves against the wheel to decrease the speed of the bicycle. Refer to S1000DBIKE-AAA-DA1-00-00-00AA-041A-A for a description of the braking system.
Shifters	The shifters are the mechanisms that you use to change the gears on the bicycle. There are 7 different types of shifters that have been developed over the years, but they all have the same functionality. When you operate the shifters, they pull the control cable to move the derailleur towards a larger diameter chain ring. The shifters can also loosen the cable to let the derailleur move towards a smaller diameter chain ring. Refer to S1000DBIKE-AAA-DA5-30-00-00AA-041A-A for a functional description of the shifters.
Crank	The crank moves the power to the chain rings when the pedals operate.

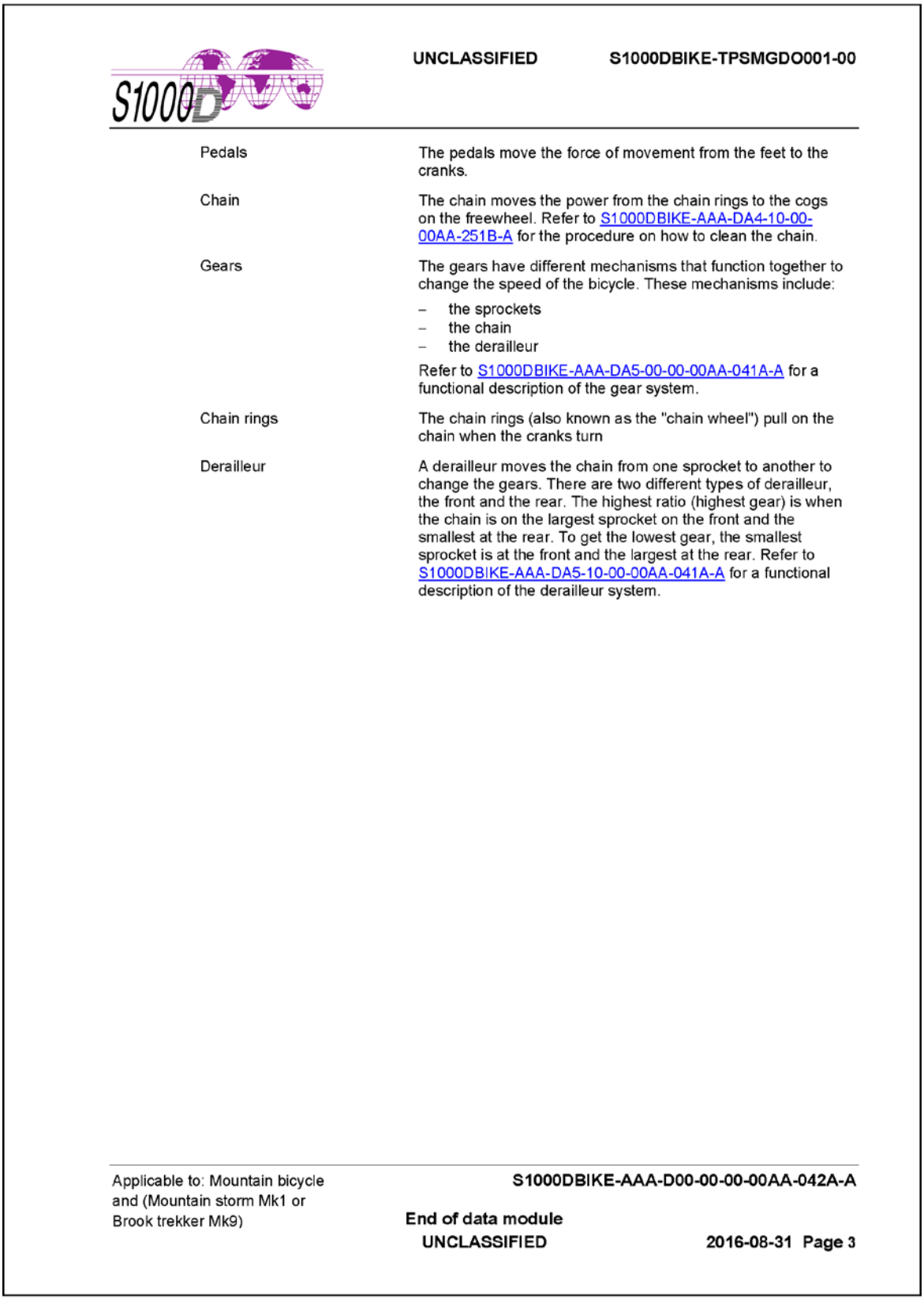
Applicable to: Mountain bicycle and (Mountain storm Mk1 or Brook trekker Mk9)

S1000DBIKE-AAA-D00-00-00-00AA-042A-A

UNCLASSIFIED 2016-08-31 Page 2

ICN-S3627-S1000D0440-004-01

Fig 5 Descriptive data module IC 042 Page 2 - Layout example



ICN-S3627-S1000D0441-004-01

Fig 6 Descriptive data module IC 042 Page 3 - Layout example

Chapter 6.2.3.3

Layout rules and examples - Procedural data modules

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References

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Chap 3.9.5.2.1.9	Common constructs - Preliminary requirements and requirements after job completion
Chap 3.9.5.2.1.10	Common constructs - Text elements
Chap 3.9.5.2.3	Content section - Procedural information
Chap 3.9.5.2.7	Content section - Parts information
Chap 4.13.3	Optimizing and reuse - Alternates concept
Chap 6.2.1	Page-oriented publications - Page layout, paper publications, headers and footers
Chap 6.2.2	Page-oriented publications - Typography and layout elements
Chap 6.2.3	Page-oriented publications - Layout rules and examples
Chap 6.2.3.6	Layout rules and examples - Component maintenance data modules
Chap 6.2.3.7	Layout rules and examples - Service bulletin data modules

1 General

This chapter gives the rules for S1000D standard page-oriented presentation of procedural data modules using the layout elements given in Chap 6.2.2. If a traditional authoring environment is used, it can be used as the input for setting up the authoring application.

The three data modules below exemplify the S1000D standard presentation of procedural data modules.

– Chain - Oil. S1000DBIKE-AAA-DA4-10-00-0000-241A-A at issue 009. This data module use titles for the steps and is presented without indented steps. Refer to Para 3.1.

  The data module is changed with reason for update:

  - Main procedure restructured

– Bicycle - Other procedure to clean. The following data modules do not use titles for the steps and are presented with indented steps.

  - S1000DBIKE-AAA-D00-00-00-00AA-258A-A at issue 009.
  - S1000DBIKE-AAA-D00-00-00-00AA-258B-A at issue 002. This data module is technically the same as "-258A" but uses the alternates concept (Chap 4.13.3) for the step "Wash the bike".

  The data module is changed with reason for update:

  - Detergent B replaced by Detergent C

All data modules belong to the Bicycle Maintenance Publication (BMP) with the publication module code S1000DBIKE-TPSMG-BMP01-00.

Note

The applicability is presented by using the content of the element <displaytext>.

Business rule decision point BRDP-S1-00572 - Presentation of data module code extension in references and tables:

– Decide whether and when to present the DME in references and tables.

Business rule decision point BRDP-S1-00573 - Presentation of issue number of the data module or the technical publication in references and tables:

– Decide whether and when to present the issue number of the data module or the technical publication in references and tables.

2 Presentation

The procedures use the tagging from the procedural Schema.

The presentation of a procedural data module is built up of:

1 Data module title (M)

2 Table of contents (M), List of figures (O) and List of tables (O)

3 References (M)

4 Common information (O)

5 Preliminary requirements (M) including safety conditions

6 Procedure (M)

7 Requirements after job completion (M)

For Component maintenance publications special rules apply. Refer to Chap 6.2.3.6.

For Service bulletin special rules apply. Refer to Chap 6.2.3.7.

The header and footer information must follow the rules given in Chap 6.2.1.

2.1 Data module title

The title of the procedure is derived from the elements <techname>, <infoname> and <infonameVariant>, and is presented following the rules for centerheads as given in Chap 6.2.2.

2.2 Table of contents, List of figures and List of tables

The introductory lists **Table of contents**, **List of figures** and **List of tables** are presented following the rules as given in Chap 6.2.2.

Note

List of figures and List of tables are presented depending on the business rules decisions.

2.3 References

The default heading **References** is presented as a centerhead following the last of the introductory tables.

The table presents the data module code, the publication module code, the technical publication reference or any other publication code together with the corresponding title, as given by the element <refs>, for all in the data module referenced publications and data modules. Publications not having a code are presented by the title only.

If there are no references, "None" is presented in the first column.

For details, refer to Chap 6.2.2.

This table has the title "*Table 1 References*".

2.4 Common information

The default heading **Common information** is presented as a centerhead following the table of references. The common information, derived from element <commonInfo>, is presented following the layout rules given in Chap 6.2.2.

2.5 Preliminary requirements

The default heading **Preliminary requirements** is presented as a centerhead following the optional Common information or the table of References. For detailed explanation of Preliminary requirements and Requirements after job completion, refer to Chap 3.9.5.2.1.9.

The preliminary requirements consist of:

1 Production management data (O). Refer to Para 2.5.1.

2 Required conditions (M) including circuit breakers (O). Refer to Para 2.5.2.

3 Required persons (O). Refer to Para 2.5.3.

4 Required technical information (O). Refer to Para 2.5.4.

5 Support equipment (M). Refer to Para 2.5.5.

6 Consumables, materials and expendables (M). Refer to Para 2.5.6.

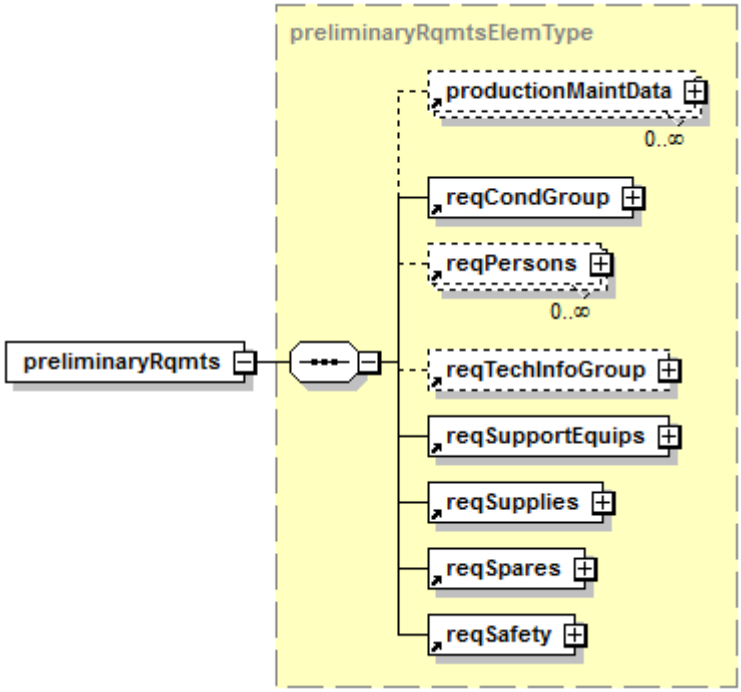
7 Spares (M). Refer to Para 2.5.7.

8 Safety conditions (M). Refer to Para 2.5.9.

Item 1 above is presented only when the element <productionMaintData> is used and its presentation is decided by the project.

Item 2 - 7 above are standardized full width tables. They are, when used, presented in the order given above numbered starting from 2 (*Table 2 Required conditions*) and they are always presented including their default heading (Sidehead 0) and table title.

Immediately after these tables follows the general safety condition valid for the data module listed under the default heading **Safety conditions**, presented as a Sidehead 0.



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Fig 1 Element <preliminaryRqmts>

2.5.1 Production management data

The production management data, derived from element <productionMaintData>, can be presented in a standardized tabular form (informal table). Refer to Fig 2. The default heading **Production management data**, presented as a Sidehead 0, precedes the informal table, divided into three parts:

- Threshold interval
- Work area location
- Maintenance task duration

Business rule decision point BRDP-S1-00574 - Presentation of Production management data:

- Decide whether to present Production management data.

2.5.1.1 Threshold interval - Element <thresholdInterval>

The threshold or threshold interval values followed by a space and the interpretation of the value of the attribute thresholdUnitOfMeasure are presented in the informal table.

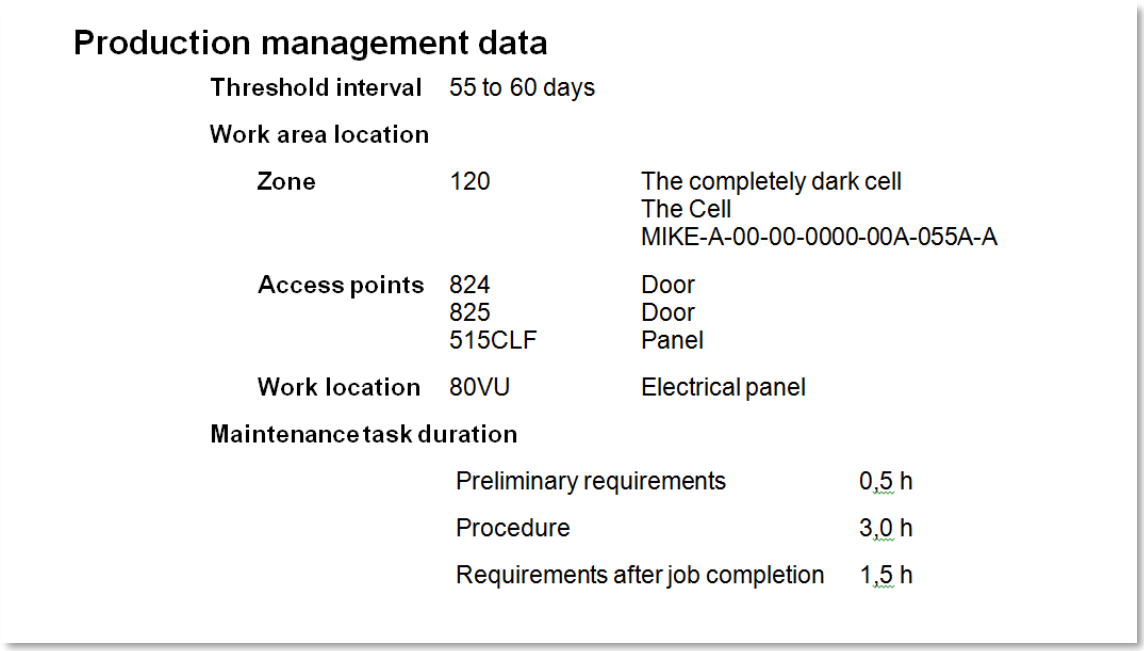
The threshold intervals are preceded by the default heading **Threshold interval**, which is only presented in the left column on the first row. Refer to Fig 2 for presentation.

2.5.1.2 Work area location - Element <workAreaLocationGroup>

The work area locations are presented divided in three parts:

- Zone
- Access point
- Work location

When there is no zone, access point or work location given, no default heading Zone, Access point or Work location is presented. Refer to Fig 3 for presentation.



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Fig 2 Presentation of Production maintenance data

2.5.1.2.1 Element <zoneRef>

Each zone is presented in one row. The zone number given by the attribute `zonenumber` is presented followed by any name, short name or reference to a data module or technical publication. The zones are preceded by the default heading **Zone**, which is only presented in the left column on the first row.

2.5.1.2.2 Element <accessPointRef>

Each access point is presented in one row. The access point given by attribute `accessPointNumber` followed by the interpretation of the value of the attribute `accessPointTypeValue` is presented. The access points are preceded by the default heading **Access points**, which is only presented in the left column on the first row.

2.5.1.2.3 Element <workLocation>

Each work location is presented in one row. The information presented depends on which of the five elements (branches) is used. Refer to Fig 3. The work locations are preceded by the default heading **Work location**, which is only presented in the left column on the first row.

Work area location

Zone	zoneNumber	<Name> <shortName> <refs>
	120	The completely dark cell The Cell MIKE-A-00-00-0000-00A-055A-A
Access	accessPointNumber	accessPointValueType
	815	Door
Work location	[1] <workArea>	
	Pilot seat	
	[2] installationLocationType +space + = + space + value of <installationLocation> unitOfMeasure	
	Station = 199 cm	
	[3] functionalItemNumber	funtionalItemType[4] <Name> <shortName> <refs>
	10VT	Terminal block Block A350-A-A0-00-00-10000-00EA-D
	[5] accessPointNumber	accessPointValueType
	80VU	Electrical panel
	[6] productItemType productItemName	
	From Frame 62 to Frame 63	

1 From branch <workArea>
2 From branch <installationLocation>
3 From branch <functionalItemRef>
4 The interpretation of the attribute value to be presented (eg, "Exact functional item", "Single functional item"). When attribute funtionalItemType is not used "Functional item number" is presented.
5 From branch <accessPointRef>
6 From branch <productItem>

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Fig 3 Work area location - Entry details

2.5.1.2.4 Examples of Work area location

Example 1 - Work on a panel

- Zone is 120 named "The completely dark cell" or shorter "The cell". A location diagram can be found in the data module MIKE-A-00-00-0000-00A-055A-A.
- Access points are Door 824, Door 825 and Panel 515CLF
- Work location is Electrical panel 80VU on which the work has to be done

Markup Example 1:

```
<productionMaintData>
<workAreaLocationGroup>
<zoneRef zoneNumber="120">
<name>The completely dark cell</name>
<shortName>The cell</shortName>
<refs><dmRef>
...
</dmRef></refs>
</zoneRef>
<accessPointRef accessPointNumber="824"
accessPointTypeValue="accpnl01"/>
<accessPointRef accessPointNumber="825"
accessPointTypeValue="accpnl01"/>
<accessPointRef accessPointNumber="515CLF"
accessPointTypeValue="accpnl02"/>
<workLocation>
<accessPointRef accessPointNumber="80VU"
accessPointTypeValue="accpnl03"/>
</workLocation>
</workAreaLocationGroup>
</productionMaintData>
```

Presentation Example 1:

Work area location

Zone	120	The completely dark cell The Cell MIKE-A-00-00-0000-00A-055A-A
Access points	824 825 515CLF	Door Door Panel
Work location	80VU	Electrical panel

Example 2 - Work behind a panel

- Zone is 120
- Access points are Door 824 and behind Electrical panel 80VU
- Work location is at Functional item number 10VT where the work has to be done

Markup Example 2:

```
<productionMaintData>
<workAreaLocationGroup>
<zoneRef zoneNumber="120"/>
<accessPointRef accessPointNumber="824"
accessPointTypeValue="accpnl01"/>
<accessPointRef accessPointNumber="80VU"
accessPointTypeValue="accpnl03"/>
<workLocation>
<functionalItemRef functionalItemNumber="10VT"/>
</workLocation>
```

```
</workAreaLocationGroup>
</productionMaintData>
```

Presentation Example 2:

Work area location

Zone	120	
Access points	824	Door
	80VU	Electrical panel
Work location	10VT	Functional item number

Example 3 - Zone, access and precise location

From a Service bulletin modifying an ACARS System (Functional Item Number 1RB and 2RB) as given in <dmStatus>.

- Zone is 120
- Access points are Avionics door 825, and Partition panels 131CW and 131DW
- Work location is Electrical panel 80VU (an access panel on which the work has to be done to change the 1RB functional item)

Markup Example 3:

```
<productionMaintData>
<workAreaLocationGroup>
<zoneRef zoneNumber="210"/>
<accessPointRef accessPointNumber="815"
accessPointTypeValue="accpnl01"/>
<accessPointRef accessPointNumber="131CW"
accessPointTypeValue="accpnl02"/>
<accessPointRef accessPointNumber="131DW"
accessPointTypeValue="accpnl02"/>
<workLocation>
<accessPointRef accessPointNumber="80VU"
accessPointTypeValue="accpnl03"/>
</workLocation>
</workAreaLocationGroup>
</productionMaintData>
```

Presentation Example 3:

Work area location

Zone	210	
Access points	815	Door
	131CW	Panel
	131DW	Panel
Work location	80VU	Electrical panel

Example 4 - Several work locations (several elements <workAreaLoactionGroup>)

Removal of parts in 3 different zones with 3 different work areas

First zone

- Zone is 210

- Access point is Door 831
- Work location is Station (199 cm), Waterline (170 cm), Buttock line (57 cm)

Second zone

- Zone are Zone 250 and Zone 260
- Work location is From Frame 62 to Frame 63

Third zone

- Zone is 210
- Work location is Pilot seat

Markup Example 4:

```
<productionMaintData>
<workAreaLocationGroup>
<zoneRef zoneNumber="210"/>
<accessPointRef accessPointNumber="831"
accessPointTypeValue="accpnl01"/>
<workLocation>
<installationLocation installationLocationType="instloctyp03"
unitOfMeasure="cm">199</installationLocation>
<installationLocation installationLocationType="instloctyp04"
unitOfMeasure="cm">170</installationLocation>
<installationLocation installationLocationType="instloctyp05"
unitOfMeasure="cm">57</installationLocation>
</workLocation>
</workAreaLocationGroup>
<workAreaLocationGroup>
<zoneRef zoneNumber="250"/><zoneRef zoneNumber="260"/>
<workLocation>
From <productItem productItemType="pi01" productItemName="62"/>
 to <productItem productItemType="pi01" productItemName="63"/>
</workLocation>
</workAreaLocationGroup>
<workAreaLocationGroup>
<zoneRef zoneNumber="210"/>
<workLocation>
<workArea>Pilot seat</workArea>
</workLocation>
</workAreaLocationGroup>
</productionMaintData>
```

Presentation Example 4:

Work area location 1

Zone	210	
Access points	831	Door
Work location	Station = 199 cm Water line = 170 cm Buttock line = 57 cm	

Work area location 2

Zone 250
260

Work location From Frame 62 to Frame 63

Work area location 3

Zone 210

Work location Pilot seat

2.5.1.3 Maintenance task duration - Element <taskDuration>

The maintenance task duration, derived from element <taskDuration>, is presented in the informal table. The three entries, Preliminary requirements, Procedure and Requirements after job completion are preceded by the default heading **Maintenance task duration**.

The value of the attributes is presented followed by a space and the value of the attribute unitOfMeasure (h = hour or d = day).

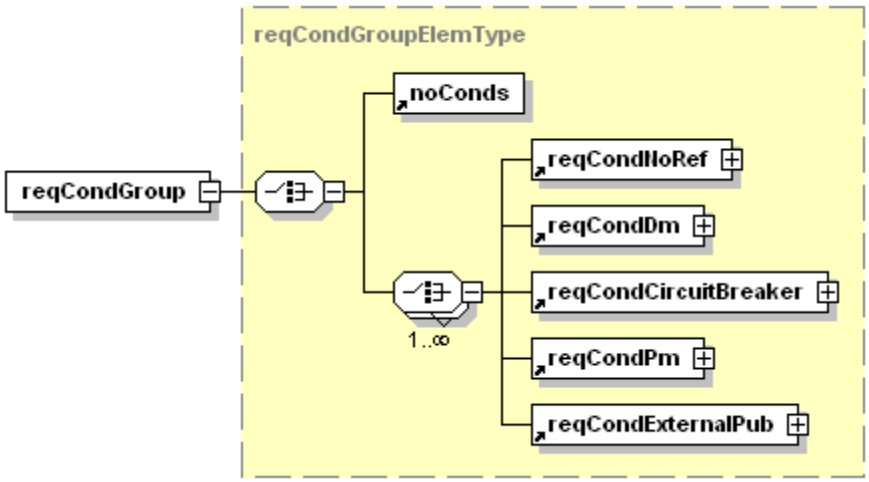
Refer to Fig 2 for presentation.

2.5.2 Required conditions

The required conditions, derived from element <reqCondGroup>, are presented in a standardized table. Refer to Fig 7. The default heading **Required conditions** presented as a Sidehead 0 precedes the table.

Note

The corresponding markup is given in Chap 3.9.5.2.1.9.



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Fig 4 Element <reqCondGroup>

2.5.2.1 No conditions - Element <noConds>

If the element <noConds> is used, "None" is presented in the column Action/Condition. Refer to Fig 5.

2.5.2.2 Conditions without references - Element <reqCondNoRef>

When the required condition does not reference a data module or technical publication, the textual content, the action or the condition, from the element <reqCond> is presented in the

column Action/Condition. The column Data module/Technical publication is left empty. Refer to Fig 5.

Required conditions

Table 2 Required conditions

Action/Condition	Data module/Technical publication
[1] None	
[2] <reqCond> The aircraft carrier is outdoors	
[3] <reqCond> Make up the mess after captain's party	<dmCode> <dmTitle> (O) or <dmCode> + space + "Iss" + space + attribute issueNumber value <dmTitle> (O) or <dmCode> + space + <year>-<month>-<day> <dmTitle> (O) AC-DC-QB-10-00-01A-250A-A AC-DC-QB-10-00-01A-250A-A Iss 003 Captain's desk - Clean with soft soap AC-DC-QB-10-00-01A-250A-A 2014-04-01 Captain's desk - Clean with soft soap
[4] <reqCond> refer to [3](<reqCondDm>) above	<pmCode> <dmTitle> (O) or
[5] <reqCond> Make up the mess after captain's party	<externalPubCode> and/or <externalPubTitle> <externalPubIssue> (O) and/or <year>-<month>-<day> (O) each starting on a new line Devil & Son 491-2 Guidebook for housemaid's Second edition 1885-02-13

1 From branch <noCond>
2 From branch <reqCondNoRef>
3 From branch <reqCondDm>
4 From branch <reqCondPm>
5 From branch <reqCondExternalPub>

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Fig 5 Required conditions - Entry details, element <reqCondCircuitBreaker> not populated

2.5.2.3 Required data modules - Element <reqCondDm>

The textual content from the element <reqCond> is presented in the column Action/Condition.

The data module code or extended data module code from element <dmRef> is presented in the column Data module/Technical publication followed by any issue number, title or issue date. Refer to Fig 5.

2.5.2.4 Circuit breaker conditions - Element <reqCondCircuitBreaker>

The textual content from the element <reqCond> is presented in the column Actions/Conditions. The following rows within the same instance of element <reqCondCircuitBreaker> are split into five columns with the first column indented. Each row presents the content of an element <circuitBreakerDescr>:

- **Access point** gives the interpreted value of the attribute accessPointTypeValue followed by the value of the attribute accessPointNumber from element <accessPointRef>
- **CB Name** gives the element <name> from the element <circuitBreakerDescr> or the element <shortName> from the element <circuitBreakerRef>
- **CB** gives the value of the attribute circuitBreakerNumber from element <circuitBreakerRef>
- **Location** gives the textual content from the element <circuitBreakerLocation>
- **Remark** gives the textual content from the element <simplePara> in the element <footnoteRemarks> or the footnote marker in the element <footnoteRef> (normally a number, refer to Chap 3.9.5.2.1.10). The footnote itself at the bottom of the table gives the content from the element <para> from the element <footnote>. For details, refer to Para 2.5.5.6.

  For details on presentation of footnotes, refer to Chap 6.2.3.

Note

The second table title row (Access point, CB Name, etc) is only presented if there are one or more element <reqCondCircuitBreaker> instances.

In the case of having the attribute circuitBreakerAction value set to "open"/"open-order" or "close"/"close-order", "- Open" and "- Close", respectively is presented left justified in the corresponding row.

Refer to Fig 6 for content details.

Note

It is assumed that the circuit breaker conditions are marked up in the order of presentation (order to be performed).

Each group or groups of circuit breaker actions/conditions is enclosed by horizontal lines at top and bottom. Refer to Fig 7.

2.5.2.5 Required publications - Element <reqCondPm>

The textual content from the element <reqCond> is presented in the column Action/Condition.

The publication module code or extended publication module code from the element <pmRef> is presented in the column Data module/Technical publication followed by any issue number, title, short title or issue date. Refer to Fig 5.

2.5.2.6 Required non-S1000D publications and documents - Element <reqCondExternalPub>
The textual content from the element <reqCond> is presented in the column Action/Condition.

The external publication code and or title from the element <externalPubRef> is presented in the column Data module/Technical publication followed by any issue number, short title or issue date. Refer to Fig 5.

Required conditions

Table 2 Required conditions

Action/Condition			Data module/Technical publication		
	Access point	**CB Name**	**CB**	**CB Location**	**Remark**
<reqCond> in <reqCondCircuitBreaker>					
[1] The interpretation of the value of circuitBreakerAction	The interpretation of the value of accessPointTypeValue Value of accessPointNumber	<name> from <circuitBreakerDescr> or <shortName> from <circuitBreakerRef>	Value of circuitBreakerNumber	<circuitBreakerLocation>	<simplePara> from <footnoteRemarks> and/or the footnote marker generated from footnoteMark in <footnote>[2]
Make sure the circuit breaker is closed, safetied/locked and tagged:					
B	Panel 121VU	DLS&/DLRB/SPLY	5TD	16 J	If installed
Close the circuit breaker:					
- Close[D]	Panel 121	JUST/AN/OTHER/CB	T4TWO	26R	

1 When the value of circuitBreakerAction is "open", "close", "open-order" or "close-order"

2 The content of <para> from the element <footnote> which relates to actual attribute internalRefId <footnoteRef> is presented in the table footer

B circuitBreakerAction not used or given the attribute value "verif-open" or "verif-close" in the element <circuitBreakerDescrGroup> or <circuitBreakerDescrSubGroup>: Column left empty.

D circuitBreakerAction given the attribute value "open", "close", "open-order" or "close-order" in the element <circuitBreakerDescrGroup> or <circuitBreakerDescrSubGroup>: The interpretation of the attribute value is presented (- Open/- Close).

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Fig 6 Required conditions - Entry details, only element <reqCondCircuitBreaker> populated

The corresponding markup of the Required condition example given in Fig 7 can be found in Chap 3.9.5.2.1.9.

Table 2 Required conditions

Action/Condition			Data module/Technical publication		
	Access point	CB Name	CB	CB Location	Remark
Remove the blanks from all orifices					
The engine is safe for maintenance			ENGINE123-AAA-70-00-00-23AA-200A-A		
Open Door 824 to access Electrical panels					
Make sure the circuit breaker is open, safetied/locked and tagged:					
A	Panel 2501VU	MMR-1 (ILS+GPS)	42RT	0867	
Make sure the circuit breaker is closed, safetied/locked and tagged:					
B	Panel 49VU	AUTO FLT/FMGC/1	10CA1	02 B	1
Open the circuit breaker:					
- Open C	Panel 2514VU	MMR-2 (ILS+GPS)	44RT	0867	
Make sure the circuit breaker is open, safetied/locked and tagged:					
A	Panel 2502VU	GILIDE ANT2 SWGT RELAY	800RT	SSPC	2
Close Door 824					
Open Door 834 to access Electrical panels 49VU and 121					
Close the circuit breaker:					
- Close D	Panel 49VU	AUTO FLT/MCDU/1	11CA1	01 B	
Make sure the circuit breaker is closed, safetied/locked and tagged:					
B	Panel 121VU	AUTO FLT/FMGC/2	10CA2	17 M	
B	Panel 121VU	DATA/LOADER/SPLY	10CA2	20 N	
B	Panel 121VU	DLS&/DLRB/SPLY	5TD	16 J	If installed
Open/Close the circuit breaker in the following order:					
- Open E	Panel 121	LGCIU/BAT SPLY/SYS1	58GA	43Q	1
- Open E	Panel 121	ENGINE/ENG1 AND 2 FIRE EXTIG/BTL1/SQUIB/A	1WE1	25 R	
- Close F	Panel 121	JUST/AN/OTHER/CB	T4TWO	26 R	2

1 The location of the circuit breaker depends on the aircraft configuration

2 If the circuit breaker is modified by SB-A350-A-25-10-0001-00A-930A-C

A `circuitBreakerAction` not used or given the attribute value "`verif-open`" in the element <`circuitBreakerDescrGroup`> or <`circuitBreakerDescrSubGroup`>

B `circuitBreakerAction` not used or given the attribute value "`verif-close`" in the element <`circuitBreakerDescrGroup`> or <`circuitBreakerDescrSubGroup`>

C `circuitBreakerAction` given the attribute value "`open`" in the element <`circuitBreakerDescrGroup`> or <`circuitBreakerDescrSubGroup`>

D `circuitBreakerAction` given the attribute value "`close`" in the element <`circuitBreakerDescrGroup`> or <`circuitBreakerDescrSubGroup`>

E `circuitBreakerAction` given the attribute value "`open-order`" in the element <`circuitBreakerDescrGroup`> or <`circuitBreakerDescrSubGroup`>

F `circuitBreakerAction` given the attribute value "`close-order`" in the element <`circuitBreakerDescrGroup`> or <`circuitBreakerDescrSubGroup`>

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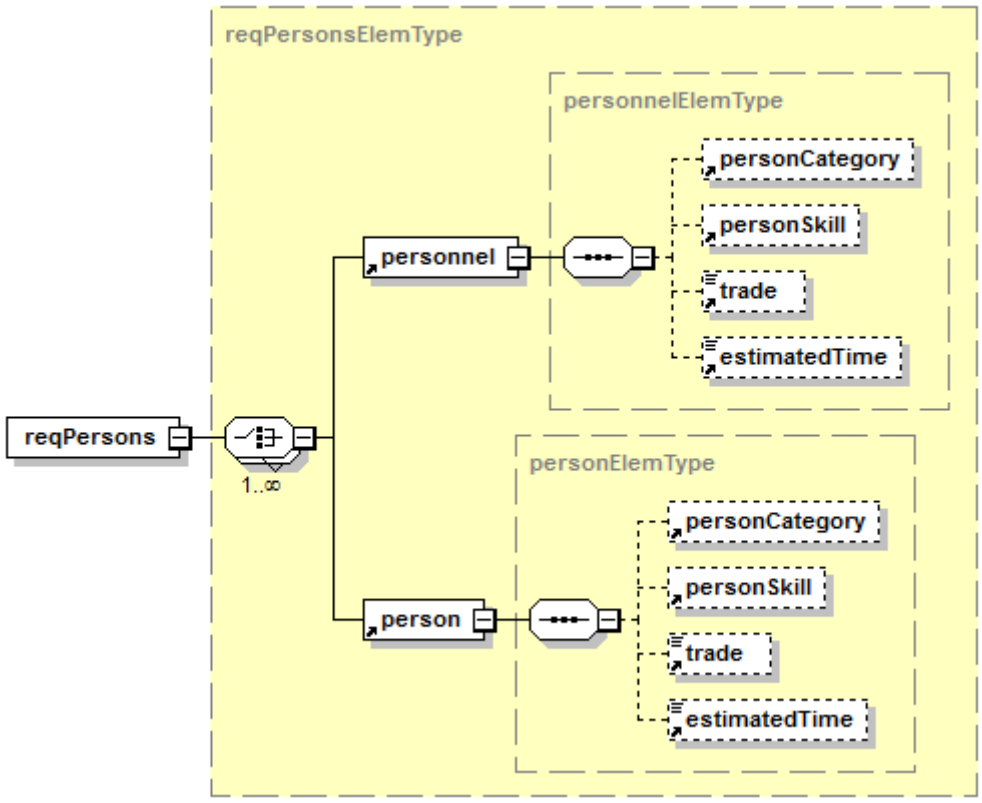
Fig 7 Presentation of the standard table "Required conditions" - Example

2.5.3 Required persons

The required persons, derived from element <reqPersons>, are presented in a standardized table. Refer to Fig 9.

The default heading **Required persons** is presented as a Sidehead 0 precedes the table.

Each <reqPerson> gives a new table (header and rows but no extra table title line). Refer to Para 2.5.3.7.



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Fig 8 Element <reqPersons>

2.5.3.1 Personnel by category - Element <personnel>

The value of the attribute numRequired in the element <personnel> is presented in the column Person. If the number of personnel (attribute numRequired) of a specific category, skill level or trade is not defined, or the value is set to "0" in the element <personnel>, the absence of a specified quantity generates at presentation the words "As required" in the column Person. If the attribute numRequired is used, then the number required will be presented.

2.5.3.2 Personnel by individual - Element <person>

The value of the attribute man in the element <person> is presented in the column Person preceded by "Man" and a space.

2.5.3.3 Category - Element <personCategory>

The value of the attribute personCategoryCode in the element <personCategory> is presented in the column Category.

2.5.3.4 Skill level - Element <personSkill>
The value of the attribute skillLevelCode in the element <personSkill> is presented in the column Skill level.

2.5.3.5 Trade/Trade code - Element <trade>
The textual content in the element <trade> is presented in the column Trade/Trade code.

2.5.3.6 Estimated time - Element <estimatedTime>
The textual content in the element <estimatedTime> is presented in the column Estimated time proceeded by a space and the value of the attribute unitOfMeasure.

2.5.3.7 Required persons - Applicability
When applicability is used (attribute applicRefid in the element <reqPersons>) a new subtable is created preceded by its applicability statement. Refer to Fig 25.

Note
The sidehead Required persons and the table title line is only presented once.

Required persons

Table 3 Required persons

Person	Category	Skill level	Trade/Trade code	Estimated time
Man + blank + value of man[1]/	Value of personCategoryCode	The interpretation of the value of skillLevelCode	<trade>	<estimatedTime> + space + value of unitOfMeasure
Value of numRequired[2]	-"-	-"-	-"-	-"-

1 From branch <person>
2 From branch <personnel>

Example: The presentation of the markup example given in Chap 3.9.5.2.1.9.

Required persons

Table 3 Required persons

Person	Category	Skill level	Trade/Trade code	Estimated time
Man[1] A	Electrician	Basic	AF901	1,5 h
Man B	PE	Intermediate	AF903	2,5 h
As required[2]	Mechanic	Basic	AF999	1 h
1[3]	SPRVR	Advanced	AF092	

1 The use of element <person> generates at presentation the word "Man" before the value of attribute man.
2 If the number of personnel of a specific category, skill level or trade is not defined or the value is set to "0" in the element <personnel>, the absence of a specified quantity generates at presentation the words "As required".
3 If the attribute numRequired is used, then the number required will be presented.

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Fig 9 Entry details and presentation of the standard table "Required persons"

2.5.4 Required technical information

The list of required technical information, derived from element <reqTechInfoGroup>, is presented in a standardized table.

Fig 10 shows which elements and attributes to be presented and how to present them.

The default heading **Required technical information** presented as a Sidehead 0 precedes the table.

2.5.4.1 Required technical information - Applicability

When applicability is used (attribute applicRefid in the element <dmRef>, <pmRef>, <externalPubRef>) each entry is preceded by its applicability statement. Refer to Fig 10.

Required technical information

Table 4 Required technical information

Document No.	Title	Category
<dmCode> or <dmCode> + space + "Issno" + space + value of issueNumber	<dmTitle>	The interpretation of the value of attribute reqTechInfoCategory
<pmCode> or <pmCode> + space + "Issno" + space + value of issueDate	<pmTitle>	-"-
<externalPubCode> or <externalPubCode>+ space + "Issno" + space + value of externalPubIssue	<externalPubTitle>	-"-

Required technical information

Table 4 Required technical information

Document No.	Title	Category
S1000DBIKE-AAA-D00-00-00-00A-901A-A	Bike - Miscellaneous list of consumables	DM
S1000DBIKE-B6865-SAFE1-00	Safety Handbook - Greasy Bikes	PM
Applicable to: Mountain bicycle Brook trekker Mk9		
GBDWG-132E470092	Power Supply Schematic (132E470092)	Drawing
SafeS-12-156B Issno 2014	Sticky stuff - Safety sheet	Safety sheet

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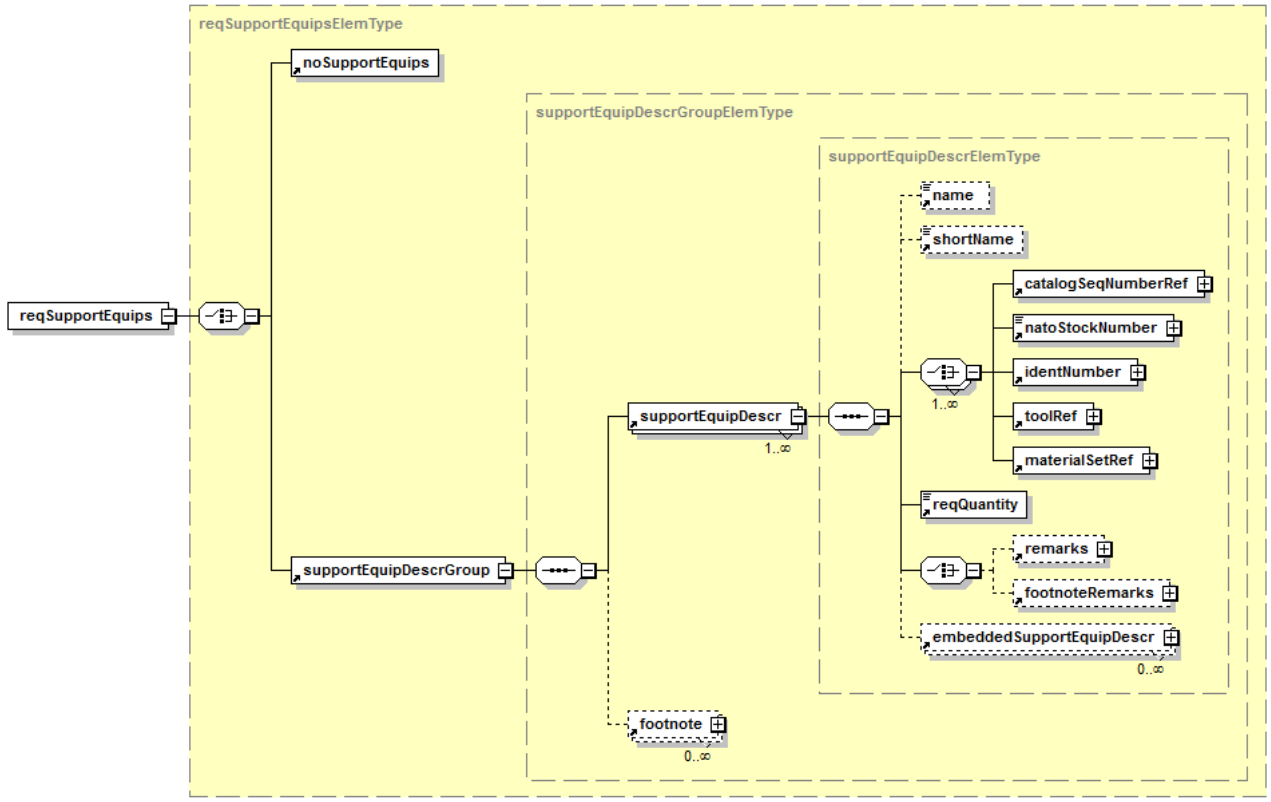
Fig 10 Entry details and presentation of the standard table "Required technical information"

2.5.5 Required support equipment

The list of support equipment, derived from element <reqSupportEquips>, is presented in a standardized table. Refer to Fig 13, which shows the markup examples given in Chap 3.9.5.2.1.9.

Fig 12 and Fig 12 shows which elements and attributes to be presented and how to present them.

The default heading **Support equipment** presented as a Sidehead 0 precedes the table.



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Fig 11 Element <reqSupportEquips>

2.5.5.1 Element <noSupportEquips>

If the element <noSupportEquips> is used, "None" is presented in the column Name.

2.5.5.2 Name/Alternate name

Element <name> and element <shortName>. The textual content in the elements <name> (Name) and <shortName> (Alternate name) are presented in the column Name/Alternate name.

Business rule decision point BRDP-S1-00575 - Presentation of Name and Alternate name:

– Decide whether to present only Name or both Name and Alternate name in the list of support equipment.

  When an Alternate name is used, this is the name that is presented in the data module when referred to by its attribute `internalRefId`.

Alternate name is presented in

- black and underlined in the list
- blue and underlined in the narrative text of the data module (as it is a link to the entry in the list)

Examples are given in Fig 13 and Fig 15.

2.5.5.3 Identification/Reference

The identification of the support equipment is derived from one or more of the following elements:

- Catalog Sequence Number - CSN. Refer to Para 2.5.5.3.1.
- NATO Stock Number - NSN. Refer to Para 2.5.5.3.2.
- Identification number. Refer to Para 2.5.5.3.3.
- Tool reference. Refer to Para 2.5.5.3.4.
- Material set reference. Refer to Para 2.5.5.3.5.

2.5.5.3.1 Catalog Sequence Number - CSN

Element <`catalogSeqNumberRef`>. The value of the attributes, preceded by "CSN" and a space are presented. For details about CSN, refer to Chap 3.9.5.2.7.

The CSN reference must be presented as follows:

- the abbreviation "CSN"
- `systemCode`
- `subSystemCode` and `subSubSystemCode`
- `assyCode`

with the attributes separated by hyphens [-] followed by

- `figureNumber` and `figureNumberVariant` preceded by "Fig "
- `itemVariant` preceded by "Item "

Examples of CSN presentation:

- CSN 12-34-56 Fig 08A Item 023A
- CSN 12-34-56 Fig 78 Item 123A (there is no value for attribute `figureNumberVariant`)
- CSN 12-34-56 Fig 78A Item 123 (there is no value for attribute `itemVariant`)

2.5.5.3.2 NATO Stock Number - NSN

Element <`natoStockNumber`>. The content of the values of the attributes `natoSupplyClass`, `natoCodificationBureau`, and `natoIdentificationNumberCore`, separated by hyphens or the content of the element <`fullNatoStockNumber`> is presented. In either case preceded by "NSN" and a space. For details about NSN, refer to Chap 3.9.5.2.7.

The NSN reference is presented in four groups all separated with hyphens [-]:

- the abbreviation "NSN"
- 1234-12-123-4567 where
  - the first group is equivalent to attribute `natoSupplyClass`
  - the second group equivalent to attribute `natoCodificationBureau`

- and the third and fourth groups are derived from attribute `natoIdentificationNumberCore` wherein a hyphen is inserted between the third and fourth number

or

– the abbreviation "NSN"
– the content of the element <`fullNatoStockNumber`>

Example of NSN presentation

– NSN 4920-99-123-4567

2.5.5.3.3 Identification number

Element <`identNumber`>. The content of the elements <`manufacturerCode`> and <`partNumber`> are presented separated by slashes [/]. The expression is preceded by "Part No." and a space.

The element <`serialNumberValue`>, if any, is presented on a new line in the Remarks column, preceded by "Serial No." and a space.

2.5.5.3.4 Tool reference

Element <`toolRef`>. The Name and the Alternate name derived from either the elements <`name`>/<`shortName`> in the element <`supportEquipDescr`> as given in Para 2.5.5.2 or from the elements <`descrForPart`>/<`shortName`> in the element <`toolRepository`> in the Tools CIR are presented.

The content of the element <`limitedPartNumber`> is presented preceded by "Part No." and a space. Alternatively, the NATO stock number (refer to Para 2.5.5.3.2 for the three alternatives) is presented preceded by "NSN" and a space. Both element contents are derived from the element <`toolRepository`> in the Tools CIR.

2.5.5.3.5 Material set reference

Element <`materialSetRef`>. The values of the attribute `materialSetIdent` and `materialSetIssue` are presented separated with a hyphen [-].

Note

If any introductory text, like "Set", is needed to name the material set identifier this must be entered as text in the attribute `materialSetIdent`.

Any accompanied reference to a service bulletin data module is derived from the element <`dmRef`> and presented as the first information in the Remark column.

Any support equipment included in the material set given in the element <`embeddedSupportEquipDescr`> is presented on a table row of its own, following the rules for presentation of the elements <`catalogSeqNumberRef`>, <`natoStockNumber`>, <`identNumber`> and <`toolRef`>. Each entry (row) starts with a hyphen [-] and a blank before the name of the support equipment.

2.5.5.3.6 References to data modules, publications and non-S1000D publications or documents

Element <`refs`>. Any reference to a data module, publication and non-S1000D publication or document is presented in the Remarks column following the rules given in Fig 5.

2.5.5.4 Quantity

Element <`reqQuantity`>. The textual content in the element <`reqQuantity`> followed by space and the value of the attribute `unitOfMeasure`, is presented in the column Quantity.

2.5.5.5 Remark

Element <remarks>. The textual content of <simplePara> in the element <remarks> is presented in the column Remark.

2.5.5.6 Footnote

Element <footnoteRemarks>. The content from the element <simplePara> is presented in the Remarks column on a new line.

Each element <footnoteRef> creates a table footnote marker as a superscripted number starting from 1 in each table. The marker is presented in the column Remarks. When several elements <footnoteRef> are given, the markers are presented on the same line separated by a comma and a space. The table footnote content derived from the element <footnote> in the element <supportEquipDescrGroup> is presented at the bottom of the complete table, following the rules given in Chap 6.2.2.

2.5.5.7 Required support equipment - Applicability

When applicability is used (attribute applicRefid in the element <supportEquipmentDescr>) each entry is preceded by its applicability statement. Refer to Fig 10 (Required technical information) and Fig 26 (Support equipment).

Table 5 Support equipment

Name/Alternate name	Identification/Reference	Quantity	Remark
[1]None			
[2]<name> or <name> <shortName>[4]	"CSN" + space + the CSN reference[3]	<reqQuantity> + space + the interpretation of the value of attribute unitOfMeasure	<simplePara> from <remarks> or <simplePara> from <footnoteRemarks> and/or the footnote marker generated from footnoteMark in <footnote>.[5] and/or <refs>[6]
[7] -"-	"NSN" + space + the values of natoSupplyClass-natoCodificationBureau-natoItemIdentNumberCore[8] (separated by hyphens) or "NSN" + space + <fullNatoStockNumber>	-"-	-"-
[9] -"-	"Part No." + space + <manufacturerCode> + slash [/] + <partNumber>	-"-	-"- "Serial No." + space + the value of serialNumberValue

1 From branch <noSupportEquips>

2 From branch <catalogSeqNumberRef>

3 Presentation of a CSN reference. Refer to Para 2.5.5.3.1.

4 <shortName> underlined

5 The content of <para> from the element <footnote> which relates to actual attribute internalRefId <footnoteRef> is presented in the table footer

6 <refs> from <catalogSeqNumberRef>, <natoStockNumber>, identNumber>, <toolRef> or <materialSetRef>

7 From branch <natoStockNumber>

8 The attribute natoItemIdentNumberCore must be split into two parts separated by a hyphen. Refer to Para 2.5.5.3.2.

9 From branch <identNumber>

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Fig 12 Support equipment - Entry details (Sheet 1 of 2)

Table 5 Support equipment

Name/Alternate_name	Identification/Reference	Quantity	Remark
[1]<name> or <name> <shortName>[2]	Set + space + the value of materialSetIdent + hyphen + the value of materialSetIssue		<dmCode> + space + "Iss" + space + the value of issueNumber (O) <simplePara> from <remarks> or <simplePara> from <footnoteRemarks> and/or the footnote marker generated from footnoteMark in <footnote>.[3]
[4] -"- preceded by a hyphen [-] and a blank	The same rules as for presentation of the elements <catalogSeqNumberRef>, <natoStockNumber>, <identNumber> and <toolRef>		<simplePara> from <remarks> or <simplePara> from <footnoteRemarks> and/or the footnote marker generated from footnoteMark in <footnote>.[3]
[5] -"- or <descrForPart> <shortName> from <toolRepository>	"Part No." + space + manufacturerCodeValue + slash [/] + toolNumber		<simplePara> from <remarks> or <simplePara> from <footnoteRemarks> and/or the footnote marker generated from footnoteMark in <footnote>.[3] and/or <refs>[6]

1 From branch <materialSetRef>

2 <shortName> underlined

3 The content of <para> from the element <footnote> which relates to actual attribute internalRefId <footnoteRef> is presented in the table footer

4 From branch <embeddedSupportEquipDescr>

5 From branch <toolRef>

6 <refs> from <catalogSeqNumberRef>, <natoStockNumber>, identNumber>, <toolRef> or <materialSetRef>

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Fig 12 Support equipment - Entry details (Sheet 2 of 2)

The corresponding markup of the Support equipment example given in Fig 13 can be found in Chap 3.9.5.2.1.9.

Note

The color codes match the markup example of the standard table "Support equipment" given in Chap 3.9.5.2.1.9.

Table 5 Support equipment

Name/Alternate name	Identification/Reference	Quantity	Remark
Specialist toolset	Part No. KZ666/BSK-TLST-001	1 EA	1
Extractor, Puller, Left-hand	CSN 11-22-33 Fig 01 Item 002A	1 EA	
Extractor, Puller, Right-hand	CSN 11-22-33 Fig 01 Item 001	1 EA	
Extractor, D-Puller, Left-hand	NSN 4920-99-123-4567 Part No. K378/JJ134252	1 EA	Serial No. A400 - A500
Extractor, D-Puller, Right-hand	NSN 4920-99-123-4561 Part No. K378/JJ134259	1 EA	
The ultimate Chief mechanic daily toolset/The toolset	Set 578015T01-00 CSN FD-10-10 Fig 01 Item 000	1 EA	FBI-A-11-12-00-0014-03-934
- Corkscrew	CSN FD-10-10 Fig 12 Item 004	1 EA	
- Glass, plastic	Part No. S5194/001.906.89	2 EA	
- Table napkin	Part No. S5194/301.286.05	2 EA	

1 Make sure to use these tools.

ICN-S3627-S1000D0713-001-01

Fig 13 Presentation of the standard table "Support equipment" - Example

2.5.6 Required supplies - Consumables, materials and expendables

The list of consumables, materials and expendables, derived from element <reqSupplies>, is presented in a standardized table. Refer to Fig 14.

The default heading **Consumables, materials and expendables** presented as a Sidehead 0 precedes the table.

The same rules as for support equipment are valid to derive and present the table. Refer to Para 2.5.5.

Example: The presentation of the markup examples given in Chap 3.9.5.2.1.9. Refer to Fig 14.

Consumables, materials and expendables

Table 6 Consumables, materials and expendables

Name/Alternate name	Identification/Reference	Quantity	Remark
Oil, Engine, Gas turbine	Part No. K0378/OIL-HHGA	2 L	
Grease, Lubricating	Part No. K0378/GRL-6726	0,5 L	

Two consumables in a set (<embeddedSupplyDescr>):

Consumables, materials and expendables

Table 6 Consumables, materials and expendables

Name/Alternate name	Identification/Reference	Quantity	Remark
Consumable set	Kit 578015CML01	1 EA	Issue 01
- Oil, Engine, Gas turbine	Part No. K0378/OIL-HHGA	2 L	
- Grease, Lubricating	Part No. K0378/GRL-6726	0,5 L	

ICN-S3627-S1000D0714-001-01

Fig 14 Content of the standard table "Consumables, materials and expendables" - Example

Consumables, materials and expendables

Table 6 Consumables, materials and expendables

Name/Alternate name	Identification/Reference	Quantity	Remark
Degreasing agent ACME Super Cleaner ACID-4U-NoT4Me-And-NOT-2B-USED Degreasing agent	Part No. KZ222/LL-004	1 L	

...

Safety conditions

WARNING

Do not get Detergent agent into your eyes. If it gets into your eyes, wash them immediately in clean warm water.

Procedure

1 Remove the grease from the Freewheel assembly with the Degreasing agent as shown in Fig 2. Use a brush to remove the grease from these parts:

...

ICN-S3627-S1000D0716-001-01

Fig 15 Use of the element <shortName> - Example

2.5.7 Required spares

The list of spares, derived from the element <reqSpares>, is presented in a standardized table. Refer to Fig 16.

The default heading **Spares** presented as a Sidehead 0 precedes the table.

The same rules as for support equipment are valid to derive and present the table. Refer to Para 2.5.5.

Example: The presentation of the markup examples given in Chap 3.9.5.2.1.9. Refer to Fig 16.

Two spares:

Spares

Table 7 Spares

Name/Alternate name	Identification/Reference	Quantity	Remark
Blade, LP Compressor	NSN 2840-99-123-4524 CSN 72-32-10 Fig 01A Item 010A	23 EA	1
Retainer, Blade, LP Compressor	NSN 2840-99-123-4584 CSN 72-32-10 Fig 01A Item 040A	23 EA	1

1 Make sure that the blade is the right one

Two spares in a set (<embeddedSpareDescr>):

Spares

Table 7 Spares

Name/Alternate name	Identification/Reference	Quantity	Remark
Blanking set	Set 578015B01 CSN 72-61-00 Fig 02, Item 000	1 EA	
- Bag	CSN 72-61-00 Fig 02, Item 001 Part No. KZ777/ P0RT-10N-12F	1 EA	
- Engine assembly protective cover	CSN 72-61-00 Fig 02, Item 002 Part No. KZ777/P0RT-10N-B1-12R	1 EA	
- ...			

ICN-S3627-S1000D0715-001-01

Fig 16 Content of the standard table "Spares" - Example

2.5.8 Presentation of values of the attribute materialUsage

Example of use and presentation of the attribute materialUsage (Discarded, Retained, Modified from, Referenced, Material set and Modified to).

Note

The color codes match the example of the standard table "Spares" given in Fig 17.

– "mu01" Discarded: Gives, for spares, "Discarded" in the Remarks column. Only used in the context of Service bulletins.

- "mu02" Retained: Gives "Retained" in the Remarks column for spares and supplies. Only used in the context of Service bulletins
- "mu03" - Modified from: Gives, for spares, "Modified from" + blank + identifier (<catalogSeqNumberRef>, <natoStockNumber>, <identNumber> or or <partRef>) following the rules given in Chap 3.9.5.2.1.9. A reference to Service bulletin or Service bulletin material information data module can be presented in the Remarks column after the identifier.
- "mu04" - Referenced. Used for indicating a referenced spare. Does not affect the presentation.

  Note

  The element <reqQuantity> is populated with a hyphen [-] which is presented in the Quantity column.

- "mu05" - Material set: Used for indicating support equipment, supplies or spares being part of a material set (kit). Does not affect the presentation.

  Note

  The element <embeddedSupportEquipDescr> is the trigger for the presentation as given in Para 2.5.5.3.5 and Fig 12.

- "mu06" - Modified to: Gives, for spares, "Modified from" + blank + identifier (<catalogSeqNumberRef>, <natoStockNumber>, <identNumber> or <partRef>) following the rules given in Chap 3.9.5.2.1.9. A reference to Service bulletin or Service bulletin material information data module can be presented in the Remarks column after the identifier.

An example of a Spares table is given in Fig 17.

- Material set 1234 consisting of two spares
- Part A is an "ordinary" part needed from store.
- Part B: A part needed from store (1 EA) which will be modified to a Part B.
- Part B1: Part B after modification.
- Part C: A part already on the Product marked with "-" in the Quantity column.
- Part C1: Part C after modification.
- Part D: The part is discarded (leftovers) when the procedure is fulfilled.
- Part F: A removed part (on the Product when work started) but is retained for future use.

Spares

Table 7 Spares

Name/Alternate name	Identification/Reference	Quantity	Remark
Material set 1234	NSN 4665-99-123-4561	1 EA	
- Part X1	Part No. KO378/JJ134267	2 EA	
- Part X2	Part No. KO278/JJ134268	3 EA	
Part A	CSN 11-22-33-01-002A	1 EA	
Part B	CSN 11-22-33-01A-012A	1 EA	
Part B1	CSN 11-22-33-01A-012B	-	Modified from CSN 11-22-33-01A-012A DMC.....
Part C	Part No. AB123/3510A377-31-303	-	
Part C1	Part No. AB123/3510A377-31-243	-	Modified from Part No. 3510A377-31-303 DMC....
Part D	Part No. AA378/JF134300	1 EA	Discarded
Part F	Part No. AD727/111-72116-2	1 EA	Retained

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Fig 17 Content of a standard table "Spares" when the attribute `materialUsage` is used - Example

2.5.9 Safety conditions

The information is derived from the element <`safetyRqmts`> in the element <`reqSafety`>. The presentation of the warnings, cautions and notes follows the rules given in Chap 6.2.2.

The default heading **Safety conditions** is presented as a Sidehead 0 following the table of spares. Refer to Fig 15.

If the element <`noSafety`> is used, "None" is presented as a text paragraph.

2.5.9.1 Safety conditions - Applicability

When applicability is used (attribute `applicRefid` in the element <`warningAndCautionPara`>) each warning and caution is preceded by its applicability statement. Refer to Fig 26.

2.6 Procedure

The default heading **Procedure** is presented as a centerhead following the safety conditions. Hereafter follows the presentation of the content of the procedural data module.

The presentation of the elements follows the layout rules given in Chap 6.2.2.

There are two basic methods of presenting procedural data modules:

- Steps without indentations (preferred method)
- Steps with indentations

Steps having a title (by project decision, refer to BRDP-S1-00506) always present these as Sidehead 1 through Sidehead 5.

2.7 Requirements after job completion

The default heading **Requirements after job completion** follows after the core procedure and is presented as a centerhead. The default heading **Required conditions** follows and is then presented as a Sidehead 0.

The required conditions, derived from element <closeRqmts> which is equal to <reqCondGroup>, is presented in a standardized table equal to Required conditions in Preliminary requirements. Refer to Para 2.

3 Examples

3.1 Example 1

This example shows a procedure (S1000DBIKE-AAA-DA4-10-00-00AA-241A-A_009-00) using titles for the steps. It is presented without indented steps.



UNCLASSIFIED S1000DBIKE-TPSMG-BMP01-00

Chain

Oil

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Oil 1
References 1
Preliminary requirements 2
Procedure 3
1 Apply the penetrating lubricant into all the parts of the bike that move 3
2 Lubricate the chain 5
3 Check lubricated parts 6
Requirements after job completion 6

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3 Required persons 2
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5 Consumables, materials and expendables 2
6 Spares 2
7 Required conditions 6

List of figures

1 Derailleur pivots 3
2 Derailleur tension 4
3 Brake lever pivots 5
4 Lubricate the chain 6

References

Table 1 References

Data module/Technical publication	Title
None	

Applicability: All S1000DBIKE-AAA-DA4-10-00-00AA-241A-A

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ICN-S3627-S1000D0780-001-01

Fig 18 Procedural data module IC241, Page 1 - Layout example of non-indented steps

Preliminary requirements

Required conditions

Table 2 Required conditions

Action/Condition	Data module/Technical publication
The bicycle chain is clean and dry	

Required persons

Table 3 Required persons

Person	Category	Skill level	Trade/Trade code	Estimated time
Man A	Operator	Intermediate	Bike rider	0,5 h

Support equipment

Table 4 Support equipment

Name/Alternate name	Identification/Reference	Quantity	Remark
Clean dry cloth	Part KZ666/BSK-TLST-001-12	1 EA	
Floor covering	Part KK999/PPP-001	1 pack	

Consumables, materials and expendables

Table 5 Consumables, materials and expendables

Name/Alternate name	Identification/Reference	Quantity	Remark
ACME sticky lube 52B/Wet lube	Part KZ222/LL-007	1 dl	
Applicable to: Dry conditions			
AECMA Heavy duty Oil 1988/Dry lube	Part B6865/HD1988	1 dl	

Spares

Table 6 Spares

Name/Alternate name	Identification/Reference	Quantity	Remark
None			

ICN-S3627-S1000D0781-001-01

Fig 19 Procedural data module IC241, Page 2 - Layout example of non-indented steps

UNCLASSIFIED S1000DBIKE-TPSMG-BMP01-00

Safety conditions

WARNING

Wet lube is a very dangerous substance. Do not get it onto your skin. Use it in a well ventilated area. If you swallow it seek immediate medical advice. If it gets into your eyes wash your eyes in clean water and seek medical advice.

Applicable to: Dry conditions

WARNING

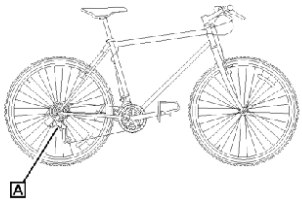
Dry lube is a very dangerous substance. Do not get it onto your skin. Use it in a well ventilated area. If you swallow it seek immediate medical advice. If it gets into your eyes wash your eyes in clean water and seek medical advice.

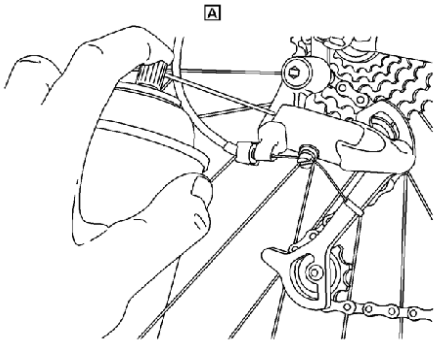
Procedure

1 Apply the penetrating lubricant into all the parts of the bike that move

1.1 Apply Wet lube to:

- Derailleur pivots (refer to Fig 1)
- Derailleur tension (refer to Fig 2)





ICN-C0419-S1000D0398-001-01

Fig 1 Derailleur pivots

Applicability: All S1000DBIKE-AAA-DA4-10-00-00AA-241A-A

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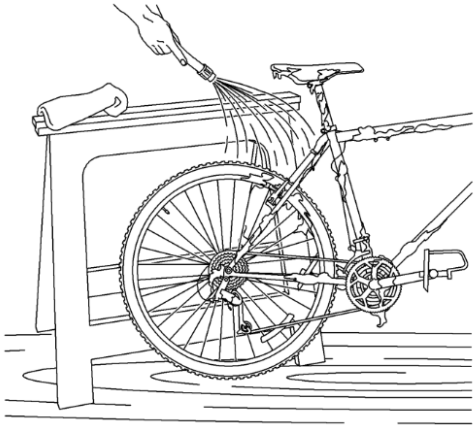
ICN-S3627-S1000D0782-001-01

Fig 20 Procedural data module IC241, Page 3 - Layout example of non-indented steps

UNCLASSIFIED S1000DBIKE-TPSMG-BMP01-00

Procedure

1 Clean the bicycle with water to remove all dirt. Refer to Fig 1.



ICN-C0419-S1000D0359-001-01

Fig 1 Cleaning the bike

2 Use a Stiff bristle brush to get access to areas that are not easy to clean. These are the shift levers, the knobbly tires, and the brakes.

3 Clean the caked grime from the chain and the sprockets with a screwdriver that has a small blade.

4 Remove the grease from the freewheel assembly with the Degreasing agent as shown in Fig 2.

Use a brush to remove the grease from these parts:

- sprockets
- guide and tension wheels of the derailleur
- chain ring teeth

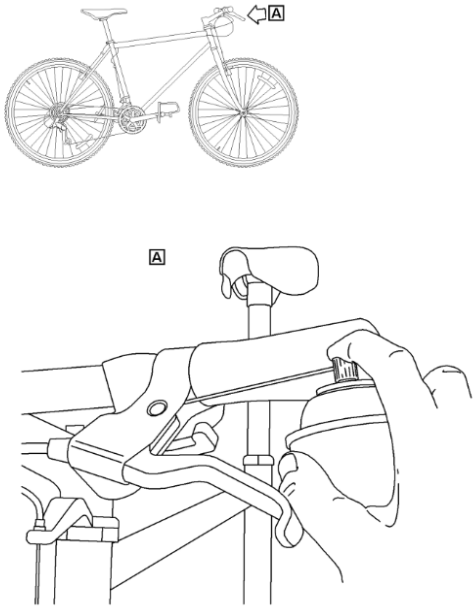
Applicable to: Mountain bicycle and (Mountain storm Mk1 or Brook trekker Mk9)

S1000DBIKE-AAA-D00-00-00-00AA-258A-A

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ICN-S3627-S1000D0783-001-01

Fig 21 Procedural data module IC241, Page 4 - Layout example of non-indented steps



ICN-C0419-S1000D0383-001-01

Fig 3 Brake lever pivots

2 Lubricate the chain

2.1 Make sure the chain is clean and dry.

2.2 Put the Floor covering on the floor below the chain.

2.3 **Applicability: Dry conditions**
Apply the Dry lube to each roller of the chain (refer to Fig 4) but only apply a small quantity.

2.4 **Applicability: Wet conditions**
Apply the Wet lube to each roller of the chain (refer to Fig 4) but only apply a small quantity.

2.5 Hold the nozzle of the container above the front of the chain ring and slowly turn the cranks rearwards.

2.6

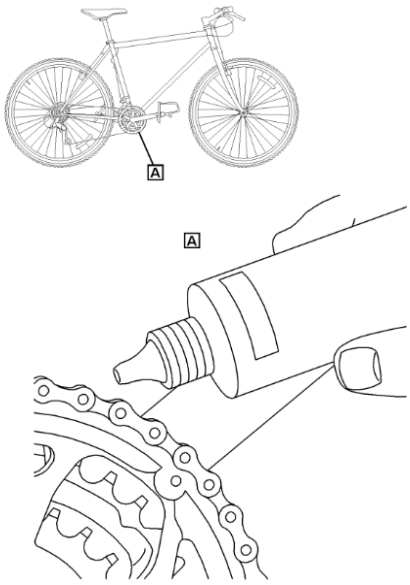
CAUTION

Do not get lubrication oil into the brake system. Oil in the break system can affect the efficiency of the bake system. Do not get oil onto the floor where it can easily get transferred onto the brake system.

Let the lubricant soak into chain before you clean the unwanted lubricant from the chain.

ICN-S3627-S1000D0784-001-01

Fig 22 Procedural data module IC241, Page 5 - Layout example of non-indented steps



ICN-C0419-S1000D0395-001-01

Fig 4 Lubricate the chain

3 Check lubricated parts

3.1 Do a check of the rear wheel rim and clean the unwanted lubricant if necessary.

3.2 Do a check of the chain to make sure that each link is lubricated. If there are links that do not move easily or have become frozen, lubricate the chain again (refer to Step 2).

3.3 Do a check of the remaining lubricated parts and clean the unwanted lubricant with a Clean dry cloth.

Requirements after job completion

Required conditions

Table 7 Required conditions

Action/Condition	Data module
None	

Applicability: All S1000DBIKE-AAA-DA4-10-00-00AA-241A-A

End of data module

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ICN-S3627-S1000D0785-001-01

Fig 23 Procedural data module IC241, Page 6 - Layout example of non-indented steps

3.2 Example 2

This example shows a procedure with indented steps. The markup of the element <procedure> from the data module S1000DBIKE-AAA-D00-00-00-00AA-258A-A_009-00 is given in Chap 3.9.5.2.3.



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Bicycle

Other procedures to clean

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2 Degreasing the freehub 5

References

Table 1 References

Chap No./Document No.	Title
S1000DBIKE-AAA-DA4-10-00-00AA-241A-A	Chain - Oil
S1000DBIKE-B6865-SAFE1-00	Safety Handbook - Greasy Bikes
SafeS-12-156B Issno 2014	Sticky stuff - Safety sheet

Common information

According to The International Bikers' Association (IBA) code of honor you are kindly requested to drive a properly maintained bicycle, which means the bike has to be regularly cleaned.

Applicable to: Mountain bicycle and (Mountain storm Mk1 or Brook trekker Mk9)

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ICN-S3627-S1000D0786-001-01

Fig 24 Procedural data module IC258, Page 1 - Layout example of indented steps



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Preliminary requirements

Required conditions

Table 2 Required conditions

Action/Condition	Data module/Technical publication
The bicycle is outdoors	

Required persons

Table 3 Required persons

Person	Category	Skill level	Trade/Trade code	Estimated time
Man A	Chemical technician	Intermediate	Bike cleaner	1,0 h

Applicable to: Mountain bicycle Mountain storm Mk1

Person	Category	Skill level	Trade/Trade code	Estimated time
Man B	Operator	Intermediate	Bike rider	1,0 h

Applicable to: Mountain bicycle Brook trekker Mk9

Person	Category	Skill level	Trade/Trade code	Estimated time
Man B	Operator	Advanced	Bike rider	0,8 h

Required technical information

Table 4 Required technical information

Document No.	Title	Category
S1000DBIKE-B6865-SAFE1-00	Safety Handbook - Greasy Bikes	PM
SafeS-12-156B Issno 2014	Sticky stuff - Safety sheet	Safety sheet

Support equipment

Table 5 Support equipment

Name/Alternate name	Identification/Reference	Quantity	Remark
Water hose	Part No. KZ666/BSK-TLST-001-09	1 EA	
Stiff bristle brush	Part No. KZ666/BSK-TLST-001-02	1 EA	
Sponge	Part No. KZ666/BSK-TLST-001-11	1 EA	

Applicable to: Mountain bicycle and (Mountain storm Mk1 or Brook trekker Mk9)

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ICN-S3627-S1000D0787-001-01

Fig 25 Procedural data module IC258, Page 2 - Layout example of indented steps



Consumables, materials and expendables

Table 6 Consumables, materials and expendables

Name/Alternate name	Identification/Reference	Quantity	Remark
ACME super 45 Agent/ Degreasing agent	Part No. KZ222/LL-004	1 L	
ACME Middling Detergent 69/Detergent A	Part No. KZ666/BSK-TLST-023-14	1 L	
Applicable to: Mountain bicycle Brook trekker Mk9			
BoeBus DeLux Detergent No.6/Detergent C	Part No. KZ666/BSK-TLST-001-15	1 L	

Spares

Table 7 Spares

Name/Alternate name	Identification/Reference	Quantity	Remark
None			

Safety conditions

WARNING

Do not get Detergent A into your eyes. If it gets into your eyes, wash them immediately in clean warm water.

Applicable to: Mountain bicycle Brook trekker Mk9

WARNING

Do not get Detergent C into your eyes. If it gets into your eyes, wash them immediately in clean warm water.

CAUTION

Do not use a Water hose that has high pressure. A water hose that has high pressure can cause some parts to become loose or full of water.

CAUTION

Do not point the hose directly at the hub or at the bottom bracket bearings. This can cause damage to the parts.

Applicable to: Mountain bicycle Brook trekker Mk9

CAUTION

Apply Detergent C in accordance with the instruction on the container. The substance may cause damage to the Bike paint if it is not applied correctly.

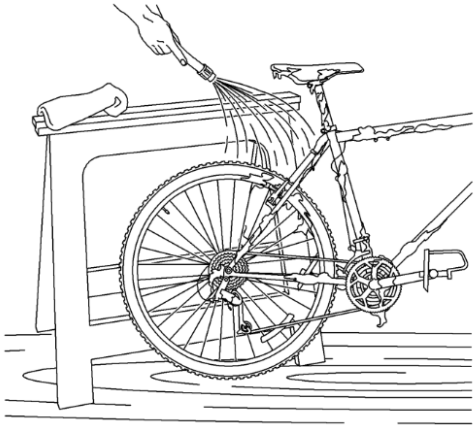
ICN-S3627-S1000D0788-001-01

Fig 26 Procedural data module IC258, Page 3 - Layout example of indented steps

UNCLASSIFIED S1000DBIKE-TPSMG-BMP01-00

Procedure

1 Clean the bicycle with water to remove all dirt. Refer to Fig 1.



ICN-C0419-S1000D0359-001-01

Fig 1 Cleaning the bike

2 Use a Stiff bristle brush to get access to areas that are not easy to clean. These are the shift levers, the knobbly tires, and the brakes.

3 Clean the caked grime from the chain and the sprockets with a screwdriver that has a small blade.

4 Remove the grease from the freewheel assembly with the Degreasing agent as shown in Fig 2.

Use a brush to remove the grease from these parts:

- sprockets
- guide and tension wheels of the derailleur
- chain ring teeth

Applicable to: Mountain bicycle and (Mountain storm Mk1 or Brook trekker Mk9)

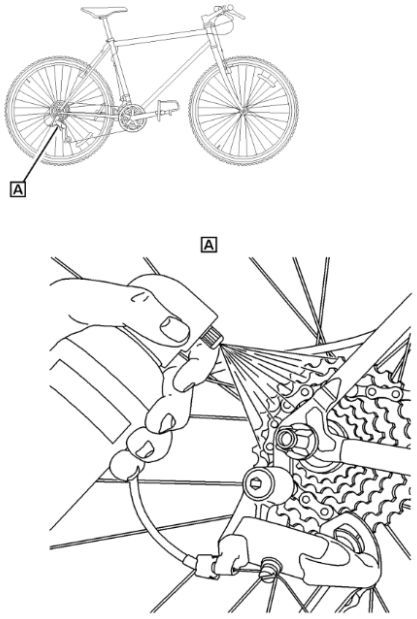
S1000DBIKE-AAA-D00-00-00-00AA-258A-A

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Fig 27 Procedural data module IC258, Page 4 - Layout example of indented steps

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ICN-C0419-S1000D0359-001-01

Fig 2 Degreasing the freehub

5 Flush the sprockets, the derailleurs, the chain rings and the chain with water.

Note
If necessary, do the flush procedure again.

6 **Applicable to: Mountain bicycle Mountain storm Mk1**
Wash the bike

6.1 Soak the Sponge into Detergent A and water.

6.2 Clean the bicycle with the soaked sponge

6.3 Flush the bicycle and make sure that all Detergent A is removed.

6.4 Move the bicycle up and down on its tires to remove all water.

7 **Applicable to: Mountain bicycle Brook trekker Mk9**
Wash the bike

7.1 Soak the Sponge into Detergent C and water.

7.2 Clean the bicycle with the soaked sponge.

7.3 Soak the Sponge into Detergent A and water.

7.4 Fully clean the bicycle with the soaked sponge.

7.5 Flush the bicycle to make sure that all detergents are removed.

Applicable to: Mountain bicycle and (Mountain storm Mk1 or Brook trekker Mk9)

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ICN-S3627-S1000D0790-001-01

Fig 28 Procedural data module IC258, Page 5 - Layout example of indented steps



7.6 Move the bicycle up and down on its tires to remove all water.

8 Lubricate the bicycle (refer to S1000DBIKE-AAA-DA4-10-00-00AA-241A-A).

Requirements after job completion

Required conditions

Table 8 Required conditions

Action/Condition	Data module
Make sure the bicycle is dry	

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Fig 29 Procedural data module IC258, Page 6 - Layout example of indented steps

Chapter 6.2.3.4

Layout rules and examples - Fault information data modules

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References

Table 1 References

Chap No./Document No.	Title
Chap 6.2.2	Page-oriented publications - Typography and layout elements

1 General

This chapter gives the rules for S1000D standard page-oriented presentation of fault information data modules using the layout elements given in Chap 6.2.2. It is used to build for example, XML stylesheets in an XML environment. If a traditional authoring environment is used, it must be used as the input for setting up the authoring application.

2 Rules and examples

The rules and guidelines for the standard presentation of fault information data modules will be included in a future issue of this publication.

Note

In general, the presentation rules given in Issue 3.0 still apply.

Chapter 6.2.3.5

Layout rules and examples - IPD publication

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Chap No./Document No.	Title
None	

1 Rules and examples

The rules and guidelines for the standard presentation of IPD data modules will be included in a future issue of this publication.

Chapter 6.2.3.6

Layout rules and examples - Component maintenance data modules

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Table 1 References

Chap No./Document No.	Title
None	

1 General

The rules and guidelines for the standard presentation of component maintenance data modules will be included in a future issue of this specification.

Chapter 6.2.3.7

Layout rules and examples - Service bulletin data module

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Chap 6.2.1	Page-oriented publications - Page layout, paper publications, headers and footers

Chap 6.2.2	Page-oriented publications - Typography and layout elements
Chap 6.2.3.2	Layout rules and examples - Descriptive data modules
Chap 6.2.3.3	Layout rules and examples - Procedural data modules

1 General

The rules for S1000D standard page-oriented presentation of service bulletin data modules are based on the layout elements given in Chap 6.2.2. They are used to build for example, XML Style Sheets in an XML environment.

2 Rules and examples

2.1 General

The service bulletin data modules must can use the layout given in Chap 6.2.1 and Chap 6.2.2 with the following significant rules:

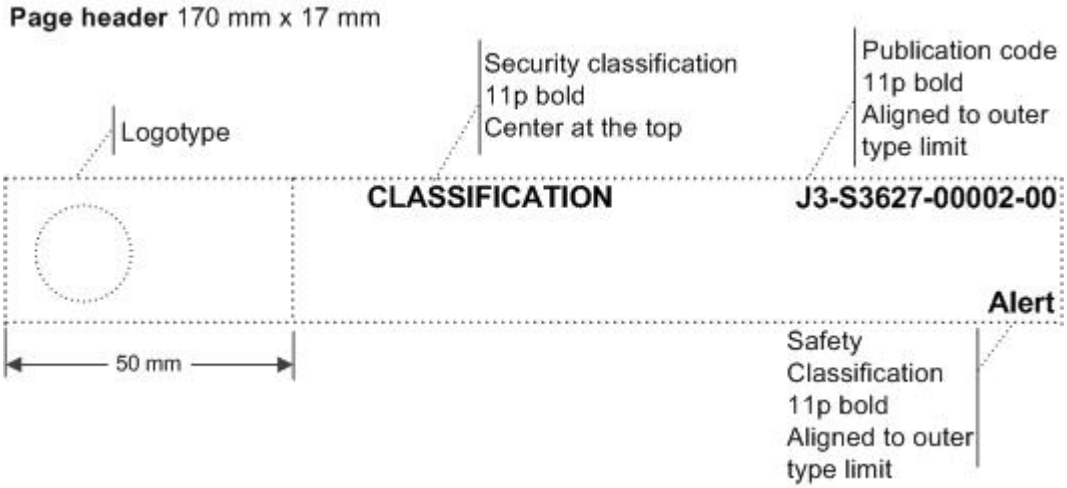
- Display of the element <`productSafety`> and the attribute `safetyLabel`. Refer to Para 2.2.
- Display of service bulletin descriptive main topics. Refer to Para 2.4.
- Display of service bulletin Material information main topic. Refer to Para 2.5.
- Display of service bulletin Accomplishment instructions main topic. Refer to Para 2.6.

2.2 Product safety and safety label

The textual content of the element <`productSafety`> (in the element <`identAndSatusSection`>) must be presented under the caption "Product safety" which comes before "Safety conditions". If there is no content in the element the caption is suppressed.

Each page in an alert service bulletin data module must have its classification presented in the header. The classification is derived from the attribute `safetyLabel` when the value is "`Alert`".

The service bulletin classification "`Alert`" must be located in the header and be presented in 11 pt bold aligned to the bottom outer type limit. Refer to Fig 1 and Chap 6.2.1.



ICN-83007-0000000126-001-01

Fig 1 Display of `safetyClassification` *Alert*

2.3 Service bulletin management information main topic

The service bulletin management information main topic is a data management section, and is designed to be processed by IT tools. Data in this section are not intended to be displayed as is but referenced from relevant topics of the service bulletin.

2.4 Service bulletin descriptive main topics

In the service bulletin data module four main topics have a descriptive model:

- Revision information
- Summary
- Planning information
- Additional information

Refer to Chap 6.2.3.2 for their display rules.

2.5 Service bulletin material information main topic

There are several business rules decision points to decide which elements and attributes to populate in the structure of the service bulletin Material information main topic. Refer to Chap 3.9.5.2.15.2. Each project or organization must choose a display standard relevant to their decisions about which elements and attributes they are going to populate.

Below are examples of display guidance for one such display standard relevant to a particular set of business rules decisions.

Note:

The layout sample given in the following paragraphs contains data extracted from the SB bike sample. The proposed layout is based on the order the data are stored in the SB data module. This layout is given as guidance and does not prevent any project or organization from providing a more sophisticated one matching its business requirements.

2.5.1 Example of Material set list display

Applic 002:

Table 2 Material set list

Material category	Material name and reference	Quantity	Remark
Support equipment set	"BSK-TLST-200" (mat-0001)	1	
Supply	(mat-0002)		
Spare set	"SPA-1000-1" (mat-0003)	1	
Removed spare set	(mat-0005)		
Modified spare	(mat-0007)		

Applic 003:

Table 3 Material set list

Material category	Material name and reference	Quantity	Remark
Support equipment set	"BSK-TLST-200" (mat-0001)	1	
Supply	(mat-0002)		
Spare	"FK-TEL1002" (mat-0004)	1	
Removed spare set	(mat-0006)		
Modified spare	(mat-0007)		

2.5.2 Example of Support equipment list display

Table 4 Support equipment set

Material set (mat-0001)			
Material set name	Saw tool set		
Identification/Reference	BSK-TLST-200 issue 001		
Procurable or Not	Yes		
Supplier	Manufacturer		
SB specific	Yes		
Name/Alternate name	**Identification/Reference**	**Quantity**	**Remark**
Saw tool	BSK-TW-100	1	
Threading tool	BSK-THR-3001	1	

2.5.3 Example of Supply list display

Table 5 Individual supply

Material (mat-0002)	
Material name	General grease
Identification/Reference	LL-005
Procurable or Not	Yes
Supplier	Any
SB specific	No
Quantity	As Required

2.5.4 Example of Spare list display

Table 6 Spare set

Material set (mat-0003)	
Material set name	Fork set
Identification/Reference	SPA-1000-1 issue 001
Procurable or Not	Yes
Supplier	Manufacturer
SB specific	Yes
Price	150 USD
Availability	3 days after purchase order reception
Procurement address	World-Bike Customer Support 100, Bike Street London UK

Name/Alternate name	**Identification/Reference**	**Quantity**	**Remark**
Fork	FK-TEL1001	1	
Spacer	SPC-200-12	2	

Table 7 Individual spare

Material (mat-0004)	
Material name	Fork
Identification/Reference	FK-TEL1002 issue 001
Procurable or Not	Yes
Supplier	Manufacturer

Material (mat-0004)	
SB specific	Yes
Price	100 USD
Availability	3 days after purchase order reception
Procurement address	World-Bike Customer Support 100, Bike Street London UK

2.5.5 Example of Removed or modified spares list display

Table 8 Removed spare list

Removed spare set (mat-0005)				
Name/ Alternate name	**Removed/modified spare Identification/ Reference**	**Replacing/new spare Identification/ Reference**	**Repla. code**	**Remark**
Fork	FK-1000	FK-TEL1001	02	Discard
Conical expansion washer	St-001-05	-		Discard

Table 9 Removed spare list

Removed spare set (mat-0006)				
Name/ Alternate name	**Removed/modified spare Identification/ Reference**	**Replacing/new spare Identification/ Reference**	**Repla. code**	**Remark**
Fork	FK-1000	FK-TEL1002	02	Discard
Conical expansion washer	St-001-05	-		Discard

Table 10 Modified spare

Modified spare (mat-0007)				
Name/ Alternate name	**Removed/modified spare Identification/ Reference**	**Replacing/new spare Identification/ Reference**	**Repla. code**	**Remark**
Wheel axis	BSK-AXS-2000	BSK-AXS-2001		Modified to

2.6 Service bulletin accomplishment instructions main topic

The service bulletin data module main topic accomplishment instructions have a procedural structure. Refer to Chap 6.2.3.3 for display rules.

Chapter 6.3

Information presentation/use - Interactive electronic technical publications

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Chap No./Document No.	Title
Chap 6.3.1	IETP - Output specification
Chap 6.4	Information presentation and use - Functionality
Chap 7.4	Information processing - Generation of publications

1 General

An IETP is built up of front matter and several documents all stored as data modules in the CSDB. The detailed specifications for the generation of IETP are given in Chap 7.4.

- Chap 6.3.1 provides rules and guidance for look and feel, and printed output from an IETP. It is not meant to be a design document.
- Chap 6.4 is to be used in conjunction with this chapter to give guidance on functionality.

2 IETP presentation flexibility

Since Chap 6.3.1 is not meant to be a design document, the use of the rules and guidance therein are a project decision. If this guidance is not to be used, then an alternate output specification must be defined by the project.

Business rule decision point BRDP-S1-00533 - Use of rules and guidance for IETP:

- Decide whether to use the rules and guidance for look and feel, and printed output from an IETP detailed in Chap 6.3.1 or an alternate output specification.

Chapter 6.3.1

IETP - Output specification

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Chap 3.9.3	Authoring - Warnings, cautions and notes
Chap 3.9.5.2.1.1	Common constructs - Change marking
Chap 3.9.5.2.1.6	Common constructs - Tables
Chap 3.9.5.2.3	Content section - Procedural information
Chap 3.9.5.2.4	Content section - Fault information
Chap 3.9.5.2.6	Content section - Crew/Operator information
Chap 4.6	Information management - Comment
Chap 6.2	Information presentation and use - Page-oriented publications
Chap 6.2.2	Page-oriented publications - Typography and layout elements
Chap 6.4.1	Functionality - Background and explanation

1 General

This chapter gives guidance for look and feel and printed output from an IETP. Where specific guidance for elements is not provided in this chapter, the guidance in Chap 6.2.2 must be applied as closely as possible.

Each project is to decide which elements of this chapter are to be mandated or be developed for the Product and end user requirements. The functionality matrix in Chap 6.4.1 is to be used in conjunction with this chapter to build the project requirement.

2 Layout and styles

2.1 Screen sizes

Proper planning for the size and resolutions of various devices up front in the planning stages is important as the presentation technology is always undergoing change (eg, terminals, desktops, laptops, personal digital assistance devices).

2.2 Stylesheets

Stylesheets are necessary to transform the XML data modules into a format that is capable of being interpreted and presented in an IETP.

2.3 Screen layout

The screen can have an outer shell, title bar and an inner shell as described in this section. Refer to Fig 1.

2.3.1 Outer shell

The outer shell is the application/browser window and is the portion of the screen that surrounds the title bar and inner shell.

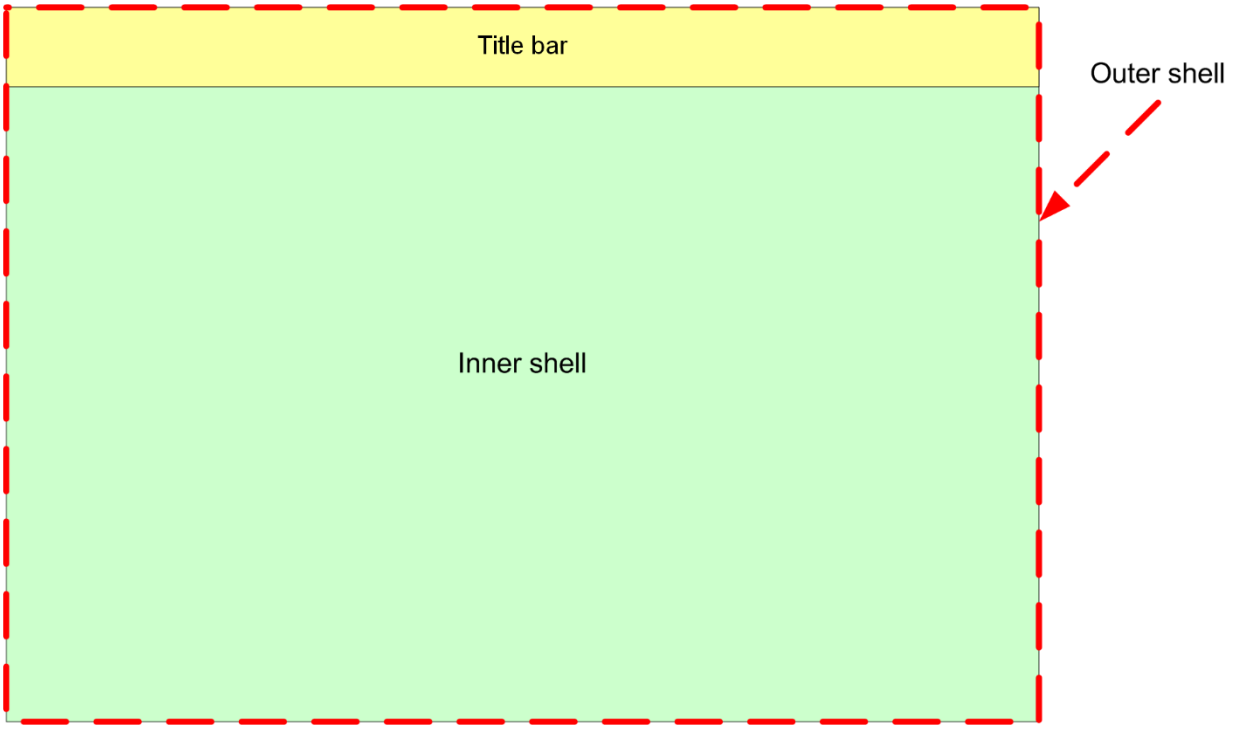


Fig 1 Application screen layout

2.3.2 Title bar

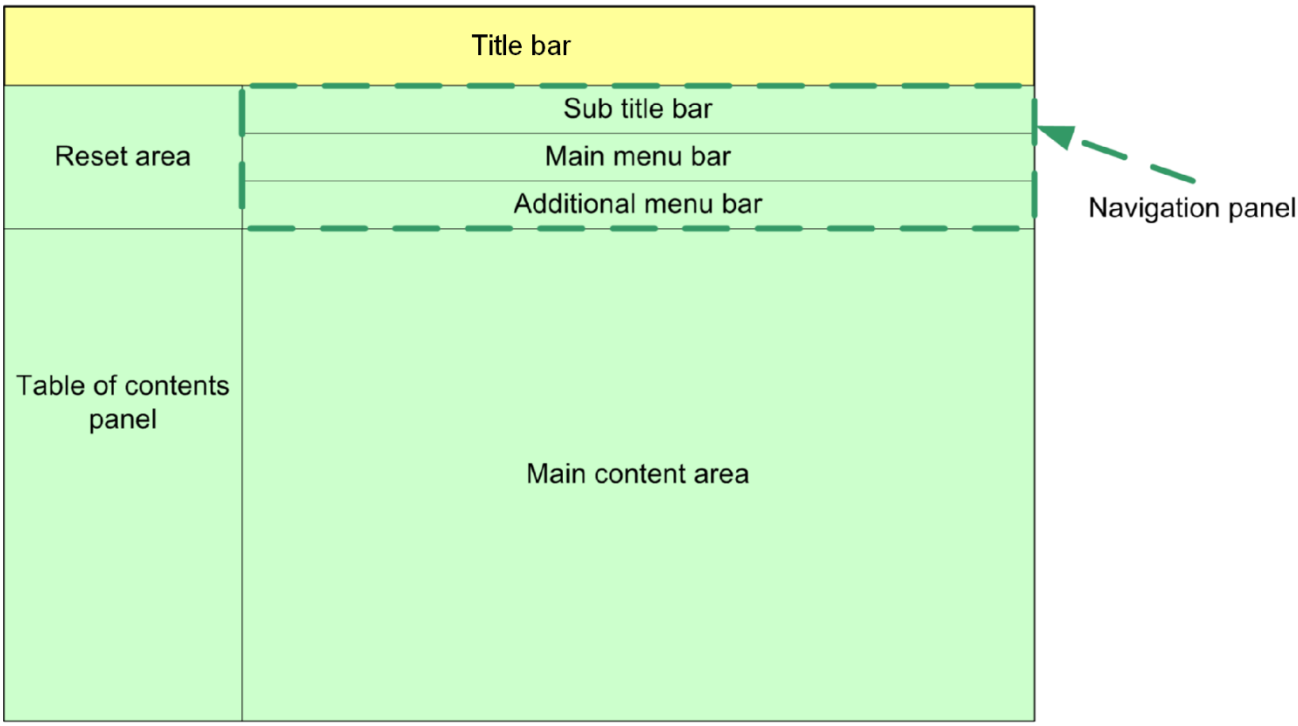
A horizontal title bar must appear at the top of the outer shell. The title bar can include the name of the application and can also include security classification markings, the data module code and the title of the data module currently being viewed.

2.3.3 Inner shell

The inner shell is the portion of the IETP that provides the primary display area.

2.3.3.1 Inner shell layout

The inner shell must contain, as a minimum, the Table of contents panel, Navigation panel and the Main content area as illustrated in Fig 2. Optionally it can include a Reset area.



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Fig 2 Inner shell components

2.3.4 Table of contents panel

The table of contents panel, located to the left of the main content area, is where the navigation interactions must appear. Refer to Fig 2. This panel can include:

- A table or list of all key entry points (eg, publication and data modules) must be made available for user access. This can be provided by a hierarchical breakdown of:
  - the publication set to publications
  - the publications to data modules by, for example, the SNS structure
- The Highlights data modules must be included here to give the user information about the status and reason for change of the updated publications and data modules.
- Other navigation, for example:
  - list of tables
  - list of figures

These can be implemented by graphical interfaces.

This panel must be resizable and can be toggled on and off.

2.3.5 Reset area

The reset area allows a user to return the IETP view back to its default settings. The reset area also provides a special mechanism for navigation and preferences. Items in this area are provided using a function menu. For example, the reset area can provide a menu allowing the user to navigate the IETP in different ways, such as, by part number, list of graphics, revision summary, etc. The reset area can be toggled on and off but must always be accessible. If toggled off, the reset area must be easy to find by the user. This could be achieved via an icon such as a compass rose or by a right click menu. Clicking on this area can provide a function menu.

The reset area also provides a means for selecting your preferences. The reset area menu could include selections allowing the user to toggle screen areas on and off. An example of a screen area that can be toggled on and off, is the additional information bar. It is recommended that a menu item be grayed out if the user is not permitted to toggle that particular screen area off.

2.4 Navigation panel

The navigation panel is comprised of multiple bars in the following sequence:

1 Sub title bar (optional)

2 Main menu bar (mandatory)

3 Additional information bar (optional)

The navigation panel can appear either above or below the main content area. The position of the navigation panel must, as far as possible, remain consistent throughout the application.

2.4.1 Subtitle bar

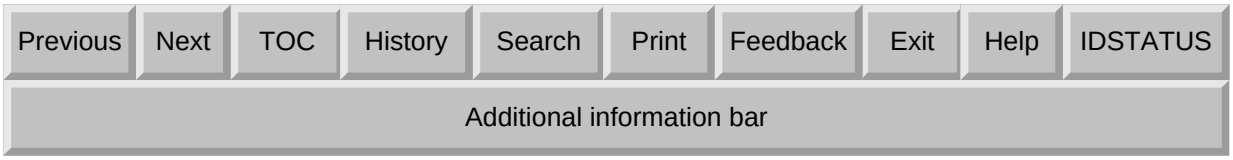
The subtitle bar can be used for additional information, from the identification and status sections such as modification state or classification, when it has not been presented in the title bar.

2.4.2 Main menu bar

The main menu bar consists of a basic set of functions. If required by the project, these functions (or any combination of them) can be mandated. There are three ways to present the standard functions:

- text based - the function is given a text label
- graphic based - the function is represented by an icon
- text and graphic - a combination of an icon and text is used

The main menu bar can contain the functions as illustrated in Fig 3.



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Fig 3 Navigation panel - Example

When used, icons must be developed to be representative of the function that they perform. Their meaning must be apparent with little confusion in the mind of the user. Icons are not mandated because the end user and operating environment have to be considered before deciding upon the final set. These relate to the basic functions previously described in this chapter with some additional icons for further expansion of the application.

Cascading menus can appear as a child of a function when selected. In a drop-down menu, this appears next to the function selected. There can be several levels of cascading menus.

Functions that are not active during any rendering must be presented as disabled. The bar must remain accessible.

Business rule decision point BRDP-S1-00534 - Main menu bar functions in the IETP viewer:

– Decide which, if any, of the basic set of main menu bar functions to mandate.

2.4.2.1 Previous
This navigates the user through the data in a sequential manner backward.

2.4.2.2 Next
This navigates the user through the data in a sequential manner forward.

2.4.2.3 Table of contents
A function that toggles the Table of contents panel on and off. Refer to Para 2.3.4.

2.4.2.4 History
A navigational function that displays previously viewed data in a sequential manner (eg, data module visited).

2.4.2.5 Search
A function that displays a search dialog box.

2.4.2.6 Print
A function that allows data to be printed (eg, by use of a print dialog box). By decision, if information is classified the print function can be disabled and the print button grayed out.

Business rule decision point BRDP-S1-00535 - Printing of classified data

– Decide whether to allow the printing of classified data. If not allowed, the print function must be disabled when classified data is presented in the IETP viewer.

2.4.2.7 Feedback
A function that allows feedback to be gained from the user either on an individual data module, publication or a complete publication set. This can be done by, for example, use of the Comment Schema. Refer to Chap 4.6.

2.4.2.8 Exit
A function that allows exit from the IETP, where appropriate, the following modes can be available:

– complete - exits the application
– suspend - suspends the session for the user

2.4.2.9 Help
A function that displays a help file. The help can contain viewer usage information.

2.4.2.10 IDSTATUS
A function that shows part or the whole of the identification and status section of the data module or publication.

2.4.3 Additional information bar
The additional information bar can be used if additional functions are required (eg, ordering of spares). It is presented below the main menu bar and must include the functionality to be toggled on and off.

Business rule decision point BRDP-S1-00536 - Additional information bar in the IETP viewer:

- Decide on the use of an additional information bar. If used, it must be decided which information to be available in the additional information bar.

2.4.4 Main content area

The main content area contains the technical content, text and graphics of the IETP, this area must not be divided into more than three panes.

2.4.5 Screen "stacking"

Screen "stacking", that is the use of multiple windows, must be avoided to aid end user clarity.

2.5 Style and format

2.5.1 General

Unless otherwise stated in this chapter, style and format must conform to the general principles defined in Chap 6.2.

2.5.2 Use of colors

Consideration must be given for capabilities of intended display devices. It is recommended to design for the least capable display device (8-bit, monochrome devices, etc). The use of color must be controlled by human factors studies or usability testing. The operational environment and equipment in use must dictate some rules regarding the colors used. There can be operational considerations such as night ops, red-light conditions and where color has special meaning. Any colors that are used must comply with the rules in Chap 3.9.2.

The recommended color scheme for standard text display must be black on a white background.

2.5.3 Typefaces

2.5.3.1 Standard typefaces

When deciding upon typeface and size, consideration must be given to the information detailed in Chap 6.2.2. The use of font size must be adequate for the user to be able to read the technical content. Attention must be paid to the display device and working environment.

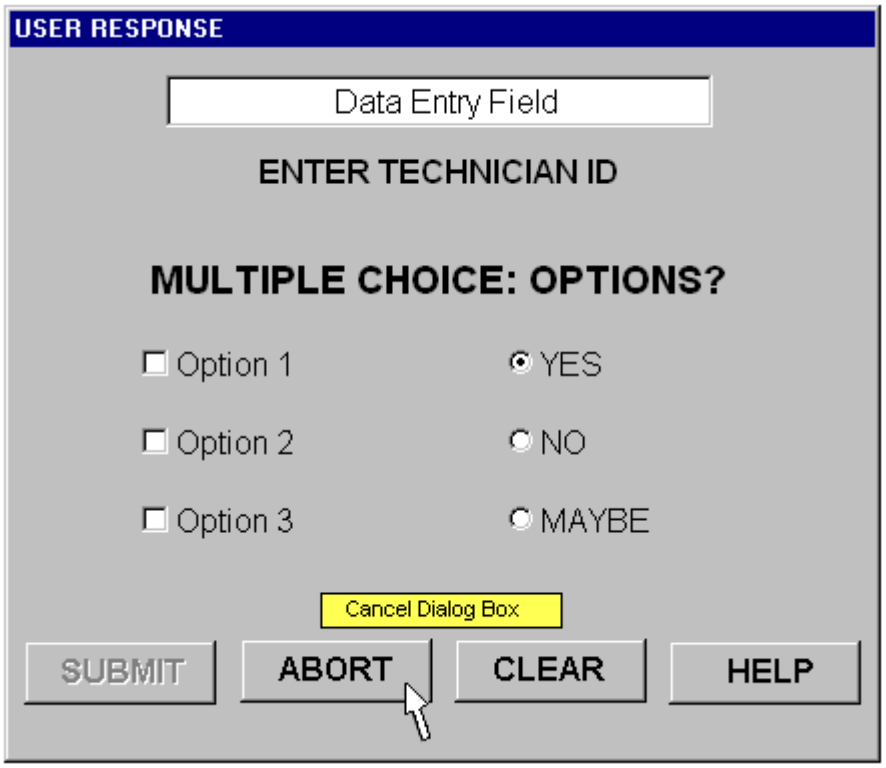
2.6 Dialog box

A dialog box is used to obtain information from the user and provide feedback to the user. When possible, it must appear in the screen center. The dialog box appearance must be consistent throughout the IETP.

A dialog box can contain controls. A user interacts with the dialog box through named controls. Typical controls are:

- Text input box
- Push button
- Checkbox
- Radio button
- Selection box

Controls can have tool tips. Tool tips display further information about the purpose of the control. A tool tip appears when the user hovers over the control with the mouse pointer. Refer to Fig 4 for an example dialog box which contains various named controls types and a tool tip.



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Fig 4 Dialog box - Example

2.6.1 Text input box

A text input box allows the end user the ability to provide information to the application in the form of free text and/or numerical values.

Wherever possible, the data input field prompt must be placed on the same line as the data entry area. Formatting for prompts must be distinctive. Prompts must be placed in close proximity to their respective data entry area.

When required, an acceptable value criteria must be provided through the element <validate> expression on the element <userEntry> expression. The acceptable values specified by the <validate> expression must be displayed in close proximity to the text input box, such as appended to the prompt or directly below the text input box. As a minimum, if the user enters a value outside of the acceptable values criteria <validate> expression, a message must be displayed to the user identifying the acceptable values. Upon acknowledging the message, the text input box must be displayed to give the user another chance to enter a valid value.

2.6.2 Push button

The push button executes a function. Examples of push buttons are "OK", "Calculator" (executes a calculator program), "Figure" (displays associated graphic), and "IDSTATUS" shows identification and status information. A dialog box has five pre-defined push button functions and must be displayed in the following order centered along the dialog box bottom:

- Submit (mandatory)
- Cancel/Abort (mandatory)
- Reset (optional)
- Help (optional)
- Generic (optional)

2.6.2.1 Submit

The submit push button is used to submit the data in the dialog box to the IETP, closes the dialog box, and performs the next action. Submit push buttons can have several different text labels. Examples of submit push buttons are:

- "OK" - the user enters the prompted data before submitting to the logic engine
- "Search" - the user enters search criteria before submitting to the search engine
- "Comment" - the user enters comments on the dialog box before submitting to the comments service

2.6.2.2 Cancel

The cancel push button is used to void information entered, to void executing the function, or to close the dialog box, and return control to the prescribed action as identified for the function.

2.6.2.3 Reset

The reset push button, when activated, is used to reset controls on the dialog box to their default values. An example of a reset push button is to "Clear" the contents of a search dialog box ready for a new search.

2.6.2.4 Help

The help push button, when activated, is used to provide further information about the dialog box.

2.6.2.5 Generic

A generic push button, when activated, executes a defined function. A generic push button must not close the dialog box or display along the dialog box bottom. An example of a generic push button is to execute a calculator to help compute an answer for the dialog box.

2.6.3 Checkboxes

Checkboxes provide "On/Off" toggle switches. A switch is "On" when the box is checked. It is possible to have none or several checkboxes with the same control name thus allowing users to select several values for the same property. An example of a checkbox function in an IETP is selecting applicability values for an applicability filter.

2.6.4 Radio buttons

Radio buttons are similar to checkboxes except that where a group of radio buttons exist, only one of the options can be selected. At all times, exactly one radio button in a group is set to "Checked".

Radio buttons can be used to implement a Yes-No dialog box. Two radio buttons are labeled with "Yes" and "No" respectively, and a submit button (eg, "Submit" or "OK") is used to submit the response to the IETP.

2.6.5 Selection boxes

Selection boxes are used when the user is required to select a value from a scrollable list box. Selection boxes can be set so that a user can pick only various options.

2.7 Lists

Lists must conform to the general requirements as identified in Chap 6.2 with the exception when those specific measurements for indentation and spacing cannot apply.

2.8 Steps

2.8.1 Procedural steps

It is preferred that procedural steps and their corresponding illustrations be presented together. When this is not feasible or it affects the user's perception of the screen layout (such as a scrolling screen or "cluttering" when using a small screen) the illustration or inline an icon can

be placed inline to allow the display of the illustration. Steps must be presented such that the order cannot be misunderstood.

Screen stacking (eg, several open windows) to present multiple steps is not permitted.

2.8.2 Keep with next

Procedural, fault isolation, and crew steps with the attribute `keepWithNext` set to "1" are presented with the next sibling step (if one exists) and therefore, all children of the step for which the attribute is set are kept together as well (if possible). Refer to Chap 3.9.5.2.3, Chap 3.9.5.2.4, and Chap 3.9.5.2.6.

2.9 Tables

Tables can appear within the body (inline) of the IETP or in their own separate window (pop-up). When pop-up tables are used an icon must identify the table. The icon serves as a push button to open up a table pane.

Table titles must conform to the guidance provided in Chap 6.2.2.

Typefaces must be the same as the rest of the data module. Presentation of tables must follow the principles given in Chap 6.2.2.

2.9.1 Headers and footers

The header must always be visible so that it does not scroll away while rows are scrolled. Where appropriate the footer can remain visible so that it does not scroll away while rows are scrolled.

2.9.1.1 Table footnotes

Table footnotes marker, presented either in superscripted format (superscripted numbers are recommended, refer to Chap 3.9.5.2.1.6), in parentheses following the item, or by any other means, must have a link to the related footnote presented in the table footer or display a pop-up when the mouse "hovers" over the footnote marker in the table cell.

The basic rules for table footnotes given in Chap 3.9.5.2.1.6 apply.

2.9.2 Background

It is preferred that the background be white. Where the table is long, it can be acceptable to change the background colors of alternate rows to aid readability.

2.9.3 Links to table cells

Only the referencing text within a table cell must be hyperlinked. Do not link the entire cell. Reference to a table cell or row must scroll directly to the referenced cell or row. This type of reference is not presented in a printed output.

2.10 Hyperlinks

2.10.1 Hyperlink presentation

Standard web practices must be followed to indicate the presence of hyperlinks. Blue underlined text must be used to indicate unvisited links and purple underlined text must be used to indicate visited links.

2.10.2 Graphic links (hotspots)

The following are the four acceptable modes of visual indication of hotspots in graphics:

- persistent visual indication that an area is hot
- cursor changes shape or color when cursor is over the hotspot area
- object changes shape or color when cursor is over the hotspot area
- pop-up appears while cursor is over the hotspot area (eg, IPD callout expands)

2.11 Warnings and cautions

Warnings and cautions must be presented inline either by the complete warning or caution or by an icon. When icons are used the warning or caution must pop-up when the icon is pushed.

The presentation of warnings and cautions must conform to the general requirements as identified in Chap 6.2. Warnings and cautions and any associated icons must be displayed prominently in the main content area. They must be treated with particular formatting requirements to ensure the user's attention. Examples of a warning and a caution are given in Fig 5 and Fig 6 together with their respective icons.

Note

Projects must ensure commonality of presentation utilized.

The warning and caution, and associated symbols, or icons must be visible to the user whenever the warning or caution is applicable to the information (procedure, etc) is viewed.

Any warnings or cautions that are applicable to the complete data module (ie, included and presented in safety conditions within preliminary requirements) must be displayed when a data module is opened. Refer to Chap 3.9.3.

2.11.1 Pop-up warnings and cautions

Pop-up warnings and cautions must appear in the center of the user viewing area, to alert the user of a specific condition. A system can display all applicable pop-ups as stacked window frames. The user must be able to again see the pop-up after they are acknowledged by clicking on an applicable icon.



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Fig 5 A Warning and a caution with acknowledge buttons - Example

For systems which allow minimized appearance of pop-up warnings and cautions (as opposed to those that are inline), an on-screen indication appears and displays an appropriate icon, refer to Fig 6.



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Fig 6 Warning and caution icons - Example

2.11.2 Safety icons and symbols

Hazardous material icons are optional. General rules for colors and shapes, reference must be made to Chap 3.9.2. The meaning of the hazardous material icon can pop-up by "hovering" the mouse over the icon.

2.12 Change markings

If change markings are presented for onscreen display, the change markings must clearly identify the changed content. A link to the highlights data module can be made available and the reason for change can be displayed as a tool tip when the cursor hovers over the changed content.

The IETP can have a function to show or hide changed content.

Changed content is best displayed in the IETP by use of a different color or highlight the changed information.

Refer to Chap 3.9.5.2.1.1 for additional information about change marking.

2.13 Acronyms and abbreviations

Any acronyms and abbreviations that are in the displayed data module can have a function that displays the meaning as a tool tip when the cursor hovers over the acronym or abbreviation.

2.14 Illustrations - Figures

Illustrations can appear within the body (inline) of the IETP or in their own separate window (pop-up). When pop-up illustrations are used an icon must identify the "hidden" illustration. The icon serves as a push button to open up an illustration pane.

Illustrations can be displayed using as much screen space as is available. The IETP presentation system must provide the user with the ability to view graphic objects with pan, zoom, expand, and magnify.

Figure titles must conform to the guidance provided in Chap 6.2.2.

If required, hovering over an area of a graphic can provide some means of descriptive data. For example, if used in an IPD graphic the information displayed can be that which is contained in the element <`descrForPart`> or in a wiring data graphic it can be some information related to the cable.

Right-mouse clicking can optionally display a menu of options to include related remove/replace/repair procedures, part ordering, training, etc.

2.15 Printed output from IETP

2.15.1 General

The IETP application is designed for the purpose of displaying data electronically. It must be discouraged for use as a publishing engine. However, if there is the requirement to print any data the following guidelines must be adhered to.

Consideration could be given to the printed output of partial data modules. This would require that any applicable caveats be printed. The function to provide a complete publication output is strongly discouraged.

When printing a data module from the IETP application, a header and footer must be printed on all pages that are output. The following information can be displayed on them:

- the data module code and its issue date
- the date and time of printing
- the security classification
- a caveat to state the information is only applicable at the time of printing and is not subjected to amendment action and that is must be "destroyed after use"
- the page number, starting with "Page 1"
- the words "End of data module" on the last page

2.15.2 Printing process data module elements

Printing a process data module is a particularly challenging task due to the programmatic nature of the data. The goal is to present the process data module "program" in a human readable form such that a maintainer can interpret the precondition, preset, postset, alt, if, and loop constructs sufficiently to correctly guide him through the maintenance flow.

Chapter 6.4

Information presentation/use - Functionality

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Chap 6.4.2	Functionality - Functionality matrix

1 General

This chapter describes the various levels of output functionality that is facilitated by producing information in accordance with this specification.

2 Content

This chapter has the following content:

- Chap 6.4.1 provides the background and explanation of the functionality matrix
- Chap 6.4.2 contains the functionality matrix. The matrices for page-oriented publications and IETP can be downloaded in digital form from www.s1000d.org.

Chapter 6.4.1

Functionality - Background and explanation

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1 General

This chapter provides an explanation of the functionality matrix and defines standard terminology associated with its use.

2 Background and use of the functionality matrix

The matrix is intended to be used by acquisition professionals as an aid to define requirements for a project or organization. The matrix provides a standard format for documenting the functional needs of a technical data project. It provides also standard definitions for each functionality, so that companies and customers can clearly state their needs and capabilities.

The matrix includes functionalities both within and beyond the capabilities of the Schema. Certain functionalities listed are typically capabilities of viewers or data delivery mechanisms and are not explicitly described elsewhere in the standard. Cross references are provided in those instances when functionality is a capability of the standard.

Chap 6.4.2 contains a matrix intended to indicate possible capabilities for various types of technical data implementations. The matrix is to be used by a project and company to help identify project and organization requirements. The matrix includes functionalities both within and beyond the capabilities of the Schema.

An MS Excel™ version of the matrix that can be used by project teams to capture requirements is available at www.s1000d.org.

2.1 Functionality categories

The matrix is divided into the following categories based on functionality type.

2.1.1 Functionality

The functionality column lists possible technical publications functionalities. The following summarizes the functional categories at a high level.

2.1.1.1 Access

These are the functionalities that allow or restrict users to view specific data.

2.1.1.2 Annotation

These are the functionalities that have to do with the user's ability to add notations or other marks associated with the data. Bookmarks are a type of annotation.

2.1.1.3 Delivery and distribution

Delivery is the method of moving tech data from a contracted company to the contracted client and distribution is the method of moving tech data from an initial point to all the end users of the tech data. Selection of the desired media and method will drive costs; however, the most significant consideration is the readiness of the infrastructure at the user level for whatever method is chosen.

2.1.1.4 Diagnostics and prognostics

Diagnostics include procedures for identification of a fault that lead to a corrective action or maintenance procedure. Diagnostics span from basic standalone troubleshooting procedures to integration with the product and other maintenance systems. Prognostics include the capability to predict system degradation or failure based on maintenance and operational data input and real time monitoring. Diagnostics/prognostics can be a significant benefit in reducing maintenance times and total ownership costs; however, they can also be a sizable cost driver in publications development.

2.1.1.5 External processes
The digital environment has the potential to provide greater functionality by interacting with external processes to retrieve and transmit information.

2.1.1.6 Graphics
Various levels of graphics display, interactivity and navigation can be implemented. Examples of these functionalities include.

- Point and click on a locator graphic for the purpose of navigating to graphic details
- Links to textual or tabular information
- Highlighting specific connections in a circuit
- System simulation expressed graphically

The more complex graphical functionalities often come at a premium for both cost and system hardware/software requirements.

2.1.1.7 Linking
Basic linking functionality is defined as essentially link access or connections to the data within the publication such as from the table of contents to the applicable section. Additional linkage such as cross-references can require some additional effort to maintain. Linking to data items externally can also be accomplished. These links can be to resources such as material handling information or for integration with other related information.

2.1.1.8 Navigation and tracking
Different navigation methods enable linear and non-linear access through the data. Features such as "next" and "previous", search and the use of bookmarks are considered to be relatively fundamental and consistent with most Web-based data presentation techniques. Higher complexity navigation techniques include dialog driven interaction, voice activated commands and various filtering techniques. Examples of filtering characteristics are model number, identification number (eg, tail number), modification performed and user qualifications.

Tracking provides the ability to allow recording and subsequent retrieval of electronic publications activity, as in an audit log.

2.1.1.9 Printing
Some publications by their nature are intended for use in an electronic environment, with print functionality limited primarily to task oriented and screen print output. By defining a hard copy output that more closely resembles a paper technical publication, the resulting costs and complexity rise.

2.1.1.10 Special content
The inclusion of additional data types such as audio, motion video, and animations are accommodated relatively easily by most presentation systems; however, content generation often cost more. Performance issues can also occur, which can have further cost implications.

2.1.1.11 Updates
There are a number of different update methodologies that affect life cycle costs and include revisions, changes, and urgent changes (Rapid Action Changes (RACs), etc). These can include change markings or other change indications. Updates include any data delivery after the initial delivery.

2.1.1.12 User operation mode
These functionalities have to do with infrastructure and a user's ability to connect with the source of the data.

Business rule decision point BRDP-S1-00537 - Use of the functionality matrix:

- Decide whether to use the functionality matrix. If used, fill in the functionality matrix. Refer to Chap 6.4.2.

2.2 References

Wherever possible references are made in the functionality definitions to indicate related material located elsewhere in S1000D. When a reference is not possible, a notation is made to indicate that the functionality is viewer, infrastructure, or external software functionality that is not enabled as a direct application of S1000D.

2.3 Matrix columns

The horizontal axis contains the column headings: Functionality, Complexity - Page, Complexity - IETP, Requirement, All data sets, and a list of the S1000D information sets. Refer to Chap 5.2.

2.3.1 Complexity

There are two columns that indicate a relative measure of difficulty and probable higher cost associated with a particular functionality (the higher the complexity factor, the more difficult implementation and a more probable higher cost). In many cases the complexity level is different depending upon a page-oriented or IETP implementation. Separate columns are provided that indicate the complexities in these two implementations. The absence of a complexity factor indicates that the functionality is generally not available or desirable.

Page-oriented publications are presented in a linear or document oriented manner. The data author largely predefines the sequence of the data presentation. Page oriented publications can be designed for traditional printing or for electronic display. Electronically displayed page oriented publications are sometimes called Electronic Technical Publications (ETP).

IETP data is displayed in a non-linear fashion. There are high levels of interactivity between the data and the user. The sequence of presentation is dictated by inputs by the user or external sources and events. IETP implementations typically require the use of the process data module and a logic engine.

The complexity factors provided are intended to provide relative complexities (and relative costs) for implementing various functionalities. The complexity factors range between one and five, with one being the least complex, to implement and five being the most complex.

2.3.2 Requirement

The requirement column is to be used by the project team to indicate the need for a specific functionality. If desired, the acquisition agent can also use the requirement column (in the spreadsheet version of the matrix) to capture and coordinate notes reflecting the importance of the functionality to the project (must have, nice to have, do not want, etc) prior to making final requirements decisions. The spreadsheet version of the matrix provides a useable format for this purpose.

2.3.3 All information sets

The All information sets column is used to identify those functionalities that typically apply universally across all information sets. These functionalities are identified with an "A." These are in contrast to functionalities that can be applied to specific identified information sets. Refer to Chap 5.2.

2.3.4 Information sets

The remaining columns represent the information sets described in Chap 5.2. These columns are to be used by the project team to indicate, which data sets should include the specified functionality. The information sets provided in the matrix are consistent with those described in Chap 5.2, a project or organization can modify the matrix to match the information sets used in their actual project or organization.

Business rule decision point BRDP-S1-00538 - Modification of the functionality matrix due to selection of information sets:

- Decide on which modifications are needed in the functionality matrix due to the selection of information sets. Refer to BRDP-S1-00004.

2.3.5 Front matter

Front matter is the information traditionally displayed in the front of paper publications. Refer to Chap 3.9.4, Chap 5.3.1.2, Chap 6.2.3.1, Chap 8.4.1, Chap 8.4.2 and Chap 8.5. It can include the title information, "A" page or change information, verification status, export control notice, warning, safety summary, title page, list of pages or data modules, change records or highlights, access illustration, list of abbreviations, list of terms, list of symbols, technical standards records, table of contents, general data, function (of an IETP/Publication), general warnings cautions and related safety data, numeric indexes, alphabetic and alphanumeric indexes, list of special materials, list of dangerous materials, list of related data, introduction, supplier lists, configuration, copyright, etc. The complexity, practicality and desirability of front matter content vary greatly depending on the data acquired.

2.4 Functionality definitions

The following tables provide descriptions of each of the functionalities identified in the matrix as well as some considerations to be made and the range of capabilities that can be addressed therein. These tables provide identification of the category, title of the functionality, a definition of the functionality and in many cases, an example.

2.4.1 Functionality definitions - Access

2.4.1.1 Login

This is the capability to identify a user for tracking, authorization or other purposes. This is an IETP viewer functionality. This functionality requires the inclusion of the Exit functionality.

Consideration must be given to determine if specific profiles, user IDs, roles and permissions will be required to permit usage. A password for log on is not necessary. It should be kept in mind, that if there is a higher-level infrastructure controlling access, it should be the controlling authority. Data access based on the training and skill of the maintainer can require that the system link into the maintainer's training records. In a standalone mode, the amount of data required on the standalone device is considerable and complex. Consideration must be given to the maintenance of this data in multiple locations.

2.4.1.2 Suspend and restart

This is the capability to suspend a session and provide the user with the ability to restart at the point of suspense. This functionality requires the inclusion of the Login functionality. This capability extends beyond a user session and retains session data. This is an IETP viewer functionality.

During the performance of a maintenance session, a part is removed. The replacement part is not available in supply. The session is suspended and subsequently restarted after the part becomes available.

2.4.1.3 Exit

Function to close the session. This is an IETP viewer functionality.

If suspend is used, the current state tables and position are maintained, otherwise all information concerning state tables and position is cleared.

2.4.2 Functionality definitions - Annotation

2.4.2.1 Action Complete Indicator (checkbox)

The functionality used to indicate the completion of an action. Refer to Chap 3.9.5.2.10 and Chap 6.3.1. This functionality is normally associated with, but not limited to use with, checklists. Other methods can be used (eg, "sign off"). The data entered via the action complete indicator can be retained for state table or audit trail purposes depending on project and organization requirements.

2.4.2.2 Global data annotation

This functionality allows the entry, storage and display of globally applicable supplemental data. This is an IETP viewer functionality.

Globally accessible annotations should be limited in scope and required to be approved by the end user's QA process and be made available to the development contractor. Globally accessible annotation is a quality maintenance supplement indicating the new type of lubricant to use. Some users of data on CD-ROM might use these global data annotations to provide updates to data by quickly revising the CD-ROM to contain the "sticky" notes.

2.4.2.3 Local data annotation

This functionality allows the entry, storage and display of locally applicable supplemental data. This is an IETP viewer functionality.

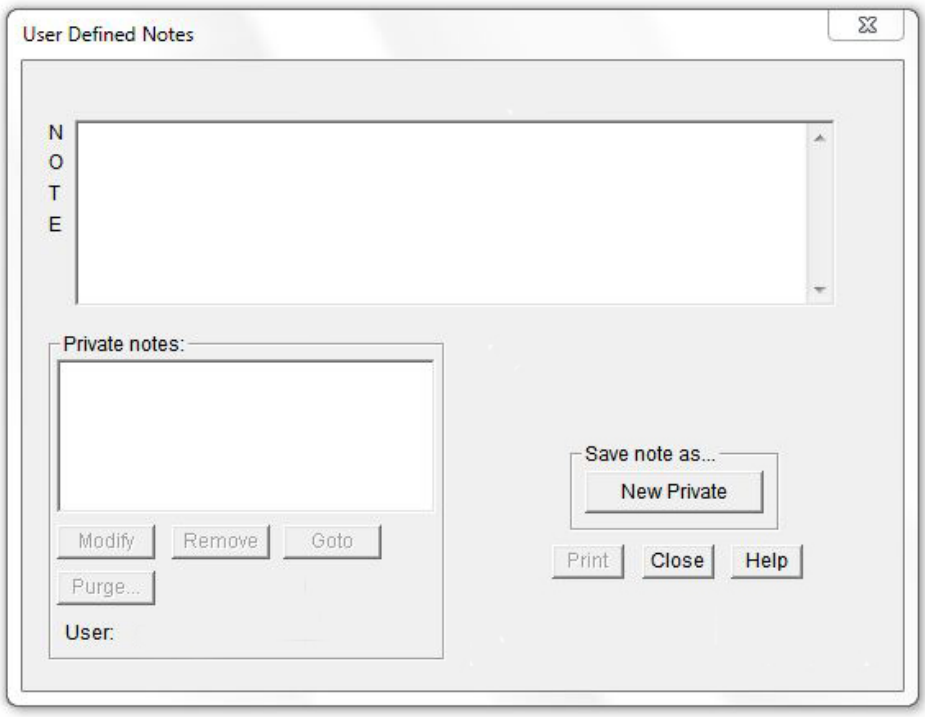
These annotations should be limited in scope and follow local approval process.

Example - The maintainer can be required to use additional filtering in a desert environment.

2.4.2.4 Personal annotation

This capability allows an individual user to add supplemental information to the data. This is an IETP viewer functionality. This functionality requires the inclusion of the Login functionality.

Personal annotation can be added or deleted at the end user's discretion and it is suggested that it is not retained at the end of the user session. It is not the intent that the personal annotation persists.



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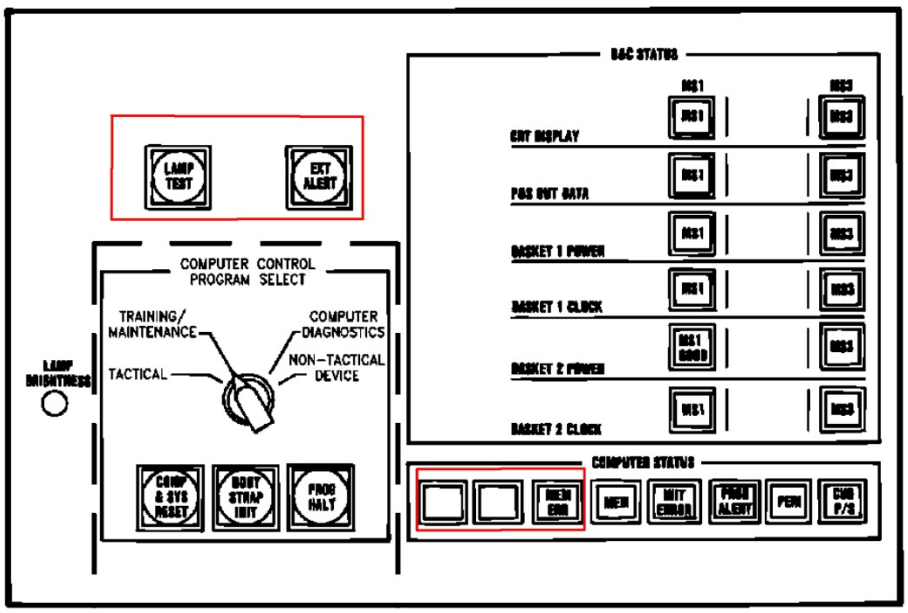
Fig 1 Personal annotations

Example - "Noticed that the radome latch was bent on left side, remember to complete appropriate forms to notify radar shop."

2.4.2.5 Redlining text

Capability provided during the publication development and verification process to annotate text using markings for deletions and insertions. The capability exists to save and attribute redline markups. These are saved for feedback only for the improvement of the publication. This is an IETP viewer functionality.

2.4.2.6 Redlining graphics
This is a capability to annotate graphics using an overlay freehand-type drawing facility. It can be used to report errors during the publication development and verification process. The capability exists to save and attribute redline markups. These are saved for feedback only for the improvement of the publication. This is an IETP viewer functionality.



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Fig 2 Redlining graphics

2.4.3 Functionality definitions - Delivery and distribution

2.4.3.1 Printed publication
A paper publication compiled from data modules. Refer to Chap 4.9.1.

2.4.3.2 Physical media
The capability to deliver and/or distribute data on hard media such as CD-ROM, DVD, hard drive. This is an infrastructure functionality.

Such physical distribution methods typically entail issuance of a complete database thus replacing the data in use. This replacement constitutes a block change update and is generally performed on a periodic basis.

2.4.3.3 Network distribution
Distribution via the Internet (connections to the World Wide Web (www))/Intranet (internal to one network) and consists of direct transfer from one computing system to another. This is an infrastructure functionality.

Delivery could be via secure FTP, (HTTP) or other transfer protocols. Bandwidth, security and operational deployment considerations should be addressed. This could enable near real-time updates. Refer to Para 2.4.11

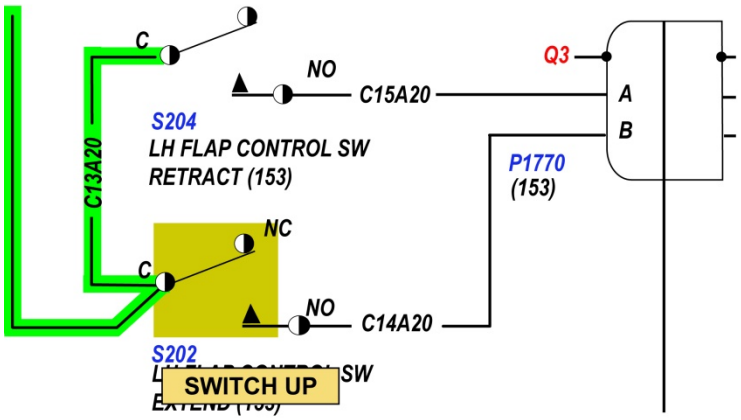
2.4.4 Functionality definitions - Diagnostics and prognostics

2.4.4.1 Diagnostics - User determined entry to data
Tasking for troubleshooting procedures is provided through primarily textual references. "If statements" provide alternatives in a narrative form. This makes use of a predefined fault tree. The user determines starting point for maintenance action. Refer to Chap 3.9.5.2.4 and Chap 5.2.1.3.2, Chap 5.2.3.4 and Chap 7.7.

2.4.4.2 Diagnostics - Software driven entry to data
The appropriate maintenance action starting point is software determined through use of an inference or logic engine. The user is provided with the appropriate starting point for fault isolation. Various inputs from personnel and system and multiple fault codes are analyzed. The analysis will determine if a relationship exists between these fault codes and information with the appropriate action as a result. This is an external software functionality. Refer to Chap 3.9.5.2.4, Chap 5.2.1.3.2, Chap 5.2.3.4 and Chap 7.7.

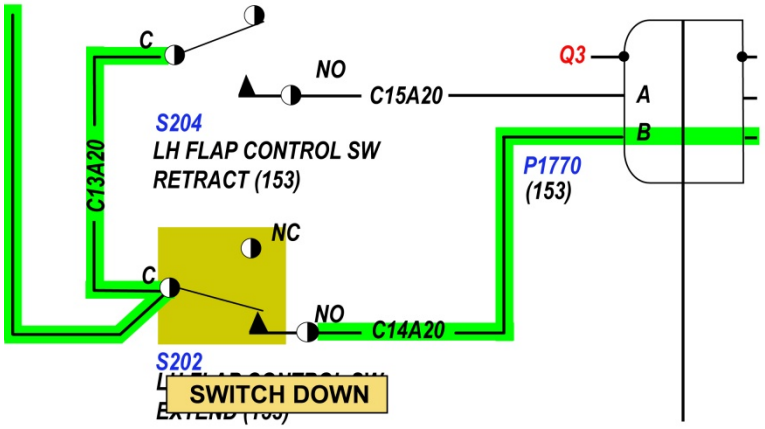
2.4.4.3 Dynamic diagnostics
This is diagnostic capabilities that use onboard monitoring devices (eg, Built-In Test (BIT)) and/or support/test equipment to provide enhanced capability for fault detection and isolation. Dynamic diagnostics direct fault isolation and troubleshooting based on results returned from the product rather than inputs received from the maintainer. With this type of diagnostics, there are no predefined paths in the troubleshooting data and the paths are generally model-based. This is an external software functionality. Refer to Chap 3.9.5.2.4, Chap 5.2.1.3.2, Chap 5.2.3.4 and Chap 7.7.

2.4.4.4 Wire/Fluid system tracing
This is the capability to select wires, fluid, pneumatic or (HVAC) line in a diagram or schematic and have continuity highlighted through the circuit or schematic. Refer to Chap 3.9.5.2.9 and Chap 5.2.1.4.



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Fig 3 Wire tracing, switch up

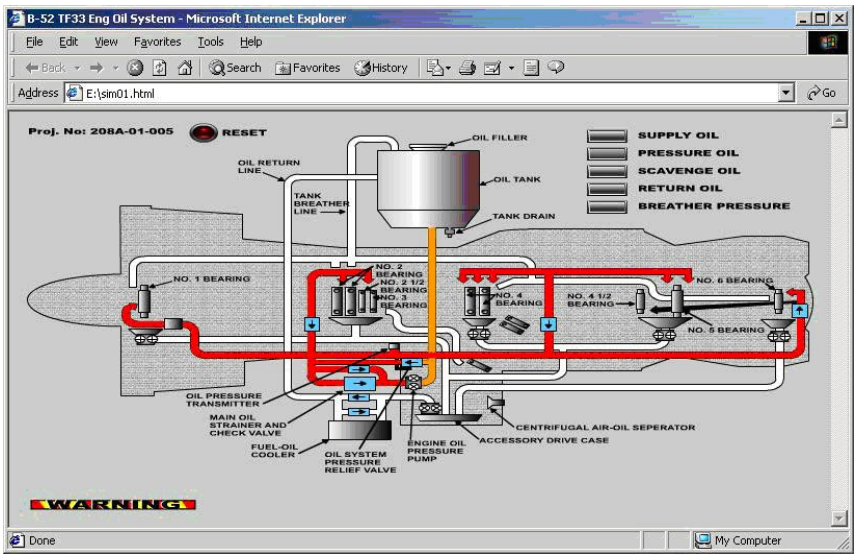


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Fig 4 Wire tracing, switch down

2.4.4.5 System simulation

This functionality includes the capability to represent the behavior or characteristics of the system function/malfunction to determine or reenact the problem. System simulation allows the user to introduce stimulus (such as pressure, valve positions, temperatures, voltages, sensor inputs, switch positions) and present the results in a manner that models the system behaviors. These capabilities can be used to model hydraulic, fuel, pneumatic and other systems. This is an external software functionality.



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Fig 5 System simulation

2.4.4.6 Prognostics
Prognostics are the prediction of component degradation or impending failure, which will allow maintenance personnel to replace components based on their actual condition. The goal is autonomic logistics, which uses electronic information collected from the Product system to determine, plan and perform preventive maintenance. This is an external software functionality. This functionality requires the inclusion of the retrieval, transmittal and maintenance data collection functionalities.

2.4.5 Functionality definitions - External processes

2.4.5.1 Parts ordering
This functionality enables parts ordering from within the IETP presentation and is integrated with the supply system. This is an external software functionality. This functionality requires inclusion of the transmittal functionality.

This functionality would not circumvent the supply system

2.4.5.2 Deficiency / improvement report transmittal
It provides a method for users to transmit errors and recommended changes to the data and/or equipment. This is an external software functionality. Refer to Chap 4.6. This functionality requires inclusion of the transmittal functionality.

The complexity of this will be determined by the level of integration with the deficiency reporting system and the type of reporting structure:

- Paper trail reporting

- Electronic reporting

2.4.5.3 Maintenance data collection
This functionality provides for the capability to capture and transmit configuration change data (ie, removed and installed part number information), tasks authorized, tasks performed, results of that work, other observed problem, etc. This is an external software functionality. This functionality requires inclusion of the Transmittal functionality.

This update can feed an external data repository or maintenance application. The state table or audit trail can be used to accumulate information for maintenance data collection.

2.4.5.4 Operator debriefing
An interface with a system or the product itself, to identify and report observed behaviors of the product. This is an external software functionality. This functionality requires inclusion of the Transmittal functionality.

The actual debriefing activity can be carried out by a human operator or the product itself.

2.4.5.5 Resource scheduling
Interface with a system designed to assign tasks, personnel and items related to maintenance of the Product. Refer to Chap 3.9.5.2.5, Chap 3.9.5.2.6 and Chap 5.2.1.6. This is an external software functionality. Refer to Chap 3.9.1, Chap 3.9.5.2.5, Chap 5.2.1.6, Chap 7.3.1.2 and Chap 7.3.1.4. This functionality requires inclusion of the transmittal and retrieval functionalities.

Resource scheduling can be coordinated among multiple human or software systems. These systems act against a set of constraints to minimize conflicts. Automatic resource scheduling is characteristic of a complex autonomic logistics system.

Example - An engine maintainer’s planned maintenance activity can be modified from "test and repair" to "remove and replace" based on reliability data, mission availability requirements and spares availability data from a ship within range.

2.4.5.6 Knowledge management
This is an interface with a system that models an organization's knowledge assets and environment to enhance its ability to deliver on its mission. This is an external software functionality. This functionality requires inclusion of the transmittal and retrieval functionalities.

Knowledge management provides for information tracking, access and synthesis in coordination with organizational culture, values and guidance. Additionally, a knowledge management system can indicate changes to maintenance actions based on given conditions and lessons learned. For example: A particular system failure can be cause by one of three things, usually it is caused by an electrical failure. However, industry conditions, a clogged air filter is the most likely cause of failure. A knowledge management system will adjust the order of procedures accordingly, so that the air filter is checked first in a dusty environment.

Example - The technical maintenance data gathered through audit logs can suggest that a restructuring of the logistics footprint is needed to maximize efficiency.

2.4.5.7 Other external applications
The other external applications functionality is provided so that customers can indicate specific external applications that are required as part of the IETP or data functionality. This is an external software functionality. Refer to Chap 7.3.1.1, Chap 7.4.1.2, Chap 7.6.1 and Chap 7.7.1.

2.4.6 Functionality definitions - Graphics functionality

2.4.6.1 Pan, zoom, expand, rotate, magnify
Controls are provided to perform pan, zoom, expand, rotate and magnify on graphic components. This is an IETP viewer function. Additional functionality can include spyglass view, text search, graphics and window resizing. Refer to Chap 6.3.1 and Chap 7.3.2.

Consideration should be given to the quality or limitations of the source data.

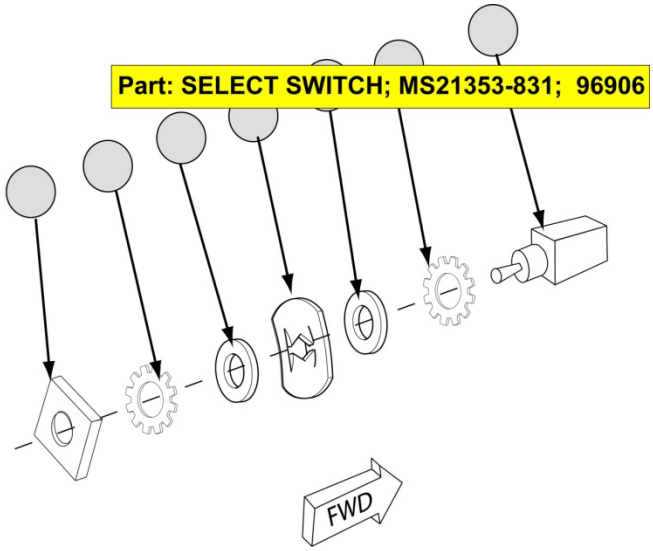


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Fig 6 Pan, zoom, expand, rotate, magnify

Example - This depicts icons that might be used for the identified function. Refer to Chap 6.3.

2.4.6.2 Assembly/Disassembly
Graphical figures that can be used to allow virtual assembly, disassembly, removal and installation of parts of the system. These can be implemented through linked drawings or through manipulation of modeled vector graphics. Refer to Chap 3.8.

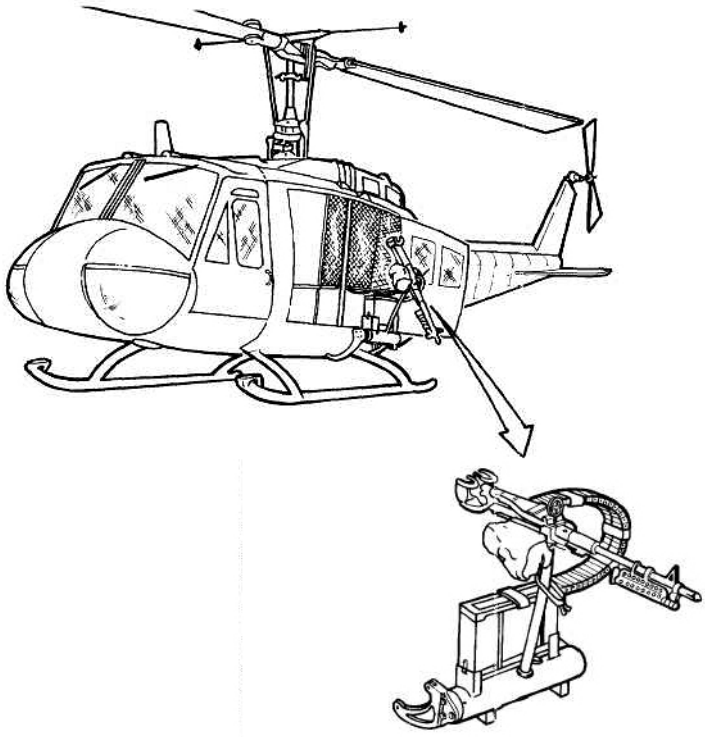


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Fig 7 Assembly/Disassembly

2.4.6.3 Locator graphics

Locator graphics show where a component is located relative to other components. Refer to Chap 5.2.2.5.



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Fig 8 Locator graphic

2.4.6.4 3D modeling

This is a modeling of the system using 3D, solid object graphical figures. Refer to Chap 3.9.2.5.

3D models can allow virtual assembly, disassembly, removal and installation of parts of the system using animation, simulation and/or virtual reality concepts. Levels of capability can

include fly through (navigation through a 3D model) type viewing. The degree of simulation, animation and virtual reality concepts can dramatically affect cost.

2.4.7 Functionality definitions - Linking

2.4.7.1 External references

External references are links to data outside the current data module or view. Refer to Chap 3.9.5.2.1.2, Chap 7.4.1.1, Chap 7.4.1.2 and Chap 7.7.4.

This includes links to supporting technical data that is helpful to the user, but not part of the traditional technical publication. Refer to Chap 3.9.5.2.1.2, Chap 7.4.1.1, Chap 7.4.1.2, Chap 7.6.1 and Chap 7.7.4. Examples include general publications, part and process publications, commodity books, commercial publications, reference material, training data, engineering drawings.

Consideration must be given for bidirectional links. A bi-directional link returns the user to the original referenced link after completing the action or procedure.

For example, a link from a data module to a publication module containing a related procedure is an external link. It should be noted that references to some data can require network connectivity.

2.4.7.2 Internal references

Internal references are links to another place in the same data module or view. Refer to Chap 3.9.5.2.1.2, Chap 7.4.1.1, Chap 7.4.1.2 and Chap 7.7.4.

Examples - Links to figures and tables.

2.4.7.3 Hot reference

This is the capability to display additional content such as acronyms, tool tips, etc. Refer to Chap 3.9.5.2.1.2, Chap 5.2.1.4 and Chap 6.3.1.

Example - A "mouse over" of the acronym IETP would generate popup text box with "IETP"

2.4.7.4 Link to separate parts data

Linkage from a maintenance task or narrative can be provided to a separate parts display (illustrated parts breakdown/catalog) in the current or separate window. Refer to Chap 3.9.5.3, Chap 3.9.5.2.1.2, Chap 3.9.5.2.7 and Chap 7.7.4.

This external link type links the user to a specific point within the parts data.

2.4.7.5 Table of contents, lists of figures, tables and photos

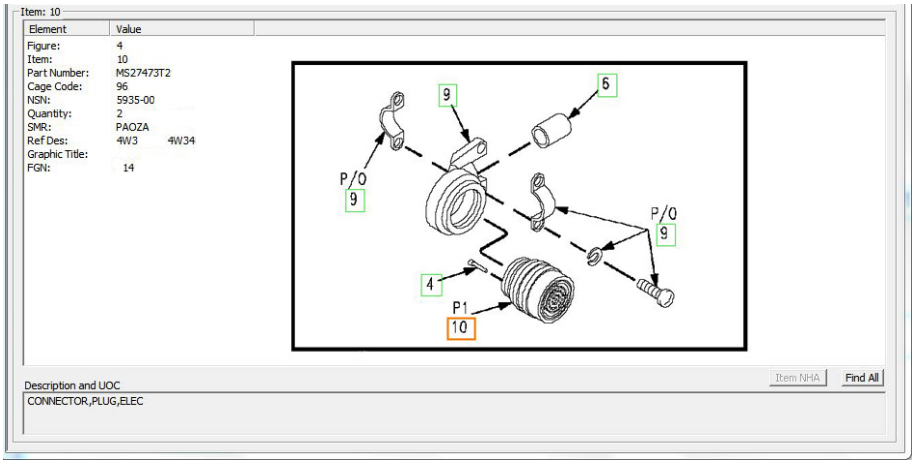
A categorized items list with links to the corresponding data within the technical publication.

2.4.7.6 Hot spotting

Graphics with links to other relevant information. Refer to Chap 3.9.2, Chap 3.9.5.2.1.8, Chap 7.3.2 and Chap 7.4.1.1.

Links can be to related text such as procedural information, IPD data; or to related graphics such as breakdown illustrations showing greater detail, next higher assembly, etc.

Example - The figure below shows a hot reference from a graphic to related text.



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Fig 9 Hot spotting

2.4.8 Functionality definitions - Navigation and tracking

2.4.8.1 Next and previous

"Next" is a navigational function that, when invoked, displays the subsequent data. "Previous" is a navigational function that, when invoked, displays the preceding data. This is an IETP viewer functionality.

"Next" can be a re-navigation of previously viewed data with no impact on state information (browse); or a progression to the next data in sequence. "Previous" can be a re-navigation of previously viewed data with no impact on state information (browse); or a reversal of steps where state table information is modified accordingly. "Next" and "previous" will normally not be implemented independent of each other. These functionalities, particularly when implemented without the process data module using a state table, are sometimes referred to as "forward" or "back".

2.4.8.2 Return (Chronological)

This is a navigational function that allows a user to get back to the link source from the link destination. This is an IETP viewer functionality.

This functionality could be implemented in such a way to allow a user to navigate back to the start of one of several branches or sub-branches.

2.4.8.3 History of traversed links

A navigational feature that tracks and lists each location (link) a user sees along the navigational path through an IETP. This is an IETP viewer functionality.

– In many cases, the user has the ability to bring the list up and use each location (link) in the history list, as a link back to a point in the path. It provides the user a way to move forward and backward along previously traversed links and a quick way to return to a home document. This feature is useful when flipping back and forth between several data types or components of the unit under maintenance.

Example - The user opens the IETP to the front matter

1 Follows the link to the section on the landing gear

2 Follows a reference link to an adjustment procedure

3 The history of traversed links will be discretely listed as 3, 2, 1

2.4.8.4 User creation of bookmarks
This is a navigational feature that allows the user to flag certain locations for later access. It allows the user to build their own index of links to specific locations in the data. This is an IETP viewer functionality.

Associated advanced features include login-specific bookmarks, so different people using the same presentation device have their own unique set of bookmarks. This is a digital means of implementing the dog-eared page or the paperclip used in paper publications.

Example - The maintenance crewmember that generally does the preventative maintenance checks and services might have the bookmarks to those tasks. Since that crewmember might also do the rotor tension adjustment, he would also have a bookmark to that task.

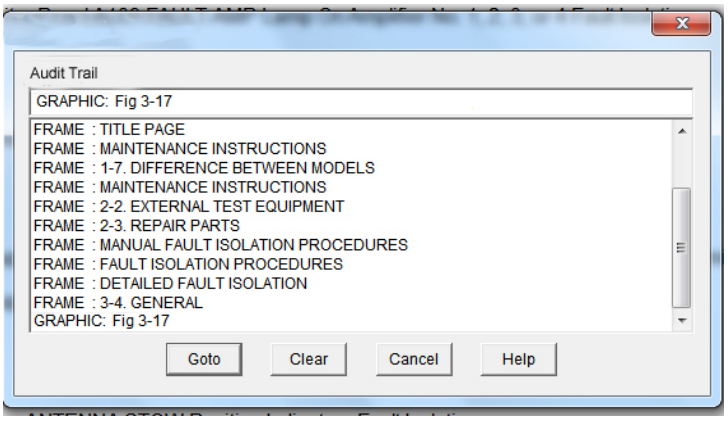
2.4.8.5 System/subsystem navigation
This is a navigational feature allowing the user to follow a top-down path through the system breakdown structure. The user follows a physical or functional breakdown to the next lower assembly and then to the next lower assembly from that. This is an IETP viewer functionality.

Example - A helicopter mechanic might begin the navigation of an IETP at the helicopter level. Next step would be to go down to the airframe. From the airframe, the mechanic might pick the cockpit. Next subsystem might be the Pilots seat and the final topic might be the forward/rearward adjustment.

2.4.8.6 Restore initial navigation view
This is a function that returns all navigational and other frames to their initial view. This is an IETP viewer functionality.

In some IETP implementations, a user will have the capability to hide navigation or other frames of the display. The restore initial navigation view functionality returns all hidden frames to their default positions. The ability to initiate the restore initial navigation view function should always be available to the user.

2.4.8.7 Audit trail
This functionality provides the capability to capture all user and IETP interaction including dialog interaction entries. This is an IETP viewer functionality.



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Fig 10 Audit trail #1

2.4.8.8 Graphical navigation
This is a navigation of the data through graphical representation of the product and its components. (The use of hot spotting is a prerequisite). Refer to Chap 3.9.2.

This can be a type of system/subsystem navigation.

Example - From a graphical overview of the aircraft, the user selects a wing. A graphical overview of the wing is presented. The user then selects the flaps. A graphical overview of the flaps is presented. The user selects the actuator. Information on the actuator is presented.

2.4.8.9 Dialog-driven interaction
A navigational feature used with the process data module that allows the user to directly feed information to the IETP environment. The IETP would cue the user to input specific data. The feature implies that at some point the IETP would then respond to the information entered. Refer to Chap 3.9.5.2.10, Chap 6.3.1 and Chap 7.

Example - During a troubleshooting procedure, the IETP would open a dialog box that states "Enter the voltage reading at TP 5". If the user types in 5 (a nominal value), the IETP jumps to the next step in the procedure. Alternately, if the user enters 0 (a fault level reading for a short) the IETP might jump to a remove and replace procedure.

2.4.8.10 Voice-activated commands
A feature that enables the user to navigate through the IETP by predetermined voice commands. This is an IETP viewer functionality.

The complexity of this feature depends upon the extent of voice tagging in the IETP and the quality of the voice recognition software.

2.4.8.11 Search - Full text
This is a navigational feature that allows the user to search an IETP for any words or phrases. This feature does not depend upon the predefinition of key words. This is an IETP viewer functionality.

Example - In searching for "IFF" the user can find "IFF", "difference", "TIFF", etc, depending on the search criteria.

2.4.8.12 Search - User defined Boolean
A search feature that permits the logical association of terms by use of the Boolean operators (such as AND, OR, etc) to narrow the results of the search. This is an IETP viewer functionality.

User defined Boolean search functionality is a possible extension of a full text search.

2.4.8.13 Search - Across multiple databases/files
A search feature that allows the user to look for words or phrases in more than one database. This is an IETP viewer functionality.

2.4.8.14 Search - Context
A feature that allows the user to search for words or phrases within predefined subsets of an IETP or data sources. This is an IETP viewer functionality.

It can be necessary to identify the predefined subsets by use of markup.



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Fig 11 Search

2.4.8.15 Search - Key word
A navigational feature that allows the user to search an IETP for occurrences of a specific word. System specific "key words" are predefined with links to their location in the data. This is an IETP viewer functionality.

A key word search provides benefits similar to an index in a paper document. It can also use other search functionalities such as Boolean, search across multiple data bases, etc.

Example - A user might search for the term "IFF". The Key word search would locate each pre-identified occurrence of the term in the data. This will find all occurrences of IFF that have been predefined as a key word, but will not find all occurrences of the letters IFF.

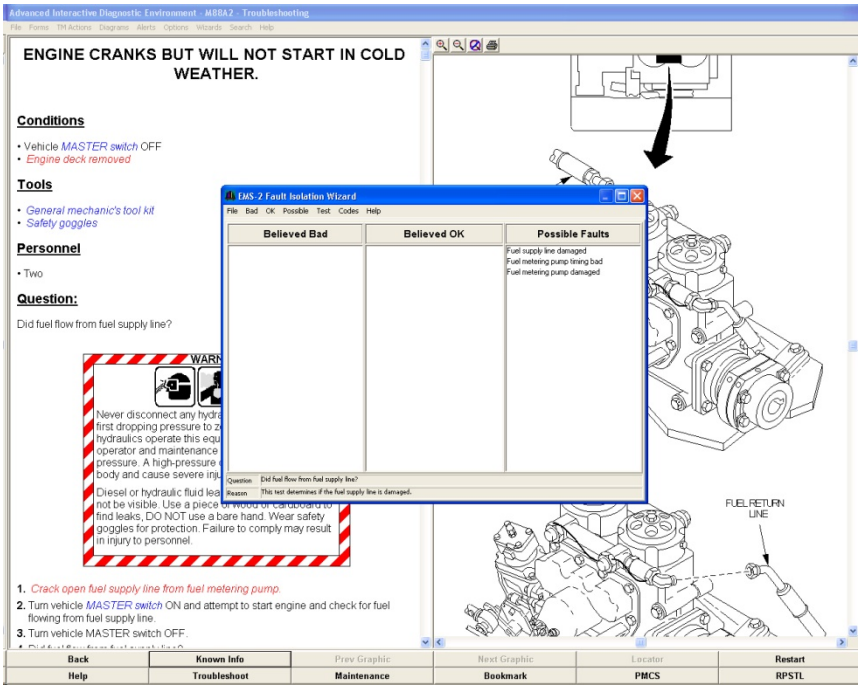
2.4.8.16 Filter content per applicability
Remove or de-emphasize content in the display based on information about the product of interest to the user."

The user has provided input that they are working on a particular aircraft ("serial number 001") with certain conditions present ("POST Service Bulletin 23- 1100"). Only content relevant to aircraft "001" with SB 23-100 implemented is displayed to the user. Alternatively content not relevant is de-emphasized in some manner (for example, is shown in a lighter colored text)."

2.4.8.17 Simultaneous display of multiple content objects
A functionality that establishes a relationship between content objects (text, tables, graphics, etc) requiring simultaneous display. Refer to Chap 6.3.1.

The text and its associated supporting graphic must be displayed concurrently to provide complete information to the user.

2.4.8.18 Tear off window
This is the capability to capture an existing pane/screen image and then allow the user to navigate forward, while retaining the captured image for later reference. This is an IETP viewer functionality.



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Fig 12 Tear off window

2.4.9 Functionality definitions - Printing

2.4.9.1 Print screen

This is the capability to print only the screen currently being viewed. This is an IETP viewer functionality.

Beyond the printed technical data, considerations should be given to time/date stamps, destruction notices, destruction dates, destruction requirements, security and derivative classification markings, associated warnings and cautions, etc.

2.4.9.2 Data module specific printing

This is the capability to print a single data module in its entirety. Refer to Chap 6.2.1 and Chap 6.3.1. This is an IETP viewer functionality.

Beyond the printed technical data, considerations should be given to time/date stamps, classified security and derivative classification marks, destruction notices, destruction dates and destruction requirements. Print linked data.

2.4.9.3 Print linked data

This capability to print any linked data on a given task/location. Refer to Chap 6.2.1 and Chap 6.3.1. This should be limited to one level of linking. Traversing lower than one layer greatly increases the complexity. Beyond the printed technical data, considerations should be given to time/date stamps, persistent warnings and cautions, classified security and derivative classification marks, destruction notices, destruction dates and destruction requirements.

2.4.9.4 Fully formatted/ book version

This is the capability to print a complete publication (Publication) from individual data modules. This implies the capability to produce the output in compliance with a predefined format for printed publications Refer to Chap 4.9.1 and Chap 6.3.1.

Beyond the printed technical data, considerations should be given to time/date stamps, classified security and derivative classification marks, destruction notices, destruction dates and destruction requirements. When the document exists as an IETP, in addition to the cost incurred, this will sub-optimize both the IETP and the printed technical publication.

2.4.10 Functionality definitions - Special content

2.4.10.1 Acknowledgement of warnings and cautions
This is the capability of the user to acknowledge warnings, cautions and notes in the technical data. Refer to Chap 3.9.3, Chap 6.2.2 and Chap 6.3.1.

Warnings and cautions must be readily identified and can require specific operator acknowledgment prior to proceeding with the presented data.

2.4.10.2 Emergency procedures
A functionality that will call up and display all emergency procedures associated with a system, subsystem or sub-subsystem. Refer to Chap 5.2.1.9, Chap 5.2.1.10, Chap 5.2.1.12, Chap 5.2.2.7 and Chap 5.2.3.2.

2.4.10.3 Photos
This is the capability to include photographic images in the technical data. Refer to Chap 3.9.2, Chap 4.4, Chap 4.8 and Chap 7.3.2.

Photos can be included to show a specific visual representation of actual systems. Presentation standards (such as resolution, the use of color, file size and file format) must be addressed as well as content and context of the photo.

2.4.10.4 Audio
This is the capability to provide sound within the technical data. Refer to Chap 3.9.2.4, Chap 4.8, Chap 7.3.3 and Chap 7.5.1.

Examples - operator warnings and cautions, presentation clips or complete audio representation of the data. Presentation standards must be addressed as well as content, duration and context of the audio. Consideration must be given to the anticipated environment to determine the usability of audio.

2.4.10.5 Motion video
This is the capability to provide video within the technical data. Refer to Chap 3.9.2.4, Chap 4.8, Chap 7.3.3 and Chap 7.5.1.

Motion video should be used as a supplement to the procedural text. Presentation standards must be addressed as well as content, duration and context of the video.

2.4.10.6 Animation
This is the capability to provide animated graphics within the technical data. Refer to Chap 3.9.2.4, Chap 4.8, Chap 7.3.3 and Chap 7.5.1.

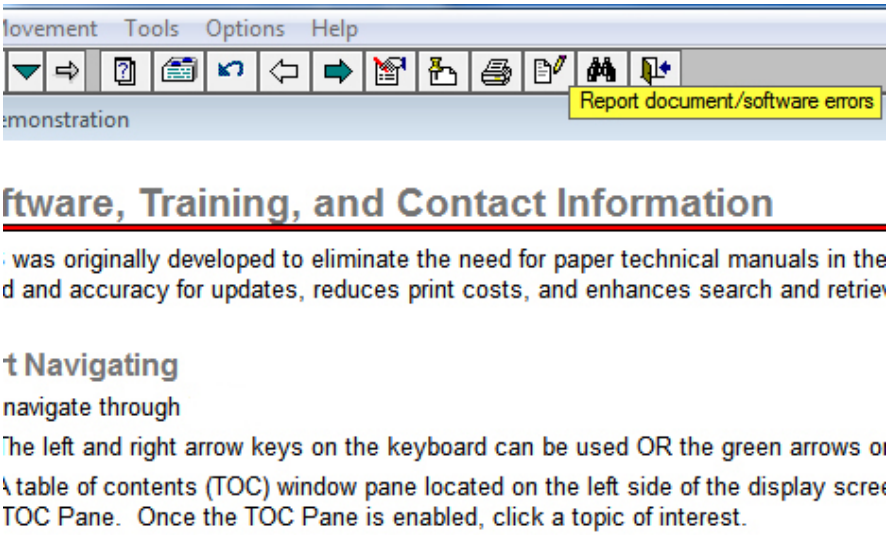
Animation should be used as a supplement to the procedural text. Animation can be included to show a variety of system functions from theory of operation (hydraulic flow) to maintenance procedures (how to access a specific part). Presentation standards must be addressed as well as content, duration and context of the animation.

2.4.10.7 Content sensitive help (Technical data help)
Help information based on the data being presented or the tasks being performed. Refer to Chap 3.9.1, Chap 6.3.1 and Chap 9.2.

Examples - Lists of acronyms, lists of abbreviations and definitions of acronyms and abbreviations. The type of help pertains to the particular subject matter of the data, such as the specific product. Content sensitive help can be delivered through pop-ups, dedicated help screens or pull down menus.

2.4.10.8 Context sensitive help (viewer help)
Help information for the IETP operation including the features and functions of the IETP viewer. This is an IETP viewer functionality.

Example - In many systems, right-clicking via the mouse or hovering the cursor over a particular graphic or menu item will cause a "tool tip" to pop up, providing help or a description for the specified feature.



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Fig 13 Context sensitive help

2.4.10.9 User training

This is the capability to integrate or link maintenance and/or operational training data with the IETP. This is both a data and IETP viewer functionality.

User training complexity can range from online access during IETP run time by linking to a CBT database to run complete training lessons.

Access of the data can be through a link to an external module or integrated with the IETP. Advanced capabilities can be to monitor usage and training access for the purpose of tracking user competency. Specific training courseware and or actions are not necessarily part of the data.

2.4.11 Functionality definitions - Updates

2.4.11.1 Passive change indications and markings

This is the capability to identify changes in the technical data through a list of changes only and not through visible marks within the actual technical data. Refer to Chap 5.3.1.2, Chap 8.4.1, Chap 8.4.2 and Chap 8.5.

Examples - List of Changes, Highlights Page or summary of changed data. Display and tracking of change information can drive costs.

2.4.11.2 Active change indications and markings

This is the capability to discretely identify and visibly mark each change in the data. Refer to Chap 3.9.5.2.1.1, Chap 6.2.2 and Chap 6.2.3.

Complexity can be affected by the methods of display, change identification and when they are removed or suppressed. The IETP can also include passive change markings. Display and tracking of change information can drive costs.

2.4.11.3 Full change

The capability to provide a complete replacement of the data previously distributed. Refer to Chap 3.9.5.2.1.1.

A full change can contain detailed change markings (or a change summary).

2.4.11.4 Block cycle and urgent changes
The capability to provide regularly scheduled updates to the technical data. Changes from all sources are consolidated and issued at regularly scheduled intervals. Urgent changes are interim updates between scheduled block cycle updates. Refer to Chap 3.9.5.2.1.1.

If block cycle updates are contracted, a company is responsible for providing both regularly scheduled updates to the data as well as urgent off-cycle updates as needed.

2.4.11.5 Near real time updates
The capability to quickly provide data updates to users rather than depending on a predetermined schedule. Refer to Chap 3.9.5.2.1.1, Chap 6.2.2 and Chap 6.2.3. This functionality requires the inclusion of the Network distribution and Network connectivity functionalities.

2.4.12 Functionality definitions - User operation mode

2.4.12.1 Web browser viewable
This is technical data that can primarily be viewed through a COTS Web browser. This is an infrastructure functionality.

The functionality selected in this matrix will determine the level of complexity and cost of implementing a Web browser viewable application. This can be accomplished directly through the Web browser (eg, Internet Explorer™) or through helper applications (eg, Adobe Acrobat™) or plug-ins (eg, IsoView™). Consideration will be required for a specific Web browser. Different implementations include remote access to a Web server, opening static HTML pages locally and Web server emulation on the client viewer.

2.4.12.2 Stand-alone mode
This is the capability to access the IETP via the hard drive on the stand-alone device after uploading data from a network or through a transfer media such as CD-ROM or DVD.

Consideration should be given for the update capabilities of this operating method. When in stand-alone mode, full update capability entails the update of the complete data after uploading from a network or through a transfer media such as CD-ROM or DVD. This method provides the lowest cost impact. When in stand-alone mode, a partial update capability entails the update of only the changed data from the previous release after uploading from a network or through a transfer media such as CD-ROM or DVD.

2.4.12.3 Network connectivity
This is the capability to access to the IETP via a network infrastructure. The data can be downloaded to or viewed on the client device. The data changes are installed on the host server and updates are transmitted via the network. This is infrastructure functionality.

Data changes are/can be incorporated as complete or partial updates.

Business rule decision point BRDP-S1-00539 - Selection of functionality using the functionality matrix:

- Decide on which functionality is required in the technical publications.

Chapter 6.4.2

Functionality - Functionality matrix

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References

Table 1 References

Chap No./Document No.	Title
Chap 6.4.1	Functionality - Background and explanation

1 General

The functionality matrix is found in Table 2 and described in Chap 6.4.1.

2 The functionality matrix

The functionality matrix is found in Table 2. Use of the functionality matrix is described in Chap 6.4.1.

Table 2 Functionality matrix

Functionality	Complexity – Page	Complexity – (IET)P	Requirement	All information sets	Front matter	Crew / operator	Description and operation	Maintenance procedures	Fault Isolation	Non-destructive testing	Corrosion control	Storage	Wiring data	IPD	Maintenance planning	Mass and balance	Recovery	Equipment	Weapon loading	Cargo loading	Stores loading	Role change	BDAR	Illust'd tool & support	Service bulletins	Material data	Common info. & data	Training	Applicability
Access																													
Login	2	2		A																									
Suspend and restart	1	1		A																									
Exit	1	1		A																									
Annotation																													
Action complete indicator (checkbox)	1	1																											
Global data annotation	2	2		A																									
Local data annotation	2	2		A																									

Functionality	Complexity – Page	Complexity – (IET)P	Requirement	All information sets	Front matter	Crew / operator	Description and operation	Maintenance procedures	Fault Isolation	Non-destructive testing	Corrosion control	Storage	Wiring data	IPD	Maintenance planning	Mass and balance	Recovery	Equipment	Weapon loading	Cargo loading	Stores loading	Role change	BDAR	Illust'd tool & support	Service bulletins	Material data	Common info. & data	Training	Applicability
Personal annotation	1	1		A																									
Redlining text	3	3		A																									
Redlining graphics	3	3		A																									
Delivery and Distribution																													
Printed publication	1	5		A																									
Physical media	1	1		A																									
Network distribution	2	2		A																									
Diagnostics																													
Diagnostics - User determined entry to data	1	1																											

Functionality	Complexity – Page	Complexity – (IET)P	Requirement	All information sets	Front matter	Crew / operator	Description and operation	Maintenance procedures	Fault Isolation	Non-destructive testing	Corrosion control	Storage	Wiring data	IPD	Maintenance planning	Mass and balance	Recovery	Equipment	Weapon loading	Cargo loading	Stores loading	Role change	BDAR	Illust'd tool & support	Service bulletins	Material data	Common info. & data	Training	Applicability
Diagnostics - Software driven entry to data	2	2																											
Dynamic diagnostics		5																											
Wire/Fluid system tracing	4	4																											
System simulation	4	4																											
Prognostics		5																											
External Processes																													
Parts ordering	3	3																											
Deficiency/Improvement report transmittal	3	3		A																									

Functionality	Complexity – Page	Complexity – (IET)P	Requirement	All information sets	Front matter	Crew / operator	Description and operation	Maintenance procedures	Fault Isolation	Non-destructive testing	Corrosion control	Storage	Wiring data	IPD	Maintenance planning	Mass and balance	Recovery	Equipment	Weapon loading	Cargo loading	Stores loading	Role change	BDAR	Illust'd tool & support	Service bulletins	Material data	Common info. & data	Training	Applicability
Maintenance data collection	3	3																											
Operator debriefing	3	3																											
Resource scheduling	3	3																											
Knowledge management		5																											
Other external application: _____																													
Graphics																													
Pan, zoom, expand, magnify	1	1		A																									

Functionality	Complexity – Page	Complexity – (IET)P	Requirement	All information sets	Front matter	Crew / operator	Description and operation	Maintenance procedures	Fault Isolation	Non-destructive testing	Corrosion control	Storage	Wiring data	IPD	Maintenance planning	Mass and balance	Recovery	Equipment	Weapon loading	Cargo loading	Stores loading	Role change	BDAR	Illust'd tool & support	Service bulletins	Material data	Common info. & data	Training	Applicability
Assembly/Disassembly	2	2																											
Locator graphics	1	1																											
3D modeling	4	4																											
Linking																													
External reference	2	2		A																									
Internal references	1	1		A																									
Hot reference	2	2		A																									
Link to separate parts data	2	2		A																									

Functionality	Complexity – Page	Complexity – (IET)P	Requirement	All information sets	Front matter	Crew / operator	Description and operation	Maintenance procedures	Fault Isolation	Non-destructive testing	Corrosion control	Storage	Wiring data	IPD	Maintenance planning	Mass and balance	Recovery	Equipment	Weapon loading	Cargo loading	Stores loading	Role change	BDAR	Illust'd tool & support	Service bulletins	Material data	Common info. & data	Training	Applicability
TOC, lists of figures, tables and photos	1	1		A																									
Hot spotting	3	3		A																									
Navigation																													
Next and previous	1	1		A																									
Return (Chronological)	1	1		A																									
History of traversed links	1	1		A																									
User creation of bookmarks	1	1		A																									

Functionality	Complexity – Page	Complexity – (IET)P	Requirement	All information sets	Front matter	Crew / operator	Description and operation	Maintenance procedures	Fault Isolation	Non-destructive testing	Corrosion control	Storage	Wiring data	IPD	Maintenance planning	Mass and balance	Recovery	Equipment	Weapon loading	Cargo loading	Stores loading	Role change	BDAR	Illust'd tool & support	Service bulletins	Material data	Common info. & data	Training	Applicability
System/Subsystem navigation	1	1		A																									
Restore initial navigation view	1	1		A																									
Audit trail	2	2		A																									
Graphical navigation	2	2																											
Dialog-driven interaction	3	3																											
Voice-Activated commands	3	3		A																									
Search - Full text	1	1		A																									
Search - User defined Boolean	1	1		A																									

Functionality	Complexity – Page	Complexity – (IET)P	Requirement	All information sets	Front matter	Crew / operator	Description and operation	Maintenance procedures	Fault Isolation	Non-destructive testing	Corrosion control	Storage	Wiring data	IPD	Maintenance planning	Mass and balance	Recovery	Equipment	Weapon loading	Cargo loading	Stores loading	Role change	BDAR	Illust'd tool & support	Service bulletins	Material data	Common info. & data	Training	Applicability
Search - Across multiple databases/files	4	3		A																									
Search - Context	2	2		A																									
Search - Key word	2	2		A																									
Filter content per applicability	2	1		A																									
Simultaneous display of multiple content objects	2	2		A																									
Tear off window	2	2		A																									
Printing																													
Print screen	1	1		A																									

Functionality	Complexity – Page	Complexity – (IET)P	Requirement	All information sets	Front matter	Crew / operator	Description and operation	Maintenance procedures	Fault Isolation	Non-destructive testing	Corrosion control	Storage	Wiring data	IPD	Maintenance planning	Mass and balance	Recovery	Equipment	Weapon loading	Cargo loading	Stores loading	Role change	BDAR	Illust'd tool & support	Service bulletins	Material data	Common info. & data	Training	Applicability
Data module specific printing	1	2		A																									
Print linked data	2	2		A																									
Fully formatted/book version	4	5		A																									
Special Content																													
Acknowledge warnings and cautions	1	1		A																									
Emergency procedures	2	2		A																									
Photos	1	1																											
Audio	2	2																											

Functionality	Complexity – Page	Complexity – (IET)P	Requirement	All information sets	Front matter	Crew / operator	Description and operation	Maintenance procedures	Fault Isolation	Non-destructive testing	Corrosion control	Storage	Wiring data	IPD	Maintenance planning	Mass and balance	Recovery	Equipment	Weapon loading	Cargo loading	Stores loading	Role change	BDAR	Illust'd tool & support	Service bulletins	Material data	Common info. & data	Training	Applicability
Motion video	3	3																											
Animation	4	4																											
Content sensitive help (Tech data help)	1	1		A																									
Context sensitive help (Viewer)	2	2		A																									
User training	3	3		A																									
Updates																													
Passive change indications and markings	1	1		A																									

Functionality	Complexity – Page	Complexity – (IET)P	Requirement	All information sets	Front matter	Crew / operator	Description and operation	Maintenance procedures	Fault Isolation	Non-destructive testing	Corrosion control	Storage	Wiring data	IPD	Maintenance planning	Mass and balance	Recovery	Equipment	Weapon loading	Cargo loading	Stores loading	Role change	BDAR	Illust'd tool & support	Service bulletins	Material data	Common info. & data	Training	Applicability
Active change indications and markings	2	2		A																									
Full change	1	1		A																									
Block cycle and urgent changes	2	2		A																									
Near real time updates	2	2		A																									
User Operation Mode																													
Web browser viewable	3	3		A																									
Stand alone mode	1	1		A																									
Network connectivity	2	2		A																									

Chapter 7

Information processing

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Chap 7.4	Information processing - Generation of publications	S1000D-A-07-04-0000-00A-040A-A	All
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Chap 7.4.1.1.1	Generation process - XML based links	S1000D-A-07-04-0101-01A-040A-A	All
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Chapter 7.1

Information processing - Introduction

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Chap 7.4	Information processing - Generation of publications
Chap 7.5	Information processing - Information interchange
Chap 7.6	Information processing - Software requirements
Chap 7.7	Information processing - Guidance and examples
Chap 7.8	Information processing - Applicability

1 General

1.1 Scope

The chapter gives general information, directives and advice in four main aspects:

– creation and maintenance of CSDB objects

- generation of publications
- interchange of information
- technical requirements for display systems

Although some basic guidelines are provided regarding the principle characteristics of systems that support the specification, it is not suggested how such a system should be implemented, nor are any specific tools suggested for such an implementation.

1.2 Purpose

The purpose of this chapter is to describe and explain the technical aspects of the information processing. This chapter provides information that is sufficient for understanding and implementing the technical concepts of S1000D. However, additional resources and examples are available at www.s1000d.org.

2 Content

2.1 Related standards

The standards specific to information processing are listed in Chap 2.2.

2.2 Basic concepts

An overview of the basic concepts of the S1000D technical solutions is given in Chap 7.2. This can be used as an introduction to the features that constitute the technical backbone of the specification.

2.3 CSDB objects

Relevant information on the technical implications of creation and maintenance of the content of a CSDB is given in Chap 7.3.

The chapter contains a useful introduction to and overview of the XML Schemas. It covers:

- descriptions of the Schemas
- definition of S1000D profiles for raster and vector graphics and technical methods for implementing graphical hotspots

2.4 Generation of publications

Information on the generation of publications from a CSDB is given in Chap 7.4.

From a technical point of view, the chapter covers:

- descriptions of publication related Schemas
- production of page-oriented publications
- compilation of IETP including linking mechanism specifics
- inclusion of legacy information

2.5 Information interchange

Details on the interchange of S1000D based information are given in Chap 7.5.

From a technical point of view, the chapter covers:

- interchange supporting resources (eg, Schema)
- methods and specifics on the interchange of data modules and compiled publications

2.6 Software requirements

The requirements for software, in support of the process data module and resource resolution, are given in Chap 7.6. It covers the requirements for basic functional properties of the software, (eg, the logic engine), which is needed to execute and display process data modules.

2.7 Guidance and examples

In support of implementation and use of an S1000D environment, guidance and examples are given in Chap 7.7.

2.8 Schema availability

Electronic copies of the Schemas for all XML CSDB objects are available for download from the S1000D web site at www.s1000d.org. In addition, online HyperText Markup Language (HTML) documentation of the Schemas and a set of sample instances can be downloaded from the S1000D web site.

2.9 Applicability

The technical aspects of evaluating applicability annotations together with guidance on the generation of applicability display text are given in Chap 7.8.

Chapter 7.2

Information processing - Basic concepts

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Chap 7.6.1	Software requirements - Process data module requirements

Chap No./Document No.	Title
Chap 7.6.2	Software requirements - Resource resolution service
Chap 7.7	Information processing - Guidance and examples

1 General

The purpose of this chapter is to give an overview of some characteristics and technical requirements concerning information processing.

A characteristic of S1000D is that it outlines an open systems approach to the production of technical publications. The specification does not take into account any particular tool or other proprietary solution. It is important to recognize that system and tool independence (eg, in addressing) is a necessity for interoperability across distributed S1000D implementations.

2 Concepts

2.1 Use of XML

The XML Schema package, provided by S1000D, covers the factual information (contained in data modules) produced within and for the Product. It also contains the documentation process related information, such as data dispatch notes included in transfer packages.

The Schema package is provided as a set of self-standing schemas, each representing a certain type of object, such as a procedural or fault isolation data module. These schemas are referable by their URL and available for invocation online by produced data modules as specified in Chap 7.3.1.3. With the exceptions of XLink, Resource description framework and Dublin core fragments (refer to Chap 7.3), each of the schemas declare all components (elements and attributes) that are used in the schema.

For maintainability reasons, the schema package is maintained in a highly modularized form where each part defines objects of a certain type (eg, "complexType" Schema objects), and where each Schema fragment is focused on its specific characteristics and substructures. The application Schema, representing specific types of data modules (eg, descriptive, procedural) are then composed by invocation of a suitable selection of the parts. This variant of the Schema package is usually referred to as the "modularized XML Schema package" (as opposed to the published "flattened Schema package") and is the master for maintenance and development of the S1000D technical base. Even though the modularized Schema package is not supposed to be referenced by factual CSDB objects it is made available for download on www.s1000d.org. The incentive to make this variant of the package available is that it fs potentially be used efficiently when S1000D is being implemented. There are not supposed to exist any produced data modules, or other objects, that refer to the modularized schemas as their underlying structure.

A detailed method of compiling publications, based on XML, is given in Chap 7.4.

Note

As of issue 4.0 of the specification support for Document Type Definition (DTD) is dropped.

2.2 Graphics and multimedia

Exchange of graphics and multimedia across information systems infrastructure (eg, platforms, tools, systems) has always been an area of considerable difficulty. This also applies to S1000D, since it, by definition, adopts an open system approach.

Information about the use of graphics, multimedia, supported graphics and multimedia formats and interchange of graphics and multimedia can be found in Chap 3.9.2, Chap 4.8, Chap 7.3.2 and Chap 7.3.3.

2.3 Referencing and linking

The S1000D Schemas provide specific constructs for expressing cross-references within and references between data modules, including references to, from and within graphics and multimedia elements. In addition, there are supported methods of referencing other information such as legacy publications.

The reference constructs enable a strict and formal method of referring from one place in a publication package to another, and to enable automated resolution of these references into hyperlinks. Refer to Chap 3.9.5.2.1.2.

The reference constructs are based on open standards. However, their main aim is to provide sufficient information to resolve them into hyperlinks, regardless of the technique used. This allows for the use of the S1000D's own "linking language" as described in Chap 7.4.1 and Chap 7.4.2.

Linking mechanisms and resource resolution in a web environment are further described in Chap 7.6.2.

2.4 Processes

The specification also includes a method for preparing data in the form of processes. These processes order the sequence of data modules and/or steps within the process, where the traversal through that sequence can be influenced by user interaction and/or environment conditions (typically equipment status). This sequencing is represented by process data modules, which provide the means to increase the interactivity of IETP, including the possible integration of the information with the Product.

The process concept also introduces the use of a logic engine. This, and its relation to the process data module, is given in Chap 4.11.

More detailed information about the process data module and logic engine can be found in Chap 3.9.5.2.10, Chap 6.3.1, Chap 7.6.1 and Chap 7.7.

2.5 Tailoring the application of Schemas

S1000D compliant projects must use the Schemas as supplied. However, a project or an organization can configure the use of various attribute values within the Schemas as described in Chap 7.3 and Chap 3.9.6, as interpreted in their business rules.

Chapter 7.3

Information processing - CSDB objects

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Chap 7.4	Information processing - Generation of publications
Chap 7.5	Information processing - Information interchange

1 General

1.1 Purpose

The purpose of this chapter is to describe and explain the technical aspects of creation and maintenance of CSDB objects. It concentrates on providing information about the underlying XML technology for generating and maintaining data modules.

1.2 Scope

Besides the description of the XML Schema structure for data modules, this chapter also contains information and guidance on the preparation of graphics and their definition within data module text for hyper-linking and navigation through graphical hotspots, as well as providing guidance on the selection and use of multimedia.

It covers the following:

- a description of the XML Schemas for data modules. Refer to Chap 7.3.1
- a description of the technical methods for implementing graphical hotspots. Refer to Chap 7.3.2 and Chap 3.9.5.2.1.8.
- a description of the technical methods for implementing multimedia. Refer to Chap 7.3.3

Note

XML Schemas for other CSDB objects such as publication modules, data management lists, comments and data dispatch notes are described in corresponding chapters. Refer to Chap 7.4 and Chap 7.5.

Chapter 7.3.1

CSDB objects - Schema

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Chap 7.3.1.1	Schema - Change summary
Chap 7.3.1.3	Schema - Invocation
Chap 7.3.1.4	Schema - Backwards compatibility

1 General

Technical background on the S1000D Schemas for all CSDB objects is provided here.

2 XML Schemas

The rules and guidance for XML Schemas are given in the following chapters:

- Chap 7.3.1.1 provides a summary of Schema changes
- Chap 7.3.1.3 provides the information how to invoke the corresponding Schema for the different types of CSDB objects
- Chap 7.3.1.4 provides a summary of backward incompatibilities with the Schemas between this issue and Issue 4.0.1

The Schemas can be referenced on the S1000D web site at www.s1000d.org by use of the respective URL shown in Chap 7.3.1.3. In addition, electronic copies of the Schemas are available for download from the web site at www.s1000d.org. In production, when accessing a Schema by the web is impossible or inconvenient, local copies of the Schema can be used. If so, conformant Schema invocation statements can be achieved if the OASIS XML catalog feature is implemented.

Chapter 7.3.1.1

Schema - Change Summary

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1 General

1.1 Purpose

The purpose of this chapter is to provide technical background on S1000D data module XML Schema development.

1.2 Scope

Only the changes to the S1000D XML Schema brought about by the Change Proposal Forms (CPF) approved for this issue are recorded in this chapter.

2 Summary of changes

The changes to the XML Schema for data modules are:

- CPF 2011-009DE - Information name variant
  - Introduced the element <`infoNameVariant`> as an optional child of the element <`dmTitle`>
- CPF 2011-020S1 - `condRefId` mandatory in incorporation status
  - Changed the definition of the attribute `condRefId` of the element <`condIncorporation`> from optional to mandatory
- CPF 2013-063DE - Redefine the type of attribute `toleranceValue`
  - Changed the type of the attribute `toleranceValue` from integer to decimal

- CPF 2013-068EPWG - textElemGroup and attentionText not redefined correctly in ACT
  - Redefined the groups textElemGroup and attentionText by deleting the child elements <zoneRef>, <controlIndicatorRef>, <accessPointRef>, <identNumber>, <caption> and <captionGroup>
- CPF 2013-069EPWG - Attribute sparePartClassCode definition
  - Changed the definition of the attribute sparePartClassCode of the element <sparePartClass> to attribute type sparePartClassCodeAttType that restricts the permissible values to "0", "1", "2", or "6"
- CPF 2015-016AA – Identification of Regulatory Information
  - Added new optional element <controlAuthorityGroup> to the element <dmStatus>
  - Replaced attribute group authorityAttGroup with new attribute controlAuthorityRefs
  - Added new attribute controlAuthorityRefs everywhere attribute group changeAttGroup exists
  - Added new attribute controlAuthorityRefs everywhere attribute applicRefId exists
  - Added new attribute controlAuthorityRefs to elements <dmodule>, <content> and <illustratedPartsCatalog>
- CPF 2015-026EPWG - Verbatim text
  - Added a FIXED attribute xml:space="preserve" to the element <verbatimText>
- CPF 2017-013AA - Conflicting Usage Instructions for the attribute allowedObjectFlag
  - Changed the usage of the attribute allowedObjectFlag to mandatory in the element <objectPath>
- CPF 2017-017DE - Remove <subjectVariantSegment> from IPD
  - Removed the element <subjectVariantSegment> from the IPD Schema
- CPF 2017-026AA – Make usableOnCodes Repeatable
  - Made the <usableOnCodeEquip> and <usableOnCodeAssy> elements within the <applicabilitySegment> repeatable.
- CPF 2017-028AA - IPD indenture attribute clarification
  - Changed the definition of the attribute indenture of the element <catalogSeqNumber> from a nonNegativeInterger to a restricted integer.
- CPF 2017-030AA – To allow Maintenance-Level Filtering without Data Replication

- Added the optional attribute `applicRefIds` to the element <`referTo`>.

Chapter 7.3.1.2

Data module Schema - Modular structure

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Chap 3.9.5.2	Data modules - Content section

1 General

This chapter describes the modular Schema for data modules and gives background information on its development and maintenance procedures.

2 Modular structure

2.1 Background

2.1.1 Application of XML

S1000D requires a unified and neutral way of describing technical information for the Product in any project. This chapter details the S1000D application of XML, a method for describing the structure of a technical document regardless of the final publishing process. XML is system and platform independent data format, thus enabling interchange of technical information across software applications.

The S1000D Schemas for data modules consist of entities which are specific to a type of data module as specified in Chap 3.9.5.2. This modular design of the Schemas allows for incremental update when new types of data modules are required.

To provide a versatile support to system/tool implementers, S1000D contains definitions of the object structures (data modules, etc) in several formats. Thus, apart from the modular Schema, which is the master, all structures are also provided in the flat Schema.

2.1.2 Development objectives

The S1000D Schemas for data modules have been developed with the following objectives:

- modular form. The master Schemas have a modular form that provides a very good basis for simple and safe maintenance of the Schemas.
- compliance with standards. The prime structure of the Schemas reflects the S1000D specification. The Schemas comply with W3C recommendations.
- versatile implementation formats. The modular master Schemas enable simple automatic generation of the data module structures in flat Schemas.
- backward compatibility. To ensure as far as possible backward compatibility between subsequent versions and the initial Schemas.

2.1.3 Development phases

2.1.3.1 Analysis

Schema development involved the analysis of S1000D requirements, the generation of XML content models and the evaluation of the most effective way of modularization. Structure charts produced from the analysis of different data module types were included in this phase.

2.1.3.2 Testing

Schema testing is undertaken at two levels:

- component testing of the individual Schema modules
- integrated testing of the complete Schema

During construction and update, the Schemas are parsed to ensure compliance with the W3C recommendations. To ensure a wide usability of the Schemas, this activity is carried out on a number of different available parsers. The testing includes integration of graphics and multimedia objects with the XML coded text.

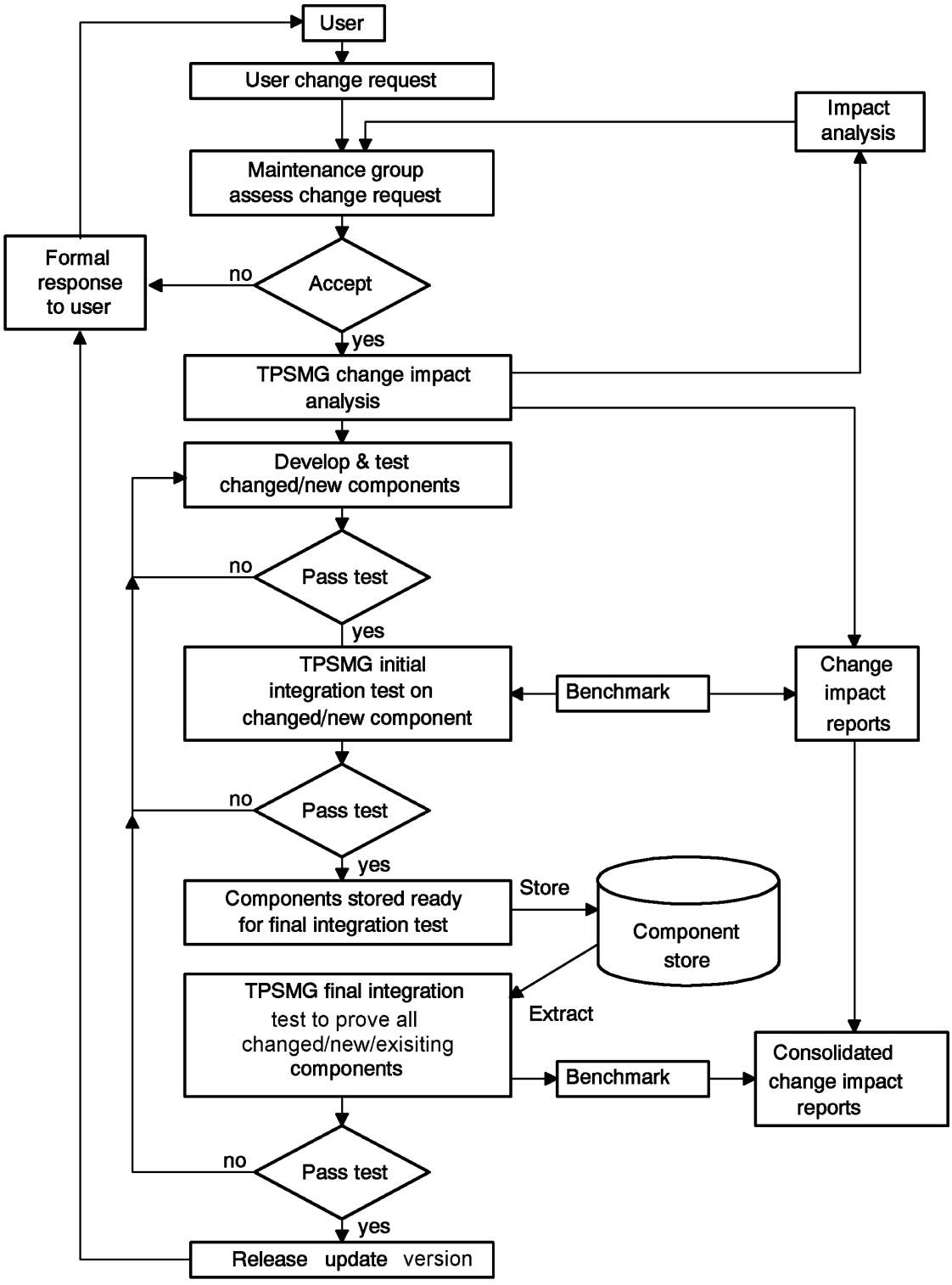
2.1.3.3 Review and approval

Before release of a specific version reflecting the requirements of the corresponding S1000D issue and change, the Schemas are reviewed by the Electronic Publications Working Group (EPWG) and approved by the Steering Committee.

2.1.4 Life cycle management

To achieve the necessary control during subsequent maintenance of the Schemas a life cycle management procedure is applied. Strict version control of releases is maintained.

Fig 1 shows the development and life cycle upgrade plan.



ICN-S1000D-A-07030102-G-S3627-00058-A-03-1

Fig 1 Schema development and life cycle upgrade plan

2.1.5 Ownership and usage

The S1000D Schemas are in the public domain; however, they remain the property of the S1000D issuing authorities. There are no additional charges or royalties required. In the event that users change the Schemas, then it is not allowed to use the name or reference S1000D Schemas for the results.

2.2 Overview of modular structure

This section gives an overview of the structural breakdown of the Schemas for data modules.

2.2.1 Theory of operation

The modular Schema structure is controlled by incorporating the different Schema modules as required. The paths through the Schema are given by references to and inclusion of the corresponding Schema modules. As applicable redefinitions of reused schema objects are made.

There is one main entry for each type of data module structure. The main entry for Schemas is given in each data module XML instance by attribute `xsi:noNamespaceSchemaLocation` of the root element <`dmodule`>.

Each "main" entity:

- redefines as needed the definition of objects that are reused
- includes the various components (complexTypes)
- declares the root element <`dmodule`>

Chapter 7.3.1.3

Schema - Invocation

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1 General

1.1 Purpose

Technical information on S1000D XML Schema invocation is provided below.

1.2 Scope

How to invoke the appropriate XML Schemas that specify the structures of the various types of CSDB objects is described here.

For each type of CSDB object it is shown how to call the corresponding XML Schema.

For XML instances to be validated against the corresponding XML Schema, the main entry point to the XML Schema must be given as the content of attribute `xsi:noNamespaceSchemaLocation` in Uniform Resource Locator (URL) form. Examples are given below.

2 Applicability Cross-reference Table (ACT) information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/
appliccrossreftable.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

3 Business rules document information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/brdoc.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

4 Business rules exchange information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/brex.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
```

```
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

5 Checklist information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/checklist.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

6 Comment information

```
<!DOCTYPE comment [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/comment.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

7 Common information repository (CIR) information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/comrep.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

8 Conditions Cross-reference Table (CCT) information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/
condcrossreftable.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

9 Container information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/container.xsd"
```

```
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

10 Crew/Operator information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/crew.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

11 Data dispatch note information

```
<!DOCTYPE ddn [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/ddn.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

12 Data management list information

```
<!DOCTYPE dml [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/dml.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

13 Descriptive information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/descript.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

14 Fault information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/fault.xsd"
```

```
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

15 Front matter information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/
frontmatter.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

16 ICN metadata information

```
<!DOCTYPE icnmetadata [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/
icnmetadata.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

17 Learning information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/learning.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

18 Maintenance planning information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/schedul.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

19 Parts information

```
<!DOCTYPE dmodule [
]>
```

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/ipd.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

20 Procedural information

```
<!DOCTYPE dmodule [
]>
```

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/proced.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

21 Process module information

```
<!DOCTYPE dmodule [
]>
```

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
http://www.s1000d.org/S1000D_4-2/xml_schema_flat/process.xsd
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

22 Product Cross-reference Table (PCT) information

```
<!DOCTYPE dmodule [
]>
```

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/
prdcrossreftable.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

23 Publication information

```
<!DOCTYPE pm [
]>
```

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
http://www.s1000d.org/S1000D_4-2/xml_schema_flat/pm.xsd
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

24 SCO content information

```
<!DOCTYPE dmodule [
]>
```

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/
scocontent.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

25 SCORM content package information

```
<!DOCTYPE scormcontentpackage [
]>
```

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/
scormcontentpackage.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

26 Service bulletin information

```
<!DOCTYPE dmodule [
]>
```

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/sb.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

27 Update information

```
<!DOCTYPE dataupdatefile [
]>
```

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/update.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

28 Wiring data information

```
<!DOCTYPE dmodule [
]>
```

```
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/wrngdata.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

29 Wiring data description information

```
<!DOCTYPE dmodule [
]>

<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation=
"http://www.s1000d.org/S1000D_4-2/xml_schema_flat/wrngflds.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
```

Chapter 7.3.1.4

Schema - Backwards compatibility

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Table 1 References

Chap No./Document No.	Title
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1 General

1.1 Scope

The scope of this chapter is limited to summarizing the backward incompatibilities between the previous issue and this issue of the XML Schema for data modules.

1.2 Purpose

This chapter provides details of the character and degree of changes that are included in this issue. It also provides guidance when for assessing the impact of converting an existing CSDB from any previous issue to this issue and can be used as a source of information, among many others, when selecting the issue of the specification that is most suitable for a project to adopt.

1.3 Previous backward compatibilities

Details of the backwards compatibilities between previous issues of the XML data module Schema are in Issue 4.2 of S1000D.

2 Numbering releases of the specification

2.1 Major

A major backward incompatibility is one where some degree of human intervention is required to convert data from one issue of the specification to another.

2.2 Minor

A minor backward incompatibility is one where automated processes can be used to convert data from one issue of the specification to another with less human intervention.

Beginning with Issue 4.0, major releases are always backward incompatible. Major releases of S1000D can contain both major and minor incompatibilities whereas minor releases only contain minor incompatibilities.

All major releases are given an issue number that is incremented in the first position. For example, a major issue after Issue 4.6 is numbered Issue 5.0.

The issue number of a minor release is increased in the second position. For example, the first minor release after Issue 5.0 is numbered 5.1.

2.3 Patches

Patches are indicated by addition of an alpha in the third position of the issue number; for example, Issue 4.1.A.

3 Backward compatibility description of Issue 5.0

- 2017-017DE - <subjectVariantSegment> removed.
  The child element <subjectVariantSegment> of element <initialProvisioningProject> was removed. It is no longer supported by S2000M. Refer to Chap 3.9.5.2.7.
- 2015-016AA - Regulatory Information
  The attribute controlAuthorityRefs replaces attributes authorityName and authorityDocument.
- 2013-068EPWG - textElemGroup and attentionText are redefined in ACT to align with CCT and PCT definition.
  The elements <zoneRef>, <controlIndicatorRef>, <accessPointRef>, <identNumber>, <caption>, <captionGroup> are no longer available in the applicrossreftable.xsd schema. Refer to Chap 3.9.3 and Chap 3.9.5.2.1.10.
- 2011-021S1 - condRefId mandatory in incorporation status.
  The definition of the attribute condRefId of the element <condIncorporation> changes from optional to mandatory. Refer to Chap 3.9.5.3.2 and Chap 4.14.2.
- 2017-029BRWG – brDoc gaps
  - Changed all occurrences of '<brDecisionpointText>' to '<brDecisionPointText><para>'.
  - Changed all occurrences of '</brDecisionPointText>' to '</para></brDecisionPointText>'.

Chapter 7.3.1.5

Data module Schema - Configuration of attributes

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Table 1 References

Chap No./Document No.	Title
Chap 3.9.6	Authoring - Attributes
Chap 4.10	Information management - Business rules exchange

1 General

1.1 Purpose

The purpose of this chapter is to provide number of attributes with values and interpretations that can be adjusted to the needs of the project or the organization.

S1000D also provides a means for the tailoring of these attributes in a controlled manner. This is permissible for such attributes that are not crucial for the function of the specification.

Note

All tailoring must be made in such a way that maximizes interoperability.

2 Configuration of attributes

Chap 3.9.6 provides a listing of the attributes concerned, including their defined values sets.

2.1 Tailoring method

To each configurable attribute, S1000D allocates a set of values. For a subset of these values there is an S1000D interpretation of each value. In addition, for each attribute there are a number of specific values open to interpretation by the project or the organization.

Tailoring can be of these kinds:

- reduction of the set of attribute values defined in the Schemas, in order to match the project or the organization needs
- introduction of interpretations for project available values (51-99)
- translation of interpretations of S1000D reserved values to other languages (eg, for styling purposes)

It is imperative that tailoring (ie, sub-setting) of attribute values does not violate project or organization requirements. Furthermore, the agreed interpretations must be communicated within the project or the organization to enable all parties concerned to take the proper measures to handle the values/interpretations (eg, in viewers).

2.1.1 S1000D configurable attributes

The attribute value sets available for tailoring are described in Chap 3.9.6. Each attribute contains assigned values by S1000D which must not be changed and a set of values available for project or organization specific definition.

2.1.2 Project BREX file

Project specific use of allowable attribute values are to be reflected in a project specific BREX data module. Refer to Chap 4.10.

Note

If, for some reason, a project BREX data module is not employed, then information of how attributes are used, like information about tailoring in general, must be communicated by some other means.

The sets of attribute values defined in Chap 3.9.6 and in the default BREX data module must not be extended by further values.

Chapter 7.3.2

CSDB objects - Graphics

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Chap 3.9.5.2.1.8	Common constructs - Hotspots
Chap 4.4	Information management - Information control number
Adobe TIFF 6.0	TIFF Revision 6.0
ISO/IEC 8632:1999	Computer Graphics Metafile
REC-webcgm21-20100301	W3C Recommendation: WebCGM 2.1

1 General

This chapter contains information and guidance on the preparation of graphics for hyper-linking and navigation through graphical hotspots. It defines in particular the S1000D profiles for Tagged Image File Format (TIFF) raster graphics and CGM vector graphics, and describes the technical methods for implementing graphical hotspots.

The concept of graphical hotspots is based on the World Wide Web Consortium (W3C) WebCGM profile which utilizes standard CGM version 4 Application Structures (APS) of ISO/IEC 8632:1999 for grouping graphical primitives into addressable objects.

A graphics object can be accompanied by metadata provided in a separate ICN metadata file. For details on its use, refer to Chap 3.9.2.7.

2 Graphic requirements

The basic S1000D principle for graphics is that they must contain only graphical information. Apart from identifiers such as callout/item numbers or generic names, all other non-graphical information associated with the building blocks of a graphic or the graphic itself must be stored and maintained externally in the XML environment. This basic principle also applies to legends and other textual information such as notes and annotations.

Embedded non-graphical information inhibits the reuse of graphics in different contexts and requires the use of a graphics editor tool to maintain them. An example for reuse is to provide the same illustration in electronic parts catalogs for different natural languages.

For illustrations containing or made up of raster images, CGM is the recommended S1000D format for interchange.

2.1 CGM versions

ISO/IEC 8632 defines four metafile versions. Every metafile declares its version with the METAFILE VERSION element in the metafile descriptor. All versions are nested and upwardly compatible. A valid version 1 metafile is automatically a valid version 2, 3, and version 4 metafile, and so on. This means for example that a metafile version 1 can be enriched by only version 4 elements for using it in intelligent graphics applications.

2.1.1 Metafile version 1

Version 1 provides a basic drawing and picture interchange capability. It is relatively simple, and is suited to simple and common graphical tasks. Nevertheless, this basic drawing set also

embraces more sophisticated graphical primitives than just polylines, polygons, or graphical text: Rectangles, circles, ellipses and arcs are also permitted in version 1 metafiles.

2.1.2 Metafile version 2

Version 2 metafiles allow all version 1 elements, and add graphical segment capabilities. Notable additions are: segmentation and the closed figure primitive.

Note

Segmentation is prohibited in the profile.

2.1.3 Metafile version 3

Version 3 metafiles permit version 1 and 2 elements, and add the capability to represent compressed tiled images, define external symbol libraries, and provide greater control of drawing aspects. Beside compound regions and paths, higher-level primitives such as hyperbolic and parabolic arcs, non-uniform B-splines, and polybeziers were introduced. The support of these higher-level primitives is essential when transforming 3D Computer Aided Design (CAD) data to 2D CGM. Version 3 provides a significant increase in CGM's capability.

2.1.4 Metafile version 4

Version 4 metafiles allow all previous version elements, and add application-structuring extensions. These capabilities are critical for the use of CGM in intelligent graphics applications.

2.2 Terminology

2.2.1 Application profile

An Application Profile (AP) is a set of specifications (beyond that in ISO/IEC 8632) appropriate to a particular environment. Profiles are used as a method for defining subsets of ISO/IEC 8632 by identifying the CGM elements, parameters, options, and implementation requirements necessary for the effective and unambiguous use of the standard.

2.2.2 Application structure

An Application Structure (APS) is a sequence of metafile elements delimited by the BEGIN APPLICATION STRUCTURE and END APPLICATION STRUCTURE elements, containing one or more optional APPLICATION STRUCTURE ATTRIBUTE elements and containing one mandatory BEGIN APPLICATION STRUCTURE BODY element. APS are used to group CGM elements for retrieval, hyperlinking, and other specific application-dependent operations.

An APS is uniquely identified within a metafile by the value of the ID parameter associated with its BEGIN APPLICATION STRUCTURE element.

Note

APS with different ID parameter values can be nested to any level.

2.2.3 CGM element

A CGM element is a functional item that can be used to construct a picture or convey information.

2.2.4 CGM generator

The process or equipment that produces the CGM is called a CGM generator.

2.2.5 CGM interpreter

The process or equipment that reads the CGM and interprets the contents is called a CGM interpreter.

2.2.6 Graphical hotspot

A graphical hotspot is a graphical object that participates in a link.

2.2.7 Graphical object

A graphical object is an addressable logical unit within a picture grouping graphical primitives and/or graphical objects. These groups are realized as standard CGM version 4 APS and allow a hierarchical structure to be imposed on a picture or to create collections of graphical objects.

2.2.8 Graphical primitive

A graphical primitive is a basic drawing element that defines the geometry and its presentation. Examples are:

- simple generic drawing primitives such as polylines, polygons, and sets of these
- specialized primitives such as rectangles, circles, ellipses, circular and elliptical arcs
- graphical text primitives such as restricted text and append text
- curves such as hyperbolic and parabolic arcs, non-uniform B-splines, and polybeziers
- embedded raster elements such as cell and tile arrays in uncompressed or compressed (CCITT4, Joint Photographic Experts Group (JPEG) or PNG) format.

Graphical primitives have rendering details and/or properties associated with them such as line attributes (type, width, color, etc), fill attributes (color, hatch style, pattern, etc) or text attributes (color, path, alignment, font, etc), where appropriate.

2.2.9 Metafile

A metafile is a mechanism for the storage and transfer of graphical data and control information in a device-independent manner. A metafile consists of one or more pictures, which in turn are composed of graphical primitives and their associated attributes.

2.3 S1000D CGM profile

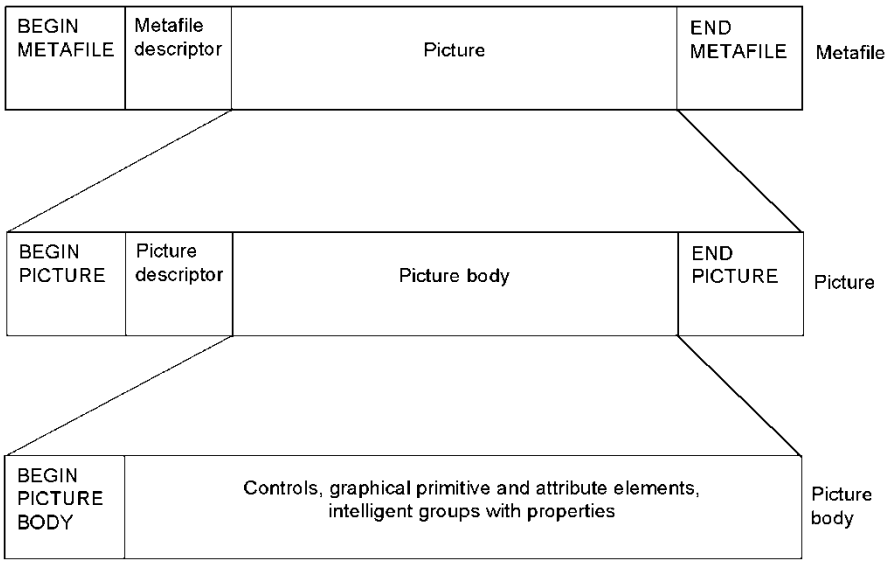
2.3.1 General

The S1000D CGM profile is defined as a cascading profile from the W3C Recommendation: REC-webcgm21-20100301. WebCGM 2.1 is a full profile based on the ISO model profile as defined in ISO/IEC 8632:1999.

The presentation of the cascading profile maintains the table numbering from the ISO model profile, but only presents table entries where the S1000D profile differs from WebCGM. References in the functionality column of the profile usually relate to sections in the CGM standard.

2.3.2 CGM structure

Fig 1 shows the structure of an S1000D CGM that consists always of one and only one picture. The picture itself contains CGM version 1, 2 or 3 graphic elements as well as version 4 application structures.



ICN-C0419-S1000D0095-001-01

Fig 1 S1000D CGM structure

2.3.3 Profile details

2.3.3.1 Delimiter elements

Table 2 lists the delimiter elements which are profiled for S1000D.

Table 2 Delimiter elements

Functionality	Specifications - S1000D profile	Specifications - WebCGM profile
T.15.1	Same as WebCGM profile: No	Same as ISO model profile: Yes
BEGIN METAFILE	Element is: Required Yes	Element is: Required Yes
END METAFILE	The metafile identifier parameter **must** follow the rules for non-graphical text, clause 9.5.4.6 and T.14.5.	The metafile identifier parameter shall follow the rules for non-graphical text, clause 9.5.4.6 and T.14.5.
	Other: **The metafile id string contains the S1000D ICN including the prefix "ICN-" without any file extension.**	Other: None
T.15.9	Same as WebCGM profile: No	Same as ISO model profile: No
BEGIN APPLICATION STRUCTURE	Element is: Required No, Permitted Yes, Prohibited No	Element is: Required No, Permitted Yes, Prohibited No
	Limits on the maximum number of defined structures within a picture: None.	Limits on the maximum number of defined structures within a picture: None.

Functionality	Specifications - S1000D profile	Specifications - WebCGM profile
BEGIN APPLICATION STRUCTURE BODY	Limits on the number and identity of elements comprising a structure: None.	Limits on the number and identity of elements comprising a structure: None.
END APPLICATION STRUCTURE	Is there any meaning to the application structure identifier parameter? Yes/no: No. No assigned meaning beyond being a unique identifier for the application structure.	Is there any meaning to the application structure identifier parameter? Yes/no: No. No assigned meaning beyond being a unique identifier for the application structure.
	Is the inheritance flag parameter restricted? Yes/no: Yes. The value of the inheritance flag is restricted to a value corresponding to "statelist".	Is the inheritance flag parameter restricted? Yes/no: Yes. The value of the inheritance flag is restricted to a value corresponding to "statelist".
	Other: **The value of the structure type parameter is restricted to "grobject". Structures are sensitive to placement and are placed in the metafile according to the content model given in Chap 3.9.5.2.1.8.**	Other: The value of the structure type parameter must be chosen from the list of valid structure types listed in section 3.2.1. Structures are placed in the metafile according to the EBNF content model fragments in section 3.2.1 and its subsections. The character repertoire of the APS id parameter is identical to that of the "objid" production as defined in section 3.1.1.3.

2.3.3.2 Metafile descriptor elements

Table 3 lists the metafile descriptor elements which are profiled for S1000D.

Table 3 Metafile descriptor elements

Functionality	Specifications - S1000D profile	Specifications - WebCGM profile
T.16.2	Same as WebCGM profile: No	Same as ISO model profile: No
METAFILE DESCRIPTION	Element is: Required Yes	Element is: Required Yes
	The description parameter **must** follow the rules for non-graphical text, clause 9.5.4.6 and T.14.5. The substring within the SF parameter **must** be of the form: "keyword:item", where the double quotes are part of the substring.	The description parameter shall follow the rules for non-graphical text, clause 9.5.4.6 and T.14.5. The substring within the SF parameter shall be of the form: "keyword:item", where the double quotes are part of the substring.
	Maximum number of occurrences of this element? 1	Maximum number of occurrences of this element? 1
	Profile identification (use keyword, "ProfileId:"): "**ProfileId:S1000D**".	Profile identification (use keyword, "ProfileId:"): "ProfileId:WebCGM".

Functionality	Specifications - S1000D profile	Specifications - WebCGM profile
	Profile edition (use keyword, "ProfileEd:"):	Profile edition (use keyword, "ProfileEd:"):
	Refers to the **edition statement of the profile** that applies to this graphic. The item associated with the keyword ProfileEd **must** be n.m, which refers to the S1000D Issue, where the profile has last changed.	Refers to the approved version and revision of the specification that applies for this graphic. The item associated with the keyword ProfileEd shall be n.m. For this WebCGM Edition: "ProfileEd:2.1".
	Example: "**ProfileEd:4.2**" for S1000D Issue 4.2.	
	Additional information content:	Additional information content:
	Metafile colour conformance class, source, and date items **must** be encoded as substrings of the description parameter using the keywords: "ColourClass:", "Source:", and "Date:", respectively.	Metafile colour conformance class, source, and date items shall be encoded as substrings of the description parameter using the keywords: "ColourClass:", "Source:", and "Date:", respectively.
	ColourClass: Required Yes	ColourClass: Required Yes
	Content: One of "ColourClass:monochrome" or "ColourClass:colour".	Content: One of "ColourClass:monochrome" or "ColourClass:colour".
	Source? Required No, Permitted Yes	Source? Required No, Permitted Yes
	Content: "Source:supplier"	Content: "Source:supplier"
	Date? Required No, Permitted Yes	Date? Required No, Permitted Yes
	Content: "Date:yyyymmdd"	Content: "Date:yyyymmdd"
	Other: Parameter strings are considered case insensitive.	Other: Parameter strings are considered case insensitive.

2.3.3.3 Application structure elements

Table 4 gives information about the application structure elements which are profiled for S1000D.

Table 4 Application structure elements

Functionality	Specifications - S1000D profile	Specifications - WebCGM profile
T.24.1	Same as WebCGM profile: No	Same as ISO model profile: No
APPLICATION STRUCTURE ATTRIBUTE	Element is: Required No, Permitted Yes, Prohibited No	Element is: Required No, Permitted Yes, Prohibited No
	Define the set of structure elements for use within application structures, and attach complete syntactic and semantic description:	Define the set of structure elements for use within application structures, and attach complete syntactic and semantic description:

Functionality	Specifications - S1000D profile	Specifications - WebCGM profile
	The set of attributes allowed on application structure type "grobject" is listed in Para 2.3.3.4 of this chapter.	The set of attributes allowed is listed in section 3.2.2, which includes complete syntactic and semantic definitions, as well as permissibility according to application structure type.
	Other: None.	Other: None.

2.3.3.4 Application structure attributes

As opposed to WebCGM, only one APS type named "grobject" is permitted in an S1000D version 4 CGM. The APS type is realized as a parameter of the BEGIN APPLICATION STRUCTURE element.

In accordance with S1000D requirements, the essential navigation information to reside within a graphic is the unique identifiers of graphical objects and their names. An identifier is realized as a parameter of the BEGIN APPLICATION STRUCTURE element itself and serves as the unique address of a graphical object within a single CGM.

All other non-graphical information about graphical objects (metadata) must be, in general, be kept outside of the metafile. This approach guarantees that graphics remain neutral and can be more easily adapted to a new target environment if required.

Hence, only a subset of APS attributes defined in WebCGM is applicable to S1000D. From the WebCGM set of optional APS attributes, only `name`, `region` and `viewcontext` are permitted. Other WebCGM APS attributes such as `linkuri` and `screentip` are realized in a different manner outside of the graphical environment (ie, in the XML data modules) and will be mapped to the APS attributes at runtime through the XML Companion File (XCF).

2.3.3.5 APS attribute `name`

The meaning of attribute `name` is to associate a generic name with an APS of type "`grobject`". Unlike the APS ID parameter, the value of the attribute `name` need not be unique within a metafile. The object can optionally be addressed by this value in circumstances where all instances of the object should be brought into view at once.

An example would be to highlight all occurrences of a specific callout/item number in an illustration.

2.3.3.6 APS attribute `region`

The meaning of attribute `region` is to associate a spatial region for picking purposes with an APS of type "`grobject`". Simple regions of type rectangle, ellipse, closed polygon and closed continuous polybezier can be defined. The APS attribute `region` can occur at a maximum of once in an APS, however complex regions, which comprise a collection of simple regions, can be built allowing the definition of disjointed subregions, regions with holes, etc.

If no region is defined, an implied region is assumed by the extents of the graphical primitives contained in the APS body.

Note

If a region is defined, the set of primitives making up the graphical object need not be enclosed by an APS. In this case, the given spatial region can geometrically identify the object. A practical example would be to define overlay regions to serve as hotspot areas for embedded raster images.

2.3.3.7 APS attribute `viewcontext`

The attribute `viewcontext` provides specification to viewers of the initial view of an object when the viewer has been directed to navigate to the graphical object. In essence, this attribute allows a rectangular viewport for fitting the object and its graphical surroundings into the viewer's display to be defined. This can also include a zoom operation.

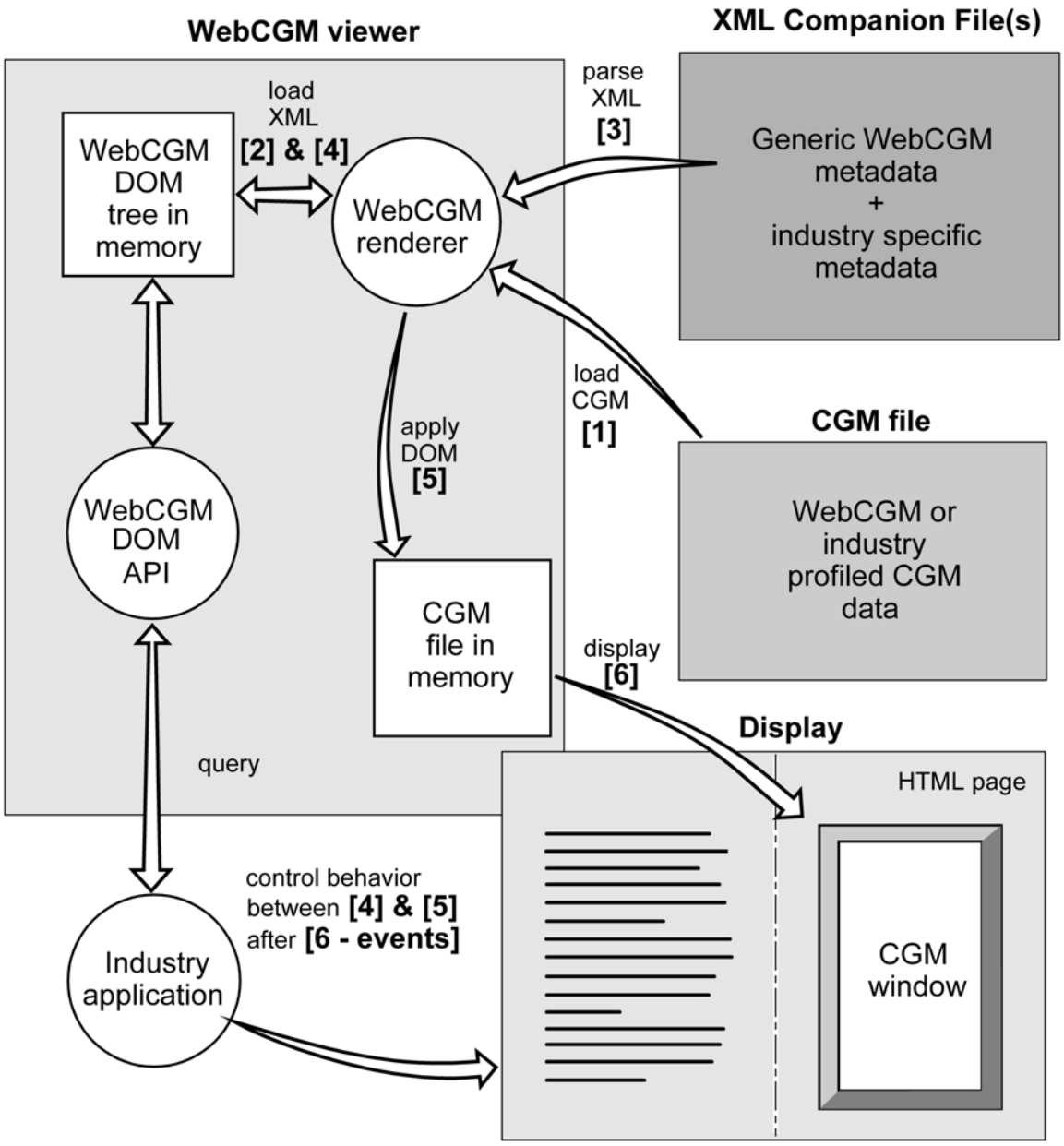
If attribute `viewcontext` is not given, but attribute `region` is there, the rectangular viewport is the rectangle enclosing the given region.

If neither attribute `viewcontext` nor attribute `region` are given, the rectangular viewport is the bounding box of the graphical primitives of the object.

The viewer moves the addressed graphical object into view and indicates visually that the region or the graphical primitives of the object is the target of the link. The manner in which the viewer creates the new display and highlights the graphical object is viewer dependent.

2.3.4 WebCGM 2.1 architecture

Fig 2 illustrates the interaction between a WebCGM viewer, external metadata, and a user application in general.



ICN-C0419-S1000D0192-001-01

Fig 2 WebCGM 2.1 viewing process

The process involves [1] the WebCGM viewer interpreting the CGM file, [2] loading the file into a Document Object Model (DOM) tree in memory, [3] parsing external WebCGM metadata, along with S1000D specific metadata, and [4] adding that metadata to the DOM tree.

At this point an external application has an opportunity to apply additional style and behavior attributes to the DOM via an ECMAScript binding. The WebCGM viewer then [5] applies the DOM to the CGM in memory and [6] sends the rendered image to the viewing window.

At this point the external application can control style attributes of the rendered illustration and the behavior of the WebCGM viewer.

2.3.4.1 WebCGM 2.1 XCF

WebCGM 2.1 includes an external companion file that enables control of the behavior of the WebCGM viewer through an XML DOM interface. The XML Schema associated with this external file is extensible to include industry specific metadata.

The content model described in Chap 3.9.5.2.1.8 does not support the XCF directly. It is generated at the point of use. The S1000D companion file content is based on the context dependent information given by the S1000D element <graphic> and the S1000D element <hotspot>.

If the S1000D element <hotspot> is present in the content model of element <graphic>, an XCF must be generated to apply the information given in element <hotspot>. During the dynamic generation of the XCF instance, the decision to transform the element <hotspot> is based on its applicability. This means that applicability filtering must be applied when the XCF instance is generated.

2.3.4.2 Creating the S1000D XCF

The S1000D XCF content is made up of five major structures.

2.3.4.2.1 The webcgm structure

The first structure of an S1000D XCF is the webcgm structure. The element <webcgm> is the document level element in the Schema. The content is derived from the S1000D element <graphic>. Table 5 represents the mapping.

Table 5 XCF mapping of element <graphic>

S1000D element <graphic>	**XCF element <webcgm>**
Attribute infoEntityIdent	Attribute id
System identifier associated with the entity given in attribute infoEntityIdent	Attribute filename

The following attributes of the XCF element <webcgm> can be used by an external application to override the properties given in the CGM at rendering time:

- background-color (O), the background color
- pictureVisibility (O), the visibility of the picture that can have one of the following values:
  - "on"
  - "off"

The style attributes given in the group stylePropertiesAttGroup of the XCF Schema can also be used for dynamic rendering.

For further details refer to the WebCGM 2.1 specification.

2.3.4.2.2 The grobject structure

The second structure of an S1000D XCF is the grobject structure.The content here is derived from the S1000D element <hotspot>. Table 6 represents the mapping.

Table 6 XCF mapping of element <hotspot>

S1000D element <hotspot>	XCF element <grobject>
Attribute applicationStructureIdent	Attribute apsid
Attribute hotspotTitle	Attribute screentip
Values of attribute visibility – "visible" – "hidden"	Values of attribute visibility – "on" – "off"

The following attributes of the XCF element <grobject> can in addition be used by an external application to override the properties of graphical objects given in the CGM at rendering time:

– interactivity (O), the interactive behavior of the graphical object. The attribute can have one of the following values:
  - "off"
  - "inherit"
  - "on"
– the style attributes given in the group stylePropertiesAttGroup of the XCF Schema. Refer to Para 2.3.4.2.1.

2.3.4.2.3 The linkuri content

The third structure of an S1000D XCF is the linkuri content.

The S1000D element <internalRef>, the S1000D element <dmRef> and the S1000D element <catalogSeqNumberRef> of the S1000D element <hotspot> are mapped to the XCF element <linkuri>. The required XCF attribute uri is derived from the attributes associated with the S1000D element <internalRef>, the S1000D element <dmRef> and the S1000D element <catalogSeqNumberRef>. Table 7, Table 8, and Table 9 represent these mappings.

Table 7 XCF mapping of element <internalRef>

S1000D element <internalRef>	XCF element <linkuri>
Attribute internalRefId or attribute referredFragment or attribute xlink:href	Attribute uri
Attribute xlink:show and/or attribute xlink:actuate	Attribute behavior
Attribute targetTitle or attribute xlink:hotspotTitle	Attribute desc

Table 8 XCF mapping of element <dmRef>

S1000D element <dmRef>	XCF element <linkuri>
Attribute referredFragment or attribute xlink:href	Attribute uri

S1000D element <dmRef>	XCF element <linkuri>
Attribute xlink:show and/or attribute xlink:actuate	Attribute behavior
Element <dmTitle> or attribute xlink:hotspotTitle	Attribute desc

Table 9 XCF mapping of element <catalogSeqNumberRef> (implicit linking)

S1000D element <catalogSeqNumberRef>	XCF element <linkuri>
For chapterized IPD: The attributes modelIdentCode, systemDiffCode, systemCode, subSystemCode, subSubSystem, assyCode, figureNumber, figureNumberVariant, itemLocationCode, item and itemVariant or for non-chapterized IPD: The attributes initialProvisioningProjectNumber, responsiblePartnerCompanyCode, figureNumber, figureNumberVariant, itemLocationCode, item and itemVariant or for both chapterized and non-chapterized IPD if a reference to a specific ISN is needed: The attribute itemSeqNumberValue or the attribute xlink:href	Attribute uri
Attribute xlink:show and/or attribute xlink:actuate	Attribute behavior
Attribute xlink:hotspotTitle	Attribute desc

Note

In this context, the values of attribute xlink:show are restricted to "new" or "replace" and the value of attribute xlink:actuate is restricted to "onload". The existence of the attribute xlink:show overrides any attribute xlink:actuate that can be present.

2.3.4.2.4 The bindById and bindByName structures

The other two structures of an S1000D XCF are bindById and bindByName. The child element <bindById> of element <webcgm> is equivalent to the child element <grobject> of element <webcgm>. The child element <bindByName> of element <webcgm> attaches the external metadata to any grobject(s) in the CGM that have the same attribute name.

The content of bindById is mapped exactly the same way as the content of grobject.

The content of bindByName is mapped the same way as the content of grobject apart from the attribute apstargetname. The XCF attribute apstargetname of the XCF element <bindByName> is derived from the S1000D attribute applicationStructureName of the S1000D element <hotspot>.

2.4 S1000D TIFF profile

2.4.1 General

Binary raster graphics interchanged in the TIFF must utilize the CCITT Group 4 compression algorithm. Colored raster graphics interchanged in TIFF must utilize the loss-less Lempel-Ziv-Welch (LZW) compression method as defined in the Adobe TIFF 6.0 specification.

S1000D prohibits multiple images in a single TIFF file. The acceptable resolutions (pixel density) are 300, 400, 600, and 1200 pixels per inch (ppi) with a minimum resolution of 300 ppi.

2.4.2 Profile details

The S1000D application profile for TIFF files is defined as a delta-profile based on the Adobe TIFF 6.0 specification. It is detailed in the following, but gives only information where it differs from the TIFF specification.

2.4.2.1 Image file header

The offset in bytes of the first and only Image File Directory (IFD) must be 8 from the beginning of the TIFF file.

2.4.2.2 Tag names and values

Table 10 lists the TIFF tags with their names and values which are profiled for S1000D.

Table 10 S1000D profile of TIFF tags

Tag name	Tag value	Specifications - S1000D profile
NewSubfileType	254	permitted - value must be 0
SubfileType	255	prohibited
BitsPerSample	258	required - values must be 1, 4 or 8 (triple 8 for RGB)
Compression	259	required - value must be 4 (bi-level: Group 4 fax) or 5 (color: LZW)
PhotometricInterpretation	262	required - value must be 0, 1, 2 or 3
FillOrder	266	permitted - value must be 1
DocumentName	269	prohibited
ImageDescription	270	required - value must be the S1000D ICN in the form "ICN-icn", where "ICN-" is a static prefix and "icn" denotes the core ICN as defined in Chap 4.4.
Orientation	274	required - values must be 1 or 4
SamplesPerPixel	277	required - values must be 1 or 3 (3 for RGB only)
MinSampleValue	280	prohibited
MaxSampleValue	281	prohibited
XResolution	282	required - values must be 300, 400, 600 or 1200
YResolution	283	required - values must be 300, 400, 600 or 1200
PlanarConfiguration	284	permitted - value must be 1
PageName	285	prohibited
XPosition	286	prohibited

Tag name	Tag value	Specifications - S1000D profile
YPosition	287	prohibited
FreeOffsets	288	prohibited
FreeByteCounts	289	prohibited
GrayResponseUnit	290	prohibited
GrayResponseCurve	291	prohibited
T4Options	292	prohibited
T6Options	293	required for compression = 4, otherwise prohibited
ResolutionUnit	296	required - value must be 2
PageNumber	297	prohibited
TransferFunction	301	prohibited
ExtraSamples	338	prohibited

Chapter 7.3.3

CSDB objects - Multimedia

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Chap 3.9.5.2.1.7	Common constructs - Figures, multimedia and foldouts
Chap 3.9.5.2.1.8	Common constructs - Hotspots
Chap 4.13.2	Optimizing and reuse - Incremental update of CIR data modules
Chap 9.2	Terms and data dictionary - Terms, acronyms and subject index
IEC 61834	Recording - Helical-scan digital video cassette recording system using 6,35 mm magnetic tape for consumer use

1 General

Information and guidance on the use of multimedia and definition of recommended minimum standards is addressed. Multimedia is intended to be used as an enhancement to the verified data within a data module, not instead of that data and as such must be verified alongside the data it supports. The element <multimediaAlts> is used to provide the capability to group several alternate solutions of multimedia. For further information on the use of alternates, refer to Chap 4.13.2. Further guidance on the authoring of multimedia can be found in Chap 3.9.2, Chap 3.9.5.2.1.7, and Chap 3.9.5.2.1.8.

A graphics object can be accompanied by metadata provided in a separate ICN metadata file. For details on its use, refer to Chap 3.9.2.7.

2 Multimedia

2.1 Abbreviations and units of measure used in the chapter

General abbreviations and units of measure are given in Chap 9.2. Abbreviations and units of measure that are specific to this chapter are:

- Digital Video (DV)
- Digital Versatile Disk (DVD)
- Family of color spaces used in video systems (YCbCr), where Y is the luma component, and Cb and Cr are the blue and red chroma components
- Motion Pictures Expert Group (MPEG2), which is the standard for generic coding of moving pictures and associated audio information

2.2 Project guidance

When selecting multimedia for use within a project consideration must be given to the role in which it will operate. Display background, use of colors and presentation methods must be considered along with the different working conditions in which the multimedia will be used. Hardware must be chosen on its ability to deliver the project's chosen multimedia types and a project needs to be aware that additional hardware such as headphones and amplifiers can be required. The project or the organization must also address verification, change management and production methods, as well as file naming conventions, file structure and hierarchy for multimedia production outside the CSDB.

Other items to consider are the user interface, whether the multimedia will be displayed at full screen size or at a predetermined size, and the use of PDF for printing functionalities in support of media elements. It is recommended that a project consider capture rates and file sizes as these affect the quality and loading times. A balance between quality and file size must be achieved. The project or organization must therefore look at utilizing multimedia authoring/production tools that aid and utilize efficient compression on streaming technologies.

A project is responsible for selecting its own multimedia types, although it is recommended to avoid the use of proprietary formats. These formats can be costly to license and maintain, which can hinder interchangeability. The use free and open codecs and specifications is recommended, where open specification means:

- any project can read or write data from/to a file created according to the specification
- the specification contains details on the behavior of objects in a file created according to the specification
- the specification is owned/used by multiple vendors/companies
- no cost is associated with implementing the specification

A list of multimedia types with notations included in the schemas is given in Table 3, Table 5, Table 6, and Table 7. The list is not definitive and a project is free to add its own notations. The more complex multimedia will often come at a premium for both cost and hardware/software requirements.

2.3 Multimedia

Description: The element <multimedia> contains the multimedia content. It is the parent of the element <multimediaObjects>, which contains the multimedia objects and the element <parameter>. The element <parameter> contains the attribute for passing parameter values to and from objects within the multimedia scene. The element <multimedia> and the element <multimediaObjects> are described in Chap 3.9.5.2.1.7. The element <parameter> is described in Chap 3.9.5.2.1.8.

2.4 Types of multimedia

2.4.1 Audio

Audio can be a sound track, audible effect or a pure narrative heard to warn, support, or clarify a procedure or diagnosis steps and actions. All of these audio elements can be embedded or linked externally with displayed media. Presentation standards must be addressed as well as content, duration and context of the audio. Consideration must be given to the anticipated environment to determine the usability of audio.

Examples include operator alerts, presentation clips, or complete audio representation of the data. Table 2 details the recommended minimum rates for audio. A list of audio types with notations included in the schemas is given in Table 3.

The following list shows the recommended use of audio:

- natural sounds to clarify the result of actions
- audio that will enhance video, adding information required in performing the displayed actions
- user controlled audio narration from verified technical information to enhance user understanding
- aural warnings and audible alarms heard on the flight deck or procedural queue to an action

Table 2 Audio - Recommended minimum rates

Type	Minimum capture	Low bandwidth output maximum	Low bandwidth output minimum	Broad bandwidth minimum	Minimum output
Master	48 kHz 16 bit	-	-	-	44 kHz 16 bit
Effects	48 kHz 16 bit	-	16 kbps	64 kbps	96 kbps
Voice	48 kHz 16 bit	44 kbps	8,5 kbps	64 kbps	96 kbps
Sound tracks	48 kHz 16 bit	-	32 kbps	96 kbps	128 kbps

Table 3 Audio types

Encoding	File extension type
Audio AIFF Format sound	AIF, AIFC and CDDA
Audio MIDI	MID, MIDI and RMI
Audio Playlist	PLS

Encoding	File extension type
CD Audio	CDA
Microsoft RIFF chunk for Waveform Data	WAV
MIDI	KAR and SMF
MP3 format sound	M3U, M3URL, MP3 and SWA
Sun Audio	AU and SND
ULAW	ULW
Windows Media Audio	WMA

2.4.2 Video

The term video in this case means real life or synthetic moving images of equipment actions, procedural steps or a captured live event. These clips can include audio narration or a sound track. Video can be linked with other media objects. Video is used primarily to show a unique procedure. Presentation standards must be addressed as well as content, duration and context of the video. Table 4 details the recommended minimum rates for video. A list of video types with notations included in the schemas is given in Table 5.

The following list shows the recommended use of video:

- real images to clarify a complex or rarely required maintenance procedure
- demonstrations
- embedded training
- presentations

Table 4 Video - Recommended minimum rates

Type	Minimum capture Digital Video (DV)	Minimum capture DV frames per second	Minimum capture DV chroma sampling	Recording media minimum compression	Minimum output
Color space	YCbCr[1]	-	-	-	-
Data rate	25 Mbps	-	-	-	-
Resolution PAL/ SECAM	720 px x 576 px	25 fps	4:2:0	5:1	-
Resolution NTSC	720 px x 420 px	29,70 fps	4:1:1	5:1	-
Low bandwidth	320 px x 240 px (Output)	-	-	-	80 kbps minimum[2]
Broad bandwidth	640 px x 480 px (Output)	-	-	-	256 kbps maximum
Profile@level	-	-	-	-	MP@ML[3]

1 Device: YCbCr – Based on IEC 61834 standard for helical scan digital recording methods

2 Acceptable, but not recommended

3 MPEG-2 Profiles at Main Level (720 x 480 pixels at 30 Hz max frame rate or 720 x 576 pixels at 25 Hz max frame rate, 4:2:0 sampling (DVD: 9,8 Mbps))

Table 5 Video types

Encoding	File extension type
Autodesk Animator FLIC Format FLI	FLI
Digital Video	DIF and DV
Macromedia Flash	FLA
Microsoft RIFF chunk for Audio/Visual Interleaved Data	AVI
Motion Picture Experts Group video	MP2, MP2V, MP4, MPE, MPEG, MPEG-1, MPEG-2, MPG, MLV, and MPG4
Multimedia and Hypermedia Experts Group	MHEG
Real Audio-Video	RA, RAM, RM and RMJ,
SMI Video	SMI
SML Video	SML
Streaming Movie	RTS, RTSP and SDP
VFW Video	VFW
Video RGB	RGB

Encoding	File extension type
Video X-FLV	FLV
Video X-MS-ASF	ASF
Video/Quicktime	MOV, QT, QTR and QTX
Windows Media	ASR and ASX
Windows Media audio/video	WM, WMP, WMV and WMX

2.4.3 Three dimensional models

The term 3D model refers to the use of 3D objects to present technical information.

Examples of use are virtual assembly/disassembly, removal and installation of parts using animation, simulation and/or virtual reality concepts. Levels of capability can include fly through type viewing (navigation through a 3D scene). The degree of simulation, animation and virtual reality modeling concepts can dramatically affect cost. A list of 3D types with notations included in the schemas is given in Table 6.

Table 6 3D types

Encoding	File extension type
ASME/ANSI Y14.26M-1987 Initial Graphics Exchange Specification	IGES
CATIA 3D models	CATDRAWING, CATPART, CATPRODUCT, CGR, CT and MODEL
Dassault Systems 3DXML	DS-3DXML
JT 3D models	UGS
Lattice 3D models	XV0, XV2, XV and XVL
Pro Engineer 3D models	ASM, DRW, ED, EDZ, FRM and PRT
RightHemisphere 3D models	RH
SolidWorks 3D models	SLDASM, SLDDRW and SLDPRT
STEP AP203 3D models	STEP
Universal 3D models	U3D
VND 3D models	DWF
VRML 3D models	WRL
Web3D 3D models	W3D
X3D 3D models	X3D
X-Director 3D models	DCR
DS 3D-VIA	SMG, SMGXML, SMGGEOM

2.4.4 Miscellaneous types

Several multimedia types such as the Synchronized Multimedia Integration Language (SMIL) and PDF do not fall into the audio, video or 3D type classification. These miscellaneous types are listed in Table 7.

Table 7 Miscellaneous types

Encoding	File extension type
Cascading Style Sheet	CSS
Microsoft Word	DOC
Movie Authoring File	FLA
Java script	JS
Microsoft Access	MDB
Microsoft Project	MPP
Portable Document Format	PDF
Microsoft PowerPoint	PPS and PPT
Synchronized Multimedia Integration Language	SMIL
Microsoft Excel	XLS
Compressed file	ZIP

Chapter 7.4

Information processing - Generation of publications

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Chap 7.4.2	Generation of publications - Publication module and SCORM Content Package Schema
Chap 7.4.3	Generation of publications - Inclusion of legacy information

1 General

The purpose of this chapter is to describe the technical aspects of the generation of publications. The content of this chapter together with the necessary additional resources, available through www.s1000d.org, is sufficient for understanding the concept of generating an S1000D IETP.

2 Generation of publications

General information and guidance on the IETP concept and on the supporting publication module are given in the following chapters.

- Chap 7.4.1 provides the general principles of IETP generation
  - Chap 7.4.1.1 provides information for IETP generation process
  - Chap 7.4.1.2 provides information for IETP resource resolution with the uniform resource names concept
- Chap 7.4.2 provides a description of the publication module XML
- Chap 7.4.3 provides a description of the inclusion of legacy information in the IETP concept

Although some guidelines are provided regarding the principle characteristics of systems that support the specification, it is not suggesting how such a system should be implemented, nor are any specific tools suggested for such an implementation.

Chapter 7.4.1

Generation of publications - IETP

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Chap 7.4.1.2	IETP - Resource resolution

1 General

1.1 Purpose

A wide variety of operational environments are envisioned for accessing and displaying IETP. These include:

- web or Local/Wide area network (LAN/WAN)
- temporarily disconnected
- stand-alone

Moreover, interoperability between IETP is becoming a firm requirement for many projects.

In addition to these operational requirements, S1000D acknowledges the fact that technical improvements and new possibilities are becoming available with Internet/Intranet technology. These improvements are accompanied by commercial off the shelf software, which might be used for implementing IETP.

The main objective of this chapter is to describe XML-oriented IETP and its definition through the use of the publication module concept.

In addition, as a by-product, this chapter describes the possibility to map S1000D concepts to web concepts. However, the IETP end user form (eg what it looks like on-screen) is out of the scope of this chapter.

2 IETP

General information on the IETP concept are given in the following chapters.

- Chap 7.4.1.1 provides information for IETP generation process
- Chap 7.4.1.2 provides information for IETP resource resolution with the Uniform Resource Name (URN) concept

2.1 Web concepts and S1000D concepts

2.1.1 Resources

A fundamental concept of the World Wide Web is a resource. A resource can be anything that can be accessed through an identifier. The resource identifier can be considered the resource name or the resource location. For web based applications resource identifiers are described by the Uniform Resource Identifier (URI) syntax. Both Uniform Resource Locators (URL) and URN are considered URI.

These names are persistent for a project if they are never re-assigned during Product life cycle. This means the name will never change even when the resource content is changed. Any reference to a resource using its name as the identity will stay valid forever.

In S1000D, all information objects such as data modules, publication modules, illustrations and multimedia objects are considered resources. The data module code, publication module code, catalogue sequence number and ICN are the resource identifiers that are each described by specific name syntax and format.

2.1.2 Metadata

A challenge for web-oriented documents is the ability to retrieve a specific resource amongst an ever increasing number of resources. A solution to this is to associate metadata to a resource.

Metadata describe additional aspects of the resource beyond its identifier such as the title, author, creation date, etc. The Resource Description Framework (RDF) and Dublin Core (DC) are methods of describing resources. A resource resolver allows the discovery of resource identifiers through the use of metadata queries.

In S1000D, all data module metadata are contained in the identification and status section.

2.2 IETP and publication modules

The IETP concept is supported in S1000D through the use of publication modules.

This concept is defined by using material derived from:

- Internet Engineering Task Force (IETF) URI specifications for naming and locating resources to be linked
- World Wide Web Consortium (W3C) XML Pointer Language (XPointer) specification, which specifies a language to be used as the basis for defining a fragment identifier in any URI reference that locates a resource
- W3C XML Linking Language (XLink) specification, which allows elements to be inserted into XML instances in order to create and describe links between resources
- RDF and disassembly code initiatives for encoding metadata

A publication module is structured in a similar way to data modules with an identification and status section followed by a content section. The content section contains references to data modules, legacy technical publications or other publication modules in the required sequence and structure of the publication delivery.

Publication modules are described in detail in Chap 4.9.1.

Chapter 7.4.1.1

IETP - Generation process

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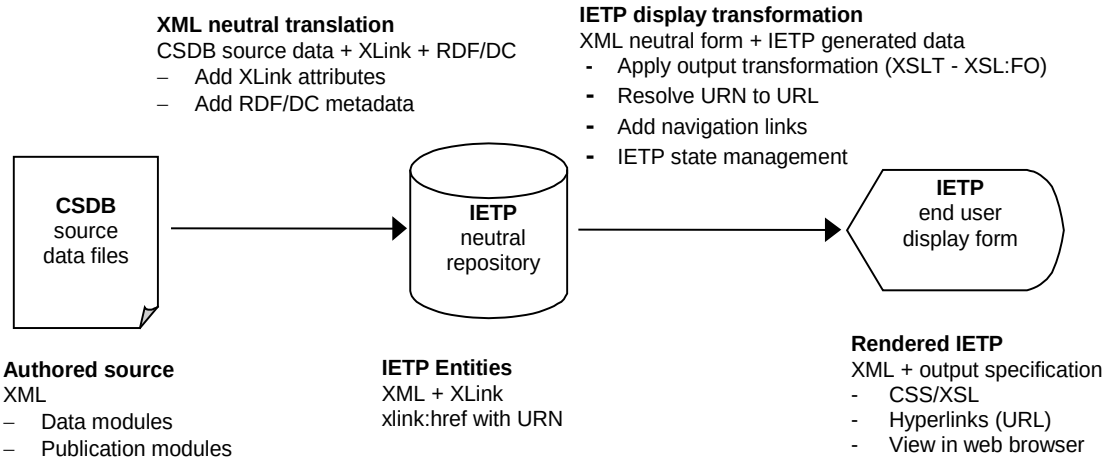
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Chap 7.4.1.1.3	Generation process - Transformation for IETP

1 General

The purpose of this chapter is to describe the technical aspects of the IETP generation. The content of this chapter together with the necessary additional resources, available through www.s1000d.org, is sufficient to understand the concept of generating an S1000D IETP.

2 IETP generation process

Fig 1 represents the IETP generation process.



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Fig 1 IETP generation process

2.1 CSDB source data

Authored data modules and publication modules reside in the CSDB and exist in XML form. This is the repository where the source data for IETP is maintained.

2.2 IETP neutral repository

The IETP neutral repository contains all data modules and publication modules in XML form. This information is generated from the CSDB and acts as a standard representation to be used for display transformation. This allows an IETP to consist of data from different CSDB implementations. The neutral data is generated and not authored. It can be generated "on the fly" from the CSDB through an automated process. The translation involves the inclusion of auto-generated XLinks and metadata. Refer to Chap 7.4.1.1.1 and Chap 7.4.1.1.2.

The form of the repository is not specified. It can be a file storage system, web server, database, or other virtual representation.

2.3 IETP display transformation

To render a data module for display to an end user the IETP process transforms the data in the XML neutral repository into a viewable "end-user" form. This transformation process applies stylesheets to the XML data and transforms the XLink references into the required form of hyperlinks (eg, HTML). Refer to Chap 7.4.1.1.3.

2.4 IETP namespaces

2.4.1 General

XML namespaces are designed to resolve naming conflicts in XML instances that contain elements and attributes from different XML Schemas. This is accomplished by associating namespaces, identified by Uniform Resource Identifier (URI) references, with names of elements and attributes.

These names appear as qualified names, ie, they contain a single colon which separates the name into a namespace prefix and a local part. The prefix, which is mapped to a URI reference,

denotes a namespace. The combination of the globally managed URI namespace and the instance's own namespace allow the names of elements and attributes to be universally unique.

There is no default XML namespace. If elements or attributes are not specifically declared to belong to an XML namespace, then they are not in any namespace.

2.4.2 Declaration of namespaces

An XML namespace is declared by using an attribute named either `xmlns` or having `xmlns:` as a prefix followed by an XML name specifying the namespace in question. The first form of the attribute `xmlns` declares that the specified namespace is the default XML namespace, whereas the second form defines the namespace prefix to be used on elements and attributes in the XML instance.

The value of the attribute `xmlns` is the namespace name in the form of a URI reference.

An XML namespace can be declared on any element in an XML document. The namespace is in scope for that element (and its attributes) and all its descendants (and their attributes) unless it is overridden or undeclared. Namespace declaration attributes can also be provided as default attributes with fixed values in an XML Schema.

To override a namespace prefix, simply another XML namespace has to be declared with the same prefix. To override the current default XML namespace, another XML namespace has to be declared as the default. A namespace prefix cannot be "undeclared". It remains in scope until the end of the element on which it was declared unless it is overridden. To "undeclare" the current default XML namespace, a default namespace with an empty (zero-length) URI has to be declared.

Note

XML namespaces do not apply to entity names, notation names, or processing instruction targets. In consequence, these names must not contain colons for conformity reasons.

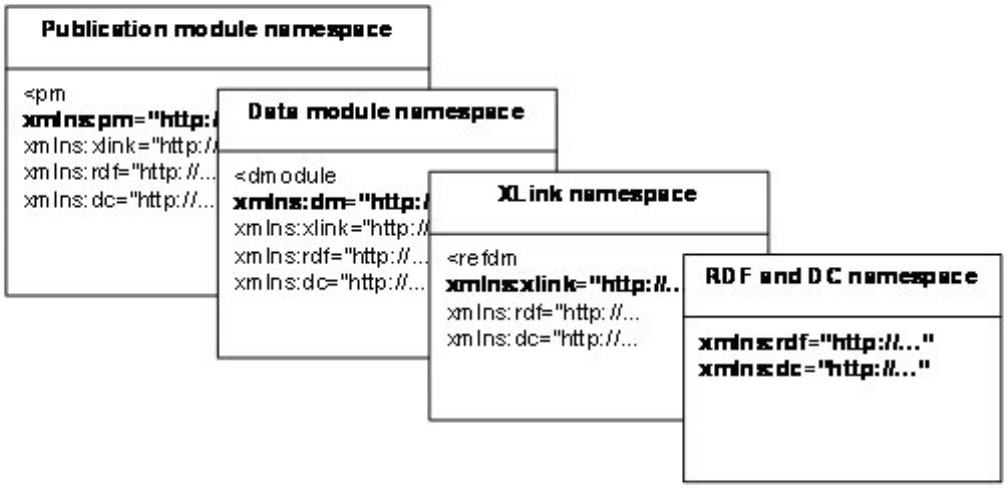
XML namespaces identified to be useful for IETP include:

- optional Resource Description Framework (RDF) (namespace prefix: rdf) and Dublin Core (namespace prefix: dc) namespaces for data module and publication module metadata
- XLink (namespace prefix: xlink) language namespace for XLink elements and attributes
- data module (namespace prefix: dm) and publication module (namespace prefix: pm) namespaces for corresponding elements and attributes

Note

The data module namespace is the default namespace for IETP.

Fig 2 gives an overview of these IETP XML namespaces and shows their relationships.



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Fig 2 IETP XML namespaces

The URI references used as the namespace names in an IETP environment are summarized in Table 2.

Table 2 IETP XML namespace definitions

Namespace prefix	URI reference
pm	http://www.s1000d.org/pm
dm	http://www.s1000d.org/dm
xlink	http:/www.w3.org/1999/xlink
rdf	http://www.w3.org/1999/02/22-rdf-syntax-ns#
dc	http://purl.org/dc/elements/1.1/

Applications wishing to make use of XML namespace-aware processing, for instances conforming to this specification must ensure that the namespace names are resolved to the above URI references.

Chapter 7.4.1.1.1

Generation process - XML-based links

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Chap 4.4	Information management - Information control number
Chap 4.9.2	Publication management - Coding publication modules
Chap 4.12	Information management - Multiple instances of CSDB objects
Chap 4.15.2	Learning information - Coding SCORM content package module

1 General

The purpose of this chapter is to describe the technical aspects of building links based on XML. The content of this chapter together with the necessary additional resources, available through www.s1000d.org, is sufficient for understanding the concept of generating an S1000D IETP.

2 Linking elements

S1000D linking elements are restricted to outbound links. These are links that point from within a data module to or into remote resources or sub-resources. For consistency, all links within a data module, which can be expressed by XML ID/IDREF mechanisms, should also be transformed to XLink linking elements.

3 Basic elements

3.1 XLink attribute list

Elements which are used in links are already marked up as elements in data modules, (eg, element <dmRef> and element <catalogSeqNumberRef>). Link semantics (behavior, type, role, etc) are completed by adding attributes to these elements.

3.2 Resource and sub-resource

In S1000D, all information objects such as data modules, publication modules, SCORM content package modules, parts information, illustrations and multimedia objects are considered resources. The data module code, ICN, publication module code and CSN are the resource identifiers that are each described by specific name syntax and format identified in Chap 3.9.5.2.7, Chap 4.3, Chap 4.4, Chap 4.9.2 and Chap 4.15.2 respectively. The resource identifier data module extension is described in Chap 4.12 and Chap 3.9.5.1.

3.3 Links

It is recommended to use simple links as far as possible, but extended links can be useful for multiple remote ending resources. For example this can be a link to all data modules dependant on language and/or issue number.

In HTML, a link is defined using the element <A>. However, just as XML is more flexible concerning tags, which describe elements, it is more flexible concerning tags that refer to external resources. In XML almost any element can be defined as a link.

Elements that assert the existence of a link are called linking elements; these are all XML elements having an attribute `xlink:type` with value "`simple`" or value "`extended`".

Chapter 7.4.1.1.2

Generation process - Metadata

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1 General

The purpose of this chapter is to describe the technical aspects of the IETP generation metadata. The content of this chapter, together with the necessary additional resources available through www.s1000d.org, is sufficient to understand the concept of generating an S1000D IETP.

2 Metadata

2.1 General

Metadata describe, through a set of attributes or elements, additional aspects of the resource beyond its identifier. Catalog records for library material with elements such as author, title, date of publication, etc, are a common example of metadata.

The association of standardized metadata with networked information objects substantially improves resource discovery, use and management capabilities by enabling field-based searches, permitting indexing of non-textual objects, and allowing access to the surrogate content that is distinct from access to the content of the resource itself.

Although all data specified within S1000D is machine-readable, this data is currently not always machine-understandable, for example where are the data modules about landing gear removal issued during last year?, is there an online French translation available for this data module?

This goal can be reached by using a precise and formal metadata definition.

2.2 Resource description framework

Resource Description Framework (RDF) is a framework for metadata providing interoperability between applications that exchange machine-understandable information on the web. RDF emphasizes facilities to enable automated processing of web resources and, as such, provides the basic building blocks for supporting the semantic web.

In general, RDF provides the basis for generic tools for authoring, manipulating, and searching machine-understandable data on the web thereby promoting the transformation of the web into a machine-processable repository of information.

2.3 Dublin core

Dublin core metadata is specifically intended to support resource discovery. The elements represent a broad, interdisciplinary consensus about the core set of elements that are useful to support resource discovery.

"Simple Dublin core" or "unqualified Dublin core" is Dublin core metadata that uses no qualifiers. The elements are expressed as attribute value pairs without any qualifiers such as encoding schemes, enumerated lists of values, or other processing clues.

"Qualified Dublin core" employs additional qualifiers to further refine the meaning of a resource. One use for such qualifiers is to indicate if a metadata value is a compound or structured value, rather than just a string. For example, a "date" is a Dublin core element that has the option of being further specified to identify it as a particular kind of date (date last modified, date published, etc).

2.4 Relationship between RDF and Dublin core

RDF and Dublin core are distinct specifications. Neither requires the other, but their co-evolution makes them natural complements in the metadata architecture for the web.

XML provides the syntax for encoding assertions in RDF, and hence in RDF-encoded Dublin core metadata.

2.5 Dublin core elements

Dublin core builds on RDF by defining 15 named properties, the Dublin core metadata set of elements, which are considered to be sufficient for resource discovery.

S1000D metadata, contained in the identification and status section of data modules, publication modules or SCORM content package modules, are mapped to the Dublin core set of elements. Any RDF/Dublin core aware application is then able to understand these mapped elements.

The following paragraphs list the 11 Dublin core elements used by S1000D together with their definitions, followed by a summary in Table 2.

2.5.1 Title

Definition: A name given to the resource. Typically, a title will be a name by which the resource is formally known.

S1000D maps the data module title, the publication module title or the SCORM content package module title to this Dublin core element, ie, for data modules the content of element <techName> and, if given, element <infoName> separated from the element <techName> by a space-surrounded hyphen as indicated below and, if given, followed by element <infoNameVariant> separated from the element <infoName> by a comma and a space as indicated below, for publication modules the content of element <pmTitle>, and for or SCORM content package modules the content of element <scormContentPackageTitle>.

Mapping:

<dc:title> = <techName> - <infoName>, <infoNameVariant> (for data modules)

or

<dc:title> = <pmTitle> (for publication modules)

or

<dc:title> = <scormContentPackageTitle> (for SCORM content package modules)

2.5.2 Creator

Definition: An entity primarily responsible for making the content of the resource. Examples of a creator include a person, an organization, or a service. Typically, the name of a creator is used to indicate the entity.

S1000D maps the content of element <originator> to this Dublin core element for data modules and the element <responsiblePartnerCompany> for publication modules and SCORM content package modules.

Mapping:

<dc:creator> = <originator> (for data modules)

or

<dc:creator> = <responsiblePartnerCompany> (for publication modules and SCORM content package modules)

2.5.3 Subject and keywords

Definition: The topic of the content of the resource. Typically, a subject will be expressed as keywords, key phrases or classification codes that describe a topic of the resource. Recommended best practice is to select a value from a controlled vocabulary or formal classification scheme.

S1000D maps the data module title or the publication module title or the SCORM content package module title to this Dublin core element.

Mapping:

<dc:subject> = <techName> - <infoName>, <infoNameVariant> (for data modules)

or

<dc:subject> = <pmTitle> (for publication modules)

or

<dc:subject> = <scormContentPackageTitle> (for SCORM content package modules)

2.5.4 Publisher

Definition: An entity responsible for making the resource available. Examples of a publisher include a person, an organization, or a service. Typically, the name of a publisher is used to indicate the entity.

S1000D maps the content of element <responsiblePartnerCompany> (ie, the value of attribute `enterpriseCode` if given, otherwise the content of element <enterpriseName>) for data modules, the attribute `pmIssuer` for publication modules, and the attribute `scormContentPackageIssuer` for SCORM content package modules to this Dublin core element.

Mapping:

<dc:publisher> = <responsiblePartnerCompany> (for data modules)

or

<dc:publisher> = `pmIssuer` (for publication modules)

or

<dc:publisher> = `scormContentPackageIssuer` (for SCORM content package modules)

2.5.5 Contributor

Definition: An entity responsible for making contributions to the content of the resource. Examples of a contributor include a person, an organization, or a service. Typically, the name of a contributor is used to indicate the entity.

S1000D maps the originator to this Dublin core element, ie, the value of attribute `enterpriseCode` if given, otherwise the content of element <enterpriseName>).

Mapping:

<dc:contributor> = <originator> (only for data modules and publication modules)

2.5.6 Date

Definition: A date associated with an event in the life cycle of the resource. Typically, <dc:date> will be associated with the creation or availability of the resource. Recommended best practice for encoding the date value is defined in a profile of International Standards Organization (ISO) 8601 and follows the YYYY-MM-DD format.

S1000D maps the data module or publication module or SCORM content package module issue date to this Dublin core element, (ie values of attribute year, attribute month and attribute day of element <issueDate>, separated by hyphens as indicated below).

Mapping:

<dc:date> = values of attributes year-month-day of element <issueDate>

2.5.7 Resource type

Definition: The nature or genre of the content of the resource. Element <dc:type> includes terms describing general categories, functions, genres, or aggregation levels for content. Recommended best practice is to select a value from a controlled vocabulary (eg, the recommended list of Dublin core types). To describe the physical or digital manifestation of the resource, use the element <dc:format>.

S1000D assigns the fixed value "text" to this Dublin core element.

Mapping:

<dc:type> = fixed value "text"

2.5.8 Format

Definition: The physical or digital manifestation of the resource. Typically, element <dc:format> includes the media type or dimensions of the resource. Element <dc:format> can be used to determine the software, hardware or other equipment needed to display or operate the resource. Examples of dimensions include size and duration. Recommended best practice is to select a value from a controlled vocabulary (eg, the list of Internet media types defining computer media formats).

S1000D assigns the fixed value "text/xml" to this Dublin core element.

Mapping:

<dc:format> = fixed value "text/xml"

2.5.9 Resource identifier

Definition: An unambiguous reference to the resource within a given context. Recommended best practice is to identify the resource by means of a string or number conforming to a formal identification system. Example formal identification systems include the URI (including the Uniform Resource Locator (URL)), the Digital Object Identifier (DOI) and the International Standard Book Number (ISBN).

S1000D maps the content of the attributes of element <dmCode>, of element <pmCode> or of element <scormContentPackageCode> to this Dublin core element, separated by hyphens as given in Chap 4.3, Chap 4.9.2 and Chap 4.15.2 respectively. When used, the content of the extension element <identExtension>, as described in Chap 4.12, is included in the mapping to the Resource identifier. In addition, the attribute issueNumber of element <issueInfo> must be added, separated from the data module code, the publication module code or the SCORM content package module code by an underscore. The attribute inWork must be added and separated by a hyphen.

Mapping:

<dc:identifier> = <dmCode>_issueNumber-inWork (for data modules)

or

<dc:identifier> = extensionProducer_extensionCode_<dmCode>_issueNumber-inWork (for data modules)

or

<dc:identifier> = extensionProducer_extensionCode_<pmCode>_issueNumber-inWork (for publication modules)

or

<dc:identifier> = extensionProducer_extensionCode_<scormContentPackageCode>_issueNumber-inWork (for SCORM content package modules)

2.5.10 Language

Definition: A language of the intellectual content of the resource. Recommended best practice for the content of element <dc:language> is defined by RFC 1766 (refer to Chap 3.9.5.1 regarding acceptable language codes), optionally followed by the country code in uppercase (taken from the ISO 3166 standard). For example, "en" for English, "fr" for French, "de" for German, or "en-GB" for English used in Great Britain.

S1000D maps the data module or publication module or SCORM content package module language to this Dublin core element, ie, the values of attribute languageIsoCode and attribute countryIsoCode of mandatory element <language>, separated by a hyphen as indicated below.

Mapping:

<dc:language> = attributes languageIsoCode-countryIsoCode of element <language>

2.5.11 Rights management

Definition: Information about rights held in and over the resource. Typically, the element <dc:rights> will contain a rights management statement for the resource, or reference a service providing such information. Rights information often encompasses Intellectual Property Rights (in process review), copyright, and various property rights. If the element <dc:rights> is absent, no assumptions can be made about the status of these and other rights with respect to the resource.

S1000D maps the data module or publication module or SCORM content package module security classification to this Dublin core element, ie, the values of attribute securityClassification, optional attribute commercialClassification and optional attribute caveat of element <security>, and the derivative classification information, if applicable.

Mapping:

<dc:rights> = attributes securityClassification_commercialClassification_caveat_ of

element <security> followed by an optionally repeatable actionIdentType_year_month_day of elements <classificationAction> or <valueAfterAction> of element <derivativeClassification> (this mapping reflects the use of all attributes)

or

<dc:rights> = attributes securityClassification_commercialClassification__ of element <security> followed by an optionally repeatable actionIdentType_year_month_day of elements <classificationAction> or <valueAfterAction> of element <derivativeClassification> (this mapping reflects the use of all attributes except the attribute caveat)

or

<dc:rights> = attributes securityClassification__caveat_ of element <security> followed by an optionally repeatable actionIdentType_year_month_day of elements <classificationAction> or <valueAfterAction> of element <derivativeClassification> (this mapping reflects the use of all attributes except the attribute commercialClassification)

or

<dc:rights> = attributes securityClassification_commercialClassification_caveat of element <security> (this mapping reflects the use of all attributes except the attribute actionIdentType_year_month_day)

or

<dc:rights> = attributes securityClassification_commercialClassification of element <security> (this mapping reflects the use of all attributes except the attributes caveat and actionIdentType_year_month_day)

or

<dc:rights> = attributes securityClassification__caveat of element <security> (this mapping reflects the use of all attributes except the attributes commercialClassification and actionIdentType_year_month_day)

or

<dc:rights> = attribute securityClassification of element <security> (this mapping reflects only the use of the attribute securityClassification)

2.5.12 Source

Definition: A related resource from which the described resource is derived. Typically the element <dc:source> will contain the derivative source for the described resource. If the element <dc:source> is absent, no assumptions can be made about the status of derived content.

S1000D maps the data module or publication module derivative classification source to the Dublin core element, ie, the value of element <derivativeSource>.

Mapping:

<dc:source> = <derivativeSource> of element <derivativeClassification>

2.6 Metadata mapping

Table 2 summarizes the mapping of S1000D elements and attributes to the Dublin core elements. It is not possible to achieve a one to one relationship as some:

- S1000D metadata elements are not within the Dublin core scope (eg, element <qualityAssurance>)
- Dublin core elements have no exact counterpart in S1000D (eg, element <dc:rights>)
- S1000D metadata elements have to be merged (eg, <techName> - <infoName>, <infoNameVariant>)

Table 2 Metadata mapping

Dublin core elements	Data module elements and/or attributes	Publication module/ SCORM content package module elements and/or attributes
<dc:creator>	<originator>	<responsiblePartnerCompany>
<dc:title>	<techName> - <infoName>, <infoNameVariant>	<pmTitle> <scormContentPackageTitle>
<dc:subject>	<techName> - <infoName>. <infoNameVariant>	<pmTitle> <scormContentPackageTitle>
<dc:publisher>	<responsiblePartnerCompany>	pmIssuer scormContentPackageIssuer
<dc:contributor>	<originator>	<originator>
<dc:date>	year-month-day	year-month-day
<dc:type>	"text"	"text"
<dc:format>	"text/xml"	"text/xml"
<dc:identifier>	<dmCode>_issueNumber-inWork or extensionProducer_ extensionCode_ <dmCode>_ issueNumber-inWork	<pmCode>_issueNumber-inWork or extensionProducer_ extensionCode_<pmCode>_ issueNumber-inWork <scormContentPackageCode>_ issueNumber-inWork or extensionProducer_ extensionCode_ <scormContentPackageCode>_ issueNumber-inWork
<dc:language>	languageIsoCode-countryIsoCode	languageIsoCode-countryIsoCode

Dublin core elements	Data module elements and/or attributes	Publication module/ SCORM content package module elements and/or attributes
<dc:source>	<derivativeSource>	<derivativeSource>
<dc:rights>	securityClassification_ commercialClassification_ caveat_actionIdentType_ year_month_day	securityClassification_ commercialClassification_ caveat_actionIdentType_ year_month_day
	or	or
	securityClassification_ commercialClassification__ actionIdentType_ year_month_day	securityClassification_ commercialClassification__ actionIdentType_ year_month_day
	or	or
	securityClassification__ caveat_actionIdentType_ year_month_day	securityClassification__ caveat_actionIdentType_ year_month_day
	or	or
	securityClassification___ actionIdentType_ year_month_day	securityClassification___ actionIdentType_ year_month_day
	or	or
	securityClassification_ commercialClassification_ caveat	securityClassification_ commercialClassification_ caveat
	or	or
	securityClassification_ commercialClassification	securityClassification_ commercialClassification
	or	or
	securityClassification__ caveat	securityClassification__ caveat
	or	or
	securityClassification	securityClassification

2.7 RDF/Dublin core example

The following example demonstrates the mapping of S1000D data module elements and/or attributes to Dublin core metadata elements within an RDF container expressed in XML:

```
<?xml version="1.0"?>
<!DOCTYPE dmodule
[
<!ENTITY % ISOEntities PUBLIC "ISO 8879-1986//ENTITIES ISO Character
Entities 20030531//EN//XML" "http://www.s1000d.org/S1000D_4-
2/ent/ISOEntities">
%ISOEntities;
```

```
]>
<dmodule xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="http://www.s1000d.org/S1000D_4-
2/xml_schema_flat/proced.xsd"
xmlns:dm="http://www.s1000d.org/dm"
xmlns:xlink="http:/www.w3.org/1999/xlink"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/">
<rdf:Description>
<dc:title>Solenoid valve, Pump No. 1 (No. 2) -
Remove procedure</dc:title>
<dc:creator>C0419</dc:creator>
<dc:subject>Solenoid valve, Pump No. 1 (No. 2) -
Remove procedure</dc:subject>
<dc:publisher>C0419</dc:publisher>
<dc:contributor>C0419</dc:contributor>
<dc:date>2001-04-01</dc:date>
<dc:type>text</dc:type>
<dc:format>text/xml</dc:format>
<dc:identifier>1B-B-29-11-01-06A-520A-A_003_01</dc:identifier>
<dc:language>sx-GB</dc:language>
<dc:rights>01_cc00_cv01_ai04_2012_12_30</dc:rights>
<dc:source>The Solenoid Handbook</dc:source>
</rdf:Description>
...
...
</dmodule>
```

Chapter 7.4.1.1.3

Generation process - Transformation

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REC-xlink11-20100506	W3C Recommendation: XML Linking Language (XLink) Version 1.1, 2010

1 General

The technical aspects of the transformation for IETP generation are described below. The content of this chapter together with the necessary additional resources, available through www.s1000d.org, is sufficient to understand the concept of generating an S1000D IETP.

2 Transformation

The transformation of data modules for IETP includes as a minimum:

– the automatic generation of identifiers for elements which will be used in hyperlinks and for which identifiers have not yet been authored into the data modules. In XML terminology these identifiers will serve as the addresses of ending resources. An example would be to amend the element <`catalogSeqNumber`> by an attribute `id` for referencing this CSN. In the S1000D Schema all these attributes are named `id`, which facilitates addressing the corresponding XML elements by name using the fragment identifier "`#xpointer(//*[@id='id-value'])`". Therefore, it is strongly recommended that this common practice also for identifiers, which are automatically generated (ie, name them

id), is used. Furthermore, the automatic generation process must obey the validity constraint of unique identifiers, otherwise only the first occurrence of an XML element in question can be retrieved.
- the generation of xlink: attributes for elements which serve both as starting resources and linking elements
- the optional, but recommended, generation of a standard RDF/Dublin core metadata section by mapping data module and publication module identification and status section to corresponding Dublin core elements. Refer to Chap 7.4.1.1.2.
- the transformation from XML to HTML for the IETP (eg, by using XSLT), if the viewer cannot interpret eXtensible Stylesheet Language (XSL) stylesheets or process native XLink attributes directly

2.1 Generation of identifiers

Identifiers are only useful for ending resources, and if they can be defined properly through a semantic rule, in order to allow safe access to them.

The recommended naming conventions for identifier values for automatic generation are, for example, as follows:

- <figure id="fignnn">, where "nnn" is a sequential number denoting the sequence of the figure within a data module, starting with "001".
- In case of multi-sheet figures:
  <graphic id="fignnn-gramm" infoEntityIdent="ICN-icn">, where "fignnn" is the identifier value of the parent element <figure> and "mm" denotes the sequential number of this illustration sheet within a multi-sheet figure.
- <catalogSeqNumber id="csn-csn"> when you are referring to a complete CSN or <itemSeqNumber id="csn-csnisn">, where "csnisn" are the related CSN and ISN values within an IPD data module when you are referring to a specific ISN.
- <term id="fignnn-trmmm">, if element <term> is a child of element <legend> of element <figure>, where value "fignnn" is the identifier value of the parent element <figure> and "mm" is a unique sequential number of this term within the figure legend.
- Within the instance, each of these generated identifier values must be unique and must not conflict with already existing identifiers.

  - For chapterized CSN, the unique identifier can be built up from the attributes systemCode, subSystemCode, subSubSystemCode, assyCode, figureNumber, figureNumberVariant, item, and itemVariant of the element <catalogSeqNumber> and the attribute itemSeqNumberValue of the element <itemSeqNumber>
  - For non-chapterized CSN, the identifier can be built up from the attributes figureNumber, figureNumberVariant, item and itemVariant of the element <catalogSeqNumber>.

  Note

  Attribute figureNumberVariant is optional and when not provided, use a "0". If the optional attribute itemVariant is not provided, omit it in the generated identifier.

The recommended naming convention for identifier values is as follows:

1 Use the first three characters of the element name.

2 Add a sequential (control) number (eventually preceded by a single hyphen), which is unique within the data module.

Examples:

```
<figure id="fig001">

<graphic  id="fig002-gra02"  infoEntityIdent="ICN-S1000D-A-004002-G-
S7282-00151-A-01-1">

<symbol id="sym123" infoEntityIdent="ICN-S1000D-A-316200-0-F0214-
00352-A-01-1">

<listItemTerm id="fig001-trm03">
```

Example for a CSN within a chapterized IPD data module, represented by `<catalogSeqNumber systemCode="53" subSystemCode="2" subSubSystemCode="5" assyCode="10" figureNumber="02" item="007">`:

```
<catalogSeqNumber id="csn-53-25-10-020-007">
```

Example for an ISN within a chapterized IPD data module, represented by `<itemSeqNumber itemSeqNumberValue="00A">` where the CSN is represented by `<catalogSeqNumber systemCode="53" subSystemCode="2" subSubSystemCode="5" assyCode="10" figureNumber="01" item="008">`:

```
<itemSeqNumber id="csn-53-25-10-010-008-00A">
```

Example for a CSN within a non-chapterized IPD data module, represented by `<catalogSeqNumber figureNumber="01" item="008">` and an ISN, represented by `<itemSeqNumber itemSeqNumberValue="00A">`:

```
<catalogSeqNumber id="csn-010-008-00A">
```

2.2 Graphics and graphical hotspots

Graphical hotspots are defined in S1000D XML data modules by child elements <hotspot> of the element <graphic>.

Example of an XML Schema fragment:

```
<xs:complexType name="graphicElemType">
    <xs:sequence>
        <xs:element maxOccurs="unbounded" minOccurs="0"
ref="hotspot"/>
        <xs:element maxOccurs="unbounded" minOccurs="0"
ref="reasonForAmendment"/>
    </xs:sequence>
    <xs:attribute ref="applicRefId"/>
    <xs:attribute ref="infoEntityIdent" use="required"/>
    <xs:attribute ref="reproductionWidth"/>
    <xs:attribute ref="reproductionHeight"/>
    <xs:attribute ref="reproductionScale"/>
    <xs:attribute ref="id"/>
    <xs:attribute ref="controlAuthorityRefs"/>
    <xs:attributeGroup ref="securityAttGroup"/>
    <xs:attributeGroup ref="xlink:XLINKATT0"/>
</xs:complexType>
```

Note

As it only makes sense to activate graphical hotspots by referencing them through the element <internalRef>, there is no need to declare the element <hotspot> as a linking element.

There is a special case for the element <symbol>, which can appear at the lowest level (eg, in paragraphs, lists and tables). The default viewer behavior is to present it without the need for user interaction, and to embed it in the flow of text.

Refer to Chap 7.7.4 for an XLink instance example concerning the element <symbol>.

Other markup examples for the element <figure> and the element <graphic> are given in the paragraphs below.

2.2.1 Single-sheet figure

Markup example for a single illustration sheet figure in an XML data module instance fragment with minimum required information:

```
<figure id="fig001">
<title>Removal of solenoid valve, Pump No. 1</title>
<graphic infoEntityIdent="ICN-1B-B-291101-M-C0419-00571-A-01-1">
</graphic>
</figure>
```

Markup example of a single illustration sheet figure in XML form with XLink attributes, assuming that the graphic file name appears as value of the attribute xlink:href, has been retrieved from the system identifier given in the corresponding graphic entity definition at the beginning of the data module (generated attributes are shown in bold):

```
<figure id="fig001">
<title>Removal of solenoid valve, Pump No. 1</title>
<graphic xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:href="URN:S1000D:ICN-1B-B-291101-M-C0419-00571-A-01-1"
xlink:title="Removal of solenoid valve, Pump No. 1"
infoEntityIdent="ICN-1B-B-291101-M-C0419-00571-A-01-1">
</graphic>
</figure>
```

Note

Although not required, it is recommended that the element <graphic> be amended using the attribute xlink:title, which contains the figure title in accordance with REC-xlink11-20100506. The value of attribute xlink:title can be used as a screen tip in the viewer application.

Depending on end user viewing requirements, the attributes xlink:show and xlink:actuate can appear in addition on the element <graphic>. They can take the value "embed" and the value "onLoad", respectively, in cases where the graphic is to be displayed in the flow of text.

Another possibility for viewing behavior is to show only an icon in the flow of text (xlink:actuate="onRequest") and display the full graphic on user request either embedded in the same window (xlink:show="embed") or in a newly created window (xlink:show="new").

2.2.2 Multi-sheet figure with two illustration sheets

Markup example of a multi-sheet figure with two illustration sheets in an XML data module instance fragment with minimum required information:

```
<figure id="fig002">
<title>Identification of components on complex circuit board
</title>
```

```
<graphic id="fig002-gra01"
infoEntityIdent="ICN-S1000D-A-004002-G-S7282-00150-A-01-1">
</graphic>
<graphic id="fig002-gra02"
infoEntityIdent="ICN-S1000D-A-004002-G-S7282-00151-A-01-1">
</graphic>
</figure>
```

Markup example of a multi-sheet figure with two illustration sheets in XML form with XLink attributes (generated XLink attributes are shown in bold):

```
<figure id="fig002">
<title>Identification of components on complex circuit board
</title>
<graphic xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:href="URN:S1000D:ICN-S1000D-A-004002-G-S2782-00150-A-01-1"
xlink:title="Identification of components on complex
circuit board (Sheet 1 of 2)"
id="fig002-gra01"
infoEntityIdent="ICN-S1000D-A-004002-G-S7282-00150-A-01-1">
</graphic>
<graphic xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:href="URN:S1000D:ICN-S1000D-A-004002-G-S2782-00151-A-01-1"
xlink:title="Identification of components on complex
circuit board (Sheet 2 of 2)"
id="fig002-gra02"
infoEntityIdent="ICN-S1000D-A-004002-G-S7282-00151-A-01-1">
</graphic>
</figure>
```

2.3 Links

Links include as a minimum the generation of XLink attributes on the elements <dmRef>, <internalRef>, <pmRef>, <externalPubRef> and <catalogSeqNumberRef>. For more information on XML-based links, refer to Chap 7.4.1.1.1.

Markup example of an XML instance fragment for the element <pmRef>:

```
<pmRef xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="replace"
xlink:title="S1000D Publication Module - The first"
xlink:href="URN:S1000D:PMC-S1000D-F6117-00001-00">
<pmRefIdent>
<pmCode modelIdentCode="S1000D" pmIssuer="F6117"
pmNumber="00001" pmVolume="00"/>
<language languageIsoCode="sx" countryIsoCode="US"/>
<issueInfo issueNumber="001" inWork="00"/>
</pmRefIdent>
<pmRefAddressItems>
<pmTitle>S1000D publication module - The first</pmTitle>
<issueDate year="2003" month="07" day="18"/>
</pmRefAddressItems>
</pmRef>
```

The following examples demonstrate the extension of a data module instance fragment with XLink attributes for the element <dmRef>.

Markup example of a data module instance fragment with minimum required information:

```
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000D" systemDiffCode="A"
systemCode="07" subSystemCode="0" subSubSystemCode="4"
assyCode="0101" disassyCode="00" disassyCodeVariant="A"
infoCode="040" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
```

Markup example with generated XLink attributes shown in bold:

```
<dmRef xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="replace"
xlink:href="URN:S1000D:DMC-S1000D-A-07-04-0101-00A-040A-A">
<dmRefIdent>
<dmCode modelIdentCode="S1000D" systemDiffCode="A"
systemCode="07" subSystemCode="0" subSubSystemCode="4"
assyCode="0101" disassyCode="00" disassyCodeVariant="A"
infoCode="040" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
```

Markup example of a data module instance fragment with optional issue number and optional data module title:

```
<dmRef>
<dmRefIdent>
<dmCode modelIdentCode="S1000D" systemDiffCode="A"
systemCode="07" subSystemCode="0" subSubSystemCode="4"
assyCode="0101" disassyCode="00" disassyCodeVariant="A"
infoCode="040" infoCodeVariant="A" itemLocationCode="A"/>
<issueInfo issueNumber="002" inWork="00" issueType="changed"/>
</dmRefIdent>
<dmRefAddressItems>
<dmTitle>
<techname>IETP</techname>
<infoName>Generation process</infoName>
</dmTitle>
</dmRefAddressItems>
</dmRef>
```

Markup example with generated XLink attributes shown in bold:

```
<dmRef xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="replace"
xlink:title="IETP - Generation process"
xlink:href="URN:S1000D:DMC-S1000D-A-07-04-0101-00A-040A-A">
<dmRefIdent>
<dmCode modelIdentCode="S1000D" systemDiffCode="A"
systemCode="07" subSystemCode="0" subSubSystemCode="4"
assyCode="0101" disassyCode="00" disassyCodeVariant="A"
```

```
infoCode="040" infoCodeVariant="A" itemLocationCode="A"/>
<issueInfo issueNumber="002" inWork="00" issueType="changed"/>
</dmRefIdent>
<dmRefAddressItems>
<dmTitle>
<techname>IETP</techname>
<infoName>Generation process</infoName>
</dmTitle>
</dmRefAddressItems>
</dmRef>
```

Markup example of a data module instance fragment when the extended code is applied:

```
<dmRef>
<dmRefIdent>
<identExtension extensionProducer="SF518"
extensionCode="USER001"/>
<dmCode modelIdentCode="S1000D" systemDiffCode="A"
systemCode="07" subSystemCode="0" subSubSystemCode="4"
assyCode="0101" disassyCode="00" disassyCodeVariant="A"
infoCode="040" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
```

Markup example with generated XLink attributes shown in bold:

```
<dmRef xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="replace"
xlink:href="URN:S1000D:DME-SF518-USER001-S1000D-A-07-04-0101-00A-040A-
A">
<dmRefIdent>
<identExtension extensionProducer="SF518"
extensionCode="USER001"/>
<dmCode modelIdentCode="S1000D" systemDiffCode="A"
systemCode="07" subSystemCode="0" subSubSystemCode="4"
assyCode="0101" disassyCode="00" disassyCodeVariant="A"
infoCode="040" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
</dmRef>
```

Note

Depending on the end user viewing requirements, the attribute `xlink:show` can take the value "`new`" instead of the value "`replace`".

Chapter 7.4.1.2

IETP - Resource resolution

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1 General

With the emergence of the Web the use of Uniform Resource Locators (URL) has provided a method to access resources located anywhere in the world. Unfortunately, the URL establishes resource links directly to a location, usually residing on a web server, but once the resource is moved to another location all users of the link must re-author their side of the link or the link is broken. Additionally, to establish a link using a URL the location of the resource must be known beforehand. To overcome these limitations there is a need to establish a location independent method of linking.

In a shared environment this situation becomes even more difficult as users of a resource must be notified of changes to the location of a resource to maintain a valid link. Use of relative URLs minimizes some of these issues, but this would imply that every resource exists in the same

fixed file structure. Relative URLs also cause issues for resources that do not exist in actual physical locations or file structures but are located in a database server or other virtual representation. Finally, relative URLs lack metadata capability and do not address communication between applications.

Within the S1000D concept, IETPs are expected to interact with one another, and interoperability between IETPs is becoming a firm requirement. Although an IETP can manage its own resources, interaction between IETPs can be difficult, especially if different enterprise's IETP applications need to communicate. Having a location independent resource system will facilitate this communication by masking the internal resource structure of the various IETP applications and allowing resource access through named requests instead of location requests.

The main objective of this chapter is to describe a method of resource resolution that will be location independent using Uniform Resource Names (URN), XLink, and promote resource description using metadata attributes.

2 Resource resolution

2.1 Resource resolution concepts

2.1.1 Resources

A fundamental concept of the World Wide Web is a resource. A resource can be anything that can be accessed through an identifier. The resource identifier can be considered the resource name or the resource location. For web based applications resource identifiers are described by the Uniform Resource Identifier (URI) syntax. Both URL and URN are considered URIs.

2.1.2 Resource resolvers

Resource resolution involves determining the physical resource location from a resource identifier. A resource resolver accepts a resource identifier and provides access to the resource location. Using URLs, a web server provides access to the resource directly. Using URNs, an intermediate server provides indirect access to resources by providing access to a URL, which can then be used to access the resource directly.

2.1.3 Location independence

The use of location independence allows the physical location of a resource to change while the identifier of the resource remains constant. If a resource is resolved indirectly using a resource resolver the link location only needs to be maintained in the resolver. Resource resolvers will accept a resource identifier and return the resolved resource location. Once the location change is updated in the resource resolver, all users of the resource through the resolver can continue to access the resource without modifying their own internal links. If the identifier is made persistent then any reference to the resource using the identifier will remain valid as long as the resource resolver remains updated with the current resource location.

2.1.4 Uniform resource names

Since URLs contain embedded location information they cannot be made location independent. The best method to achieve resource location independence is to use the URI described as a Uniform Resource Name. The URN identifies a resource by name only and contains no location information. To use a URN as a link, the link location must be resolved to a URL through an intermediate resource resolution process.

2.1.5 XLinks

An XLink provides a powerful linking mechanism for XML documents. For the purpose of location independence all XLink references used in this specification should use the URN form of URI.

2.1.6 Metadata

Another important aspect of resources is metadata. Metadata describes additional aspects of the resource beyond its identifier, such as the title, author, creation date, etc. The Resource

Description Framework (RDF) and Dublin Core (DC) are methods of describing resources. A resource resolver allows discovery of resource identifiers through the use of metadata queries.

2.2 Use of URNs for resource resolution

To provide location independence in the XML neutral repository all links should be expressed in URN format. The IETP application will process the URN links and transform them into URL links for the rendered "end user form". The use of URNs will standardize data access across IETP repositories allows for XML neutral repositories to be shared between IETP applications.

2.2.1 URN format

The URN format is described by the following:

- URN:NID:NSS
- Where:
- URN = Required URN Prefix
- NID = Namespace Identifier
- NSS = Namespace Specific String

2.2.2 S1000D URN namespace identifiers

In S1000D, all information objects such as data modules, publication modules, and illustrations are considered resources. The Data Module Code (DMC), Data Module code Extended (DME), Publication Module Code (PMC), Publication Module code Extended (PME), SCORM content package Module Code (SMC), SCORM content package Module code Extended (SME), CSN, ICN, ICN metadata file code (IMF), COMment code (COM), Data Dispatch Note code (DDN), Data Management List code (DML), data UPdate File (UPF) and data UPdate file Extended (UPE) are the resource identifiers that are each described by a specific name syntax and format identified elsewhere in this specification. Since DMC, DME, PMC, PME, SMC, SME, CSN, ICN, IMF, COM, DDN, DML, UPF and UPE codes have global name uniqueness and are controlled under the authority of the S1000D each can be considered an S1000D subnamespace.

2.2.3 S1000D URN namespace registration

S1000D has a registered namespace identifier to reserve a range of names for specification use. The namespace identifier "S1000D" is reserved as illustrated by the following string:

```
URN:S1000D:{NSS as DMC, DME, PMC, PME, SMC, SME, CSN, ICN, IMF,
COM, DDN, DML, UPF, UPE encodings}
```

2.2.4 S1000D URN namespace specific strings

The namespace specific string for URNs defined by this specification will be divided into three components: subnamespace prefix, subnamespace code, and namespace extension suffix.

2.2.4.1 S1000D URN subnamespace prefix

Within S1000D, the namespace specific string is divided into subnamespaces for each of the encodings defined by this specification through the use of a prefix at the start of the string. The following are identified subnamespaces:

- the "URN:S1000D:DMC" subnamespace must contain all DMCs
- the "URN:S1000D:DME" subnamespace must contain all DMCs with extensions
- the "URN:S1000D:PMC" subnamespace must contain all PMCs
- the "URN:S1000D:PME" subnamespace must contain all PMEs
- the "URN:S1000D:SMC" subnamespace must contain all SMCs
- the "URN:S1000D:SME" subnamespace must contain all SMEs
- the "URN:S1000D:CSN" subnamespace must contain all CSNs
- the "URN:S1000D:ICN" subnamespace must contain all ICNs
- the "URN:S1000D:IMF" subnamespace must contain all IMFs
- the "URN:S1000D:COM" subnamespace must contain all COMs

- the "URN:S1000D:DDN" subnamespace must contain all DDNs
- the "URN:S1000D:DML" subnamespace must contain all DMLs
- the "URN:S1000D:UPF" subnamespace must contain all UPFs
- the "URN:S1000D:UPE" subnamespace must contain all UPEs

2.2.4.2 S1000D URN subnamespace codes

The subnamespacecode follows the subnamespace prefix. The subnamespace prefix will be separated from the subnamespace code using the "-" (ASCII 45) character.

```
URN:S1000D:DMC-{Code in DMC syntax}
URN:S1000D:DME-{Code in DME syntax}
URN:S1000D:PMC-{Code in PMC syntax}
URN:S1000D:PME-{Code in PME syntax}
URN:S1000D:SMC-{Code in SMC syntax}
URN:S1000D:SME-{Code in SME syntax}
URN:S1000D:CSN-{Code in CSN syntax}
URN:S1000D:ICN-{Code in ICN syntax}
URN:S1000D:IMF-{Code in IMF syntax}
URN:S1000D:COM-{Code in COM syntax}
URN:S1000D:DDN-{Code in DDN syntax}
URN:S1000D:DML-{Code in DML syntax}
URN:S1000D:UPF-{Code in UPF syntax}
URN:S1000D:UPE-{Code in UPE syntax}
```

2.2.4.3 S1000D URN subnamespace extension suffix

In addition, the code syntax must be extended within the namespace to include qualifiers that further identify the item. Each qualifier is separated from the subnamespace code by an underscore, (ie, the "_" (ASCII 95) character and appended after the subnamespace code). A qualifier begins with a qualifier identifier separated from the qualifier data using the "-" (ASCII 45) character.

The following qualifiers are required:

The issue of the data is identified using the "I" qualifier by appending the string "_I-{ISSUE}" to issue number where "{ISSUE}" is the issue number.

The INWORK status of the data is identified using the "W" qualifier by appending the string "_W-{INWORK}" to the code where "{INWORK}" is the inwork number.

The encoded language of the data is identified using the "L" qualifier by appending the string "_L-{LANG}" where "{LANG}" is the language code.

The encoded country of the data further qualifies the language using the "C" qualifier by appending the string "_C-{COUNTRY}" to the code where "{COUNTRY}" is the country code.

2.2.5 URN examples

URN for the DMC "S1000D-A-07-05-0000-00A-000A-A":

URN:S1000D:DMC-S1000D-A-07-05-0000-00A-000A-A_I-001_W-00_L-SX_C-US

URN for the DMC "S1000D-A-07-05-0000-00A-000A-A" specifying the first issue in English:

URN:S1000D:DMC-S1000D-A-07-05-0000-00A-000A-A_I-001_W-00_L-EN_C-US

URN for the training DMC "S1000D-A-07-05-0000-00A-000A-A-T80E" specifying the first issue in English:

URN:S1000D:DMC-S1000D-A-07-05-0000-00A-000A-A-T80E_I-001_W-00_L-EN_C-US

URN for an instance of the DMC "S1000D-A-07-05-0000-00A-000A-A" applying the extension "SF518-ABC00231", and also specifying the first issue in English:

URN:S1000D:DME-SF518-ABC00231-S1000D-A-07-05-0000-00A-000A-A_I-001_W-00_L-EN_C-US

2.2.6 URN security considerations

There are no additional security considerations other than those normally associated with the use and resolution of URI in general. Most implementations of resolution services will likely be web services. Therefore security considerations in this case will be the same well known issues related to accessing and protecting information over the internet.

2.3 IETP URN to URL translation

Since current browsers do not have the capability to resolve URNs and XLinks directly, each IETP application will need to resolve link information during the transformation to the end user form to be displayed in the browser. The process to resolve URN information depends on the IETP implementation.

To convert a URN to a file name a simple method is to parse the namespace specific string of the URN and append the appropriate file extension and possibly a static directory structure to get a relative or static URL. More advanced applications could use a database to lookup the URL for a specific URN and possibly even store the data module within the database.

To achieve a common resolution interface, IETP applications must implement the URN resolution server interface proposed in this specification by providing an external interface to the internal IETP data repository, thereby allowing external applications to access the information. Using this interface for internal URN resolution is also recommended to simplify link resolution.

Chapter 7.4.2

Generation of publications - Publication module and SCORM content package Schema

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Chap No./Document No.	Title
Chap 4.9	Information management - Publication management
Chap 7.4.2.1	Publication module Schema - Issue summary
Chap 7.4.2.2	SCORM content package module Schema - Issue summary

1 General

1.1 Purpose

The purpose of this chapter is to provide technical background on S1000D publication module and SCORM content package.

1.2 Scope

The publication module defines the content and the structure of a publication. It contains references to data modules, other publication modules, data modules with front matter and access illustrations, gives corresponding titles and specifies how these are structured within the publication instance.

The SCORM content package defines the content and the structure of a SCO. It contains references to data modules, other SCORM content packages, data modules with front matter and access illustrations, gives corresponding titles and specifies how these are structured within the SCO instance.

2 Publication module and SCORM content package Schemas

The rules and guidance for publication module and SCORM content package are given in the following chapters:

- Chap 4.9: provides a detailed description of the concept and structure of the publication module
- Chap 4.15 provides a detailed description of the concept and structure of the SCORM content package

Electronic copies of the XML Schema for publication modules and SCORM content package are available for download from the S1000D web site at www.s1000d.org. System identifiers shown in examples point to these reference copies at:

`http://www.s1000d.org/S1000D_4-1/...`

From S1000D Issue 4.0 onwards, Standard Generalized Markup Language (SGML) and XML Document Type Definition (DTD) are no longer supported.

General information on the Publication module and SCORM content package concept are given in the following chapters:

- Chap 7.4.2.1 provides information for publication module Schema.
- Chap 7.4.2.2 provides information for SCORM content package module Schema.

2.1 Publication module and SCORM content package structure

2.1.1 Formats

The structure of a publication module and SCORM content package is based on addressable items and has no reference to pages.

The publication module and SCORM content package instance must be a valid XML instance. This means that the publication module and SCORM content package instance must conform to either a publication module or SCORM content package XML schema.

Data modules and publication modules and SCORM content package can reside as XML instances within the CSDB. It is strongly advised to check that data modules, publication or SCORM content package modules in XML format are valid XML instances before they enter into the IETP building process, to ensure S1000D conformity and, thus, interoperability.

2.1.2 Schema structure

This paragraph outlines the representation of the hierarchical (tree) structure of the S1000D publication module and SCORM content package.

The publication module and SCORM content package structure is divided into three parts:

- An optional XML RDF/DC metadata section (element <`rdf:Description`>) (available only for the XML format)
- A mandatory publication module identification and status section (element <`identAndStatusSection`>) derived from the data module identification and status section
- A mandatory publication module and SCORM content package content section (element <`content`>) which includes only references to data modules, publication modules or external publications (ie for legacy interoperability)

Chapter 7.4.2.1

Publication module Schema and SCORM content package module Schema - Publication module Schema, Change summary

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1 General

There were no changes made to the publication module Schema.

Chapter 7.4.2.2

Publication module Schema and SCORM content package module Schema - SCORM content package module Schema, Change summary

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1 General

1.1 Purpose

Technical background on Schema issues related to the SCORM content package module which have been formally released for productive use, is given below.

1.2 Scope

Only the changes to the S1000D XML Schema brought about by the Change Proposal Forms (CPF) approved for this issue are recorded here.

Note

From Issue 4.0 of S1000D, the corresponding XML Schemas are named Issue instead of Version.

2 Summary of changes

Summary of the change for this issue of the SCORM content package module XML Schema is:

– CPF 2014-015AA - Introduction of the element <scormContentPackageRef>

- Added the optional element<scormContentPackageRef> and child elements to the element <scoEntryItem>

Chapter 7.4.3

Generation of publications - Inclusion of legacy information

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Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 7.4.1.1	IETP - Generation process
Chap 7.4.2	Generation of publications - Publication module and SCORM content package module Schema
Chap 7.7.4	Guidance and examples - XLink

1 General

Operation and maintenance of a Product in a certain user environment quite frequently call for additional information apart from the Product specific publications. Typically, such information concerns general matters or local circumstances, and can include local safety regulations, support equipment or commercial off the shelf documentation, etc. This kind of information, not complying with S1000D as far as structure and/or format are concerned, is herein called legacy information/data.

S1000D appreciates the need for legacy information. Therefore, to facilitate compilation of complete packages of information to meet the comprehensive requirements of specific user groups, S1000D provides the means to include legacy data in publications.

2 Inclusion techniques

2.1 Encapsulation in data modules

One way of including legacy data in an S1000D publication is to reference the data from within a data module. The technique for this is based on the use of the element <`externalPubRef`>. Refer to Chap 3.9.5.2.1.2.

The element <externalPubCode>, contained in element <externalPubRefIdent>, is used to store the identification of the legacy publication concerned. In addition, good practice is to use the attribute pubCodingScheme of element <externalPubRefIdent> to reflect the type of identification that is applied.

Business rule decision point BRDP-S1-00540 - Population of the element <externalPubCode>:

– Decide the preferred syntax to identify legacy data by a publication code.

Business rule decision point BRDP-S1-00541 - Use of the attribute pubCodingScheme:

– Decide whether to use the attribute pubCodingScheme. If used, decide on the set of allowed coding schemes and the syntax of those schemes.

S1000D does not impose or suggest any specific coding of legacy publications or any particular method for identifying such a coding system. That is a project or an organization decision.

The encapsulating data module must be a valid data module, including the required <identAndStatusSection> section, and a minor structure to encompass the reference element. In consequence, the data module must also be assigned a valid data module code.

Note

The format of an encapsulated legacy object must be one of the allowed data formats that apply to illustrations, etc. Normally it would be a PDF file.

2.2 Reference by publication modules

As an alternative to encapsulating legacy data in a data module, the data can be included by a reference within a publication module. In this case, the element <externalPubRef>, contained in element <pmEntry>, is used to refer to the legacy publication. Refer to Chap 7.4.2.

Markup of this reference is similar to that described in Para 2.1. The element <externalPubCode>, contained in element <externalPubRefIdent>, is used to give the identification of the legacy publication concerned as text. Also in this case, it is good practice to let the attribute pubCodingScheme of element <externalPubRefIdent> reflect the type of identification that is applied. The business rule decision points given in Para 2.1 are also applicable here.

This alternative method can also be used to include "S1000D legacy" data (ie, publications produced to a previous issue of this specification). However, the preferred method to include such data is to regenerate the publications to meet the current standards.

Note

To include legacy publications in an IETP, the software applied must be able to read and present the legacy information.

2.3 Transformation for display

To enable viewing of legacy data in an IETP, it is necessary to resolve the references made in either a data module or a publication module and transform these to a format complying with the viewer used.

Business rule decision point BRDP-S1-00542 - Method to include legacy information in an IETP:

– Decide whether to include legacy information by encapsulating it in data modules or by referencing it as external publications using the publication module.

Business rule decision point BRDP-S1-00543 - IETP reference format:

– Decide the syntax and semantics of the links established to reference legacy data.

Since the preconditions are not fully controlled by S1000D, the specification does not elaborate on transformation of the references for viewing and navigation purposes. This is left to the project or the organization. Nevertheless, it is recommended to apply the principles and methods for IETP link management as described in Chap 7.4.1.1 and Chap 7.7.4.

Chapter 7.5

Information processing - Information interchange

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Chap 7.5.1	Information interchange - File based transfer
Chap 7.5.2	Information interchange - Interchange Schemas
Chap 7.5.3	Information interchange - Resource Description Framework/Dublin Core metadata

1 General

1.1 Purpose

The purpose of this chapter is to provide technical background on S1000D data interchange rules and procedures.

1.2 Scope

In addition to providing details of the file based transfer method for information interchange, this chapter also contains descriptions of interchange related Schemas.

2 Information interchange

The rules and guidance for information interchange are e given in the following chapters:

- Chap 7.5.1 provides a detailed description of the file based transfer method including file naming conventions
- Chap 7.5.2 provides a descriptions of interchange related Schemas
- Chap 7.5.3 provides a mapping of S1000D elements and attributes to RDF/DC metadata

Chapter 7.5.1

Information interchange - File based transfer

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Chap 4.9	Information management - Publication management
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Chap 4.15	Information management - Learning information
Chap 7.3.2	CSDB objects - Graphics

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Chap 7.3.3	CSDB objects - Multimedia
Adobe TIFF 6.0	Tagged Image File Format
CGM	Computer Graphics Metafile
CompuServe GIF 89a	Graphics Interchange Format
ISO/IEC 10918	Information technology - Digital compression and coding of continuous-tone still images (JPEG)
ISO/IEC 15948	Information technology - Computer graphics and image processing - Portable Network Graphics (PNG): Functional specification
MIL-PRF-28002C	Raster Graphics Representation in Binary Format, Requirements for: CCITT Gr 4
PDF Reference	Adobe Portable Document Format

1 General

The purpose of this chapter is to describe the file based transfer method to be used for S1000D compatible electronic information interchange.

2 File based transfer method

The file based transfer method imposes a file naming convention to allow simple CSDB data import checks to be performed without the need to investigate values inside data files.

2.1 File based transfer package structure

An S1000D file based transfer package consists of one data dispatch note text file, marked up with XML, and at least one file out of the data categories given in Chap 4.8.

The files can be transferred in any order, but it is recommended that the data dispatch note is the first data file in the sequence for serial media. A directory structure will not be used.

Appropriate data compression techniques (eg, ZIP, GZIP, TAR or X/Open (UNIX) compress) can be applied to the data file set as a whole before transfer. This reduces transfer package sizes and transfer times but has to be mutually agreed upon between sender and receiver for each individual project.

Business rule decision point BRDP-S1-00544 - Use of data compression techniques:

- Decide whether to use compression techniques on files being transferred and which techniques to be used.

2.2 File types

Table 2 summarizes the permitted data formats for S1000D compatible information interchange, where filename examples are shown according to the mandatory filename format with hyphens and, if applicable, underscores.

The file types for graphics and multimedia are particularly important because of a potential financial impact. Refer to Chap 3.9.2.7.

Table 2 Permitted interchange data formats and corresponding filename examples

Data format	Filename example
CALS Raster (CCITT Gr 4)	ICN-1B-A-270000-M-C0419-00002-A-002-03.CG4
CGM	ICN-A1-A-532510-D-F6117-00001-A-001-01.CGM
Graphics Interchange Format (GIF)	ICN-E2-A-721060-R-K0378-00066-A-001-01.GIF
Joint Photographic Experts Group (JPEG)	ICN-1B-B-291101-M-C0419-00571-B-001-01.JPG
PDF	ICN-S1000D-A-07050100-0-I9005-00002-A-003-01.PDF
Portable Network Graphics (PNG)	ICN-S1000D-A-004005-0-I9005-00001-A-001-01.PNG
Tagged Image File Format (TIFF)	ICN-E2-A-723200-R-K0378-00003-A-003-02.TIF
XML	PMC-S1000D-I9005-1000D-00_001-02_SX-US.XML
Multimedia formats	ICN-S1000D-A-005004-0-E8010-00001-A-001-01.XXX where XXX is the filename extension of the multimedia type used

2.3 File naming conventions

The transfer files are named according to the following generic structure:

TYPE-CONTROLNUMBER.FORMAT, where:

- **TYPE** can have the following values:
  - "**DDN**" for data dispatch notes
  - "**DMC**" for data module text
  - "**DME**" for data module text, extended identification
  - "**ICN**" for illustrations and multimedia objects
  - "**IMF**" for illustrations and multimedia object metadata files
  - "**DML**" for data management lists
  - "**PMC**" for publication modules
  - "**SMC**" for SCORM content package modules
  - "**PME**" for publication modules, extended identification
  - "**SME**" for SCORM content package modules, extended identification
  - "**COM**" for comment forms
  - "**UPF**" for data update files
  - "**PE**" for data update files, extended identification
- **CONTROLNUMBER** is the unique identifier of the data file written with hyphens and underscores depending on the type of data as given below.
- **FORMAT** can have the following values:
  - "**XML**", denoting text marked up with XML in accordance with the corresponding Schema
  - "**CGM**", denoting 2D Computer Graphics Metafile (CGM) graphics in accordance with the S1000D CGM profile given in Chap 7.3.2
  - "**CG4**", denoting binary Continuous Acquisition and Life-cycle Support (CALS) raster type 1 (untiled) graphics encoded in CCITT/4 in accordance with MIL-PRF-28002C

- "**TIF**", denoting Tagged Image File Format (TIFF) binary raster graphics encoded in CCITT/4 in accordance with the S1000D TIFF profile given in Chap 7.3.2, or LZW encoded colored raster graphics in accordance with the Adobe TIFF 6.0 specification
- "**JPG**", denoting Joint Photographic Expert Group (JPEG) raster graphics encoded in accordance with ISO/IEC 10918
- "**PNG**", denoting Portable Network Graphics (PNG) raster images encoded in accordance with ISO/IEC 15948
- "**GIF**", denoting Graphic Interchange Format (GIF) raster images encoded in accordance with the CompuServe GIF 89a specification
- "**PDF**", denoting documents encoded in accordance with the Adobe PDF Reference
- "**XXX**", (where XXX is the filename extension) denoting the specific encoding for the multimedia type used. Refer to Chap 7.3.3.

The filenames are built of three characters followed by a hyphen, followed by the appropriate unique identifier including hyphens, followed by a period, followed by the three character filename extension. All filenames must be in uppercase.

The CONTROLNUMBER consists of the following sequence:

– data identifier, written with hyphens
– underscore
– issue number (content of attribute `issueNumber` of element <`issueInfo`>)
– hyphen
– inwork number (content of attribute `inWork` of element <`issueInfo`>)

For data types "**DDN**" (data dispatch notes) and "**ICN**" (illustrations and multimedia objects), the CONTROLNUMBER consists only of the data identifier.

For data modules, publication modules, SCORM content package modules and comment forms, the CONTROLNUMBER is further extended by the following sequence:

– underscore
– language code (content of attribute `languageIsoCode` of element <`language`>)
– hyphen
– country code (content of attribute `countryIsoCode` of element <`language`>)

The element <`language`> and the attributes `countryIsoCode` and `languageIsoCode` must be used.

Details on the breakdown of control numbers and more examples of filenames for the different data categories are given in the following paragraphs.

2.3.1 Data dispatch note

CONTROLNUMBER is the data dispatch note identifier in the form:

MI-SSSSS-RRRRR-XXXX-NNNNN, where:

– MI = model identification code
– SSSSS = Commercial And Government Entity (CAGE) code of the sender
– RRRRR = CAGE code of the receiver
– XXXX = year (eg, 1999, 2001)
– NNNNN = unique sequential decimal data dispatch note number per year depending on the model identification code, the sender, the receiver and the year, starting with value "00001" every new year

Filename example of the third dispatch from EADS-M to BAES in 2001:

– DDN-S1000D-C0419-K0999-2001-00003.XML

Filename example of the second dispatch from MoD UK to ASD in 2003:

– DDN-S1000DBIKE-U8025-I9005-2003-00002.XML

Filename example of the first dispatch from EADS-M to MoD UK in 2004:

– DDN-S1000DBIKE-C0419-U8025-2004-00001.XML

The data dispatch note defines the sender, the receiver and the content of the dispatch. A data delivery list (DDL) is optionally included in the data dispatch note which lists all filenames of the dispatched data together with their control numbers and issue numbers as additional options.

The element <deliveryListItem> specifies one dispatched object in the transfer package. The element <dispatchFileName> must contain the complete dispatch filename including TYPE and FORMAT, separated by hyphens and underscores as appropriate.

The element <entityControlNumber> must contain only the CONTROLNUMBER without TYPE and FORMAT (ie, without any prefix or postfix) separated by hyphens as appropriate.

Markup examples:

```
<deliveryListItem>
<dispatchFileName>DMC-1B-A-31-16-00-00A-040A-A_003-00_SX-US.XML
</dispatchFileName>
<entityControlNumber>1B-A-31-16-00-00A-040A-A_003-00_SX-US
</entityControlNumber>
</deliveryListItem>

<deliveryListItem>
<dispatchFileName>PMC-1B-D9460-00001-00_002-00_EN-US.XML
</dispatchFileName>
<entityControlNumber>1B-D9460-00001-00_002-00_EN-US
</entityControlNumber>
</deliveryListItem>

<deliveryListItem>
<dispatchFileName>ICN-A1-A-532510-D-F6117-00001-A-001-01.CGM
</dispatchFileName>
<entityControlNumber>A1-A-532510-D-F6117-00001-A-001-01
</entityControlNumber>
</deliveryListItem>

<deliveryListItem>
<dispatchFileName>COM-AJ-I9034-2006-00365-R_SX-US.XML
</dispatchFileName>
<entityControlNumber>AJ-I9034-2006-00365-R_SX-US
</entityControlNumber>
</deliveryListItem>

<deliveryListItem>
<dispatchFileName>ICN-S1000D-A-005004-0-E8010-00001-A-001-01.AVI
</dispatchFileName>
<entityControlNumber>S1000D-A-005004-0-E8010-00001-A-001-01
</entityControlNumber>
</deliveryListItem>
```

2.3.2 Data module text

CONTROLNUMBER is the data module code with hyphens between the different parts of the code (refer to Chap 4.3), followed by the sequence:

- underscore
- data module issue number
- hyphen
- inwork number

The CONTROLNUMBER is extended by _LL-CC, where:

- LL = language code
- CC = country code

Filename examples:

- DMC-1B-A-31-16-00-00A-040A-A_003-00_SX-US.XML
- DMC-S1000DBIKE-AAA-DA5-20-00-0000-251C-A_001-01_SX-US.XML

2.3.3 Data module text, extended identification

CONTROLNUMBER is the data module code with hyphens between the different parts of the code (refer to Chap 4.3), preceded by the content of the attributes `extensionProducer` and `extensionCode` of the element <`identExtension`> in the element <`dmIdent`>, also separated by hyphens.

Filename examples:

- DME-SF518-ABC00231-1B-A-31-16-00-00A-040A-A_003-00_EN-US.XML
- DME-SF518-USER001-S1000DBIKE-AAA-DA5-20-00-0000-251C-A_001-01_EN-US.XML

2.3.4 Illustrations and multimedia objects

CONTROLNUMBER is the ICN (without the "**ICN-**" prefix) written with hyphens between the different parts of the code.

Filename examples:

- ICN-A1-A-535210-D-F6117-00001-A-001-01.CGM
- ICN-S3627-S1000D00494-001-01.CG4
- ICN-K0378-D1B00003-003-02.TIF
- ICN-B2-A-746210-E-G9216-00001-A-001-01.MPG
- ICN-2C-A-390000-M-F0518-00003-A-002-03.AVI
- ICN-F3-A-123400-K-R0863-00005-A-003-02.MP3

Note

This CONTROLNUMBER format must also be used along with the prefix "**ICN-**" in graphic/multimedia entity definitions and for the values of attribute `infoEntityIdent` of the elements <`graphic`>, <`symbol`> and <`multimediaObject`>.

A variety of computer media are available and in widespread use for the interchange of technical information. The most appropriate medium, or combination of media, must be agreed upon at the project or the enterprise level. Whichever interchange medium is selected, file naming, file types and file structure must be implemented as described above.

Note

The term "interchange media" includes situations where the parties involved agree on providing the information in a shared web or distributed file system environment.

2.3.5 Data management list

CONTROLNUMBER is the data management list identifier in the form:

MI-SSSSS-T-XXXX-NNNNN_III-WW, where:

- MI = model identification code
- SSSSS = CAGE code of the sender
- T = type of list. Possible values are:
  - "S" for CSDB status lists
  - "P" for partial data management requirement lists
  - "C" for complete data management requirement lists
- XXXX = year (eg, 2012)
- NNNNN = unique sequential decimal data management list number per year depending on the model identification code, the sender, the list type and the year, starting with value "00001" every new year
- III = issue number
- WW = inwork number

Filename examples:

- DML-S1000D-C0419-S-1999-00003_001-00.XML
- DML-S1000D-C0419-P-2000-00002_001-00.XML
- DML-S1000D-C0419-C-2002-00001_001-00.XML
- DML-S1000D-I9005-C-2003-00001_002-00.XML
- DML-S1000DBIKE-U8025-S-2004-00001_000-01.XML

The functionality and content of data management lists is described in Chap 4.5.

2.3.6 Publication module and SCORM content package module

CONTROLNUMBER is the publication module and the SCORM content package module identifiers in the form:

MI-YYYYY-XXXXX-NN_III-WW, where:

- MI = model identification code
- YYYYY = CAGE code of the issuing authority
- XXXXX = unique alphanumeric identification of the publication module or the SCORM content package module depending on the model identification code and the issuing authority
- NN = volume number of the publication, the default value "00" means there are no volumes (ie, single volume publication)
- III = issue number
- WW = inwork number

The CONTROLNUMBER is extended by _LL-CC, where:

- LL = language code
- CC = country code

Filename examples:

- PMC-E2-K0378-00001-00_001-00_EN-GB.XML
- PMC-1B-D9460-00001-00_002-00_EN-GB.XML
- PMC-S1000D-I9005-1000D-00_000-02_SX-US.XML
- SMC-E2-K0378-00001-00_001-00_EN-GB.XML
- SMC-1B-D9460-00001-00_002-00_EN-GB.XML

– SMC-S1000D-I9005-1000D-00_000-02_EN-GB.XML

The functionality and the content of publication modules and SCORM content package modules are described in Chap 4.9 and Chap 4.15, respectively.

2.3.7 Publication module, extended identification

CONTROLNUMBER is the publication module code with hyphens between the different parts of the code (refer to Para 2.3.6), preceded by the content of the attributes `extensionProducer` and `extensionCode` of the element <`identExtension`> in the element <`pmIdent`>, also separated by hyphens.

2.3.8 SCORM content package module, extended identification

CONTROLNUMBER is the SCORM module code with hyphens between the different parts of the code (refer to Para 2.3.6), preceded by the content of the attributes `extensionProducer` and `extensionCode` of the element <`identExtension`> in the element <`scormContentPackageIdent`>, also separated by hyphens.

2.3.9 Comment

CONTROLNUMBER is the comment identifier in the form:

MI-YYYYY-XXXX-NNNNN-T, where:

– MI = model identification code
– YYYYY = CAGE code of the authority, which raised the query/comment originally
– XXXX = year (eg, 2005)
– NNNNN = unique sequential decimal comment number per year depending on the model identification code, the originator of the query/comment and the year, starting with the value "`00001`" every new year
– T = type of comment form. Possible values are:
  - "`Q`", the query (originally raised comment)
  - "`I`", the interim response
  - "`R`", the final response

The CONTROLNUMBER is extended by _LL or _LL-CC, where:

– LL = language code
– CC = country code

Filename examples:

– COM-E2-K0378-2002-00001-Q_EN_GB.XML
– COM-E2-K0378-2002-00001-I_SX_US.XML
– COM-JA-H2433-2002-00058-Q_EN_US.XML
– COM-JA-H2433-2002-00058-R_SX_US.XML

The functionality and content of comment forms is described in Chap 4.6.

2.3.9.1 Attachments to comments

CONTROLNUMBER is the comment identifier amended by the sequential number (MM) of the attachment to this comment in the form:

MI-YYYYY-XXXX-NNNNN-T-MM, where:

– MM = unique sequential decimal number of the attachment starting with the value "`01`"

The data format of the attachment is not restricted to the permitted interchange formats given in Para 2.2. The allowed extensions must be defined by the project or the enterprise. Refer to Para 2.3.

Filename examples:

- COM-AJ-I9034-2006-00365-Q-01_EN_US.PDF
- COM-AJ-I9034-2006-00365-I-01_SX_US.ZIP

2.3.10 Data update file

CONTROLNUMBER is the data update file code with hyphens between the different parts of the code (refer to Chap 4.13.2.2), followed by the sequence:

- underscore
- data module issue number
- hyphen
- inwork number

The CONTROLNUMBER is extended by _LL-CC, where:

- LL = language code
- CC = country code

Filename examples:

- UPF-1B-A-31-16-00-00A-040A-A_003-00_SX-US.XML
- UPF-S1000DBIKE-AAA-DA5-20-00-0000-251C-A_001-01_SX-US.XML

2.3.11 Data update file, extended identification

CONTROLNUMBER is the data update file code with hyphens between the different parts of the code (refer to Chap 4.13.2.2), preceded by the content of the attributes `extensionProducer` and `extensionCode` of the element <`identExtension`> in the element <`updateIdent`>, also separated by hyphens.

Filename examples:

- UPE-SF518-ABC00231-1B-A-31-16-00-00A-040A-A_003-00_EN_US.XML
- UPE-SF518-USER001-S1000DBIKE-AAA-DA5-20-00-0000-251C-A_001-01_EN-US.XML

2.3.12 Illustrations and multimedia metadata files

CONTROLNUMBER is derived from the ICN concerned, written as described in Para 2.3.4, followed by metadata file issue numbering:

- ICN (without the "ICN-" prefix)
- underscore
- metadata file issue number
- hyphen
- metadata file inwork number

The illustration and multimedia metafile is described in Chap 3.9.2.7.

Filename examples:

- IMF-A1-A-535210-D-F6117-00001-A-001-01_001-00.XML
- IMF-S3627-S1000D00494-001-01_001-02.XML
- IMF-K0378-D1B00003-003-02_002-00.XML
- IMF-B2-A-746210-E-G9216-00001-A-001-01_001-03.XML
- IMF-2C-A-390000-M-F0518-00003-A-002-03_003-00.XML
- IMF-F3-A-123400-K-R0863-00005-A-003-02_001-01.XML

Chapter 7.5.2

Information interchange - Interchange Schemas

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Chap No./Document No.	Title
Chap 7.5.2.1	Interchange Schemas - Version summary

1 General

The purpose of this chapter is to provide a description of the interchange Schemas.

2 Interchange Schemas

The rules and guidance for information interchange Schemas are given in the following chapters.

– Chap 7.5.2.1 provides a version summary of Schemas for data dispatch notes, data management lists and comment forms

Electronic copies of the Schemas for data dispatch notes, data management lists, and comment forms are available for download from the S1000D web site at www.s1000d.org.

Chapter 7.5.2.1

Interchange Schemas - Issue summary

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Chap No./Document No.	Title
None	

1 General

The purpose of this chapter is to identify all S1000D interchange related Schema issues, which have been formally released. For each issue there is a summary of the reasons for change from previous releases. Details of the changes are recorded in the appropriate sections.

From S1000D Issue 4.0 and onwards, Standard Generalized Markup Language (SGML) and XML Document Type Definition (DTD) are no longer supported.

Note

From Issue 4.0 of the specification the corresponding XML Schema are named Issue instead of Version.

2 Issue summary

2.1 Data dispatch note

2.1.1 List of XML Schema issues for data dispatch notes

Table 2 lists all XML Schema issues for data dispatch notes together with their corresponding S1000D issue.

Table 2 List of S1000D XML Schema issues for data dispatch notes

S1000D	XML Schema	Release date
Issue 2.0	Version 2.0	2003-05-31
Issue 2.1	Version 2.1	2004-02-29
Issue 2.2	Version 2.2	2005-05-01
Issue 2.3	Version 2.3	2007-02-28
Issue 3.0	Version 3.0	2007-07-31
Issue 4.0	Issue 4.0	2008-08-01
Issue 4.1	Issue 4.1	2012-07-31

2.1.2 Update summary

2.1.2.1 Version 2.0

This was the first formal version of a Schema for data dispatch notes, released to coincide with Issue 2 of the specification. This Schema version just reflects the SGML/XML DTD.

2.1.2.2 Version 2.1

Summary of changes for Version 2.1 of the S1000D Schema for data dispatch notes:

- CPF 2003-13DE: Element <issno> removed from content model of element <ddn> (refer to ddnSchema.xsd and ddn.xsd). Attribute issno and attribute inwork removed from pattern of element <dc:Identifier>. Refer to dc_ddn.xsd.

2.1.2.3 Version 2.2

Summary of changes for Version 2.2 of the S1000D Schema for data dispatch:

- CPF 2004-21GB: List of values on attribute change within attribute group "INSDEL" amended by value "modify". Refer to dmaddr2.xsd.
- CPF 2004-22GB: Element <copyright> redefined to contain only running text or simple paragraph element <p> (refer to datarest2.xsd). Inclusion of file datarest.xsd replaced by datarest2.xsd for data restrictions on CSDB objects other than data modules. Refer to ddnSchema.xsd.
- CPF 2004-24GB: Simple type "MNTLVLS" introduced for the definition of generic maintenance levels. Refer to project.cfg.
- CPF 2004-49DE: Pattern on element <seqnum> redefined to contain always a 5-digit positive integer for a uniform definition of sequential numbers in data dispatch note, data module list and COMMENT starting with 00001. Refer to seqnum.xsd.
- Bug fixes:
  - Content model of element <remarks> changed to allow optional repeatable sub element <p>. Refer to listcode.xsd.
  - Pattern definitions on attribute issno and attribute inwork of element <issno> corrected. Refer to dmaddr2.xsd.

- Pattern definitions on attribute year, attribute month and attribute day of element <issdate> corrected. Refer to dmaddr2.xsd.

– TPSMG request: Introduce attributeGroup "bodyatt" on element <p>. Refer to listcode.xsd.
– TPSMG request: Introduce entity %bodyatt; on element <p>. Refer to listcode.xsd.
– Consistency:

- Type of all elements which contain only Parsed Character Data and which have no attributes has been redefined to type="xs:string".

2.1.2.4 Version 2.3
Summary of changes for Version 2.3 of the Schema for data dispatch notes:

– CPF 2005-65SE: Dublin Core element names changed to all lowercase.

2.1.2.5 Version 3.0
There were no changes compared to the data dispatch note Schema Version 2.3.

2.1.2.6 Issue 4.0
Summary of changes for Issue 4.0 of the Schema for data dispatch:

– CPF 2004-051DE:

- Elements <ddnAddress> and <ddnIdent> have been introduced in order to contain the data dispatch note code (old element <ddnc>).
- Content model of element <dmRef> (old element <refdm>) changed from (identExtension?, dmCode, dmTitle?, issueInfo?, issueDate?, language?) to (identExtension?, dmCode, language?, issueInfo?, issueDate?, dmTitle?).

– CPF 2006-044US: the attribute inWork of element <issueInfo> is now required (old element <issno>).
– CPF 2006-046SE:

- Sequence of repeated sibling elements has been wrapped in its own element in order to enhance clarity in the schemas. The structure of the element <deliveryList> has changed.
- A wrapper element has been added to make structure more easily understood
  – <deliveryListItem> in <deliveryList>
- Mixed content has been eliminated in the <remarks> element.

– CPF 2007-098SE:

- The top structure and the identification of the CSDB objects have been harmonized, which affects all of data module, publication module, data module list, data dispatch note and Comment.

2.1.2.7 Issue 4.1
Summary of changes for Issue 4.1 of the Schema for data dispatch:

– CPF_2009-098US:

- Element <brexDmRef> has been introduced to the element <ddnStatus> in order to allow the BREX data module reference.

2.2 Data management list

2.2.1 List of XML Schema issues for data management lists

Table 3 lists all XML Schema issues for data management lists with their corresponding S1000D issue.

Note

From Issue 4.1 of the specification the data module list was renamed to data management list.

Table 3 List of S1000D XML Schema issues for data management lists

S1000D Issue	XML Schema Issue No.	Release date
Issue 2.0	Version 2.0	2003-05-31
Issue 2.2	Version 2.2	2005-05-01
Issue 2.3	Version 2.3	2007-02-28
Issue 3.0	Version 3.0	2007-07-31
Issue 4.0	Issue 4.0	2008-08-01
Issue 4.1	Issue 4.1	2012-07-31

2.2.2 Update summary

2.2.2.1 Version 2.0

This was the first formal version of a Schema for data management lists, released to coincide with Issue 2 of the specification. This Schema version just reflects the SGML/XML DTD.

2.2.2.2 Version 2.2

Summary of changes for Version 2.2 of the S1000D Schema for data management lists:

- CPF 2004-21GB: List of values on attribute change within attribute group "INSDEL" amended by value "modify". Refer to dmaddr2.xsd.
- CPF 2004-22GB: Element <copyright> redefined to contain only running text or simple paragraph element <p> (see datarest2.xsd). Inclusion of file datarest.xsd replaced by datarest2.xsd for data restrictions on CSDB objects other than data modules. Refer to dmlSchema.xsd.
- CPF 2004-24GB: Simple type "MNTLVLS" introduced for the definition of generic maintenance levels. Refer to project.cfg.
- CPF 2004-49DE: Pattern on element <seqnum> redefined to contain always a 5-digit positive integer for a uniform definition of sequential numbers in data dispatch note, data module list and COMMENT starting with 00001. Refer to seqnum.xsd.
- Bug fixes:
  - Content model of element <remarks> changed to allow optional repeatable sub element <p>. Refer to listcode.xsd.
  - Pattern definitions on attribute issno and attribute inwork of element <issno> corrected. Refer to dmaddr2.xsd.
  - Pattern definitions on attribute year, attribute month and attribute day of element <issdate> corrected. Refer to dmaddr2.xsd.
- TPSMG request: Introduce attributeGroup "bodyatt" on element <p>. Refer to listcode.xsd.
- TPSMG request: Introduce entity %bodyatt; on element <p>. Refer to listcode.xsd.

- Consistency:
  - Type of all elements which contain only Parsed Character Data and which have no attributes has been redefined to type="xs:string".

2.2.2.3 Version 2.3
Summary of changes for Version 2.3 of the S1000D Schema for data management lists:

- CPF 2004-64SE: Addition of element <dmcextension> to the <addresdm> content model.
- CPF 2005-65SE: Dublin Core element names changed to all lowercase.

2.2.2.4 Version 3.0
There were no changes compared to the data management list Schema Version 2.3.

2.2.2.5 Issue 4.0
Summary of changes for Issue 4.0 of the Schema for data management lists:

- CPF 2004-051DE:
  - Elements <dmlAddress> and <dmlIdent> have been introduced in order to contain the data module list code (old element <dmlc>).
  - Content model of element <dmRef> (old element <refdm>) changed from (identExtension?, dmCode, dmTitle?, issueInfo?, issueDate?, language?) to (identExtension?, dmCode, language?, issueInfo?, issueDate?, dmTitle?).
- CPF 2006-044US: the attribute inWork of element <issueInfo> is now required (old element <issno>).
- CPF 2006-046SE: Mixed content has been eliminated in the <remarks> element.
- CPF 2007-098SE:
  - The top structure and the identification of the CSDB objects have been harmonized, which affects all of data module, publication module, data module list, data dispatch note and Comment.

2.2.2.6 Issue 4.1
Summary of changes for Issue 4.1 of the Schema for data dispatch notes:

- CPF_2009-098US:
  - Element <brexDmRef> has been introduced to the element <dmlStatus> in order to allow the BREX data module reference.
- CPF_2005-008GB (CPF_2007-015SE)
  - Change name of element <dmEntry> to <dmlEntry>
  - Add <pmRef> to <dmlEntry>

2.3 Comment

2.3.1 List of XML Schema issues for comment forms

Table 4 lists all XML Schema issues for comment forms together with their corresponding S1000D issue.

Table 4 List of S1000D XML Schema issues for comment forms

S1000D Issue	XML Schema Issue No.	Release date
Issue 2.0	Version 2.0	2003-05-31
Issue 2-1	Version 2.1	2004-02-29
Issue 2.2	Version 2.2	2005-05-01
Issue 2.3	Version 2.3	2007-02-28
Issue 3.0	Version 3.0	2007-07-31
Issue 4.0	Issue 4.0	2008-08-01
Issue 4.1	Issue 4.1	2012-07-31

2.3.2 Update summary

2.3.2.1 Version 2.0

This was the first formal version of a Schema for comment forms, released to coincide with Issue 2 of the specification. This Schema version just reflects the SGML/XML DTD.

2.3.2.2 Version 2.1

Summary of changes for Version 2.1 of the S1000D Schema for comment forms:

- CPF 2004-09DE: Element <ccode> removed from content model of element <refcattach>. Refer to commentSchema.xsd and comment.xsd.

2.3.2.3 Version 2.2

Summary of changes for Version 2.2 of the S1000D Schema for comment:

- CPF 2004-21GB: List of values on attribute change within attribute group "INSDEL" amended by value "modify". Refer to dmaddr2.xsd.
- CPF 2004-22GB: Element <copyright> redefined to contain only running text or simple paragraph element <p>. Refer to datarest2.xsd. Inclusion of file datarest.xsd replaced by datarest2.xsd for data restrictions on CSDB objects other than data modules. Refer to commentSchema.xsd.
- CPF 2004-24GB: Simple type "MNTLVLS" introduced for the definition of generic maintenance levels. Refer to project.cfg.
- CPF 2004-49DE: Inclusion of seqnum_comment.xsd replaced by seqnum.xsd to contain always a 5-digit positive integer for a uniform definition of sequential numbers in data dispatch note, data module list and COMMENT starting with 00001. Refer to commentSchema.xsd.
- CPF 2004-63DE: Optional sub element <language> introduced on element <cstatus>. Refer to comment.xsd.
- CPF 2005-06SE: Publication module number <pmnumber> within publication module code <pmc> became alphanumeric. Refer to pmc.xsd.
- Bug fixes:
  - Content model of element <remarks> changed to allow optional repeatable sub element <p>. Refer to listcode.xsd.
  - Pattern definitions on attribute issno and attribute inwork of element <issno> corrected. Refer to dmaddr2.xsd.
  - Pattern definitions on attribute year, attribute month and attribute day of element <issdate> corrected. Refer to dmaddr2.xsd.
  - Definition of empty element <cnorefs> corrected. Refer to comment.xsd.

- TPSMG request: Introduce attributeGroup "bodyatt" on element <p>. Refer to listcode.xsd.
- Consistency:
  - Type of all elements which contain only Parsed Character Data and which have no attributes has been redefined to type="xs:string".

2.3.2.4 Version 2.3

Summary of changes for Version 2.3 of the S1000D Schema for comment forms:

- CPF 2004-64SE: Addition of element <dmcextension> to the <crefdm> content model in element <crefdms>.
- CPF 2005-02FR: Transition to XML Schema from SGML DTD master.
- CPF 2005-65SE: Dublin Core element names changed to all lowercase.

2.3.2.5 Version 3.0

There were no changes compared to the comment Schema Version 2.3.

2.3.2.6 Issue 4.0

Summary of changes for Issue 4.0 of the Schema for comment forms:

- CPF 2004-051DE:
  - Elements <commentAddress> and <commentIdent> have been introduced in order to contain the data module list code (old element <commentc>).
  - Content model of element <dmRef> (old element <refdm>) changed from (identExtension?, dmCode, dmTitle?, issueInfo?, issueDate?, language?) to (identExtension?, dmCode, language?, issueInfo?, issueDate?, dmTitle?).
- CPF 2006-044US: the attribute inWork of element <issueInfo> is now required (old element <issno>).
- CPF 2006-046SE: Mixed content has been eliminated in the <remarks> element.
- CPF 2007-098SE:
  - The top structure and the identification of the CSDB objects have been harmonized, which affects all of data module, publication module, data module list, data dispatch note and Comment.

2.3.2.7 Issue 4.1

Summary of changes for Issue 4.1 of the Schema for comment forms:

- CPF_2009-098US:
  - Element <brexDmRef> has been introduced to the element <commentStatus> in order to allow the BREX data module reference.

Chapter 7.5.3

Information interchange - Resource description framework/Dublin core metadata

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Chap No./Document No.	Title
Chap 7.4.1.1.2	Generation process - Metadata

1 General

The mapping of S1000D elements and attributes to the Resource Description Framework (RDF) / Dublin core metadata element <`rdf:Description`> for data dispatch notes, data management lists and comments is specified below.

2 RDF/Dublin core metadata mapping

2.1 Introduction

The inclusion of RDF/Dublin core metadata is a project decision. If required, it is to be done automatically during the publishing process. Manual inclusion of this metadata is strongly discouraged.

The mapping follows in principle the one given for data modules, publication modules and SCORM content package modules in Chap 7.4.1.1.2 with the exceptions detailed below.

2.2 RDF/Dublin core metadata mapping for data dispatch notes

Table 2 summarizes the mapping of the elements and attributes to the Dublin core metadata of the element <rdf:Description> for data dispatch notes. Exceptions to the principles given for data modules and publication modules in Chap 7.4.1.1.2 are:

- The elements <dc:title> and <dc:subject> contain the fixed value "Data Dispatch Note".
- The element <dc:identifier> contains the data dispatch note identification code, ie, the values of attributes modelIdentCode, senderIdent, receiverIdent, yearOfDataIssue and seqNumber of element <ddnCode>, separated by hyphens.
- The value of attribute senderIdent of element <ddnCode> is mapped to the element <dc:publisher>.
- The elements <dc:creator>, <dc:contributor>, <dc:language> and <dc:source> are not used for mapping.

Table 2 Metadata mapping for data dispatch note

Dublin core elements	Data dispatch note elements and/or attributes
<dc:title>	"Data Dispatch Note"
<dc:subject>	"Data Dispatch Note"
<dc:publisher>	senderIdent
<dc:date>	year-month-day
<dc:type>	"text"
<dc:format>	"text/xml"
<dc:identifier>	modelIdentCode-senderIdent-receiverIdent-yearOfDataIssue-seqNumber
<dc:rights>	securityClassification_commercialClassification_caveat or securityClassification_commercialClassification or securityClassification__caveat or securityClassification

2.3 RDF/Dublin core metadata mapping for data management list

Table 3 summarizes the mapping of S1000D elements and attributes to the Dublin core metadata of the element <rdf:Description> for data management lists. Exceptions to the principles given for data modules and publication modules in Chap 7.4.1.1.2 are:

- The elements <dc:title> and <dc:subject> contain the fixed value "Data Management List"
- The element <dc:identifier> contains the data management list code, ie, the values of attributes modelIdentCode, senderIdent, dmlType,

yearOfDataIssue and seqNumber of element <dmlCode>, separated by hyphens, followed by an underscore and the attributes issueNumber and inWork of element <issueInfo>, separated by a hyphen.

- The value of attribute senderIdent of element <dmlCode> is mapped to the element <dc:publisher>.
- The elements <dc:creator>, <dc:contributor>, <dc:language> and <dc:source> are not used for mapping.

Table 3 Metadata mapping for data management list

Dublin core elements	Data management list elements and/or attributes
<dc:title>	"Data Management List"
<dc:subject>	"Data Management List"
<dc:publisher>	senderIdent
<dc:date>	year-month-day
<dc:type>	"text"
<dc:format>	"text/xml"
<dc:identifier>	modelIdentCode-senderIdent-dmlType-yearOfDataIssue-seqNumber_issueNumber-inWork
<dc:rights>	securityClassification_commercialClassification_caveat or securityClassification_commercialClassification or securityClassification__caveat or securityClassification

2.4 RDF/Dublin core metadata mapping for comments

Table 4 summarizes the mapping of the elements and attributes to the Dublin core metadata of the element <rdf:Description> for comments. Exceptions to the principles given for data modules and publication modules in Chap 7.4.1.1.2 are:

- The element <commentTitle> is mapped to the element <dc:title> and to the element <dc:subject>.
- The element <dc:identifier> contains the comment code, ie, the values of attributes modelIdentCode, senderIdent, yearOfDataIssue, seqNumber and commentType of element <commentCode>, separated by hyphens.
- The value of attribute senderIdent of element <commentCode> is mapped to the element <dc:publisher>.
- The values of attributes languageIsoCode and countryIsoCode of element <language> are mapped to the element <dc:language>, separated by a hyphen.

– The elements <dc:creator>, <dc:contributor> and <dc:source> are not used for mapping.

Table 4 Metadata mapping for comments

Dublin core elements	Comment elements and/or attributes
<dc:title>	<commentTitle>
<dc:subject>	<commentTitle>
<dc:publisher>	senderIdent
<dc:date>	year-month-day
<dc:type>	"text"
<dc:format>	"text/xml"
<dc:identifier>	modelIdentCode-senderIdent-yearOfDataIssue-seqNumber-commentType
<dc:language>	languageIsoCode-countryIsoCode
<dc:rights>	securityClassification_commercialClassification_caveat or securityClassification_commercialClassification or securityClassification__caveat or securityClassification

3 Examples

3.1 RDF/Dublin core metadata for data dispatch notes

The following example demonstrates the mapping of the data dispatch note elements and/or attributes to DC metadata elements within an RDF container expressed in XML:

```
<?xml version="1.0"?>
<ddn xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="http://www.s1000d.org/S1000D_4-
2/xml_schema_flat/ddn.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/">
<rdf:Description>
<dc:title>Data Dispatch Note</dc:title>
<dc:subject>Data Dispatch Note</dc:subject>
<dc:publisher>C0419</dc:publisher>
<dc:date>1999-03-08</dc:date>
<dc:type>text</dc:type>
<dc:format>text/xml</dc:format>
<dc:identifier>URN:S1000D:DDN-AE-C0419-K0999-1999-00002
</dc:identifier>
<dc:rights>01</dc:rights>
</rdf:Description>
```

```
...
</ddn>
```

3.2 RDF/Dublin core metadata for data management lists

The following example demonstrates the mapping of the data management list elements and/or attributes to Dublin core metadata elements within an RDF container expressed in XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<dml xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="http://www.s1000d.org/S1000D_4-
2/xml_schema_flat/dml.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
<rdf:Description>
<dc:title>Data Management List</dc:title>
<dc:subject>Data Management List</dc:subject>
<dc:publisher>A0019</dc:publisher>
<dc:date>1999-04-01</dc:date>
<dc:type>text</dc:type>
<dc:format>text/xml</dc:format>
<dc:identifier>URN:S1000D:DML-1B-A0019-P-1999-00003_003-00
</dc:identifier>
<dc:language>sx-US</dc:language>
<dc:rights>01</dc:rights>
</rdf:Description>
...
</dml>
```

3.3 RDF/Dublin core metadata for comments

The following example demonstrates the mapping of the comment elements and/or attributes to Dublin core metadata elements within an RDF container expressed in XML:

```
<?xml version="1.0"?>
<comment xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="http://www.s1000d.org/S1000D_4-
2/xml_schema_flat//comment.xsd"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:dc="http://www.purl.org/dc/elements/1.1/"
xmlns:xlink="http://www.w3.org/1999/xlink">
<rdf:Description>
<dc:title>Window, LH Front - Installation (Job Completion)
</dc:title>
<dc:subject>Window, LH Front - Installation (Job Completion)
</dc:subject>
<dc:publisher>H2433</dc:publisher>
<dc:date>2002-02-26</dc:date>
<dc:type>text</dc:type>
<dc:format>text/xml</dc:format>
<dc:identifier>URN:S1000D:COM-JA-H2433-2002-00058-Q
</dc:identifier>
<dc:language>sx-US</dc:language>
<dc:rights>01</dc:rights>
</rdf:Description>
...
</comment>
```

Chapter 7.5.4

Information interchange – Learning Object Metadata

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References

Table 1 References

Chap No./Document No.	Title
SCORM_2004_4ED_v1_1_CAM_20090814	SCORM 2004, 4th Edition, Version 1.1: Content Aggregation Model (CAM)

1 General

There is a mapping between certain of the identification and status section elements and attributes, and the Learning Object Metadata (LOM) child elements of element <lom> in the SCORM content package module.

1.1 Scope

The elements of the LOM Schema are used to provide metadata about the learning event defined in the SCORM content package.

1.2 Purpose

The LOM is used in the Content Aggregation Model (CAM) in SCORM to provide:

- search and discovery capability of learning objects across systems
- the learner with information about the content organization (course, lesson, module, etc)
- information at runtime to help in the decision of what content model component to deliver to the learner

For these reasons, the LOM has been added to the SCORM content package module Schema. There is some overlap between metadata captured in the identification and status section of the SCORM content package module and the LOM, but the LOM allows for additional metadata, specific for training that the SCORM content package module does not address.

2 LOM metadata

2.1 Metadata mapping

Table 2 summarizes the mapping of elements and attributes to the LOM element <lom> for the SCORM content package module.

Table 2 Metadata for the LOM in the SCORM content package module

LOM elements	Identification and status section elements and attributes
lom/general/identifier	DMC, PMC, ICN, SMC or SME
lom/general/title	<dmTitle> or <pmTitle>
lom/lifecycle/version	<issueInfo issueNumber>
lom/lifecycle/contribute/date	<dmStatus issueDate>
lom/general/language	<language>
lom/annotation/entity	<responsiblePartnerCompany>
lom/annotation/entity	<originator>
lom/general/coverage	<applic>
lom/general/coverage	<systemBreakdownCode>
lom/general/coverage	<functionalItemCode>
lom/annotation/description	<reasonForUpdate>
lom/annotation/description	<remarks>
lom/technical/format	<scormContentPackageMedia scormContentPackageMediaType>

2.2 Other LOM metadata

The LOM is a SCORM requirement, therefore a full description of the LOM can be found at

http://www.adlnet.gov/capabilities/scorm/scorm-2004-4th#tab-resources

The LOM is described in detail in the CAM. Refer to Table 1.

3 Examples

The following example demonstrates the mapping of the Identification and status section elements and attributes to the LOM metadata elements included in the SCORM content package module Schema containers expressed in XML:

```
<lom>
<lom:lom>
<lom:general>
<lom:identifier>
<lom:entry>DMC-MD-A-32-23-10-00A-340A-A</lom:entry>
</lom:identifier>
<lom:language>en</lom:language>
<lom:title>
<lom:string> Landing gear system - Retraction and extension
```

```
function test</lom:string>
</lom:title>
<lom:description>
<lom:string>Air vehicle maintenance training - Landing gear
system</lom:string>
</lom:description>
<lom:keyword>
<lom:string>Air vehicle maintenance training</lom:string>
<lom:string> Landing gear system </lom:string>
<lom:string>Retraction and extension function test</lom:string>
</lom:keyword>
</lom:general>
<lom:annotation>
<lom:entity>AH019</lom:entity>
</lom:annotation>
<lom:lifeCycle>
<lom:version>
<lom:string>001</lom:string>
</lom:version>
<lom:status>
<lom:source>LOMv1.0</lom:source>
<lom:value>final</lom:value>
</lom:status>
</lom:lifeCycle>
<lom:metaMetadata>
<lom:identifier>
<lom:catalog>GUID</lom:catalog>
<lom:entry>3D16197F-4BA0-4F5C-BF57-CD3C8BA61148</lom:entry>
</lom:identifier>
<lom:metadataSchema>LOMv1.0</lom:metadataSchema>
<lom:metadataSchema>SCORM_CAM_v1.3</lom:metadataSchema>
</lom:metaMetadata>
<lom:technical>
<lom:format>application/x-shockwave-flash</lom:format>
<lom:format>image/gif</lom:format>
<lom:format>image/ico</lom:format>
<lom:format>image/jpg</lom:format>
<lom:format>image/bmp</lom:format>
<lom:format>image/png</lom:format>
<lom:format>image/svg</lom:format>
<lom:format>audio/wav</lom:format>
<lom:format>video/quicktime</lom:format>
<lom:format>video/x-ms-wmv</lom:format>
<lom:format>video/x-msvideo</lom:format>
<lom:format>video/mpeg</lom:format>
<lom:format>audio/mpeg</lom:format>
<lom:format>text/plain</lom:format>
<lom:format>text/html</lom:format>
<lom:format>text/xml</lom:format>
<lom:format>text/xslt</lom:format>
<lom:format>application/c3-caa</lom:format>
<lom:requirement>
<lom:orComposite>
```

```
<lom:type>
<lom:source>LOMv1.0</lom:source>
<lom:value>browser</lom:value>
</lom:type>
<lom:name>
<lom:source>LOMv1.0</lom:source>
<lom:value>ms-internet explorer</lom:value>
</lom:name>
<lom:minimumVersion>6.0</lom:minimumVersion>
</lom:orComposite>
</lom:requirement>
<lom:installationRemarks>
<lom:string language="en">This activity requires the client
browser to have a Macromedia Flash plugin
installed.</lom:string>
</lom:installationRemarks>
<lom:otherPlatformRequirements>
<lom:string language="en">Sound card, Min. RAM: 256Mb, Video
card and display: at least 1024 X 768 pixels x 16384
colors</lom:string>
</lom:otherPlatformRequirements>
</lom:technical>
<lom:rights>
<lom:cost>
<lom:source>LOMv1.0</lom:source>
<lom:value>no</lom:value>
</lom:cost>
<lom:copyrightAndOtherRestrictions>
<lom:source>LOMv1.0</lom:source>
<lom:value>yes</lom:value>
</lom:copyrightAndOtherRestrictions>
<lom:description>
<lom:string language="en">This SCO was... </lom:string>
</lom:description>
</lom:rights>
</lom>
```

Chapter 7.6

Information processing - Software requirements

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Table 1 References

Chap No./Document No.	Title
Chap 7.6.1	Software requirements - Process data module requirements
Chap 7.6.2	Software requirements - Resource resolution service

1 General

Information processing software requirements are necessary to achieve consistency of software behavior so that the data modules will behave the same on any software implementation. This will ensure the common behavior and functionality that is required of all software implementations.

2 Software requirements

Chap 7.6.1 defines requirements for the software components that implement the process data module logic engine. Chap 7.6.2 defines the requirements for the Uniform Resource Name (URN) / Uniform Resource Identifier (URI) resolution engine.

Any software implementation must adhere to the requirements defined herein.

Chapter 7.6.1

Software requirements - Process data module requirements

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Chap 7.6.1.1	Process data module requirements - Navigation
Chap 7.6.1.2	Process data module requirements - Variables and global properties
Chap 7.6.1.3	Process data module requirements - Variable and global property management
Chap 7.6.1.4	Process data module requirements - Expression evaluation
Chap 7.6.1.5	Process data module requirements - Dialogs
Chap 7.6.1.6	Process data module requirements - External application interface
Chap 7.6.1.7	Process data module requirements - Error handling

1 General

There are detailed software requirements for the logic engine component of S1000D. The logic engine is required to interpret the navigation instructions contained within the process data module and pass the result for display. Additionally, in order to maintain standardized data modules that are interoperable (shared amongst projects and within different presentation tools), any implementation of a logic engine must conform to the requirements detailed within this chapter.

For an overview of the S1000D process data module, refer to Chap 4.11.

For a successful implementation of the process data module, two elements are required:

- **Logic engine**, the runtime software component of the S1000D display package that interprets and executes a process data module
- **State table**, the collection of variables declared within a process data module and the value currently assigned to each variable

2 Requirements

The logic engine is capable of interpreting process data modules and acting upon the data contained within. Although the process data module is an XML document, the data represents the information that is to be executed in a defined order with specific rules as detailed in this chapter.

The logic engine must sequentially interpret the markup contained within the process data module. Certain elements contain information to be displayed to the user in the form of a data module reference, a step, or a dialog. Other elements contain instructions that control the behavior and navigation through the process data module content as defined in this chapter.

The logic engine must determine the unit of information to be displayed (depending on the state table values) and will wait for user input. The current position within the process data module must be retained and the current state of local variables and global properties will be maintained. The "Next" and "Previous" functions will cause the logic engine to continue interpreting at the saved position.

These requirements are explained in more detail in the following chapters:

- Process data module requirements - Navigation. Refer to Chap 7.6.1.1.
- Process data module requirements - Variables and global properties. Refer to Chap 7.6.1.2.
- Process data module requirements - Variable and global property management. Refer to Chap 7.6.1.3.
- Process data module requirements - Expression evaluation. Refer to Chap 7.6.1.4.
- Process data module requirements - Dialogs. Refer to Chap 7.6.1.5.
- Process data module requirements - External application interface. Refer to Chap 7.6.1.6.
- Process data module requirements - Error handling. Refer to Chap 7.6.1.7.

Chapter 7.6.1.1

Process data module requirements - Navigation

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Chap No./Document No.	Title
Chap 7.6.1.2	Process data module requirements - Variables and global properties
Chap 7.6.1.4	Process data module requirements - Expression evaluation
Chap 7.8	Information processing - Applicability

1 Navigation functions

The navigation functions provide the interface to step through procedural sequences defined in the process data module. Functions are provided to move to the next and previous nodes in the process data module. The element <dmNode> defines the set of data that should be interpreted by the logic engine and displayed to the user.

Note

In this paragraph, the phrase "passes applicability evaluation" means that either:

no applicability exists, or

applicability exists with an element <assert> or an element <evaluate> and the evaluation in accordance with Chap 7.8 returns a "true" result, or

applicability exists with an element <expression> and the evaluation of the expression in accordance with Para 2.2.1 returns a "true" result

1.1 Main navigation functions

1.1.1 Next

The "Next" function instructs the logic engine to proceed with interpreting the process data module from the current position. The logic engine must proceed until one of the following conditions occurs (user input or navigation function is required or no more data):

- an element <dmNode> with a child element <dmRef> is executed and passes applicability evaluation in which case the data module referenced is displayed to the user
- an element <dmNode> with one or more child element <proceduralStep> and an optional last element <dialog> is executed and at least one proceduralStep or the dialog passes applicability evaluation in which case the proceduralStep(s) and/or dialog that pass applicability evaluation are displayed to the user
- an element <dmNode> with one or more child element <proceduralStepAlts> is executed and at least one <proceduralStep> child of the <proceduralStepAlts> passes applicability evaluation in which case the first proceduralStep that passes applicability evaluation in sequence order is displayed to the user
- an element <dmNode> with a child element <dialog> is executed and passes applicability evaluation in which case the dialog is displayed to the user
- an element <dmNode> with a child element <externalApplication> is executed
- the end of the outermost process data module is reached in which case a message is displayed to the user indicating that the end of the procedure has been reached

1.1.2 Previous

The "Previous" function instructs the logic engine to logically reverse through actions taken beginning at the current location until a node with displayable content is encountered. When navigating to a previous node, the logic engine must restore the state table to the condition that it was when it first encountered the node being returned to. Restoring the state table includes any variables that were assigned a new value through the following: element <dialog>, element <variablePreSet>, element <variablePostSet>, element <variableDeclarations>, element <assertion>, or element <externalApplication>. This allows the user to change his input, which could change the forward logical path.

When executing a previous node, the entire node must be evaluated in the same manner as going forward. All child elements must be evaluated including presets and applicability.

The logic engine must proceed backwards until one of the following conditions occurs (user input or navigation function is required or no more data):

- an element <dmNode> with a child element <dmRef> is executed and passes applicability evaluation in which case the data module referenced is displayed to the user
- an element <dmNode> with one or more child element <proceduralStep> and an optional last element <dialog> is executed and at least one proceduralStep or the dialog passes applicability evaluation in which case the proceduralStep(s) and/or dialog that pass applicability evaluation are displayed to the user
- an element <dmNode> with one or more child element <proceduralStepAlts> is executed and at least one <proceduralStep> child of the <proceduralStepAlts> passes applicability evaluation in which case the first proceduralStep that passes applicability evaluation in sequence order is displayed to the user
- an element <dmNode> with a child element <dialog> is executed and passes applicability evaluation in which case the dialog is displayed to the user including the input originally entered by the user
- an element <dmNode> with a child element <externalApplication> is executed
- the beginning of the outermost process data module is reached in which case a message is displayed to the user indicating that the start of the procedure has been reached

If an element <dmLoop> is encountered when reversing then the processing path depends upon the forward path and number of iterations taken through the loop. If the user continues to perform the previous function, the logic engine must process the same number of iterations in reverse as was processed in the forward path.

1.2 Dialog navigation functions

When a dialog is displayed, either as the sole content of a <dmNode> or as an optional sibling of <proceduralStep> in <dmNode>, the dialog will assume responsibility for the viewer navigation function. Next and Previous navigation controls that can be present on the viewer navigation panel or equivalent will be disabled.

1.2.1 Submit function dialog response

The submit function dialog response instructs the logic engine to process the user input, either fill-in input data or a menu selection, then perform the Next navigation function. Refer to Para 1.1.1.

1.2.2 Cancel function dialog response

The cancel function dialog response instructs the logic engine to remove the dialog display, discard any user input and perform the "Previous" navigation function. Refer to Para 1.1.2.

Note

The cancel function is the method to perform a previous navigation function from a dialog.

1.2.3 Reset function dialog response

The reset function dialog response instructs the logic engine to revert the dialog data fields to the original values (eg, default settings) and remain in the dialog.

2 Data navigation processing classes

Several of the process data module elements are processed in an identical manner. These data module elements are grouped into classes; wrapper, node, node sequence, node alternative, if node, and loop node.

2.1 Wrapper class

Implemented by: element <process>

The wrapper class provides the outermost content tag for a data module that supports the interactive constructs. The order of processing is as follows:

- element <variableDeclarations> - All element <variable> within an element <variableDeclarations> are created.
- element <variablePreSet> - Variables and global properties may be assigned a value upon entering a process data module.
- element <variablePostSet> - Variables and global properties may be assigned a value upon exiting a process data module.
- content - The content is usually an element of the sequence class.

2.2 Node class

Implemented by: element <dmNode>

The node class is the main building block within a process data module. The order of processing is as follows:

- attribute applicRefId - The applicability reference is resolved and the element <applic> is evaluated. If it evaluates to "true" the element <dmNode> is processed. Within the element <applic>, the element <expression>, if provided, must evaluate to "true" to continue processing the element <dmNode>.
- element <variablePreSet> - Before processing any content, element <variablePreSet> assignments are made.
- content - Processing can suspend here if there is displayable data to present to the user. Processing remains suspended until the user selects the "Next" or "Previous" function.
- element <variablePostSet> - Before moving on in the process data module, element <variablePostSet> assignments are made.

2.2.1 Attribute applicRefId

The node class element can contain an attribute applicRefId that identifies the element's applicability. The referenced element <applic> can contain element <displayText>, and an element <assert>, element <evaluate> or element <expression>.

The element <displayText> is used for display to the user. The element <assert> and the element <evaluate> must be processed in accordance with Chap 7.8.

The element <expression> must be evaluated against current variable or global property values using the expression evaluation rules specified in Chap 7.6.1.4. If the element <expression> evaluates to "true", the logic engine must proceed with processing this node. If the element <expression> is given and evaluates to "false", then the remainder of the node is skipped and processing continues with the next node.

If no element <expression>, <assert> or <evaluate> is given then the logic engine must assume "true" and proceed with processing this node.

2.2.2 Element <variablePreSet>

The node class element can contain a list of element <variablePreSet> that assigns values to variables and global properties. Each element <variablePreSet> contains an element <assertion> which will modify the value of a variable or global property as specified in Chap 7.6.1.2.

2.2.3 Content

For element <dmRef>, the logic engine must cause the referenced data module to be accessed and processed accordingly. If the referenced data module is another process data module, then the process data module must be executed by the logic engine. If the referenced data module is not a process data module, then the referenced data module must be sent to the display software to be rendered to the user.

For element <proceduralStep>, the logic engine must process all step content including the hierarchical substep structure, build a display package, and send the display package to the display software to be rendered to the user. The element <proceduralStep> content is modified from the procedural data module with the addition of element <variableRef> or <globalPropertyRef> within element <para>. Upon encountering element <variableRef> or <globalPropertyRef>, the logic engine must obtain the value associated with the referenced variable and embed that value into the para to be displayed to the user.

For element <dialog>, the logic engine must process the dialog content, build a display package, and send the display package to the display software to be rendered to the user.

For element <externalApplication>, the logic engine must process all external application content including parameters to send and expected results. Depending upon implementation, the logic engine must interface with the external application directly or send the interface information to the display software to perform the interface with the external application.

2.2.4 Postset

The node class element can contain a list of element <variablePostSet> that assigns values to variables or global properties. Each element <variablePostSet> contains an element <assertion> which will modify the value of a variable or global property as specified in Chap 7.6.1.2.

2.3 Sequence class

Implemented by: element <dmSeq>
element <dmThenSeq>
element <dmElseSeq>

The sequence provides the mechanism to specify sequences of nodes, if nodes, loop nodes, and node alternates that create the procedure flow. The sequence simply contains a list of nodes that are processed in the order that they appear. A sequence cannot directly contain another sequence.

2.4 Alternate class

Implemented by:

- the element <dmNodeAlts>
- the element <proceduralStepAlts>
- the element <dialogAlts>
- the element <messageAlts>
- the element <dmSeqAlts>

The node alternate provides the mechanism to group a list of alternative nodes. The grouping is to define that the nodes apply to different contextual situations. Where two or more nodes exist within a node alternate grouping, the nodes must be of the same type. For instance: an element <proceduralStepAlts> can only contain one or more element

<proceduralStep>. Each node must contain the attribute applicRefId. Not every contextual situation has to be covered by the nodes within a node alternate.

The element <applic> must be evaluated on each alternative node in order using the rules specified in Chap 7.6.1.4. The first node where the element <applic> evaluates to "true" (if any) will continue to be processed and the remaining nodes will be skipped. Nodes where the element <applic> evaluates to "false" are not to be processed. If no node passes applicability testing, then the node alternate is skipped and processing continues after the node alternate.

2.5 If node class

Implemented by:

– the element <dmIf>

The If node provides a simple if-then-else branching mechanism. The logic engine is to evaluate the element <expression> using the expression evaluation rules specified in Chap 7.6.1.4. If the element <expression> evaluates to "true", the then branch (element <dmThenSeq>) is processed according to the node sequence rules specified in Para 2.3. If the expression evaluates to "false", the else branch (element <dmElseSeq>), if present, is processed according to the node sequence rules.

2.6 Loop node class

Implemented by: element <dmLoop>

The loop node provides a looping mechanism, similar to a traditional programming language loop. The loop node supports an initial element <variablePreSet> for variable or global property assignment, an element <expression> to loop on while "true", an element <dmSeq> to process on each loop iteration, and an element <assertion> for variable or global property reassignment at the end of a loop iteration prior to evaluating the element <expression> for the next iteration.

2.6.1 Preset

The element <variablePreSet>, if present, is always processed. Each element <variablePreSet> contains an element <variableRef> or <globalPropertyRef> to be assigned and an element <expression>. The logic engine must evaluate the element <expression> using the expression evaluation rules specified in Chap 7.6.1.4 and assign the result to the referenced variable or global property.

2.6.2 Expression

The element <expression> is evaluated using the expression evaluation rules specified in Chap 7.6.1.4. If the element <expression> evaluates to anything other than "true" the loop is terminated.

2.6.3 Node sequence

The element <dmSeq> is processed according to the node sequence rules listed previously.

2.6.4 Assertion

The element <assertion>, if present, is processed. Each element <assertion> contains an element <variableRef> or <globalPropertyRef> to be assigned and an element <expression>. The logic engine must evaluate the element <expression> using the expression evaluation rules specified in Chap 7.6.1.4 and assign the result to the referenced variable or global property.

2.6.5 Looping

The logic engine jumps up to the expression step of this process and continues looping until the element <expression> evaluates to anything other than "true".

Chapter 7.6.1.2

Process data module requirements - Variables and global properties

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Chap 7.6.1.5	Process data module requirements - Dialogs

1 Variables and Global Properties

Variables and global properties hold state values and are used within expressions to context filter, branch, loop, pass parameters, and display state information to the user. Variables are

local in scope. Local variables are created as elements <variable> in process data modules and are only visible to the process data module in which they were created. Global properties are defined as either elements <productAttribute> in the ACT or elements <cond> in the CCT and are visible to all data modules in the IETP. Local variables are referenced by element <variableRef> while global properties are referenced by element <globalPropertyRef>. These elements have an "OR" relationship within variable referencing structures such as element <expression>.

2 Local Variables

2.1 Variable identification

Local variables are identified by the attribute variableName. Variable names are case insensitive, unique within a single data module and must not exceed a length of 64 characters. The first character in a variable name must be a letter, [A-Z] or [a-z]. Subsequent characters can be any of the following: [A-Z], [a-z], [0-9], underscore [_], or blank space [ ]. The last character cannot be a blank space. The logic engine must ignore any leading or trailing white space.

2.2 The variableDescr and productConfigurationFlag attributes

The attribute productConfigurationFlag provides a flag indicating whether this local variable represents a product configuration item and the attribute variableDescr provides a human readable description of the variable. Using attribute variableDescr and attribute productConfigurationFlag and values from the state table, a display can optionally be presented to the user which conveys the current state of the logic engine state table. By filtering on the attribute productConfigurationFlag, the display can be limited to items pertaining to product configuration. This can be helpful to verify that the state table configuration matches the actual product configuration. This flag was introduced into the specification when all variables were declared in a process data module and were global. However, it could be useful in the case where global variable values are assigned to local variables in order to manipulate them in a procedure without affecting the global variable values.

2.3 The valueType attribute

The logic engine is required to support the data types Boolean, integer, real, string and set for local variables.

2.3.1 Boolean

A Boolean variable is allowed to have the values "true" or "false".

2.3.2 Integer

An integer variable must support, at a minimum, a 32 bits signed long integer, providing a range of -2.147.483.648 to 2.147.483.647.

2.3.3 Real

A real variable must support, at a minimum, a 32 bits (4 bytes) real number. It must support the IEEE standard of 1-bit sign, 8 bits exponent, and 23 bits mantissa, which gives a minimum precision of 6 significant digits and a minimum exponent range of -38 to 38. A range of approximately 3,4E-38 to 3,4E+38 should be supported.

2.3.4 String

A string variable must support, at a minimum, a Unicode string up to 64 characters long.

2.3.5 Set

A set variable is allowed to contain a collection of like values: integer, real, or string. A set variable is also allowed to have value "noValue". A particular value can be a member of a set only once.

2.4 The valuePrecision attribute

For local variables with a valueType of real, the attribute valuePrecision is used to specify the number of digits after the decimal point that is relevant. The nth decimal position specified by valuePrecision is rounded up when the nth + 1 digit is greater than or equal to 5 and truncated when the nth + 1 digit is less than 5.

The attribute valuePrecision is used only for formatting the display and should not be confused with the number of significant digits capable of being represented by a real number within a computer.

2.5 The scope attribute

The element <variable> attribute scope defaults to "local", as only local variables are defined within a process data module. Local variables must be available to only the data module in which they are created and no longer exist once that data module is exited. Refer to Para 1.

2.6 Dialog

The optional element <dialog> provides a method to obtain the value of a local variable from the user at runtime when that variable is not defined in the state table. The dialog should assign a value to the variable, although this is not enforced in the Schema and would be difficult to validate. Refer to Chap 7.6.1.5.

2.7 Initialize

The optional element <initialize> provides the initial value to assign to a local variable at the time of creation in the state table. Refer to variable and global property management in Chap 7.6.1.3.

3 Global Properties

Global properties are created in the ACT and CCT data modules as elements <productAttribute> and <cond>. Refer to Chap 4.14.1 and Chap 4.14.2. Discussed below are elements <productAttribute> and <cond> attributes relevant to the process data module.

3.1 Global property identification

Global properties are uniquely identified by the combination of a product attribute identifier or condition identifier and the global property type which indicates whether the property was declared as a product attribute or a condition.

A product attribute identifier is declared in the ACT data module in element <productAttribute> with the attribute id. A condition identifier is declared in the CCT in element <cond> with the attribute id. The global property type indicates whether the property was declared as a product attribute or a condition.

Both global property types are referenced by their property type (product attribute or condition) and their attribute id.

3.2 Value typing

Product attribute global properties are typed by the element <productAttribute> attribute valueDataType.

Condition global properties are typed by reference by element <cond> attribute condTypeRefId.

The local variable base types are supported in both cases except for type "set". Refer to Para 2.3.

3.3 Scope

No scope is specified for global properties. They are assumed global.

3.4 Dialogs

Element <productAttribute> child element <prompt> or <displayName> from the ACT data module can be used to generate a dialog question in order to obtain the value of a product attribute global property. If a menu type dialog is required, the element <productAttribute> child element <enumeration> attribute enumerationLabel can be used to generate a menu of choices for the global property value.

Element <cond> child element <prompt> from the CCT data module can be used to generate a dialog question in order to obtain the value of a condition global property. If a menu type dialog is required, the element <condType> child element <enumeration> attribute enumerationLabel can be used to generate a menu of choices for the global property value.

Dialogs supporting global properties may also be authored in a process data module using the element <dialog>. Refer to Chap 7.6.1.5.

3.5 Initialization

Global properties can be initialized in the PCT. If they are not, the value of "noValue" should be assigned to the global property to indicate it has no value. Refer to Chap 7.6.1.3.

Chapter 7.6.1.3

Process data module requirements - Variable and global property management

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Chap 7.6.1.5	Process data module requirements - Dialogs
Chap 7.6.1.7	Process data module requirements - Error handling

1 Variable and global property management

The logic engine is required to maintain the process data module state table containing all declared local variables and global properties during execution.

The state table must provide access to local variables by name. Global properties are referenced by their property type (condition or product attribute) and id. The currently assigned value, the description, and the data type must be retained and made accessible by the variable name or global property reference as defined above. A configuration flag and precision must also be retained for local variables.

2 Local variables

2.1 Variable declarations

All local variables are required to be defined within an element <variableDeclarations> and must be unique within a process data module.

Local variables must be added according to the following rules:

- If the element <variable> contains an element <initialize>, the initialization element <expression> is to be evaluated using the expression evaluation rules specified in Chap 7.6.1.4 and the result must be assigned to the variable in the state table.
- If the element <variable> does not contain an element <initialize>, the value of "noValue" must be assigned to the variable in the state table.

2.2 Assigning a value to a local variable

An element <assertion> causes the logic engine to assign the value of a variable. The element <assertion> contains an element <variableRef> and an element <expression>. These can be considered the left-hand and right-hand portions of an assignment statement (eg, variable = expression).

The variableName attribute provided in the element <variableRef> is used to find the variable. The element <expression> is to be evaluated using the expression evaluation rules specified in Chap 7.6.1.4. The value of the variable is then assigned the result of the expression.

If the variable does not exist in the state table, an error message must be generated. Refer to error handling in Chap 7.6.1.7.

If the variable exists in the state table, but the data type of the variable and the data type of the expression result do not match, an error message must be generated. Refer to error handling in Chap 7.6.1.7.

2.3 Accessing the value of a local variable

Accessing the value of a variable is done during run-time processing by the logic engine. The logic engine uses the name of the variable provided in the element <variableRef> to retrieve the value of the variable.

If a variable has the value of "noValue" and an element <dialog> is included in the element <variable> declaration, the dialog must be presented to the user according to the dialog rules specified in Chap 7.6.1.5. The user's response is to be assigned to the variable. If the variable has the value of "noValue" and an element <dialog> is not included in the element <variable> declaration, an error message is to be generated. If the variable does not exist in the state table, an error message must be generated. Refer to error handling at Chap 7.6.1.7.

3 Global properties

3.1 Global property definition

Global variables are defined in the ACT and CCT as discussed in Chap 7.6.1.2.

New global properties must be added to the state table according to the following rules:

- If the element <productAttribute> or element <cond> is initialized in the PCT with the element <assign>, then the assign attribute applicPropertyValue value must be assigned to the global property in the state table.

– If the element <productAttribute> or element <cond>is not initialized, the value of "noValue" must be assigned to the global property in the state table.

3.2 Assigning values to global properties

An element <assertion> causes the logic engine to assign the value of a global property. The element <assertion> contains an element <globalPropertyRef> and an element <expression>. These can be considered the left-hand and right-hand portions of an assignment statement (eg, variable = expression).

The applicPropertyIdent and applicPropertyType attributes provided in the element <globalPropertyRef> are used to find the global property. The element <expression> is to be evaluated using the expression evaluation rules specified in Chap 7.6.1.4. The value of the variable or global property is then assigned the result of the expression.

If the global property does not exist in the state table, an error message must be generated. Refer to error handling in Chap 7.6.1.7.

If the global property exists in the state table, but the data type of the global property and the data type of the expression result do not match, an error message must be generated. Refer to error handling in Chap 7.6.1.7.

3.3 Accessing the value of a global property

Accessing the value of a global property is done during run-time processing by the logic engine. The logic engine uses the applicPropertyIdent and applicPropertyType attributes provided in the element <globalPropertyRef> to retrieve the value of the variable.

If a global property has the value of "noValue" and the element <prompt> and optional element <enumeration> attribute enumerationLabel were provided in the ACT or CCT productAttribute or cond definition, a dialog should be generated and presented to the user according to the dialog rules specified in Chap 7.6.1.5. The user's response is to be assigned to the global property. If the global property has the value of "noValue" and no prompts or enumeration labels were provided in the ACT/CCT productAttribute or cond definitions, an error message is to be generated. If the global property does not exist in the state table, an error message must be generated. Refer to error handling at Chap 7.6.1.7.

Chapter 7.6.1.4

Process data module requirements - Expression evaluation

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1 Expression evaluation

The cornerstone of the process data module is the capability to branch, loop, and filter data. It is the expression evaluation that makes this possible. Expressions are defined in the content of the element <expression> and a rich set of operations are supported for the different data types.

A set of sample expressions are provided in Chap 7.7.1.

2 Supported operations

The expression element contains one of four forms: an operation between two expressions, a function on a single expression, a variable or global property value, or a static value. Expression evaluations returning imaginary numbers, positive infinity or negative infinity are not supported, refer to error handing in Chap 7.6.1.7.

2.1 Operations between two expressions

The following tables (Table 2 thru Table 5) list the operations required to be supported. Operations between two expressions are always in the form of <expression><"operation "><expression>. The operation, the forms that the operation can take, the return value data type and a description are listed in the following tables. The form column defines the return value type for the expression on each side of the operator.

The binary operations are divided into four groups depending upon the type of the operands (the type of the expression on either side of the operation): Boolean operations, number operations (for integer and real operands), set operations and string operations. Within each group, several operations are possible.

When one side of an operation contains an expression that contains a value, data type errors will be caught by comparing the type of value with the data type of the operation they are contained within. For instance: the operation <booleanOperator booleanOperation="and"> will fail if one side of the operation has the value element <stringValue>Yes</stringValue>.

Table 2 Boolean Operations

Value of attribute **booleanOperation**	Form	Return Value	Description
"and"	Boolean "and" Boolean	Boolean	"true" if both Booleans are "true", "false" otherwise.
"equal"	Boolean "equal" Boolean	Boolean	"true" if the values are the same or "false" if they are different.
"exclusiveOr"	Boolean "exclusiveOr" Boolean	Boolean	"true" if one and only one Boolean is "true", "false" otherwise.
"notEqual"	Boolean "notEqual" Boolean	Boolean	"true" if the values are different or "false" if they are the same.

Value of attribute booleanOperation	Form	Return Value	Description
"or"	Boolean "or" Boolean	Boolean	"true" if either Boolean is "true", "false" otherwise.

Table 3 Number Operations

Value of attribute numberOperation	Form	Return Value	Description
"divide"	Integer "divide" Integer	Real	Return the value of the first number divided by the second number.
	Integer "divide" Real	Real	
	Real "divide" Integer	Real	
	Real "divide" Real	Real	
"equal"	Integer "equal" Integer	Boolean	"true" if the values are the same or "false" if they are different.
	Real "equal" Real	Boolean	
"exponent"	Integer "exponent" Integer	Integer or Real	Return the value of the first number raised to the power of the second number. The return value is a real unless the first number is an integer and the second number is a positive integer.
	Integer "exponent" Real	Real	
	Real "exponent" Integer	Real	
	Real "exponent" Real	Real	
"greaterThan"	Integer "greaterThan" Integer	Boolean	"true" if the first number is greater than the second number, "false" otherwise.
	Integer "greaterThan" Real	Boolean	
	Real "greaterThan" Integer	Boolean	
	Real "greaterThan" Real	Boolean	

Value of attribute `numberOperation`	Form	Return Value	Description
"greaterThanOrEqual"	Integer "greaterThanOrEqual" Integer	Boolean	"true" if the first number is greater than or equal to the second number, "false" otherwise.
	Integer "greaterThanOrEqual" Real	Boolean	
	Real "greaterThanOrEqual" Integer	Boolean	
	Real "greaterThanOrEqual" Real	Boolean	
"integerDivide"	Integer "integerDivide" Integer	Integer	Return the value of the first number divided by the second number, truncated to an integer.
	Integer "integerDivide" Real	Integer	
	Real "integerDivide" Integer	Integer	
	Real "integerDivide" Real	Integer	
"lessThan"	Integer "lessThan" Integer	Boolean	"true" if the first number is less than the second number, "false" otherwise.
	Integer "lessThan" Real	Boolean	
	Real "lessThan" Integer	Boolean	
	Real "lessThan" Real	Boolean	
"lessThanOrEqual"	Integer "lessThanOrEqual" Integer	Boolean	"true" if the first number is less than or equal to the second number, "false" otherwise.
	Integer "lessThanOrEqual" Real	Boolean	
	Real "lessThanOrEqual" Integer	Boolean	
	Real "lessThanOrEqual" Real	Boolean	
"minus"	Integer "minus" Integer	Integer	Return the value of the first number minus the second number.
	Integer "minus" Real	Real	
	Real "minus" Integer	Real	
	Real "minus" Real	Real	

Value of attribute `numberOperation`	Form	Return Value	Description
"`modulus`"	Integer "`modulus`" Integer	Integer	Return the integer remainder after the first number is integer-divided by the second number.
"`notEqual`"	Integer "`notEqual`" Integer	Boolean	"`true`" if the values are different or "`false`" if they are the same.
	Real "`notEqual`" Real	Boolean	
"`plus`"	Integer "`plus`" Integer	Integer	Return the value of the first number plus the second number.
	Integer "`plus`" Real	Real	
	Real "`plus`" Integer	Real	
	Real "`plus`" Real	Real	
"`times`"	Integer "`times`" Integer	Integer	Return the value of the first number multiplied by the second number.
	Integer "`times`" Real	Real	
	Real "`times`" Integer	Real	
	Real "`times`" Real	Real	

Table 4 Set Operations

Value of attribute `setOperation`	Form	Return Value	Description
"`add`"	Set "`add`" Value	Set	Make a new set containing all members of the old set plus Value.
"`disjoint`"	Set "`disjoint`" Set	Boolean	"`true`" if the intersection of the two sets is empty, "`false`" otherwise.
"`equal`"	Set "`equal`" Set	Boolean	"`true`" if the values in the set are the same or "`false`" if they are different.

Value of attribute `setOperation`	Form	Return Value	Description
"`intersection`"	Set "`intersection`" Set	Set	Make a new set that contains only values that are members of both sets in the expression.
"`member`"	Value "`member`" Set	Boolean	"`true`" if Value is contained in the set, "`false`" otherwise.
"`notEqual`"	Set "`notEqual`" Set	Boolean	"`true`" if the values of the set are different or "`false`" if they are the same.
"`remove`"	Set "`remove`" Value	Set	Make a new set containing all members of the old set minus Value.
"`setDifference`"	Set "`setDifference`" Set	Set	Make a new set which is the difference of the two sets.
"`subset`"	Set "`subset`" Set	Boolean	"`true`" if all elements of the first set are contained in the second, "`false`" otherwise.
"`union`"	Set "`union`" Set	Set	Make a new set containing members of both sets in the expression. Members contained in both sets will be contained in the new set only once.

Table 5 String Operations

Value of attribute `stringOperation`	Form	Return Value	Description
"`concatenate`"	String "`concatenate`" String	String	Make a new string which is equal to the first string with the second string concatenated

Value of attribute `stringOperation`	Form	Return Value	Description
			to the end of it.
"`contains`"	String "`contains`" String	Boolean	"`true`" if the first string occurs anywhere within the second string, "`false`" otherwise.
"`equal`"	String "`equal`" String	Boolean	"`true`" if the values are the same or "`false`" if they are different.
"`greaterThan`"	String "`greaterThan`" String	Boolean	"`true`" if the first string is greater than the second string, "`false`" otherwise.
"`greaterThanOrEqual`"	String "`greaterThanOrEqual`" String	Boolean	"`true`" if the first string is greater than or equal to the second string, "`false`" otherwise.
"`lessThan`"	String "`lessThan`" String	Boolean	"`true`" if the first string is less than the second string, "`false`" otherwise.
"`lessThanOrEqual`"	String "`lessThanOrEqual`" String	Boolean	"`true`" if the first string is less than or equal to the second string, "`false`" otherwise.

Value of attribute `stringOperation`	Form	Return Value	Description
"notEqual"	String "notEqual" String	Boolean	"true" if the values are different or "false" if they are the same.

2.2 Functions on a single expression

The following tables (Table 6 thru Table 10) list the functions required to be supported. Functions on a single expression are always in the form of <"function"><expression>. The function result and the return value data type must be returned. The function, the forms that the function can take, the return value data type and a description are listed.

The functions are divided into five groups depending upon the type of the operand: Boolean functions, number functions, set functions, string functions, and a substring function. Within each group, several operations are possible.

When a function contains an expression that contains a value, data type errors will be caught by comparing the type of value with the data type of the operation they are contained within. For example, the operation <numberFunction numberAction="float"> will fail if the operation has the value element <stringValue>Yes</stringValue>.

Table 6 Boolean Functions

Value of attribute `booleanAction`	Form	Return Value	Description
"defined"	"defined" <variableRef>	Boolean	"true" if variable exists in state table and does not have a "noValue" value.
"not"	"not" Boolean	Boolean	"true" if operand is "false". "false" if operand is "true".

Table 7 Number Functions

Value of attribute `numberAction`	Form	Return Value	Description
"commonLogarithm"	"commonLogarithm" Integer	Real	Return the common logarithm (log) of the number
	"commonLogarithm" Real	Real	
"cosecant"	"cosecant" Integer	Real	Return the cosecant (csc or cosec) of the number
	"cosecant" Real	Real	
"cosine"	"cosine" Integer	Real	

Value of attribute numberAction	Form	Return Value	Description
	"cosine" Real	Real	Return the cosine (cos) of the number
"cotangent"	"cotangent" Integer	Real	Return the cotangent (cot) of the number
	"cotangent" Integer	Real	
"exponential"	"exponential" Integer	Real	Return the exponential (exp) of the number.
	"exponential" Real	Real	
"factorial"	"factorial" Integer	Integer	Return the product of multiplying all integers up to and including the given positive integer.
"float"	"float" Integer	Real	Return the number converted to a real.
	"float" Real	Real	
"hyperbolicCosecant"	"hyperbolicCosecant" Integer	Real	Return the hyperbolic cosecant (csch) of the number
	"hyperbolicCosecant" Real	Real	
"hyperbolicCosine"	"hyperbolicCosine" Integer	Real	Return the hyperbolic cosine (cosh) of the number
	"hyperbolicCosine" Real	Real	
"hyperbolicCotangent"	"hyperbolicCotangent" Integer	Real	Return the hyperbolic cotangent (coth) of the number
	"hyperbolicCotangent" Real	Real	
"hyperbolicSecant"	"hyperbolicSecant" Integer	Real	Return the hyperbolic secant (sech) of the number
	"hyperbolicSecant" Real	Real	
"hyperbolicSine"	"hyperbolicSine" Integer	Real	Return the hyperbolic sine (sinh) of the number
	"hyperbolicSine" Real	Real	
"hyperbolicTangent"	"hyperbolicTangent" Integer	Real	Return the hyperbolic tangent (tanh) of the number
	"hyperbolicTangent" Real	Real	

Value of attribute **numberAction**	Form	Return Value	Description
"inverseCosine"	"inverseCosine" Integer	Real	Return the inverse cosine (arccos or cos-1) of the number.
	"inverseCosine" Real	Real	
"inverseCosecant"	"inverseCosecant" Integer	Real	Return the inverse cosecant (arccsc or csc-1) of the number.
	"inverseCosecant" Real	Real	
"inverseCotangent"	"inverseCotangent" Integer	Real	Return the inverse cotangent (arccot or cot-1) of the number.
	"inverseCotangent" Real	Real	
"inverseSine"	"inverseSine" Integer	Real	Return the inverse sine (arcsin) of the number.
	"inverseSine" Real	Real	
"inverseSecant"	"inverseSecant" Integer	Real	Return the inverse secant (arcsec or sec-1) of the number.
	"inverseSecant" Real	Real	
"inverseTangent"	"inverseTangent" Integer	Real	Return the inverse tangent (arctan or tan-1) of the number.
	"inverseTangent" Real	Real	
"naturalLogarithm"	"naturalLogarithm" Integer	Real	Return the natural logarithm (ln) of the number
	"naturalLogarithm" Real	Real	
"negative"	"negative" Integer	Integer	Return the negative value of the number.
	"negative" Real	Real	
"secant"	"secant" Integer	Real	Return the secant (sec) of a number
	"secant" Real	Real	
"sine"	"sine" Integer	Real	Return the sine (sin) of a number
	"sine" Real	Real	
"squareRoot"	"squareRoot" Integer	Integer or Real	Return the square root (sqrt) of a number
	"squareRoot" Real	Real	
"tangent"	"tangent" Integer	Real	Return the tangent (tan or tg) of a number
	"tangent" Real	Real	

Value of attribute **numberAction**	Form	Return Value	Description
"truncate"	"truncate" Real	Integer	Return the real number truncated to an integer.

Table 8 Set Functions

Value of attribute **setAction**	Form	Return Value	Description
"empty"	"empty" Set	Boolean	"true" if the set is empty, "false" otherwise.
"sizeOf"	"sizeOf" Set	Integer	Number of characters in the set

Table 9 Unary String Functions

Value of attribute **stringAction**	Form	Return Value	Description
"empty"	"empty" String	Boolean	"true" if the string is empty, "false" otherwise.
"sizeOf"	"sizeOf" String	Integer	Number of characters in the string

Table 10 Unary Substring Functions

Form	Return Value	Description
<subStringFunction> <subStringPosition> </subStringFunction> String	String	The subStringFunction will return a substring depending on the values provided in one or two element <subStringPosition> and element <subStringLength>. The subStringPosition specifies the position in the string by the following rules: A positive subStringPosition means an index position counted from the beginning of the string. A negative subStringPosition is counted from the end. A one means the start and a zero means the end of the string. A single subStringPosition will return a single character string. A positive subStringLength means the length towards the string end. A negative subStringPosition means the length towards the string start. A zero means the returned string is from the

Form	Return Value	Description
		subStringPosition to string end. A subStringLength greater then remainder of the string means the returned string is from the subStringPosition to string end (positive) or to string start (negative).
<subStringFunction> <subStringPosition> <subStringPosition> </subStringFunction> String	String	Two subStringPositions specify the starting position and ending position of the substring to be returned. NOTE: The starting position can occur after the ending position. For example, a starting position of 10 and ending position of 3 will return the range between 3 and 10.
<subStringFunction> <subStringPosition> <subStringLength> </subStringFunction> String	String	A subStringPosition and subStringLength specify the starting position and length, respectively, of the substring to be returned.

2.3 Variable and global property references

If the expression contains an element <variableRef> or <globalPropertyRef>, the value of the expression is obtained by looking up the current value of the variable or global property in the state table. Refer to variable and global property management - accessing the value of a variable or global property in Chap 7.6.1.3 for the rules governing state table retrieval.

2.4 Values

Values within an expression represent a constant. The data type of the value is indicated by the name of the element. For value elements that contain character data (element <stringValue>, element <integerValue> and element <realValue>), the character data must match the data type. Data content that does not match the data type must be flagged as an error. Refer to error handing in Chap 7.6.1.7.

2.5 Operations by data type

The following is provided as a quick reference to the operations supported per data type.

Operations that operate on Boolean data types are:

- "and"
- "defined"
- "equal"
- "exclusiveOr"
- "notEqual"
- "not"
- "or"

Operations that operate on integer data types are:

- "commonLogarithm"
- "cosecant"

- "cosine"
- "cotangent"
- "divide"
- "equal"
- "exponent"
- "exponential"
- "factorial"
- "float"
- "greaterThan"
- "greaterThanOrEqual"
- "hyperbolicCosecant"
- "hyperbolicCosine"
- "hyperbolicCotangent"
- "hyperbolicSecant"
- "hyperbolicSine"
- "hyperbolicTangent"
- "integerDivide"
- "inverseCosine"
- "inverseCosecant"
- "inverseCotangent"
- "inverseSine"
- "inverseSecant"
- "inverseTangent"
- "lessThan"
- "lessThanOrEqual"
- "minus"
- "modulus"
- "naturalLogarithm"
- "notEqual"
- "negative"
- "plus"
- "secant"
- "sine"
- "squareRoot"
- "tangent"
- "times"

Operations that operate on real data types are:

- "commonLogarithm"
- "cosecant"
- "cosine"
- "cotangent"
- "divide"
- "equal"
- "exponent"
- "exponential"
- "float"
- "greaterThanOrEqual"

- "greaterThan"
- "hyperbolicCosecant"
- "hyperbolicCosine"
- "hyperbolicCotangent"
- "hyperbolicSecant"
- "hyperbolicSine"
- "hyperbolicTangent"
- "integerDivide"
- "inverseCosine"
- "inverseCosecant"
- "inverseCotangent"
- "inverseSine"
- "inverseSecant"
- "inverseTangent"
- "lessThanOrEqual"
- "lessThan"
- "minus"
- "naturalLogarithm"
- "notEqual"
- "negative"
- "plus"
- "secant"
- "sine"
- "squareRoot"
- "tangent"
- "times"
- "truncate"

Operations that operate on string data types are:

- "concatenate"
- "contains"
- "empty"
- "equal"
- "greaterThan"
- "greaterThanOrEqual"
- "lessThan"
- "lessThanOrEqual"
- "notEqual"
- "sizeOf"
- <subStringFunction>

Operations that operate on set data types are:

- "add"
- "disjoint"
- "empty"
- "equal"
- "intersection"
- "member"

- "notEqual"
- "remove"
- "setDifference"
- "sizeOf"
- "subset"
- "union"

3 Failed evaluations

An expression that cannot be evaluated must be considered a fatal error. The logic engine must immediately stop executing the process data module and present an error message to the user. Refer to error handling in Chap 7.6.1.7.

4 Error conditions

The following error conditions must be trapped and handled according to error handling in Chap 7.6.1.7:

- Division by zero
- Calculating the nth root of a negative integer or negative real
- Calculating the factorial of a negative integer
- Fixed value content does not match the data type implied by the value element (element <stringValue>, element <integerValue>, element <realValue>)
- Operation between two expressions with incorrect data type operand(s)
- Function on a single expression with incorrect data type operand
- Expression cannot be evaluated

Chapter 7.6.1.5

Process data module requirements - Dialogs

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Chap 7.6.1.1	Process data module requirements - Navigation

1 Dialogs

Dialogs provide interactivity between the user and the state local variables and global properties used in the process data module. Dialogs provide the capability of prompting the user to input a typed response via a fill-in dialog or select from a set of choices via a menu dialog.

1.1 Dialog state variable management

Any state variable or global property references (element <variableRef> or <globalPropertyRef>) used in the element <dialog> is replicated to a temporary state table when the dialog is executed. Dialog state variables and global properties are managed separately to maintain the asserted values during the dialog, not to the system state table. All dialog expressions (element <applic>, element <enabledState>, element <validate>, and element <assertion>) are evaluated using the dialog state table.

1.1.1 System state table modification

When a dialog navigation function (submit, cancel, or reset) is selected, an event is performed to the system state table. The following navigation functions perform the following system state table event.

- submit - The system state table is updated with the dialog state values
- cancel - The system state values are unchanged
- reset - The dialog state values are reverted to the current system state values

1.2 Applicability dialog component elements

The dialog and dialog component elements (element <dialog>, element <userEntry>, element <menu>, element <menuChoice>, element <pushButton>, and element <message>) are based on the node template and can contain applicability elements that are to be processed by the rules defined in the data navigation classes in Chap 7.6.1.1, above. It does not contain the element <variablePreSet> or the element <variablePostSet> from the node template.

1.3 Enable / disable dialog component elements

Each dialog component element (element <userEntry>, element <menu>, element <pushButton>, and element <menuChoice>) can contain the element <enabledState>. The logic engine must evaluate each element <enabledState> expression after each fill-in is completed or menu choice is selected and asserted. When evaluating the enable/disable expression the dialog state values are used. When the evaluated expression is "false", the associated data entry information is disabled (not available) and visibly dimmed or grayed out. When the dialog is submitted, any asserted state variables or global properties, in a disabled data entry, are reverted to the original values.

2 Fill-in dialogs

A dialog element <userEntry> is constructed with an element <prompt> which contains the question to be presented to the user, an element <variableRef> or <globalPropertyRef> which will receive the user's response, an optional element <default> which defines the default value, and an optional element <validate> which defines a criteria for the input. The fill-in can contain the element <pushButton> specifying an action push button next to the data entry field.

The attribute mandatory identifies whether the user must input text before the submit function.

A fill-in dialog is presented with the prompt and an area to enter input.

2.1 Default data entry

When a default expression or value is provided, the input area is to be pre-filled with the text. The logic engine determines the default entry by evaluating the element <default> expression, if present. If no element <default> exists, the logic engine will not provide pre-filled text.

2.2 Validate data entry

The logic engine is to validate user input either as characters are entered or when the user has completed entry and wants to continue. The validation rules are enforced by getting the data type of the variable or global property to receive the user's response and validating that all characters are valid for that data type. For an integer data type, an optional leading minus sign [-] and numeric characters [0-9] are valid. For a real data type, an optional leading minus sign [-], numeric characters [0-9], and one dot [.] or one comma [,] are valid, scientific notation is not currently supported. For a string data type, any ASCII characters are valid. Processing must not continue until a valid input is entered or the user cancels the dialog.

Fill-in dialogs that contain an element <validate> are to validate that the user input returns a value "true" against the validation expression. If the user enters a value that fails the validation check, a warning is to be presented that includes the acceptable criteria (as specified in the attribute errorMessage). Processing must not continue until an acceptable criterion is entered or the user cancels the dialog. Once an acceptable input value is received, it is assigned to the variable or global property in the dialog state table.

3 Menu dialogs

A dialog element <menu> is constructed with an element <prompt> that contains the question to be presented to the user and one or more elements <menuChoice> that the user can select from. The element <prompt> has an attribute textDisplayPosition, which gives the position of the prompt. It has values "top", "bottom", "left" and "right".

A menu dialog is presented with the prompt and the list of choices to select from.

- The attribute choiceSelection identifies whether the user is limited to selecting a single choice or can select multiple choices. For value of "single", the preferred method of display is a list of radio boxes. For value of "multiple", the preferred method of display is a list of check boxes.
- The attribute mandatory identifies whether the user must select a choice(s).
- The attribute choiceType identifies the preferred layout as either item or scrollable list. For value of "select", the preferred method of display is either a list of radio or check boxes, depending on attribute choiceSelection. An alternative method of display for a large number of choices is a scrolling list. For value of "pulldown", the preferred method of display is a scrolling list.
- The attribute menuChoiceFlow identifies the preferred layout as either in horizontal or vertical direction.

Each element <menuChoice> contains the element <prompt> for the choice, either element <assertion> specifying the operation to perform if the choice is selected or element <noAssertions> if no operation is to be performed. Each choice can contain element <externalApplication> specifying upon selection to execute the application, element <dialog> specifying upon selection to launch a secondary dialog, or element <pushButton> specifying an action push button next to the menu choice answer.

The attribute menuChoiceDefaultFlag on the element <menuChoice> determines if the choice is initially displayed as pre-selected. For value of "1", the choice is pre-selected. For value of "0", the choice is not pre-selected. If more than one choice of a single choice menu dialog (<menu choiceSelection="single">) has the attribute menuChoiceDefaultFlag value of "1", then only the first choice with the attribute menuChoiceDefaultFlag value of "1" must be displayed pre-selected.

The element <externalApplication> or element <dialog> is executed by the logic engine after the menu choice is selected.

The element <pushButton> is displayed next to the menu choice and is executed after the push button is selected, not when the menu choice is selected.

Each element <menuChoice> must contain one or more elements <assertion> or the element <noAssertions> specifying the action to perform when the choice is selected. For choices with element <assertion>, the logic engine must perform all of the assertions

assigning values to variables and global properties in the dialog state table. For choices with an element <noAssertions>, the logic engine must not perform any assertion actions.

4 Push button dialogs

The logic engine launches the external application, using the element <externalApplication> or secondary dialog, using the element <dialog>, after the push button is selected.

Chapter 7.6.1.6

Process data module requirements - External application interface

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Chap No./Document No.	Title
Chap 7.6.1.1	Process data module requirements - Navigation
Chap 7.6.1.7	Process data module requirements - Error handling

1 External application interface

The logic engine/IETP combination must provide the capability to interface with applications external to the IETP. Examples of external applications are diagnostic tools, which can run tests that return results; and additional technical data viewers, such as an interactive wiring viewer, which typically would not return results. The external application interface is intended to support interfaces with any type of application.

The requirements for the external application interface apply to the combination of logic engine and IETP. Specific projects will have to allocate the requirements between the logic engine and the IETP. Different projects or organizations can allocate the requirements differently. No specific implementation guidance is provided here.

1.1 External application

The element <externalApplication> defines an interface to an external application. The mandatory attribute application defines the "service" being requested. The attribute application refers to an ENTITY, which provides further information about the service being requested. The logic engine/IETP uses this information to identify the actual application to invoke through some sort of mapping (such as XSL). The attribute provides the flexibility to use the best-suited external application to perform the request. The implementation of mapping an external application request to an actual application is not specified.

1.2 Description

The element <paraBasic> provides a description of the interface. This description can aid the author and can be used to provide a display to the user if there is a delay involved, such as waiting for results in an interface to a diagnostic program which performs on-product testing.

2 Send parameters

The element <send> identifies parameters to send to the external application. Each element <send> can specify either a value or a name/value pair. Each send parameter value must be specified as a static value using the element <stringValue> or as a variable or global property value using the element <variableRef> or <globalPropertyRef>. S1000D does not specify the communication protocol used between the logic engine/IETP and the application being called. The logic engine/IETP is required to format the send parameters to be compatible with the application being called.

3 Receive parameters

Some applications will return results that the process data module author can then use to further guide navigation through the process data module. This is accomplished by identifying variables or global properties in the state table to receive return values from the external application. The element <receiveValue>, element <receiveByName>, and element <receiveByPosition> are used to specify what return data to assign to which variables or global properties in the state table. The three methods are mutually exclusive and cannot be mixed.

Each of the three methods specify an element <variableRef> or <globalPropertyRef> indicating which variable or global property to update with the value returned by the external application. The logic engine/IETP must accept the return value(s) from the external application and update the referenced variable or global property's value.

3.1 Receive

The receive method assigns each result from the external process in the order received to the variable or global property in the state table specified in the element <receiveValue> in the order of the markup. This requires that an element <receiveValue> is provided for each expected return value. It also requires that the elements <receiveValue> are authored in the order expected from the external application results.

3.2 Receive by name

The receive by name method is used when the external application returns results with a name / value pair, such as with an XML message. The element <receiveByName> must include an element <returnedValueName> with the name to associate in the result from the external application and an element <variableRef> or <globalPropertyRef> specifying the variable or global property in the state table to update. The receive by name method does not require that all returned results are assigned.

3.3 Receive by position

The receive by position method is used when only some of the results are needed to be stored in the state table. The element <receiveByPosition> must include an element <returnedValuePosition> with the position of the return result from the external application (starting at 1) and an element <variableRef> or <globalPropertyRef> specifying the variable or global property in the state table to update. The receive by position method does not require that all returned results are assigned.

4 Processing requirements

4.1 General

The logic engine/IETP must provide a mapping to associate an actual application to invoke with the element <externalApplication> attribute application.

The logic engine/IETP must invoke the appropriate external application including parameters in the format required by the external application.

If the external application cannot be successfully invoked, an error message must be presented to the user. Refer to error handling in Chap 7.6.1.7.

4.2 Send parameters

The logic engine/IETP must process the element <send> to build a list of parameters to send to the external application. If the element <variableRef> or <globalPropertyRef> is included, the value associated with the variable or global property referenced is sent. If the value cannot be obtained, then an error message must be presented to the user. Refer to error handling in Chap 7.6.1.7.

4.3 Wait, no wait, and cancel

If no element <receiveValue>, element <receiveByName>, or element <receiveByPosition> is provided, after invoking the external application the logic engine/IETP must continue processing the process data module and must not wait for a return result from the external application.

If any element <receiveValue>, element <receiveByName>, or element <receiveByPosition> is provided, after invoking the external application the logic engine/IETP must suspend processing the data module and presents the user with an indication that the IETP is in a wait state. A cancel operation must be provided to the user.

If the logic engine/IETP is suspended waiting for an external process to return and the user invokes the cancel function, the logic engine/IETP must resume by performing the previous operation (refer to Chap 7.6.1.1) and ignore any results that can eventually be returned by the external application.

If the logic engine/IETP is suspended waiting for an external process to return and the external process returns, the logic engine/IETP must process the return results as defined in the following paragraphs and if successful continue processing the process data module.

4.4 Receive

If the receive method is used, the logic engine/IETP must assign each return result in the order received to each element <receiveValue> in the order in the markup. The value of the state table variable or global property must be updated with the associated return value.

If the external application returns a value with a data type that does not match the value-type of the variable or global property specified by the element <variableRef> or <globalPropertyRef>, then an error message must be presented to the user. Refer to error handling in Chap 7.6.1.7.

If the number of return values does not match the number of element <receiveValue>, then an error message must be presented to the user. Refer to error handling in Chap 7.6.1.7.

4.5 Receive by name

If the receive by name method is used, the logic engine/IETP must match the name specified in element <returnedValueName> with the name in a name/value pair returned from the external application. The value of the variable or global property specified by the element <variableRef> or <globalPropertyRef> must be updated with the associated return value.

If a name match cannot be made, then an error message must be presented to the user. Refer to error handling in Chap 7.6.1.7.

If the external application returns a value with a data type that does not match the value-type of the variable or global property specified by the element <variableRef> or <globalPropertyRef>, then an error message must be presented to the user. Refer to error handling in Chap 7.6.1.7.

4.6 Receive by position

If the receive by position method is used, the logic engine/IETP must assign the value of the nth return result as specified by element <returnedValuePosition> to the variable or global property specified by the element <variableRef> or <globalPropertyRef>. If a position match cannot be made, then an error message must be presented to the user. Refer to error handling in Chap 7.6.1.7.

If the external application returns a value with a data type that does not match the value-type of the variable or global property specified by the element <variableRef> or <globalPropertyRef>, then an error message must be presented to the user. Refer to error handling in Chap 7.6.1.7.

Chapter 7.6.1.7

Process data module requirements - Error handling

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Table 1 References

Chap No./Document No.	Title
Chap 6.3	Information presentation/use - Interactive electronic technical publications

1 Error handling

Due to the programmatic nature of the process data module, there exists the possibility of runtime errors occurring. Upon detection of an error, the logic engine error processing must record detailed error information that is sufficient to reconstruct the errors in order to pinpoint the problem. An error or warning message must be presented to the user identifying the problem and the next action that will occur.

The format of the messages and reports are not specified. At a minimum, the following error conditions and actions must be trapped and reported by the logic engine.

Table 2 Error Conditions

Error	Message	Action
Node-Alts with one or more nodes that do not contain the attribute `applicRefId`	Warning	System must process the first Node that evaluates to "`true`" (a Node without an applic is considered "`true`")
A variable declaration contains a data type different from an existing variable of the same name	Fatal	Fatal error, processing cannot continue
A variableRef or globalPropertyRef references a variable or global property that is	Fatal	Fatal error, processing cannot continue

Error	Message	Action
not in the state table, was never declared		
An assertion variable or global property data type and expression result data type do not match	Fatal	Fatal error, processing cannot continue
Division by zero, applies to elements <divide>, <idivide> and <modulus>	Fatal	Fatal error, processing cannot continue, infinity not supported
Calculating the nth root of a negative integer or negative real	Fatal	Fatal error, processing cannot continue, imaginary numbers not supported
Calculating the factorial of a negative integer	Fatal	Fatal error, processing cannot continue
Fixed value content does not match the data type implied by the value element (element <stringValue>, element <integerValue>, element <realValue>)	Fatal	Fatal error, processing cannot continue
Operation between two expressions with incorrect data type operand(s)	Fatal	Fatal error, processing cannot continue
Function on a single expression with incorrect data type operand	Fatal	Fatal error, processing cannot continue
Calculating the common logarithm or natural logarithm of a negative number	Fatal	Fatal error, processing cannot continue, imaginary numbers and infinity not supported
Calculating the common logarithm or natural logarithm of 0 is negative infinity (-∞)	Warning	Result will be set to the largest negative number supported by the system and processing will continue
Calculating the cosecant or cotangent of zero or any multiple of pi (π) is infinity (∞)	Warning	Result will be set to the largest positive number supported by the system and processing will continue
Calculating the hyperbolic cosecant or hyperbolic cotangent of zero	Fatal	Fatal error, processing cannot continue
Calculating the inverse cosecant, inverse secant or inverse cotangent of 0 is infinity (∞)	Warning	Result will be set to the largest positive number supported by the system and processing will continue
Calculating the inverse cosine or inverse sine of a number greater than 1 or less than -1.	Fatal	Fatal error, processing cannot continue

Error	Message	Action
Calculating the secant or tangent of π/2 or any integer multiple, such as 3π/2, 5π/2 or -3π/2 is infinity (∞)	Warning	Result will be set to the largest positive number supported by the system and processing will continue
Calculating the square root of a negative number produces an imaginary number	Fatal	Fatal error, processing cannot continue, imaginary numbers not supported
Expression can not be evaluated	Fatal	Fatal error, processing cannot continue
External application cannot be invoked - no return data expected	Warning	Processing will continue
External application cannot be invoked - return data is expected	Fatal	Fatal error, processing cannot continue
External application send cannot obtain the value of a variableRef or globalPropertyRef	Fatal	Fatal error, processing cannot continue
External application return value type mismatched with receiving parameter variable or global property type	Fatal	Fatal error, processing cannot continue
External application receive method - number of return values and number of receive parameters mismatch	Fatal	Fatal error, processing cannot continue
External application receive by name method - cannot match return value name with the receive parameter name	Fatal	Fatal error, processing cannot continue
External application receive by position method cannot match return value position	Fatal	Fatal error, processing cannot continue

2 User interface

The User Interface and printing requirements are specified in Chap 6.3.

Chapter 7.6.2

Software requirements - Resource resolution service

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Table 1 References

Chap No./Document No.	Title
IETF RFC 2483	URI Resolution Services
IETF RFC 3986	Uniform Resource Identifiers (URI): Generic Syntax

1 General

To allow the use of Uniform Resource Names (URN) within IETP applications it is necessary to construct a URN resolution service. The primary function of a resolution service is to resolve a Uniform Resource Locator (URL) location from a URN name. How each project implements a resolution service is up the project or the organization. The following guidelines must be followed when implementing the resolution service:

- All solutions are constrained by Internet Engineering Task Force (IETF) Request for Comments (RFC) 2396, Uniform Resource Identifier (URI) Syntax. Since this proposal concerns URNs, the suggested URN format must conform to the current IETF proposals or superseding documents.
- All solutions must be possible to implement using existing technologies. Since web browsers and web servers do not support URN resolution, the solution must be able to function with the existing browsers that are not URN capable.
- No solution must require a specific method of resolving URNs. Since there are many methods of defining a URN resolution server there is no need to constrain implementers to a specific methodology.
- All solutions must be web capable. Since the internet is foreseen to be the primary medium for IETP publications, solutions must have a particular emphasis on using web-based technologies.

To allow interoperability between IETP applications this specification proposes a standard interface describing a URN resolution service. Resolution services implemented using the proposed interface must be able to communicate with each other regardless of specific implementation details. Considering the above guidelines, a compatible interface can be described as meeting IETF guidelines, be able to be implemented by enterprises using existing tools they are familiar with, capable of working with any URN resolution service implementations, and focused on the use of web technologies.

2 Resource resolution

2.1 Proposed resource resolution interface

The following is a proposal to allow interoperability for IETP implementations using URN syntax for referencing. A basic interface would be a concrete implementation of IETF RFC 2483 using Hypertext Transfer Protocol (HTTP) as a transfer protocol and XML as communication medium. The interface is a web service or services implementing the service functions of RFC 2483. The interface can be used to implement a resolution service for any IETP application.

The resource resolution interface consists of two subfunctions, resource resolution and resource description. Resource resolution responds by redirecting to the resource. Resource description will provide more information about the resource in an XML document.

A standard HTTP query string provides access to this service. The service will be a URL with the following syntax:

http://urn.server.com/urnServiceName?urnQueryString

Where:

- *urn.server.com* = The Domain Name System (DNS) name or Internet Protocol (IP) of the URN resolution server
- *urnService* = The name and location of the URN resolution service within the server
- *urnQueryString* = The HTTP query string used to access or request information about a resource

2.1.1 Resource queries

The resource resolution interface must accept queries using an HTTP query string. `Query` parameters will be the metadata characteristics specified as name/value pair. The resolution services attempt to resolve resources having the specified characteristics. The parameters in Table 2 are service keywords that resolution services must accept:

Table 2 Resolution service keywords

Parameter	Description
`urn`	Requests the service to return information describing a resource identified by the passed URN.
`url`	Requests the service to return information describing a resource identified by the passed URL.
`multiple`	Requests the service to return multiple information sets describing the resource, if possible.
`allurcs`	Requests the service to return all known characteristics about the requested resource.

2.1.2 Parameter handling

The HTTP query string is considered the resource request. If the resolution service was a relational database the `urn` and `url` parameters could be considered the primary keys of a resource. The `multiple` parameter allows the service to describe the resource in multiple formats, if possible. The `allurcs` is a shorthand method to request that all metadata characteristics be described. The resolution service can also contain other metadata characteristics and any other parameter will be considered a query on these characteristics. There is no specified set of metadata characteristics defined, but implementations must consider the use of the Dublin core as a standard metadata set.

If the request contains parameters without values, or parameters with and without values, the request is considered a query for the values of resource characteristics matching the names of the parameters without values, returned as an XML document. If the request contains only parameters with values the request is consider a query for the resource stream and the resource data is returned as a response. To promote interoperability the requests parameter names must be considered as case insensitive and values that are considered dates must be in International Standards Organization (ISO) format. A service must be able to handle resource characteristic queries even if the service does not support the characteristic. A query on an unsupported characteristic will return a "not found" error message.

2.1.3 Multiple resource formats

A URN could be described by multiple URLs, for example a URN available in multiple formats, such as different languages. When a URN is linked to multiple URLs, the service identifies one as the default format and that resource will be returned when the resource is requested by URN only. The definition of the default resource must be identified in the business rules of the service or application. If a URN is describing multiple URLs each match must have at least one metadata characteristic vary between differing formats.

A URL could also be described by multiple URNs, for example if the URN is available in multiple formats one URN could generically describe all resource formats and another URN could describe the specific format.

The query results will be the resource itself or an XML document describing the resource characteristics. A Resource Description Unit (RDU) will describe the resource characteristics of a particular resource or resource format. Result sets can contain multiple RDUs and messages from the resolution service.

2.2 Resource resolution interface definition

The interface can support the following functions as defined by RFC 2483. For interface simplicity, a single service handles the various functions. The particular function to be

invoked is based on the structure and occurrence of the HTTP `query` parameters sent to the resolution service.

- `N2R/L2R:` URN/URL to resource resolution.
- `N2C/L2C:` URN/URL to characteristic resolution.
- `N2L/L2N:` URN to URL resolution.
- `NEN/LEL:` URN/URL equivalence.

2.2.1 URN/URL to resource (N2R/L2R)

This function will resolve a URN or a URL to a resource. This is the most basic service of the interface, allowing a link containing the URN to return the resource data. The service accepts a URN as a `query` parameter and returns the resource data. The service returns Error 004 "unknown resource" message if the resource is unknown to the service or redirect to the resource as an HTTP response. If the resource can be returned in more than one format, such as different languages, the service provides the one it considers a default or the resource most specifically identified by the additional parameters.

Query Format: The reserved `query` parameter `urn` and the parameter value is the URN string. N2R resolution occurs if only the `urn` parameter is found or only other parameters with values are found. If the service is passed a parameter with no value and the parameter name can be interpreted as a URN then the resource to resolve will be the resource specified by the parameter name. L2R performs the same function but accepts a URL as the `url` parameter. Examples that return the resource identified in English if possible are:

http://urn.server.com/urnService?urn=URN:NID:NSS&lang=EN

or

http://urn.server.com/urnService?URN:NID:NSS&lang=EN

2.2.2 URN to characteristic (N2C/L2C)

This function resolves a URN to one or more resource characteristics. The service accepts a URN as a `query` parameter and returns an XML document describing the requested characteristics. The service returns each specified characteristic or an error message as an XML document. The Error 301 "unsupported characteristic" indicates that the characteristic is not found. If there are unsupported characteristics the service returns the supported characteristics and the error messages in a single document.

Query Format: The N2C query accepts the `urn` parameter of the N2R query and another single parameter without a value. The name of the other parameters without values are the names of the characteristics to return. Additional parameters with values will further filter the query. The `allurcs` parameter requests the service to return all characteristics of the identified resource. Characteristics for multiple formats will be returned in multiple resource description units using the `multiple` parameter. L2C performs the same function but accepts a URL as the `url` parameter. An example that resolves the value of the author characteristic of the English language resource is:

http://urn.server.com/urnService?urn=URN:NID:NSS&author&lang=EN

An example that resolves the value of the all characteristics of the identified resource is:

http://urn.server.com/urnService?urn=URN:NID:NSS&allurcs

2.2.3 URN to URL/URL to URN (N2L/L2N)

This function resolves a URN or to a URL. The service accepts a URN or a URL as a `query` parameter and returns an XML document containing the URL characteristic. If the resource can be returned in more than one format the service will provide the one it

considers default or the resource most identified by the additional parameters. The error message 004 "unknown resource" indicates that the URL is not found.

Query Format: The N2L query accepts the `urn` parameter of the N2R query and a valueless `url` reserved parameter is used to activate this service. The service will return the URL or an error message as an XML document. This function is a special form of N2C where the reserved `url` parameter is to be recognized by all services. If the resource exists in multiple formats the `multiple` parameter requests the service to return multiple resource description units describing each format, otherwise information concerning the default format is returned. L2N accepts a URL as the reserved `url` parameter and returns the URN using a valueless `urn` parameter. An example that returns the URL of the identified resource in English:

http://urn.server.com/urnService?urn=URN:NID:NSS&url&lang=EN

2.2.4 URI equivalence (NEN/LEL)

This function determines if multiple URNs are equivalent, basically if the multiple URNs point to the same resource location or if the multiple URLs describe the same URN. Examples could be where a URN has multiple formats each with their own URL or if there are two URNs that identify the same URL. This service accepts two URNs and returns an XML document describing their equivalence relationship. The Errors 501 or 502 will be returned indicating the equivalence relationship. An example that returns the URLs identified by the specified URI is:

http://urn.server.com/urnService?urn=URN:NID:NSS1& urn=URN:NID:NSS2

2.2.5 General query format (QRY)

This function provides the same functionality as N2C, L2C, N2L, or L2N. The query format is the same as the matching function but does not take the reserved `urn` or `url` parameter. Basically the function will return information for all resources that match the query instead of matching against a specific URN. As this function can return many matches, services could limit the results to a specific number of matches. The messages 301 or 302 are returned as appropriate. An example that returns the titles of all the resources in English format is:

http://urn.server.com/urnService?title&lang=EN

2.2.6 Advanced query services

Advanced query services could be implemented in a Resource Description Service (RDS) that allows the submission of complex queries and perform searches using more than name/value pairs.

2.3 Resource description

When the service returns resource characteristics the data returned will be an XML document. The function that returns this document is the RDS. This document will return one or more Resource Description Units (RDU) containing the requested resource characteristics. Multiple RDUs can be returned, one for each resource or resource format queried. The document can also contain a messaging structure to allow applications using the service to intelligently respond to errors or to provide additional information.

2.3.1 Resource description units

RDUs are defined using the Resource Description Framework (RDF) to describe the specified resource. An RDU can be considered the resource metadata set described by a particular metadata schema. The default resource description schema used by this specification is the Dublin core element set defining the standard set of Uniform Resource Characteristics (URC). The RDU contains the resource identifier and can contain one or more URCs that identify particular resource metadata elements, such as the document title. A URC consists of the name of the URC element and the specific value of the URC as data

contained within that element. Additionally URC can describe their own RDU schema if different from the primary RDU and provide URC creation, ownership, modification, and expiry information for URC management between resolution servers. All services at a minimum must support URC characteristics for URN and URL information to allow link resolution.

2.3.2 Resource description framework

The result set RDU is described by a document containing a single `rdf:RDF` element and multiple `rdf:Description` elements defined by the RDF.

As defined by this specification the `rdf:Description` element can contain multiple urc elements identifying resource metadata elements with simple name/value pairs. The resource description must be returned in the rdf:Description element and for the purposes of this specification must contain both an rds:urn attribute specifying the resource URN and an `rdf:about` attribute identifying the resource URL. Every tag that is a first level child of the `rdf:Description` element is considered an URC and with the name of the tag as the URC name and the contents of the tag describing the URC value. The namespace of the URC element must describe the specific RDF schema used. This allows advanced resource description structures, therefore applications must not assume any particular structure within the `rdf:Description` element and process only RDF schemas that they recognize and ignore all other schemas. This implies that the query results document must be processed as well-formed, but not valid, for applications that do not recognize RDF schemas. All RDUs will contain at a minimum an empty `rdf:Description` element with the `rdf:about` and `rds:urn` elements as required by this specification. It is suggested that resource resolvers maintain URC metadata defined by the Dublin core. An example of an RDF structure describing a specified resource is:

```
<rdf:RDF>
< rdf:Description urn="URN:S1000D:DMC-AE-A-00-40-50-50A-000A-
A" about="http:\\www.examples.org\DMC\AE-A-00-40-50-50A-000A-
A.xml">
<!-- URCs describing the resource -->
</rdf:Description>
</rdf:RDF>
```

2.3.3 Uniform resource characteristics

The URC defines a simple metadata structure in the form of a name/value pair. The URC name is the name of the metadata element and the URC value is the data within that metadata element, for a particular resource. Documents will return the name of the URC as the name of the XML tag and the URC value as the text string or subobject contained within that tag. To perform resolution queries the `query` parameters can be matched against data within the resolution resolver. This simple structure fits well with HTTP queries, which are also described by name/value pairs. The URC must fit most metadata identification needs. More advanced resource description could use RDF schemas. It is suggested URC names are processed as case insensitive without including the namespace prefix. The following example illustrates a URC with the name of "title" and a value of "Example Resource Title" using the Dublin core resource schema.

```
<dc:title>Example Resource Title</dc:title>
```

2.3.3.1 URC extended attributes

A URC element can be extended by the resource service to provide additional information about the returned resource characteristics. The following are specified URC extension attributes.

- `rds:name` - The name of the URC as a string. If this attribute is provided the value will override the name implied by the element name.

- `rds:type` - Datatype for the URC. If this attribute is specified the value will describe the datatype of the URC value. Valid types are constrained by the XML Schema datatypes. If this attribute is not specified the URC value will be assume to be of type "`xs:string`".
- `rds:schema` - This attribute will be a string indicating the resource schema describing the URC.
- `rds:created` - This attribute value will indicate the creation date of the URC.
- `rds:modified` - This attribute value will indicate the modification date of the URC.
- `rds:expiry` - This attribute value will indicate the expiry date of the URC.
- `rds:owner` - This attribute value will be a string indicating the owner of the URC.

2.3.4 Messaging

The resolution service can provide additional information to the requester using messages in the response. The message will consist of a text string describing the message and identify the message number and type. Certain messages should be reserved by the interface such as "Not Found", "Invalid Query", etc. Message numbers must be assigned using the following numbering scheme:

- 000-299 Reserved for RDS errors
- 300-599 Reserved for RDS warnings
- 500-799 Reserved for RDS information
- 800-999 Reserved for future use
- >999 RDS implementation specific messages

Table 3 RDS service messages

Number	Message	Description
001	General Failure.	RDS service had an internal error and could not continue.
002	Method <%TYPE%> not supported.	RDS service does not support the query type used. %TYPE% parameter values are (N2R,L2R,N2C,L2C,N2L,L2N,N2N).
004	Resource <%NAME%> is unknown.	Requested resource is unknown to the RDS service. %NAME% is the URN or URL of the resource.
005	Resource <%NAME%> does not exist.	Response if the resolution service is handling HTTP 404 message. %NAME% is the URN or URL of the resource.
301	Query contained unsupported metadata characteristic, <%URC_NAME%>	The query contained a characteristic that was not supported by the RDS service. %URC_NAME% parameter value will be the name of the unsupported characteristic.
302	No Matches	This message indicates that the query returned no results.
501	Resource <%NAME1%> is equivalent to resource <%NAME2%>.	Message in response to NEN/LEL indicating that the passed URIs are equivalent. %NAME1% is the URN or URL of the first resource and %NAME2% is the URN or URL of the second resource.
502	Resource <%NAME1%> is not equivalent to resource <%NAME2%>.	Message in response to NEN/LEL indicating that the passed URIs are not equivalent. %NAME1% is the URN or URL of the first resource and %NAME2% is the URN or URL of the second resource.

Note

Text within the '<' and '>' characters will be replaced by a value from the RDS server.

End of data module

Chapter 7.7

Information processing - Guidance and examples

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Chap 7.7.3	Guidance and examples - Resource resolution
Chap 7.7.4	Guidance and examples - XLink
Chap 7.7.5	Guidance and examples - XPath

1 General

Guidance and examples are provided in support of technical concepts.

2 Guidance and examples

Guidance and examples are provided in:

- Chap 7.7.1 for the logic engine
- Chap 7.7.2 for the process data module nodes
- Chap 7.7.3 for resource resolution
- Chap 7.7.4 for XLink
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Chapter 7.7.1

Guidance and examples - Logic engine

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Table 1 References

Chap No./Document No.	Title
Chap 7.6.1.3	Process data module requirements - Variable and global property management

1 General

The purpose of this chapter is to provide technical examples of logic engine processing on various process data module structures. It presents process data module markup samples and details how a logic engine is expected to process the samples.

2 Guidance and examples

2.1 State management

The following examples will illustrate the assignment of state within the logic engine. As the nodes within the process data module are evaluated, certain elements such as element <variableDeclarations>, element <variablePreSet>, element <variablePostSet> and element <dialog> will request the logic engine to modify the state information.

2.1.1 Variable declarations

All local variables used in a process data module must be declared using element <variableDeclarations>. Each variable must be identified and referenced by a uniquely defined name. Global properties are declared in the ACT and CCT and initialized in the PCT. Refer to Chap 7.6.1.3.

Table 2 Local Variable declaration example

Line	Markup
1	`<variableDeclarations>`
2	`<variable variableName="OnStand" valueType="boolean">`

Line	Markup
3	<dialog submitCaption="ok01" cancelCaption="ca01">
4	...
5	</dialog>
6	</variable>
7	<variable variableName="BicyclePartnum" valueType="string">
8	<initialize>
9	<expression><stringValue>MC-168119</stringValue></expression>
10	</initialize>
11	</variable>
12	</variableDeclarations>

Table 3 Global declaration example

Line	Markup
1	<condTypeList>
2	<condType id="conditionType" valueDataType="string">
3	<name>equipment condition</name>
4	<descr>condition of equipment</descr>
5	<enumeration applicPropertyValues=”fullyFunctional" enumerationLabel="Fully Functional"/>
6	<enumeration applicPropertyValues=”partiallyFunctional" enumerationLabel="Partially Functional"/>
7	<enumeration applicPropertyValues=”notFunctional" enumerationLabel="Not Functional"/>
8	</condType>
9	</condTypeList>
10	<condList>
11	<cond condTypeRefId="conditionType" id="bikeCondition">
12	<name>bike condition</name>
13	<descr>condition of bike</descr>
14	<prompt> <paraBasic> What is the state of the bike?</paraBasic>
15	</prompt>
16	</cond>
17	</condList>

Variable declaration processing:

In Table 2 two local variables are declared: `OnStand` and `BicyclePartnum`. Each element <`variable`> informs the logic engine to allocate a variable in the state information. The variable named `OnStand` (line 2) is allocated as a Boolean type and the value of the

variable is set to "noValue" since there is no initialization code. If the variable is accessed as "noValue" the associated dialog (line 3-5) will be displayed to assign a value to the variable. The second variable named BicyclePartnum (lines 7-12) is allocated as a string type and is initialized to the value "MC-168119". Variable BicyclePartnum is not provided a dialog in this example. While a dialog is optional content of variable, the logic engine has no way of querying for a variable's value on its own without an associated dialog.

In Table 3 a Global Boolean Variable bikeCondition is declared in the CCT. Lines 1-9 define the Condition type within the Condition Type List. Lines 10-17 define the Condition within the Condition List. Initialization of this variable would take place in the PCT. If there were no initialization specified, a dialog would be generated from the optional prompt declaration in the CCT when a value for the variable was required. In this example, the viewer would display a dialog with prompt "What is the state of the bike?" and answer choices "Fully Functional", "Partially Functional", and "Not Functional".

2.1.2 Expression evaluation

Expressions are evaluated by the logic engine and are used to perform dynamic state assignment and determine conditional processing. An expression can be any combination of subexpressions.

2.1.3 Value expressions

Value expressions are simple functions that return a constant value.

Table 4 Value expression example

Line	Markup
1	`<expression>`
2	`<stringValue>MC-168119</stringValue>`
3	`</expression>`

Value expression processing:

The above fragment will be processed by extracting the string constant and returning the constant value as a string.

2.1.4 Variable expressions

Variable expressions are functions that retrieve the value of a variable from the state table and return the value of the variable as the appropriate data type.

Table 5 Variable expression example

Line	Markup
1	`<expression>`
2	`<variableRef variableName="BicyclePartnum"/>`
3	`</expression>`

Variable expression processing:

To process the above fragment, the logic engine will look up the value of the previously defined variable named BicyclePartnum (line 2) in the state table and return the value of that variable as the result of the expression.

2.1.5 Unary expressions

Unary expressions are functions that operate on a single expression and return a value.

Table 6 Unary expression example

Line	Markup
1	`<expression>`
2	`<booleanFunction booleanAction="defined"/>`
3	`<expression>`
4	`<variableRef variableName="BicyclePartnum"/>`
5	`</expression>`
6	`</expression>`

Unary expression processing:

The above fragment illustrates use of the element <booleanFunction> operator (line 2). The logic engine evaluates the inner expression (lines 3-5) by checking for the existence of the previously defined variable named BicyclePartnum (line 4) in the state information. If the inner expression returns a value that is not "noValue", then the outer expression returns the Boolean value "true", otherwise the outer expression returns the Boolean value "false".

2.1.6 Binary expressions

Binary expressions are functions that take two parameters and return a value.

Table 7 Binary expression example

Line	Markup
1	`<expression>`
2	`<expression>`
3	`<variableRef variableName="BicyclePartnum"/>`
4	`</expression>`
5	`<numberOperator numberOperation="equal"/>`
6	`<expression>`
7	`<stringValue>MC-168119</stringValue>`
8	`</expression>`
9	`</expression>`

Binary expression processing:

The above fragment illustrates use of the element <numberOperator> operator (line 5). The logic engine evaluates the first inner expression (lines 2-4) and returns the value of the previously defined variable named BicyclePartnum. Then the logic engine will evaluate the second inner expression (lines 6-8) returning the string value "MC-168119". Finally, the outer expression will be evaluated using the element <numberOperator numberOperation="equal"> operator to compare the previously determined values of the inner expressions. In this case, the value of the variable BicyclePartnum will be compared to the string "MC-168119". The Boolean value "true" is returned if the

expression values are equal, the Boolean value "false" is returned if the expression values are not equal.

2.1.7 Assert expressions

Assert expressions use the applicability element <assert> structure within an expression to evaluate the current value of a global variable.

Table 8 Assert expression example

Line	Markup
1	`<expression>`
2	`<assert applicPropertyIdent="bikeCondition" applicPropertyType="condition" applicPropertyValues="fullyFunctional"/>`
3	`</expression>`

Assert expression processing:

The above fragment shows how one can include applicability <assert> structure within an expression. The <assert> returns either "true", in the case that the current value of the bikeCondition global condition variable is "fullyFunctional", or returns "false" to the expression if the current value of the variable is one of the other allowed values. If the variable value is not set, a dialog will be displayed to the end user to get input.

2.1.8 Combined expressions

Expressions can be combined to form more complex expressions. The level of complexity is theoretically infinite, but can be limited by software constraints.

Table 9 Combined expression example

Line	Markup
1	`<expression>`
2	`<expression>`
3	`<booleanFunction booleanAction="defined"/>`
4	`<expression>`
5	`<variableRef variableName="BicyclePartnum"/>`
6	`</expression>`
7	`</expression>`
8	`<booleanOperator booleanOperation="and"/>`
9	`<expression>`
10	`<expression>`
11	`<variableRef variableName="OnStand"/>`
12	`</expression>`
13	`<booleanOperator booleanOperation="equal"/>`
14	`<expression>`
15	`<booleanValue><trueValue/></booleanValue>`
16	`</expression>`
17	`</expression>`

Line	Markup
18	</expression>

Combined expression processing:

The above fragment will be processed by having the logic engine check for the existence of the previously defined variable named BicyclePartnum (lines 2-7). The result of this evaluation will be ANDed (line 8) with the result of comparing the variable OnStand to the Boolean value "true" (lines 9-17) and then will be ANDed again with the result of the final <assert>.

2.2 Applicability presets and postsets

2.2.1 Applicability

The element <applic>, referenced by use of the attribute applicRefId, provides an expression which determines whether the rest of the content of the current node is to be processed. When used within the element <applic>, the element <expression> must evaluate to a Boolean result.

Table 10 Applicability example

Line	Markup
1	<referencedApplicGroup>
2	<applic id="appl-001">
3	<expression>
4	<expression>
5	<variableRef variableName="OnStand"/>
6	</expression>
7	<booleanOperator booleanOperation="equal"/>
8	<expression>
9	<booleanValue><trueValue/></booleanValue>
10	</expression>
11	</expression>
12	</applic>
13	</referencedApplicGroup>
	...
14	<variableDeclarations>
15	<variable variableName="OnStand" valueType="boolean"/>
16	</variableDeclarations>
	...
17	<dmNode applicRefId="appl-001">
18	<dmRef>...</dmRef>
19	</dmNode>

Applicability processing:

The element <dmNode> (line 17) in the above fragment is processed by the logic engine by first following the applicability statement reference, attribute applicRefId, and evaluating the expression (lines 2-12) which returns a Boolean value depending upon the value of the variable OnStand in the state table. If the expression evaluates to the Boolean value "true", then the node, which includes element <dmRef>, is displayed and presented to the user. If the expression evaluates to the Boolean value "false", then the element <dmRef> is skipped and processing continues after the current element <dmNode>.

2.2.2 Preset

An element <variablePreSet> will instruct the logic engine to modify the value of a variable in the state table before processing any node content. Preset is also available as a child of element <process> in addition to elements <dmNode> and <dmLoop>.

Table 11 Preset example

Line	Markup
1	`<variableDeclarations>`
2	`<variable variableName="OnStand" valueType="boolean"/>`
	`...`
3	`</variableDeclarations>`
	`...`
4	`<dmNode><!--Secure bike to stand-->`
5	`<variablePreSet>`
6	`<assertion>`
7	`<variableRef variableName="OnStand"/>`
8	`<expression>`
9	`<booleanValue><falseValue/></booleanValue>`
10	`</expression>`
11	`</assertion>`
12	`</variablePreSet>`
13	`<dmRef>...</dmRef>`
14	`</dmNode>`

Preset processing:

In the above fragment the element <variablePreSet> (lines 5-12) contains a child element <assertion> that informs the logic engine to modify the state table by assigning the Boolean value "false" to the variable OnStand. After the state table is updated, the data module identified by the element <dmRef> (line 13) is displayed and presented to the user and processing is halted until the user activates the "Next" function.

2.2.3 Postset

An element <variablePostSet> will instruct the logic engine to modify the value of a variable in the state table after the node content is processed. Postset is also available as a child of element <process> in addition to element <dmNode>.

Table 12 Postset example

Line	Markup
1	<variableDeclarations>
2	<variable variableName="OnStand" valueType="boolean"/>
	...
3	</variableDeclarations>
	...
4	<dmNode><!--Remove bike from maintenance stand-->
5	<dmRef>...</dmRef>
6	<variablePostSet>
7	<assertion>
8	<variableRef variableName="OnStand"/>
9	<expression>
10	<booleanValue><falseValue/></booleanValue>
11	</expression>
12	</assertion>
13	</variablePostSet>
14	</dmNode>

Postset processing:

In the above fragment, the data module referenced by the element <dmRef> (line 5) will be displayed and processing will halt until the "Next" function is activated. After the user activates the "Next" function the element <variablePostSet> (lines 6-13) is processed with the child element <assertion> informing the logic engine to modify the state information by assigning the Boolean value "false" to the variable OnStand.

2.3 Step content

The process data module can include step content. The step content is grouped within the element <dmNode>. This grouping defines a screen of information to be presented to the user.

2.3.1 Step content grouping

The step content collected within an element <dmNode> is to be displayed as a screen of information to the user. This example illustrates two screens of information.

Table 13 Step content grouping example

Line	Markup
1	<dmNode>
2	<proceduralStep><para>This is the first screen of data</para> </proceduralStep>
3	<proceduralStep><para>This step has substeps</para>
4	<proceduralStep><para>First screen, first substep</para> </proceduralStep>
5	<proceduralStep><para>First screen, second substep</para> </proceduralStep>

Line	Markup
6	</proceduralStep>
7	</dmNode>
8	<dmNode>
9	<proceduralStep><para>This is the second screen of data</para> </proceduralStep>
10	<proceduralStep><para>This step has substeps</para>
11	<proceduralStep><para>Second screen. first substep</para> </proceduralStep>
12	<proceduralStep><para>Second screen, second substep</para> </proceduralStep>
13	</proceduralStep>
14	</dmNode>

Step content grouping processing:

In the above fragment, the logic engine would process the first dmNode (lines 1-7) and build a package for IETP display. Expected output can look like:

1 This is the first screen of data

2 This step has substeps

2.1 First screen, first substep

2.2 First screen, second substep

When the user has read the information and wishes to proceed, he would activate the "Next" function. The logic engine would then process the second dmNode (lines 8-14) and build a package for IETP display. Expected output can look like:

1 This is the second screen of data

2 This step has substeps

2.1 Second screen, first substep

2.2 Second screen, second substep

2.3.2 Embedded variable references

In this example, the user is presented with the value from a state table variable. This example represents display of a voltage reading. The example shows the voltage reading being set with an assertion, which might have been obtained using an external application interface to a piece of automated test equipment.

Table 14 Embedded variable reference example

Line	Markup
1	<variableDeclarations>
2	<variable variableName="Voltage" valueType="real"/>
3	</variableDeclarations>
4	...
5	<assertion>

Line	Markup
6	<variableRef variableName="Voltage"/>
7	<expression><realValue>12.8</realValue></expression>
8	</assertion>
9	...
10	<dmNode>
11	<proceduralStep>
12	<para>
13	Voltage is <variableRef variableName="Voltage"/> volts.
14	</para>
15	</proceduralStep>
16	</dmNode>

Embedded variable reference processing:

In the above fragment the logic engine will create a variable named Voltage in the state table (line 2) and will assign the value of "12.8" to it (lines 5-8). When processing the dmNode (lines 10-16), the logic engine will retrieve the value of the embedded attribute variableRef (line 13), from the state table, and embed the value directly inline with the text. The dmNode display package will then be displayed. The output would be expected to be displayed similar to the following:

1 Voltage is 12.8 volts.

If the variable Voltage had been defined as a global variable, the reference markup would change from:

<variableRef variableName="Voltage"/>

to:

<globalPropertyRef applicPropertyIdent="Voltage" applicPropertyType="condition"/> in lines 6 and 13.

2.4 Dialogs

A dialog will apply state after the user has completed the dialog by activating the "OK" function.

The examples below utilize local variables. Dialogs can be authored for values of global variables by replacing element <variableRef> with element <globalPropertyRef> in the markup lines 10, 24, and 30.

2.4.1 Fill-in dialog

A fill-in dialog requests the logic engine to present a dialog to the user containing an input box where the user can enter data.

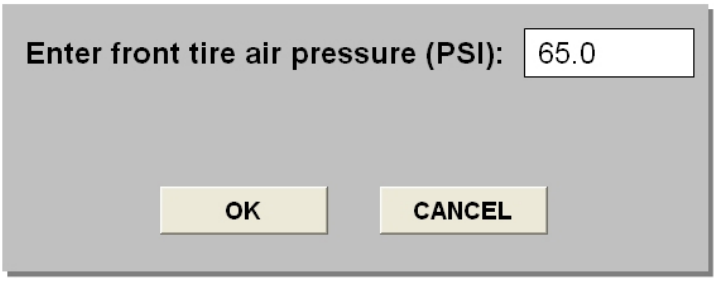
Table 15 Fill-in example

Line	Markup
1	<variableDeclarations>
2	<variable variableName="TirePressureFront" valueType="real"/>
	...

Line	Markup
3	</variableDeclarations>
	...
4	<dmNode><!--Air pressure dialog-->
5	<dialog submitCaption="ok01" cancelCaption="ca01">
6	<userEntry mandatory="1" dataEntryFieldLength="8">
7	<prompt>
8	<paraBasic>Enter front tire air pressure (PSI):</paraBasic>
9	</prompt>
10	<variableRef variableName="TirePressureFront"/>
11	<default>
12	<expression>
13	<realValue>65.0</realValue>
14	</expression>
15	</default>
16	<validate errorMessage="Tire pressure must be between 0.0 and 90.0 PSI">
17	<expression>
18	<expression>
19	<expression>
20	<realValue>0.0</realValue>
21	</expression>
22	<numberOperator numberOperation="lessThanOrEqual"/>
23	<expression>
24	<variableRef variableName="TirePressureFront"/>
25	</expression>
26	</expression>
27	<booleanOperator booleanOperation="and"/>
28	<expression>
29	<expression>
30	<variableRef variableName="TirePressureFront"/>
31	</expression>
32	<numberOperator numberOperation="lessThanOrEqual"/>
33	<expression>
34	<realValue>90.0</realValue>
35	</expression>
36	</expression>
37	</expression>
38	</validate>
39	</userEntry>
40	</dialog>
41	</dmNode>

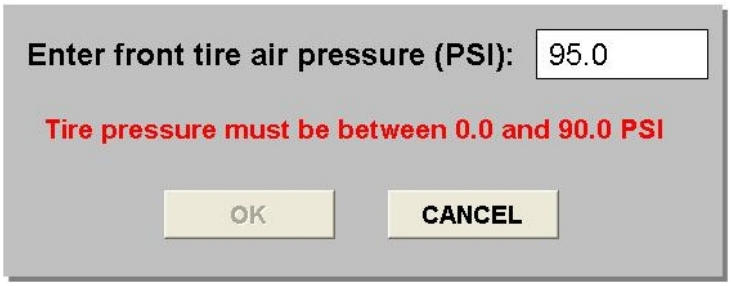
Fill-in processing:

In the above fragment the element <dialog> will instruct the logic engine to display a dialog containing an input box pre-filled with the value "65,0" (lines 11-15) which prompts the user with the message "Enter front tire air pressure (PSI):" (lines 7-9). Refer to Fig 1 for tire pressure dialog fill-in example. Processing will halt until the user activates the "OK" function. If the user enters a value outside of the range 0,0 to 90,0 (lines 16-38) an error message informs the user of the acceptable range. Refer to Fig 2 for error message dialog fill-in example. When the user activates the "OK" function with an acceptable value the logic engine will modify the state table by assigning the data entered by the user to the variable identified in the element <variableRef> (line 10), in this case the variable named TirePressureFront.



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Fig 1 Example tire pressure dialog fill-in



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Fig 2 Example error message dialog fill-in

2.4.2 Menu dialog

A menu dialog requests the logic engine to present a dialog to the user containing one or more choices for the user to select. When the user selects a choice, the logic engine will perform the assertion(s) associated with the selected choice. The attribute choiceSelection determines whether the user is allowed to select single or multiple choices.

The examples below show dialogs for local variables. Dialogs for global variables may be authored also by replacing the element <variableRef > with the element <globalPropertyRef> in lines 11and 20.

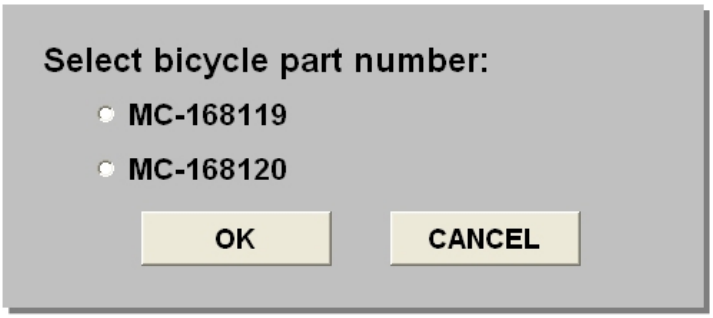
Table 16 Menu example

Line	Markup
1	<variableDeclarations>
2	<variable variableName="BicyclePartnum" valueType="string"/>
	...
3	</variableDeclarations>

Line	Markup
	...
4	<dmNode><!--Part number dialog-->
5	<dialog submitCaption="ok01" cancelCaption="ca01">
6	<menu choiceSelection="single" choiceType="select" menuChoiceFlow="list" mandatory="1">
7	<prompt><paraBasic>Select bicycle part number:</paraBasic></prompt>
8	<menuChoice menuChoiceDefaultFlag="0">
9	<prompt><paraBasic>MC-168119</paraBasic></prompt>
10	<assertion>
11	<variableRef variableName="BicyclePartnum"/>
12	<expression>
13	<stringValue>MC-168119</stringValue>
14	</expression>
15	</assertion>
16	</menuChoice>
17	<menuChoice>
18	<prompt><paraBasic>MC-168120</paraBasic></prompt>
19	<assertion>
20	<variableRef variableName="BicyclePartnum"/>
21	<expression>
22	<stringValue>MC-168120</stringValue>
23	</expression>
24	</assertion>
25	</menuChoice>
26	</menu>
27	</dialog>
28	</dmNode>

Menu processing:

In the above fragment, the element <dialog> will instruct the logic engine to display a dialog containing a user prompt "Select bicycle part number:" (line 7) and provide choices of "MC-168119" (line 9) and "MC-168120" (line 18). Refer to Fig 3 for dialog menu example. Processing will halt until the user selects one of the choices and activates the "OK" function. When the user activates the "OK" function, the logic engine will modify the state information by processing the element <assertion> of the selected choice (lines 10-15 or lines 19-24) and performing the appropriate modification to the state table.



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Fig 3 Example part number dialog menu

2.5 External application interface

The external application interface provides a method for the logic engine/IETP to interface with programs external to the IETP. Abilities include sending parameters to the external application, either static values or state table variable values, and receiving data from the external application, which update variables in the state table. External application data may be passed using either local variables or global properties. The following examples use local variables. To pass or receive global properties replace element <variableRef> with element <globalPropertyRef>.

This set of examples is built on an imaginary tool for displaying and isolating wiring defects. The tool accepts parameters, consisting of a reference designator and pin, to designate the wiring circuit to display and returns a status and a defective wire number.

2.5.1 Send parameters

Parameters to send to the external application can be specified in two ways as detailed below.

2.5.1.1 Static parameters with name pair

Start the wiring isolation tool with a set reference designator and pin, do not process any results.

Table 17 Send parameters with name pair example

Line	Markup
1	`<!ENTITY WireTool SYSTEM "file://Wired/Wired.exe" NDATA exe>`
	`...`
2	`<dmNode>`
3	`<externalApplication application="WireTool">`
4	`<paraBasic>Isolate Wiring Defect</paraBasic>`
5	`<send>`
6	`<sendName>RefDes</sendName>`
7	`<stringValue>52P-H004</stringValue>`
8	`</send>`
9	`<send>`
10	`<sendName>Pin</sendName>`
11	`<stringValue>4</stringValue>`
12	`</send>`
13	`</externalApplication>`

Line	Markup
14	</dmNode>

Static parameters with name pair processing:

In the above example, the logic engine/IETP would invoke the wiring tool with two parameters. The format of the invocation is not specified and will depend on the actual implementation, but a typical executable invocation can look like:

Wired.exe - RefDes 52P-H004 - Pin 4

Another typical invocation can include Hypertext Markup Language (HTML):

http://wired&RefDes=52P-H004&Pin=4

Yet another invocation can include XML bundled in a SOAP message:

```
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope">
<env:Header>...</env:Header>
<env:Body>
<p:refdes>52P-H004</p:refdes>
<p:pin>4</p:pin>
</env:Body>
</env:Envelope>
```

Since there are no receive parameters, the logic engine continues processing past the external application invocation (line 14) in this data module node, then waits until the "NEXT" function is selected before proceeding.

2.5.1.2 Variable parameters with name pair
Start the wiring isolation tool with a reference designator and pin values obtained from state table variables, do not process any results.

Table 18 Variable parameters with name pair example

Line	Markup
1	<!ENTITY WireTool SYSTEM "file://Wired/Wired.exe" NDATA exe>
	...
2	<variableDeclarations>
3	<variable variableName="MyRefDes" valueType="string"/>
4	<variable variableName="MyPin" valueType="integer"/>
5	</variableDeclarations>
	...
6	<dmNode>
7	<variablePreSet>
8	<assertion>
9	<variableRef variableName="MyRefDes"/>
10	<expression><stringValue>52P-H004</stringValue></expression>
11	</assertion>
12	</variablePreSet>
13	<variablePreSet>
14	<assertion>

Line	Markup
15	<variableRef variableName="MyPin"/>
16	<expression><integerValue>4</integerValue></expression>
17	</assertion>
18	</variablePreSet>
19	<externalApplication application="WireTool">
20	<paraBasic>Isolate Wiring Defect</paraBasic>
21	<send>
22	<sendName>RefDes</sendName>
23	<variableRef variableName="MyRefDes"/>
24	</send>
25	<send>
26	<sendName>Pin</sendName>
27	<variableRef variableName="MyPin"/>
28	</send>
29	</externalApplication>
30	</dmNode>

Variable parameters with name pair processing:

In the above example as with the previous example, the logic engine/IETP would invoke the wiring tool with two parameters. In this case, on lines 2-5 the author has defined two variables to hold the RefDes and Pin values to be sent as parameters. The values of the variables can be assigned in many ways, but for the example two presets on lines 7-18 set the values in the state information.

On lines 19-29, the external application interface markup defines the two parameters and indicates that the parameter values should be obtained from the state table variables. The format of the invocation is not specified and will depend on the actual implementation, but a typical executable invocation can look the same as the previous example:

Wired.exe -RefDes 52P-H004 -Pin 4

Since there are no receive parameters, the logic engine continues processing past the external application invocation (line 30) in this data module node. Processing waits until the "NEXT" function is selected before proceeding.

2.5.1.3 Parameters without name pair

Start the wiring isolation tool with a set reference designator and pin, do not process any results.

Table 19 Parameters without name pair example

Line	Markup
1	<!ENTITY WireTool SYSTEM "file://Wired/Wired.exe" NDATA exe>
	...
2	<dmNode>
3	<variablePreSet>
4	<assertion>

Line	Markup
5	<variableRef variableName="MyPin"/>
6	<expression><integerValue>4</integerValue></expression>
7	</assertion>
8	</variablePreSet>
9	<externalApplication application="WireTool">
10	<paraBasic>Isolate Wiring Defect</paraBasic>
11	<send>
12	<stringValue>52P-H004</stringValue>
13	</send>
14	<send>
15	<variableRef variableName="MyPin"/>
16	</send>
17	</externalApplication>
18	</dmNode>

Parameters without name pair processing:

The external application does not require send variable name, since it only process the variables in the order received.

In the above example, the logic engine/IETP would invoke the wiring tool with two parameters in the order received. The format of the invocation is not specified and will depend on the actual implementation, but a typical executable invocation can look like:

Wired.exe 52P-H004 4

Since there are no receive parameters, the logic engine continues processing past the external application invocation (line 18) in this data module node. Processing waits until the "NEXT" function is selected before proceeding.

2.5.2 Return values

Return values can be specified in three different formats as detailed below. For the return values examples, the example of a wiring tool will continue to be used, but in these cases, the wiring tool has the capability for the user to select the defective wire number found during isolation. The wiring tool will report the status, defective wire number A1000A26, and bundle 20201.

For these examples, the wiring tool returns the following XML message:

```
<wireToolResults>
<status>Isolated</status>
<wireNumber>A1000A26</wireNumber>
<bundle>20201</bundle>
</wireToolResults>
```

2.5.2.1 Return values "Receive by Order" method

In this method all return results must be accounted for an in the same order as the return results.

Table 20 Return values "Receive by Order" example

Line	Markup
1	`<!ENTITY WireTool SYSTEM "file://Wired/Wired.exe" NDATA exe>`
	`...`
2	`<variableDeclarations>`
3	`<variable variableName="RtnStatus" valueType="string"/>`
4	`<variable variableName="RtnWireno" valueType="string"/>`
5	`<variable variableName="RtnBundle" valueType="string"/>`
6	`</variableDeclarations>`
	`...`
7	`<dmNode>`
8	`<externalApplication application="WireTool">`
9	`<paraBasic>Isolate Wiring Defect</paraBasic>`
10	`<send>`
11	`<sendName>RefDes</sendName>`
12	`<stringValue>52P-H004</stringValue>`
13	`</send>`
14	`<send>`
15	`<sendName>Pin</sendName>`
16	`<stringValue>4</stringValue>`
17	`</send>`
18	`<receiveValue>`
19	`<variableRef variableName="RtnStatus"/>`
20	`</receiveValue>`
21	`<receiveValue>`
22	`<variableRef variableName="RtnWireno"/>`
23	`</receiveValue>`
24	`<receiveValue>`
25	`<variableRef variableName="RtnBundle"/>`
26	`</receiveValue>`
27	`</externalApplication>`
28	`</dmNode>`

"Receive by Order" method processing:

Using the "Receive by Order" method on lines 18-26, the logic engine will take the values received from the external application in the order received and assign them to the variables referenced within the receive markup.

In this example, after the WireTool returns, the state information variables would be updated to the following values:

`RtnStatus` = "Isolated"

`RtnWireno` = "A1000A26"

RtnBundle = "20201"

2.5.2.2 Return values "Receive by Position" method

In this method, return results are accounted for by position, not all results have to be accounted for. This example only saves the wireNumber and bundle return values. The status return value is not used.

Table 21 Return values "Receive by Position" example

Line	Markup
1	<!ENTITY WireTool SYSTEM "file://Wired/Wired.exe" NDATA exe>
	...
2	<variableDeclarations>
3	<variable variableName="RtnWireno" valueType="string"/>
4	<variable variableName="RtnBundle" valueType="string"/>
5	</variableDeclarations>
	...
6	<dmNode>
7	<externalApplication application="WireTool">
8	<paraBasic>Isolate Wiring Defect</paraBasic>
9	<send>
10	<sendName>RefDes</sendName>
11	<stringValue>52P-H004</stringValue>
12	</send>
13	<send>
14	<sendName>Pin</sendName>
15	<stringValue>4</stringValue>
16	</send>
17	<receiveByPosition>
18	<returnedValuePosition>3</returnedValuePosition>
19	<variableRef variableName="RtnBundle"/>
20	</receiveByPosition>
21	<receiveByPosition>
22	<returnedValuePosition>2</returnedValuePosition>
23	<variableRef variableName="RtnWireno"/>
24	</receiveByPosition>
25	</externalApplication>
26	</dmNode>

"Receive by Position" method processing:

Using the "Receive by Position" method, the logic engine will take the values received from the external application in the order received and assign them to the variables referenced within the "Receive by Position" markup, lines 17-24, as indicate by the position indicated in element <returnedValuePosition>. Note in this example that only two of the three return values are saved and the two that are saved are listed in the markup in reverse order, as they

are received from the external application. The return value in the first position is not referenced in the markup; therefore, it is not processed or saved in the state table.

In this example, after the WireTool returns, the state table variables would be updated to the following values:

`RtnWireno` = "A1000A26"

`RtnBundle` = "20201"

2.5.2.3 Return values "Receive by Name" method

In this method, return results are accounted for by name, not all results have to be accounted for. This example only saves the wireNumber and bundle return values. The status return value is not used.

Table 22 Return values "Receive by Name" example

Line	Markup
1	`<!ENTITY WireTool SYSTEM "file://Wired/Wired.exe" NDATA exe>`
	`...`
2	`<variableDeclarations>`
3	`<variable variableName="RtnWireno" valueType="string"/>`
4	`<variable variableName="RtnBundle" valueType="string"/>`
5	`</variableDeclarations>`
	`...`
6	`<dmNode>`
7	`<externalApplication application="WireTool">`
8	`<paraBasic>Isolate Wiring Defect</paraBasic>`
9	`<send>`
10	`<sendName>RefDes</sendName>`
11	`<stringValue>52P-H004</stringValue>`
12	`</send>`
13	`<send>`
14	`<sendName>Pin</sendName>`
15	`<stringValue>4</stringValue>`
16	`</send>`
17	`<receiveByName>`
18	`<returnedValueName>bundle</returnedValueName>`
19	`<variableRef variableName="RtnBundle"/>`
20	`</receiveByName>`
21	`<receiveByName>`
22	`<returnedValueName>wireNumber</returnedValueName>`
23	`<variableRef variableName="RtnWireno"/>`
24	`</receiveByName>`
25	`</externalApplication>`
26	`</dmNode>`

"Receive by Name" method processing:

In order to use the "Receive by Name" method, the external application must provide a return consisting of name/value pairs which the logic engine can use to match names with values.

Using the "Receive by Name" method, the logic engine will take the name/value pairs received from the external application and assign them to the variables referenced within the "Receive by Name" markup, lines 17-24, as indicated by the name indicated in element <returnedValueName>. Note in this example that only two of the three return values are saved and the two that are saved are listed in the markup in reverse order, as they are received from the external application.

In this example, after the WireTool returns, the state table variables would be updated to the following values:

RtnWireno = "A1000A26"

RtnBundle = "20201"

2.5.3 External application cancel operation

This sample is included to illustrate how data can be structured in a way to provide fault tolerance when using the external application interface. In this example, assume that we are testing a piece of equipment where the test can be run both automated and manually. The automated method has the possibility of an error condition where the expected return value is never returned. The logic engine/IETP will, by default, wait forever for the return value.

Table 23 Return values "Receive by Name" example

Line	Markup
1	<!ENTITY AutoTest SYSTEM "multimeter/8842A-9/8842a.exe">
	...
2	<variableDeclarations>
3	<variable variableName="Reading" valueType="real"/>
4	<variable variableName="TestType" valueType="string"/>
5	</variableDeclarations>
	...
6	<dmNode>
7	<dialog submitCaption="ok01" cancelCaption="ca01">
8	<menu choiceSelection="single" choiceType="select" menuChoiceFlow="list" mandatory="1">
9	<prompt><paraBasic>Choose the type of test:</paraBasic></prompt>
10	<menuChoice><prompt><paraBasic>Automated</paraBasic></prompt>
11	<assertion>
12	<variableRef variableName="TestType"/>
13	<expression><stringValue>Auto</stringValue></expression>
14	</assertion>
15	</menuChoice>
16	<menuChoice><prompt><paraBasic>Manual</paraBasic></prompt>
17	<assertion>
18	<variableRef variableName="TestType"/>
19	<expression><stringValue>Manual</stringValue></expression>

Line	Markup
20	</assertion>
21	</menuChoice>
22	</menu>
23	</dialog>
24	</dmNode>
25	<dmIf>
26	<expression>
27	<expression><variableRef variableName="TestType"/> </expression>
28	<stringOperator stringOperation="equal"/>
29	<expression><stringValue>Auto</stringValue></expression>
30	</expression>
31	<dmThenSeq>
32	<dmNode>
33	<externalApplication application="AutoTest">...</externalApplication>
34	</dmNode>
35	</dmThenSeq>
36	<dmElseSeq>
37	<dmNode>
38	<proceduralStep>
39	<para>Steps for taking manual reading</para>
40	</proceduralStep>
41	</dmNode>
42	</dmElseSeq>
43	</dmIf>

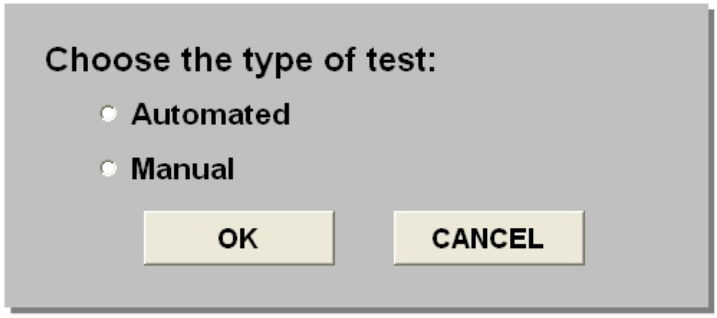
External application "Cancel" operation processing:

In this scenario, the user is first presented with a dialog (lines 7-23) to choose either the automated test or manual test. Refer to Fig 4. If the user selects automated the state table variable `TestType` is updated with the value "`Auto`".

Next, the If statement (line 25) expression (lines 26-30) is evaluated and the then branch (lines 31-35) is executed and the external application is invoked.

Assuming the external application has an error and does not return a result, the user would perform the cancel function.

The logic engine would perform a previous function and back up to the dialog (lines 7-23) again asking the user to choose either the automated test or manual test. At this point, the user can choose to attempt the automated test again, or proceed to bypass it with the manual test. The logic engine would reevaluate the If statement (line 25) and process the appropriate then or else leg of the data.



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Fig 4 Example test method dialog menu

Chapter 7.7.2

Guidance and examples - Process data module nodes

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References

Table 1 References

Chap No./Document No.	Title
None	

1 General

The purpose of this chapter is to provide technical examples of the process data module nodes to illustrate the usage of interactivity. It contains examples which demonstrate basic functionality. The examples are not intended to express the full system capabilities.

2 Process data module node guidance and examples

2.1 Data module node

The element <dmNode> represents a reference to another data module, a dialog or a sequence.

Table 2 Node example

Line	Markup
	<dmNode><!--Inspect bicycle-->
	<dmRef>
	...
	</dmRef>
	</dmNode>

Node processing:

In the above example the logic engine will display the reference data module indicated by the element <dmRef> and processing will halt until the user selects the "Next" function.

2.2 Data module node alternates

The element <dmNodeAlts> represents a collection of data module nodes where only one node in the collection is displayed based on node preconditions.

Table 3 Node alternates example

Line	Markup
1.	<referencedApplicGroup>
2.	<applic id="appl-001">
3.	<expression>
4.	<expression>
5.	<variableRef variableName="BicyclePartnum"/>
6.	</expression>
7.	<stringOperator stringOperation="equal"/>
8.	<expression>
9.	<stringValue>MC-168119</stringValue>
10.	</expression>
11.	</expression>
12.	</applic>
13.	</referencedApplicGroup>
14.	...
15.	<variableDeclarations>
16.	<variable name="BicyclePartnum" valueType="string"/>
17.	...
18.	</variableDeclarations>

Line	Markup
19.	`...`
20.	`<dmNodeAlts><!--Adjust brakes-->`
21.	`<dmNode applicRefId="appl-001"><!--Adjust side-pull brakes-->`
22.	`<dmRef>`
23.	`...`
24.	`</dmRef>`
25.	`</dmNode>`
26.	`<dmNode><!--Adjust center-pull brakes-->`
27.	`<dmRef>`
28.	`...`
29.	`</dmRef>`
30.	`</dmNode>`
31.	`</dmNodeAlts>`

Node alternates processing:

The logic engine will begin examining each child element <dmNode> in sequence and evaluate each element <applic>. The logic engine will continue examining each element <dmNode> in sequence until an element <applic><expression> construct is found that evaluates to the Boolean value "true". The first element <dmNode> containing an element <applic> that evaluates to the Boolean value "true", or the first element <dmNode> without an element <applic>, will have its content displayed.

In the above example, if the value of the variable named "BicyclePartnum" equals "MC-168119" (lines 2-12) then the associated element <dmRef> made by attribute applicRefId (line 21) is displayed and processing is halted. Otherwise, the element <dmRef> of the second node (line 26) is displayed since it does not contain the attribute applicRefId. This data module node (lines 25-29) could be considered similar to the default case in a programmatic switch type construct.

Note

If none of applicability referenced by attribute applicRefId evaluates to the Boolean value "true" processing continues after the element <dmNodeAlts>.

2.3 Data module node sequence

The element <dmSeq> represents a collection of data module nodes that are processed sequentially. The logic engine will process each node in sequential order until the end of the sequence is reached.

Table 4 Node sequence example

Line	Markup
1.	<referencedApplicGroup>
2.	<applic id="appl-001">
3.	<expression>
4.	<expression>
5.	<variableRef variableName="TirePressure"/>
6.	</expression>
7.	<numberOperator numberOperation="lessThan"/>
8.	<expression>
9.	<realValue>60,0</realValue>
10.	</expression>
11.	</expression>
12.	</applic>
13.	</referencedApplicGroup>
14.	...
15.	<variableDeclarations>
16.	<variable variableName="TirePressure" valueType="real"/>
17.	...</variableDeclarations>
18.	<dmSeq><!--Monthly periodic maintenance-->
19.	<dmNode><!--Visually inspect-->
20.	<dmRef>
21.	...
22.	</dmRef>
23.	</dmNode>
24.	<dmNode><!--Check tire pressure-->
25.	<dialog>
26.	...
27.	</dialog>
28.	</dmNode>
29.	<dmNode applicRefId="appl-001"><!--Inflate tires-->
30.	<dmRef>...</dmRef>
31.	</dmNode>
32.	<dmNode><!--Lubricate chain-->

Line	Markup
33.	<dmRef>
34.	...
35.	</dmRef>
36.	</dmNode>
37.	<dmNode><!--Clean bicycle-->
38.	<dmRef>
39.	...
40.	</dmRef>
41.	</dmNode>
42.	</dmSeq>

Node sequence processing:

The logic engine will evaluate each child element <dmNode> in sequence and display the content as appropriate. The first node content, "Visual inspection", (lines 19-23) will be displayed and processing will halt until the user activates the "Next" function. The next function continues processing to the second node, "Check tire pressure" (lines 24-28), and a dialog is displayed with processing again halting for user input. This dialog is assumed to set the variable named "TirePressure". When the user activates the dialog "OK" function the "Inflate tires" node (lines 29-31) is processed, the attribute applicRefId is resolved and the applicability statement element <applic><expression> (lines 2-12) is evaluated. If the "TirePressure" variable is less than the real value of "60,0" then the associated element <dmRef> (line 30) is displayed and processing is halted, otherwise processing continues. The "Lubricate chain" (lines 32-36) and "Clean bicycle" (lines 37-41) nodes are then displayed with processing halting as appropriate until the user activates the "Next" function. Processing will then continue past the element <dmSeq> node.

2.4 Data module node if

The element <dmIf> will instruct the logic engine to branch processing between "then" or "else" branches, behaving as a programmatic "if" construct.

Table 5 Node if example

Line	Markup
1.	<variableDeclarations>
2.	<variable name="BicyclePartnum" valueType="string"/>
3.	...
4.	</variableDeclarations>
5.	...
6.	<dmIf><!--Remove/replace brakes-->
7.	<expression>

Line	Markup
8.	`<expression>`
9.	`<variableRef variableName="BicyclePartnum"/>`
10.	`</expression>`
11.	`<stringOperator stringOperation="equal"/>`
12.	`<expression>`
13.	`<stringValue>MC-168119</stringValue>`
14.	`</expression>`
15.	`</expression>`
16.	`<dmThenSeq><!--Replace side-pull brakes-->`
17.	`<dmNode><!--Remove side-pull brakes-->`
18.	`<dmRef>`
19.	`...`
20.	`</dmRef>`
21.	`</dmNode>`
22.	`<dmNode><!--Repair side-pull brakes-->`
23.	`<dmRef>`
24.	`...`
25.	`</dmRef>`
26.	`</dmNode>`
27.	`<dmNode><!--Install side-pull brakes-->`
28.	`<dmRef>`
29.	`...`
30.	`</dmRef>`
31.	`</dmNode>`
32.	`</dmThenSeq>`
33.	`<dmElseSeq><!--Replace center-pull brakes-->`
34.	`<dmNode><!--Remove center-pull brakes-->`
35.	`<dmRef>`
36.	`...`
37.	`</dmRef>`
38.	`</dmNode>`
39.	`<dmNode><!--Repair center-pull brakes-->`

Line	Markup
40.	<dmRef>
41.	...
42.	</dmRef>
43.	</dmNode>
44.	<dmNode><!--Install center-Pull Brakes-->
45.	<dmRef>
46.	...
47.	</dmRef>
48.	</dmNode>
49.	</dmElseSeq>
50.	</dmIf>

Node if processing:

In the above example the logic engine will evaluate the child element <expression> (lines 7-15). If the element <expression> construct evaluates to the Boolean value "true" each node in the element <dmThenSeq> (lines 16-32) will be processed in sequential order. If the element <expression> construct evaluates to the Boolean value "false" the nodes in the element <dmElseSeq> (lines 33-49) will be evaluated in sequential order. If the element <dmElseSeq> does not exist, then processing will continue beyond the element <dmIf>.

2.5 Data module node loop

The element <dmLoop> will iterate a sequence of data module nodes as long as condition is met. The logic engine will examine the child expression and if it evaluates to the Boolean value "true" the child nodes will be processed in sequence. When the end of the sequence is reached the logic engine will reexamine the expression and reiterate the sequence if the expression continues to evaluate to the Boolean value "true". Otherwise processing will continue beyond the element <dmLoop>. Node loops can also contain assertions at the end of the loop node sequence to increment or otherwise assign variable values to modify the condition after each pass of the loop. The post assertions are not illustrated in this example.

Table 6 Node loop example

Line	Markup
1.	<variableDeclarations>
2.	<variable variableName="ChainPlay" valueType="real">
3.	<initialize>
4.	<expression><realValue>100,0</realValue></expression>
5.	</initialize>
6.	</variable>

Line	Markup
7.	...
8.	</variableDeclarations>
9.	<dmLoop><!--Adjust chain-->
10.	<expression>
11.	<expression>
12.	<variableRef variableName="ChainPlay"/>
13.	</expression>
14.	<numberOperator numberOperation="greaterThan"/>
15.	<expression>
16.	<stringValue>20,0</stringValue>
17.	</expression>
18.	</expression>
19.	<dmSeq>
20.	<dmNode><!--Adjust chain-->
21.	<dmRef>
22.	...
23.	</dmRef>
24.	</dmNode>
25.	<dmNode><!--Measure chain play-->
26.	<dialog>
27.	...
28.	</dialog>
29.	</dmNode>
30.	</dmSeq>
31.	</dmLoop>

Node loop processing:

This example illustrates a loop where the chain is adjusted then measured repeatedly until the chain play is less than 20 mm.

The "ChainPlay" variable (lines 2-6) is initialized to 100,0 when added to the state information. Processing of the element <dmLoop> begins by evaluating the element <expression> (lines 10-18) which checks if the "ChainPlay" variable (initialized to 100,0) is greater than 20,0, returning the Boolean value "true". The element <dmSeq> (lines 19-30) is then processed. The "Adjust chain" node (lines 20-24) is displayed and processing will halt until the user activates the "Next" function. The next function continues processing to the second

node, "Measure chain play" (lines 25-29), and a dialog is displayed with processing again halting for user input. This dialog is assumed to set the variable named "ChainPlay". When the user activates the dialog "OK" function the bottom of the loop is hit and processing returns to the element <expression> (lines 10-18). This continues until the expression evaluates to the Boolean value "false".

2.6 Data module node sequence alternates

The element <dmSeqAlts> represents a collection of data module sequences where only one sequence in the collection is displayed based on sequence preconditions.

Table 7 Node sequence alternates example

Line	Markup
1.	`<referencedApplicGroup>`
2.	`<applic id="appl-001">`
3.	`<assert applicPropertyIdent="BicyclePartnum" applicPropertyType="prodattr" applicPropertyValues="MC-168119"/>`
4.	`</applic>`
5.	`<applic id="appl-002">`
6.	`<assert applicPropertyIdent="BicyclePartnum" applicPropertyType="prodattr" applicPropertyValues="MC-168234"/>`
7.	`</applic>`
8.	`</referencedApplicGroup>...`
9.	`<process>`
10.	`<variableDeclarations>`
11.	`<variable name="BrakesOK" valueType="boolean"/>`
12.	`...`
13.	`</variableDeclarations>`
14.	`...`
15.	`<dmSeq>`
16.	`<dmNode>`
17.	`<dialog>`
18.	`<menu choiceType="select" mandatory="1" menuChoiceFlow="list">`
19.	`<prompt><paraBasic>Do the brakes work? </paraBasic></prompt>`
20.	`<menuChoice>`
21.	`<prompt><paraBasic>Yes</paraBasic></prompt>`
22.	`<assertion>`

Line	Markup
23.	`<variableRef variableName="BrakesOK"/>`

24.	`<expression>`
	`<booleanValue><trueValue/></booleanValue>`
	`</expression>`

25.	`</assertion>`
26.	`</menuChoice>`
27.	`<menuChoice>`
28.	`<prompt><paraBasic>No</paraBasic></prompt>`
29.	`<assertion>`
30.	`<variableRef variableName="BrakesOK"/>`

31.	`<expression>`
	`<booleanValue><falseValue/></booleanValue>`
	`</expression>`

32.	`</assertion>`
33.	`</menuChoice>`
34.	`</menu>`
35.	`</dialog>`
36.	`</dmNode>`
37.	`<dmIf>`

38.	`<expression>`
	`<variableRef variableName="BrakesOK"/>`
	`</expression>`

39.	`<dmThenSeq>  <!-- Brakes OK check next component -->`
40.	`<dmRef>`
41.	`...`
42.	`</dmRef>`
43.	`</dmThenSeq>`
44.	`<dmElseSeq>  <!-- Brakes faulty -->`
45.	`<dmSeqAlts>`

46.	`<dmSeq applicRefId="appl-001">  <!-- Brake repairs for bicyle part number "MC-168119" -->`
	`...`
	`</dmSeq>`

47.	`<dmSeq applicRefId="appl-002">  <!-- Brake repairs for bicyle part number "MC-168234" -->`
	`...`
	`</dmSeq>`

48.	`</dmSeqAlts>`

Line	Markup
49.	`</dmElseSeq>`
50.	`</dmIf>`
51.	`</dmSeq>`

Node sequence alternates processing:

The logic engine will begin examining each child element <dmSeqAlts> in sequence and evaluate each element <applic>. The logic engine will continue examining each element <dmSeqAlts> in sequence until an element <applic><assert> construct is found that evaluates to the Boolean value "true". The first element <dmSeqAlts> containing an element <applic> that evaluates to the Boolean value "true" will have its content displayed.

In the above example, the applicability values are identified (lines 1-8) then the user is asked in the dialog if the brakes are working (lines 17-35). If the brakes are OK, then the user is referenced to the next data module to check other bicycle components (lines 39-43). If the brakes are faulty, then if the product configuration is "BicyclePartnum" equals "MC-168119" then the first <dmSeqAlts> is selected and displayed (line 46). However, if the product configuration is "BicyclePartnum" equals "MC-168234" then the second <dmSeqAlts> is selected and displayed (line 47).

Note

If none of applicability referenced by attribute applicRefId evaluates to the Boolean value "true" processing continues after the element <dmSeqAlts >.

Chapter 7.7.3

Guidance and examples - Resource resolution

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Table 1 References

Chap No./Document No.	Title
None	

1 General

The purpose of this chapter is to provide guidance and examples of resource resolution. It contains examples of resource resolution.

2 Guidance and examples

2.1 Sample resource resolution dataset

The following is a sample dataset to use in the example queries. In this example, three metadata characteristics are defined:

- title
- issue
- language

As a default, the resource service in this example will first resolve the resource with the highest issue and then resolve the English format if a resource conflict exists. Implementations can use other methods of resolving resource conflicts.

Table 2 Resource resolution dataset

URN	URL	Title	Issue-Inwork	Language-Country
URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A	www.s1000d.org/DMC-YY-A-53-25-10-02A-999A-A_I-001_W-00_L-EN_C-US.XML	Example instance	001-00	EN-US
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A	www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-002_W-01_L-EN_C-GB.XML	English instance Issue 2	002-01	EN-GB
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A	www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-001_W-00_L-EN_C-US.XML	English instance Issue 1	001-00	EN-US
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A	www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-002_W-01_L-FR_C-FR.XML	French instance Issue 2	002-01	FR-FR
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A	www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-001_W-00_L-FR_C-FR.XML	French instance Issue 1	001-00	FR-FR
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A	www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-002_W-00_L-SX_C-US.XML	Simplified Technical English instance Issue 2	002-00	SX-US
URN:S1000D:ICN-1B-B-311501-B-K0999-00352-A-001-01	www.s1000d.org/ICN-1B-B-311501-B-K0999-00352-A-001-01.CGM	Example graphic		

2.2 Query to redirect to a resource

The following query will redirect to the resource:

```
URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A
```

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A
```

Redirects to the URL:

```
http://www.s1000d.org/DMC-YY-A-53-25-10-02A-999A-A_I-001_W-00_L-EN_C-US.XML
```

2.3 Query to resolve a resource characteristic

The following query will return the "Issue" characteristic of the resource:

```
URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A
```

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A&Issue
```

The following XML instance will be returned:

```
<rds:RDS>
<rdf:RDF>
```

```
<rdf:Description
rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-999A-A.XML"
rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A">
<issueInfo issueNumber="001" inWork="00"/>
<language languageIsoCode="en" countryIsoCode="US"/>
</rdf:Description>
</rdf:RDF>
</rds:RDS>
```

2.4 Query for resources with multiple formats

The following query will redirect to the resource:

`URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A`

which exists in multiple formats. The resource indicated as the default will be returned.

`http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A`

Redirects to the URL:

`http://www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-002_W-01_L-EN_C-GB.XML`

2.5 Query to resolve a resource with multiple formats by characteristic

The following query will redirect to the resource:

`URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A`

which exists in multiple formats. The resource service is requested to return the second issue in French.

`http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A&Issue=002&Work=01&Language=FR&Country=FR`

Redirects to the URL:

`http://www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-002_W-01_L-FR_C-FR.XML`

2.6 Query to resolve a conflicted resource

The following query will return the "Title" characteristic for the default format of the resource:

`URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A`

Since a conflict exists with multiple documents returned for the query, the resolution rules for the example resource resolution service will determine what resource description will be returned. In this example, the defined rules dictate that the highest issue of the resource in English or the resource that best matches those criteria will be returned. Within the dataset, the document "Simplified Technical English instance Issue 2" meets the conflict criteria.

`http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A&Title`

The following XML instance will be returned:

```
<rds:RDS>
<rdf:RDF>
<rdf:Description
rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-002_L-EN.XML"
```

```
rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A">
<title>Simplified Technical English instance Issue 2</title>
<issueInfo issueNumber="002" inWork="00"/>
<language languageIsoCode="sx" countryIsoCode="US"/>
</rdf:Description>
</rdf:RDF>
</rds:RDS>
```

2.7 Query to return results describing multiple formats

The following query will return the "Title" characteristic for all formats of the resource:

```
URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A
```

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-YY-A-
53-25-10-02A-520A-A&multiple&Title
```

The following XML instance will be returned:

```
<rds:RDS>
<rdf:RDF>
<rdf:Description
rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-002_W-00_L-
SX_C-US.XML"
rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A">
<title>Simplified Technical English instance Issue 2</title>
<issueInfo issueNumber="002" inWork="00"/>
<language languageIsoCode="sx" countryIsoCode="US"/>
</rdf:Description>
</rdf:RDF>
<rdf:RDF>
<rdf:Description
rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-001_W-00_L-
EN_C-US.XML"
rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A">
<title>English instance Issue 1</title>
<issueInfo issueNumber="001" inWork="00"/>
<language languageIsoCode="en" countryIsoCode="US"/>
</rdf:Description>
</rdf:RDF>
<rdf:RDF>
<rdf:Description
rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-002_W-01_L-
FR_C-FR.XML"
rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A">
<title>French instance Issue 2</title>
<issueInfo issueNumber="002" inWork="01"/>
<language languageIsoCode="fr" countryIsoCode="FR"/>
</rdf:Description>
</rdf:RDF>
<rdf:RDF>
<rdf:Description
rdf:about="www.s1000d.org/DMC-YY-A-53-25-10-02A-520A-A_I-001_W-01_L-
FR_C-FR.XML"
rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-520A-A">
<title>French instance Issue 1</title>
<issueInfo issueNumber="001" inWork="01"/>
<language languageIsoCode="fr" countryIsoCode="FR"/>
</rdf:Description>
```

```
</rdf:RDF>
</rds:RDS>
```

2.8 Query to resolve all characteristics of a resource

The following query will return all characteristics of the resource:

```
URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A
```

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-YY-A-
53-25-10-02A-999A-A&allurcs
```

The following XML instance will be returned:

```
<rds:RDS>
<rdf:RDF>
<rdf:Description
rdf:about="http://www.s1000d.org/DMC-YY-A-53-25-10-02A-999A-A_I-001_W-
00_L-EN_C-US.XML"
rds:urn="URN:S1000D:DMC-YY-A-53-25-10-02A-999A-A">
<title>Example instance 1</title>
<issueInfo issueNumber="001" inWork="00"/>
<language languageIsoCode="en" countryIsoCode="US"/>
</rdf:Description>
</rdf:RDF>
</rds:RDS>
```

2.9 Query to resolve the URL of a resource

The following query will return the URL of the resource:

```
URN:S1000D:ICN-1B-B-311501-B-K0999-00352-A-001-01
```

The attribute `rdf:about` within the element <`rdf:Description`> will contain the resource location. Notice that the URL and the URN are always returned for any resource description.

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:ICN-1B-B-
311501-B-K0999-00352-A-001-01&url
```

The following XML instance will be returned:

```
<rds:RDS>
<rdf:RDF>
<rdf:Description
rdf:about="http://www.s1000d.org/ICN-1B-B-311501-B-K0999-00352-A-001-
01.CGM"
rds:urn="URN:S1000D:ICN-1B-B-311501-B-K0999-00352-A-001-01">
</rdf:Description>
</rdf:RDF>
</rds:RDS>
```

2.10 Query that returns an error message

The following query requests an unknown instance:

```
URN:S1000D:DMC-YY-A-53-25-10-02A-720A-A
```

```
http://www.s1000d.org/resolution/resolveUrn?urn=URN:S1000D:DMC-YY-A-
53-25-10-02A-720A-A&allurcs
```

The following XML instance will be returned:

```
<rds:RDS>
<rds:Message number="004" type="E">The resource URN:S1000D:DMC-YY-A-
53-25-10-02A-720A-A is unknown.</rds:Message>
</rds:RDS>
```

Chapter 7.7.4

Guidance and examples - XLink

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References

Table 1 References

Chap No./Document No.	Title
REC-xlink11-20100506	W3C Recommendation: XML Linking Language (XLink) Version 1.1

1 General

This chapter gives guidance and examples for the use of the XLink attributes within the various reference structures.

Linkage within an IETP is specified using XLink attributes within the XML repository. Links must use the URN of the resource referenced, and can be created automatically from the content of the elements <dmRef>, <pmRef>, <externalPubRef>, <catalogSeqNumberRef>, <graphic>, <multimediaObject>, <symbol> and <internalRef>.

The XLink attributes are as follows:

– xlink:type (O), the link type, if an XLink link is established. This attribute can have the following values:
  - "simple" - a simple link
  - "extended" - an extended, possibly multi-source, link

– xlink:href (O), the link address (the URN of the requested resource), if an XLink link is established.

- xlink:title (O), the link title, if an XLink link is established.
- xlink:show (O), the link appearance, if an XLink link is established. This attribute can have the following values:
  - "new" - opens a new window to display the information
  - "replace" - replaces the current window with the displayed information
  - "embed" - embeds the information inline
  - "other" - defined by user
  - "none" - does not display the information
- xlink:actuate (O), the link behavior, if an XLink link is established. This attribute can have the following values:
  - "onLoad" - displays the information when the page loads
  - "onRequest" - displays the information on user click

2 Guidance and examples

The attribute xlink:type has the value "simple" and the attribute xlink:href contains the URN of the requested resource. All examples are provided for illustration purposes only.

2.1 DMC reference

The data module link URN must be created from the content of the element <dmCode>.

```
<dmRef
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="replace"
xlink:title="IETP resource resolution"
xlink:href="URN:S1000D:DMC-S1000D-A-07-07-0400-00A-040A-A">
<dmRefIdent>
<dmCode modelIdentCode="S1000D" systemDiffCode="A"
systemCode="07" subSystemCode="0" subSubSystemCode="7"
assyCode="0400" disassyCode="00" disassyCodeVariant="A"
infoCode="040" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
<dmRefAddressItems>
<dmTitle>
<techName>IETP resource resolution</techName>
</dmTitle>
</dmRefAddressItems>
</dmRef>
```

Example data module code display transformation to the HyperText Markup Language (HTML):

```
<a href="DMC-S1000D-A-07-07-0400-00A-040A-A.XML">
AE-A-07-07-0400-00A-040A-A</a>
```

2.2 PMC reference

The publication module link URN must be created from the content of the element <pmCode>.

```
<pmRef
xlink:type="simple"
xlink:actuate="onRequest"
```

```
xlink:show="replace"
xlink:title="Example publication module"
xlink:href="URN:S1000D:PMC-S1000D-I9005-01000-00">
<pmRefIdent>
<pmCode modelIdentCode="S1000D" pmIssuer="I9005"
pmNumber="01000" pmVolume="00"/>
</pmRefIdent>
</pmRef>
```

Example publication module code display transformation to HTML:

```
<a href="PMC-S1000D-I9005-01000-00.XML">
PMC-S1000D-I9005-01000-00</a>
```

2.3 CSN reference

The link URN built from an implicit catalog sequence number must contain the values of the attributes `modelIdentCode`, `systemDiffCode`, `systemCode`, `subSystemCode`, `subSubSystemCode`, `assyCode`, `figureNumber`, `figureNumberVariant`, `item`, `itemVariant`, `itemLocationCode` of the element <`catalogSeqNumberRef`> and attribute `itemSeqNumberValue` of the element <`itemSeqNumber`>. If attributes values for `modelIdentCode` and `systemDiffCode` are not present, they will be derived from the data module code of the containing data module. If attribute value for `itemLocationCode` is not present, the value "`D`" is implied. The catalog sequence number is given after the # starting with "`csn`" and with dashes between its parts. If there is no figure number variant, add a "`0`".

Reference to an item (72-32-00 Fig 01A, Item 100A) in a chapterized catalog:

```
<catalogSeqNumberRef
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="new"
xlink:title="Part: ABCD"
xlink:href="URN:S1000D:DMC-AE-A-72-32-00-01A-941A-D#csn-72-32-
00-01A-100A"
modelIdentCode="AE" systemDiffCode="A" systemCode="72"
subSystemCode="3" subSubSystemCode="2" assyCode="00"
figureNumber="01" figureNumberVariant="A" itemLocationCode="D"
item="100" itemVariant="A"/>
```

Example CSN display transformation to HTML:

```
<a href="JavaScript:openwindow('AE-A-72-32-00-01A-941A-D#csn-72-
32-00-01A-100A')">csn-72-32-00-01A-100A</a>
```

Reference to an item (72-32-00 Fig 02, Item 600) in a chapterized catalog:

```
<catalogSeqNumberRef
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="new"
xlink:title="Part: ABCD"
xlink:href="URN:S1000D:DMC-AE-A-72-32-00-020-941A-D.XML#csn-72-
32-00-020-600"
systemCode="72" subSystemCode="3" subSubSystemCode="2"
```

```
assyCode="00" figureNumber="02" figureNumberVariant="0"
itemLocationCode="D" item="600"/>
```

Example CSN display transformation to HTML:

```
<a href="JavaScript:openwindow('AE-A-72-32-00-01A-941A-D#csn-72-
32-00-020-600')">csn-72-32-00-020-600</a>
```

Reference to an item (72-32-00 Fig 02, Item 600, ISN 00A) in a chapterized catalog:

```
<catalogSeqNumberRef
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="new"
xlink:title="Part: ABCD"
xlink:href="URN:S1000D:DMC-AE-A-72-32-00-020-941A-D.XML#csn-72-
32-00-020-600-00A"
systemCode="72" subSystemCode="3" subSubSystemCode="2"
assyCode="00" figureNumber="02" item="600"
itemSeqNumberValue="00A"/>
```

Example CSN display transformation to HTML:

```
<a href="JavaScript:openwindow('AE-A-72-32-00-01A-941A-D#csn-72-
32-00-020-600-00A')">csn-72-32-00-020-600-00A</a>
```

Reference to an item (IPPN K0378730E, Fig 01, Item 300) in a non-chapterized catalog:

```
<catalogSeqNumberRef figureNumber="01" item="300"
initialProvisioningProjectNumber="K0378730E"
responsiblePartnerCompanyCode="R"
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="new"
xlink:title="Part: ABCD"
xlink:href="URN:S1000D:AE-A-ZR-73-0E-010-941A-D#csn-010-300"/>
```

Example CSN display transformation to HTML:

```
<a href="JavaScript:openwindow('AE-A-ZR-73-0E-010-941A-D#csn-
010-300')">csn-010-300</a>
```

The CSN reference link URN built from an explicit element <dmRef> (contained in the element <catalogSeqNumberRef>) is marked up like any other reference to a data module. The reference can target the referred item/fragment in the IPD data module, where the attribute id of the item entry has for example the value "csn-53-25-10-010-001".

```
<catalogSeqNumberRef
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="new"
xlink:title="Part: ABCD"
xlink:href="URN:S1000D:DMC-YY-A-53-25-10-010-941A-D#csn-53-25-
10-010-001"
figureNumber="01" item="001" >
<refs>
<dmRef referredFragment="csn-53-25-10-010-001">
```

```
<dmRefIdent>
<dmCode modelIdentCode="YY" systemDiffCode="A" systemCode="53"
subSystemCode="2" subSubSystemCode="5" assyCode="10"
disassyCode="01" disassyCodeVariant="0" infoCode="941"
infoCodeVariant="A" itemLocationCode="D"/>
</dmRefIdent>
</dmRef>
</refs>
</catalogSeqNumberRef>
```

Example CSN display transformation to HTML:

```
<a href="JavaScript:openwindow('YY-A-53-25-10-010-941A-
D.XML#csn-53-25-10-010-001')">csn-53-25-10-010-001</a>
```

Note

In the examples above it is assumed that the value "ABCD" of attribute `xlink:title` is derived based on the sub-structure of element <`catalogSeqNumberRef`>

2.4 Graphic reference

The graphic link URN must be derived from the attribute `infoEntityIdent` of the element <`graphic`>.

```
<figure id="fig001">
<title>LH multifunction head down display</title>
<graphic
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="new"
xlink:href="URN:S1000D:ICN-1B-B-311501-B-K0999-00352-A-001-01"
infoEntityIdent="ICN-1B-B-311501-B-K0999-00352-A-001-01"/>
</figure>
```

Example ICN display transformation to HTML:

```
<a href="ICN-1B-B-311501-B-K0999-00352-A-001-01.CGM"
target="_blank">ICN-1B-B-311501-B-K0999-00352-A-001-01</a>
```

2.5 Symbol reference

The symbol link URN must be derived from the attribute `infoEntityIdent` of element <`symbol`>.

```
<symbol
xlink:type="simple"
xlink:actuate="onLoad"
xlink:show="embed"
xlink:href="URN:S1000D:ICN-AE-A-316200-0-F0214-00352-A-001-01"
infoEntityIdent="ICN-AE-A-316200-0-F0214-00352-A-001-01"/>
```

Example ICN display transformation to HTML:

```
<img src="ICN-AE-A-316200-0-F0214-00352-A-001-01.CGM"/>
```

2.6 External reference with a target

The data module link URN must be created from the content of the element <dmCode> and the target identifier within the referenced data module.

In the following example, the link points to a figure with id="fig-0001" in another external data module.

```
<dmRef referredFragment=
"URN:S1000D:DMC-S1000D-A-06-02-0301-00A-040A-A#fig-0001"
xlink:type="simple"
xlink:actuate="onRequest"
xlink:show="replace"
xlink:href=
"URN:S1000D:DMC-S1000D-A-06-02-0301-00A-040A-A#fig-0001">
<dmRefIdent>
<dmCode modelIdentCode="S1000D" systemDiffCode="A"
systemCode="06" subSystemCode="0" subSubSystemCode="2"
assyCode="0301" disassyCode="00" disassyCodeVariant="A"
infoCode="040" infoCodeVariant="A" itemLocationCode="A"/>
</dmRefIdent>
<dmRefAddressItems>
<dmTitle>
<techName>Layout rules and examples</techName>
<infoName>Front matter data modules</infoName>
</dmTitle>
</dmRefAddressItems>
</dmRef>
```

Example data module code display transformation to HTML:

```
<a href=
"DMC-AE-A-06-02-0301-00A-040A-A.XML#fig-0001">
Layout rules and examples - Front matter data modules</a>
```

2.7 Internal reference

Internal references are defined by the attributes internalRefId and internalRefTargetType of the element <internalRef>.

In the following example, the link points to a figure with id="fig-0001" in the same data module.

```
<internalRef internalRefId="fig-0001"
internalRefTargetType="irtt01"
xlink:actuate="onRequest"
xlink:show="replace"
xlink:href="#fig-0001">
</internalRef>
```

Example reference display transformation to HTML:

```
<a href="#fig-0001"></a>
```

Chapter 7.7.5

Guidance and examples - XPath

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Chap 3.9.5.2.1.2	Common constructs - Referencing
Chap 3.9.5.2.17	Content section - SCO content data module
REC-xpath20-20101214	W3C Recommendation: XML Path Language (XPath) 2.0 (Second Edition)

1 General

The element <dmSegmentRef> is used within, and restricted to, the SCO content data module to address data portions inside a data module of interest for reuse in learning context. Refer to Chap 3.9.5.2.17.

2 XPath identified data module segments

The basic structure of the element <dmSegmentRef> is the same as that of element <dmRef>. Refer to Chap 3.9.5.2.1.2. As opposed to the element <dmRef>, however, the element <dmSegmentRef> does not require that the target portions (substructures) in the referenced data modules are identified by use of ID attributes. Instead, the element <dmSegmentRef> uses an XPath expression to address the target portion(s) of interest. The path must be given in accordance with the XML Path Language (XPath) specification. Refer to REC-xpath20-20101214.

The element <dmSegmentRef> is used to reference specific portions of information in another data module, allowing for the inclusion of data module parts (eg, paragraphs or figures) in a learning object. The location is entered in the attribute `targetPath` of element <dmSegmentRef>.

3 Examples

All examples below are provided for illustration purposes only.

```
<content>
<scoContent>
<trainingStep>
<dmSegmentRef
targetPath="//lcInstruction/description/levelledPara[attribute::id =
'para-000' and child::levelledPara[fn:position() = 1]]">
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0" assyCode="20"
disassyCode="00" disassyCodeVariant="AA" infoCode="520"
infoCodeVariant="A" itemLocationCode="T" learnCode="T4J"
learnEventCode="C"/>
</dmRefIdent>
</dmSegmentRef>
<dmSegmentRef
targetPath="//lcInstruction/description/levelledPara[attribute::id =
'para-000' and child::levelledPara[fn:position() = 3]]">
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="1" subSubSystemCode="0" assyCode="20"
disassyCode="00" disassyCodeVariant="AA" infoCode="520"
infoCodeVariant="A" itemLocationCode="T" learnCode="T4J"
learnEventCode="C"/>
</dmRefIdent>
</dmSegmentRef>
</trainingStep>
<trainingStep>
<dmSegmentRef targetPath="//lerningAssessment">
<dmRefIdent>
<dmCode modelIdentCode="S1000DBIKE" systemDiffCode="AAA"
systemCode="DA0" subSystemCode="0" subSubSystemCode="0" assyCode="00"
disassyCode="00" disassyCodeVariant="AA" infoCode="041"
infoCodeVariant="A" itemLocationCode="T" learnCode="T61"
learnEventCode="E"/>
</dmRefIdent>
</dmSegmentRef>
</trainingStep>
</scoContent>
</content>
```

Chapter 7.8

Information processing - Applicability

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1 General

There are a number of technical details associated with processing applicability annotations and the generation of human-readable display text from computable applicability annotations.

Refer to Chap 4.14 and its subchapters for an overview of applicability. It is recommended that these chapters and the concepts therein have been read before.

2 Content

2.1 Supported data types

Each product attribute and condition is given a data type when it is declared in the Applicability Cross-reference Table (ACT) data module or the Conditions Cross-reference Table (CCT) data module, respectively. Any values given in an applicability annotation element <assert> in the attribute applicPropertyValue must conform to the data type of the product attribute or condition being tested. The default data type is string unless specifically declared in the ACT data module or CCT data module.

The supported data types and allowable values are detailed below.

2.1.1 Boolean

A Boolean variable is allowed to have the values "true" or "false".

2.1.2 Integer

An integer variable must support, at a minimum, a 32 bits signed long integer.

2.1.3 Real

A real variable must support, at a minimum, a 32 bits (4 bytes) real number. It must support the IEEE standard of 1 bit sign, 8 bits exponent, and 23 bits mantissa which gives a minimum precision of 6 significant digits and a minimum exponent range of -38 to 38.

2.1.4 String

A string variable must support, at a minimum, a Unicode string up to 64 characters long.

2.2 Evaluation of applicability annotations

The applicability model provides a framework which can facilitate a computer system to understand and process applicability annotations. The result of that processing will either be the Boolean value of true, meaning that the associated technical data is appropriate for the current situation, or the Boolean value of false, meaning that the associated technical data is not appropriate for the current situation.

Computer systems must follow the processing rules defined in this chapter to ensure that technical data is interchangeable between computer systems. The processing rules will ensure that different computer systems arrive at the same result given the same input.

2.2.1 Evaluation of assert annotations

The element <assert> defines a single test. The result of the test will be a Boolean value of true or false.

2.2.1.1 Components of an assert annotation

Assert annotations can take on two forms: computable and textual.

2.2.1.1.1 *Computable assert annotation*
The computable assert annotation contains the following computable components which are used during evaluation:

- The attribute `applicPropertyIdent` containing the identifier of a product attribute or condition to test, this is the same attribute used in the Products Cross-reference Table (PCT) data module element <`assign`> and provides a reference to either:
  - the element <`productAttribute`> attribute `id` from the Applicability Cross-reference Table (ACT) data module

  or
  - the element <`cond`> attribute `id` from the Conditions Cross-reference Table (CCT) data module
- The attribute `applicPropertyValues` containing the values and ranges to test against

2.2.1.1.2 *Textual assert annotation*
The textual assert annotation contains no computable components.

2.2.1.2 Evaluation rules
If any of the following rules fail, the result is a Boolean value of true causing the associated technical data to be considered appropriate for display. If technical data cannot be absolutely determined to be inappropriate, then it must be considered appropriate.

1 The applicability annotation must be of the computable form.

2 There must be a PCT data module identifying product instances.

3 A specific product instance from the PCT must be identified.

4 The identified product instance in the PCT data module must have an element <`assign`> with the attribute `applicPropertyIdent` value matching the applicability annotation element <`assert`> and attribute `applicPropertyIdent` value.

5 The value of the attribute `applicPropertyValue` from the identified element <`assign`> in the PCT data module is tested against the values and ranges in the assert annotation attribute `applicPropertyValues`.

If an assert annotation value does not conform to the data type of the product attribute or condition being tested, the result is the Boolean value of true. This condition is an error which must be checked for and corrected before data delivery.

If the product instance value matches an assert annotation value or falls within an assert annotation range, the result is the Boolean value of true.

If the product instance value does not match an assert annotation value and does not fall within an assert annotation range, the result is the Boolean value of false.

2.2.1.3 Examples
Refer to Para 3.2.1.

2.2.2 Evaluation of evaluate annotations
The element <`evaluate`> groups several tests together and provides the logical operation to perform between the results of the individual tests. The result of the logical operation will be a Boolean value of true or false.

2.2.2.1 Components of an evaluate annotation
The evaluate annotation contains the following computable components which are used during evaluation:

- The attribute `andOr` containing the operation to perform
- Content consisting of any combination of the element <`assert`> and the element <`evaluate`>, each providing a Boolean value result of true or false of their own

2.2.2.2 Evaluation rules

1 For the attribute `andOr` value of "`and`":

- If all child element results are the Boolean value of true, then this evaluation results in the Boolean value of true.
- If any child element result is the Boolean value of false, then this evaluation results in the Boolean value of false.

2 For the attribute `andOr` value of "`or`":

- If any child element result is the Boolean value of true, then this evaluation results in the Boolean value of true.
- If all child element results are the Boolean value of false, then this evaluation results in the Boolean value of false.

2.2.2.3 Examples
Refer to Para 3.2.2.

2.3 Generation of display text

The guidance provided in this paragraph is a suggestion for the default format for generating display text.

The generated human-readable applicability annotation can be used to populate the element <`displayText`> within the applicability annotation (element <`applic`> within data modules). Viewers can also generate an human-readable applicability annotation at display time if no information is available in element <`displayText`>.

Business rule decision point BRDP-S1-00547 - Format of generated display text:

- Decide on the format for generating the displayed applicability annotation from the computable applicability annotation that will best fulfill industry and/or customer display requirements.

Auto-generated applicability statements may not be completely consistent between processors. In determining whether to populate the element <`displayText`> a project must weigh this fact with the cost of maintaining the authored element <`displayText`> and with the possibility that the authored element <`displayText`> may not match the actual applicability assertion.

2.3.1 Conversion of assert annotations

An assert annotation is used to perform a single test. The assert annotation can be a textual annotation that is already in human-readable form, or it can be a test of a single product attribute or condition against a set of values and ranges.

2.3.1.1 Conversion to readable form
A single assert annotation can be converted to readable form by presenting the element <`displayName`> from the declaration in the ACT or CCT data module, or alternately the

element <name> if display name is not available, followed by a colon, a space and the allowable value or values. If the assert annotation is textual, only the content is used.

Note

Do not enter spaces and colons as they are auto-generated by the presentation system.

2.3.1.2 Examples
Refer to Para 3.3.1.

2.3.2 Conversion of evaluate annotations

An evaluate annotation is used to group several annotations together and assign a logical operation between the grouped annotations. The operation can be either a logical "and" operation or a logical "or" operation.

2.3.2.1 Conversion of a logical "and" annotation to human-readable form
An evaluate annotation performing a logical "and" operation can be converted to human-readable form by displaying each of the contained elements separated by spaces [ ], the word "and" and space [and] […and …]. If the contained element is another occurrence of the element <evaluate> performing a logical "or" operation, then parentheses must be placed around the displayed contents of the contained evaluate annotation […and (… or …)].

Note

Spaces and parenthesis are auto-generated by the presentation system and must not be entered by the author.

2.3.2.2 Conversion of a logical "or" annotation to human-readable form
An evaluate annotation performing a logical "or" operation can be converted to human-readable form by displaying each of the contained elements separated by spaces [ ], the word "or" and a space [or], […or …]. If the contained element is another occurrence of the element <evaluate> performing a logical "and" operation, then parentheses must be placed around the displayed contents of the contained evaluate annotation […or (… and …)].

Note

Spaces and parenthesis are auto-generated by the presentation system and must not be entered by the author.

2.3.2.3 Examples
Refer to Para 3.3.2.

2.3.3 Use of display class

2.3.3.1 Concept
In order to facilitate a more sophisticated display text generation, the attribute applicDisplayClass can be used to provide a hint to the software application performing the generation of the human-readable form of specific formatting that is applied to the applicability annotation. The use of the attribute applicDisplayClass, the allowable values and the meaning of those values are to be previously defined as business rules. Refer to Chap 3.9.5.3.

2.3.3.2 Example
Refer to Para 3.3.3.

2.3.4 Determining when to "show" applicability statements

Care has to be taken when deciding to "hide" applicability statements from the end user. A data module can contain applicability statements utilizing product or condition attributes for which the viewer has not obtained values from the end user. In this case, it is important that the applicability statements be visible in order for the end user to determine the applicability.

Applicability operates hierarchically. This means that if applicability is assigned to an element then all of the children of that element have the same or further restricted applicability. However, applicability is read linearly. When reading information that contains applicability, the displayed applicability is in effect until another applicability statement is encountered.

When a procedure or descriptive information is read in document order (top to bottom), an indication is needed whenever the applicability of the content changes.

- The data module applicability must always be displayed.
- Whenever the applicability changes in the sequence of the current rendered view, it must be displayed.

Rules for presentation applicability statements are given in Chap 6.2.2 and examples of procedures presenting applicability can be found in Chap 6.2.3.3.

2.4 Obtaining applicability values at IETP run time

2.4.1 Auto-generated dialogs

The ACT data module is used to declare all product attributes that can affect applicability of data. The ACT data module serves as the central point of reference for applicability definitions. Similarly, the CCT data module is used to declare any type of conditions that can affect applicability of data.

The constructs of these two data modules are sufficient to generate simple dialogs to obtain values from an end-user.

The element <productAttribute> is used to declare a single attribute of the Product, such as "serial number" or "model". The attribute valuePattern and subelements <displayName> and the element <enumeration> can be used to auto-generate a dialog.

Note

The element <displayName> is also used in the auto-generation of applicability statements displayed in a data module.

A simple dialog can be auto-generated that consist of a parameter name (taken from the element <displayName>) and either a text fill-in or a menu selection. Careful consideration must be exercised when choosing to use a menu selection. If a given attribute definition specifies a finite set of enumerated values, then a menu selection can be provided, but if the set of values is large, the selection list can become difficult to use.

For example, if an attribute definition includes an enumeration statement using the element <enumeration> with values such as:

<enumeration applicPropertyValues="000000~999999"/>,

providing a selection of 1 million items can be impractical.

A viewer can only want to provide a menu selection if the set of values are defined without ranges, or the size of the set is in practical limits of the display device.

Regardless of the type of input field used (fill-in or selection), the viewer must ensure that the value entered conforms to the attribute definition, either by the allowed set of enumerated values and/or the attribute value pattern specification.

2.4.2 Authored dialogs

There are use-case scenarios where a simple dialog auto-generated with the element <displayName> is insufficient. The element <displayName> is used as part of the auto-generated applicability statements that are displayed in a data module. Therefore, it is recommended that the element <displayName> is not used to capture complex dialogs.

The ACT and CCT allow a means for an author to specify a prompt for the dialog and text for each choice (if appropriate).

An IETP viewer can still auto-generate dialogs if no prompt or choice text is available.

In the ACT, the element <prompt> is added to the element <productAttribute> to avoid affecting the applicability statement. In addition, the attribute enumerationLabel is added to the element <enumeration> to provide end user clear text in choosing an enumerated value.

In the CCT, the element <prompt> element is added to the element <cond> to avoid affecting the applicability statement. In addition, the attribute enumerationLabel is added to the element <enumeration> of the element <condType> to provide end user clear text in choosing an enumerated value.

2.4.3 Allowing modification of a product attribute value

It is a project decision if modifications to PCT assigned values are allowed. A PCT may only assign a subset of attributes and conditions for a given product since some attributes and conditions values cannot be determined when the PCT was generated, and/or some attributes and conditions are only known at run-time (eg, wind speed, temperature). A project must decide if values obtained at run-time are only for attributes and conditions not already assigned in the PCT, or if PCT assigned values can be modified/overridden at run-time. Modifying PCT assigned values for a given viewer session can be needed by projects where PCT data cannot accurately reflect product configuration at the time a procedure is being done.

Note

Any assignment and modifications to attribute values at run-time are in effect only for the viewer session where changes were entered. At no time must a viewer modify PCT data module source.

Business rule decision point BRDP-S1-00548 - Modifying an assigned product attribute value in the PCT.

– Decide if modifications to PCT assigned values are allowed.

3 Examples

3.1 Applicability markup example

An example of how to markup applicability for procedural steps is given in Chap 3.9.5.3. The presentation of the example is given in Chap 6.2.2.

3.2 Evaluation of applicability annotations

3.2.1 Evaluation of assert annotations

3.2.1.1 Textual assert annotation

The following example illustrates a textual assert annotation. Since this is not computable the result is a Boolean value of true.

Assert annotation:

```
<assert>in icy conditions</assert>
```

Boolean value result: true

3.2.1.2 Value assert annotation with Boolean value result of true

The following example illustrates an element <assert> annotation testing the attribute applicPropertyIdent with a value of "model" for two attribute applicPropertyValues, with values of either "Brook trekker" or "Mountain storm". The selected product instance has an element <assign> with the attribute

applicPropertyIdent with a value of "model" and the attribute applicPropertyValue with a value of "Mountain storm" which matches one of the test values. The result is the Boolean value of true.

Assert annotation:

```
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker|Mountain storm"/>
```

Assign annotation from PCT:

```
<assign applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValue="Mountain
storm"/>
```

Boolean value result: true

3.2.1.3 Value assert annotation with Boolean value result of false

The following example illustrates an element <assert> annotation testing attribute applicPropertyIdent with a value of "model" for one attribute applicPropertyValues with a value of "Brook trekker". The selected product instance has an element <assign> with the attribute applicPropertyIdent with a value of "model" and the attribute applicPropertyValue with a value of "Mountain storm" which does not match the test value. The result is the Boolean value of false.

Assert annotation:

```
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
```

Assign annotation from PCT:

```
<assign applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValue="Mountain
storm"/>
```

Boolean value result: false

3.2.1.4 Range assert annotation with Boolean value result of false

The following example illustrates an element <assert> annotation testing the attribute applicPropertyIdent with a value of "serialno" for range in the attribute applicPropertyValues with values from "1B070643" to "1B070799". The selected product instance has an element <assign> with the attribute applicPropertyIdent with a value of "serialno" and the attribute applicPropertyValue with a value of "1B070642" which falls outside of the acceptable range. The result is the Boolean value of false.

Assert annotation:

```
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr"
applicPropertyValues="1B070643~1B070799"/>
```

Assign annotation from PCT:

```
<assign applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValue="1B070642"/>
```

Boolean value result: false

3.2.1.5 Combination assert annotation with Boolean value result of true

The following example illustrates an element <assert> annotation testing the attribute applicPropertyIdent with a value of "serialno" for multiple values and ranges. The selected product instance has an element <assign> with the attribute applicPropertyIdent with a value of "serialno" and the attribute applicPropertyValue with a value of "1B070642" which falls inside of one of the acceptable ranges. The result is the Boolean value of true.

Assert annotation:

```
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr"
applicPropertyValues="1B070640|1B070642~1B070720|1B070722|1B0707
30~1B070799"/>
```

Assign annotation from PCT:

```
<assign applicPropertyIdent="serialno"
applicPropertyType="prodattr" applicPropertyValue="1B070642"/>
```

Boolean value result: true

3.2.2 Evaluation of evaluate annotations

3.2.2.1 Logical "and" evaluate annotation

The following example illustrates an evaluate annotation performing a logical "and" operation. If all three assert annotations result in the Boolean value of true, then the evaluate result is the Boolean value of true. If any of the three assert annotations results in the Boolean value of false, then the evaluate result is the Boolean value of false.

Evaluate annotation:

```
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk9"/>
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr"
applicPropertyValues="1B070643~1B070799"/>
</evaluate>
```

Assign annotation from PCT:

```
<assign applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValue="Brook
trekker"/><assign applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValue="Mk9"/><assign
applicPropertyIdent="serialno" applicPropertyType="prodattr"
applicPropertyValue="1B070643"/>
```

Boolean value result: true

3.2.2.2 Logical "or" evaluate annotation

The following example illustrates an evaluate annotation performing a logical "or" operation. If either assert annotation results in the Boolean value of true, then the evaluate result is the Boolean value of true. If both assert annotations result in the Boolean value of false, then the evaluate result is the Boolean value of false.

Evaluate annotation:

```
<evaluate andOr="or">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Mountain
storm"/>
</evaluate>
```

Assign annotation from PCT:

```
<assign applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValue="Brook
trekker"/>
```

Boolean value result: true

3.2.2.3 Recursive evaluate annotation

The following example illustrates the recursive nature of the evaluate annotation. The outer evaluate annotation performs a logical "or" operation on the results of the two inner evaluate annotations.

Evaluate annotation:

```
<evaluate andOr="or">
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Mountain
storm"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk1"/>
</evaluate>
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk9"/>
</evaluate>
</evaluate>
```

Assign annotation from PCT:

```
<assign applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValue="Brook
trekker"/><assign applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValue="Mk1"/>
```

Boolean value result: false

3.3 Generation of display text

3.3.1 Conversion of assert annotations

3.3.1.1 Textual assert annotation

Assert annotation:

```
<assert>in icy conditions</assert>
```

Human-readable format:

"in icy conditions"

3.3.1.2 Assert annotation with a single value

Assert annotation:

```
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
```

Product attribute declaration from ACT:

```
<productAttribute id="model" valuePattern=".">
<name>Model name</name>
<displayName>Model</displayName>
<descr>Model of the bike</descr>
<enumeration applicPropertyValues="Brook trekker|Mountain
storm"/>
</productAttribute>
```

Human-readable format:

"Model: Brook trekker"

3.3.1.3 Assert annotation with a multiple values

Assert annotation:

```
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker|Mountain storm"/>
```

Product attribute declaration from ACT:

```
<productAttribute id="model" valuePattern=".">
<name>Model name</name>
<displayName>Model</displayName>
<descr>Model of the bike</descr>
<enumeration applicPropertyValues="Brook trekker|Mountain
storm"/>
</productAttribute>
```

Human-readable format:

"Model: Brook trekker, Mountain storm"

Note

At presentation the vertical bar [|] is presented as a comma [,].

3.3.1.4 Assert annotation with a single range

Assert annotation:

```
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr"
applicPropertyValues="1B070643~1B070799"/>
```

Product attribute declaration from ACT:

```
<productAttribute id="serialno" productIdentifier="primary">
<name>Serial number</name>
<displayName>Serial Number (SN)</displayName>
<descr>Serial number etched on the bicycle frame</descr>
</productAttribute>
```

Human-readable format:

"Serial Number (SN): 1B070643-1B070799"

Note

At presentation the tilde [~] is presented as a hyphen [-].

3.3.1.5 Assert annotation with a combination of values and ranges

Assert annotation:

```
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr"
applicPropertyValues="1B070640|1B070642~1B070720|1B070722|1B0707
30~1B070799"/>
```

Product attribute declaration from ACT:

```
<productAttribute id="serialno">
<name>Serial number</name>
<displayName>SN</displayName>
<descr>Serial number etched on the bicycle frame</descr>
</productAttribute>
```

Human-readable format:

"SN: 1B070640, 1B070642-1B070720, 1B070722, 1B070730-1B070799"

3.3.2 Conversion of evaluate annotations

3.3.2.1 Single evaluate, logical "and" operation

Evaluate annotation:

```
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="version"
applicPropertyType="prodattr" applicPropertyValues="Mk9"/>
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr"
applicPropertyValues="1B070643~1B070799"/>
</evaluate>
```

Product attribute declarations from ACT:

```
<productAttribute id="model" valuePattern=".">
<name>Model name</name>
```

```
<displayName>Model</displayName>
<descr>Model of the bike</descr>
<enumeration applicPropertyValues="Brook trekker|Mountain
storm"/>
</productAttribute>
<productAttribute id="version">
<name>Version</name>
<displayName>Version</displayName>
<descr> Version of the bike </descr>
<enumeration applicPropertyValues="Mk1|Mk9"/>
</productAttribute>
<productAttribute id="serialno">
<name>Serial number</name>
<displayName>SN</displayName>
<descr>Serial number etched on the bicycle frame</descr>
</productAttribute>
```

Human-readable format:

"Model: Brook trekker and Version: Mk9 and SN: 1B070643-1B070799"

3.3.2.2 Single evaluate, logical "or" operation
Evaluate annotation:

```
<evaluate andOr="or">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Mountain
storm"/>
</evaluate>
```

Product attribute declaration from ACT:

```
<productAttribute id="model" valuePattern=".">
<name>Model name</name>
<displayName>Model</displayName>
<descr>Model of the bike</descr>
<enumeration applicPropertyValues="Brook trekker|Mountain
storm"/>
</productAttribute>
```

Human-readable format:

"Model: Brook trekker or Model: Mountain storm"

3.3.2.3 Multiple evaluate, mixed logical operations
Evaluate annotation:

```
<evaluate andOr="and">
<assert applicPropertyIdent="model"
applicPropertyType="prodattr" applicPropertyValues="Brook
trekker"/>
<evaluate andOr="or">
<evaluate andOr="and">
```

```
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr"
applicPropertyValues="1B070643~1B070720"/>
<assert applicPropertyIdent="SB-S001"
applicPropertyType="condition" applicPropertyValues="Post"/>
</evaluate>
<assert applicPropertyIdent="serialno"
applicPropertyType="prodattr"
applicPropertyValues="1B070721~1B070799"/>
</evaluate>
</evaluate>
```

Product attribute declaration from ACT:

```
<productAttribute id="model" valuePattern=".">
<name>Model name</name>
<displayName>Model</displayName>
<descr>Model of the bike</descr>
<enumeration applicPropertyValues="Brook trekker|Mountain
storm"/>
<productAttribute id="serialno">
<name>Serial number</name>
<displayName>SN</displayName>
<descr>Serial number etched on the bicycle frame</descr>
</productAttribute>
```

Condition declaration from CCT:

```
<condType id="SB">
<name>Service bulletin</name>
<descr>Generic service bulletin type</descr>
<enumeration applicPropertyValues="Pre|Post"/>
</condType>
```

```
<cond conTypeRefId="SB" id="SB-S001">
<name>Service bulletin (SB) S001</name>
<descr>Service bulletin S001 - Installation of the chain
guard</descr>
</cond>
```

Human-readable format:

> "Model: Brook trekker and ((SN: 1B070643-1B070720 and Service bulletin (SB) S001: Post) or SN: 1B070721-1B070799)"

3.3.3 Use of display class

An example illustrating how the civil airline community might encode an applicability annotation using the attribute `applicDisplayClass` follows:

```
<applic>
<evaluate andOr="or">
<assert applicPropertyType="prodattr"
applicPropertyIdent="serialno"
applicPropertyValues="1~10|12~34"
applicDisplayClass="ConfirmedSN"/>
<evaluate andOr="and">
```

```
<assert applicPropertyType="prodattr"
applicPropertyIdent="serialno"
applicPropertyValues="101~118|201~213"
applicDisplayClass="ConditionalSN"/>
<evaluate andOr="or" applicDisplayClass="ConditionStack">
<evaluate andOr="and" applicDisplayClass="techcond">
<assert applicPropertyType="prodattr"
applicPropertyIdent="serialno" applicPropertyValues="101~118"/>
<assert applicPropertyType="condition"
applicPropertyIdent="SB-0001"
applicPropertyValues="Post" applicDisplayClass="sb"/>
<assert applicPropertyType="condition"
applicPropertyIdent="SB-0002"
applicPropertyValues="Post" applicDisplayClass="sb"/>
</evaluate>
<evaluate andOr="and" applicDisplayClass="techcond">
<assert applicPropertyType="prodattr"
applicPropertyIdent="serialno" applicPropertyValues="201~213"/>
<assert applicPropertyType="condition"
applicPropertyIdent="SB-0002"
applicPropertyValues="Post" applicDisplayClass="sb"/>
</evaluate>
</evaluate>
</evaluate>
</evaluate>
</applic>
```

Product attribute declaration from ACT:

```
<productAttribute id="serialno">
<name>Serial number</name>
<displayName>SN</displayName>
<descr>Serial number etched on the bicycle frame</descr>
</productAttribute>
```

Condition declaration from CCT:

```
<condType id="SB">
<name>Service bulletin</name>
<descr>Generic service bulletin type</descr>
<enumeration applicPropertyValues="Pre|Post"/>
</condType>
```

```
<cond conTypeRefId="SB" id="SB-0001">
<name>SB-A350-A-25-10-0004-00A-930A-C_001</name>
<descr>Equipment/Furnishings – Cabin escape facilities – Optimize
slide girt retention flap at pax doors 1, 2 and 4</descr>
</cond>
<cond conTypeRefId="SB" id=" SB-0002">
<name> SB-A350-A-25-10-0001-00A-930A-C_002</name>
<descr>Equipment/Furnishings – Cabin escape facilities – Inspection of
slide girt retention flap for early detachment</descr>
</cond>
```

Human-readable format could be:

> "SN: 1-10, 12-34 or ((SN: 101-118, 201-213) and ((SN: 101-118 and SB-A350-A-25-10-0004-00A-930A-C_001: Post and SB-A350-A-25-10-0001-00A-930A-C_002: Post) or (SN: 201-213 and SB-A350-A-25-10-0004-00A-930A-C_001: Post)))"

This human-readable format can be hard to read and interpret. Using the display class attribute values (attribute `applicDisplayClass`), the following display can be generated, which meets specific project or organization requirements:

> **Confirmed** on SN: 1-10, 12-34
> **Conditional** on SN: 101-118, 201-213
>
> SN: 101-118 and Post SB-A350-A-25-10-0004-00A-930A-C_001 and SB A350-A-25-10-0001A-00A-930A-C_002
>
> SN: 201-213 and Post SB-A350-A-25-10-0004-00A-930A-C_001

The attribute value "`ConfirmedSN`" provides the hint to display "Confirmed on SN" prior to the values.

The attribute value "`ConditionalSN`" provides the hint to display "Conditional on SN" prior to the values.

Other display class attribute values provide the information needed to generate the desired display.

Chapter 7.9

Information processing - Business rules processing

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Table 1 References

Chap No./Document No.	Title
Chap 2.5.1	Business rules - Categories and layers
Chap 4.10	Information management - Business rules exchange

1 General

The development and maintenance of business rules is by nature mainly a manual activity. Every S1000D business rules decision point has to be considered with respect to the requirements of an organization or project trying to implement the specification. In most cases, the requirements are collected from several places, such as from customers, internal processes, distribution environment and in-house infrastructure.

To some extent, which may vary based on the circumstances, it is possible to perform automatic processing on the business rules. In particular, but not exclusively, this is the case for rules expressed in the BREX data module. This chapter offers some points of view and advice related to the validation of CSDB objects against a BREX data module.

2 BREX processing

2.1 Basics when validating objects against a BREX data module

In Chap 4.10 it is suggested that one of the use cases for the BREX data module is to utilize it for automatic validation that a data module conforms to the rules defined in a specific BREX.

A business rules checker, that makes an automatic check of a data module against the BREX data module to which it refers, can be made in many ways. Normally, and without excluding other functionality, a business rules checker would act in at least two steps:

1 Read the rules in the BREX data module and translate them into a syntax that is suitable/optimized for the checker.

2 Check the content of the data module (and additional data modules that refer to the same BREX data module) against the optimized rules.

2.2 Validating against layered BREX data modules

A data module is valid according to its BREX reference if it passes relevant rules at each BREX layer. This is accomplished by validating the data module against each BREX data module individually in the complete hierarchy of layered BREX data modules.

Note

In this context, a relevant rule means a rule with a severity code such that breaking the rule invalidates the data module.

The results from each layer validation will indicate if there is a failure on that particular layer. The complete validation will be passed if and only if there are no failures at any of the layers checked.

Note

A CSDB object can be validated against a BREX data module that is not explicitly referred to by the object. In this case, the same principle validation steps and methods apply.

Note

The above strategy does not offer any specific guidance in writing layered BREX data modules. This is the responsibility of the organization or project to which the rules apply. Refer to Chap 2.5.1.

Chapter 8

SNS, information codes and learn codes

Table of contents

Chapter	Data module title	Data module code	Applic
Chap 8	SNS, information codes and learn codes	S1000D-A-08-00-0000-00A-009A-A	All
Chap 8.1	SNS, information codes and learn codes - General	S1000D-A-08-01-0000-00A-040A-A	All
Chap 8.2	SNS, information codes and learn codes - Maintained SNS	S1000D-A-08-02-0000-00A-040A-A	All
Chap 8.2.1	Maintained SNS - Generic	S1000D-A-08-02-0100-00A-040A-A	All
Chap 8.2.2	Maintained SNS - Support and training equipment	S1000D-A-08-02-0200-00A-040A-A	All
Chap 8.2.3	Maintained SNS - Ordnance	S1000D-A-08-02-0300-00A-040A-A	All
Chap 8.2.4	Maintained SNS - General communications	S1000D-A-08-02-0400-00A-040A-A	All
Chap 8.2.5	Maintained SNS - Air vehicle, engines and equipment	S1000D-A-08-02-0500-00A-040A-A	All
Chap 8.2.6	Maintained SNS - Tactical missiles	S1000D-A-08-02-0600-00A-040A-A	All
Chap 8.2.7	Maintained SNS - General surface vehicles	S1000D-A-08-02-0700-00A-040A-A	All
Chap 8.2.8	Maintained SNS - General sea vehicles	S1000D-A-08-02-0800-00A-040A-A	All
Chap 8.3	SNS, information codes and learn codes - Example SNS	S1000D-A-08-03-0000-00A-040A-A	All
Chap 8.4	SNS, information codes and learn codes - Information codes	S1000D-A-08-04-0000-00A-040A-A	All
Chap 8.4.1	Information codes - Short definitions	S1000D-A-08-04-0100-00A-040A-A	All
Chap 8.4.2	Information codes - Full definitions	S1000D-A-08-04-0200-00A-040A-A	All
Chap 8.5	SNS, information codes and learn codes - Learn codes	S1000D-A-08-05-0000-00A-040A-A	All
Chap 8.5.1	Learn codes - Human performance technology codes	S1000D-A-08-05-0100-00A-040A-A	All
Chap 8.5.2	Learn codes - Training codes	S1000D-A-08-05-0200-00A-040A-A	All

Chapter 8.1

SNS, information codes and learn codes - General

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Chap No./Document No.	Title
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Chap 4.3.3	Data module code - Standard numbering system
Chap 8.2	SNS, information codes and learn codes - Maintained SNS
Chap 8.3	SNS, information codes and learn codes - Example SNS
Chap 8.4	SNS, information codes and learn codes - Information codes
Chap 8.5	SNS, information codes and learn codes - Learn codes

1 General

There are specific codes in the data module code that have definitions applied to them. These are:

- SNS
- information codes
- learn codes

2 SNS, information codes and learn codes

2.1 SNS

2.1.1 Maintained SNS

The maintained SNS covers the requirements for air, land and sea and is subject to CPF action in the normal manner described in Chap 1.5. A numeric, generic SNS is provided for common system information together with alphanumeric SNS specifically for air, land, sea, support and training, tactical missiles, communications, technical publications and ordnance. These SNS can be found in Chap 8.2.

2.1.2 Example SNS

A number of example SNS have been provided. The project or the organization can decide to reuse these SNS as they are or to modify them to suit their needs. These SNS are provided as examples only and will not be maintained by the S1000D Steering Committee. These are described in Chap 8.3 and are available for download on www.s1000d.org.

2.1.3 Use of the SNS

The SNS is used to codify the functional and/or physical breakdown of the Product. The project or the organization can decide to use any of the SNS given in this specification, either without change or with their own modifications. The project or the organization can also decide to create their own SNS that is not based on any of the SNS given herein. The allocation of definitions for the various levels of breakdown is given in Chap 4.3.3.

2.2 Information codes

Information codes are used to identify the type of information. The definitions of these codes are given in the form of short and full definitions. These can be found in Chap 8.4.

2.3 Learn codes

There are two types of learn codes:

- Human performance technology. These are used to identify information regarding the human performance system in which project will be used.
- Training. These are used to identify the type of information related to training but associated with the SNS and information code.

The learn codes can be found in Chap 8.5.

Chapter 8.2

SNS, information codes and learn codes - Maintained SNS

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Chap 1.3	How to use the specification
Chap 8.2.1	Maintained SNS - Generic
Chap 8.2.2	Maintained SNS - Support and training equipment
Chap 8.2.3	Maintained SNS - Ordnance
Chap 8.2.4	Maintained SNS - General communications
Chap 8.2.5	Maintained SNS - Air vehicle, engines and equipment
Chap 8.2.6	Maintained SNS - Tactical missiles
Chap 8.2.7	Maintained SNS - General surface vehicles
Chap 8.2.8	Maintained SNS - General sea vehicles

1 General

The S1000D Steering Committee maintains eight SNS.

If SNS values for the first three characters are not allocated a title/definition in the SNS tables, then these values are not available for projects. Refer to Chap 1.3.

Note

Projects can develop their own SNS based on any of the maintained SNS being aware that a project specific allocated system/subsystem can be defined differently in a future issue of the specification.

2 Content

The long and short definitions of the SNS are given in the following chapters:

- Chap 8.2.1 gives a generic numeric SNS that can be used for common and system level information
- Chap 8.2.2 gives the maintained SNS for support and training equipment
- Chap 8.2.3 gives the maintained SNS for ordnance
- Chap 8.2.4 gives the maintained SNS for general communications
- Chap 8.2.5 gives the maintained SNS for air vehicle, engines and equipment
- Chap 8.2.6 gives the maintained SNS for tactical missiles
- Chap 8.2.7 gives the maintained SNS for general surface vehicles
- Chap 8.2.8 gives the maintained SNS for general sea vehicles

3 Translation of SNS titles and definitions

A project can, by project decision, translate the titles and the definitions given to the systems/subsystems/sub-subsystems listed in Chap 8.2.1 thru Chap 8.2.8. The translation must be a direct translation without any deviations in the scope of the titles or the definitions.

Business rule decision point BRDP-S1-00549 - Translation of SNS titles and definitions:

- Decide whether to translate and use the SNS titles and the definitions in the languages adopted by the project.

Chapter 8.2.1

Maintained SNS - Generic

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2.1 Definitions of systems and subsystems 2

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9 System 09 - Handling and maneuvering 7
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Chap 4.3.3	Data module code - Standard numbering system
Chap 5.2.3.1	Land/Sea specific information sets - Crew/Operator descriptive information
Chap 5.2.3.2	Land/Sea specific information sets - Crew/Operator operation information
Chap 5.2.3.5	Land/Sea specific information sets - International, national and regulatory scheduled check information

1 General

The SNS is used in this specification as a method to describe the functional and/or physical breakdown of items of the Product. Its position in the data module code and structure is defined in Chap 4.3.3. This is an SNS that will be maintained by the S1000D Steering Committee and is subject to normal CPF action in accordance with Chap 1.5.

2 Generic SNS

The coding and definitions for the generic SNS is appropriate for common and system level information for all products and is described in Table 2. However, projects can decide not to use this generic SNS.

Table 2 Index of standard systems

System	Title
00	Product, General
01	Not available for projects
02	Available for projects
03	Available for projects
04	Worthiness (fit for purpose) limitations
05	Scheduled/unscheduled maintenance
06	Dimensions and areas
07	Lifting, shoring, recovering and transporting
08	Leveling and weighing
09	Handling and maneuvering
10	Parking, mooring, storing and return to service
11	Placards and markings
12	Servicing
13	Available for projects
14	Product loading and offloading
15	Crew information
16	Change of role
17	Available for projects
18	Vibration and noise analysis and attenuation
19	Available for projects **Note** This system is used for breaking down the information for land and sea systems. Refer to Chap 5.2.3.5.

2.1 Definitions of systems and subsystems

The SNS for the basic systems of the Product are given in Table 3 thru Table 16.

Table 3 System 00 - Product, General

System	Subsystem	Title	Definition
00		Product, General	General information for the complete Product, procedures for the Product safety and general Product maintenance, use of the Product safety and protective devices, information on the technical publication required to support the Product.
	-00	Product, Description	General description with illustrations of the Product and its systems to include type of Product, its roles, accommodation, salient constructional features, power system installation, systems and operational equipment.
	-10	Product, General maintenance	Those instructions necessary for the Product maintenance condition, electrical (static) grounding.
	-20	Product, Safety	Those specific or Product peculiar instructions necessary to make safe and prepare the Product for maintenance action. Includes instructions for returning the Product to its serviceable state.
	-30	Safety and protective devices	Those instructions necessary for the use or operation of devices such as safety pins, safety locks, safety pin flag assemblies, safety struts, safety strut extensions, etc. Instructions for removal and installation of protective covers, bungs, blanks, etc, are to be included.
	-40	Technical publication	Information on the technical publication required to support the Product (not a technical publication project in its own right) such as the Lists of Applicable Publications, Publication Guide, the coding system of technical publications, instruction for handling and updating technical publication.
	-41	Publications	Information on the suite of publications that are required by the customer.
	-42	Information Sets	Information on the information sets that were used to produce the suite of publications that are required by the customer.
	-50	Material data	Information concerning all material (products) used for the maintenance of the complete Product and its systems.
	-60 thru -80	Available for projects	
	-90	Battle damage repair	Information and data which cannot be allocated to a specific SNS because the involved zone of the Product contains more than one hardware "system".

Table 4 System 04 - Worthiness (fit for purpose) limitations

System	Subsystem	Title	Definition
04		Worthiness (fit for purpose) limitations	This System provides guidance for the calculation of lives for critical items/components and defines the operating parameters for such calculations.

System	Subsystem	Title	Definition
	-00	General	
	-10	Fatigue index calculations	Procedures and formulae for calculating Fatigue Index/Fatigue Lives of the Product structure from Fatigue Meter readings.
	-20	Operating spectrums	Assumed operating spectrums for the Product from which the safe fatigue lives are calculated.

Table 5 System 05 - Scheduled/unscheduled maintenance

System	Subsystem	Title	Definition
05		Scheduled/ unscheduled maintenance	Manufacturers' recommendation for time limits inspection (both scheduled and unscheduled).
	-00	General	
	-10	Time limits	Those manufacturer recommended time limits for maintenance and overhaul of the Product, its systems and subassemblies, and life of its parts.
	-20	Scheduled maintenance checks lists	A list of the manufacturer recommended scheduled and unscheduled maintenance checks and inspections, including operating tests applicable to the Product, its systems and subassemblies. The checks listed at -40, -50 and -60 must be included.
	-30	Available for projects	
	-40	Scheduled maintenance checks	Those manufacturer recommended maintenance checks and inspections of the Product, its systems and subassemblies dictated by the time limits specified in -10 above. This section lists in more detail the items which are outlined on the user job forms (usually by title only) and cross references the detailed procedures included in the individual maintenance practices.
	-50	Unscheduled maintenance checks	Those maintenance checks and inspections on the Product, its systems and subassemblies which are dictated by special or unusual conditions which are not related to the time limits specified in -10 above.
	-60	Acceptance and functional check usage	Those current status functional checks necessary to fulfill inspection requirements to prove the safety/usage of all components and systems following delivery or maintenance activities.
	80	Maintenance allocation	The maintenance authority and responsibility for the performance of maintenance functions on a Product, including grouped maintenance functions (where necessary), lists of tools and lists of remarks.

Table 6 System 06 - Dimensions and areas

System	Subsystem	Title	Definition
06		Dimensions and areas	Those illustrations and text which show the principal dimensions and shapes of the Product and the zones, areas and reference lines used to locate subassemblies/components. It also includes all access and drainage provisions.
	-00	General	
	-10	Principal dimensions	To include a conventional 3-view illustration of the Product with principal dimensions.
	-20	Reference lines	To include a system for locating subassemblies/components in relation to the Product reference lines.
	-30	Zones and areas	To include Product subdivision by zone/area to identify the zone/area in which the maintenance task is done.
	-40	Access provisions	To identify all access doors and panels, and maintenance access points. **Note** Walkways are covered in System 12.
	-50	Master shapes	To define the master shape by representing in three dimensions the exterior and interior shapes of the Product, including: – Internal and external product master shapes to be used by lead function as reference surfaces to design product parts – Simplified and adapted master shapes for physical mock-up manufacturing (for tests, for exhibitions, etc) – Specific shape profiles provided for aerodynamics studies and computation (as wind tunnel test, computational fluid dynamics, etc) – Specific proposals of style and shape for system and equipment integration

Table 7 System 07 - Lifting, shoring, recovering and transporting

System	Subsystem	Title	Definition
07		Lifting, shoring, recovering and transporting	Includes all necessary procedures to lift the Product with jacks or slings, and to recover it in any of the conditions to which it can be subjected, including maintenance and repair. It also includes information on recovering the Product from any condition to which it can be subjected (including emergency recovering) and how to transport it by air/road/rail, etc.
	-00	General	
	-10	Jacking	Information on jacking points, adapters, balance weights, jacking procedures and the jacks used to lift the Product during Product maintenance, repair and recovery.
	-20	Shoring	Information on shoring points, shoring procedures and the shoring equipment used during Product maintenance, repair and recovery.

System	Subsystem	Title	Definition
	-30	Slinging	Information on slinging points, slinging procedures and the slings used to lift the Product during maintenance, repair and recovery.
	-40	Recovering	Information on recovery procedures and the tools and equipment required to recover the Product from any condition to which it can be subjected, including emergency recovery.
	-50	Transporting	Information on how to dismantle the Product to a standard of breakdown consistent with the Product in which it can have to be transported. Information for the manufacture of transportation sledges or pallets. For removal procedures and maintenance information, refer to appropriate system/subsystem.

Table 8 System 08 - Leveling and weighing

System	Subsystem	Title	Definition
08		Leveling and weighing	This System includes the necessary information to level the Product for any of the various maintenance, overhaul or major repairs which becomes necessary during the life of the Product. It also includes those on- Product subassemblies or components which are specifically dedicated to record, store or compute mass and balance data. Includes those maintenance practices necessary to prepare the Product for weighing and the weighing procedure. Mass and center of gravity (c.g.) data also to be included.
	-00	General	
	-10	Mass and balance	Those subassemblies or components on the Product dedicated to the specific function of recording, storing or computing mass and balance data.
	-20	Leveling	Those instructions necessary to prepare the Product for leveling and the leveling procedure. Includes information on the leveling equipment used.
	-30	Weighing	Those instructions necessary to prepare the Product for weighing and the weighing procedure. Includes information on the weighing equipment used. To include limits of variation allowed between physical recorded mass and calculated mass based and specific Product record.

System	Subsystem	Title	Definition
	-40	Mass and c.g. data	Mass and moment or index information characteristic of the Product, limitations, datum points and lines, center of gravity, range, mass and balance management of the fuel and other expendable loads, residual fuel, ballast and the effects of role change. Can include: - Expression of c.g. as a percentage of Mean Aerodynamic Chord (MAC) - Diagram of c.g. envelope and equipment location charts if necessary - Effect on the c.g. position of dropping or picking up stores (with an example) Relevant equipment included in the basic mass, plus variable equipment (ie, "role" or "fit-list" equipment), tabulated and showing mass, load arm and moment or index of each item. Relationship between the Product and ECU datum lines including the jet pipe and/or propeller datum lines and the effect of an ECU change (with a worked example).
08	-50	Static stability	Information detailing the static stability limits of the Product. Can include information required to determine the minimum nose wheel reaction necessary to ensure that the Product is stable about its main wheels whilst being moved and whilst static during servicing operations, and to ensure the Product remains stable during jacking operations. Can include tabular and graphical data for the calculation of nose wheel reaction in relation to Product mass and residual moment for both a fully equipped Product and for situations where items of equipment/stores have been removed or the fuel state is outside the normal sequence. Safety precautions and limitations cover de-fueling sequences, maximum movement speeds and movement on gradients or over rough ground.

Table 9 System 09 - Handling and maneuvering

System	Subsystem	Title	Definition
09		Handling and maneuvering	Those instructions necessary to handle and taxi the Product. Illustrations showing the location of attachment points, turning radius, etc, are included. Includes those maintenance procedures necessary to prepare the Product for handling and taxiing.
	-00	General	
	-10	Handling	Those instructions necessary to tow, winch or handle the Product in normal or other conditions such as towing and handling with engines removed, berthing sea vessels, etc. It includes the equipment and materials required such as tow bars, steering arms, towing cables/bridles, etc, safety precautions and limitations.

System	Subsystem	Title	Definition
	-20	Maneuvering	Those instructions necessary to maneuver or taxi the Product in normal or abnormal conditions such as adverse weather conditions, etc. It includes procedures to be used such as use of engines, interphone and brakes, ground turning techniques, etc, safety precautions and limitations such as exhaust danger areas, minimum turning radius, friction coefficients for various ground conditions, etc.

Table 10 System 10 - Parking, mooring, storing and return to service

System	Subsystem	Title	Definition
10		Parking, mooring, storing and return to service	This System is to contain the necessary information to park, moor and/or store the Product in all conditions to which it can be subjected. Where appropriate, it is to include the procedures to prepare for parking, mooring and storing and any related return to service requirements. Illustrations, where appropriate, are to show, for example, locations of any fixing or mooring points and any controls used in the parking/mooring and storing procedure.
	-00	General	
	-10	Parking	Information necessary to park the Product in all weather conditions, where parking is considered as a routine short-term activity (eg, overnight, over-weekend) performed on a serviceable Product (ie, where return to service can normally be expected to be accomplished by a standard pre-operation check). Includes equipment required.
	-20	Mooring	Information necessary to moor the Product under all weather conditions, where mooring is considered as a long or short-term activity whose purpose is to tie down or otherwise secure the unit. Must also include information such as special techniques applicable to ballasting, installation and use of special support equipment applicable to mooring (eg, installation of tie-down rings to strong points) precautions and limits for the safety of the Product in high wind conditions, etc.

System	Subsystem	Title	Definition
	-30	Storing	Information necessary to store the Product in normal or abnormal conditions under all weather conditions, where storing is considered as a non-operational period of long or short-term duration in excess of that defined for parking. It includes all appropriate inspection and preventive maintenance to safeguard structural and system integrity during storage. Where applicable, a stored Product can also be moored. Mooring during storage is covered under Section -20, not integrated within Section -30. This includes equipment required. It also includes information concerning, but not limited to: – techniques for entry into and removal from storage (eg, cleaning and inhibition/de-inhibition), fluid system draining/replenishing, static grounding, protective blanking, etc – timescales for routine in-storage maintenance such as wheel rotation, pressure checks, engine running, etc – procedures or techniques uniquely applicable to long or short-term storage (project-defined terms) – preparation of the Product after storage and return to service
	-40	Return to Service	Those instructions necessary to prepare the Product for operation following mooring, parking or a period of storage.

Table 11 System 11 - Placards and markings

System	Subsystem	Title	Definition
11		Placards and markings	All procurable placards, labels, etc, is included in the Illustrated Parts Catalog. They are illustrated, showing the part number, legend and location. The maintenance publications must provide the approximate location (eg, FWD UPPER RH) and illustrate each placard, label, marking, self-illuminating sign, etc, required for safety information, maintenance significant information or by government regulations. Those required by government regulations are so identified.
	-00	General	
	-10	Exterior color schemes and markings	The specifications and requirements covering Product exterior color schemes and markings.
	-20	Exterior placards and markings	Those placards and markings required for ground servicing instructions, inspections, cautions, warnings, etc.
	-30	Interior placards and markings	Those placards, markings self-illuminating signs, etc, required for interior general and emergency information, instructions, cautions, warnings, etc.

Table 12 System 12 - Servicing

System	Subsystem	Title	Definition
12		Servicing	Those instructions for the replenishment and depletion of fluids, scheduled and unscheduled servicing, applicable to the whole Product. The information is concise and preferably in tabular or chart form. Precautions to be observed in servicing a particular container (eg, tank, reservoir, bottle, LOX converter, tire) such as grounding and prevention of fire hazards, is clearly stated. A diagram showing the location of regular and emergency servicing points is included. "No-step" areas or walkways, with necessary precautions, are indicated.
	-00	General	
	-10	Replenishing and depleting	Those instructions necessary for the replenishment or depletion of fluids. Container capacities in US, imperial and SI units of measure are included. ANA or other standard specification number and grade (if applicable) of fuel, oil, fluid, and other material used are given. Specifications and grades should be shown grouped on one page to facilitate revisions. For fuel, give expansion volume, total fuel capacity, sump capacity, net fuel capacity (as applicable) for each tank. For oil give allowance for expansion.
	-20	Scheduled servicing	Those instructions necessary to carry out servicing that can be scheduled. Includes instructions such as those for periodic lubrication of components, radioactivity decontamination, Product external and internal cleaning, etc. It does not include lubrication procedures required for the accomplishment of maintenance practices.
	-30	Unscheduled servicing	Those instructions necessary to carry out servicing that is normally unscheduled. Includes instructions such as those for ice and snow removal from parked Product.

Table 13 System 14 - Product loading and offloading

System	Subsystem	Title	Definition
14		Product loading and offloading	This System contains those procedures and illustrations necessary to load and offload internal and external stores and munitions and cargo. The System also contains information on the support equipment and special tools required. Cross-references are made to applicable systems for information on the Product attachment points, pylons and carriers.
	-00	General	
	-10	Support equipment	A list of all support equipment and special tools, also information and illustrations as necessary on those items not covered in other documentation.

System	Subsystem	Title	Definition
	-20	Cargo	Examples of loading and offloading techniques, interior layout, floor loadings, location and strength of lashing points, methods of stowing and securing, capacities and dimensions of compartment and doors.
	-30	Internal and external stores	A list of stores carried and the carrier/adapter on which they are fitted.
	-31	Basic information	Includes the basic information on internal and external stores.
	-32	Supplementary information	Includes any supplementary information on internal and external stores.
	-33	Loading procedures	Includes the loading procedures for internal and external stores.
	-34	Offloading procedures	Includes the offloading procedures for internal and external stores.
	-35	Loading and offloading procedures checklists	Includes the checklists for loading and offloading of internal and external stores.
	-40	Non-nuclear munitions	A list of the non-nuclear munitions (eg, rockets, missiles, bombs, ammunition) and the carrier/adapter on which they are fitted.
	-41	Basic information	Includes the basic information on non-nuclear munitions.
	-42	Supplementary information	Includes any supplementary information on non-nuclear munitions.
	-43	Loading procedures	Includes the loading procedures for non-nuclear munitions.
	-44	Offloading procedures	Includes the offloading procedures for non-nuclear munitions.
	-45	Loading and offloading procedures checklists	Includes the checklists for loading and offloading for non-nuclear munitions.
	-46	Integrated combat turnaround procedures	Includes information on integrated combat turnaround procedures.
	-47	Integrated combat turnaround procedures checklists	Includes the checklists for integrated combat turnaround procedures.
	-48	Cross servicing checklists	Includes the checklists for cross servicing for non-nuclear munitions.

System	Subsystem	Title	Definition
	-50	Nuclear munitions	A list of the nuclear munitions and the carrier/adapter on which they are fitted.

Table 14 System 15 - Crew information

System	Subsystem	Title	Definition
15		Crew information	This System provides all specific information given to crew for performing all the designed missions of the Product. Description and function of the Product systems, system controls and installed equipment are included only to the extent that the information is essential to crew/operators and is not covered in the relevant system (21 and up). **Note** Sub-subsystem 15-04, 15-05 and 15-06 are used for breaking down the information for land and sea systems. Refer to Chap 5.2.3.1 and Chap 5.2.3.2.
	-00	General	This section contains an introduction which gives a general overview of the salient features of the Product.
	-10	Aircraft release/operating limitations	This section contains all limitations that must be observed throughout the cleared operating envelope.
	-20	Operational characteristics	This section contains a comprehensive description of the operational characteristics of the Product including both those advantageous and those undesirable.
	-30	Normal procedures	This section contains in narrative and/or checklist form all normal procedures required to accomplish operation. Procedures for special conditions such as scramble or missions requiring intermediate operational stops re included. This section also contains the handling of installed equipment, which is not satisfactorily covered in the systems with regard to crew.
	-40	Emergency procedures	This section contains in narrative and/or checklists form the procedures to be followed to meet any emergency that could reasonably be expected.
	-41	General	Includes general information on crew/operator emergency procedures.
	-42	Ground emergencies	Includes information on crew/operator ground based emergency procedures.
	-43	Initialization emergencies	Includes information on crew/operator initialization emergency procedures.
	-44	System related emergencies	Includes information on crew/operator system related emergency procedures.

System	Subsystem	Title	Definition
	-45	Single or multi-engine failures	Includes information on crew/operator single or multi-engine emergency failure procedures.
	-46	Arrival/Disembarking emergencies	Includes information on crew/operator arrival/disembarking emergencies.
	-47	Control system failures	Includes information on control system failures.
	-48	Other emergencies or failures	Includes information on other emergencies or failures.
	-49	Multi-function display readouts giving emergency information	Includes information on crew/operator multi-function display related emergencies.
	-50	Special conditions	This section contains information pertaining to the operation of the Product under special conditions (eg, adverse weather and climatic conditions).
	-60	Performance data	This section contains the Product performance data required by the project and agreed upon in the Performance Substantiation document.
	-70	Role Operation/Weapon system procedures	This section contains in narrative and/or checklist form all normal and reversionary procedures relating to role operation and the role/weapons systems not covered in the relevant systems (21 and up). All relevant safety requirements must be specified.
	-80	Configuration	This section contains the various stores configurations, including weapons and fuel tanks, carried both internally and externally and should include details of the effect on weight, drag index, limitations.

Table 15 System 16 - Change of role

System	Subsystem	Title	Definition
16		Change of role	Those instructions necessary to change the Product from one role to another.
	-00	General	List of the primary and secondary roles of the Product, and the role equipment to be removed/installed, presented in tabular format.
	-10	Role changes	Individual procedures to cover all changes from any one role to any other role including any necessary testing.

Table 16 System 18 - Vibration and noise analysis and attenuation

System	Subsystem	Title	Definition
18		Vibration and noise analysis and attenuation	This System provides the necessary information to enable operators to monitor and diagnose vibration and noise levels in order to identify imbalance, damage or misalignment in the Product dynamic and structural components. It also includes those Product and components which furnish a means of automatically controlling and/or reducing the force and/or value of the levels of vibration and/or noise within the Product through the use of active or passive systems/equipment.
	-00	General	
	-10	Vibration analysis	Those instructions necessary to monitor, measure, diagnose and locate sources of vibration in dynamic and structural components.
	-20	Noise analysis	Those instructions necessary to monitor, measure, diagnose and locate sources of noise in dynamic and structural components.
	-30	Active attenuation/actuation	That portion of the system which from a power source ensures distribution to the system and provides a physical means of reducing vibration. Included are items such as actuating mechanisms, control valves, motors, plumbing, etc.
	-40	Sensing	Those subassemblies or components which provide a means of detecting vibration levels and conveying information to the control computing or indicating systems. Includes items such as accelerometers.
	-50	Control/computing	Those Product or components used for processing data, from multiple sources, employed to activate and control attenuation systems. Includes items such as computers, switches, etc.
	-60	Passive attenuation	Those Product and components which provide a means of passive attenuation. Includes items such as vibration absorbers, suspension bars, etc.

Chapter 8.2.2

Maintained SNS - Support and training equipment

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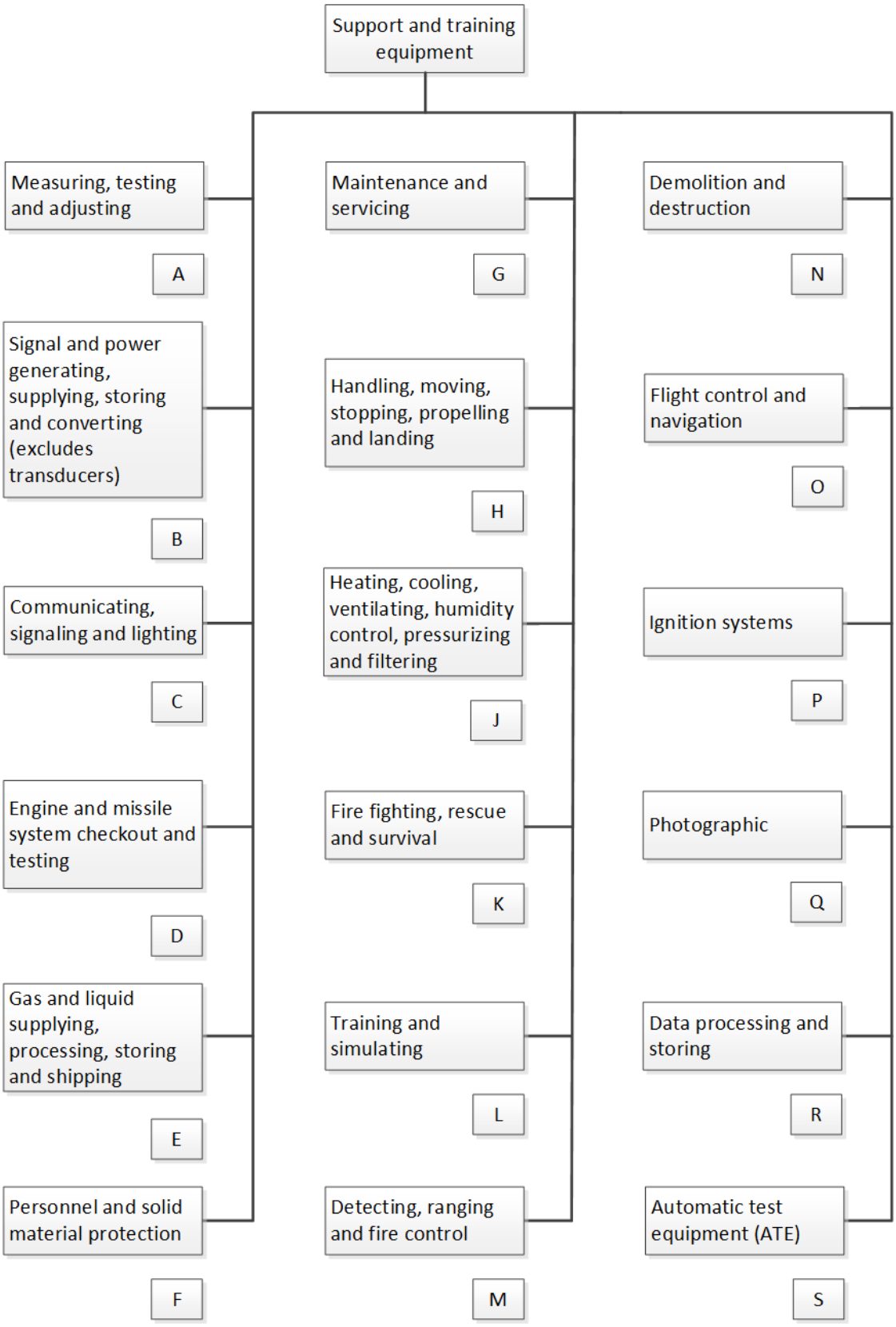
Chap No./Document No.	Title
Chap 1.5	Request for change
Chap 4.3.3	Data module code - Standard numbering system

1 General

The SNS is used in this specification as a method to describe the functional and/or physical breakdown of items of the Product. Its position in the data module code and structure is defined in Chap 4.3.3. This is an SNS that will be maintained by the S1000D Steering Committee and is subject to normal CPF action in accordance with Chap 1.5.

2 Support and training equipment SNS

The coding and definitions for the support and training equipment SNS are appropriate for common and system level information for all Products and is described in Table 2 and shown in Fig 1. However, projects can decide not to use this generic SNS. Business rules decision points are given at Para 2.



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Fig 1 Top level breakdown for support and training equipment

2.1 System breakdown

2.1.1 Main systems

This support and training equipment SNS is divided into systems categories.

Table 2 Top level breakdown for support and training equipment

System	Title
A	Measuring, testing and adjusting
B	Signal and power generating, supplying, storing and converting (excludes transducers)
C	Communicating, signaling and lighting
D	Engine and missile system checkout and testing
E	Gas and liquid supplying, processing, storing and shipping
F	Personnel and solid material protection
G	Maintenance and servicing
H	Handling, moving, stopping, propelling and landing
I	Not available for projects
J	Heating, cooling, ventilating, humidity control, pressurizing and filtering
K	Fire fighting, rescue and survival
L	Training and simulating
M	Detecting, ranging and fire control
N	Demolition and destruction
O	Flight control and navigation
P	Ignition systems
Q	Photographic
R	Data processing and storing
S	Automatic test equipment (ATE)
T	Not available for projects

2.2 Definition of systems category and subcategory

2.2.1 System category A - Measuring, testing and adjusting

Table 3 System category A - Measuring, testing and adjusting

System	Title	Definition
A	Measuring, testing and adjusting	

System	Title	Definition
AA	Voltage, current and resistance measuring and indicating	Includes voltage, current and resistance measuring, voltage leakage, short circuit, continuity and cable testing and multimeters.
AB	Standing wave ratio and impedance measuring	Includes standing wave ratio, impedance and related parameter measuring.
AC	Waveform measuring and analyzing	Includes oscillographs, oscilloscopes, synchroscopes, waveform and spectrum analyzing.
AD	Power and mechanical energy measuring	Includes electrical power measuring (including metered loads), radiated (non-cabled) and mechanical power measuring.
AE	Intensity measuring	Includes mechanical force, sound and light measuring, motion, displacement, impact, electric and magnetic field detecting and measuring, infrared, ultraviolet, X and nuclear radiation detecting and measuring.
AF	Acceleration, velocity, rate, frequency and time measuring and counting	Includes acceleration, velocity, rate and mechanical frequency measuring, electrical frequency measuring and indicating, mechanical and electrical counting, reference time, elapsed time and duration measuring and interval measuring (chronoscopes).
AG	Optical measuring, testing and aligning	Includes collimation and similar optical measuring, spectroscopic, spectrographic and microscopic testing, photographic measuring and testing.
AH	Material measuring and testing	Includes physical dimension, weight, density, volume, pressure, stress and strain, tension and compression, static and dynamic balance measuring, shock testing, solid, liquid and gas analysis.
AJ	Multifunction measuring and testing (excludes engines and missile systems but includes most test sets)	Includes electronic, electrical, mechanical and hydraulic systems and components testing, circuit board, circuit card, electron tube, semiconductor, relay, selsyn, synchro, etc testing.
AK	Standards and calibration equipment for measuring and testing	Includes calibration equipment for voltage, current and resistance measuring devices, SWR, impedance and related parameters, waveform measuring and analyzing devices, power, mechanical energy and intensity measuring devices, velocity, frequency and time measuring devices, optical devices, material measuring and testing devices.
AL	Active devices for test purposes (excludes most test sets)	Includes transducers, active filters, active mixers and modulators, active couplings matching and distribution devices, test amplifiers, active terminations and dummy loads.

System	Title	Definition
AM	Passive devices for test purposes (excludes most test sets)	Includes variable resistors and unqualified variable attenuators, variable capacitors, variable inductances, passive electrical coupling matching and distribution devices (including fixed attenuators and most dividers and probes), passive electromagnetic and electro-static coupling, matching and distribution devices (including inductive voltage dividers and probes), mounting devices and passive mechanical coupling devices, passive filters, passive delay devices, passive non-power measuring terminations and dummy loads, passive mixer, modulator and detectors.
AN	Nondestructive inspection and oil analysis	Includes fluorescent penetrant, magnetic particle, X-ray, ultrasonic, eddy current, oil analysis and acoustic emission.

2.2.2 System category B - Signal and power generating, supplying, storing and converting (excludes transducers)

Table 4 System category B - Signal and power generating, supplying, storing and converting (excludes transducers)

System	Title	Definition
B	Signal and power generating, supplying, storing and converting (excludes transducers)	
BA	Signal generating	Includes AM/FM pulse-modulated, audio, sweep, square-wave, triangular-wave, saw tooth etc generators, random noise and noise generators and waveform synthesizers.
BB	Electrical power supplying, generating, storing and converting	Includes electrical generators, converters, inverters, dynamotors, power supplies and battery chargers, transformers and distribution networks.
BC	Mechanical, hydraulic, pneumatic and vacuum power supplying, storing and converting	Includes mechanical power supplying, storage and converting (including motors, turbines etc), general purpose compressing and pumping, hydraulic and pneumatic power and vacuum generating and storing, mechanical, hydraulic, pneumatic and vacuum devices (including those which also supply power).

2.2.3 System category C - Communicating, signaling and lighting

Table 5 System category C - Communicating, signaling and lighting

System	Title	Definition
C	Communicating, signaling and lighting	

System	Title	Definition
CA	Communicating (excludes headsets, loudspeakers, etc)	Includes intercommunication systems, public address systems, non-airborne and airborne multifunction and special purpose communication devices.
CB	Signaling	Includes signal lights, mechanical signaling devices and special purpose signaling devices.
CC	Lighting	Includes area, search, marking and identification lighting and special purpose lighting.

2.2.4 System category D - Engine and missile system checkout and testing

Table 6 System category D - Engine and missile system checkout and testing

System	Title	Definition
D	Engine and missile system checkout and testing	
DA	Engine checkout and testing	Includes automotive engine, air vehicle engine and missile engine testing and general and special purpose engine testing. Note: This code is also applicable to engine modules and accessories.
DB	Missile system checkout and testing	Includes missile guidance, missile target or flight programming, missile telemetering and training, missile hydraulic, pneumatic and fuel systems checkout, miscellaneous missiles system checkout and testing and missile countdown equipment.

2.2.5 System category E - Gas and liquid supplying, processing, storing and shipping

Table 7 System category E - Gas and liquid supplying, processing, storing and shipping

System	Title	Definition
E	Gas and liquid supplying, processing, storing and shipping	
EA	Gas storage, processing, supplying and shipping	Includes gas storage containers, gas storage processing, supplying and shipping equipment and vehicles and multipurpose and special purpose gas handling equipment.
EB	Liquid storage, processing, supplying and shipping	Includes liquid storage containers, liquid storage, processing, supplying and shipping equipment and vehicles and multipurpose and special purpose liquid handling equipment.

2.2.6 System category F - Personnel and solid material protection

Table 8 System category F - Personnel and solid material protection

System	Title	Definition
F	Personnel and solid material protection	
FA	Shelters and chambers	Includes personnel and maintenance shelters, test chambers and test shelters, special purpose and multipurpose shelters and chambers.
FB	Protective deflectors, shields, screens and coverings	Includes deflectors, shields, screens, protective coverings, miscellaneous protective equipment.
FC	Supports for shoring and shipping	Includes supports for storing and shipping.
FD	Special purpose and multipurpose devices	Includes special purpose and multipurpose devices.
FE	Flight clothing and accessories	Includes flight clothing and accessories.

2.2.7 System category G - Maintenance and servicing

Table 9 System category G - Maintenance and servicing

System	Title	Definition
G	Maintenance and servicing	
GA	General mechanical cleaning, degreasing and scaling	Includes pressure and vacuum cleaners, spray cleaners and degreasers, scalars, special purpose and multipurpose cleaning devices.
GB	Deicing and decontaminating	Includes deicing and decontaminating equipment.
GC	Road and runway cleaning and repairing	Includes road and runway cleaning and repairing, combination and special purpose road and runway cleaning and repairing and associated devices.
GD	Lubricating	Includes oiling and greasing equipment and special purpose lubricating equipment.
GE	Wheel, tire and mechanical system servicing	Includes wheel and tire servicing, brake, hydraulic and pneumatic systems servicing and special purpose and multipurpose mechanical system servicing.

System	Title	Definition
GF	Special purpose and multipurpose servicing	Includes maintenance tool sets, kits and machines, repair kits, maintenance trailers, welding machines, purging units, spray outfit preservation units, etc.
GG	Maintenance platform, stands, supports and accessories	Includes maintenance platforms and stands for personnel, equipment supports, weapon and special purpose supports and maintenance accessories.
GH	Special machines	Includes maintenance tools, (eg, extractors, guiders, stackers, specific spanners) and also other means such as complex machines/parts interfaces.

2.2.8 System category H - Handling, moving, stopping, propelling and landing

Table 10 System category H - Handling, moving, stopping, propelling and landing

System	Title	Definition
H	Handling, moving, stopping, propelling and landing	
HA	Hoisting, jacking, lifting, towing and positioning	Includes hoisting, lifting, jacking, erecting and towing equipment and special purpose and multipurpose lifting and positioning equipment.
HB	Transporting of equipment and solid material	Includes powered trucks and tractors, hand trucks, carts, dollies, trailers, transporting vehicles and devices, accessory equipment for transporting, delivery and recovery systems, tires and tubes.
HC	Launching	Includes air vehicle, guided missile, rocket and space vehicles launching equipment and special purpose and multipurpose launching equipment.
HD	Arresting, parking and securing	Includes auxiliary braking, emergency braking and arresting, securing, checking, looking and parking and similar storing.
HE	Special purpose and multipurpose handling and moving	Includes combined lifting and moving vehicles and equipment (trailers, dollies and cradles for air vehicle equipment and components handing, installation, removal, transportation and storage; handling adapter sets; trailers for ammunition lifting and transportation; trucks for loading munitions, fuel tanks, pylons and special weapons onto air vehicles, etc).
HF	Propulsion system	Includes rocket engines, motors and hybrids, reciprocating engines, turbine engines and miscellaneous engines and components.

2.2.9 System category J - Heating, cooling, ventilating, humidity control, pressurizing and filtering

Table 11 System category J - Heating, cooling, ventilating, humidity control, pressurizing and filtering

System	Title	Definition
J	Heating, cooling, ventilating, humidity control, pressurizing and filtering	
JA	Heating	Includes area heating equipment and special purpose and multipurpose heating equipment.
JB	Air cooling and air conditioning	Includes air cooling and air conditioning equipment and special purpose and multipurpose cooling equipment.
JC	Ventilating and air circulating	Includes ventilating and air circulating and special purpose and multipurpose ventilating and air conditioning equipment.
JD	Humidity controlling	Includes humidity reducing, humidity increasing, constant humidity equipment and special purpose and multipurpose humidity controlling equipment.
JE	Refrigerating	Includes general purpose refrigerating equipment and special purpose and multipurpose pressurizing equipment.
JF	Multipurpose and special purpose equipment	Includes multipurpose and special purpose heating, cooling, ventilating and humidity control equipment.
JG	Pressurizing	Includes compartment pressurizing and special purpose and multipurpose pressurizing equipment.
JH	Water cooling	Includes engine cooling systems and components and special purpose and multipurpose water cooling equipment.
JI	Filtering	Includes pneumatic and liquid filtering and special purpose and multipurpose filtering equipment.

2.2.10 System category K - Fire fighting, rescue and survival

Table 12 System category K - Fire fighting, rescue and survival

System	Title	Definition
K	Fire fighting, rescue and survival	
KA	Fire fighting, crash and rescue equipment	Includes fire fighting, crash, rescue equipment and special purpose and multipurpose fire fighting, crash and rescue equipment.
KB	Survival equipment and devices	Includes survival tools and accessories, survival vehicles and special purpose and multipurpose survival items.

2.2.11 System category L - Training and simulating

Table 13 System category L - Training and simulating

System	Title	Definition
L	Training and simulating	
LA	Pilot and flight crew flight simulators	Includes basic flight and advanced flight simulator trainers, instrument, flight trainers and mobile training units.
LB	Ground crew training flight simulators	Includes flight principle trainers, flight control, navigation, warning indicator instrument system trainers, mechanical and electrical systems trainers, engine operation and maintenance trainers, aircraft servicing equipment trainers and mobile training units.
LC	Armament trainers	Includes stationary airborne gunnery, free airborne gunnery, airborne rocketry, high altitude bombing, ground support bombing, armament components and multipurpose armament trainers and mobile training units.
LD	Navigation trainers	Includes dead-reckoning, celestial, electronic and crew navigation trainers, mobile and aerospace navigation training units.
LE	Radar and communications trainers	Includes primary and advanced communications equipment trainers, primary and advanced radar equipment trainers and radar countermeasures trainers.
LF	Psychological and psycho-physiological trainers	Includes low pressure chambers, ejection seat trainers, underwater escape trainers and other survival procedures, space environment and vertigo simulator trainers.
LG	Ground-to-ground and ground-to-air missile trainers	Includes ground crew, missile operation and maintenance trainers, launch control and flight control equipment trainers.
LH	Special project trainers	Includes synthetic warfare tactics trainers and combat information centers equipment trainers.
LJ	Training aids	Includes charts and posters, maneuvering boards and demonstrator panels, self instruction cards, training manuals, three-dimensional models, projectors, sound recorders and reproducers, training films and recordings and miscellaneous classroom teaching aids.
LK	Command training programs (tangible items)	Includes service-school training programs and activity training programs.
LL	Miscellaneous training and simulating devices	Includes automotive and airfield training devices, simulators for material testing, hydraulic, pneumatic, oxygen, fuel, air systems training, dummy guided missiles, simulated bombs for test aid training purposes, training dummy or practice warhead and aircraft simulated rockets.

2.2.12 System category M - Detecting, ranging and fire control

Table 14 System category M - Detecting, ranging and fire control

System	Title	Definition
M	Detecting, ranging and fire control	
MA	Detecting, range bearing and search	Includes transmitting, receiving, designating, indicating and locating equipment.
MB	Directing	Includes computing sights and devices, optical sighting and ranging, stabilizing mechanisms and transmitting and receiving equipment.
MC	Miscellaneous fire control	Includes fuse setters, ordnance cable system, aiming circles, flash and round ranging sets.

2.2.13 System category N - Demolition and destruction

Table 15 System category N - Demolition and destruction

System	Title	Definition
N	Demolition and destruction	
NA	Guns	Includes air vehicle and non air vehicle guns, ammunition feeders, loaders, storage drums, etc.
NB	Ammunition	Includes dummy or blank ammunition, tracer projectiles, live or special purpose ammunition.
NC	Bombs, rockets and missiles	Includes photo flashing, chemical warfare, general purpose, practice, guided or drones bombs and rockets and warheads and explosive components.

2.2.14 System category O - Flight control and navigation

Table 16 System category O - Flight control and navigation

System	Title	Definition
O	Flight control and navigation	
OA	Automatic flight or remote control	Includes guided missiles and spaces vehicles.
OB	Navigation	Includes airborne and non airborne direction finding equipment.

2.2.15 System category P - Ignition systems

Table 17 System category P - Ignition systems

System	Title	Definition
P	Ignition systems	
PA	Engine ignition system	Includes air vehicle and non air vehicle ignition systems.
PB	Special ignition systems	Includes special purpose and multipurpose ignition systems.

2.2.16 System category Q - Photographic

Table 18 System category Q - Photographic

System	Title	Definition
Q	Photographic	
QA	Picture taking equipment	Includes strike recording, aerial mapping, still and motion pictures.
QB	Picture processing equipment	Includes processing mechanisms, developers, washers and driers.
QC	Picture using equipment	Includes still projectors, motion picture projectors and viewing devices.

2.2.17 System category R - Data processing and storing

Table 19 System category R - Data processing and storing

System	Title	Definition
R	Data processing and storing	
RA	Analog computing	Includes all analog computing devices.
RB	Digital computing	Includes all digital computing devices.
RC	Hybrid computing	Includes all computing equipment that is a hybrid of analog and digital.
RD	Input/output and storage	Includes all input and out devices such as keyboards, mice, displays, projectors, flash cards, hard disks and other storage media.
RE	Collating, reading and interpreting	Includes cameras and scanners.
RF	Special purpose equipment	Includes special purpose and multipurpose data processing equipment.

2.2.18 System category S - Automatic test equipment (ATE)

Table 20 System category S - Automatic test equipment (ATE)

System	Title	Definition
S	Automatic test equipment (ATE)	
SA	Available for projects	

Chapter 8.2.3

Maintained SNS - Ordnance

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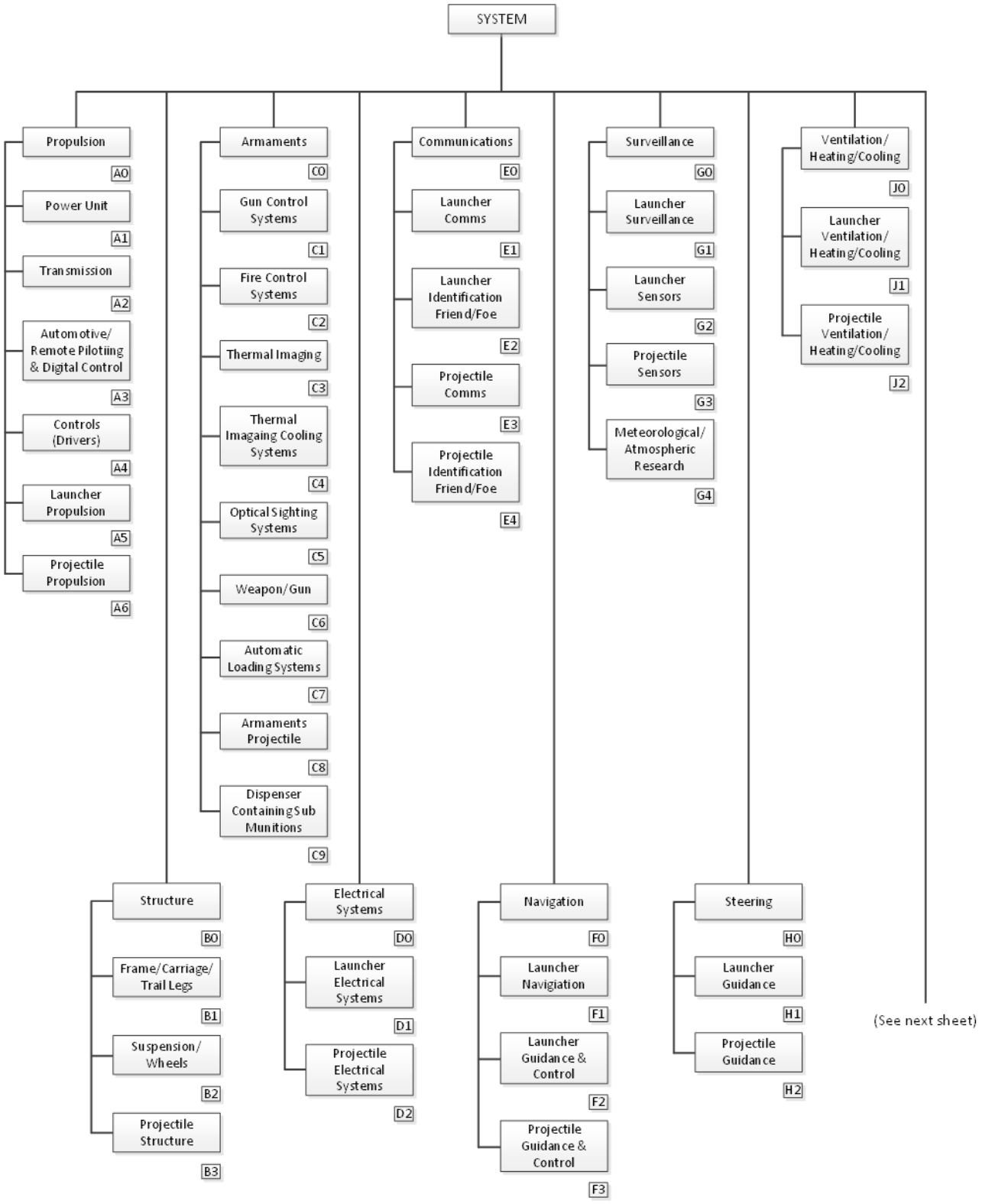
Chap No./Document No.	Title
Chap 1.3	How to use the specification
Chap 1.5	Request for change
Chap 4.3.3	Data module code - Standard numbering system

1 General

This is an SNS, for ordnance. It is used in this specification as a method to describe the functional and/or physical breakdown of items of the Product. Its position in the data module code and structure is defined in Chap 4.3.3. This is an SNS that will be maintained by the S1000D Steering Committee and is subject to normal CPF action in accordance with Chap 1.5.

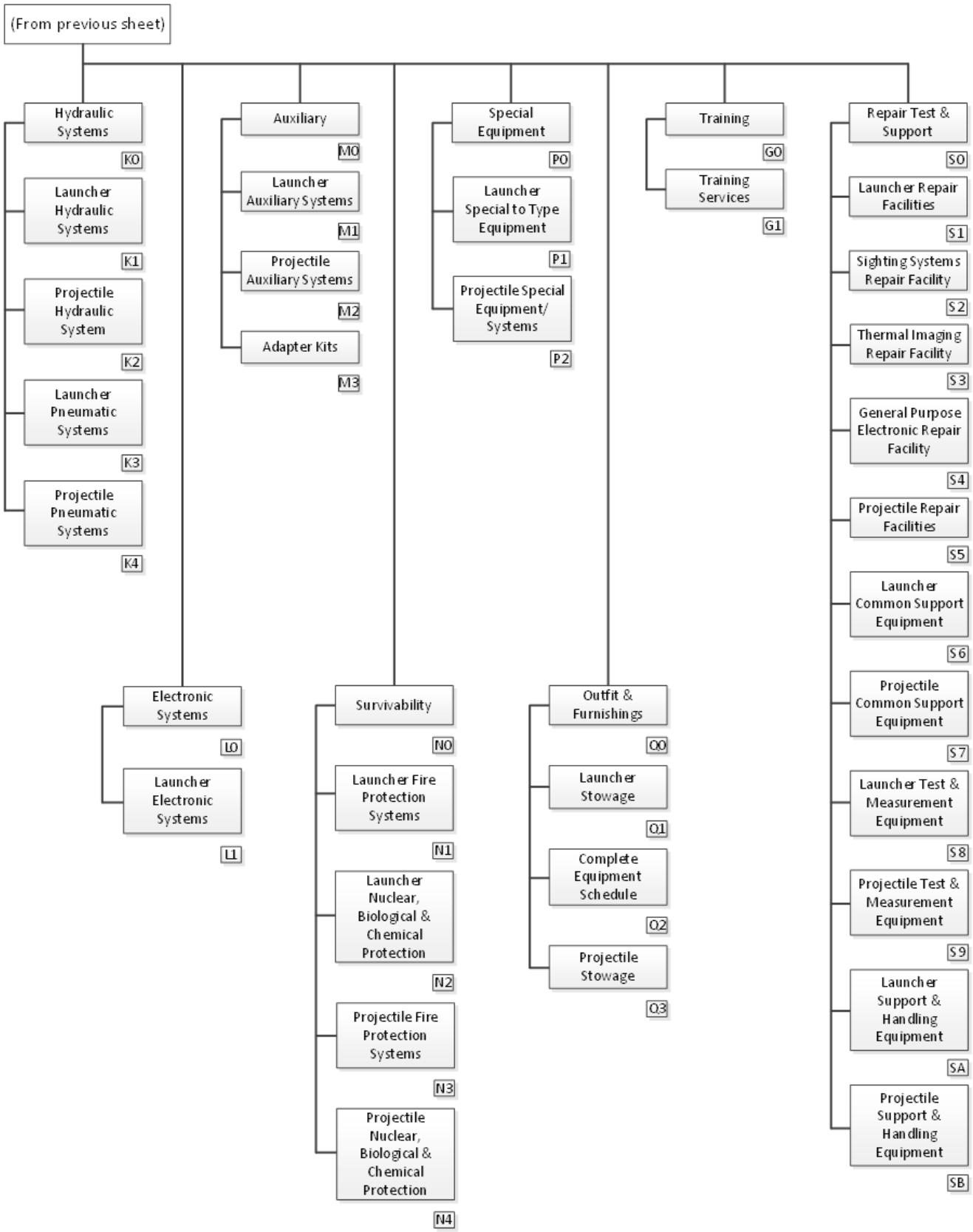
2 Ordnance SNS

The coding and definitions for the ordnance SNS are appropriate for common and system level information for all Products and are described in Table 2 and shown in Fig 1. However, projects can decide not to use this generic SNS.



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Fig 1 Top level breakdown of an ordnance system (Sheet 1 of 2)



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Fig 1 Top level breakdown of an ordnance system (Sheet 2 of 2)

2.1 System breakdown

2.1.1 Main systems

This ordnance SNS is divided into 17 main systems.

Table 2 Top level breakdown of an ordnance system

System	Title
A0	Propulsion, General
B0	Structure, General
C0	Armaments, General
D0	Electrical systems, General
E0	Communications, General
F0	Navigation, General
G0	Surveillance, General
H0	Steering, General
J0	Ventilation/heating/cooling, General
K0	Hydraulic systems, General
L0	Electronic systems, General
M0	Auxiliary, General
N0	Survivability, General
P0	Special equipment, General
Q0	Outfit and furnishings, General
R0	Training, General
S0	Repair test and support, General

2.2 Definitions of systems and subsystems

2.2.1 System A - Propulsion, General

Table 3 System A0 - Propulsion, General

System	Subsystem	Title	Definition
A0	-00	Propulsion, General	A system or equipment for producing and delivering power, to move/position the launcher.

Table 4 System A1 - Power unit, General

System	Subsystem	Title	Definition
A1	-00	Power unit, General	The power unit element refers to a discrete means for generating and delivering power for maneuvering the ordnance system in the battlefield. It can include, for example, flywheel and clutch assemblies.

	-10	Engine	Refers to a diesel, petrol, electric, etc fuelled means for generating power and a means whereby this power can be delivered to the transmission. It can include, for example, flywheel and clutch assemblies and engine mounted cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-20	Cooling system	Refers to systems designed to maintain the correct operating temperatures for the power unit. It includes, for example, cooling air ducting, coolant pumps, liquid filled radiators, intercoolers, fans and associated heat exchange equipment.
	-30	Fuel systems	Refers to a system or equipment designed to deliver fuel to the power unit. It includes, for example, fuel storage facilities, pumps, filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors.
	-40	Air and exhaust systems	Refers to a system which supplies air to, or collects and removes exhaust gasses from the engine. It includes, for example, all pipes, ducting, filters, couplings, gaskets, turbochargers/superchargers, silencers and catalytic converters.
	-50	Lubrication systems	Refers to a system that provides lubrication to the power unit and any external components related to the power unit lubrication system. It includes, for example, delivery and return pipes, pumps, filters, intercoolers and separately mounted heat exchangers.
	-60	Electrical	Refers to a system that provides or uses electrical power associated with the power unit. It includes, for example, starter motors, alternators and generators directly mounted on the power unit. It also includes, for example, ignition system components including spark plugs, distributor, coils and leads.
	-70	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the power unit. It includes, for example, engine mountings.
	-80	Hydraulic	Refers to a system that provides or uses hydraulic power associated with the power unit. It includes, for example, hydraulic pumps, valves, pipes, and tanks. It also includes any external components related to the power unit hydraulic systems.

Table 5 System A2 - Transmission, General

System	Subsystem	Title	Definition
A2	-00	Transmission, General	Refers to a means to transmit power from the engine to the driving member and can include clutch, torque converter, gearbox. It can also include steering and brakes if they are integral to the transmission. Also included are differentials and power takeoffs.
	-10	Gearbox	Refers to a means for varying the speed/torque delivered from the power unit to the driving member. It can include the steering control and brake assemblies.

	-20	Steering control assembly	Refers to a discrete means for varying the drive applied, through the transmission system, to each of the launcher's driving members.
	-30	Brake assembly	Refers to a discrete means for applying braking forces through the launcher transmission system.
	-40	Auxiliary drive/ power takeoff	Refers to an auxiliary means of obtaining an output from the engine. It includes transfer gearboxes which can also include a slip differential.
	-50	Clutch	Refers to a means for engaging/disengaging the transmission to/from the engine, when fitted as a separate assembly.
	-60	Drive shaft	Refers to the means for connecting power output from the engine to the driving member. It includes muff couplings, universal joints, chains, belts and final drives.
	-70	Torque converter	Refers to a means for varying the torque delivered from the engine to the driving member.
	-80	Differential	Refers to a means for changing the direction of rotation delivered from the engine to the driving member or wheels.

Table 6 System A3 - Automotive/remote piloting and digital control systems, General

System	Subsystem	Title	Definition
A3	-00	Automotive/ remote piloting and digital control systems, General	The automotive and remote piloting and Digital Automotive Control System (DACS) element refers to that equipment (hardware/software) installed in the launcher which is used to plan and control its speed and direction either autonomously or via tele-operation. This includes equipment which senses, processes and displays imagery data such as stereo vision systems, laser scanners, multiple sensor fusion algorithms and processors, image enhancement algorithms and processors etc. This includes, for example, equipment which performs intelligence analysis and planning functions such as automated route planners, image understanding algorithms and processors, computer aided driving algorithms, DACS and processors.
	-10	Control	Refers to processing and control elements. It includes central processors, analogue/digital converters, associated software, memory boards, servo units, actuators, associated wiring, etc.
	-20	Sensors	Refers to sensors which are specifically associated with providing inputs to an automotive/remote piloting system or DACS.
	-30	Indicators	Refers to the part of the system used to indicate/ monitor an automotive/remote piloting system or DACS. It includes indicators, wiring, etc.

Table 7 System A4 - Controls (drivers), General

System	Subsystem	Title	Definition
A4	-00	Controls (drivers), General	Given in this element are the controls required to start, stop, steer and generally control the launcher, commensurate with the mobility role of the equipment. It includes, for example, on-board diagnostic systems.
	-10	Foot controls	Refers to the foot-operated controls to start, stop, steer and generally control the launcher. It includes, for example, pedal assemblies (clutch, brake, accelerator, etc), associated linkages, cables, hydraulic/pneumatic connections, master and slave cylinders, brake shoes and pads and disks and drums.
	-20	Hand controls	Refers to the hand-operated controls to start, stop, steer and generally control the launcher. It includes, for example, stop/start, steering (wheel, tiller, etc) and braking controls.
	-30	Ancillary controls	Refers to ancillary controls and associated systems. It includes, for example, such items as screen wash equipment, windscreen wipers and adjustable wing mirrors.
	-40	Propulsion control systems	Refers to systems which monitor and/or control engine speed and performance.
	-50	Instrumentation	Refers to systems (hardware/software) which monitor/ report on the operation of launcher systems. It includes, for example, the driver's instrumentation panel, warning lights and condition monitoring systems.

Table 8 System A5 - Launcher propulsion, General

System	Subsystem	Title	Definition
A5	-00	Launcher propulsion, General	The launcher propulsion element provides the forces to expel the complete round from the launcher to the target. It does not include propulsion provided by the projectile.
	-10	Chemical	Refers to the chemical launch element.
	-20	Mechanical	Refers to the mechanical launch element.
	-30	Electrical	Refers to the electrical launch element, including magnetic propulsion systems.
	-40	Pneumatic	Refers to the pneumatic launch element.

Table 9 System A6 - projectile propulsion, General

System	Subsystem	Title	Definition
A6	-00	Projectile propulsion, General	The projectile propulsion element provides the forces to transport the complete round from the launch position to the target. For artillery ammunition this element includes the cartridge case and if applicable the primer as well as the explosive charge itself. It does not include propulsion provided by the launcher assembly.

System	Subsystem	Title	Definition
	-10	Chemical	Refers to the chemical projectile propulsion element, including such devices as chemical precision initiation charges.
	-20	Mechanical	Refers to the mechanical projectile propulsion element.
	-30	Electrical	Refers to the electrical projectile propulsion element. It includes such devices as electric power charges.
	-40	Pneumatic	Refers to the pneumatic projectile propulsion element.
	-50	Rocket motor	Refers to the rocket motor projectile propulsion element.

2.2.2 System B - Structure, General

Table 10 System B0 - Structure, General

System	Subsystem	Title	Definition
B0	-00	Structure, General	Framework and/or basic structural housing for a system, including load bearing components.

Table 11 System B1 - Frame/carriage/ trail legs, General

System	Subsystem	Title	Definition
B1	-00	Frame/carriage/ trail legs General	The frame/carriage/trail legs element refers to the primary load bearing components of the launcher which provide the structural integrity to withstand operational loading stresses generated whilst in use, for example when traversing various terrain profiles. This element applies to firing posts, wheeled frames, etc. It does not apply to hand-held weapons. It includes all structural subassemblies and appendages which attach directly to the primary structure. This element, for example, includes towing and lifting fittings, bumpers, hatches and grilles. It also includes provision to accommodate other subsystems such as mountings for suspension, weapons, turret, track body, cab, special equipment, loads etc.
	-10	Frame/firing post	Refers to the basic structural housing for a non-wheeled ordnance system, including load bearing components, recoil mechanisms, mountings, firing platforms, stays, fittings and fixtures.
	-20	Carriage	Refers to the basic structural housing for a wheeled ordnance system, including load bearing components, recoil mechanisms, mountings, towing assemblies, fittings and fixtures.
	-30	Trail legs/spades	Refers to trail legs and spades provided to ensure launch platform stability during firing. They can also be used for towing.

System	Subsystem	Title	Definition
	-40	Traverse/ elevation mechanism	Refers to elevating/ traversing mechanisms (manual or powered) and their associated systems/components directly mounted on the frame/carriage/trail legs.
	-50	Armor	Refers to protective amour and associated components directly mounted on the frame/carriage/trail legs.
	-60	Ammunition storage	Refers to ammunition storage facilities and associated components directly mounted on the frame/carriage/trail legs.
	-70	Seats	Refers to seating which is directly mounted on the frame/ carriage/trail legs.

Table 12 System B2 - Suspension/ wheels, General

System	Subsystem	Title	Definition
B2	-00	Suspension/ wheels, General	The suspension/track/wheels element refers to the means for providing mobility or generating tractive effort, thrust and lift, generally at or in proximity to the earth's surface and adapting the launcher to the irregularities of the surface. It includes, for example, wheels and steering gears for traction and control functions. Also, it includes springs, shock absorbers, braking mechanisms, and other suspension members.
	-10	Suspension unit	Refers to the means for adapting the launcher to irregularities of the surface. It includes shock absorbers, leaf and coil springs, pneumatic suspension units, etc.
	-20	Axle	Refers to axle assemblies. It includes, for example, axle arms, links, torsion arms, bearings, wheels that transfer tractive effort to the surface and rolling wheels, hub assemblies, tires, valves, inner-tubes, brake drums, pads, slave cylinders and discs.
	-30	Braking assembly	Refers to a means for preventing un-planned movement of the ordnance system, not integral to the axle assembly. It includes, for example, hydraulic master cylinders, pipes, cables, over-run braking systems and hand brakes.

Table 13 System B3 - projectile structure, General

System	Subsystem	Title	Definition
B3	-00	Projectile structure, General	This element refers to the portion of the complete round which carries the payload to the target. It includes the casing of a projectile, the housing of a bomb and the body of a torpedo.
	-10	Projectile casing	Refers to the basic casing of the projectile. It includes those structural devices which provide stability (eg, fins).
	-20	Bomb housing	Refers to the basic housing of the bomb. It includes those structural devices which provide power, stability and control (eg, fins, parachutes, anchors, batteries).

System	Subsystem	Title	Definition
	-30	Torpedo body	Refers to the basic housing of the torpedo. It includes those structural devices which provide power, stability and control (eg, fins, parachutes, anchors, batteries).
	-40	Rocket housing	Refers to the basic housing of the rocket. It includes those structural devices which provide power, stability and control (eg, fins, parachutes, anchors, batteries).

2.2.3 System C - Armaments, General

Table 14 System C0 - Armaments, General

System	Subsystem	Title	Definition
C0	-00	Armaments, General	A defensive or offensive system or equipment.

Table 15 System C1 - Gun control systems, General

System	Subsystem	Title	Definition
C1	-00	Gun control systems, General	The gun control element refers to that equipment (hardware/ software) installed in the launcher which provides intelligence necessary to power elevate and traverse the weapons systems and also to control via stabilization systems, and gun drives, including gun position indicators and sensors.
	-10	Installation	Refers to the Gun Control Equipment (GCE) installation.
	-20	Control panel	Refers to control panels associated with GCE.
	-30	Power supply	Refers to power supply units associated with GCE.
	-40	Switch units	Refers to switch units associated with GCE. It includes trimming units, fire control switches, etc.
	-50	Gun controller	Refers to control systems associated with GCE. It includes controls for the gun, motor generators, metadynes, amplidynes, magnicons, power amplifiers.
	-60	Power motors	Refers to gearbox drive motors, associated with GCE. It includes the power, elevation and traverse drive motors.
	-70	Gyroscope assembly	Refers to gyroscope assemblies associated with GCE.
	-80	Ancillary	Refers to ancillary GCE controls and associated systems. It includes such items as turnbuckle assemblies, traverse displacement units, fire control quadrants, inter-connecting boxes, wiring, connectors, etc.

Table 16 System C2 - Fire control systems, General

System	Subsystem	Title	Definition
C2	-00	Fire control systems, General	The fire control element refers to that equipment (hardware/ software) installed in the launcher which provides intelligence necessary for weapons delivery such as launching and firing. This element includes, for example, radar and other sensors necessary for search recognition, meteorological and/ or tracking; controls and displays, fire control computers, and computer programs.
	-10	Computer/ interface	Refers to computer interface systems and equipment associated with fire control systems. It includes computer/ interface units, program loading facilities, etc.
	-20	Control/monitor	Refers to control and monitoring equipment associated with the fire control systems.
	-30	Filter units	Refers to filter units associated with the fire control systems.
	-40	Sensors	Refers to sensors associated with the fire control systems. It includes sensors for elevation and traverse displacement, trunnion tilt, sighting angle, etc.
	-50	Firing handles	Refers to firing handles associated with the fire control systems, including trigger mechanisms.
	-60	Fire control boxes	Refers to control boxes associated with the fire control system. It includes the commander's, and gunner's control boxes, the loader's safety box, etc.
	-70	Ancillary	Refers to ancillary items and associated systems. It includes, for example, such items as junction boxes, cables, connectors and services.

Table 17 System C3 - Thermal imaging, General

System	Subsystem	Title	Definition
C3	-00	Thermal imaging, General	This element refers to that equipment (hardware/software) which provides a thermal picture for the crew or operator to use for surveillance and weapon guidance. It includes thermal imaging sensor heads, drive units, processors, sights, power supply units, and display units.
	-10	Sensor	Refers to sensors specifically associated with thermal imaging systems. It includes scanner head assemblies, IR telescopes, tilt sensors, focal telescopes, etc.
	-20	Processing	Refers to processing elements associated with thermal imaging systems. It includes symbology units, processors, etc.
	-30	Display	Refers to the display elements of a thermal imaging system. It includes binocular viewers, commander's and gunner's display units, display drive units, etc.

System	Subsystem	Title	Definition
	-40	Control	Refers to the control elements of a thermal imaging system. It includes servo units, gunner's and commander's control units, etc.
	-50	Converter units	Refers to converter elements of a thermal imaging system. It includes isolating converter units, etc.
	-60	Structure and framework	Refers to framework and/or basic structural housing for a thermal imaging system, including load bearing components.
	-70	Ancillary	Refers to ancillary controls, items and associated systems related to thermal imaging systems. It includes such items as wash/wipe equipment, cables, connectors, services, etc.

Table 18 System C4 - Thermal imaging cooling systems, General

System	Subsystem	Title	Definition
C4	-00	Thermal imaging cooling systems, General	This element refers to that equipment which provides a cooling medium, for thermal images. It will include, for example, compressors, bottles, pipes, fans, mini coolers, air cleaning columns and stirling cycle cooling machines.
	-10	Compressors	Refers to the part of the system used to pressurize the cooling system. It includes motors, pumps, etc.
	-20	Storage	Refers to the part of the system used for storage of coolant. It includes tanks, pressurized containers, filling systems, sumps, drains, etc.
	-30	Distribution	Refers to the part of the system used for distribution of coolant. It includes pipes, valves, etc.
	-40	Indicating	Refers to the part of the system used to monitor the condition of coolant (quantity, temperature and pressure). It includes transmitters, indicators, wiring, warning systems, etc.

Table 19 System C5 - Optical sighting systems, General

System	Subsystem	Title	Definition
C5	-00	Optical sighting systems, General	The optical element refers to the sighting systems for search, observation, identification, tracking, range-finding and will include sensors and displays associated with this system.
	-10	Surveillance	Refers to optical surveillance equipment. It includes, for example, such items as observation periscopes, etc.
	-20	Sighting	Refers to optical sighting equipment. It includes, for example, such items as sighting and aiming periscopes and iron sights.
	-30	Reticle image projector	Refers to a means for displaying a reticle image in/on the sighting device.
	-40	Sighting unit	Refers to a means for displaying a reticle image in the sighting device.

System	Subsystem	Title	Definition
	-50	Ancillary	Refers to ancillary controls, items and associated systems related to optical sighting systems. It includes such items as wash/ wipe equipment, cables, connectors, services, etc.

Table 20 System C6 - Weapon/gun, General

System	Subsystem	Title	Definition
C6	-00	Weapon/gun, General	The weapon/gun element refers to the means for the launcher to deliver fire on hostile targets or for logistics and other vehicles to exercise self-defense. This element includes, for example, the main gun/ elevating mass and secondary armaments such as small arms and mortars. Fire control, gun control, and optical systems are excluded.
	-10	Launcher	The launcher assembly provides initial guidance for launch of projectiles. It includes, for example, barrels, tubes (mortar, torpedo, etc) and rails.
	-20	Breech, housing and firing mechanism	Refers to a system which provides a means of access for the projectile/case to enter the barrel. It also provides a pressure seal and firing mechanism, together with the means by which the breech and firing mechanism are housed within the equipment. It includes all associated housing items.
	-30	Mountings	Refers to the means for attaching the barrel assembly and can include the mountlet assembly as well as the means to balance the armament system. It also includes tripods and bipods.
	-40	Recoil mechanism	Refers to systems which provide a means for absorbing energy created by projectile launch. It includes recuperator and recoil assemblies, etc.
	-50	Smoke discharger	Refers to a means for dispersing smoke/fumes generated when a round is fired.
	-60	Secondary armaments installation	Refers to systems which provide a secondary armaments installation.
	-70	Sights	Refers to a mechanical sighting system used on small arms, machine guns, man-portable launchers, etc.
	-80	Ancillary	Refers to ancillary items and associated systems. It includes, for example, such items as spare barrels and other parts, wallets, cleaning kits and sustained fire kits.

Table 21 System C7 - Automatic loading systems, General

System	Subsystem	Title	Definition
C7	-00	Automatic loading systems, General	The automatic loading element consists of that equipment (hardware/software) providing the means to select ammunition from a stored position, its transfer to and loading of the armament system. This element also includes the means to eject spent cases and misfired rounds. Components include all ammunition storage racks, transfer/ lift mechanisms, ramming and ejecting mechanisms as well as specialized hydraulic and electrical controls. It does not include storage provided externally from the main system.
	-10	Storage (ready round)	Refers to ammunition storage racks, bins, etc.
	-20	Rocket pods/mine racks/dispensers	Provides a means of holding/supporting the projectile during transportation, and a means of releasing the projectile.
	-30	Transfer/lift	Refers to the means to select ammunition from a stored position in the launcher and transfer it to the armament system. It includes transfer and lift mechanisms
	-40	Loading/ramming	Refers to the means to loading the armament system. It includes ramming and ejecting mechanisms.
	-50	Feed mechanism	The feed mechanism element refers to the equipment for placing ammunition in a position, ready for chambering.
	-60	Automatic loading devices	The automatic loading element consists of that equipment providing the means to select ammunition from a stored position and transferring it to a feed mechanism or ready magazine.
	-70	Control	Refers to the means to control loading the armament system. It includes specialized hydraulic and electrical controls and safety devices.

Table 22 System C8 - Armaments projectile, General

System	Subsystem	Title	Definition
C8	-00	Armaments projectile, General	This element refers to the portion of the projectile which carries the payload to the target. It is the basic housing of the bomb or rocket, casing of the projectile, body of a torpedo or the tactical munitions dispenser containing sub-munitions. It also includes those structural devices which provide stability and control (eg, fins, parachutes, anchors).
	-10	Payload	Payload element refers to the subsystem which contains the warhead and its support assemblies. In some munitions such as small arms and munitions, the payload can only be the warhead. With complex munitions the payload can contain sub munitions (the payload subsystem can also include discrete guidance and control, fuse, safety/armament and propulsion systems).

System	Subsystem	Title	Definition
	-20	Fuse	Fuse element refers to the mechanical or electronic device in the projectile designed to detonate or to set forces into action to detonate the charge or primer under desired conditions.
	-30	Initial safety & arming	The initial safety and arming element refers to the device in the projectile which controls the capability of initiating the explosive sequence.
	-40	Secondary safety & arming	The secondary safety and arming element refers to the device in the complete round which controls the capability of initiating the explosive sequence, should the initial safety and arming device fail.

Table 23 System C9 - Dispenser containing sub-munitions, General

System	Subsystem	Title	Definition
C9	-00	Dispenser containing sub-munitions, General	This element refers to the portion of the projectile which carries sub-munitions to the target.
	-10	Tactical munitions dispenser	Tactical munitions dispenser containing sub-munitions, other than those contained within the payload.

2.2.4 System D - Electrical system, General

Table 24 System D0 - Electrical systems, General

System	Subsystem	Title	Definition
D0	-00	Electrical systems, General	A system or equipment for generation, distribution and/or control of electric power.

Table 25 System D1 - Launcher electrical systems, General

System	Subsystem	Title	Definition
D1	-00	Launcher electrical systems, General	This element refers to the electrical or electronic systems for the launcher. It will include wiring harnesses, line replaceable units (LRUs), sensors, lighting, batteries, generators, etc.
	-10	Generating	Refers to generating systems and equipment related to the launcher. It includes such items as alternators, dynamos, generator panels, etc.
	-20	Batteries	Refers to battery equipment related to the launcher. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.

System	Subsystem	Title	Definition
	-30	Instrumentation	Refers to instrumentation systems and equipment related to the launcher. It includes such items as tachometers, speedometers, indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment related to the launcher. It includes such items as inspection lights, etc.
	-50	Wiring	Refers to wiring and cable looms related to the launcher. It includes looms, wires, harnesses, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the launcher. It includes, for example, actuators, engine controls and ignition systems.
	-70	Distribution	Refers to electrical distribution systems and equipment related to the launcher. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the launcher. It includes such items as fuses, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the launcher. It includes such items as controllers, switches, relays, regulators, etc.

Table 26 System D2 - projectile electrical systems, General

System	Subsystem	Title	Definition
D2	-00	Projectile electrical systems, General	This element refers to the devices within the projectile which provide electrical power.
	-10	AC power	Refers to AC power systems within the projectile (eg, generators).
	-20	DC power	Refers to DC power systems within the projectile (eg, batteries, quartz crystal).
	-30	External power	That portion of the system within the projectile that connects external electrical power sources (eg, battery charging points).

2.2.5 System E - Communications, General

Table 27 System E0 - Communications, General

System	Subsystem	Title	Definition
E0	-00	Communications, General	A system or equipment for transferring information.

Table 28 System E1 - Launcher communications, General

System	Subsystem	Title	Definition
E1	-00	Launcher communications, General	The communications element refers to that equipment (hardware/ software) which provides the means within the system for commanding, controlling and transmitting/ receiving information and data to launcher crews and other personnel exterior to the operating environment. This element includes radio frequency equipment, microwave and optic communication links, networked equipment for multiple launcher control and intercoms and external phones systems. It can include navigational system and data displays when these are integral with the equipment of crew stations of the turret assembly or drivers automotive display.
	-10	UHF/SHF/EHF	Refers to that portion of the system used for communications utilizing ultra, super and extra high frequency (UHF, SHF, EHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-20	VHF	Refers to that portion of the system used for communications utilizing very high frequency (VHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-30	HF	Refers to that portion of the system used for communications utilizing high frequency (HF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-40	LF	Refers to that portion of the system used for communications utilizing low frequency (LF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-50	Audio	Refers to that portion of the system used for voice communications. It includes such items as intercoms, headphones, loudspeakers, switching/control panels, etc.
	-60	Digital	Refers to that portion of the system used for digital/data communications. It includes modems, encryption devices, etc.
	-70	Satellite	Refers to that portion of the system used for communications via satellites. It includes transmitters, receivers, control, antennas, etc.
	-80	Optical	Refers to that portion of the system used for communications via line-of-site. It includes transmitters, receivers, control, signaling devices, etc.
	-90	Ancillary	Refers to ancillary controls and associated systems. It includes such items as wiring, connectors, etc.

Table 29 System E2 - Launcher identification friend/foe (IFF), General

System	Subsystem	Title	Definition
E2	-00	Launcher identification friend/foe (IFF), General	IFF equipment is common to all services and is therefore interactive with many other users. It covers the equipment (hardware/software) that identifies friend or foe and transmits that information using the launcher communication system(s).
	-10	Transmitting	Refers to that part of the launcher system which is used to send data.
	-20	Receiving	Refers to that part of the launcher system which is used to receive IFF data.
	-30	Indicating	Refers to that part of the launcher system which is used to display IFF data.

Table 30 System E3 - Projectile communications, General

System	Subsystem	Title	Definition
E3	-00	Projectile communications, General	The communications element refers to that equipment (hardware/software) which provides the means within the system for commanding, controlling and transmitting/ receiving information and data to the projectile. This element includes radio frequency equipment, microwave and optical communication links and networked equipment for multiple control. It can include navigational system and data displays when these are integral with the projectile equipment.
	-10	UHF/SHF/EHF	Refers to that portion of the system used for communications utilizing ultra, super and extra high frequency (UHF, SHF, EHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-20	VHF	Refers to that portion of the system used for communications utilizing very high frequency (VHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-30	HF	Refers to that portion of the system used for communications utilizing high frequency (HF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-40	LF	Refers to that portion of the system used for communications utilizing low frequency (LF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-50	Digital	Refers to that portion of the system used for digital/data communications. It includes modems, encryption devices, etc.
	-60	Satellite	Refers to that portion of the system used for communications via satellites. It includes transmitters, receivers, control, antennas, etc.
	-70	Optical	Refers to that portion of the system used for communications via line-of-site. It includes transmitters, receivers, control, signaling devices, etc.

System	Subsystem	Title	Definition
	-80	Ancillary	Refers to ancillary controls and associated systems. It includes such items as wiring, connectors, etc.

Table 31 System E4 - Projectile identification friend/foe (IFF), General

System	Subsystem	Title	Definition
E4	-00	Projectile identification friend/foe (IFF), General	IFF equipment is common to all services and is therefore interactive with many other users. It covers the equipment (hardware/software) within the projectile that identifies friend or foe.
	-10	Transmitting	Refers to that part of the launcher system which is used to send data.
	-20	Receiving	Refers to that part of the launcher system which is used to receive IFF data.
	-30	Indicating	Refers to that part of the launcher system which is used to display IFF data.

2.2.6 System F - Navigation, General

Table 32 System F0 - Navigation, General

System	Subsystem	Title	Definition
F0	-00	Navigation, General	A system or equipment used to determine, conduct, manage, or plot a position or course.

Table 33 System F1 - Launcher navigation, General

System	Subsystem	Title	Definition
F1	-00	Launcher navigation, General	The navigation element refers to that equipment (hardware/ software) installed in the launcher which permits the crew to determine location and to plot a course. It includes navigation systems such as dead reckoning, inertial and global positioning systems. Landmark recognition algorithms and processors are also included.
	-10	Independent	Refers to that portion of the system (hardware/software) which provides information to determine position and is independent on ground installations or orbiting satellites. It includes inertial guidance systems, tracking systems, sextants, etc.
	-20	Dependant	Refers to that portion of the system (hardware/software) which provides information to determine position and is mainly dependant on ground installations or orbiting satellites. It includes GPS, radio compass, etc.

System	Subsystem	Title	Definition
	-30	Computing	Refers to that portion of the system (hardware/software) which combines/processes navigational data to compute or manage the geographical position of the launcher. It includes course computers, landmark recognition algorithms, processors, displays, etc.

Table 34 System F2 - Launcher guidance and control, General

System	Subsystem	Title	Definition
F2	-00	Launcher guidance and control, General	This system refers to the complex of electronic equipment/ hardware/software, based on the launcher, which evaluates and correlates the path of the projectile with target information and which performs the necessary functions to enable the payload to intercept the target. This element also includes emplacement of mines.
	-10	Computers/ software	This element refers to any computational devices hardware/ software associated with launcher-based guidance and control of the projectile. This element also includes emplacement of mines.
	-20	Control consoles	This element refers to any control consoles (hardware/ software), associated with launcher-based guidance and control of the projectile. This element also includes emplacement of mines.

Table 35 System F3 - Projectile guidance and control, General

System	Subsystem	Title	Definition
F3	-00	Projectile guidance and control, General	This system refers to the complex of electronic equipment/ hardware/software which evaluates and correlates the path of the projectile with target information and which performs the necessary functions to enable the payload to intercept the target. It includes, for example, laser guided bombs.
	-10	Projectile built-in stability mechanisms	This element refers to the control devices within the projectile which provide stability during flight. It does not include fixed fins, etc which form part of the structure.
	-20	Projectile built-in control mechanisms	This element refers to the devices within the projectile which provide guidance control. For example navigation systems, laser target sensors, etc.

2.2.7 System G - Surveillance, General

Table 36 System G0 - Surveillance, General

System	Subsystem	Title	Definition
G0	-00	Surveillance, General	A system or equipment used to sense the environment.

Table 37 System G1 - Launcher surveillance, General

System	Subsystem	Title	Definition
G1	-00	Launcher surveillance, General	The surveillance element is defined as all equipment (hardware/software) and associated systems used to sense the surrounding environment and then process, display and record the resulting information. This can include, for example, Meteorological equipment. It does not include specific thermal imaging or meteorological/atmospheric systems.
	-10	Control	Refers to the processing, control and recording elements of the sensor systems. It includes central processors, analogue/ digital converters, associated software, storage units, etc.
	-20	Indicating	Refers to the part of the system used to indicate/monitor sensor information. It includes data identification, indicators, displays panels, etc.
	-30	Recording	Refers to the part of the system used to record sensor information.
	-40	Infra-red	Refers to that portion of a system that uses heat-sensing devices to acquire information. It includes infra-red scanners and image intensifiers. It does not include specific thermal imaging systems.
	-50	Laser	Refers to that portion of a system that uses laser devices to acquire information. It includes distance measuring, target identification, etc.
	-60	Radar	Refers to that portion of a system that uses radar devices to acquire information. It includes antennas, receivers, transmitters, indicators, etc.
	-70	Magnetic	Refers to that portion of a system that uses magnetic sensors to acquire information. It includes magnetometers, amplifiers, processors, indicators, etc.
	-80	Sonar	Refers to that portion of a system that uses sonar to acquire information. It includes modulators, transducers, processors, indicators, etc.
	-90	Acoustic	Refers to that portion of a system that uses sound to acquire information. It includes listening devices, amplifiers, processors, indicators, etc.

Table 38 System G2 - Launcher sensors, General

System	Subsystem	Title	Definition
G2	-00	Launcher sensors, General	The sensor element refers to those systems (hardware/ software) within the launcher that provide data required for targeting, launch, arming and payload delivery.

System	Subsystem	Title	Definition
	-10	Radar	The radar element refers to those radar systems (hardware/ software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-20	Sonar	The sonar element refers to those sonar systems (hardware/ software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-30	Thermal	The thermal imaging element refers to those thermal imaging and image intensifying systems (hardware/ software) within the launcher that provide data required for targeting, launch, and payload delivery.
	-40	Laser	The laser element refers to those laser target-designator systems (hardware/software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-50	Magnetic	The magnetic element refers to those magnetic systems (hardware/software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-60	Acoustic	The acoustic element refers to those sound sensing systems (hardware/ software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-70	Pressure	The pressure element refers to those pressure systems (hardware/software) within the launcher that provide data required for targeting, launch, arming and payload delivery.
	-80	Proximity	This element refers to the proximity sensing systems (hardware/software) within the launcher that provide proximity sensing data required for targeting, launch, arming and payload delivery.

Table 39 System G3 - Projectile sensors, General

System	Subsystem	Title	Definition
G3	-00	Projectile sensors, General	The sensor element refers to those systems (hardware/ software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-10	Radar	The radar element refers to those radar systems (hardware/ software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-20	Sonar	The sonar element refers to those sonar systems (hardware/ software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-30	Thermal	The thermal imaging element refers to those thermal imaging and image intensifying systems (hardware/ software) within the projectile that provide data required for targeting, launch, and payload delivery.

System	Subsystem	Title	Definition
	-40	Laser	The laser element refers to those laser target-designator systems (hardware/software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-50	Magnetic	The magnetic element refers to those magnetic systems (hardware/software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-60	Acoustic	The acoustic element refers to those sound sensing systems (hardware/software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-70	Pressure	The pressure element refers to those pressure systems (hardware/software) within the projectile that provide data required for targeting, launch, arming and payload delivery.
	-80	Proximity	This element refers to the proximity sensing systems (hardware/software) within the projectile that provide proximity sensing data required for targeting, launch, arming and payload delivery.

Table 40 System G4 – Meteorological/atmospheric research, General

System	Subsystem	Title	Definition
G4	-00	Meteorological/ atmospheric research, General	Refers to the systems and devices which furnish a means of providing, processing and recording meteorological data.
	-10	Weather	Refers to that portion of a system which is used to detect, measure, process or record weather (moisture, temperature, cloud, wind, etc) data. It includes hygrometers, thermometers, anemometers, etc.
	-20	Air turbulence	Refers to that portion of a system which is used to detect, measure, process or record air turbulence data.
	-30	Pollutants	Refers to that portion of a system which is used to detect, measure, process or record contaminated particles.
	-40	Magnetic/ gravitational	Refers to that portion of a system which is used to detect, measure, process or record the earth's magnetic or gravitational forces.

2.2.8 System H - Steering, General

Table 41 System H0 - Steering, General

System	Subsystem	Title	Definition
H0	-00	Steering, General	A system or equipment used to guide or govern direction.

Table 42 System H1 - Launcher guidance, General

System	Subsystem	Title	Definition
H1	-00	**Launcher guidance, General**	This element refers to the devices within the launcher used to guide or govern direction of the projectile.
	-10	Guidance mechanism	This element refers to the devices (hardware/software) within the launcher used to govern direction of the projectile.

Table 43 System H2 - Projectile guidance, General

System	Subsystem	Title	Definition
H2	-00	Projectile guidance, General	This element refers to the devices within the projectile used to govern direction or placement.
	-10	Projectile direction control	This element refers to the devices within the projectile which provide direction control. For example rudders, etc.

2.2.9 System J - Ventilation, heating, cooling, General

Table 44 System J0 - Ventilation/ heating/cooling, General

System	Subsystem	Title	Definition
J0	-00	Ventilation/ heating/cooling, General	A system or equipment used to provide a controlled environment.

Table 45 System J1 - Launcher ventilation/ heating/cooling, General

System	Subsystem	Title	Definition
J1	-00	Launcher ventilation/ heating/cooling, General	This element refers to those subassemblies or components which provide a micro-climatic condition (heating or cooling), for the launcher, including heating/cooling suits or components. It also covers purification systems not covered by NBC.
	-10	Compression	That portion of the system and its controls which supplies pressurized air/gas. Includes items such as controls and indicating systems related to pressure, gas-filled systems, etc.
	-20	Distribution	That portion of the system used to induct and distribute air. It includes equipment rack cooling, seals, demisting, waveguide pressurization system and items of such systems, like blowers, ducting and inlets.
	-30	Heating	That portion of the system and its controls which supply heated air. It includes items such as heater units, wiring, etc.

System	Subsystem	Title	Definition
	-40	Cooling	That portion of the system and its controls which supply cooled air. Includes items such as the cooling unit, indicating systems related to the cooler operation, wiring etc. Does not include temperature control and indicating systems.
	-50	Temperature control	That portion of the system used to control the temperature of the air. Includes items such as, thermal sensing devices, switches, indicators, wiring etc.
	-60	Moisture/air	That portion of the system used to contaminant control moisture in the air, to control ozone concentrations, to filter radioactive debris and chemical/biological contaminants, etc.
	-70	Liquid coolant	Those components required to supply liquid coolant to a cooling system.

Table 46 System J2 - Projectile ventilation/ heating/cooling, General

System	Subsystem	Title	Definition
J2	-00	Projectile ventilation/ heating/cooling, General	Those units and components which furnish a means of pressurizing, heating, cooling, moisture controlling, filtering and treating the air/gas used to condition areas of the projectile system environment. It includes cooling, heating, vents, ducts, seals, wiring etc.
	-10	Compression	That portion of the system and its controls which supplies pressurized air/gas. Includes items such as controls and indicating systems related to pressure, gas-filled systems, etc.
	-20	Distribution	That portion of the system used to induct and distribute air. It includes equipment rack cooling, seals, demisting, waveguide pressurization system and items of such systems like blowers, ducting and inlets.
	-30	Heating	That portion of the system and its controls which supply heated air. Includes items such as heater units, wiring, etc.
	-40	Cooling	That portion of the system and its controls which supply cooled air. Includes items such as the cooling unit, indicating systems related to the cooler operation, wiring etc. Does not include temperature control and indicating systems.
	-50	Temperature control	That portion of the system used to control the temperature of the air. Includes items such as, thermal sensing devices, switches, indicators, wiring etc.
	-60	Moisture/air	That portion of the system used to contaminant control moisture in the air, to control ozone concentrations, to filter radioactive debris and chemical/biological contaminants, etc.
	-70	Liquid coolant	Those components required to supply liquid coolant to an equipment cooling system.

2.2.10 System K - Hydraulic system, General

Table 47 System K0 - Hydraulic systems, General

System	Subsystem	Title	Definition
K0	-00	Hydraulic systems, General	A system or equipment for generation, distribution and/or control of hydraulic (or pneumatic) power.

Table 48 System K1 - Launcher hydraulic system, General

System	Subsystem	Title	Definition
K1	-00	Launcher hydraulic system, General	This element refers to a system or equipment within the launcher for the generation, distribution and/or control of hydraulic power.
	-10	Main	This element refers to a system or equipment within the launcher which is used to generate, store, distribute or control hydraulic power. It includes such items as tanks, valves, pumps, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	That portion of the launcher hydraulic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main hydraulic system.
	-30	Indicating	That part of the launcher hydraulic system which is used to monitor condition of the hydraulic system or fluid. It includes transmitters, indicators, warning systems, etc.

Table 49 System K2 - Projectile hydraulic system, General

System	Subsystem	Title	Definition
K2	-00	Projectile hydraulic system, General	This element refers to a system or equipment within the projectile for the generation, distribution and/or control of hydraulic power.
	-10	Main	This element refers to a system or equipment within the projectile which is used to generate, store, distribute or control hydraulic power. It includes such items as tanks, valves, pumps, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	That portion of the projectile hydraulic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main hydraulic system.
	-30	Indicating	That part of the projectile hydraulic system which is used to monitor condition of the hydraulic system or fluid. It includes transmitters, indicators, warning systems, etc.

Table 50 System K3 - Launcher pneumatic systems, General

System	Subsystem	Title	Definition
K3	-00	Launcher pneumatic systems, General	This element refers to a system or equipment (hardware/ software) within the launcher for the generation, distribution and/ or control of pneumatic (including vacuum) power.
	-10	Main	This element refers to a system or equipment within the launcher which is used to generate, store, distribute or control pneumatic power. It includes such items as tanks, valves, pumps, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	That portion of the launcher pneumatic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main pneumatic system.
	-30	Indicating	That part of the launcher pneumatic system which is used to monitor condition of the system. It includes transmitters, indicators, warning systems, etc.

Table 51 System K4 - Projectile pneumatic systems, General

System	Subsystem	Title	Definition
K4	-00	Projectile pneumatic systems, General	This element refers to a system or equipment (hardware/ software) within the projectile for the generation, distribution and/or control of pneumatic (including vacuum) power.
	-10	Main	This element refers to a system or equipment within the projectile which is used to generate, store, distribute or control pneumatic power. It includes such items as tanks, valves, pumps, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	That portion of the projectile pneumatic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main pneumatic system.
	-30	Indicating	That part of the projectile pneumatic system which is used to monitor condition of the system. It includes transmitters, indicators, warning systems, etc.

2.2.11 System L - Electronic system, General

Table 52 System L0 - Electronic system, General

System	Subsystem	Title	Definition
L0	-00	Electronic system, General	A system or equipment using electronic/automated software and/or firmware elements not specifically included in other systems.

Table 53 System L1 - Launcher electronic system, General

System	Subsystem	Title	Definition
L1	-00	Launcher electronic system, General	This element refers to a system or equipment within the launcher which uses electronic/automated software and/or firmware elements not specifically included in other systems.

Table 54 System L2 - Projectile electronic system, General

System	Subsystem	Title	Definition
L2	-00	Projectile electronic system, General	This element refers to a system or equipment within the projectile which uses electronic/automated software and/or firmware elements not specifically included in other systems.

2.2.12 System M - Auxiliary, General

Table 55 System M0 - Auxiliary, General

System	Subsystem	Title	Definition
M0	-00	Auxiliary, General	Subsidiary systems that provide services or support to main systems or equipment.

Table 56 System M1 - Launcher auxiliary systems, General

System	Subsystem	Title	Definition
M1	-00	Launcher auxiliary systems, General	This element refers to subsidiary systems that provide services or support to main systems or equipment related to the launcher system.
	-10	Magazine	The magazine element refers to the structure or compartment for storing ammunition or explosives in a 'ready for use' condition, or position, not directly mounted on the launcher.

Table 57 System M2 - Projectile auxiliary systems, General

System	Subsystem	Title	Definition
M2	-00	Projectile auxiliary systems, General	This element refers to subsidiary systems that provide services or support to main systems or equipment within the projectile.

Table 58 System M3 - Adapter kits, General

System	Subsystem	Title	Definition
M3	-00	Adapter kits, General	The adapter kits element refers to the equipment (hardware/software) for adapting the launch system to particular applications. For example, vehicle adapter kits and for adaption to different aircraft and/ or ship models. Also, kits for backpacking, etc.

2.2.13 System N - Survivability, General

Table 59 System N0 - Survivability, General

System	Subsystem	Title	Definition
N0	-00	Survivability, General	A system or equipment used to provide hazard detection, protection, survivability and escape facilities.

Table 60 System N1 - Launcher fire protection systems, General

System	Subsystem	Title	Definition
N1	-00	Launcher fire protection systems, General	This element refers to systems (hardware/software) that provide a warning to the launcher crew that a possible fire hazard exists. It includes the suppression/fire fighting and heat sensors required for this system.
	-10	Detecting	Refers to that part of the system which is used to sense the presence of excessive heat, smoke or fire.
	-20	Indicating	Refers to that part of the system which is used to indicate the presence of excessive heat, smoke or fire.
	-30	Extinguishing	Refers to that part of the system, either fixed or portable, which is used to extinguish fire.

Table 61 System N2 - Launcher nuclear, biological and chemical protection, General

System	Subsystem	Title	Definition
N2	-00	Launcher nuclear, biological and chemical protection, General	The NBC element refers to those subassemblies or components which provide nuclear, biological and chemical detection, protection and survivability to the launcher and/ or crew, either individually or collectively, during an NBC attack. This can include a positive pressure system, purification system, ventilated face piece (mask), NBC detection and warning devices, decontamination equipment and chemical resistant coatings. It can also include environmental control equipment, such as heaters, coolers, etc.
	-10	Pack	Refers to NBC protection packs.
	-20	Control	Refers to NBC protection controls.
	-30	Pressure relief	Refers to pressure relief devices specifically fitted for NBC protection purposes.

System	Subsystem	Title	Definition
	-40	Door assemblies	Refers to NBC protection fitted to doors and hatches.
	-50	Ancillary	Refers to ancillary controls and associated systems. It can include, for example, such items as wiring, connectors, heaters, coolers and ducting.

Table 62 System N3 - Projectile fire protection systems, General

System	Subsystem	Title	Definition
N3	-00	Projectile fire protection systems, General	This element refers to systems (hardware/software) that provide a warning within the projectile that a possible fire hazard exists. It includes the suppression/fire fighting and heat sensors required for this system.
	-10	Detecting	Refers to that part of the system which is used to sense the presence of excessive heat, smoke or fire.
	-20	Indicating	Refers to that part of the system which is used to indicate the presence of excessive heat, smoke or fire.
	-30	Extinguishing	Refers to that part of the system, either fixed or portable, which is used to extinguish fire.

Table 63 System N4 - Projectile nuclear, biological and chemical protection, General

System	Subsystem	Title	Definition
N4	-00	Projectile nuclear, biological and chemical protection, General	The NBC element refers to those subassemblies or components which provide nuclear, biological and chemical detection, protection and survivability to the projectile, either individually or collectively, during an NBC attack. This includes a positive pressure system, purification system, NBC detection and protection devices, decontamination equipment and chemical resistant coatings.
	-10	Pack	Refers to NBC protection packs.
	-20	Control	Refers to NBC protection controls.
	-30	Pressure relief	Refers to pressure relief devices specifically fitted for NBC protection purposes.
	-40	Door assemblies	Refers to NBC protection fitted to doors and hatches.
	-50	Ancillary	Refers to ancillary controls and associated systems. It includes such items as wiring, connectors, etc.

2.2.14 System P - Special equipment, General

Table 64 System P0 - Special equipment, General

System	Subsystem	Title	Definition
P0	-00	Special equipment, General	A system or equipment used to provide a special mission capability.

Table 65 System P1 - Launcher special to type equipment, General

System	Subsystem	Title	Definition
P1	-00	Launcher special to type equipment, General	This element refers to that special equipment (hardware/ software) to be mated to a launcher, to enable the achievement of a special mission capability, recovery operations, winterization, etc. It can include, for example blades, booms, cranes, winches, robotic arms, and manipulators.
	-10	Launcher special recovery equipment	This element refers to that special recovery equipment (hardware/software) to be mated to a launcher, to enable the achievement of a recovery capability. It includes cranes and towing equipment.
	-20	Launcher special fit equipment	This element refers to that special fit equipment (hardware/ software) to be mated to a launcher, to enable the achievement of a specialized capability. It will include supply, DROPS, lift trucks, side loaders, etc.
	-30	Launcher special purpose equipment	This element refers to that special-to-purpose equipment (hardware/software) to be mated to a launcher, for the achievement of a special mission purpose. It covers, for example, ISO container bodies and equipment and other special purpose vehicles.
	-40	Installation kit	The installation kit element refers to the equipment (hardware/software) for installation of the launch system related to a particular application.
	-50	Portability kit	The portability kit refers to that equipment required to prepare the launcher for transportation, other than its prime means of movement.
	-60	Bore variation/ velocity change kits	This refers to equipment (hardware/software) designed to affect the velocity of a projectile.
	-70	Winterization kit	The winterization kit element refers to the equipment (hardware/software) for protection of the launcher/ crew, in adverse weather conditions.

Table 66 System P2 - Projectile special equipment/ systems, General

System	Subsystem	Title	Definition
P2	-00	Projectile special equipment/ systems, General	A system or equipment used to provide a special mission capability for the projectile.
	-10	Portability kit	The portability kit refers to that equipment required to prepare projectiles for transportation.

2.2.15 System Q - Outfit and furnishings, General

Table 67 System Q0 - Outfit and furnishings, General

System	Subsystem	Title	Definition
Q0	-00	Outfit and furnishings, General	A function or equipment used to provide habitability or operability that is not specifically included in other systems.

Table 68 System Q1 - Launcher stowage, General

System	Subsystem	Title	Definition
Q1	-00	Launcher stowage, General	This element is required to provide for personal equipment stowage as well as operational equipment stowage on or in the launcher.
	-10	Charge bin	Refers to charge bin stowage facilities.
	-20	Shell stowage	Refers to shell stowage facilities.
	-30	Ammunition	Refers to stowage facilities for both secondary and personal ammunition.
	-40	Launcher internal	Refers to stowage facilities within the launcher.
	-50	Launcher external	Refers to stowage facilities mounted on launcher.

Table 69 System Q2 - Complete equipment schedule (CES), General

System	Subsystem	Title	Definition
Q2	-00	Complete equipment schedule (CES), General	This element refers to lists detailing the equipment required by the user to operate and maintain the system. It includes, for example, both fitted and loose items, spares, tools and operator manuals.
	-10	Production CES	This element refers to the production version of the CES.
	-20	Service CES	This element refers to the service version of the CES.

System	Subsystem	Title	Definition
	-30	Complex CES	This element refers to the complex version of the CES.

Table 70 System Q3 - Projectile stowage, General

System	Subsystem	Title	Definition
Q3	-00	Projectile stowage, General	This element is required to provide for equipment stowage on or in the projectile.

2.2.16 System R - Training, General

Table 71 System R0 - Training, General

System	Subsystem	Title	Definition
R0	-00	Training, General	The training element is defined as the deliverable training services, devices, accessories, aids, equipment and facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency. This element includes all effort associated design, development and production of deliverable training equipment as well as the execution of training services.

Table 72 System R1 - Training services, General

System	Subsystem	Title	Definition
R1	-00	Training services, General	The training services element refers to the deliverable training services, used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-10	Devices/ accessories/aids	The training devices/accessories/aids element refers to the deliverable devices, accessories and aids used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-20	Equipment	The training equipment element refers to the deliverable training equipment used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-30	Facilities	The training facilities element refers to the deliverable training facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.

2.2.17 System S - Repair, test and support, General

Table 73 System S0 - Repair test and support, General

System	Subsystem	Title	Definition
S0	-00	Repair test and support, General	A system, equipment or facilities used to maintain operational capability.

Table 74 System S1 - Launcher repair facilities, General

System	Subsystem	Title	Definition
S1	-00	Launcher repair facilities, General	This element refers to the facility which will allow unserviceable launchers to be repaired, tested and returned to service use.
	-10	Mobile	This element refers to a mobile facility which will allow unserviceable launchers to be repaired, tested and returned to service use.
	-20	Fixed	This element refers to a static facility which will allow unserviceable launchers to be repaired, tested and returned to service use.

Table 75 System S2 - Sighting systems repair facility, General

System	Subsystem	Title	Definition
S2	-00	Sighting systems repair facility, General	This element refers to equipment (hardware/software) that enables the repair, test or calibration of the optical sighting equipment, including laser range finders for example.
	-10	Mobile	Refers to mobile (man-porTable or vehicle mounted) equipment (hardware/software), which can be in a vehicle container or box body, that enables the repair, test and/or calibration of optical sighting equipment.
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/software) that enables the repair, test or calibration of optical sighting equipment.

Table 76 System S3 - Thermal imaging repair facility, General

System	Subsystem	Title	Definition
S3	-00	Thermal imaging repair facility, General	To provide a transportable facility (hardware/software) whereby thermal imaging equipment including its associated cooling systems can be repaired, tested and returned to service. The equipment covered will include, for example, clean air equipment, jigs, fixtures, computer interface adapters and test equipment.

System	Subsystem	Title	Definition
	-10	Mobile	Refers to mobile (man-portable or vehicle mounted) equipment (hardware/software), which can be in a vehicle container or box body, that enables the repair, test and/or calibration of thermal imaging equipment.
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/software) that enables the repair, test or calibration of thermal imaging equipment.

Table 77 System S4, General purpose electronic repair facility, General

System	Subsystem	Title	Definition
S4	-00	General purpose electronic repair facility, General	This element refers to equipment (hardware/software) that enables unserviceable electrical/electronic items to be repaired, tested and returned to service use.
	-10	Mobile	Refers to mobile (man-portable or vehicle mounted) equipment (hardware/software), which can be in a vehicle container or box body, that enables the repair, test and/or calibration of general purpose electronic equipment.
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/software) that enables the repair, test or calibration of general purpose electronic equipment.

Table 78 System S5 - Projectile repair facilities, General

System	Subsystem	Title	Definition
S5	-00	Projectile repair facilities, General	This element refers to the facility which will allow unserviceable projectiles to be repaired, tested and returned to service use.
	-10	Mobile	This element refers to a mobile facility which will allow unserviceable projectiles to be repaired, tested and returned to service use.
	-20	Fixed	This element refers to a static facility which will allow unserviceable projectiles to be repaired, tested and returned to service use.

Table 79 System S6 - Launcher common support equipment, General

System	Subsystem	Title	Definition
S6	-00	Launcher common support equipment, General	The launcher common support equipment element refers to those items required to support and maintain the launcher or portions of the launcher systems while not directly engaged in the performance of its mission, and which are presently in the MOD inventory for support of other systems. This element includes all efforts required to assure the availability of this equipment for support of the particular defense Product item. It also includes the acquisition of additional quantities of this equipment if caused by the introduction of the defense material item into operational service.

Table 80 System S7 - Projectile common support equipment, General

System	Subsystem	Title	Definition
S7	-00	Projectile common support equipment, General	The projectile common support equipment element refers to those items required to support and maintain the projectiles or portions of the projectile systems while not directly engaged in the performance of their mission, and which are presently in the MOD inventory for support of other systems. This element includes all efforts required to assure the availability of this equipment for support of the particular defense Product item. It also includes the acquisition of additional quantities of this equipment if caused by the introduction of the defense material item into operational service.

Table 81 System S8 - Launcher test and measurement equipment, General

System	Subsystem	Title	Definition
S8	-00	Launcher test and measurement equipment, General	The launcher test and measurement equipment element is defined as common testing and measurement equipment which allows an operator or maintenance function to evaluate operational conditions of a launcher system or equipment by performing specific diagnostics, screening or QA effort at an organizational, intermediate, or depot level of equipment support. It includes test measurement and diagnostic equipment, precision measuring equipment, automatic test equipment, manual test equipment, automatic test systems, test program sets, appropriate interconnect devices, automated load modules, tap(s), and related software, firmware and support hardware (power supply equipment, etc) used at all levels of maintenance. It includes packages which enable a line or shop replaceable unit, printed circuit boards, or similar items to be diagnosed using automatic test equipment.

Table 82 System S9 - Projectile test and measurement equipment, General

System	Subsystem	Title	Definition
S9	-00	Projectile test and measurement equipment, General	The projectile test and measurement equipment element is defined as common testing and measurement equipment which allows an operator or maintenance function to evaluate operational conditions of a projectile, subsystem or equipment by performing specific diagnostics, screening or QA effort at an organizational, intermediate, or depot level of equipment support. It includes test measurement and diagnostic equipment, precision measuring equipment, automatic test equipment, manual test equipment, automatic test systems, test program sets, appropriate interconnect devices, automated load modules, tap(s), and related software, firmware and support hardware (power supply equipment, etc) used at all levels of maintenance. It includes packages which enable a line or shop replaceable unit, printed circuit boards, or similar items to be diagnosed using automatic test equipment.

Table 83 System SA - Launcher support and handling equipment, General

System	Subsystem	Title	Definition
SA	-00	Launcher support and handling equipment, General	The launcher support and handling equipment element is defined as the deliverable tools and handling equipment used for support of the launcher system. It typically includes ground support equipment, vehicular support equipment, powered support equipment, non-powered support equipment, and software support equipment.

Table 84 System SB - Projectile support and handling equipment, General

System	Subsystem	Title	Definition
SB	-00	Projectile support and handling equipment, General	The projectile support and handling equipment element is defined as the deliverable tools and handling equipment used for support of the projectile (eg, munitions Product handling equipment and software support equipment).

Chapter 8.2.4

Maintained SNS - General communications

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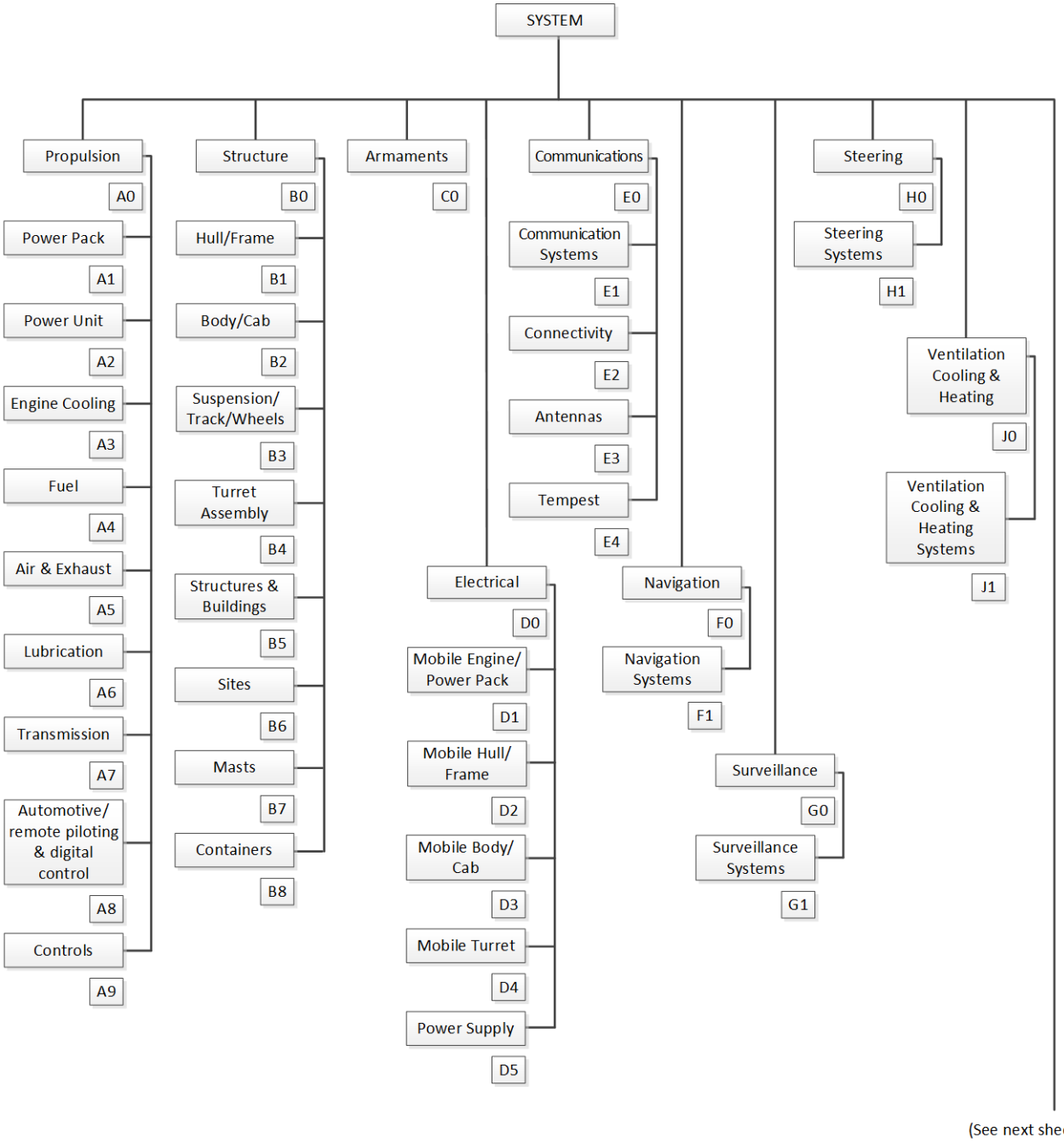
Chap No./Document No.	Title
Chap 1.3	How to use the specification
Chap 1.5	Request for change
Chap 4.3.3	Data module code - Standard numbering system

1 General

This is an SNS, for a general communications. It is used in this specification as a method to describe the functional and/or physical breakdown of items of the Product. Its position in the data module code and structure is defined in Chap 4.3.3. This is an SNS that will be maintained by the S1000D Steering Committee and is subject to normal CPF action in accordance with Chap 1.5.

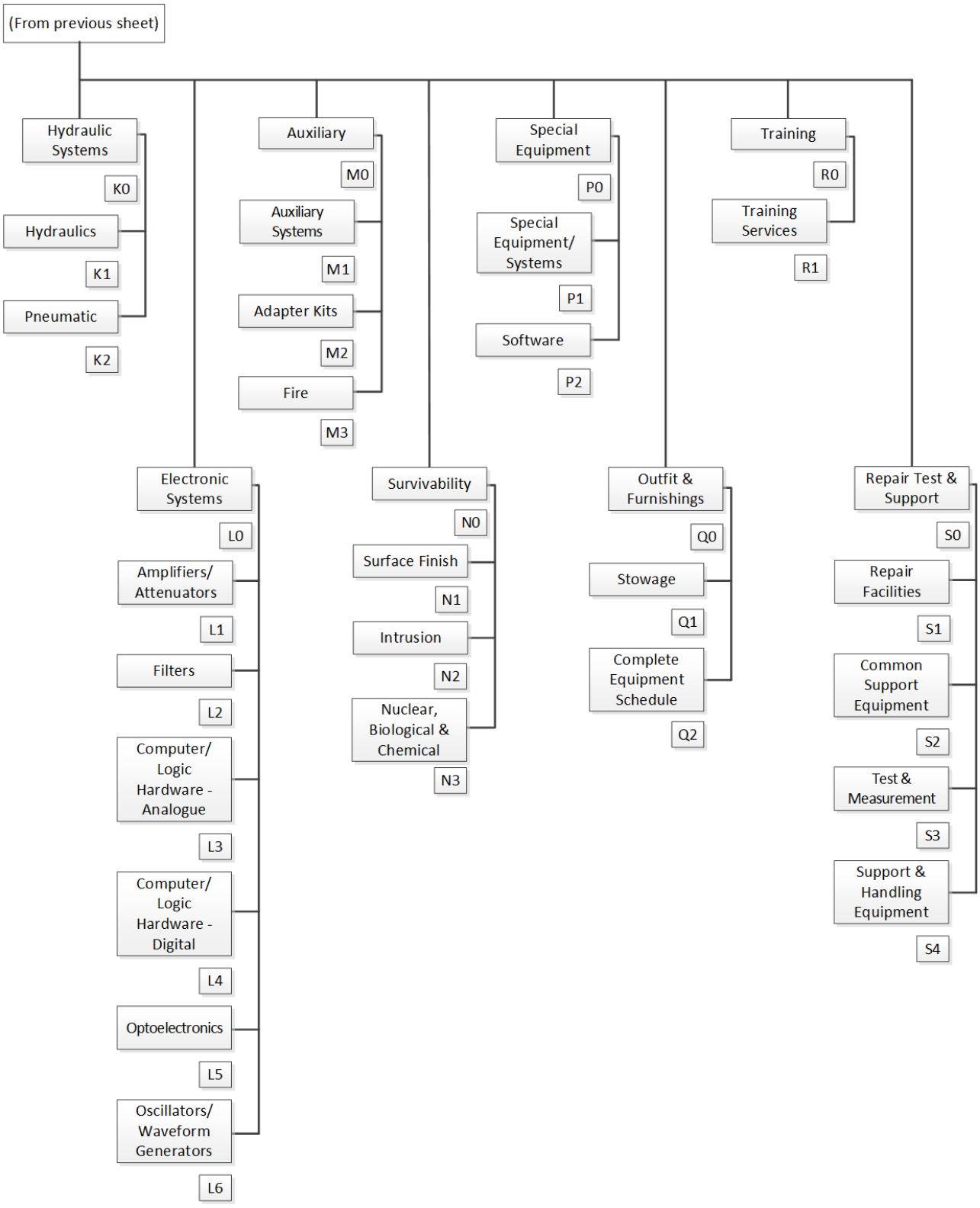
2 General communications SNS

The coding and definitions for the general communications SNS is appropriate for common and system level information for all Products and is described in Table 2 and shown in Fig 1. However, projects can decide not to use this generic SNS.



ICN-83007-0000000129-001-01

Fig 1 Top level breakdown for a general communications system (Sheet 1 of 2)



ICN-83007-0000000130-001-01

Fig 1 Top level breakdown for a general communications system (Sheet 2 of 2)

2.1 System breakdown

2.1.1 Main systems

This general communications SNS is divided into 71 main systems.

Table 2 Top level breakdown for a general communications system

System	Title
A0	Propulsion, General
A1	Power pack, General
A2	Power unit, General
A3	Engine cooling system, General
A4	Fuel systems, General
A5	Air and exhaust systems, General
A6	Lubrication systems, General
A7	Transmission, General
A8	Automotive/remote piloting & digital control systems, General
A9	Controls (drivers), General
B0	Structure, General
B1	Hull/frame, General
B2	Body/cab, General
B3	Suspension/track/wheels, General
B4	Turret assembly, General
B5	Structures and buildings, General
B6	Sites, General
B7	Masts, General
B8	Containers, General
C0	Armaments, General
D0	Electrical systems, General
D1	Mobile electrical systems (engine/power pack), General
D2	Mobile electrical systems (hull/frame), General
D3	Mobile electrical systems (body/cab), General
D4	Mobile electrical systems (turret), General
D5	Power supply, General
E0	Communications, General
E1	Communications systems, General
E2	Connectivity, General

System	Title
E3	Antennas, General
E4	Tempest, General
F0	Navigation, General
F1	Navigation systems, General
G0	Surveillance, General
G1	Surveillance systems, General
H0	Steering, General
H1	Steering systems, General
J0	Ventilation cooling & heating, General
J1	Ventilation cooling & heating systems, General
K0	Hydraulic systems, General
K1	Hydraulics, General
K2	Pneumatic, General
L0	Electronic systems, General
L1	Amplifiers/attenuators, General
L2	Filters, General
L3	Computer/logic hardware-analogue, General
L4	Computer/logic hardware-digital, General
L5	Optoelectronics, General
L6	Oscillators/waveform generators, General
M0	Auxiliary, General
M1	Auxiliary systems, General
M2	Adapter kits, General
M3	Fire, General
N0	Survivability, General
N1	Surface finish, General
N2	Intrusion, General
N3	Nuclear, biological & chemical, General
P0	Special equipment, General
P1	Special equipment/systems, General
P2	Software, General
Q0	Outfit and furnishings, General

System	Title
Q1	Stowage, General
Q2	Complete equipment schedule (ces), General
R0	Training, General
R1	Training services, General
S0	Repair test and support, General
S1	Repair facilities, General
S2	Common support equipment, General
S3	Test and measurement, General
S4	Support and handling equipment, General

2.2 Definitions of systems and subsystems

2.2.1 System A - Propulsion, General

Table 3 System A0 - Propulsion, General

System	Subsystem	Title	Definition
A0	-00	**Propulsion, General**	A system or equipment for producing and delivering power.

Table 4 System A1 - Power pack, General

System	Subsystem	Title	Definition
A1	-00	**Power pack, General**	The power pack element refers to a self-contained means for generating and delivering power. It includes such systems as the main engine, transmission and interfaces. Subsystems can include such items as cooling, fuel, air and exhaust, lubrication, auxiliaries and electrical.
	-10	Main engine	Refers to a diesel, petrol, electric, etc, fuelled means for generating power and a means whereby this power can be delivered to the transmission It can include, for example, engine-mounted flywheel and clutch assemblies, cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-20	Transmission	Refers to a system which transmits power from the engine to the driving member and can include torque converter and gearbox. It can also include flywheel and clutch assemblies, steering and brakes if they are integral to the transmission. Also included are differentials and power takeoffs.
	-30	Power pack interfaces	Refers to the mounting assemblies connecting the main engine and transmission, together with associated ancillaries, including such systems as cooling, fuel, air and exhaust, lubrication, auxiliary and electrical. It can also include transmission items.

Table 5 System A2 - Power unit, General

System	Subsystem	Title	Definition
A2	-00	**Power unit, General**	The power unit element refers to a discrete means for generating and delivering power to the transmission. It can include, for example, flywheel and clutch assemblies.
	-10	Engine	Refers to a diesel, petrol, electric, etc, fuelled means for generating power and a means whereby this power can be delivered to the transmission. It can include, for example, flywheel and clutch assemblies and engine mounted cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-20	Cooling system	Refers to systems designed to maintain the correct operating temperatures for the power unit. It includes, for example, cooling air ducting, coolant pumps, liquid filled radiators, intercoolers, fans and associated heat exchange equipment.
	-30	Fuel systems	Refers to a system or equipment designed to deliver fuel to the power unit. It includes, for example, fuel storage facilities, pumps, filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors.
	-40	Air and exhaust systems	Refers to a system which supplies air to, or collects and removes exhaust gasses from the engine. It includes, for example, all pipes, ducting, filters, couplings, gaskets, turbochargers/superchargers, silencers and catalytic converters.
	-50	Lubrication systems	Refers to a system that provides lubrication to the power unit and any external components related to the power unit lubrication system. It includes, for example, delivery and return pipes, pumps, filters, intercoolers and separately mounted heat exchangers.
	-60	Electrical	Refers to a system that provides or uses electrical power associated with the power unit. It includes, for example, starter motors, alternators and generators directly mounted on the power unit. It also includes, for example, ignition system components including spark plugs, distributor, coils and leads .
	-70	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the power unit. It includes, for example, engine mountings.
	-80	Hydraulic	Refers to a system that provides or uses hydraulic power associated with the power unit. It includes, for example, hydraulic pumps, valves, pipes, and tanks. It also includes any external components related to the power unit hydraulic systems.

Table 6 System A3 - Engine cooling system, General

System	Subsystem	Title	Definition
A3	-00	**Engine cooling system, General**	This system includes cooling air ducting, coolant pumps, liquid filled radiators, fans and associated heat exchange equipment.
	-10	Fluid	Refers to fluid (water/oil) filled coolant systems. It includes pumps, radiators, fans, pipes and associated heat exchange equipment.
	-20	Air	Refers to cooling air ducting, fans and associated heat exchange equipment.

Table 7 System A4 - Fuel systems, General

System	Subsystem	Title	Definition
A4	-00	**Fuel systems, General**	Equipment to provide fuel storage facilities, filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors mounted externally to the power unit/pack.
	-10	Storage	Refers to the portion of the system which stores fuel. It includes, for example, tanks, filler necks, seals, valves, vents and drainage.
	-20	Distribution	Refers to the portion of the system which is used to distribute fuel from the storage system. It includes, for example, filters, restrictors, valves, controls and pipes.
	-30	Priming	Refers to the portion of the system which is used to pressurize/pump the fuel. It includes, for example, lift pumps, pressurization pumps, and cold starting systems.
	-40	Fuel injection	Refers to the portion of the system which delivers fuel. It includes, for example, FIP, fuel injectors, fuel pump metering and carburetors.
	-50	Indicating	Refers to the portion of the system which is used to monitor the condition of fuel (quantity, temperature and pressure). It includes, for example, transmitters, indicators, wiring and pressure warning systems.
	-60	Venting and de-fuelling	Refers to the portion of the system which is used to vent fumes from the fuel system and to provide a means for removing/dumping unwanted fuel.

Table 8 System A5 - Air and exhaust systems, General

System	Subsystem	Title	Definition
A5	-00	**Air and exhaust systems, General**	Refers to a system which supplies and filters air to the engine and collects and removes exhaust gases from the engine. It includes, for example, all filters, pipes, couplings, silencers, catalytic converters and ducting mounted externally to the power unit/pack.

System	Subsystem	Title	Definition
	-10	Air system	Refers to a system which supplies and filters air to the engine. It includes, for example, pre-filters, main air filters, and associated ducting. It can also include air cooling/heating systems and intercoolers.
	-20	Collector	Refers to that portion of the system which collects exhaust gases from the engine manifold. It includes pipes, joints, gaskets, etc.
	-30	Noise suppression	Refers to that portion of the system which reduces noise produced by the engine exhaust gases. It includes silencers, baffles, shields, etc.
	-40	Emission control	Refers to that portion of the system which is designed to reduce or eliminate engine exhaust gas emissions. It includes, for example, catalytic converters and tail pipes.

Table 9 System A6 - Lubrication systems, General

System	Subsystem	Title	Definition
A6	-00	**Lubrication systems, General**	This system is to include lubrication storage facilities that are external to the engine/power pack. It includes delivery and return pipes, pumps, filters and heat exchangers mounted externally to the power unit/pack.
	-10	Storage	Refers to the part of the system used for storage of engine and/or transmission lubricating oil. It includes tanks, filling systems, sumps, drains, etc.
	-20	Distribution	Refers to the part of the system used for distribution of lubricating oil to and from the engine and/or transmission. It includes pipes, pumps, filters, valves, etc.
	-30	Indicating	Refers to the part of the system used to monitor the condition of engine and/or transmission lubricating oil (quantity, temperature and pressure). It includes transmitters, indicators, wiring, pressure warning systems, etc.

Table 10 System A7 - Transmission, General

System	Subsystem	Title	Definition
A7	-00	**Transmission, General**	Refers to a means to transmit power from the engine to the driving member and can include clutch, torque converter, gearbox. It can also include steering and brakes if they are integral to the transmission. Also included are differentials and power takeoffs.
	-10	Gearbox	Refers to a means for varying the speed/torque delivered from the power unit to the driving member. It can include the steering control and brake assemblies.

System	Subsystem	Title	Definition
	-20	Steering control assembly	Refers to a discrete means for varying the drive applied, through the transmission system, to each of the vehicle's driving members (eg, tracked vehicles).
	-30	Brake assembly	Refers to a discrete means for applying braking forces through the vehicle transmission (eg, tracked vehicles).
	-40	Auxiliary drive/ power takeoff	Refers to an auxiliary means of obtaining an output from the engine. It includes transfer gearboxes which can also include a slip differential.
	-50	Clutch	Refers to a means for engaging/disengaging the transmission to/from the engine, when fitted as a separate assembly (for clutches fitted to a flywheel, see A21000).
	-60	Drive shaft	Refers to the means for connecting power output from the engine to the driving member. It includes muff couplings, propeller shafts, universal joints and final drives.
	-70	Torque converter	Refers to a means for varying the torque delivered from the engine to the driving member.
	-80	Differential	Refers to a means for changing the direction of rotation delivered from the engine to the driving member or wheels. For wheeled vehicles, it includes the driving axles, half shafts, hubs, etc.

Table 11 System A8 - Automotive/remote piloting and digital control systems, General

System	Subsystem	Title	Definition
A8	-00	**Automotive/ remote piloting and digital control systems, General**	The automotive and remote piloting and Digital Automotive Control System (DACS) element refers to that equipment (hardware/software) installed in the vehicle which is used to plan and control vehicle speed and direction either autonomously or via tele-operation. This includes equipment which senses, processes and displays imagery data such as stereo vision systems, laser scanners, multiple sensor fusion algorithms and processors, image enhancement algorithms and processors etc. This includes, for example, equipment which performs intelligence analysis and planning functions such as automated route planners, image understanding algorithms and processors, computer aided driving algorithms, DACS and processors.
	-10	Control	Refers to processing and control elements. It includes central processors, analogue/digital converters, associated software, memory boards, servo units, actuators, associated wiring, etc.
	-20	Sensors	Refers to sensors which are specifically associated with providing inputs to an automotive/remote piloting system or DACS.
	-30	Indicators	Refers to the part of the system used to indicate/monitor an automotive/remote piloting system or DACS. It includes indicators, wiring, etc.

Table 12 System A9 - Controls (drivers), General

System	Subsystem	Title	Definition
A9	-00	**Controls (drivers), General**	Given in this element are the controls required to start, stop, steer and generally control the vehicle commensurate with the mobility role of the equipment. It includes, for example, on-board diagnostic systems.
	-10	Foot controls	Refers to the foot-operated controls to start, stop, steer and generally control the vehicle. It includes, for example, pedal assemblies (clutch, brake, accelerator, etc), associated linkages, cables, hydraulic/pneumatic connections, master and slave cylinders, brake shoes and pads and disks and drums.
	-20	Hand controls	Refers to the hand-operated controls to start, stop, steer and generally control the vehicle. It includes, for example, stop/start, steering (wheel, tiller, etc) and braking controls.
	-30	Ancillary controls	Refers to ancillary controls and associated systems. It includes, for example, such items as screen wash equipment, windscreen wipers and adjustable wing mirrors.
	-40	Propulsion control systems	Refers to systems which monitor and/or control engine speed and performance.
	-50	Instrumentation	Refers to systems (hardware/software) which monitor/report on the operation of vehicle systems. It includes, for example, the drivers instrumentation panel, warning lights and condition monitoring systems.

2.2.2 System B - Structure, General

Table 13 System B0 - Structure, General

System	Subsystem	Title	Definition
B0	-00	**Structure, General**	Framework and/or basic structural housing for a system, including load bearing components.

Table 14 System B1 – Hull/frame, General

System	Subsystem	Title	Definition
B1	-00	**Hull/frame, General**	This element refers to the vehicles primary load bearing component which provides the structural integrity to withstand the operational loading stresses generated while traversing various terrain profiles. This element could be a simple wheeled vehicle frame or a more complicated combat vehicle hull which satisfies not only the structural requirements but also provides armor protection. It includes all structural subassemblies and appendages which attach directly to the primary structure. This element, for example, includes towing and lifting fittings, bumpers, hatches and grilles. It also includes provision to accommodate other Subsystems such as mountings for suspension, weapons, turret, track body, cab, special equipment, loads etc.
	-10	Internal mountings	Refers to internal fitments mounted on the hull/frame. It includes brackets, stud welding, floors and insulation panels.
	-20	External mountings	Refers to the chassis and external fitments mounted on the hull/frame. It includes brackets, stud welding, steps, bumpers, mud-guards, windows, etc.
	-30	Doors/hatches	Refers to loading/entry hatches and doors in, or directly mounted on, the hull/frame assembly. It includes shell loading doors, driver and passenger doors, hatches, locks, handles, drivers/operators hoods, cowls and windshields, etc.
	-40	Seats	Refers to seating which is directly mounted on the hull/frame.
	-50	Drinking water tank	Refers to a system designed to provide drinking water for the driver and crew, which is directly mounted on the hull/frame. It includes tanks, filler necks, filters, pipes, seals, valves, vents, drainage, etc.
	-60	Access cover plates	Refers to access cover plates directly mounted on the hull/frame. It includes, for example, guards, plugs, drain/inspection covers. It can also include deck area assemblies.
	-70	Gun crutch/ depression rails	Refers to gun crutch and depression rails directly mounted on the hull/frame.
	-80	Skirting plates/ brackets/splash plates	Refers to skirting plates, brackets and splash plates directly mounted on the hull/frame. It includes the plates and associated fittings, brackets, towing attachments, etc.

Table 15 System B2 - Body/cab, General

System	Subsystem	Title	Definition
B2	-00	**Body/cab, General**	Refers to the major components to be mated to a chassis or frame to provide a complete vehicle having a defined mission capability. This element includes accommodation for personnel, cargo, and such subsystems as need to be placed in proximity of the operators.

System	Subsystem	Title	Definition
	-10	Internal mountings	Refers to internal fitments mounted on the body/cab. It includes panels, brackets, clips, fascia, instrument panels, stud welding, internal windows, etc.
	-20	External mountings	Refers to external fitments mounted on the body/cab. It includes the external cab assembly, panels, brackets, stud welding, steps, windows, cab tilt and locking mechanism, etc.
	-30	Doors/hatches	Refers to loading/entry hatches and doors in, or directly mounted on, the body/cab. It includes loading doors, driver and passenger doors, hatches, locks, handles, etc.
	-40	Seats	Refers to seating and associated fittings which are directly mounted on the body/cab. It includes, for example, seat belts and harnesses.
	-50	Drinking water tank	Refers to a system designed to provide drinking water for the driver and crew, which is directly mounted on the body/cab. It includes tanks, filler necks, filters, pipes, seals, valves, vents, drainage, etc.
	-60	Access panels	Refers to access panels directly mounted on the body/cab.
	-70	Load bay	Refers to load (or passenger) carrying areas in the body/cab and any soft/hard top covering, supports, etc.
	-80	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the body or cab.

Table 16 System B3 - Suspension/track/wheels, General

System	Subsystem	Title	Definition
B3	-00	**Suspension/ track/wheels, General**	This element refers to the means for generating tractive effort, thrust and lift, generally at or in proximity to the earth's surface and adapting the vehicle to the irregularities of the surface. It includes, for example, wheels, tracks and steering gears for traction and control functions. Also, it includes springs, shock absorbers, skirts and other suspension members such as track adjusting mechanisms. It does not include specific steering mechanisms.
	-10	Suspension unit	Refers to the means for adapting the vehicle to irregularities of the surface. It includes hydrogas units, shock absorbers, leaf and coil springs, pneumatic suspension units, etc. Also included is the lift mechanism, skirts, etc, for hovercraft.
	-20	Road wheel/hub assembly	Refers to a means for distributing the nominal ground pressure of the vehicle. On wheeled vehicles, it includes wheels that transfer tractive effort to the surface and rolling wheels. It includes road wheels, hub assemblies, tires, valves, inner-tubes, etc.
	-30	Sprocket wheel assembly	Refers to the sprocket drive wheels which transfer tractive effort to the track.
	-40	Track assembly	Refers to the track and associated linkages.

System	Subsystem	Title	Definition
	-50	Idler wheels	Refers to the feed/guide mechanism(s) associated with track laying. It includes idler wheels and track tensioners.
	-60	Roller assembly	Refers to the track roller guide assemblies.
	-70	Axle	Refers to non-driving axles not covered under the transmission system. It includes axle arms, links, bearings, etc.

Table 17 System B4 - Turret assembly, General

System	Subsystem	Title	Definition
B4	-00	**Turret assembly, General**	The turret assembly refers to the structures and equipment installation required to provide the fighting compartment element of combat vehicles. This element includes turret armour, EMC shielding, turret rings, slip rings, attachments and appendages such as latches and cupolas, and accommodation for personnel, weapons and C^3I.
	-10	Internal mountings	Refers to internal fitments mounted in the turret. It includes drinking water installations, periscope mountings, panels, brackets, clips, stud welding, etc.
	-20	External mountings	Refers to external fitments mounted on the turret. It includes brush deflector assemblies, cooler boxes, gun covers, splash curtains, panels, brackets, stud welding, etc.
	-30	Hatches	Refers to loading/entry hatches in, or directly mounted on, the turret. It includes loading hatches, crew hatches and associated locks, handles, fittings, etc. It does not include cupolas.
	-40	Seats	Refers to seating which is directly mounted in the turret.
	-50	Ring assembly	Refers to a circular track and roller/ball-race assembly designed to facilitate turret rotation.
	-60	Cupola	Refers to a roof aperture and domed hatch assembly, primarily for observation purposes. It can be capable of rotation, and can also provide access for entry/exit.
	-70	Elevating/ traversing gearbox	Refers to elevating traversing gearboxes mounted on the turret wall.
	-80	Turntable assembly	Refers to the turret turntable assembly. It includes drive and roller assemblies, RBJ mountings, etc.
	-90	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the turret. It includes such items as wash/wipe equipment, turret and elevation locks, position indicators and adjustable mirrors, etc.

Table 18 System B5 - Structures and buildings, General

System	Subsystem	Title	Definition
B5	-00	**Structures and buildings, General**	This element refers to the structural portion of the electronic/automated software system. It includes, for example, frames, chassis, racks, etc.
	-10	Frame/chassis	Refers to the structural frame or chassis of the electronic/automated software system.
	-20	Rack	Refers to the mounting rack of the electronic/automated software system.
	-30	Fixtures/fittings	Refers to fixtures and fittings in the racks of the electronic/automated software system. It includes, for example, blank panels, runners, bonding rails, anti-vibration mounts, grilles, cable trays and guides.
	-40	Encapsulation	Refers to the enclosure of items within the electronic/automated software system by use of a potting compound.

Table 19 System B6 - Sites, General

System	Subsystem	Title	Definition
B6	-00	**Sites, General**	This element refers to the physical make-up of a site where an electronic/automated software system is installed or housed. It includes, for example, boundaries, buildings, chambers, radomes and hard-standing.
	-10	Buildings	Refers to the buildings in which the electronic/automated software system is housed.
	-20	Radomes	Refers to the radomes in which the electronic/automated software system is housed.
	-30	Chambers	Refers to the chambers in the electronic/automated software system. It includes, for example, underground chambers, cable and EMP vaults, secure and other storage areas.
	-40	Hard standing	Refers to hard standing on the site where the electronic/automated software system is installed or located.

Table 20 System B7 - Masts, General

System	Subsystem	Title	Definition
B7	-00	**Masts, General**	Refers to structures erected to provide support for antennas etc. It includes, for example, masts, towers and securing equipment.
	-10	Masts	Refers to those erected structures which are not free-standing.
	-20	Towers	Refers to those erected structures which are free-standing.

System	Subsystem	Title	Definition
	-30	Securing equipment	Refers to the equipment and devices which is used to secure masts, towers and antennas.

Table 21 System B8 - Containers, General

System	Subsystem	Title	Definition
B8	-00	**Containers, General**	Refers to containers that form part of the electronic/automated software system. It includes, for example, ISO containers, cabins and cases.
	-10	ISO containers	Refers to ISO containers which form part of the electronic/automated software system.
	-20	Cabins	Refers to cabins which form part of the electronic/automated software system.
	-30	Cases	Refers to covers and cases which form part of the electronic/automated software system.

2.2.3 System C - Armaments, General

Table 22 System C0 - Armaments, General

System	Subsystem	Title	Definition
C0	-00	**Armaments, General**	A defensive or offensive system or equipment (including small arms and machine guns).

2.2.4 System D - Electrical system, General

Table 23 System D0 - Electrical systems, General

System	Subsystem	Title	Definition
D0	-00	**Electrical systems, General**	A system or equipment for generation, distribution and/or control of electric power.

Table 24 System D1 - Mobile electrical systems (engine/power pack), General

System	Subsystem	Title	Definition
D1	-00	**Mobile electrical systems (engine/power pack), General**	This element refers to the electrical or electronic systems for the engine/power pack. It will include wiring harnesses, line replaceable units (LRUs), sensors, lighting, batteries, generators, etc.
	-10	Generating	Refers to generating systems and equipment in the engine/power pack compartment that are not directly mounted on the engine/power-pack. It includes such items as alternators, dynamos, generator panels, etc.

System	Subsystem	Title	Definition
	-20	Batteries	Refers to battery equipment mounted in the engine/power pack compartment. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment mounted in the engine/power pack compartment. It includes such items as tachometers, speedometers, indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment mounted in the engine/power pack compartment. It includes such items as inspection lights, etc.
	-50	Wiring	Refers to wiring and cable looms mounted in the engine/power pack compartment. It includes looms, wires, harnesses, etc.
	-60	Electrical equipment	Refers to electrical equipment mounted in the engine/power pack compartment. It includes, for example, actuators, engine controls and ignition systems.
	-70	Distribution	Refers to electrical distribution systems and equipment mounted in the engine/power pack compartment. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment mounted in the engine/power pack compartment. It includes such items as fuses, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment mounted in the engine/power pack compartment. It includes such items as controllers, switches, relays, regulators, etc.

Table 25 System D2 - Mobile electrical systems (hull/frame), General

System	Subsystem	Title	Definition
D2	-00	**Mobile electrical systems (hull/ frame), General**	This element refers to the electrical or electronic systems for the hull and frame. It will include both internal and external wiring harnesses, junction and distribution boxes, line replaceable units (LRUs), sensors and lighting systems. It also includes the interfaces and connectors associated with the engine, power pack, generating and starting systems.
	-10	Internal electrical systems	Refers to the internal electrical or electronic systems mounted in the hull/frame. It will include, for example, wiring harnesses, LRUs, junction and distribution boxes. It also includes the interfaces and connectors associated with the engine, power pack, generating and starting systems.
	-20	Batteries	Refers to battery equipment related to the hull/frame. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Internal lights	Refers to lighting systems mounted internally in the hull/frame.

System	Subsystem	Title	Definition
	-40	External electrical systems	Refers to the electrical or electronic systems mounted externally on the hull/frame. It will include, for example, external lighting systems, horns and flashing beacons.
	-50	Wiring	Refers to wiring, cable looms and clips related to the hull/frame or associated with connecting to the engine/power pack. It includes looms, wires, clips, harnesses, connectors, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the hull/frame. It includes, for example, actuators, wiper controls, heaters, cooking pots, horns, radio fittings and ancillary items.
	-70	Distribution	Refers to electrical distribution and interconnecting systems and equipment related to the hull/frame. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the hull/frame. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the hull/frame. It includes such items as controllers, switches, relays, regulators, etc.

Table 26 System D3 - Mobile electrical systems (body/cab), General

System	Subsystem	Title	Definition
D3	-00	**Mobile electrical systems (body/cab), General**	This element refers to the electrical or electronic systems for either the body or cab. It will include wiring harnesses, line replaceable units (LRUs), sensors and lighting systems.
	-10	Generating	Refers to generating systems and equipment related to the body/cab. It includes such items as generator control panels, etc.
	-20	Batteries	Refers to battery equipment related to the body/cab. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment related to the body/cab. It includes such items as indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment related to the body/cab. It includes such items as inspection lights, head lights, spot lights, tail/side lights, indicators, panel lights, convoy lights, etc.
	-50	Wiring	Refers to wiring and cable looms related to the body/cab. It includes looms, wires, harnesses, earthing straps, etc.

System	Subsystem	Title	Definition
	-60	Electrical equipment	Refers to electrical equipment related to the body cab. It includes, for example, actuators, wiper controls, heaters, cooking pots and horns.
	-70	Distribution	Refers to electrical distribution systems and equipment related to the body/cab. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the body/cab. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the body/cab. It includes such items as controllers, switches, relays, regulators, etc.

Table 27 System D4 - Mobile electrical systems (turret), General

System	Subsystem	Title	Definition
D4	-00	**Mobile electrical systems (turret), General**	This element refers to the electrical or electronic systems for the turret. It will include wiring harnesses, line replaceable units (LRUs), sensors and lighting systems.
	-10	Generating	Refers to generating systems and equipment related to the turret. It includes such items as generator control panels, etc.
	-20	Batteries	Refers to battery equipment related to the turret. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment related to the turret. It includes such items as indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment related to the turret. It includes such items as inspection lights, panel lights, roof lights, spot lights, convoy lights, etc.
	-50	Wiring	Refers to wiring and cable looms related to the turret. It includes looms, wires, harnesses, earthing straps, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the turret. It includes, for example, actuators, wiper controls, heaters and cooking pots.
	-70	Distribution	Refers to electrical distribution systems and equipment related to the turret. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the turret. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.

System	Subsystem	Title	Definition
	-90	Control	Refers to control systems and equipment related to the turret. It includes such items as controllers, switches, relays, regulators, etc.

Table 28 System D5 - Power Supply, General

System	Subsystem	Title	Definition
D5	-00	**Power supply, General**	Refers to the systems, subsystems, equipment and devices which provide power for a non-mobile facility. It includes, for example, AC power, DC power, external power and protection.

2.2.5 System E - Communications, General

Table 29 System E0 - Communications, General

System	Subsystem	Title	Definition
E0	-00	**Communications, General**	A system or equipment for transferring information.

Table 30 System E1 - Communications systems, General

System	Subsystem	Title	Definition
E1	-00	**Communications systems, General**	This element refers to the devices within the electronic/automated software system which provide the means for transmitting and receiving data. It includes, for example, fixed, tactical and mobile systems.
	-10	UHF/SHF/EHF	Refers to that portion of the electronic/automated software system that is used for communications utilizing UHF/SHF/EHF carriers (excluding satellite). It includes, for example, transmitters, receivers, antennas, signal processors, modems, etc.
	-20	VHF	Refers to that portion of the electronic/automated software system that is used for communications utilizing VHF carriers. It includes, for example, transmitters, receivers, antennas, signal processors, modems, etc.
	-30	HF	Refers to that portion of the electronic/automated software system that is used for communications utilizing HF carriers. It includes, for example, transmitters, receivers, antennas, signal processors, modems, etc.
	-40	LF	Refers to that portion of the electronic/automated software system that is used for communications utilizing LF carriers. It includes transmitters, receivers, antennas, signal processors, modems, etc.

System	Subsystem	Title	Definition
	-50	Digital	That portion of the electronic/automated software system that is used for digital/data communications. It includes, for example, data processors and DC line bays.
	-60	Audio/video	Refers to that portion of the electronic/automated software system that is used for audio and visual communications. It includes, for example, telephone equipment, fax machines, public address systems, modems and audio line bays.
	-70	Satellite	Refers to that portion of the electronic/automated software system that is used for communications via satellite. It includes, for example, satellite ground stations, fixed, transportable and portable satellite ground terminals.
	-80	Command & control	Refers to that portion of the electronic/automated software system that is used for command and control. It includes, for example, network and system control centers and other command and control subsystems.
	-90	Signal distribution	Refers to that portion of the electronic/automated software system that distributes signals. It includes, for example, switching matrices, combiners, dividers, slip-rings and commutators.

Table 31 System E2 - Connectivity, General

System	Subsystem	Title	Definition
E2	-00	**Connectivity, General**	Refers to that portion of the electronic/automated software system that provides connectivity. It includes, for example, landlines, twin-feeders, waveguides, inter and intra connection cabling, fiber optic cables and patching facilities.
	-10	Landlines	Refers to that portion of the electronic/automated software system that provides connectivity via landline.
	-20	Twin feeders	Refers to that portion of the electronic/automated software system that provides connectivity via twin feeders.
	-30	Inter-connectivity	Refers to that portion of the electronic/automated software system that provides inter-connectivity
	-40	Intra-connectivity	Refers to that portion of the electronic/automated software system that provides intra-connectivity
	-50	Optical fibre	Refers to that portion of the electronic/automated software system that provides connectivity via optical fiber cables.
	-60	Patching facilities	Refers to that portion of the electronic/automated software system that provides patching/switching facilities within the connectivity area. It includes, for example, jack-field panels.
	-70	Power cables	Refers to that portion of the electronic/automated software system that provides power connectivity.

Table 32 System E3 - Antennas, General

System	Subsystem	Title	Definition
E3	-00	**Antennas, General**	Refers to that portion of the electronic/automated software system that radiates or absorbs electromagnetic waves.
	-10	UHF/SHF/EHF	Refers to that portion of the electronic/automated software system that radiates or absorbs electromagnetic waves in the UHF/SHF/EHF frequency bands.
	-20	VHF	Refers to that portion of the electronic/automated software system that radiates or absorbs electromagnetic waves in the VHF frequency band.
	-30	HF	Refers to that portion of the electronic/automated software system that radiates or absorbs electromagnetic waves in the HF frequency band.

Table 33 System E4 - Tempest, General

System	Subsystem	Title	Definition
E4	-00	**Tempest, General**	Refers to that portion of the system that provides TEMPEST protection. It includes, for example, cages and vaults.
	-10	Cages	Refers to the cages in the electronic/automated software systems that provide TEMPEST protection.
	-20	Vaults	Refers to the vaults in the electronic/automated software systems that provide TEMPEST protection.

2.2.6 System F - Navigation, General

Table 34 System F0 - Navigation, General

System	Subsystem	Title	Definition
F0	-00	**Navigation, General**	A system or equipment used to determine, conduct, manage, or plot a position or course.

Table 35 System F1 - Navigation systems, General

System	Subsystem	Title	Definition
F1	-00	**Navigation systems, General**	Refers to that portion of the electronic/automated software system that provides range, bearing and/or height information for the system.
	-10	Radar	Refers to that portion of the electronic/automated software system which uses radar principles to provide range, bearing and/or height information. It includes, for example, air defense, precision and tracking radars.

	-20	Radio guidance	Refers to that portion of the electronic/automated software system which uses modulated radio waves to provide range, bearing and/or height information. It includes, for example, beacons, landing aids and direction finding equipment.
	-30	Laser	Refers to that portion of the electronic/automated software system which uses laser principles to provide range, bearing and/or height information.
	-40	Satellite	Refers to that portion of the electronic/automated software system which uses satellites to provide range, bearing and/or height information. It includes, for example, both satellite and ground positioning elements.
	-50	Magnetic	Refers to that portion of the electronic/automated software system which uses magnetic principles to provide range and/or bearing information. It includes, for example, compasses.
	-60	Thermal	Refers to that portion of the electronic/automated software system which uses heat sensing or infra-red principles to provide range, bearing and/or height information.
	-70	Optical	Refers to that portion of the electronic/automated software system which uses optical sighting to provide range, bearing and/or height information.

2.2.7 System G - Surveillance, General

Table 36 System G0 - Surveillance, General

System	Subsystem	Title	Definition
G0	-00	**Surveillance, General**	A system or equipment used to sense the environment.

Table 37 System G1 - Surveillance systems, General

System	Subsystem	Title	Definition
G1	-00	**Surveillance systems, General**	Refers to that portion of the electronic/automated software system which senses, monitors and, where required provides alarms and environmental data. It includes, for example, radar, sonar, thermal, optical and environmental technologies.
	-10	Radar	Refers to that portion of the electronic/automated software system which uses the principles of radar.
	-20	Sonar	Refers to that portion of the electronic/automated software system which uses the principles of sonar.
	-30	Thermal	Refers to that portion of the electronic/automated software system which uses thermal imaging/intensifying and temperature monitoring principles. It includes, for example, electronic thermostats and IR detectors.

System	Subsystem	Title	Definition
	-40	Optical	Refers to that portion of the electronic/automated software system which uses optical and/or laser principles. It includes, for example, CCTV.
	-50	Magnetic	Refers to that portion of the electronic/automated software system which uses magnetic principles.
	-60	Acoustic	Refers to that portion of the electronic/automated software system which uses acoustic principles.
	-70	Pressure	Refers to that portion of the electronic/automated software system which operates through pressure sensing techniques.
	-80	Proximity	Refers to that portion of the electronic/automated software system which operates through proximity sensing techniques.
	-90	Environmental	Refers to that portion of the electronic/automated software system which provides environmental data. It includes, for example, air quality (NBC, smoke) and weather (anemometer) monitoring.

2.2.8 System H - Steering, General

Table 38 System H0 - Steering, General

System	Subsystem	Title	Definition
H0	-00	**Steering, General**	A system or equipment used to guide or govern direction.

Table 39 System H1 - Steering systems, General

System	Subsystem	Title	Definition
H1	-00	**Steering systems, General**	Refers to those units and devices within the electronic/automated software system which govern movement and/or direction of assemblies. It includes, for example, motors, gearboxes, drives and turning gear.
	-10	Motors	Refers to the motor drive units within the electronic/automated software system which affect movement and/or direction of assemblies.
	-20	Gearboxes	Refers to the geared units within the electronic/automated software system which vary torque, speed and/or direction of movement of assemblies.
	-30	Drives	Refers to the interconnecting links between motor, gearbox and device, within the electronic/automated software system, which affect movement and/or direction of assemblies.
	-40	Turning gear	Refers to the final drive link to moving assemblies within the electronic/automated software system.

System	Subsystem	Title	Definition
	-50	Control systems	Refers to those units within the electronic/automated software system which control movement and/or direction of assemblies.

2.2.9 System J - Ventilation cooling & heating

Table 40 System J0 - Ventilation cooling & heating

System	Subsystem	Title	Definition
J0	-00	**Ventilation cooling & heating**	A system or equipment used to provide a controlled environment.

Table 41 System J1 - Ventilation cooling & heating systems, General

System	Subsystem	Title	Definition
J1	-00	**Ventilation cooling & heating systems, General**	Refers to those units and devices which furnish a means of pressurizing, heating, cooling, moisture controlling, filtering and treating the air/gas used to condition areas of the electronic/automated software system environment. It includes, for example, cooling, heating, vents, ducts and seals.
	-10	Compression	Refers to that portion of the electronic/automated software system which supplies pressurized air/gas. It includes, for example, gas-filled systems, controls and indicating systems.
	-20	Distribution	Refers to that portion of the electronic/automated software system used to induct and distribute air/gas. It includes, for example, rack cooling, seals, demisting, blowers, ducting and inlets.
	-30	Heating	Refers to that portion of the electronic/automated software system and its controls which supply heated air/gas. It includes, for example, heater units, control and indicating systems.
	-40	Cooling	Refers to that portion of the electronic/automated software system and its controls which supply cooled air/gas. It includes, for example, cooling units, control and indicating systems.
	-50	Temperature control	Refers to that portion of the electronic/automated software system used to control the temperature of the air/gas. It includes, for example, sensing devices, switches and indicators.
	-60	Moisture/air	Refers to that portion of the electronic/automated software system used to contaminant control the air/gas. It includes, for example, control of moisture and/or ozone concentrations, filtration of radioactive debris and removal of chemical/biological contaminants.

System	Subsystem	Title	Definition
	-70	Liquid coolant	Refers to those units and devices within the electronic/automated software system which supply liquid coolant to an equipment cooling system.

2.2.10 System K - Hydraulic systems, General

Table 42 System K0 - Hydraulic systems, General

System	Subsystem	Title	Definition
K0	-00	**Hydraulic systems, General**	A system or equipment for generation, distribution and/or control of hydraulic (or pneumatic) power.

Table 43 System K1 - Hydraulic, General

System	Subsystem	Title	Definition
K1	-00	**Hydraulic, General**	Refers to that portion of the electronic/automated software system which generates, distributes and/or controls hydraulic power.
	-10	Main	Refers to that portion of the electronic/automated software system which generates, distributes and/or controls primary hydraulic power. It includes, for example, tanks, valves, pumps and plumbing. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	Refers to that portion of the electronic/automated software hydraulic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main hydraulic system.
	-30	Indicating	Refers to that portion of the electronic/automated software hydraulic system which is used to monitor its condition. It includes, for example, transmitters, indicators and alarm systems.
	-40	Support	Refers to that portion of the electronic/automated software system which is used to hydraulically raise or lower other units.

Table 44 System K2 - Pneumatic, General

System	Subsystem	Title	Definition
K2	-00	**Pneumatic, General**	Refers to that portion of the electronic/automated software system which generates, distributes and/or controls pneumatic (including vacuum) power.
	-10	Main	Refers to that portion of the electronic/automated software system which generates, distributes and/or controls primary pneumatic (including vacuum) power. It includes, for example, tanks, valves, pumps and plumbing. It does not include user systems classified elsewhere, or their connecting valves.

System	Subsystem	Title	Definition
	-20	Auxiliary	Refers to that portion of the electronic/automated software pneumatic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main pneumatic system.
	-30	Indicating	Refers to that portion of the electronic/automated software pneumatic system which is used to monitor its condition. It includes, for example, transmitters, indicators and alarm systems.
	-40	Pressurization	Refers to that portion of the electronic/automated software system which is used to pressurize cables, waveguides, and other system devices. It includes, for example, dehydrators and compressors.

2.2.11 System L - Electronic system, General

Table 45 System L0 - Electronic system, General

System	Subsystem	Title	Definition
L0	-00	**Electronic system, General**	A system or equipment using electronic/automated software and/or firmware elements not specifically included in other systems.

Table 46 System L1 - Amplifiers/attenuators, General

System	Subsystem	Title	Definition
L1	-00	**Amplifiers/ attenuators, General**	Refers to equipment and devices within the electronic/automated software system which increase or decrease the magnitude of a signal, voltage or current. It applies to elements not specifically included in other groups.
	-10	Audio	Refers to equipment and devices within the electronic/automated software system which increase or decrease the magnitude of a signal, voltage or current within the audio frequency range (up to 30 kHz).
	-20	Power	Refers to equipment and devices within the electronic/automated software system which increase or decrease the magnitude of a signal, voltage or current with a power of greater than or equal to 5 watts.
	-30	RF	Refers to equipment and devices within the electronic/automated software system which increase or decrease the magnitude of a signal, voltage or current within the radio frequency range.

Table 47 System L2 - Filters, General

System	Subsystem	Title	Definition
L2	-00	**Filters, General**	Refers to that portion of the electronic/automated software system, which passes or rejects a signal, voltage or current. It applies to elements not specifically included in other groups.
	-10	Low-pass	Refers to equipment and devices within the electronic/automated software system which pass low-frequency and reject high frequency signals.
	-20	High-pass	Refers to equipment and devices within the electronic/automated software system which reject low-frequency and pass high frequency signals.
	-30	Band-pass	Refers to equipment and devices within the electronic/automated software system which pass signals within a defined frequency band.
	-40	Band-stop	Refers to equipment & devices within the electronic/ automated software which reject signals within a range.

Table 48 System L3 - Computer/logic hardware-analogue, General

System	Subsystem	Title	Definition
L3	-00	**Computer/logic hardware-analogue, General**	Refers to equipment and devices within the electronic/automated software system which process or store analogue data. It applies to elements not specifically included in other groups.
	-10	Processing	Refers to equipment and devices within the electronic/automated software system which perform a process on a signal, voltage or current. It includes, for example, mixers, converters, decoders and microwave devices (including couplers, cavity devices and circulators).
	-20	Input	Refers to equipment and devices within the electronic/automated software system which provide a means for inputting analogue data. It includes, for example, acoustic couplers, work stations, analogue controls and microphones.
	-30	Output	Refers to equipment and devices within the electronic/automated software system which provide a means of outputting analogue data. It includes, for example, headphones, loudspeakers, moving coil displays, visual display units and projectors.
	-40	Data storage	Refers to equipment and devices within the electronic/automated software system which retain analogue data. It includes, for example, video and audio recorders.
	-50	Multiplexer	Refers to equipment and devices within the electronic/automated software system which multiplex and/or switch signals. It includes, for example, time division multiplexers and switching multiplexers.

System	Subsystem	Title	Definition
	-60	Comparator/ discriminator/ integrator	Refers to equipment and devices within the electronic/automated software system which compare, discriminate and/or integrate signals.

Table 49 System L4 - Computer/logic hardware-digital, General

System	Subsystem	Title	Definition
L4	-00	**Computer/logic hardware-digital, General**	Refers to equipment and devices within the electronic/automated software system which process or store digital data. It applies to elements not specifically included in other groups.
	-10	Processing	Refers to equipment and devices within the electronic/automated software system which receive and perform arithmetic and/or logic operations on digital data. It includes, for example, central processing units and math co-processors.
	-20	Input	Refers to equipment and devices within the electronic/automated software system which provide a means of inputting digital data. It includes, for example, punched tape readers, keyboards, digital joysticks, mice and image scanners.
	-30	Output	Refers to equipment and devices within the electronic/automated software system which provide a means of outputting digital data. It includes, for example, printers, plotters and monitors.
	-40	Data storage	Refers to equipment and devices (other than memory) within the electronic/automated software system which retain data and/or instructions. It includes, for example, floppy, hard and optical disks, magnetic tape and CD-ROM.
	-50	Memory	Refers to equipment and devices within the electronic/automated software system which store data or instructions. It includes, for example, RAM, ROM and bubble memory
	-60	Control	Refers to equipment and devices within the electronic/automated software system which control internal and/or external processes.

Table 50 System L5 - Optoelectronics, General

System	Subsystem	Title	Definition
L5	-00	**Optoelectronics, General**	Refers to equipment and devices within the electronic/automated software system which generate or detect radiation above the radio spectrum (including infra-red, ultra-violet and x-rays). It applies to elements not specifically included in other groups.

System	Subsystem	Title	Definition
	-10	Fiber-optic	Refers to equipment and devices within the electronic/automated software system which interface to and/or enhance the performance of fiber optic cables. It includes, for example, adapters, drivers, repeaters and ITLs.
	-20	Measurement	Refers to equipment and devices within the electronic/automated software system which measure light. It includes, for example, photometers.
	-30	Detection	Refers to equipment and devices within the electronic/automated software system which detect light. It includes, for example, photo-cells and cameras.
	-40	Emission	Refers to equipment and devices within the electronic/automated software system which emit light. It includes, for example, bulbs, lasers and LEDs.
	-50	Switching	Refers to equipment and devices within the electronic/automated software system which switches light. It includes (eg, beam splitters and resonating mirrors).

Table 51 System L6 - Oscillators/waveform generators, General

System	Subsystem	Title	Definition
L6	-00	**Oscillators/ waveform generators, General**	Refers to equipment and devices within the electronic/automated software system which produce varying or switched waveforms. It includes, for example, oscillating devices, timing subsystems and station clocks. It applies to elements not specifically included in other groups.
	-10	Astable	Refers to equipment and devices within the electronic/automated software system which continually switch or oscillate from one state to another.
	-20	Bistable	Refers to equipment and devices within the electronic/automated software system which can switch between two states.

2.2.12 System M - Auxiliary systems, General

Table 52 System M0 - Auxiliary systems, General

System	Subsystem	Title	Definition
M0	-00	**Auxiliary systems, General**	Refers to equipment and devices within the electronic/automated software system which provide services and/or support to the main systems or equipment. It applies to elements not specifically included in other groups.

Table 53 System M1 - Adapter kits, General

System	Subsystem	Title	Definition
M1	-00	**Adapter kits, General**	Refers to equipment and devices within the electronic/automated software system which adapt the system to particular applications.

Table 54 System M2 - Fire, General

System	Subsystem	Title	Definition
M2	-00	**Fire, General**	Refers to equipment and devices within the electronic/automated software system which provide a means of alerting and/or dealing with fire hazards. It includes, for example, detection and extinguishing facilities.
	-10	Detecting	Refers to equipment and devices within the electronic/automated software system which is used to sense the presence of excessive heat, smoke or flame.
	-20	Indicating	Refers to equipment and devices within the electronic/automated software system which is used to indicate the presence of excessive heat, smoke or flame.
	-30	Protection	Refers to equipment and devices within the electronic/automated software system which is used to extinguish fires.

2.2.13 System N - Survivability, General

Table 55 System N0 - Survivability, General

System	Subsystem	Title	Definition
N0	-00	**Survivability, General**	A system or equipment used to provide hazard detection, protection, survivability and escape facilities.

Table 56 System N1 - Surface finish, General

System	Subsystem	Title	Definition
N1	-00	**Surface finish, General**	Refers to equipment and devices within the electronic/automated software system which provides protection against corrosion. It includes, for example, painting, plating, dip coating and laminating.

Table 57 System N2 - Intrusion, General

System	Subsystem	Title	Definition
N2	-00	**Intrusion, General**	Refers to equipment and devices within the electronic/automated software system which provide a means of detecting and indicating an intrusion.

System	Subsystem	Title	Definition
	-10	Detecting	Refers to equipment and devices within the electronic/automated software system which provide a means of detecting an intrusion.
	-20	Indicating	Refers to equipment and devices within the electronic/automated software system which provide a means of indicating an intrusion.
	-30	Protection	Refers to equipment and devices within the electronic/automated software system which provide a means of protecting against an intrusion.

Table 58 System N3 - Nuclear, biological, chemical

System	Subsystem	Title	Definition
N3	-00	**Nuclear, biological, chemical**	Refers to equipment and devices within the electronic/automated software system which provide nuclear, biological and chemical detection, protection and survivability. It applies to elements not specifically included in other groups and includes positive pressure and purification systems, NBC detection and warning devices, decontamination equipment and chemical resistant coatings. It can also include environmental control equipment, such as heaters, coolers, etc.
	-10	Detecting	Refers to equipment and devices within the electronic/automated software system which detects an NBC hazard.
	-20	Indicating	Refers to equipment and devices within the electronic/automated software system which indicates an NBC hazard.
	-30	Protection	Refers to equipment and devices within the electronic/automated software system which provides a means of protection against an NBC hazard.

2.2.14 System P - Special Equipment, General

Table 59 System P0 - Special equipment, General

System	Subsystem	Title	Definition
P0	-00	**Special equipment, General**	A system or equipment used to provide a special mission capability.

Table 60 System P1 - Special equipment/systems, General

System	Subsystem	Title	Definition
P1	-00	**Special equipment/ systems, General**	Refers to equipment and devices within the electronic/automated software system which can be used to provide a special capability for the system.
	-10	Special recovery equipment	This element refers to that special recovery equipment to enable the achievement of a recovery capability. It includes cranes and towing equipment.
	-20	Launcher special fit equipment	This element refers to that special fit equipment to enable the achievement of a specialized capability. It will include supply, DROPS, lift trucks, side loaders, etc.
	-30	Launcher special purpose equipment	This element refers to that special-to-purpose equipment for the achievement of a special mission purpose. It covers, for example, ISO container bodies and equipment and other special purpose vehicles.
	-40	Installation kit	The installation kit element refers to the equipment for installation of the system related to a particular application.
	-50	Portability kit	The portability kit refers to that equipment required to prepare the system for transportation, other than its prime means of movement.
	-60	Winterization kit	The winterization kit element refers to the equipment for protection of the equipment and/or crew, in adverse weather conditions.

Table 61 System P2 - Software, General

System	Subsystem	Title	Definition
P2	-00	**Software, General**	Refers to software and associated items for the electronic/automated software system which cannot be linked to other areas within the SNS.

2.2.15 System Q - Outfit and furnishings, General

Table 62 System Q0 - Outfit and furnishings, General

System	Subsystem	Title	Definition
Q0	-00	**Outfit and furnishings, General**	A function or equipment used to provide habitability or operability that is not specifically included in other systems.

Table 63 System Q1 - Stowage, General

System	Subsystem	Title	Definition
Q1	-00	**Stowage, General**	Refers to provision for stowage of operational and/or personnel equipment.

Table 64 System Q2 - Complete equipment schedule (CES), General

System	Subsystem	Title	Definition
Q2	-00	**Complete equipment schedule, General**	This element refers to lists detailing the equipment required by the user to operate and maintain the system. It includes, for example, both fitted and loose items, spares, tools and operator manuals.
	-10	Production CES	This element refers to the production version of the CES.
	-20	Service CES	This element refers to the service version of the CES.
	-30	Complex CES	This element refers to the complex version of the CES.

2.2.16 System R - Training, General

Table 65 System R0 - Training, General

System	Subsystem	Title	Definition
R0	-00	**Training, General**	The training element is defined as the deliverable training services, devices, accessories, aids, equipment and facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the electronic/automated software system with maximum efficiency. This element includes all effort associated with design, development and production of deliverable training equipment as well as the execution of training services.

Table 66 System R1 - Training services, General

System	Subsystem	Title	Definition
R1	-00	**Training services, General**	Refers to the deliverable training services used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-10	Training devices/ accessories/ aids	Refers to the deliverable devices, accessories and aids used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-20	Training equipment	Refers to the deliverable training equipment used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-30	Training facilities	Refers to the deliverable training facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.

2.2.17 System S - Repair test and support, General

Table 67 System S0 - Repair test and support, General

System	Subsystem	Title	Definition
S0	-00	**Repair test and support, General**	A system, equipment or facilities used to maintain operational capability.

Table 68 System S1 - Repair facilities, General

System	Subsystem	Title	Definition
S1	-00	**Repair facilities, General**	Refers to the facilities which will allow unserviceable electronic/automated software systems to be repaired, programmed, tested, calibrated and returned to service use.

Table 69 System S2 - Common support equipment, General

System	Subsystem	Title	Definition
S2	-00	**Common support equipment, General**	Refers to common equipment and devices required to support and maintain the electronic/automated software system, whilst not directly engaged in the performance of its mission. The common support equipment must presently exist in the MOD inventory for support of other systems (ie, GFE). It also includes the acquisition of additional quantities of this equipment, where necessary, to support introduction of the electronic/automated software system into operational service.

Table 70 System S3 - Test and measurement, General

System	Subsystem	Title	Definition
S3	-00	**Test and measurement, General**	Refers to that peculiar or unique test and measurement equipment which allows an operator or maintainer to evaluate operational conditions of the system, including specific diagnostics, screening or QA effort at a unit, intermediate or base level of equipment support. It includes, for example, installation and maintenance test equipment, BIT/BITE, GPTE and STTE.
	-10	Installation	Refers to the test and measurement equipment which is used during the installation and commissioning process of the system.
	-20	Maintenance	Refers to the test and measurement equipment which is required during the performance of both corrective and preventive maintenance of the system.

System	Subsystem	Title	Definition
	-30	BIT/BITE	Refers to the built-in test and measurement equipment which provides a means of monitoring and/or testing the performance and/or condition of the system.
	-50	STTE	Refers to the test and measurement equipment which is special to type. The STTE must not exist in the present MOD inventory for support of other systems (ie, Not GFE).
	-40	GPTE	Refers to the test and measurement equipment which is general purpose. The GPTE must presently exist in the MOD inventory for support of other systems (ie, GFE). It also includes the acquisition of additional quantities of this equipment, where necessary, to support introduction of the electronic/automated software system into operational service.
	-60	NDT & specialist testing	Refers to the test and measurement of the structural integrity of structures and devices within the electronic/automated software system, through non-destructive means. It includes, for example, ultrasonic, dye-penetrant and X-ray techniques.

Table 71 System S4 - Support and handling equipment, General

System	Subsystem	Title	Definition
S4	-00	**Support and handling equipment, General**	The support and handling equipment element is defined as the deliverable tools and handling equipment used for support of the electronic/automated software system (eg, ground support equipment, mechanical handling equipment and software support equipment).

Chapter 8.2.5

Maintained SNS - Air vehicle, engines and equipment

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Chap No./Document No.	Title
Chap 1.5	Request for change
Chap 4.3.3	Data module code - Standard numbering system
Chap 8.2.1	Maintained SNS - Generic

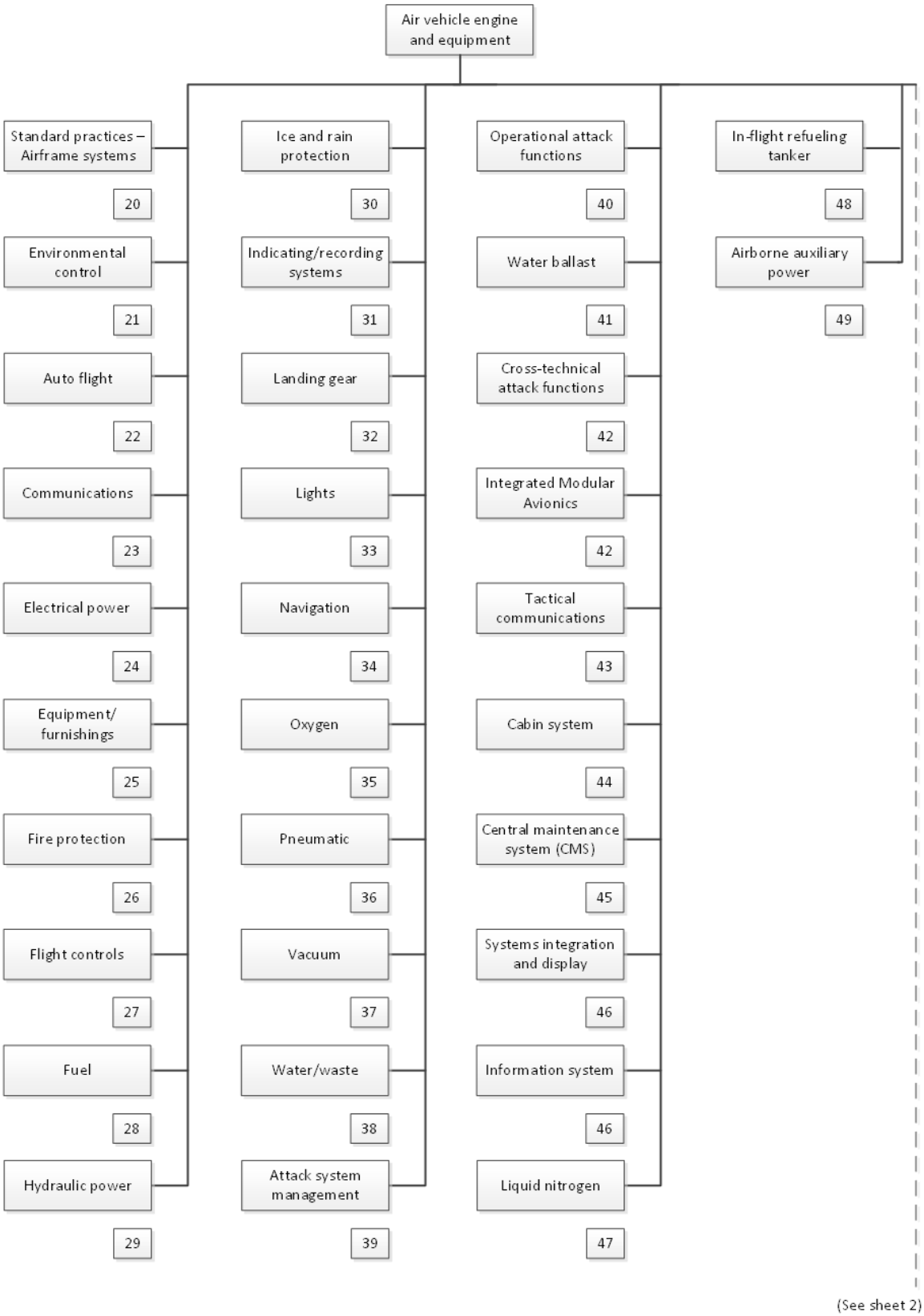
1 General

The SNS is used in this specification as a method to describe the functional and/or physical breakdown of items of the Product. Its position in the data module code and structure is defined in Chap 4.3.3. This is an SNS that will be maintained by the S1000D Steering Committee and is subject to normal CPF action in accordance with Chap 1.5.

This chapter gives the definitions for the systems and subsystems, which relate to systems and subsystems, for Air Vehicle, Engines and Equipment (AVEE). For details on how to use this SNS within the data module code, refer to Chap 4.3.3.

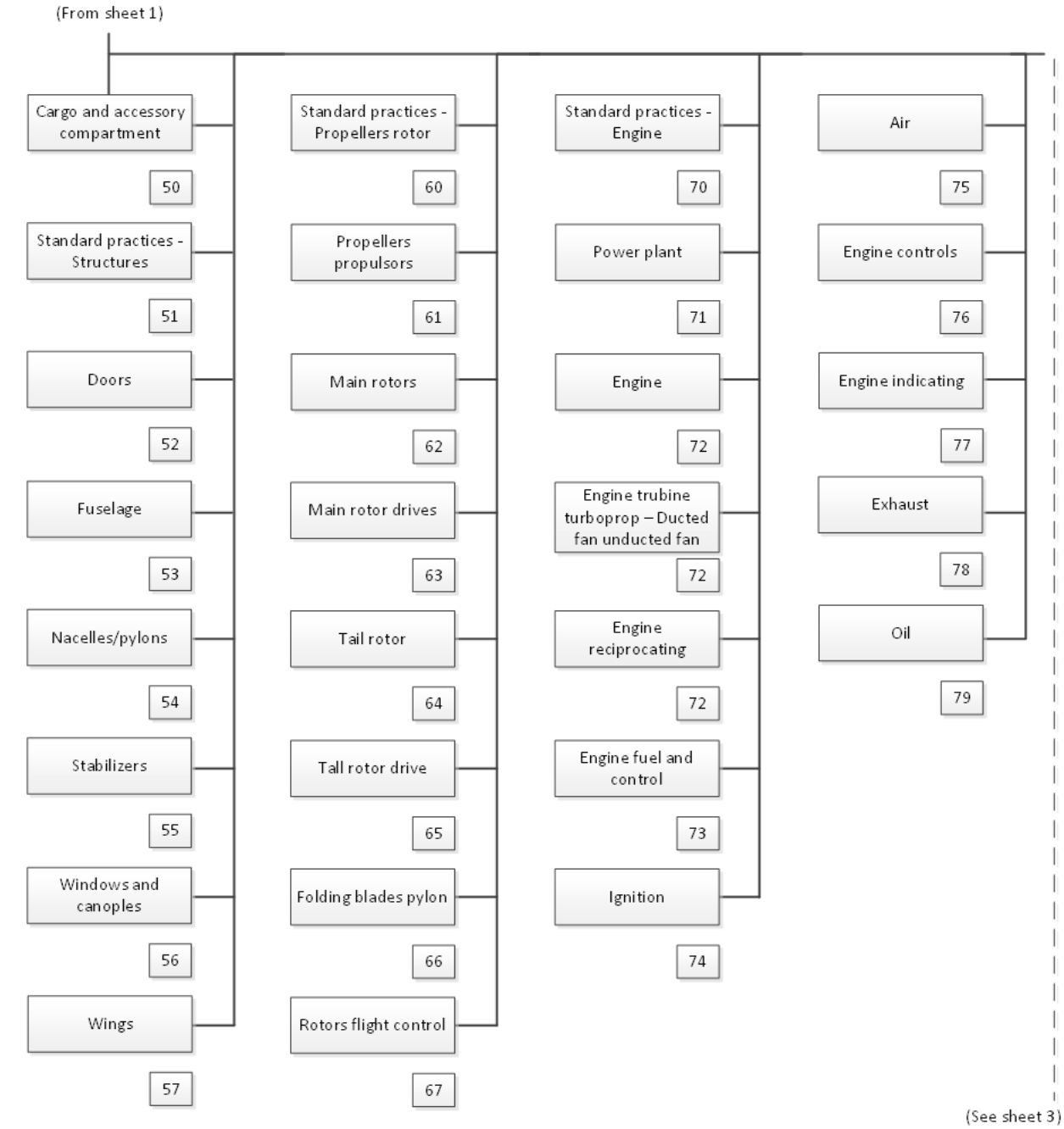
2 Air vehicle, engines and equipment SNS

The coding and definitions for the AVEE SNS is appropriate for common and system level information for all Products and is described in Table 2 and shown in Fig 1. However, projects can decide not to use this SNS.



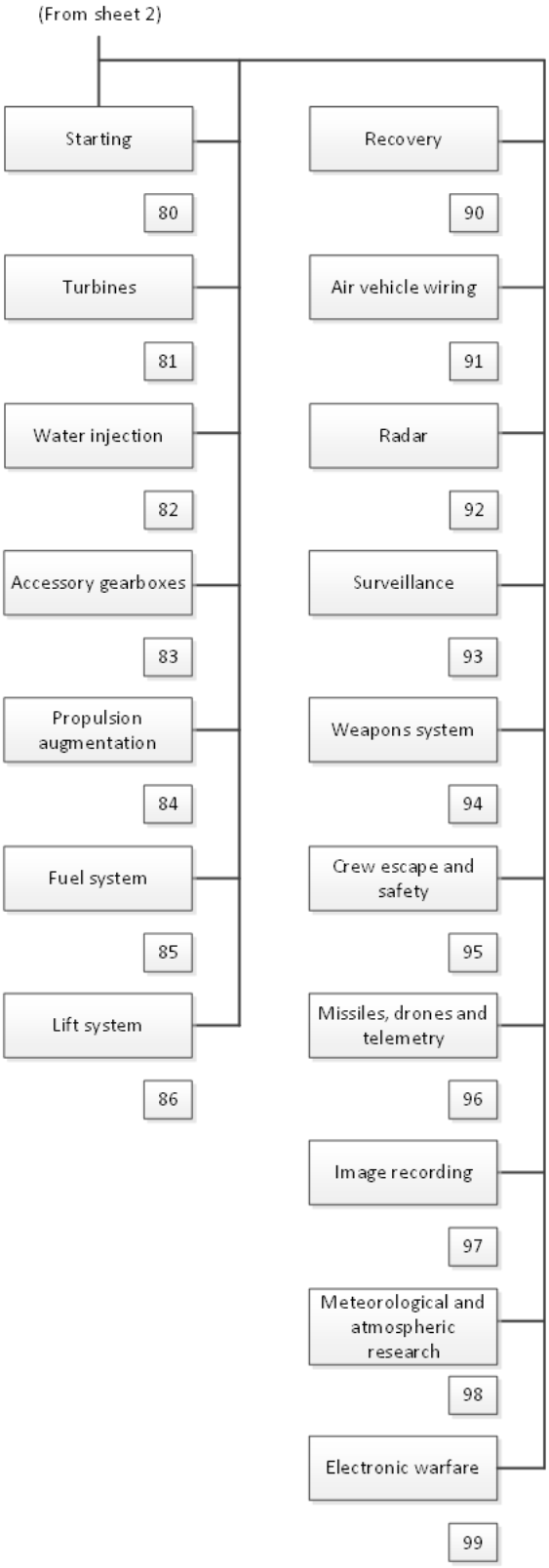
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Fig 1 Top level breakdown for AVEE (Sheet 1 of 3)



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Fig 1 Top level breakdown for AVEE (Sheet 2 of 3)



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Fig 1 Top level breakdown for AVEE (Sheet 3 of 3)

2.1 System breakdown

2.1.1 Main systems

This AVEE SNS is divided into 72 main systems.

Table 2 Top level breakdown for AVEE

System	Title
20	Standard practices, Airframe systems
21	Environmental control
22	Auto flight
23	Communications
24	Electrical power
25	Equipment/furnishings
26	Fire protection
27	Flight controls
28	Fuel
29	Hydraulic power
30	Ice and rain protection
31	Indicating/recording systems
32	Landing gear
33	Lights
34	Navigation
35	Oxygen
36	Pneumatic
37	Vacuum
38	Water/waste
39	Attack system management
40	Operational attack functions
41	Water ballast
42	Cross-technical attack functions
42	Integrated Modular Avionics
43	Tactical communications
44	Cabin System
45	Central maintenance system (CMS)
46	Systems integration and display
46	Information system

System	Title
47	Liquid nitrogen
48	In-flight refueling tanker
49	Airborne auxiliary power
50	Cargo and accessory compartment
51	Standard practices, Structures
52	Doors
53	Fuselage
54	Nacelles/pylons
55	Stabilizers
56	Windows and canopies
57	Wings
58	Not available for projects
59	Not available for projects
60	Standard practices, Propeller/rotor
61	Propellers/propulsors
62	Main rotors
63	Main rotor drives
64	Tail rotor
65	Tail rotor drive
66	Folding blades/pylon
67	Rotors flight control
68	Not available for projects
69	Not available for projects
70	Standard practices, Engine
71	Power plant
72	Engine
72	Engine turbine/turboprop Ducted fan/inducted fan
72	Engine reciprocating
73	Engine fuel and control
74	Ignition
75	Air
76	Engine controls

System	Title
77	Engine indicating
78	Exhaust
79	Oil
80	Starting
81	Turbines
82	Water injection
83	Accessory gearboxes
84	Propulsion augmentation
85	Fuel cell system
86	Lift system
87	Not available for projects
88	Not available for projects
89	Not available for projects
90	Recovery
91	Air vehicle wiring
92	Radar
93	Surveillance
94	Weapons system
95	Crew escape and safety
96	Missiles, drones and telemetry
97	Image recording
98	Meteorological and atmospheric research
99	Electronic warfare

2.1.2 Definitions of systems and subsystems

This SNS is to be supplemented with the generic SNS given at Chap 8.2.1.

2.1.3 System 20 - Standard practices - Airframe systems

Table 3 System 20 - Standard practices - Airframe systems

System	Subsystem	Title	Definition
20		**Standard practices - Airframe systems**	This System contains those standard mechanical and electrical electric/engineering practices applicable to more than one airframe system task which are not covered in systems 21 thru 49. It excludes those practices which are recognized as standard trade practices and also those practices/processes which are only applicable to manufacture. Practices for a particular application must be included in the appropriate airframe system as part of the procedure.
	-00	General	Standard practices applicable to all airframe systems.
	-10 thru -90		Sections -10 thru -90 are used to describe standard practice. The manufacturer or manufacturing partners can assign the section numbers to suit generic standard practices related to more than one airframe system.

2.1.4 System 21 - Environmental control

Table 4 System 21 - Environmental control

System	Subsystem	Title	Definition
21		**Environmental control**	Those units and components which furnish a means of pressurizing, heating, cooling, moisture controlling, filtering and treating the air used to ventilate the areas of the fuselage within the pressure seals. Includes cabin supercharger, equipment cooling, heater, heater fuel system, expansion turbine, valves, scoops, ducts, cabin seals, etc. Also includes such systems as canopy/door seals, anti-g, demisting, waveguide pressurization, etc.
	-00	General	
	-10	Compression	That portion of the system and its controls which supplies compressed air. Includes items such as controls and indicating systems related to the compressors, wiring, etc. Does not include the pressure control and indicating system for the cabin pressurization.
	-20	Distribution	That portion of the system used to induct and distribute air. Includes equipment rack cooling, canopy/door seals, anti-g, demisting, waveguide pressurization system and items of such systems like blowers, scoops, ducting, inlets, valves, wiring, etc. Does not include valves which are part of pressurization and temperature control.
	-30	Pressurization control	That portion of the system used to control the pressure within the fuselage. Includes items such as control valves, relief valves, indicators, switches, amplifiers, wiring, etc.

System	Subsystem	Title	Definition
	-40	Heating	That portion of the system and its controls which supply heated air. Includes items such as heater units, fuel system and control, ignition indicating systems related to heater operation, wiring, etc. Does not include temperature control and indicating systems.
	-50	Cooling	That portion of the system and its controls which supply cooled air. Includes items such as the cooling unit, indicating systems related to the cooler operation, wiring, etc. Does not include temperature control and indicating systems.
	-60	Temperature control	That portion of the system used to control the temperature of the air. Includes items such as control valves, thermal sensing devices, switches, indicators, amplifiers, wiring, etc.
	-70	Moisture/air contaminant control	That portion of the system used to control moisture in the air, to control ozone concentrations, to filter radioactive debris and chemical/biological contaminants from conditioned air, and to treat the air with deodorizers, insecticides, etc.
	-80	Liquid/gas coolant	Those components required to supply liquid/gas coolant to an equipment cooling system.
	-90	Integrated environmental control system (ECS)	That portion of the system which provides integrated functionality for conditioned, cooled, heated, pressurized air, NBC filtration, and emergency ventilation to sustain crew and component operation over wide range of temperatures. This includes avionics (component racks) cooling.

2.1.5 System 22 - Auto flight

Table 5 System 22 - Auto flight

System	Subsystem	Title	Definition
22		**Auto flight**	Those units and components which furnish a means of automatically controlling the flight of the air vehicle. Includes those units and components which control direction, heading, attitude, altitude and speed.
	-00	General	
	-10	Autopilot	That portion of the system that uses radio/radar signals, directional and vertical references, air data (pitot static), computed flight path data, or manually induced inputs to the system to automatically control the flight path of the air vehicle through adjustment to the pitch/roll/yaw axis or wing lift characteristics and provide visual cues for flight path guidance (ie, Integrated Flight Director). This includes power source devices, interlocking devices and amplifying, computing, integrating, controlling, actuating, indicating and warning devices such as computers, servos, control panels, indicators, warning lights, etc.

System	Subsystem	Title	Definition
	-20	Speed-attitude correction	That portion of the system that automatically maintains safe flight conditions by correcting for effects of speed and out-of-trim conditions by such means as automatic trim, mach trim or speed stability and mach feel. This includes sensing, computing, actuating, indicating, internal monitoring, and warning devices, etc.
	-30	Auto throttle	That portion of the system that automatically controls the position of the throttles to properly manage engine power during all phases of flight/attitude. This includes engaging, sensing, computing, amplifying, controlling, actuating and warning devices such as amplifiers, computers, servos, limit switches, clutches, gear boxes, warning lights, etc.
	-40	System monitor	That which provides separate or external monitoring/remote readout (for maintenance or other purposes) not directly related to the internal system monitoring (for system integrity flight crew warning). This includes sensing, computing, indicating and warning devices, control panels, etc.
	-50	Aerodynamic load alleviating	The system or portion of the system that automatically corrects/provides for gust loading/ upset, aerodynamic augmentation/ alleviations/ suppression, ride control, etc. This includes sensing, computing, actuating indicating internal monitoring, warning devices, etc.

2.1.6 System 23 - Communications

Table 6 System 23 - Communications

System	Subsystem	Title	Definition
23		**Communications**	Those units and components which furnish a means of communicating from one part of the air vehicle to another and between the air vehicle or ground stations. Includes voice, data C-W communicating components, PA system, intercom and tape reproducers-record player.
	-00	General	
	-10	Speech communication	That portion of the system which utilizes voice modulated electromagnetic waves to transmit and/or receive messages from air to air, or air to ground installations. Includes HF, VHF, UHF, etc, in-flight telephone, communication transmitting and receiving equipment.
	-15	SATCOM	That portion of the system which utilizes satellite communication systems (SATCOM).
	-20	Data transmission and automatic calling	That portion of the system which presents information derived from pulse coded transmissions. Includes Teleprinter, Selcal, Calsel, ACARS, etc.

System	Subsystem	Title	Definition
	-30	Passenger address and entertainment	That portion of the system used to address and entertain the passengers. Includes items such as amplifiers, speakers, handsets, reproducers, control panels, etc. Also includes items of audio, video and film equipment.
	-40	Interphone	That portion of the system which is used by flight and ground personnel to communicate between areas on the air vehicle. Includes items such as amplifier, handset, etc. Does not include the interphone system within the flight compartment which is part of the integrating system.
	-50	Audio integrating and voice command systems	That portion of the system which controls the output of the communications and navigation receivers into the flight crew headphones and speakers and the output of the flight crew microphones into the communications transmitters. Includes items such as audio selector control panel, microphones, headphones, cockpit loudspeakers, etc. Also includes those items which provide for voice command systems used by the operating crew members. (Not including items which are components of an associated air vehicle system).
	-60	Static discharging	That portion of the system which is used to dissipate static electricity.
	-70	Audio and video monitoring	Those installations that record, or monitor crew or passenger conversation or movement for security of safety purposes. Includes voice recorders, television, monitors, etc.
	-80	Integrated automatic tuning	That portion of the system which maintains integrated control of the operating frequencies of communication and navigation transmitter/receivers after either a manually inserted command or a preprogrammed integrated flight system command. Includes such items as integrated frequency selector panels, digital frequency control computers, integrated frequency display panels, etc.

2.1.7 System 24 - Electrical power

Table 7 System 24 - Electrical power

System	Subsystem	Title	Definition
24		**Electrical power**	Those electrical units and components which generate, control and supply AC and/or DC electrical power for other systems, including generators and relays, inverters, batteries etc, through the secondary busses. Also includes those units and components which provide for multiplexing of electrical power and common electrical items such as wiring, switches, connectors, etc.
	-00	General	

System	Subsystem	Title	Definition
	-10	Generator drive	Mechanical devices that drive the generators at a desired RPM. Includes items such as oil system, connecting devices, indicating and warning systems for the drive, ram air turbine, etc.
	-20	AC generation	That portion of the systems used to generate, regulate, control, and indicate AC electrical power. Includes items such as inverters, AC generators/alternators, control and regulating components, indicating systems etc, all wiring to but not including main busses.
	-30	DC generation	That portion of the systems used to generate, regulate, control and indicate DC electrical power. Includes items such as generators/alternators, transformers, rectifiers, batteries, control and regulating components, indicating systems etc, all wiring to but not including main busses.
	-40	External power	That portion of the system within the air vehicle which connects external electrical power to the air vehicle's electrical system. Includes items such as receptacles, relays, switches, wiring, warning lights, etc.
	-50	AC electrical load distribution	That portion of the system which provides for connection of AC power to using systems. Includes items such as main and secondary busses, main system circuit breakers, power system devices, etc.
	-60	DC electrical load distribution	That portion of the system which provides for connection of DC power to using systems. Includes items such as main and secondary busses, main system circuit breakers, power system devices, etc.
	-70	Electrical monitoring and protection	That portion of the system used to supply aircraft or ground power to use the ground power switching system, avionics low cooling protection system, essential 28 V DC bus monitoring system and system monitoring. Also includes air vehicle grounding receptacles.
	-80	Electrical power multiplexing	Those units or components which provide for multiplexing of electrical power. Includes computers, remote terminals and related interfaces to transmit electrical power control signals.
	-90	Multipurpose equipment	Those units or components which are applicable to more than one system or system interfaces, such as junction boxes, relay panels, terminal blocks, etc.

2.1.8 System 25 - Equipment/furnishings

Table 8 System 25 - Equipment/furnishings

System	Subsystem	Title	Definition
25		**Equipment/furnishings**	Those removable items of equipment and furnishings contained in the flight and passenger compartments. Includes emergency, buffet and lavatory equipment. Does not include structures of equipment assigned specifically to other systems.
	-00	General	
	-10	Flight compartment	The compartment above the floor and between the forward passenger partition and the forward pressure dome. Includes items such as flight crew seats, tables, pilot check lists and food containers, wardrobes, curtains, manuals, electronic equipment rack, spare bulbs, fuses, etc. Does not include cargo compartments.
	-20	Passenger/operating crew compartment	The areas in which the passengers/operating crew are accommodated. Includes lounges but not dressing rooms. Includes items such as seats, consoles, equipment racks, berths, overhead storage compartments, curtains, wall coverings, carpets, magazine racks, movable partitions, wall type thermometers, spare bulbs, fuses, etc.
	-30	Buffet/galley	The areas in which food and beverages are stored and prepared. Includes items such as removable and fixed cabinets, ovens, refrigerators, garbage containers, dish racks, coffee maker and dispensers, containers, electrical outlets, wiring, etc.
	-40	Lavatories	The toilet and dressing room areas containing wash basins, dressing tables and water closet. Includes items such as mirrors, seats, cabinets, dispensing equipment, electrical outlets, wiring, etc. Wash basins and water closets are included in System 38.
	-50	Additional compartments	Those additional compartments for the use of passengers and/or crew. Includes such compartments as crew rest compartments, sleeping compartments etc.
	-60	Emergency	Those items of equipment carried for use in emergency procedures. Includes items such as evacuation equipment, life rafts, life jackets, emergency locator transmitters, underwater locator devices, first aid kit, incubators, oxygen tents, medical stretchers, landing and signal flares, drag parachutes, evacuation signaling systems, etc. Does not include fire extinguishers, oxygen equipment or masks.
	-70	Available for projects	

System	Subsystem	Title	Definition
	-80	Insulation and lining	Those blankets which are used for heat and sound insulation. Includes flight compartments, passenger compartment, additional compartment insulation etc.

2.1.9 System 26 - Fire protection

Table 9 System 26 - Fire protection

System	Subsystem	Title	Definition
26		**Fire protection**	Those fixed and portable units and components which detect and indicate fire or smoke and store and distribute fire extinguishing agent to all protected areas of the air vehicle; including bottles, valves, tubing, etc.
	-00	General	
	-10	Detection	That portion of the system which is used to sense and indicate the presence of overheats, smoke or fire.
	-20	Extinguishing	That portion of those fixed or portable systems which is used to extinguish fire.
	-30	Explosion suppression	That portion of the system which is used to sense, indicate and extinguish a flame propagating into the fuel system to prevent an explosion.

2.1.10 System 27 - Flight controls

Table 10 System 27 - Flight controls

System	Subsystem	Title	Definition
27		**Flight controls**	Those units and components which furnish the means of controlling the flight attitude characteristics of the air vehicle. Also includes the functioning and maintenance of the primary and secondary flying control surfaces and lift augmenting systems but not the maintenance of the structure of control surfaces which is covered by the system structures. Includes items such as control stick grips, rudder pedals, gearboxes, control rods and cables, linkages, hydraulic valves, actuators, control units, controls and indicators, computers, transducers, transformers, sensor units, displays, gyros, accelerometers, servos, warning systems and control locking devices. This includes rotorcraft rotor controls which are covered in the rotor systems.
	-00	General	
	-10	Roll control	That portion of the system which controls the roll axis of the aircraft. Includes items such as the control wheels, cables, booster, linkages, control surfaces, indicators, etc.

System	Subsystem	Title	Definition
	-20	Yaw control	That portion of the system which controls the yaw axis of the aircraft. Includes items such as the rudder pedals, tab control wheel, cables, boosters, linkages, control surfaces, position indicators, etc.
	-30	Pitch control	That portion of the system which controls the pitch axis of the aircraft. Includes items such as the control column, stickshaker units, automatic stall recovery devices, tab control wheels, cables, boosters, linkages, control surfaces, position indicators, stall warning systems etc.
	-40	Horizontal stabilizers	That portion of the system which controls the position and movement of the horizontal stabilizer/canard. Includes items such as control handle, cables, jackscrews, motors, warning systems, linkages, control surfaces, position indicators, etc.
	-50	Flaps	That portion of the system which controls the position and movement of the trailing edge flaps. Includes items such as control handles, cables, actuators, warning systems, linkages, control surfaces, position indicators, etc.
	-60	Spoilers, drag devices and variable aerodynamic fairings	That portion of the system which controls the position and movement of the spoilers, drag devices and variable aerodynamic fairings. Includes items such as control handles, cables, warning systems, linkages, spoilers, drag devices, position indicators, etc.
	-70	Gust lock and damper	That portion of the system which protects the control surfaces from movement by wind while the aircraft is on the ground. Does not include locking the control by means of flight control boost system.
	-80	Lift augmenting	That portion of the system which controls the position and movement of variable opening wings slots, leading edge wing flaps and similar auxiliary devices used for increasing aerodynamic lift. Includes items such as control handles, cables, actuators, linkages, warning systems, control surfaces, position indicators, etc. This does not include trailing edge flaps.
	-90	Primary Flight Control System (PFCS)	That portion of the system, which centralizes all controls and computing means common to multiple primary flying control surfaces. This includes items such as flight control computer, flight data concentrator, side sticks, BUS coupler, rate gyro meter, accelerometer, etc.

2.1.11 System 28 - Fuel

Table 11 System 28 - Fuel

System	Subsystem	Title	Definition
28		**Fuel**	Those units and components which store and deliver fuel to the engine. Includes engine driven fuel pumps for reciprocating engines, includes tanks (bladder), valves, boost pumps etc, and those components which furnish a means of dumping fuel overboard. Includes integral and tip fuel tank leak detection and sealing. Does not include the structure of integral or tip fuel tanks and the fuel cell backing boards which are covered by the system structures, and does not include fuel flow rate sensing, transmitting and/or indicating, which are covered in System 73.
	-00	General	
	-10	Storage	That portion of the system which stores fuel. Includes tank sealing, bladder type cells, venting system, drainage provisions for tank pumps, cell and tank inter-connectors, over wing filler necks and caps, etc. Also includes reservoir feed pumping systems and reservoirs within the tanks which are not part of the distribution system.
	-20	Distribution	That portion of the system which is used to distribute fuel from the filler connector to the storage system and from the storage system to and including the power plant fuel quick disconnect. Includes items such as plumbing, pumps, valves, controls, etc.
	-30	Dump	That portion of the system which is used to dump fuel overboard during flight. Includes items such as plumbing, valves, controls, chutes, etc.
	-40	Indicating	That portion of the system which is used to indicate the quantity, temperature and pressure of the fuel. Includes pressure warning systems for pumping systems within the tank, etc. Does not include engine fuel flow or pressure.
	-50	In-flight refueling	That portion of the system which provides the means of accepting in-flight refueling. This will include access door controls/actuators, fuel receptor, distribution system to fuel storage or interface with standard fuel distribution system, flow controls and indicators, and audio interconnections with the tanker aircraft. Includes manual transfer and refueling controls but excludes automatic systems based on fuel quantity and c.g. constraints which are covered in Fuel/c.g. Management (System 28-60) on air vehicles so equipped.
	-60	Fuel/center of gravity management	That portion of the system which controls fuel distribution during aerial and ground refueling to maintain a safe c.g. configuration. Utilizes fuel quantity and stores data to compute air vehicle c.g. Includes fuel quantity and c.g. indication for in-flight and ground refueling operations.

2.1.12 System 29 - Hydraulic power

Table 12 System 29 - Hydraulic power

System	Subsystem	Title	Definition
29		**Hydraulic power**	Those units and components which furnish hydraulic fluid under pressure (includes pumps, regulators, lines, valves etc) to a common point (manifold) for redistribution to other defined systems.
	-00	General	
	-10	Main	That portion of the system which is used to store and deliver hydraulic fluid to using systems. Includes items such as tanks, accumulators, valves, pumps, levers, switches, cables, plumbing, wiring, external connectors, etc. Does not include the supply valves to the using systems.
	-20	Auxiliary	That portion of the system which is classified as auxiliary, emergency or standby, and which is used to supplement or take the place of the main hydraulic system. Includes items such as tanks and accumulators which are separate from the main system, hand pumps, auxiliary pumps, ram air turbine, valves, plumbing, wiring, etc.
	-30	Indicating	That portion of the system which is used to indicate the quantity, temperature and pressure of the hydraulic fluid. Includes items such as transmitters, indicators, wiring, warning systems, etc.

2.1.13 System 30 - Ice and rain protection

Table 13 System 30 - Ice and rain protection

System	Subsystem	Title	Definition
30		**Ice and rain protection**	Those units and components which provide a means of preventing or disposing of formation of ice and rain on various parts of the aircraft. Includes alcohol pump, valves, tanks, propeller/rotor anti-icing system, wing heaters, water line heaters, pitot heaters, scoop heaters, windshield wipers and the electrical and heated air portion of windshield ice control. Does not include the basic windshield panel. For turbine type power plants using air as the anti-icing medium, engine anti-icing is contained in System 75.
	-00	General	
	-10	Airfoil	That portion of the system which is used to eliminate or prevent the formation of ice on all airfoil surfaces. Includes wings, airfoil sections of the empennage and pylons.
	-20	Air intakes	That portion of the system which is used to eliminate or prevent the formation of ice in or around air intakes. Includes power plant cowling anti-icing.

System	Subsystem	Title	Definition
	-30	Pitot and static	That portion of the system which is used to eliminate or prevent the formation of ice on the pitot and static systems.
	-40	Windows, windshields, canopies and doors	That portion of the system which is used to eliminate or prevent the formation and accumulation of ice, frost or rain on the windows, windshields, canopies and doors.
	-50	Antennas and radomes	That portion of the system which is used to eliminate or prevent the formation of ice on antennas and radomes.
	-60	Propellers/rotors	That portion of the system which is used to eliminate or prevent the formation of ice on propellers or rotors. Includes all components up to but not including rotating assembly.
	-70	Water lines	That portion of the system which is used to prevent the formation of ice in water supply and drain lines.
	-80	Detection	That portion of the system which is used to detect and indicate the formation of ice.

2.1.14 System 31 - Indicating/recording systems

Table 14 System 31 - Indicating/recording systems

System	Subsystem	Title	Definition
31		**Indicating/recording systems**	Pictorial coverage of all instruments, instrument panels and controls. Procedural coverage of those systems which give visual or aural warning of conditions in unrelated systems. Includes units which record, store or compute data from unrelated systems and those units/systems that integrate indicating instruments into a central display system and instruments not related to any specific system.
	-00	General	
	-10	Instrument and control panels	Coverage of all panels fixed or movable with their replaceable components such as instruments, switches, circuit breakers, fuses, etc. Also includes general coverage of instrument panel vibrators and other panel.
	-20	Independent instruments	Those instruments, units and components which are not related to specific systems. Includes items such as inclinometers, clocks, etc.
	-30	Recorders	Those systems and components used for recording data not related to specific systems. Includes items such as flight recorders, performance or maintenance recorders, VG recorders, etc.

System	Subsystem	Title	Definition
	-40	General computers	Those systems and components used for computing data from a number of different sources without a preponderance of functions in any one system. Includes items such as Digital Core Avionic System (DCAS), stored check list, emergency procedures, company regulations etc, for call up on a display, integrated instrument systems such as engine, air vehicle power and central warning indicators when combined into a central display.
	-50	Central warning systems	Those systems and components which give audible or visual warning of conditions in unrelated systems. Includes items such as master warning or flight warning systems, central instrument warning or caution and warning systems, tone generators, annunciators, etc.
	-60	Display systems	Those systems and components which give visual display of conditions in unrelated systems.
	-70	Automatic data reporting systems	Those systems and components used for collating and computing data from unrelated systems and transmitting same automatically. Includes ASDAR systems and components.

2.1.15 System 32 - Landing gear

Table 15 System 32 - Landing gear

System	Subsystem	Title	Definition
32		**Landing gear**	Those units and components which furnish a means of supporting, steering, and maneuvering the air vehicle on the ground or water, and make it possible to retract and store the landing gear in flight. Includes tail skid assembly, arresting hooks, landing assistance equipment, drag chutes, brakes, wheels, floats, skids, skis, doors, shock struts, tires, linkages, position indicating and warning systems, motor, control systems, power supplies or converter. Also includes the functioning and maintenance aspects of the landing gear doors but does not include the structure which is covered in System 52.
	-00	General	
	-10	Main gear and doors	That portion of the system which provides the major support for the air vehicle while on the ground. Includes items such as shock struts, bogie axles, drag struts, doors, linkages, attach bolts, etc.
	-20	Nose/tail gear and doors	That portion of the system which supports the nose/tail of the air vehicle while the air vehicle is on the ground. Includes items such as shock struts, drag struts, doors, linkages, attach bolts, etc.

System	Subsystem	Title	Definition
	-30	Extension and retraction	That portion of the system which is used to extend and retract the landing gear and open and close the landing gear doors. Includes items such as actuating mechanisms, bogie trim, bungees, up and down latches, operating controls, valves and motors, cables, wiring, plumbing, etc.
	-40	Wheels and brakes	That portion of the system which provides for rolling and stopping the air vehicle while on the ground and stopping wheel rotation after retraction. Includes items such as bearings, tires, valves, de-boosters, swivel glands, anti-skid devices, pressure indicators, plumbing, etc.
	-50	Steering and maneuvering	That portion of the system which is used to control the direction and the movement of the air vehicle on the ground. Includes items such as actuating cylinders, controls, bogie swivel unlock, motor, control systems, power supplies or converter, etc.
	-60	Position and warning	That portion of the system which is used to indicate and warn of the position of the landing gear/doors. Includes items such as switches, relays, lights, indicators, horns, wiring, etc.
	-70	Supplementary gear	Devices used to stabilize the air vehicle while on the ground and prevent damage by ground contact. Includes items such as shock strut, ski block, wheels, etc.
	-80	Drag chute	That portion of the system used to aid in slowing the speed of the air vehicle when landing.
	-90	Arresting hook/landing assistance equipment	That portion of the system which is used to extend, retract and indicate the position of an arresting hook. Alternatively, those items providing landing assistance, such as helicopter winch-down systems and Harpoon system.

2.1.16 System 33 - Lights

Table 16 System 33 - Lights

System	Subsystem	Title	Definition
33		**Lights**	Those units and components (electrically powered) which provide for external and internal illumination such as landing lights, taxi lights, position lights, rotating lights, ice lights, master warning lights, passenger reading and cabin dome lights, etc. Includes light fixtures, switches and wiring. Does not include warning lights for individual systems or self-illuminating signs. Does not include lamps/bulbs which are covered in System 25. **Note** For those aircraft that do not contain passenger compartments, and where the flight compartment(s) can be reasonably divided, subsystem - 20 can be used to aid in defining such division.
	-00	General	

System	Subsystem	Title	Definition
	-10	Flight compartment	The lighting subsystems in the compartment above the floor and between the forward passenger partition and the forward pressure dome. Does not include cargo compartment. Includes primary and secondary lighting and lighting control of work areas, panels, instruments, night vision goggles (NVG), lighting mode selection and lamp test operation. Includes master warning light and warning light dimming systems, where not integrated with a central audio or visual system under System 31-50.
	-20	Passenger compartments	The lighting subsystems in the areas in which the passengers are seated and in buffet/galley, lavatories, lounges and coat rooms. Includes items such as direct and indirect illumination, passenger call system, lighted signs, etc.
	-30	Cargo and service compartments	The lighting subsystems in the compartments for stowage or cargo and the housing of various components of accessories.
	-40	Exterior	The lighting subsystems used to provide illumination outside of the aircraft. Includes lights such as landing, navigation, position indicating, wing illumination, rotating, courtesy, taxi, etc.
	-50	Emergency lighting	The separate and independent subsystems used to provide illumination in case of primary electrical power failure. Includes items such as inertia flashlights, lanterns, etc.

2.1.17 System 34 - Navigation

Table 17 System 34 - Navigation

System	Subsystem	Title	Definition
34		**Navigation**	Those units and components which provide air vehicle navigational information. Includes VOR, pitot, static, ILS, flight director, compasses, indicators, etc.
	-00	General	
	-10	Flight environment data	That portion of the system which senses environmental conditions and uses the data to influence navigation. Includes such items as Central Air Data Computers, pitot/static systems, air temperature, rate-of-climb, airspeed, high speed warning, altitude, altitude reporting, altimeter correction system, air disturbance detection system, etc.
	-20	Attitude and direction	That portion of the system which uses magnetic or inertia forces to sense and display the direction or attitude of the air vehicle. This includes sensing, computing, indicating and warning devices such as magnetic compasses, vertical and directional references, magnetic heading systems, attitude director systems, symbol generators, turn and bank, rate of turn, amplifiers, indicators, etc. Includes Flight Director when it is not integral with the auto pilot computation.

System	Subsystem	Title	Definition
	-30	Landing and taxiing aids	That portion of the system which provides guidance during approach, landing and taxiing. Includes items such as localizer, glide slope, ILS, markers, paravisual director ground guidance systems, etc.
	-40	Independent position determining	That portion of the system which provides information to determine position and is mainly independent of ground installations or orbital satellites. Includes items such as inertial guidance systems, weather radar, Doppler, electronic/radar altimeter, proximity warning, collision avoidance, star tracker, etc. Also includes sextants/octants, etc.
	-50	Dependent position determining	That portion of the system which provides information to determine position and is mainly dependent on ground installations or orbital satellites. Includes items such as DME, transponders, radio compass, LORAN, VOR, ADF, OMEGA, GLOBAL POSITIONING, IFF, etc.
	-60	Flight management computing	That portion of the system which combines navigational data to compute or manage the air vehicle's geographical position or theoretical flight path. Includes items such as course computers, flight management computers, performance data computers and associated control display units, warning annunciators, etc.
	-70	Environment surveillance system	That portion of the system that integrates dependent and independent position determining, which identifies all kind of hazards external to the aircraft on its potential aircraft flight path and manage the actions to avoid these threads. Includes items that combine surveillance of weather events, windshear, turbulence, airborne collision, collision with terrain, etc. Functions are described under another 34 subsystem when they are managed as a standalone system.

2.1.18 System 35 - Oxygen

Table 18 System 35 - Oxygen

System	Subsystem	Title	Definition
35		**Oxygen**	Those units and components which store, generate, regulate, indicate, deliver and control oxygen to the passengers and crew, including bottles, relief valves, shut-off valves, outlets, regulators, masks, walk-around bottles, etc.
	-00	General	
	-10	Crew	That portion of the system which furnishes oxygen to the crew.
	-20	Passenger	That portion of the system which furnishes oxygen to the passengers.
	-30	Portable	That portion of the system which has an independent oxygen supply and which can be transported about the airplane.

System	Subsystem	Title	Definition
	-40	On board oxygen generating system	That portion of the system which generates oxygen for distribution in the other subsystems.

2.1.19 System 36 - Pneumatic

Table 19 System 36 - Pneumatic

System	Subsystem	Title	Definition
36		**Pneumatic**	Those units and components (ducts and valves) which deliver large volumes of compressed air from a power source to connecting points for such other systems as air conditioning, pressurization, deicing, etc.
	-00	General	
	-10	Distribution	That portion of the system which is used to distribute high or low pressure air to using systems. Includes items such as ducts, valves, actuators, heat exchangers, controls, etc. Does not include the supply valves to the using systems.
	-20	Indicating	That portion of the system which is used to indicate temperature and pressure of the pneumatic system. Includes temperature and pressure warning systems.

2.1.20 System 37 - Vacuum

Table 20 System 37 - Vacuum

System	Subsystem	Title	Definition
37		**Vacuum**	Those units and components used to generate, deliver and regulate negative air pressure, including pumps, regulators, lines etc, through and including the manifold.
	-00	General	
	-10	Distribution	That portion of the system which is used to distribute negative pressure air to using systems.
	-20	Indicating	That portion of the system which is used to indicate pressure. Includes pressure warning system.

2.1.21 System 38 - Water/waste

Table 21 System 38 - Water/waste

System	Subsystem	Title	Definition
38		**Water/waste**	Those fixed units and components which store and deliver for use, fresh water, and those fixed components which store and furnish a means of removal of water and waste. Includes wash basins, toilet assemblies, tanks, valves, etc.
	-00	General	
	-10	Potable	That portion of the system which is used to store and deliver fresh drinking water. Includes wash water system if the potable water is also used for washing.
	-20	Wash	That portion of the system which is used to store and deliver washwater which is not potable.
	-30	Waste disposal	That portion of the system which is used for disposal of water and waste. Includes items such as wash basins, water closets, flushing systems, etc.
	-40	Air supply	That portion of the system common to more than one subsystem which is used for pressurizing supply tanks to insure fluid flow.

2.1.22 System 39 - Attack system management

Table 22 System 39 - Attack system management

System	Subsystem	Title	Definition
39		**Attack system management**	Those functions and hardware used for attack system management. That includes digital information networking, crew-machine communication management (including knowledge-based help), stores management etc.
	-00	General	
	-10	Architecture management	General organization and its management depending on missions and their phases.
	-20	Attack system functions	Management of the different functions of the attack system depending on type of the missions and the different phases. In this section, the classification of these functions is indicated with the management of their activity during the missions.
	-30	Attack system resources	All the contributing resources of the attack system are listed and their role is presented depending on the missions and their different phases.
	-40	General rules of man-machine communication	Management of the man-machine communication by the system side (including knowledge based functions).

System	Subsystem	Title	Definition
	-50	Digital networks	Hardware and software related to digital networks (eg, MIL-1553B or Stanag-3810). Management of exchanges by these means is also to be presented.
	-60	Other information networks	These other networks needed in attack systems (eg, network for video signals, network for blanking signals, etc).
	-70	Stores management	Hardware and software within the air vehicle itself used for stores management.

2.1.23 System 40 - Operational attack functions

Table 23 System 40 - Operational attack functions

System	Subsystem	Title	Definition
40		**Operational attack functions**	Those functions and hardware used for attack system operational aim. Links of these functions with technical functions are included.
	-00	General	
	-10	Navigational functions	Include localization (with updating), flight management, approach and landing management etc.
	-20	Nap of the earth flight	Terrain following and obstacle avoidance management.
	-30	Self-protection	Defensive maneuvers and tactics elaboration against threats.
	-40	Information exchange and cooperation	Elaboration of pieces of information to be exchanged for cooperation with other air vehicles including AWACS-type air vehicles and ground or surface weapons systems.
	-50	Identification	Aerial and surface objects identification based on autonomous but also external (available through cooperation) identification means.
	-60	Air-to-air functions	Fire control functions related to air-to-air attacks. These sections can be divided as required to deal with bullet gun firing, short range missiles, medium range or beyond visual range missiles firing (for single or multiple targets attack). These functions are generally spread between weapons seekers and computers and aircraft sensors, computers, etc. This also includes air-to-air management after weapon launch (to guide or help the weapon for the target hitting).
	-70	Air-to-surface functions	Fire control functions related to air-to-surface attacks. These sections can be divided as required to deal with bombs delivery, rockets or missiles firing (either short range, medium range or of fire and forget type). These weapons can be guided or not. These functions are generally spread between weapons seekers, computers, and aircraft sensors, computers, etc. Management of guidance when made onboard is also to consider in these sections.

2.1.24 System 41 - Water ballast

Table 24 System 41 - Water ballast

System	Subsystem	Title	Definition
41		**Water ballast**	Those units and components provided for the storage, balancing, control, filling, discharge and dumping of water ballast. Does not include units or components covered in System 38.
	-00	General	
	-10	Storage	That portion of the system which stores water solely for the purpose of providing airship ballast. Includes removable tanks (bladder cells), interconnecting balance pipes, filler valves, etc.
	-20	Dump	That portion of the system used to dump water ballast during flight. Includes valves (remote/direct) manual/automatic controls, etc.
	-30	Indication	That portion of the system used to indicate quantity, condition and relative distribution of the water ballast.

2.1.25 System 42 - Cross-technical attack functions

Table 25 System 42 - Cross-technical attack functions

System	Subsystem	Title	Definition
42		**Cross-technical attack functions**	Those functions and hardware used for attacks execution. These technical functions considered in this System are common to many attack system operational functions, and therefore within the "crossroad" of the attack system.
	-00	General	
	-10	Mission system control and management	Functions in charge of scheduling and deciding about planned actions, priority management for resources consumption, etc.
	-20	Trajectory management	Functions dealing with trajectory constraints given by execution of operational functions and in charge of determination of the exact trajectory to follow (by autopilot) or to indicate (to the pilot).
	-30	Attack system compatibilities management	Function in charge of all the aspects related to electromagnetic compatibility between all the transmitters and receivers (including radios, ECM, radars, external stores, lasers, etc).
	-40	Tactical situation awareness	Functions in charge of establishing knowledge about tactical environment and its distribution to other functions (eg, fire control). The tactical situation awareness is based on information received from aircraft sensors, weapons seekers, cooperation, etc.

System	Subsystem	Title	Definition
	-50	Mission preparation	Embedded functions dedicated to deal with data given before flight and dispatch them to the other attack functions.
	-60	Mission restitution	Embedded functions dedicated to take care of all the data needed to replay the whole or part of the mission later on.
	-70	Warnings and cautions management	Functions in charge of telling crew or ground personnel bad events. Here is to consider only the result of each system warning and caution activity and mainly the filtering process (including knowledge based filters) to provide crew only with accurate messages depending on mission phases or aircraft status.

2.1.26 System 42 - Integrated modular avionics

Note

For this system the material item category code must be used in accordance with Chap 4.3.3.

Table 26 System 42 - Integrated modular avionics

System	Subsystem	Title	Definition
42		**Integrated modular avionics**	Generalize computing devices that can host software applications for system functions that had traditionally been implemented in dedicated hardware. The actual system functions are covered in their respective systems.
	-00	General	
	-20	Core System	
	-30	Network Components	

2.1.27 System 43 - Tactical communications

Table 27 System 43 - Tactical communications

System	Subsystem	Title	Definition
43		**Tactical communications**	Those units and components that furnish the crew with a means of communicating within the air vehicle, one air vehicle to another, and from the air vehicle to ground stations. Includes voice, C-W communicating components, PA system, intercom and recorder/record player.
	-00	General	
	-10	Ultra, super and extra high frequencies (UHF/SHF/EHF)	That portion of the system which is used for communications utilizing UHF/SHF/EHF carriers. Includes items such as transmitters, receivers, control panel, selcal decoder, antenna, etc.

System	Subsystem	Title	Definition
	-20	Very high frequency (VHF)	That portion of the system which is used for communications utilizing VHF carriers. Includes items such as transmitters, receivers, control panel, selcal decoder, antenna, etc.
	-30	High frequency (HF)	That portion of the system which is used for communications utilizing HF carriers. Includes items such as transmitters, receivers, power supply, control panel, antenna, coupler, etc.
	-40	Low and very low frequency (LF/VLF)	That portion of the system which is used for communications utilizing LF/VLF carriers. Includes items such as transmitters, receivers, power supply, control panel, antenna, coupler, etc.
	-50	Audio integrating	That portion of the system which controls the output of the communications and navigation receivers into the crews' headphones and speakers and the output of the crews' microphones into the communications transmitter. Includes items such as audio selector control panel, microphones, headphones, loudspeakers, etc.
	-60	Digital	That portion of the system which is used for air vehicle to air vehicle or air vehicle to ground stations utilizing C-W. Includes items such as teletypewriters, modems, keyers, encryption devices, etc.
	-70	Multiplex and audio switching	That portion of the system which is used for telephone communications between air vehicles or ground stations. Includes items such as telephones and multiplexing equipment.
	-80	Interphone and passenger address	That portion of the system used to address the passengers and which is used by the crew to communicate between areas of the air vehicle. Includes items such as amplifiers, speakers, handsets, control panels, audio, video and film equipment. Does not include the interphone system within the flight compartment which is part of the integrating system.
	-90	Satellite communications	That portion of the system which is used for air vehicle to satellite communications. Includes items such as receivers, transmitters, modems, amplifiers, etc.

2.1.28 System 44 - Cabin systems

Table 28 System 44 - Cabin systems

System	Subsystem	Title	Definition
44		**Cabin systems**	Those units and components which furnish a means of entertaining the passengers and providing communication within the aircraft and between the aircraft cabin and ground stations. Includes voice, data, music and video transmissions. Does not include SATCOM, HF, VHF, UHF, and all transmitting/receiving equipment, antennas, etc, which are covered in System 23 or System 46.
	-00	General	
	-10	Cabin core system	That portion of the system used to accomplish the integrated functional control, operation, testing and monitoring of cabin systems and the increase cabin comfort (such as active noise control). Includes items such as controllers, cabin control panels, handsets, signs, loudspeakers, etc.
	-20	Inflight entertainment system	That portion of the system used to entertain the passengers with music, video, information, games, etc. Includes items such as controllers, cabin control panels, audio and video equipment, etc.
	-30	External communication system	That portion of the system used by passengers and cabin crew to transmit and/or receive data/messages from air to air or from air to ground installations. Includes items such as telephones, telefaxes, modems, AM/FM radio units, etc.
	-40	Cabin mass memory system	That portion of the system used to store and process cabin related data, such as systems configuration data, multimedia programs, etc. Includes items such as controllers, terminals, keyboards, disk drives, printers, modems, etc.
	-50	Cabin monitoring system	The portion of the system used to monitor parts of the cabin area. Includes items such as surveillance cameras, monitors, etc. Does not include external anti-hijack devices or external video monitoring which are covered in System 23.
	-60	Miscellaneous cabin system	That portion of the system used to support miscellaneous cabin functions.

2.1.29 System 45 - Central maintenance system (CMS)

Table 29 System 45 - Central maintenance system (CMS)

System	Subsystem	Title	Definition
45		**Central maintenance system (CMS)**	Those units, components and associated system which interfaces with multiple air vehicle systems. Contains checkout and fault isolation procedures using a central computer complex and/or standard fault isolation procedures to locate a single system or component malfunction.
	-00	General	

System	Subsystem	Title	Definition
	-04 thru -19	CMS/Air vehicle general	CMS interfaces with general air vehicle systems and identification of maintenance functions related to air vehicles.
	-20 thru -44 and -46 thru -49	CMS/Airframe systems	CMS interfaces with airframe systems and identification of maintenance functions related to airframe systems.
	-45	Central maintenance system	That portion of the system which interfaces with other airplane systems, flight line mechanics and radio communications. Includes computers, storage devices, control and display devices.
	-50 thru -59	CMS/structures	CMS interfaces with structures and identification of maintenance functions related to structures.
	-60 thru -69	CMS/propellers	CMS interfaces with propeller and identification of maintenance functions related to propellers.
	-70 thru -89	CMS/power plant	CMS interfaces with power plant and identification of maintenance functions related to power plant.
	-91 thru -99	CMS/military systems	CMS interfaces with military systems and identification of maintenance functions related to military systems.
			Note Subsystem/Section code is selected to match applicable system interface. For example, 45-21-XX identifies all air conditioning monitoring and testing provided by the CMS and provides directions for using the CMS to execute those maintenance functions. Detailed testing not capable of coverage in System 45 is appropriately cross referenced and provided in System 21. Similarly, 45-32-XX identifies landing gear monitoring and testing provided by the CMS. 45-45-XX identifies the CMS itself.

2.1.30 System 46 - Systems integration and display

Table 30 System 46 - Systems integration and display

System	Subsystem	Title	Definition
46		**Systems integration and display**	The primary air vehicle system used to provide central acquisition, processing and display of data from multiple sources such as flight controls, navigation computation, air data computation, warnings, engine parameters, etc.
	-00	General	

	-10	Acquisition	Those units and components used to acquire data for integration and processing. Excludes components which are covered by the system dealing with the system/subsystem from which the data is being obtained.
	-20	Processing and integration	Those units and components used to integrate and process data acquired from a variety of sources and output signals to display or warning devices. Includes such items as interfaces, central processing units, data bus controls.
	-30	Display	Those units which display data warning units, remote displays, etc.
	-40 thru -79	Systems integration, software packages	These sections are used to provide information about those software packages which are applicable to more than one system of the air vehicle and can be classified as multi-system applicable software. This can be taken to mean software for computers which, in the event of failure of the computer(s) in another system, assume responsibility for the management of that system and thus provides backup to the failed systems, even though the computer which is providing backup normally has no connection with the system for which it is the backup.

2.1.31 System 46 - Information system

Note

For this system the material item category code must be used in accordance with Chap 4.3.3.

Table 31 System 46 - Information system

System	Subsystem	Title	Definition
46		**Information system**	Those units and components, which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm, or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the Electronic Library mass storage and controller. Does not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display.
	-00	General	
	-10	Airplane general information systems	
	-20	Flight deck information systems	That portion of the onboard information system that supports the flight deck systems, flight deck crew and flight operations.
	-30	Maintenance information systems	That portion of the onboard flight information system that supports all onboard maintenance system functions, maintenance technicians, and any ground based maintenance activity.

System	Subsystem	Title	Definition
	-40	Passenger cabin information systems	That portion of the onboard information system that supports the passenger cabin, cabin operations, and flight attendants.
	-50	Miscellaneous information systems	That portion of the onboard information system that supports other functions, as defined by the user that cannot be related to the flight deck, passenger cabin, or maintenance.

2.1.32 System 47 - Liquid nitrogen

Table 32 System 47 - Liquid nitrogen

System	Subsystem	Title	Definition
47		**Liquid nitrogen**	Those units and components used to generate, store, deliver and regulate liquid nitrogen to 2 or more using systems. Includes regulators, lines, manifolds, etc. Does not include liquid nitrogen handling components of the using system (ie, System 21-80).
	-00	General	
	-10	Generation/storage	That portion of the system which generates and/or stores nitrogen. Includes tanks, cells reservoirs, accumulators, etc. Does not include plumbing, pumps, valves, controls, etc.
	-20	Distribution	That portion of the system which is used to distribute nitrogen to the using systems. Includes plumbing, pumps, valves, regulators, etc.
	-30	Controlling	The nitrogen controls which meter the nitrogen to the distribution components and into the using systems. Includes items such as levers, switches, cables, etc.
	-40	Indicating	That portion of the system which is used to indicate the flow rate, temperature and pressure of the nitrogen. Includes items such as transmitters, indicators, etc.

2.1.33 System 48 - In-flight refueling tanker

Table 33 System 48 - In-flight refueling tanker

System	Subsystem	Title	Definition
48		**In-flight refueling tanker**	Those units and components which store, and deliver fuel to a receiver vehicle while in flight. Includes fuel storage units, distribution system, controls, sensors, etc, specifically used for in-flight refueling supply. Includes interfaces with other systems but does not include any dual purpose item that is identified with another system.

System	Subsystem	Title	Definition
			Note When systems and components serve both the operational and refueling system they are identified with the operational fuel system (System 28-00).
	-00	General	
	-10	Storage	That portion of the system which stores fuel specifically for the purpose of in-flight refueling. Includes tank sealing, bladder type cells, ventilating system, cell and tank inter-connectors, over wing filler necks and caps, etc. Also includes reservoir feed pumping systems and reservoirs within the tanks which are not part of the distribution system.
	-20	Distribution	That portion of the system which is used to distribute fuel from the filler connector to the storage system and from the storage system to and including the interface with the vehicle to vehicle transfer system. Includes such items as plumbing, pumps, valves, controls, etc.
	-30	Delivery	That portion of the system that accepts the fuel from the distribution portion and conducts it to the receiving vehicle. Includes refueling boom and nozzle or hose and drogue, boom control surfaces, actuators and hoist and stowage system. Does not include operator controls.
	-40	Controls	That portion of the system which is used to control the transfer of fuel from tanker to receiving vehicle. Includes operator controls, indicators, inter vehicle communications.
	-50	Indicating	That portion of the system which is used to indicate fuel quantity, temperature and pressure. Includes pressure warning systems for pumping within the storage and distribution areas.
	-60	Dump	That portion of the system which is used to dump fuel overboard during flight. When the tanker vehicle dump system (System 28-30) is used, the interface with it is identified in this system. Includes such items as plumbing, controls, indicators, chutes, etc.

2.1.34 System 49 - Airborne auxiliary power

Table 34 System 49 - Airborne auxiliary power

System	Subsystem	Title	Definition
49		**Airborne auxiliary power**	Those airborne power plants (engines) which are installed on the air vehicle for the purpose of generating and supplying a single type or combination of auxiliary electric, hydraulic, pneumatic or other power. Includes power and drive section, fuel, ignition and control systems; also wiring, indicators, plumbing, valves and ducts up to the power unit. Does not include generators, alternators, hydraulic pumps etc, or their connecting systems which supply and deliver power to their respective air vehicle systems.

System	Subsystem	Title	Definition
	-00	General	
	-10	Power plant	For definitions see System 71.
	-20	Engine	For definitions see System 72.
	-30	Engine fuel and control	For definitions see System 73.
	-40	Ignition/starting	For definitions see System 74 and 80.
	-50	Air	For definitions see System 75.
	-60	Engine controls	For definitions see System 76.
	-70	Engine indicating	For definitions see System 77.
	-80	Exhaust	For definitions see System 78.
	-90	Oil	For definitions see System 79.

2.1.35 System 50 - Cargo and accessory compartment

Table 35 System 50 - Cargo and accessory compartment

System	Subsystem	Title	Definition
50		**Cargo and accessory compartment**	Those compartments for storage of cargo and various components and accessories. Includes those systems used to load/unload cargo and other cargo related systems. Does not include aircraft structure which is in System 53.
	-00	General	
	-10	Cargo compartments	Those compartments for storage of cargo.
	-20	Cargo loading systems	Those systems which have components which are or can be mounted on the aircraft and used to load/unload, restrain, guide or service cargo. Includes drive systems rollers, latches, restraint nets, etc.
	-30	Cargo related systems	Those systems which are related to loading/unloading of cargo. Includes aircraft leveling, loader alignment systems etc. Does not include Cargo Loading Systems.
	-40	Aerial delivery	Those items required for air drop of cargo or personnel. Includes platforms, parachutes and drogue chutes, load release mechanisms and load transfer devices, anchor cables, static lines, retrieval winches, jump lines, etc.
	-50	Accessory compartments	Those compartments used for the housing of various components and accessories. Includes wheel wells, tell-hydraulic-electrical/electronic equipment racks, main battery structure, etc.

System	Subsystem	Title	Definition
	-60	Insulation	Those insulation blankets which are used for heat and sound insulation. Includes cargo compartments and accessory compartments, insulation, etc.

2.1.36 System 51 - Standard practices - Structures

Table 36 System 51 - Standard practices - Structures

System	Subsystem	Title	Definition
51		**Standard practices - Structures**	This System contains those standard practices, general procedures and typical repairs applicable to more than one structural task which are not specifically covered in Systems 52 thru 57. This excludes those standard practices which are recognized as standard trade practices, also those practices/processes which are only applicable to manufacture. Practices for a particular application are included in the appropriate structural system as part of the procedure.
	-00	General	Standard practices applicable to all structural systems. Air vehicle major structural breakdown and primary and secondary structure diagrams. Principal area and dimensional data. Restricted area diagram. Zoning diagram. Access door and panel identification. Glossary.
	-10	Investigation, cleanup and aerodynamic smoothness	Definition of damage classifications. Cleanup of dents, cracks, scratches, corrosion, etc. Aerodynamic smoothness requirements for the airplane, and permissible contour variations, gaps and mismatch data.
	-20	Processes	Special processes for use in the repair of the airplane. It does not include general engineering practices unless specific deviations are required. Unique processes such as welding specifications, etc., relative to a single repair are to be incorporated in the repair and only referenced here.
	-30	Materials	Description of materials (metallic and non-metallic) including extrusions, formed sections, sheet, sealants, adhesives, and special materials used in airplane repair. Where possible, permissible substitutes and sources of supply will be given.
	-40	Fasteners	Description of fastener types, materials, and sizes. Procedures for fastener installation and removal including hole preparation. Fastener strength values and substitution data.
	-50	Support of airplane for repair and alignment check procedures	Procedure for supporting the airplane to relieve loads during repairs. Includes location for supports and contour dimensions for required support equipment.

System	Subsystem	Title	Definition
	-60	Control-surface balancing	Procedures for adjusting the mass balance of control surfaces after repair. Where applicable, individual repairs will contain their own balancing instructions.
	-70	Repairs	Typical repairs suited for general use, not limited to one S1000D System
	-80	Electrical bonding	Topics concerning the electrical bonding of aircraft structures as well as electrical bonding of subsystems to aircraft structure.

2.1.37 System 52 - Doors

Table 37 System 52 - Doors

System	Subsystem	Title	Definition
52		**Doors**	Removable units used for entrance or exit and for enclosing other structure contained within the fuselage. Includes passenger and crew doors, cargo doors, emergency exits, etc. Electrical and hydraulic systems associated with door control are included as appropriate.
	-00	General	
	-10	Passenger/crew	Doors used for entrance and exit of the passengers and crew to and from the air vehicle. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, integral steps, ramps, handrails, attach/attached fittings, etc.
	-20	Emergency exit	Exit doors used to facilitate evacuation that are normally used for exit. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, attach/attached fittings, etc.
	-30	Cargo	Exterior doors used primarily to gain access to cargo compartments. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, integral steps, ramps, handrails, attach/attached fittings, etc.
	-40	Service and miscellaneous	Exterior doors used primarily to gain access for servicing air vehicle systems and equipment. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, integral steps, handrails, attach/attached fittings, etc.
	-50	Fixed interior	Doors inside the fuselage installed in fixed partitions. Includes items such as structure, latching mechanisms, handles, lining, attach/attached fittings, etc. Does not include doors installed in movable partitions which are covered in System 25.

System	Subsystem	Title	Definition
	-60	Entrance stairs	Stairs which operate in conjunction with but are not an integral part of entrance doors. Stairs whose primary structure is a door are covered under the appropriate topic. Includes items such as structure, actuating mechanisms and controls, handrails, attach/attached fittings, etc.
	-70	Door warning	That portion of the system which is used to indicate whether the doors are closed and properly latched. Includes items such as switches, lights, bells, horns, etc. Does not include landing gear door warning which is covered in System 32.
	-80	Landing gear	Structure of the doors used to enclose the landing gear compartments. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, attach/attached fittings, etc.

2.1.38 System 53 - Fuselage

Table 38 System 53 - Fuselage

System	Subsystem	Title	Definition
53		**Fuselage**	Structural units and associated components and members which make up the compartments for equipment, passengers, crew, cargo, plus the structure of the envelope and gondola of airships. Includes skins, belt frames, stringers, floor beams, floor, pressure dome, scuppers, tail cone, fuselage-to-wing-and-empennage fillets, attach/attached fittings, load curtains, cables, ballonets, etc. Also includes structural and removable pylons used for the carriage of external stores. Does not cover those pylons used for weapons which are covered in System 94-30.
	-00	General	
	-10 thru -90	Fuselage sections	Skins, main structure, secondary structure and fairings of the complete fuselage with any structural differences grouped together and highlighted by fuselage section location. The section locations are defined by manufacturing joints or other suitable demarcations in sequence from front to rear. Does not include movable partitions covered in System 25 nor the functional and maintenance aspects of variable aerodynamic fairings covered in System 27.

2.1.39 System 54 - Nacelles/pylons

Table 39 System 54 - Nacelles/pylons

System	Subsystem	Title	Definition
54		**Nacelles/pylons**	Structural units and associated components and members which furnish a means of mounting and housing the power plant or rotor assembly. Includes skins, longerons, belt frames, stringers, clamshells, scuppers, doors, nacelle fillets, attach/attached fittings, etc. Also includes the structure of power plant cowling inclusive of the structural portion of the inlet whether or not integral with the air vehicle. Structural portions of the exhaust systems are excluded where they are not integral with the airframe.
	-00	General	
	-10 thru -40	Nacelle section	Skins, primary structure, secondary structure, fillets and fairings of a complete nacelle with any structural differences grouped together and highlighted by specific nacelle designator. The section locations are defined by manufacturing joints or other suitable demarcations in a logical sequence.
	-50 thru -80	Pylon	Skins, primary structure, secondary structure, fillets and fairings of a complete pylon with any structure differences grouped together and highlighted by specific pylon designator. The section locations are defined by manufacturing joints or other suitable demarcations in a logical sequence.
	-90	Air management	Consists of those components which regulate and direct inlet air flow and/or provide engine air particle separation (EAPS).

2.1.40 System 55 - Stabilizers

Table 40 System 55 - Stabilizers

System	Subsystem	Title	Definition
55		**Stabilizers**	Horizontal and vertical stabilizers. Includes the structure of the elevator, rudder, auxiliary stabilizers and strakes.
	-00	General	
	-10	Horizontal stabilizer or canard	The horizontal airfoil of the tail or nose section to which an elevator can be attached. Includes items such as spars, ribs, stringers, skins, access covers, tips, attach/attached fittings, etc.
	-20	Elevator	Removable airfoil which is attached to the horizontal stabilizer or canard and used for pitch control. Includes items such as spars, ribs, stringers, skins, access covers, tabs, balance devices, attach/attached fittings, etc.
	-30	Vertical stabilizer	Vertical airfoil to which the rudder is attached. Includes items such as spars, ribs, stringers, skins, access covers, tips, attach/attached fittings, etc.

System	Subsystem	Title	Definition
	-40	Rudder	Removable airfoil which is attached to the vertical stabilizer and used for yaw control. Includes items such as spars, ribs, stringers, skins, access covers, tabs, balance devices, attach/attached fitting, etc.
	-50	Auxiliary stabilizers and strakes	Fuselage mounted auxiliary stabilizers and strakes includes items such as spars, ribs, stringers, skins, access covers.

2.1.41 System 56 - Windows and canopies

Table 41 System 56 - Windows and canopies

System	Subsystem	Title	Definition
56		**Windows and canopies**	Fuselage and crew compartment windows and canopies, inclusive of windshield; also those windows installed in doors. Associated electrical/hydraulic/pneumatic actuation systems are to be included.
	-00	General	
	-10	Flight compartment	Compartment in which the crew fly the aircraft. Includes items such as the transparent material and its frame of movable and fixed windows, windshields and canopies, handles, latching mechanisms and associated electrical/hydraulic/pneumatic actuation systems, etc. Does not include doors or inspection/observation windows.
	-20	Fuselage compartment	The compartment used for passengers/tactical crew/cargo, etc. Includes lounges, lavatories, buffets/galleys and coatrooms. Includes items such as transparent material, its frame, frost shield, etc.
	-30	Door	Doors in the flight and fuselage compartments. Includes items such as transparent material, its frame, etc. Does not include emergency exit windows.
	-40	Inspection and observation	Windows used for examining compartments and equipment in and about the air vehicle, astrodomes used for celestial navigation, and in-flight refueling operator’s windows. Includes items such as transparent material, its frame, etc.

2.1.42 System 57 - Wings

Table 42 System 57 - Wings

System	Subsystem	Title	Definition
57		**Wings**	Center wing and outer wing structural units and associated components and members which support the air vehicle in flight. Includes spars, skins, ribs, stringers, clamshells, scuppers etc, and integral fuel tank structure of the flaps, slats, ailerons or elevons (complete with tabs) and spoilers. Also includes structural and removable pylons used for carriage of external stores. Does not cover those pylons used for weapons which are covered in System 94-30.
	-00	General	
	-10	Center wing	Skins, primary structure, fillets and fairings of the center wing and attach/attached fittings.
	-20	Outer wing	Skins, primary structure, fillets and fairings of the outer wing and attach/attached fittings.
	-30	Wing tip	Skins and structure of the wing tip and attached fittings.
	-40	Leading edge and leading edge devices	Skins and structure of the wing leading edge and removable leading edge airfoils such as flaps, slats, attach/attached fittings, etc.
	-50	Trailing edge and trailing edge devices	Skins and structure of the wing trailing edge and removable trailing edge ailerons such as flaps and attach/attached fittings.
	-60	Ailerons, elevons and flaperons	The skin and structure of ailerons, elevons, flaperons and tabs including balancing devices and attach/attached fittings, etc.
	-70	Spoilers	Skins and structure of wing-mounted spoilers, airbrakes, lift dumpers, attach/attached fittings, etc.
	-80	Wing folding	System that controls the on-ground movement of any portion of the main wing structure. Includes mechanisms linkages, actuators, locks, indicating/warning systems, etc. **Note** This represents the wing stow system and is not to be confused with System 66 Folding blades/pylon.

2.1.43 System 60 - Standard practices, Propeller/rotor

Table 43 System 60 - Standard practices, Propeller/rotor

System	Subsystem	Title	Definition
60		**Standard practices, Propeller/rotor**	This system contains those standard mechanical and electrical/electronic engineering practices applicable to more than one propeller/rotor which are not covered in Systems 61 thru 69. It excludes those practices which are recognized as standard trade practices, also those practices/processes which are only applicable to manufacture. Practices for a particular application are included in the appropriate propeller/rotor system as part of the procedure.
	-00	General	Standard practices applicable to all propeller/rotor systems.
	-10 thru -90		Sections -10 thru -90 are used to describe standard practices. The manufacturer or manufacturing partners can assign the section numbers to suit generic standard practices related to more than one propeller or rotor system.

2.1.44 System 61 - Propellers/propulsors

Table 44 System 61 - Propellers/propulsors

System	Subsystem	Title	Definition
61		**Propellers/propulsors**	The complete mechanical or electrical propeller, pumps, motors, governor, alternators and those units and components external to or integral with the engine used to control the propeller blade angle. Includes propeller spinner synchronizers. Also includes propulsor duct assemblies, including aerodynamic fairing of mechanical components, stators, vectoring systems, etc.
	-00	General	
	-10	Propeller assembly	That portion of the system which rotates except the engine propeller shaft. Includes items such as blades, dome, hub, spinner, slip ring, deicer boot, distributor valve, etc.
	-20	Controlling	That portion of the system which controls the pitch of the propeller blades. Includes items such as governor synchronizers, switches, wiring, cables, levers, etc. Does not include any parts which rotate with the propeller assembly. Also includes all those units and components provided for the propulsor vector drive system. Includes flight deck control, drive motors, gearboxes, drive shafts, synchronizing shafts, etc.
	-30	Braking	That portion of the system which is used to decrease run-down time or stop propeller rotation during engine power-off conditions. Includes brake mechanisms, levers, pulleys, cables, switches, wiring, plumbing, etc.

System	Subsystem	Title	Definition
	-40	Indicating	That portion of the system used to indicate operation or activation of propeller/propulsor systems. Includes items such as light, switches, wiring, etc.
	-50	Propulsor duct	The complete duct assembly including vector drive attachment, fairings, stators, gearbox covers, etc.

2.1.45 System 62 - Main rotors

Table 45 System 62 - Main rotors

System	Subsystem	Title	Definition
62		**Main rotors**	Rotor head assemblies and rotor blades, including the swash plate assemblies and the rotor shaft units if not an integral part of the gearboxes. Does not include the rotor anti-icing system which is dealt with in System 30, Ice and Rain Protection.
	-00	General	
	-10	Rotor blades	Rotor blade assemblies, including the heating mat (electrical resistors) for anti-icing.
	-20	Rotor heads	Complete rotor heads, including blade folding systems. Includes sleeves, spindles, dampers, rotor head fairings as well as rotor shafts and swash plates if the rotor head and shaft constitute a non-dissociable assembly.
	-30	Rotating controls, rotor shafts/swash plate assemblies	Includes pitch change rods and swash plate assemblies if not included in Section -20.
	-40	Indicating	That portion of the system which indicates operation or activation of rotor systems. Includes items such as lights, gauges, switches, wiring, etc.

2.1.46 System 63 - Main rotor drives

Table 46 System 63 - Main rotor drives

System	Subsystem	Title	Definition
63		**Main rotor drives**	Includes all components transmitting power to the rotors: engine coupling components, drive shafts, clutch and free wheel units, gearboxes, it's (their) components, systems and securing elements.
	-00	General	
	-10	Engine/gearbox couplings	Drive shafts between engines and main gearboxes, gearbox to gearbox, and, if applicable, clutch and free wheel units.

System	Subsystem	Title	Definition
	-20	Gearboxes	Part of the system driving the rotors. Includes the mechanical power take-offs and accessory drives but does not include the accessories themselves (alternators, hydraulic pumps etc). Includes the gearbox lubricating systems and the rotor brakes if the latter forms part of the gearboxes.
	-30	Mounts and attachments	Suspension bars, vibration damping system providing attachment of the gearboxes to the airframe.
	-40	Indicating	That portion of the system which indicates operation or activation of rotor systems. Includes items such as lights, gauges, switches, wiring, etc.

2.1.47 System 64 - Tail rotor

Table 47 System 64 - Tail rotor

System	Subsystem	Title	Definition
64		**Tail rotor**	Assembly that rotates in a plane nearly parallel to the symmetry plane and delivers a thrust opposing to the main rotor torque thus ensuring yaw control. Includes the rotor blades and rotor head. Does not include the rotor anti-icing system which is dealt with in System 30, Ice and Rain Protection.
	-00	General	
	-10	Rotor blades	Blade assemblies, including the heating mats (electrical resistors) for anti-icing. **Note** For an integral unit, only one section will be used.
	-20	Rotor head	Tail rotor head **Note** For an integral unit, only one section will be used.
	-30	Rotating controls	Includes pitch control beams, links and associated components.
	-40	Indicating	That portion of the system which indicates operation or activation of rotor systems. Includes items such as lights, gauges, switches, wiring, etc. **Note** For an integral unit, only one section will be used.

2.1.48 System 65 - Tail rotor drive

Table 48 System 65 - Tail rotor drive

System	Subsystem	Title	Definition
65		**Tail rotor drive**	Includes all the components transmitting power to the tail rotor: drive shafts, bearings, gearboxes.

System	Subsystem	Title	Definition
	-00	General	
	-10	Shafts	Drive shafts, bearings, flexible couplings.
	-20	Gearboxes	Intermediate gearbox. Tail gearbox.
	-30	Not available for projects	
	-40	Indicating	That portion of the system which indicates operation or activation of rotor system. Includes items such as lights, gauges, switches, wiring, etc.

2.1.49 System 66 - Folding blades/pylon

Table 49 System 66 - Folding blades/pylon

System	Subsystem	Title	Definition
66		**Folding blades/pylon**	The whole of the system which provides automatic or manual folding and spreading of the rotor blades and/or tail pylon. **Note** Procedures produced in accordance with this system can also affect the components described by other systems.
	-00	General	
	-10	Rotor blades	Part of the system ensuring rotor blade folding and spreading; includes the mechanical, hydraulic and electrical means permanently fitted on the air vehicle.
	-20	Tail pylon	Part of system ensuring tail pylon folding and spreading; includes mechanical, hydraulic and electrical means permanently fitted on the air vehicle.
	-30	Controls and indicating	Part of the system intended for controlling folding/spreading sequences and for indicating the system operation. Includes the control units, caption lights, indicator, wiring, etc.

2.1.50 System 67 - Rotors flight control

Table 50 System 67 - Rotors flight control

System	Subsystem	Title	Definition
67		**Rotors flight control**	The system which provides means of manually controlling the flight attitude of the helicopter. Includes items such as control linkage and control cables for collective pitch, cyclic pitch, directional control, servo-controls and corresponding system. The trim system and the indicating and monitoring system.

System	Subsystem	Title	Definition
			Note This system includes the complete rigging of rotor control including the associated items not described under this system, such as auto-pilot, servo-control unit, automatic trim (System 22), blade pitch change rods, beams and swash plates (Systems 62 and 64).
	-00	General	
	-10	Rotor control	That portion of the system which controls the attitude by the angle of attack of the rotor blades. Includes items such as collective pitch lever, cyclic pitch stick and corresponding linkage and cable controls, coupling and mixing units and artificial feel unit systems. Also includes the control position indicating system.
	-20	Anti-torque rotor control (yaw control)	That portion of the controls which control the direction of the helicopter (yaw control). Includes items such as tail rotor control pedals, relevant linkage and cable controls, bell cranks constituting the yaw control channel and the control position indicating system.
	-30	Servo-control system	That portion of the system which from a power source ensures distribution to the rotor servo-control system. Includes items such as pressure relief valves, electro valves, check valves, accumulators and equipment needed for the operation of the servo-control system, the servo-controls, the systems used for monitoring and indicating the operation of the servo-control system.

2.1.51 System 70 - Standard practices, Engine

Table 51 System 70 - Standard practices, Engine

System	Subsystem	Title	Definition
70		**Standard practices, Engine**	This system contains those standard mechanical, electrical, electronic etc, engineering practices applicable to more than one engine task which are not covered in Systems 71 thru 84. It excludes those practices which are recognized as standard trade practices, also those practices/processes which are only applicable to manufacture. Practices for a particular application are included in the appropriate engine system as part of the procedure.
	-00	General	Standard practices applicable to all engine and associated systems.
	-10	Marking and masking	This section contains marking and masking processes and any required test of process and/or product.
	-20	Cleaning and coating removal	This section contains chemical and mechanical cleaning procedures, removal of coating by chemical or mechanical processes.

System	Subsystem	Title	Definition
	-30	Inspection	This section contains inspection processes such as hardness measurement, fluorescent penetrant, eddy current, etc. Includes any required test of process and/or product.
	-40	Repair principles	This section contains various processes applicable to repair engine parts (eg, riveting, machining, heat treatment). Includes any required test of process and/or product.
	-50	Surface preparation	This section contains processes to prepare a surface of a part before coating application (eg, abrasive blast etching) or to modify the surface hardness (eg, glass bead peening) Includes any required test of process and/or product.
	-60	Coating application	This section contains processes to apply a coating on engine parts such as nickel plating, oxide film, lubricants, paints. Includes any required test of process and/or product.
	-70	Assembly	This section contains processes which are applied during engine assembly such as locking method. Includes any required test of process and/or product.
	-80	Disassembly	This section contains processes which are applied during engine disassembly such as requirements for installing blanks and special inspections.

2.1.52 System 71 - Power plant

Table 52 System 71 - Power plant

System	Subsystem	Title	Definition
71		**Power plant**	The overall power package including engine, air intake, mount, cowling, scoops, cowl flaps.
	-00	General	This section includes general information, limits and procedures. This section also covers subjects such as engine changes, run-up, externally-mounted spare power plants, etc. This section also covers subjects such as power plant build-up, teardown, etc.
	-10	Cowling	Those removable coverings which extend over and around the power plant assembly. Includes the functioning and maintenance aspects of items such as accessory section cowls, cowl flaps, cowling supports and attach and locking mechanisms, etc. Does not include the structure integral with the airframe which is covered by the applicable system structure.
	-20	Mounts	The framework, either of build-up construction or forgings which support the engine and attach it to the nacelle or pylon. Includes items such as engine mounts, vibration dampeners, support links, mounting bolts, etc.

System	Subsystem	Title	Definition
	-30	Fire seals	Those fire resistant partitions and seals mounted on or about the power package for the purpose of isolating areas subject to fire. Does not include those fire walls which are included in System 54.
	-40	Attach fittings	Those fittings and brackets which are used for the support of equipment in and about the power package.
	-50	Electrical harness	Those electrical cables, conduits, plugs, sockets etc, which serve several power plant systems, but which are banded together to facilitate removal and installation of the power plant. Does not include the wiring which is specifically covered under another system.
	-60	Air intakes	That portion of the power plant system which directs and can or cannot vary the mass air flow to the engine. Includes items such as nose ring cowls, scoops, compressor fan cowls, buried engine ducts, vortex generators, actuators, control handles, cables, wiring, plumbing, linkages, doors, warning systems, position indicators, etc. This does not include integral structure with the airframe, which are included in the applicable system structure.
	-70	Engine drains	Those components and manifold assemblies which are used to drain off excess fluids from the power plant and its accessories. Includes drain lines, manifolds, tanks, flame arrestors, vents and their supporting brackets, etc. Also includes components that are an integral part of, or fitted to the power plant cowling.
	-80	Engine ancillary systems	Those components and manifold assemblies which are used to deliver compressor wash fluids to the engine. Includes plumbing, valves, controls, air supply lines for closing compressor bleeds etc.

2.1.53 System 72 - Engine

Table 53 System 72 - Engine

System	Subsystem	Title	Definition
72		**Engine**	Those units and components which are used to induce and convert fuel-air mixture into power. Includes, for the basic turbine engine: - air inlet, compressor, diffuser, combustion chambers, turbine and exhaust; and for the reciprocating engine: - blower and clutch, clutch control valve, cylinders, cylinder baffles, intake pipes, crankshaft assembly, etc. Used to transmit power to the propeller shaft, if any, and accessory drives. Includes reduction gearing, gear trains, extension shaft and torque meter.

	Within the profile of the basic engine, used to supplement the functioning of other defined systems external to the engine. Includes items such as accessory drive, mechanical portion of the spark advance mechanism, oil transfer tubes from the propeller governor pad to the propeller shaft, BMEP section, etc.
	Used to control and direct the flow of lubrication through the engine from the inlet fitting to the outlet fitting. Includes engine pumps (pressure and scavenger), pressure relief valves, screens, oil lines (internal and external), etc.

2.1.54 System 72 - Engine turbine/turboprop Ducted fan/inducted fan

Table 54 System 72 - Engine turbine/turboprop Ducted fan/inducted fan

System	Subsystem	Title	Definition
72		**Engine turbine/turboprop Ducted fan/inducted fan**	
	-00	General	This section is intended to cover general information, limits and procedures. In the engine manual it includes such subjects as tear down, cleaning, inspection, assembly, testing, etc.
	-10	Reduction gear, shaft section (turboprop and/or front mounted gear driven propulsor)	The section of the engine which contains the propeller shafts and reduction gears. Includes items such as drives for hose mounted accessories, etc. If applicable, the section of the engine which uses mechanical force, through a gear-driven system, to drive front mounted propulsors which provide the majority of the energy generated. Includes items such as propulsor blades, actuation systems, reduction gears, drive-shafts, etc.
	-20	Air inlet section	The section of the engine through which the air enters the compressor. Includes items such as guide vanes, shrouds, cases, etc.
	-30	Compressor section	The section of the engine in which the air is compressed. Includes items such as cases, vanes, shrouds, rotors, diffusers, etc. Also includes the maintenance of stator blades but not the operation of variable stator blades which is covered under System 75-30. Does not include compressor bleed system.
	-40	Combustion section	The section of the engine in which the air and fuel are combined and burned. Includes items such as burner cans, cases, etc.
	-50	Turbine section	The section of the engine containing the turbines. Includes items such as turbine nozzles, turbine rotors, cases, etc.

System	Subsystem	Title	Definition
	-60	Accessory drives	The mechanical power take-offs to drive accessories. Includes items such as engine mounted gear boxes, gears, seals, pumps, etc. Does not include remotely installed gear boxes which are covered in System 83.
	-70	By-pass section	The section of the engine which by-passes a portion of the normal engine airflow (either ram or compressed air) for the prime purpose of adding to engine thrust or reducing specific fuel consumption.
	-80	Propulsor section (rear mounted)	The section of the engine which contains a propulsors and provides the majority of the energy generated. The propulsor can be turbine driven or gear driven. Includes such items as propulsor turbines, propulsor blades, blade actuation, and frames (rotating and/or stationary).
	-90	Multi-system hardware	The section of the engine made up of more than one of the above given subsystems (eg, gas generator, core engine).

2.1.55 System 72 - Engine reciprocating

Table 55 System 72 - Engine reciprocating

System	Subsystem	Title	Definition
72		**Engine reciprocating**	
	-00	General	This section is intended to cover general information, limits and procedures. In the engine manual this section includes such subjects as tear down cleaning, inspection, assembly, testing, etc.
	-10	Front section	The section of the engine which contains the propeller shafts and reduction gears. Includes items such as drives for nose mounted accessories, etc.
	-20	Power section	The section of the engine which contains the crankshaft, master and link rod assemblies, cams, cam drive gears, tappet guides, rollers, carriers, etc.
	-30	Cylinder section	The section of the engine which contains the cylinders, valves, pistons, push rods, intake pipes, baffles, etc. Also includes rocker arm assembly, valve springs, etc.
	-40	Supercharger section	The section of the engine which contains cases, shroud plates, PRT coupling and gearing, impeller and drives, accessory drives, bushings, etc.
	-50	Lubrication	Those units and components which are used to distribute oil throughout the engine. Includes front and rear pressure and scavenger pumps, sumps, strainers, valves, etc. Also includes those oil lines not included in System 79. Does not include those items which form integral passages within the engine.

2.1.56 System 73 - Engine fuel and control

Table 56 System 73 - Engine fuel and control

System	Subsystem	Title	Definition
73		**Engine fuel and control**	For turbine engines, those units and components and associated mechanical systems or electrical circuits which furnish or control fuel to the engine beyond the main fuel quick disconnect and thrust augmenter, fuel flow rate sensing, transmitting and/or indicating units whether the units are before or beyond the quick disconnect. It includes coordinator or equivalent, engine driven fuel pump and filter assembly, main and thrust augmenter fuel controls, electronic temperature datum control, temperature datum valve, fuel manifold, fuel nozzles, fuel enrichment system, speed sensitive switch, relay box assembly, solenoid drip valve, burner drain valve, etc. For reciprocating engines, those units and components which deliver metered fuel and air to the engine. The fuel portion includes the carburetor/master control from the inlet side to the discharge nozzle, injection pumps, carburetor, injection nozzles and fuel primer. The air portion includes units from the scoop inlet to the vapor vent return and the impeller chamber.
	-00	General	
	-10	Distribution	That portion of the system from the main quick disconnect to the engine, which distributes fuel to the engine burner section and the thrust augmenter. Includes items such as plumbing, pumps, temperature regulators, valves, filters, manifold, nozzles, etc. Does not include the main or thrust augmenter fuel control.
	-20	Controlling	The main fuel control which meters fuel to the engine and to the thrust augmenter. Includes items such as hydro mechanical or electronic fuel control, levers, actuators, cables, pulleys, linkages, sensors, valves, etc, which are components of the fuel control units.
	-30	Indicating	That portion of the system which is used to indicate the flow rate, temperature and pressure of the fuel. Includes items such as transmitters, indicators, wiring, etc. Does not include indication, if indication is accomplished as part of an integrated engine instrument system (System 77-40).

2.1.57 System 74 - Ignition

Table 57 System 74 - Ignition

System	Subsystem	Title	Definition
74		**Ignition**	Those units and components which generate, control, furnish, or distribute an electrical current to ignite the fuel air mixture in the cylinders of reciprocating engines or in the combustion chambers or thrust augmenters of turbine engines. Includes induction vibrators, magnetos, switches, lead filters, distributors, harnesses, plugs, ignition relays, exciters and the electrical portion of spark advance.
	-00	General	
	-10	Electrical power supply	That portion of the system which generates electrical current for the purpose of igniting the fuel mixture in the combustion chambers and thrust augmenters. Includes items such as magnetos, distributors, booster coils, exciters, transformers, storage capacitors and compositors, etc.
	-20	Distribution	That portion of the system which conducts high or low voltage electricity from the electrical power supply to the spark plugs, or igniters. Includes wiring between magneto and distributor in those systems where they are separate units. Includes items such as ignition harness, high tension leads, coils as used in low tension systems, spark plugs, igniters, etc.
	-30	Switching	That portion of the system which provides a means of rendering the electrical power supply inoperative. Includes items such as ignition switches, wiring, connectors, etc.

2.1.58 System 75 - Air

Table 58 System 75 - Air

System	Subsystem	Title	Definition
75		**Air**	For turbine engines, those external units and components and integral basic engine parts which go together to conduct air to various portions of the engine and the extension shaft and torque-meter assembly, if any. Includes compressor bleed systems used to control flow of air through the engine, cooling air systems and heated air systems for engine anti-icing. Does not include aircraft anti-icing, engine starting systems, nor exhaust supplementary air systems.
	-00	General	
	-10	Engine anti-icing	That portion of the system which is used to eliminate and prevent the formation of ice by bleed air in all parts of the engine, excluding power plant cowling which is covered under System 30. Includes items such as valves, plumbing, wiring, regulators, etc. Electrical anti-icing is covered in System 30.

System	Subsystem	Title	Definition
	-20	Cooling	That portion of the system which is used to ventilate the engine and accessories. Includes items such as valves, plumbing, wiring, jet pumps, vortex spoilers, etc.
	-30	Compressor control	That portion of the system which is used to control the flow of air through the engine. Includes items such as governors, valves, actuators, linkages, etc. Also includes the operation of variable stator blades, but not the maintenance which is covered under System 72-30.
	-40	Indicating	That portion of the system which is used to indicate temperature, pressure, control positions etc, of the air systems. Includes items such as transmitters, indicators, wiring, etc.
	-50	Air intake foreign object removal	That portion of the system which is used to remove foreign objects from the engine air intake.

2.1.59 System 76 - Engine controls

Table 59 System 76 - Engine controls

System	Subsystem	Title	Definition
76		**Engine controls**	Those controls which govern operation of the engine. Includes units and components which are interconnected for emergency shutdown. For turbo-prop engines, includes linkages and controls to the coordinator or equivalent and from the coordinator or equivalent to the propeller governor, fuel control unit or other units being controlled. For reciprocating engines, includes controls for blowers. Does not include units or components which are specifically included in other systems.
	-00	General	
	-10	Power control	That portion of the system which furnishes a means of controlling the main fuel control or coordinator. Includes controls to the propeller regulator on turbo-prop engines. Includes items such as linkages, cables, levers, pulleys, switches, wiring, etc. Does not include the units themselves.
	-20	Emergency shutdown	That portion of the system which furnishes a means of controlling the flow of fluids to and from the engine during emergency procedures. Includes items such as levers, cables, pulleys, linkages, switches, wiring, etc. Does not include the units themselves.

2.1.60 System 77 - Engine indicating

Table 60 System 77 - Engine indicating

System	Subsystem	Title	Definition
77		**Engine indicating**	Those units, components and associated systems which indicate engine operation. Includes indicators, transmitters, analyzers, etc. For turbo-prop engines includes phase detectors. Does not include systems or items which are specifically included in other systems except when indication is accomplished as part of an integrated engine instrument system (System 77-40).
	-00	General	
	-10	Power	That portion of the system which directly or indirectly indicates power or thrust. Includes items such as BMEP, pressure ratio, RPM, etc.
	-20	Temperature	That portion of the system which indicates temperatures in the engine. Includes items such as cylinder head, exhaust (turbine inlet), etc.
	-30	Analyzers	That portion of the system which is used to analyze engine performance or condition by means of instruments or devices such as oscilloscopes, etc. Includes items such as generators, wiring, amplifiers, oscilloscopes, etc.
	-40	Integrated engine instrument systems	That portion of the system which as an integrated concept receives several/all engine operating parameters and then transmits this to a central processor for crew presentation. Includes items such as display units, transmitters, receivers, computers, etc.

2.1.61 System 78 - Exhaust

Table 61 System 78 - Exhaust

System	Subsystem	Title	Definition
78		**Exhaust**	Those units and components which direct the engine exhaust gases overboard. For turbine engines, includes units external to the basic engine such as thrust reverser and noise suppressor. For reciprocating engines, includes augmenters, stacks, clamps, etc. Excludes exhaust driven turbines.
	-00	General	
	-10	Collector/nozzle	That portion of the system which collects the exhaust gases from the cylinders or turbines. Includes item such as collector rings, exhaust ducts, variable nozzles, actuators, plumbing, linkages, wiring, position indicators, warning systems, etc. Does not include power recovery turbines, turbo-superchargers etc, nor noise suppressors or thrust reversers where they are not an integral part of the nozzle system.

System	Subsystem	Title	Definition
	-20	Noise suppressor	That portion of the system which reduces the noise generated by the exhaust gases. Includes items such as pipes, baffles, shields, actuators, plumbing linkages, wiring, position indicators, warning systems, etc. Use Section -10 where integral part of nozzle system.
	-30	Thrust reverser	That portion of the system which is used to change the direction of the exhaust gases for reverse thrust. Includes items such as clamshells, linkages, levers, actuators, plumbing, wiring, indicators, warning systems, etc. Use Section -10 where integral part of nozzle system.
	-40	Supplementary air	That portion of the system which varies and controls supplementary air flow of the exhaust system. Includes items such as tertiary air doors, actuators, linkages, springs, plumbing, wiring, position indicators, warning systems, etc.
	-50	Augmenter	That portion of the system which provides additional thrust for takeoff and in-flight at the command of the pilot. Includes items such as liners, rings, actuators, linkages, wiring, indicators, warning systems, etc. Does not include augmentation external to the power plant which is covered in System 84 Propulsion augmentation.
	-60	Dissipation/deflection	That portion of the system which dilutes and/or redirects engine exhaust away from the aircraft for the purpose of reducing infrared (IR) signature and decreasing exhaust temperatures.

2.1.62 System 79 - Oil

Table 62 System 79 - Oil

System	Subsystem	Title	Definition
79		**Oil**	Those units and components external to the engine concerned with storing and delivering lubricating oil to and from the engine. Covers all units and components from the lubricating oil engine outlet to the inlet, including the inlet and outlet fittings, tank, radiator, by-pass valve etc, and auxiliary oil systems.
	-00	General	
	-10	Storage	That portion of the system used for storage of oil. Includes items such as tanks, filling systems, internal hoppers, baffles, tank sump and drain, etc. Does not include tanks which are an integral portion of the engine.

System	Subsystem	Title	Definition
	-20	Distribution	That portion of the system which is used to conduct oil from and to the engine. Includes items such as plumbing, valves, temperature regulator, control systems, etc.
	-30	Indicating	That portion of the system which is used to indicate the quantity, temperature and pressure of the oil. Includes items such as transmitters, indicators, wiring, warning systems, etc. Does not include indication if indication is accomplished as part of an integrated engine instrument system (System 77-40).

2.1.63 System 80 - Starting

Table 63 System 80 - Starting

System	Subsystem	Title	Definition
80		**Starting**	Those units, components and associated systems used for starting the engine. Includes electrical, inertia air or other starter systems. Does not include ignition systems which are covered in System 74.
	-00	General	
	-10	Cranking	That portion of the system which is used to perform the cranking portion of the starting operation. Includes items such as plumbing, valves, wiring, starters, switches, relays, etc.

2.1.64 System 81 - Turbines

Table 64 System 81 - Turbines

System	Subsystem	Title	Definition
81		**Turbines**	For reciprocating engines only. Includes power recovery turbine assembly and turbo-supercharger unit when external to the engine.
	-00	General	
	-10	Power recovery	The turbines which extract energy from the exhaust gases and are coupled to the crankshaft.
	-20	Turbo-supercharger	The turbines which extract energy from the exhaust gases and drive an air compressor.

2.1.65 System 82 - Water injection

Table 65 System 82 - Water injection

System	Subsystem	Title	Definition
82		**Water injection**	Those units and components which furnish, meter and inject water or water mixtures into the induction system, includes tanks, pumps, regulators, etc.
	-00	General	
	-10	Storage	That portion of the system which is used for the storage of water or water mixtures. Includes tank sealing, attachment of bladder type cells, ventilating system, cell and tank interconnections, filling systems, etc.
	-20	Distribution	That portion of the system which is used to conduct water or water mixtures from the tanks or cells to the engine. Includes items such as plumbing, cross feed system, pumps, valves, controls, etc.
	-30	Dumping and purging	That portion of the system which is used to dump injection water and to purge the system. Includes items such as plumbing, valves, controls, etc.
	-40	Indicating	That portion of the system which is used to indicate the quantity, temperature and pressure of the water or water mixtures. Includes items such as transmitters, indicators, wiring, etc.

2.1.66 System 83 - Accessory gearboxes

Table 66 System 83 - Accessory gearboxes

System	Subsystem	Title	Definition
83		**Accessory gearboxes**	Those units and components which are remotely installed and connected to the engine by a drive shaft and which drive multiple types of accessories. Does not include those accessory drives which are bolted to and are immediately adjacent to the engine. The latter item is covered under System 72.
	-00	General	
	-10	Drive shaft section	That portion of the system which is used to conduct power from the engine to the gearbox. Includes items such as drive shaft, adapters, seals, etc.
	-20	Gearbox section	The case which contains the gear trains and shafts. Includes items such as gears, shafts, seals, oil pumps, coolers, etc.

2.1.67 System 84 - Propulsion augmentation

Table 67 System 84 - Propulsion augmentation

System	Subsystem	Title	Definition
84		**Propulsion augmentation**	Those units and components that, independent of the primary propulsion system, furnish additional thrust of short duration. Includes solid or liquid propellants, controls, indicators, etc.
	-00	General	
	-10	Jet assist takeoff	Those units or components dedicated to jet assist takeoff systems.

2.1.68 System 85 - Fuel cell system

Table 68 System 85 - Fuel cell system

System	Subsystem	Title	Definition
85		**Fuel cell system**	Those units and components using an electrochemical conversion process to produce electricity from a fuel (on the anode side) and an oxidant (on the cathode side). This includes reactants and reaction products supply/exhaust devices, fuel cell stacks, electric power output devices, cooling and/or heating devices and a centralized control and monitoring subsystem.
	-00	General	This section is intended to cover general information, limits and procedures applicable for the complete system not only subsystems. It also includes the system control and indication. It does not include subsystem controls which are covered by each individual subsystem.
	-10	Fuel cell stack	That portion of the fuel cell system achieving electrochemical conversion of fuel and oxidant into electrical energy, thermal energy and exhaust gas. This includes fuel cell housing, fitting, wiring and all devices allowing the connection to other fuel cell subsystems.
	-20	Fuel storage and supply	Those units and components storing and/or delivering fuel to the fuel cell stacks.
	-30	Oxidant storage and supply	Those units and components storing and/or delivering oxygen/air to the fuel cell stacks.
	-40	Thermal management	That portion of the system which is used to cool or heat the fuel cell stacks, the power electronics and accessories. It includes items such as cooler, blower, heating devices, valves, etc.
	-50	Power conditioning	Those units and components used to provide the electrical power in the condition needed by the aircraft network and the fuel cell system itself. It includes converter, contactor, filter, etc.

	-60	Exhaust conditioning	Those units and components necessary to process the exhaust for further use. It includes condenser, dryer, valves, etc.
	-70	Interface	Those units and components used to connect the system to the rest of the aircraft: structure, the environment and other systems. This includes mounts, electrical harness, air intake/ exhaust and drain, etc.

2.1.69 System 86 - Lift system

Table 69 System 86 - Lift system

System	Subsystem	Title	Definition
86		**Lift system**	Those units and components, which together with the primary propulsion system furnish vector able vertical thrust allowing the aircraft to achieve short take-off and vertical landing (STOVL). Also includes those units and components which provide the means for stabilizing the aircraft when in the STOVL mode.
	-00	General	
	-10	Fan	That portion of the system that provides lift for the aircraft when operating in a STOVL flight condition. This includes gearboxes, clutches and accessories.
	-20	Drive shaft	That portion of the system that provides a means of transmitting power from the engine to the STOVL lift system.
	-30	Variable area nozzle	That portion of the system that controls and ducts STOVL fan outlet air to provide aircraft STOVL lift.
	-40	Roll control	That portion of the system that ducts and controls main engine generated air for the control of aircraft roll attitude when in a STOVL flight configuration.

2.1.70 System 90 - Recovery

Table 70 System 90 - Recovery

System	Subsystem	Title	Definition
90		**Recovery**	Those systems, units and components used to recover air vehicles and equipment.
	-00	General	
	-10	Parachute recovery system	That part of the system that uses a parachute and its deployment devices to recover an air vehicle and equipment from flight. Includes items such as main- and drogue parachute container, ejection assembly, initiation assembly, deployment assembly and release assembly.

-20	Impact attenuation system	That part of the system which provides a shock for the air vehicle to absorb shock/attenuation. Includes items such as crushable impact attenuators, air bags, retrorocket landing attenuation systems, initiation assembly, deployment assembly and attenuator container.
-30	Sequencing system	That part of the system that provides the sequencing for the recovery. Includes items such as computer, interfaces, transmitter, electrical signal etc.
-40	Location system	That part of the system which provides information on the location of the aircraft after landing. Includes items such as computer, transmitter, antenna, etc.

2.1.71 System 91 - Air vehicle wiring

Table 71 System 91 - Air vehicle wiring

System	Subsystem	Title	Definition
91		**Air vehicle wiring**	Miscellaneous charts, diagrams and/or lists applicable to more than one system, or to system interfaces, such as wiring charts, spare wire charts, junction boxes charts, disconnect plug charts, conduit and wire routing charts, rigid tube charts, flexible hose charts, system integration diagrams, reusable hose component lists, control cable lists, multi-system consumables lists etc.

2.1.72 System 92 - Radar

Table 72 System 92 - Radar

System	Subsystem	Title	Definition
92		**Radar**	Those units and components which comprise multifunction radar systems used on fighters (generally nose-mounted), on maritime patrol air vehicles, on AWACS-type air vehicles, etc.
	-00	General	
	-10	Frequency generation	That portion of the system which gives the original signals used as references (micro-waves, clock signals, etc).
	-20	Transmission	That portion of the system acting for waves output.
	-30	Reception	That portion of the system which collects electro-magnetic signals, transposes the frequencies of collected signals or generates video-frequencies signals.
	-40	Processing	Computing resources used for signals processing, data processing, radar system management or I/O exchanges of information with other air vehicle systems processing functions.
	-50	Beam control	That portion of the system which points the beam in any direction of space. This device can be based on mechanical or electronic steering.

System	Subsystem	Title	Definition
	-60	Power supply and safety	That portion of the system in charge of the setting of electrical power and all the safety functions concerning the starting phase and the current functioning states (eg, cut-off).
	-70	Conditioning	That portion of the system in charge of cooling and pressurization for the different modules.
	-80	Built-in tests	That portion of the system devoted to failures detection and states reporting. The content of these sections have to be determined in connection with the System 45-92-XX.

2.1.73 System 93 - Surveillance

Table 73 System 93 - Surveillance

System	Subsystem	Title	Definition
93		**Surveillance**	Those units and components which furnish a means of sensing the surrounding environment, and then process, display and record the resulting information.
	-00	General	
	-10	Data processing	That portion of the system that provides computation, switching and storage of signals acquired.
	-20	Data display	That portion of the system that provides the data display of information acquired by sensors.
	-30	Recording	That portion of the system that provides recording of information acquired by sensors.
	-40	Identification	That portion of the system that provides identification of information acquired by sensors.
	-50	Infrared sensors	That portion of the system that uses heat sensing devices such as infra-red scanners, infra-red image and detection to acquire information.
	-60	Laser sensors	That portion of the system that uses laser devices to acquire information for distance measuring, identification, etc.
	-70	Surveillance radar	That portion of the system that uses radar for surveillance or mapping purposes. This includes devices such as antennas, receivers, transmitters, indicators, etc. **Note** System 93-70 is to be used for surveillance oriented radars (eg, weather radar on transport aircraft). For large multifunction radars use System 92.
	-80	Magnetic sensors	That portion of the system that senses magnetic anomalies. This includes devices such as magnetometers, amplifiers, computers, indicators, etc.

	-90	Sonar sensors	That portion of the system that senses objects underwater. This includes devices such as modulators, computers, transducers, indicators, etc.

2.1.74 System 94 - Weapons system

Table 74 System 94 - Weapons system

System	Subsystem	Title	Definition
94		**Weapons system**	Those units and components which furnish a means of acquiring a target and releasing stores.
	-00	General	
	-10	Weapon release	The weapon release system consists of all equipment required to release, fire and/or jettison stores. Includes computers, displays, controls, stores management, etc.
	-20	Available for projects	
	-30	Weapon suspension	The weapon suspension system provides interconnecting equipment to transport and release/fire weapons. Includes multipurpose pylons if used for any weapon mounting role, specialist pylons, ejection racks, launchers, etc.
	-40	Available for projects	
	-50	Gunnery	The gunnery system consists of all guns and equipment necessary to fire guns.
	-60	Available for projects	
	-70	Weapon control	Those units and components which furnish a means of designating and acquiring a target. Includes radar, computers, displays etc, necessary to provide weapon release decision (aiming cues).

2.1.75 System 95 - Crew escape and safety

Table 75 System 95 - Crew escape and safety

System	Subsystem	Title	Definition
95		**Crew escape and safety**	Those units and components which furnish a means of ejecting or jettisoning seats, hatches, canopies, capsules etc, from the airframe also includes safety and survival equipment.
	-00	General	
	-10	Ejection seats	That portion of the system which is used to eject flight crew or passenger seats individually from the airframe.

	-20	Escape hatches/canopy	That portion of the escape system involving hatches and canopies including miniature detonating cord. Does not include the canopy and its actuating mechanisms which are covered in System 56.
	-30	Capsule ejection	That portion of the escape system that provides a protective environment to the flight crew after separation from the airframe.
	-40	Available for projects	
	-50	Global survival kits	That portion of the system that insures flight crew survivability and/or after unplanned separation landing.
	-60	Impact protection and floatation	That portion of the system providing protection to personnel/equipment after impact.
	-70	Capsule flight	That portion of the system used to control attitude and direction of the capsule or container after ejecting or jettisoning from the airframe.

2.1.76 System 96 - Missiles, drones and telemetry

Table 76 System 96 - Missiles, drones and telemetry

System	Subsystem	Title	Definition
96		**Missiles, drones and telemetry**	Those units and components which furnish a means of launching and controlling drones.
	-00	General	
	-10	Surface to surface missiles	That portion of the system which is used for launching and controlling surface to surface missiles.
	-20	Surface to air missiles	That portion of the system which is used for launching and controlling surface to air missiles.
	-30	Drones	That portion of the system which is used for launching and controlling drones.
	-40	Telemetry	That portion of the system which is used for telemetry, for applications other than missile, drone or decoy usage.

2.1.77 System 97 - Image recording

Table 77 System 97 - Image recording

System	Subsystem	Title	Definition
97		**Image recording**	Those units and components which furnish a means of recording events on film, video, disc or tape, etc. Does not cover recording systems which are part of any other system or Subsystem.
	-00	General	
	-10	Strike camera	That portion of the system which is used for recording the results of an air strike.
	-20	Bomb bay system camera	That portion of the system which is used for recording instruments and the dropping of bombs.
	-30	Fire control camera system	That portion of the system which is used for recording rocket or gunfire.
	-40	Instrumentation camera system	That portion of the system which is used for recording meters, dials, CRT display, etc.
	-50	Range camera system	That portion of the system which is used for range camera. Includes installation such as forward and oblique camera systems.
	-60	Reconnaissance camera system	That portion of the system which is used for reconnaissance.
	-70	Image recorder	That portion of the system which is used for storing the images on disc, tape (such as VCR), etc.

2.1.78 System 98 - Meteorological and atmospheric research

Table 78 System 98 - Meteorological and atmospheric research

System	Subsystem	Title	Definition
98		**Meteorological and atmospheric research**	Those units and components which furnish a means of providing and recording measurement of natural or man-made atmospheric, gravitation and magnetic phenomena.
	-00	General	
	-10	Weather	That portion of the system which is used to measure and record moisture, temperature, cloudiness, wind, etc.
	-20	Clear air turbulence	That portion of the system which is used to detect, measure and record clear air turbulence.
	-30	Pollutants	That portion of the system which is used to detect, measure and record contaminated particles.

	-40	Magnetic/gravitational	That portion of the system which is used to detect measure and record the earth's magnetic and gravitational force.

2.1.79 System 99 - Electronic warfare

Table 79 System 99 - Electronic warfare

System	Subsystem	Title	Definition
99		**Electronic warfare**	Those units and components which furnish a means of detecting, analyzing, jamming, or nullifying the effectiveness of defensive detection devices and communication links (tactical or not).
	-00	General	
	-10	Active, electro-magnetic	That portion of the system operating in the electro-magnetic range of 1 Hz to 100 GHz. This subsystem can have the capability of receiving, analyzing, transmitting, etc.
	-20	Available for projects	
	-30	Passive, electro-magnetic	That portion of the system operating in the electro-magnetic field that has no active or radiating elements (eg, chaff).
	-40	Available for projects	
	-50	Elint (Electronic intelligence)	That portion of the system tasked with the gathering of electronic information and can include receivers, processors/analyzers and recorders.
	-60	Available for projects	
	-70	Infrared (IR)	That portion of the system operating in the IR range/field and can have the capability of receiving, analyzing and transmitting.
	-80	Laser	That portion of the system operating in the laser range/field and can have the capability of receiving, analyzing and transmitting.

Chapter 8.2.6

Maintained SNS - Tactical missiles

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Table 1 References

Chap No./Document No.	Title
Chap 1.5	Request for change
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1 General

This is an SNS, at the top level, for tactical missiles. It is used in this specification as a method to describe the functional and/or physical breakdown of items of the Product. Its position in the data module code and structure is defined in Chap 4.3.3. This is an SNS that will be maintained by the S1000D Steering Committee and is subject to normal CPF action in accordance with Chap 1.5.

Further breakdown will be required for its full use on projects and this breakdown must be applied in accordance with the design of the tactical missile system in question and the information and publication sets to be used.

2 Tactical missile SNS

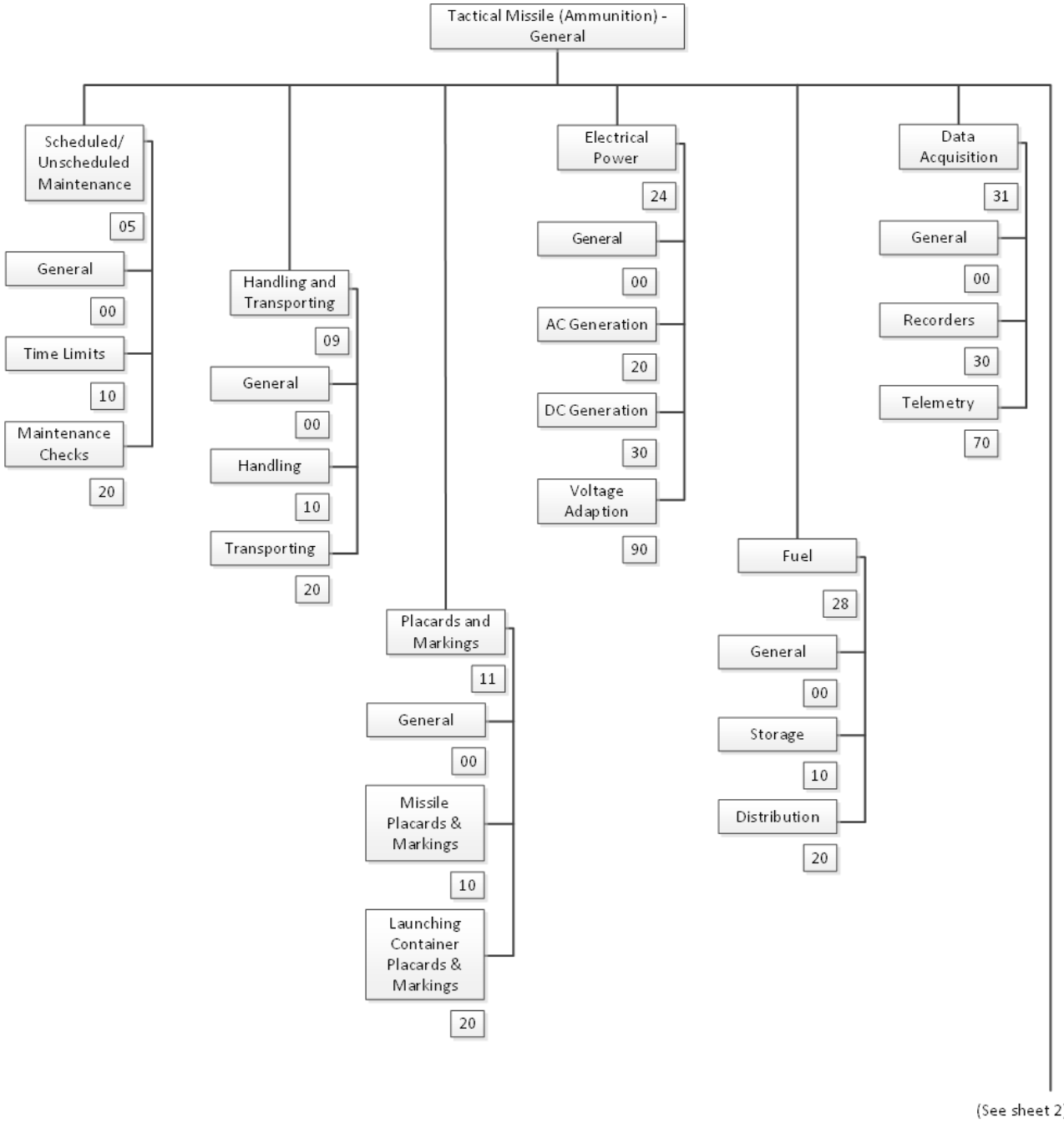
The coding and definitions for the tactical missile SNS is appropriate for common and system level information for all Products and is described in Table 2. However, projects can decide not to use this generic SNS.

The basic structure of this SNS uses an alphanumeric breakdown, which begins with numbers and progresses onto alpha characters where required. This top level breakdown is as shown in Fig 1 and listed in Table 2.

2.1 Definitions

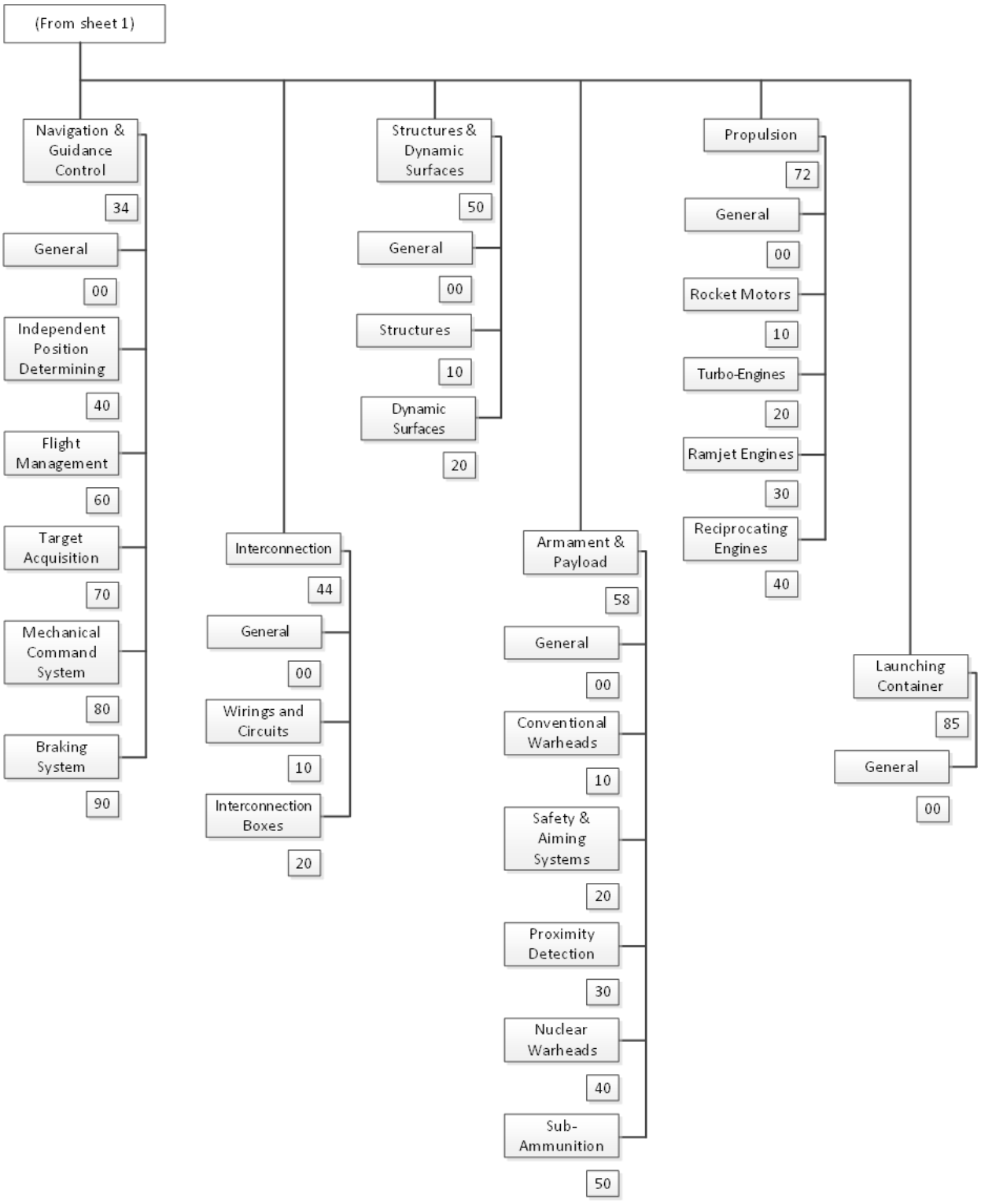
The following definitions are used:

- **Tactical missile**: A propelled and guided air-vehicle, used for a given point target mission, with the aim of destroying or damaging a determined target. A tactical missile can be launched from an aircraft, a ship or any ground launching system.
- **Tactical ammunition**: A tactical missile in its launching container.



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Fig 1 Top level breakdown for a tactical missile system (Sheet 1 of 2)



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Fig 1 Top level breakdown for a tactical missile system (Sheet 2 of 2)

2.2 System breakdown

2.2.1 Main systems

This tactical missile SNS is divided into 13 main systems.

Table 2 Top level breakdown for a tactical missile system

System	Title
00	Tactical missile (or ammunition) general
01	Not available for projects
02	Not available for projects
03	Not available for projects
04	Not available for projects
05	Scheduled/unscheduled maintenance
06	Not available for projects
07	Not available for projects
08	Not available for projects
09	Handling and transporting
10	Not available for projects
11	Placards and markings
12 thru 23	Not available for projects
24	Electrical power
25	Not available for projects
26	Not available for projects
27	Not available for projects
28	Fuel
29	Not available for projects
30	Not available for projects
31	Data acquisition
32	Not available for projects
33	Not available for projects
34	Navigation guidance control
35 thru 43	Not available for projects
44	Interconnection
45 thru 49	Not available for projects
50	Structures and dynamics surfaces

System	Title
51 thru 57	Not available for projects
58	Armament and payload
59 thru 71	Not available for projects
72	Propulsion
73 thru 84	Not available for projects
85	Launching container
86 thru 99	Not available for projects

2.2.2 System 00 - Tactical missile (or ammunition), General

Table 3 System 00 - Tactical missile (or ammunition), General

System	Subsystem	Title	Definition
00		**Tactical missile (or ammunition), General**	General information for the complete tactical missile (or ammunition) including description, main dimensions, etc.
			Instructions and procedures for tactical missile (or ammunition) safety.
			Information on the technical publication required to support the tactical missile (or ammunition).
	-00	Tactical missile (or ammunition) description	General description and dimensions with illustrations of tactical missile (or ammunition) including associated missiles such as training missile, dummy missile, etc.
	-10	Available for projects	
	-20	Tactical missile (or ammunition) safety	Those instructions and procedures necessary to make safe the tactical missile (or ammunition) for storage, preparation and maintenance action.
			General information on tactical missile (or ammunition) safety such as risk divisions, dangerous components, hazard zones, etc.
			Those instructions necessary for the use or the operation of protective or safety devices such as: protective covers, plugs, safety pins, safety flags, etc.

System	Subsystem	Title	Definition
	-30	Available for projects	
	-40	Technical publication	Information on the technical publication required to support the tactical missile (or ammunition) such as the Lists of Applicable Publications, Publication Guide, the coding system of technical publications, instructions for handling and updating technical publications.

2.2.3 System 05 - Scheduled/unscheduled maintenance

Table 4 System 05 - Scheduled/unscheduled maintenance

System	Subsystem	Title	Definition
05		**Scheduled/unscheduled maintenance**	The recommended time limits for inspection, maintenance checks and overhaul. General information on maintenance policy of the tactical missile (or ammunition).
	-00	General	
	-10	Time limits	The recommended life limits in utilization and/or in storage of the tactical missile (or ammunition) equipment or components subject to wear or time limitation. The recommended maintenance periodicities according to the storage and/or the utilization conditions of the tactical missile (or ammunition).
	-20	Maintenance checks	The recommended maintenance checks and inspections of the tactical missile (or ammunition) according to: - the storage and/or utilization conditions of the tactical missile (or ammunition) - the maintenance level or following: - unusual events - exposure to unusual conditions

2.2.4 System 09 - Handling and transporting

Table 5 System 09 - Handling and transporting

System	Subsystem	Title	Definition
09		**Handling and transporting**	Includes all the necessary procedures for handling the tactical missile (or ammunition) with illustrations showing hoisting and supporting points.
	-00	General	

System	Subsystem	Title	Definition
	-10	Handling	Those procedures for handling the tactical missile (or ammunition) in its storage and transportation container including information on the equipment required such as forklift truck, hoisting system, etc.
	-20	Transporting	Information on transporting the tactical missile (or ammunition) in its storage and transportation container by air/road/rail/sea, with reference to safety information covered in the first chapter.

2.2.5 System 11 - Placards and markings

Table 6 System 11 - Placards and markings

System	Subsystem	Title	Definition
11		**Placards and markings**	All placards, labels and markings of the tactical missile, the storage and transportation container, and the launching container in the case of tactical ammunition. Includes illustrations showing the place and the meaning of each placard, label or marking.
	-00	General	
	-10	Missile placards and markings	Those placards, labels and markings of the tactical missile, required for ground servicing, identification, handling, cautions, warnings, etc. Those placards, labels and markings of the storage and transportation container, required for storage identification, handling, cautions, warnings, etc, of the tactical missile in its container.
	-20	Launching container placards and markings	In the case of tactical ammunition, those placards, labels and markings required for ground servicing, identification, handling, cautions, warnings, etc.

2.2.6 System 24 - Electrical power

Table 7 System 24 - Electrical power

System	Subsystem	Title	Definition
24		**Electrical power**	All the electrical power units which generate, control and adapt DC and/or AC electrical power for other systems of the tactical missile. Does not include those electrical units integrated in other systems of the tactical missile.
	-00	General	
	-10	Available for projects	

System	Subsystem	Title	Definition
	-20	AC generation	Electrical units which generate and control AC electrical power such as alternators etc.
	-30	DC generation	Electrical units which generate and control DC electrical power such as batteries, primable batteries, thermal batteries, etc.
	-40 thru -80	Available for projects	
	-90	Voltage adaptation	Those units which adapt and transform electrical power such as inverter, voltage generator, transformer, etc.

2.2.7 System 28 - Fuel

Table 8 System 28 - Fuel

System	Subsystem	Title	Definition
28		**Fuel**	All units and components which store and deliver fuel to engines.
	-00	General	
	-10	Storage	Units and components which store fuel such as: tank sealing, bladder type cells, venting system, filling circuit, etc.
	-20	Distribution	Units and components which distribute fuel to engine combustion chamber such as: plumbing, pumps, temperature and pressure regulators, valves, filters, nozzles, etc.

2.2.8 System 31 - Data acquisition

Table 9 System 31 - Data acquisition

System	Subsystem	Title	Definition
31		**Data acquisition**	All units and components which furnish the means of measuring, recording and transmitting the functioning data of the tactical missile.
	-00	General	
	-10 thru -20	Available for projects	
	-30	Recorders	In the case of airborne training and acquisition missile, units and components which record the functioning data of seeker during target detection. Could include other types of recorder if necessary.
	-40 thru -60	Available for projects	

System	Subsystem	Title	Definition
	-70	Telemetry	In the case of drill missile for firing campaign, units and components which measure and transmit to a ground tracking station, the functioning data sequences of the tactical missile during its free flight.

2.2.9 System 34 - Navigation guidance control

Table 10 System 34 - Navigation guidance control

System	Subsystem	Title	Definition
34		**Navigation guidance control**	All the units and components which furnish the means of controlling the trajectory of the tactical missile in correlation with target data in order to steer the missile towards its target. Includes units which determine and control position, direction, attitude and altitude of the tactical missile.
	-00	General	
	-10 thru -30	Available for projects	
	-40	Independent position determining	Mechanical and electronic units equipped with sensors able to determine position, direction, attitude and altitude of the tactical missile. Includes all types of sensors and associated electronic boxes such as: inertial guidance systems (inertial guidance units, accelerometers, gyroscopes, and gyro meters), altimeters, etc. Includes also global positioning systems (GPS).
	-50	Available for projects	
	-60	Flight management system	Units which combine guidance and navigational data, to compute and/or manage the geographical position of the missile, to determine its theoretical flight and to control the missile trajectory (direction and vertical references, computed or introduced trajectory parameters, maneuvering orders, etc). Includes computers, sequencers, order generators, etc.
	-70	Target acquisition	Units and components which furnish communication means between the missile and the firing control system and/or which participate in target acquisition (detection, location and tracking). Includes radars, seekers, receivers, transmitters, responders, laser offset detectors, wire guided systems, transcoders, etc.
	-80	Mechanical command system	Units and components which transform signals into mechanical actions and furnish the means to command the missile trajectory. Includes all types of actuators (without control surfaces), thrust deflectors, jet interceptors, thrust vector control systems, hydraulic and/or pneumatic control systems, etc. Not including thrust vectoring nozzles which are covered in the propulsion chapter.

System	Subsystem	Title	Definition
	-90	Braking system	Units and components used in some tactical missiles which furnish the means of temporary braking the missile during its free flight.

2.2.10 System 44 - Interconnections

Table 11 System 44 - Interconnections

System	Subsystem	Title	Definition
44		**Interconnections**	All the units and components which establish electrical connections (LF, HF, VHF, etc) and cryogenic connections (between units of equipment of the tactical missile). Includes also tactical missile external interfaces.
	-00	General	
	-10	Wirings and circuits	Units and components making electrical connections such as: wires, cables, ribbon cable, ground braid, optic fiber, coax, wave guide, etc. Units and components used to convey very high pressure gas to cool the infrared detection cell of infrared seeker such as: tube, pipe, pressure relief valve, pressure shear valve, etc.
	-20	Interconnection boxes	Units and components that centralize and distribute electrical and cryogenic systems.

2.2.11 System 50 - Structures and dynamic surfaces

Table 12 System 50 - Structures and dynamic surfaces

System	Subsystem	Title	Definition
50		**Structures and dynamic surfaces**	All the structural units and associated components which constitute the body of the tactical missile. All the fixed and mobile dynamic surfaces linked to the body of the tactical missile and allowing its motion in the air.
	-00	General	
	-10	Structures	Skins, tubes, nosecone, tail cone, doors, panels, frames, belts, fastenings, stiffeners, attachment fittings, fairing, air inlet, etc. Not including structural components belonging to structural equipment such as propulsion unit, seeker, etc, which are covered in the corresponding systems.
	-20	Dynamic surfaces	Wings, fins, control surfaces, etc. In case of retractable or folding wings or fins, includes the unfolding or spreading system.

2.2.12 System 58 - Armament and payload

Table 13 System 58 - Armament and payload

System	Subsystem	Title	Definition
58		**Armament and payload**	All units and components belonging to the safety, arming, and initiation chain of the warhead of the tactical missile. Includes also autonomous sub-ammunition and other types of autonomous units such as infrared video camera, etc.
	-00	General	
	-10	Conventional warheads and explosive trains	Units and components which contain and initiate high explosive material. Includes all types of warhead, detonators, boosters, etc.
	-20	Safety and arming systems	Mechanical and electric units used for the safety, arming and initiation of the warhead. Includes safety and arming mechanism, electric initiator, safety plug, etc.
	-30	Proximity detection and impact detection	Units such as proximity fuse which initiate the firing of the warhead explosive train after infrared or radio frequency, etc, detection in close proximity of the target. Devices which command the firing of the warhead explosive train after impact against the target.
	-40	Nuclear warheads and explosive trains	Units and components which contain and initiate high explosive nuclear material.
	-50	Sub-ammunition	Autonomous sub-ammunition equipped, following the types, with warhead, rocket motor, guidance system, etc, and ejected by some tactical missiles in the terminal flight phase.

2.2.13 System 72 - Propulsion

Table 14 System 72 - Propulsion

System	Subsystem	Title	Definition
72		**Propulsion**	All units and components used for the propulsion of the tactical missile including vector nozzles.
	-00	General	
	-10	Rocket motors	Non-air breathing reaction propulsion motors that consist of a combustion chamber, exhaust nozzles and a solid propellant charge from which hot gases are generated by combustion and expanded through the nozzles. Includes main rocket motors, acceleration rocket motors, ejection motors and their components.
	-20	Turbojet engines	Turbine engines that consist of compressor, diffuser, combustion chamber, turbine and nozzle, from which hot gases are generated by combustion of fuel-air mixture and expanded through the nozzle. Includes the engine and its components.

System	Subsystem	Title	Definition
	-30	Ramjet engines	Engines that consist of injector, combustion chamber and nozzle, in which the air compress by kinetic effect and from which hot gases are generated by combustion of fuel-air mixture and expanded through the nozzle. Includes the engine and its components.
	-40	Reciprocating engines	Engine in which fuel-air mixture is compressed by a piston within a cylinder and ignited to transform linear motion in circular motion to drive a propeller. Includes the engine and its components.

2.2.14 System 85 - Launching container

Table 15 System 85 - Launching container

System	Subsystem	Title	Definition
85		**Launching container**	For tactical ammunition, system which includes all the mechanical, electrical and pyrotechnical, etc, units and components used to protect, to maintain, and to launch the tactical missile.
	-00	General	

Chapter 8.2.7

Maintained SNS - General surface vehicles

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Chap No./Document No.	Title
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1 General

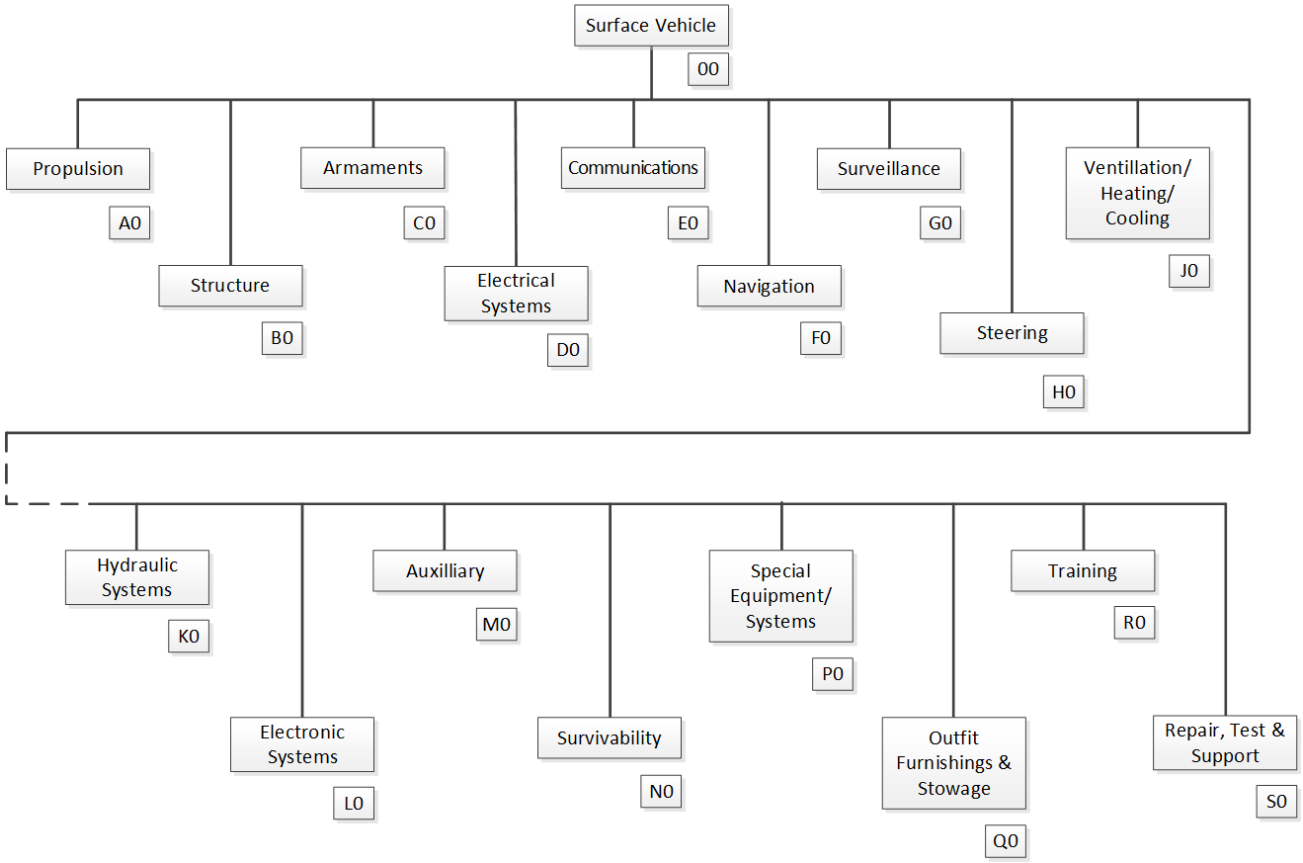
The SNS is used in this specification as a method to describe the functional and/or physical breakdown of items of the Product. Its position in the data module code and structure is defined in Chap 4.3.3. This is an SNS that will be maintained by the S1000D Steering Committee and is subject to normal CPF action in accordance with Chap 1.5.

This chapter gives the definitions which relate to systems and subsystems, for general surface vehicles. For details on how to use this SNS within the data module code, refer to Chap 4.3.3.

2 General surface vehicles SNS

The coding and definitions for the general surface vehicles SNS is appropriate for common and system level information for all Products and is described in Table 2. However, projects can decide not to use this generic SNS.

The basic structure of this SNS uses an alphanumeric breakdown. This top level breakdown is as shown in Fig 1 and listed in Table 2.



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Fig 1 Top level breakdown of a general surface vehicle

2.1 System breakdown

2.1.1 Main systems

This surface vehicle SNS is divided into the 17 main systems shown in Table 2.

Table 2 Main systems

System	Title
A0	Propulsion
B0	Structure
C0	Armaments
D0	Electrical systems
E0	Communications
F0	Navigation
G0	Surveillance
H0	Steering
J0	Ventilation/heating/cooling
K0	Hydraulic systems
L0	Electronic system
M0	Auxiliary
N0	Survivability
P0	Special equipment/systems
Q0	Outfit, furnishings and stowage
R0	Training
S0	Repair, test and support

2.1.2 System A - Propulsion

Table 3 System A0 - Propulsion, General

System	Subsystem	Title	Definition
A0		**Propulsion, General**	
	-00	General	A system or equipment for producing and delivering power.

Table 4 System A1 - Power pack, General

System	Subsystem	Title	Definition
A1		**Power pack - General**	

System	Subsystem	Title	Definition
	-00	General	The power pack element refers to a self-contained means for generating and delivering power. It includes such systems as the main engine, transmission and interfaces. Subsystems can include such items as cooling, fuel, air and exhaust, lubrication, auxiliaries and electrical.
	-10	Main engine	Refers to a diesel, petrol, electric, etc, fuelled means for generating power and a means whereby this power can be delivered to the transmission. It can include, for example, engine mounted flywheel and clutch assemblies, cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-20	Transmission	Refers to a system which transmits power from the engine to the driving member and can include torque converter and gearbox. It can also include flywheel and clutch assemblies, steering and brakes if they are integral to the transmission. Also included are differentials and power takeoffs.
	-30	Power pack Interfaces	Refers to the mounting assemblies connecting the main engine and transmission, together with associated ancillaries, including such systems as cooling, fuel, air and exhaust, lubrication, auxiliary and electrical. It can also include transmission items.

Table 5 System A2 - Power unit, General

System	Subsystem	Title	Definition
A2		**Power unit, General**	
	-00	General	The power unit element refers to a discrete means for generating and delivering power to the transmission. It can include, for example, flywheel and clutch assemblies.
	-10	Engine	Refers to a diesel, petrol, electric, etc, fuelled means for generating power and a means whereby this power can be delivered to the transmission. It can include, for example, flywheel and clutch assemblies and engine mounted cooling, fuel, air and exhaust, lubrication, auxiliary and electrical systems.
	-20	Cooling system	Refers to systems designed to maintain the correct operating temperatures for the power unit. It includes, for example, cooling air ducting, coolant pumps, liquid filled radiators, intercoolers, fans and associated heat exchange equipment.
	-30	Fuel systems	Refers to a system or equipment designed to deliver fuel to the power unit. It includes, for example, fuel storage facilities, pumps, filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors.

System	Subsystem	Title	Definition
	-40	Air and exhaust systems	Refers to a system which supplies air to, or collects and removes exhaust gasses from the engine. It includes, for example, all pipes, ducting, filters, couplings, gaskets, turbochargers/superchargers, silencers and catalytic converters.
	-50	Lubrication systems	Refers to a system that provides lubrication to the power unit and any external components related to the power unit lubrication system. It includes, for example, delivery and return pipes, pumps, filters, intercoolers and separately mounted heat exchangers.
	-60	Electrical	Refers to a system that provides or uses electrical power associated with the power unit. It includes, for example, starter motors, alternators and generators directly mounted on the power unit. It also includes, for example, ignition system components including spark plugs, distributor, coils and leads.
	-70	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the power unit. It includes, for example, engine mountings.
	-80	Hydraulic	Refers to a system that provides or uses hydraulic power associated with the power unit. It includes, for example, hydraulic pumps, valves, pipes, and tanks. It also includes any external components related to the power unit hydraulic systems.

Table 6 System A3 - Engine cooling system, General

System	Subsystem	Title	Definition
A3		**Engine cooling system, General**	
	-00	General	This system includes cooling air ducting, coolant pumps, liquid filled radiators, fans and associated heat exchange equipment mounted externally to the power unit/pack.
	-10	Fluid	Refers to fluid (water/oil) filled coolant systems. It includes pumps, radiators, fans, pipes and associated heat exchange equipment.
	-20	Air	Refers to cooling air ducting, fans and associated heat exchange equipment.

Table 7 System A4 - Fuel systems, General

System	Subsystem	Title	Definition
A4		**Fuel systems, General**	

System	Subsystem	Title	Definition
	-00	General	Equipment to provide fuel storage facilities, filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors mounted externally to the power unit/pack.
	-10	Storage	Refers to the portion of the system which stores fuel. It includes, for example, tanks, filler necks, seals, valves, vents and drainage.
	-20	Distribution	Refers to the portion of the system which is used to distribute fuel from the storage system. It includes, for example, filters, restrictors, valves, controls and pipes.
	-30	Priming	Refers to the portion of the system which is used to pressurize/pump the fuel. It includes, for example, lift pumps, pressurization pumps, and cold starting systems.
	-40	Fuel injection	Refers to the portion of the system which delivers fuel. It includes, for example, FIP, fuel injectors, fuel pump metering and carburetors.
	-50	Indicating	Refers to the portion of the system which is used to monitor the condition of fuel (quantity, temperature and pressure). It includes, for example, transmitters, indicators, wiring and pressure warning systems.
	-60	Venting and de-fuelling	Refers to the portion of the system which is used to vent fumes from the fuel system and to provide a means for removing/dumping unwanted fuel.

Table 8 System A5 - Air and exhaust systems, General

System	Subsystem	Title	Definition
A5		**Air and exhaust systems, General**	
	-00	General	Refers to a system which supplies and filters air to the engine and collects and removes exhaust gases from the engine. It includes, for example, all filters, pipes, couplings, silencers, catalytic converters and ducting mounted externally to the power unit/pack.
	-10	Air system	Refers to a system which supplies and filters air to the engine. It includes, for example, pre-filters, main air filters, and associated ducting. It can also include air cooling/heating systems and intercoolers.
	-20	Collector	Refers to that portion of the system which collects exhaust gases from the engine manifold. It includes pipes, joints, gaskets, etc.
	-30	Noise suppression	Refers to that portion of the system which reduces noise produced by the engine exhaust gases. It includes silencers, baffles, shields, etc.

System	Subsystem	Title	Definition
	-40	Emission control	Refers to that portion of the system which is designed to reduce or eliminate engine exhaust gas emissions. It includes, for example, catalytic converters and tail pipes.

Table 9 System A6 - Lubrication systems, General

System	Subsystem	Title	Definition
A6		**Lubrication systems, General**	
	-00	General	This system includes lubrication storage facilities that are external to the engine/power pack. It includes delivery and return pipes, pumps, filters and heat exchangers mounted externally to the power unit/pack.
	-10	Storage	Refers to the part of the system used for storage of engine and/or transmission lubricating oil. It includes tanks, filling systems, sumps, drains, etc.
	-20	Distribution	Refers to the part of the system used for distribution of lubricating oil to and from the engine and/or transmission. It includes pipes, pumps, filters, valves, etc.
	-30	Indicating	Refers to the part of the system used to monitor the condition of engine and/or transmission lubricating oil (quantity, temperature and pressure). It includes transmitters, indicators, wiring, pressure warning systems, etc.

Table 10 System A7 - Transmission, General

System	Subsystem	Title	Definition
A7		**Transmission, General**	
	-00	General	Refers to a means to transmit power from the engine to the driving member and can include clutch, torque converter, and gearbox. It can also include steering and brakes if they are integral to the transmission. Also included are differentials and power takeoffs.
	-10	Gearbox	Refers to a means for varying the speed/torque delivered from the power unit to the driving member. It can include the steering control and brake assemblies.
	-20	Steering control assembly	Refers to a discrete means for varying the drive applied, through the transmission system, to each of the vehicle's driving members (eg, tracked vehicles).
	-30	Brake assembly	Refers to a discrete means for applying braking forces through the vehicle transmission (eg, tracked vehicles).

System	Subsystem	Title	Definition
	-40	Auxiliary drive/ power takeoff	Refers to an auxiliary means of obtaining an output from the engine. It includes transfer gearboxes which can also include a slip differential.
	-50	Clutch	Refers to a means for engaging/disengaging the transmission to/from the engine, when fitted as a separate assembly (for clutches fitted to a flywheel, see A21000).
	-60	Drive shaft	Refers to the means for connecting power output from the engine to the driving member. It includes muff couplings, propeller shafts, universal joints and final drives.
	-70	Torque converter	Refers to a means for varying the torque delivered from the engine to the driving member.
	-80	Differential	Refers to a means for changing the direction of rotation delivered from the engine to the driving member or wheels. For wheeled vehicles, it includes the driving axles, half shafts, hubs, etc.

Table 11 System A8 - Automotive/remote piloting and digital control systems, General

System	Subsystem	Title	Definition
A8		**Automotive/ remote piloting and digital control systems, General**	
	-00	General	The automotive and remote piloting and Digital Automotive Control System (DACS) element refers to that equipment (hardware/software) installed in the vehicle which is used to plan and control vehicle speed and direction either autonomously or via tele-operation. This includes equipment which senses, processes and displays imagery data such as stereo vision systems, laser scanners, multiple sensor fusion algorithms and processors, image enhancement algorithms and processors etc. This includes, for example, equipment which performs intelligence analysis and planning functions such as automated route planners, image understanding algorithms and processors, computer aided driving algorithms, DACS and processors.
	-10	Control	Refers to processing and control elements. It includes central processors, analogue/digital converters, associated software, memory boards, servo units, actuators, associated wiring, etc.
	-20	Sensors	Refers to sensors which are specifically associated with providing inputs to an automotive/remote piloting system or DACS.
	-30	Indicators	Refers to the part of the system used to indicate/monitor an automotive/remote piloting system or DACS. It includes indicators, wiring, etc.

Table 12 System A9 - Controls (drivers), General

System	Subsystem	Title	Definition
A9		**Controls (drivers), General**	
	-00	General	Given in this element are the controls required to start, stop, steer and generally control the vehicle commensurate with the mobility role of the equipment. It includes, for example, on-board diagnostic systems.
	-10	Foot controls	Refers to the foot-operated controls to start, stop, steer and generally control the vehicle. It includes, for example, pedal assemblies (clutch, brake, accelerator, etc), associated linkages, cables, hydraulic/pneumatic connections, master and slave cylinders, brake shoes and pads and disks and drums.
	-20	Hand controls	Refers to the hand-operated controls to start, stop, steer and generally control the vehicle. It includes, for example, stop/start, steering (wheel, tiller, etc) and braking controls.
	-30	Ancillary controls	Refers to ancillary controls and associated systems. It includes, for example, such items as screen wash equipment, windscreen wipers and adjustable wing mirrors.
	-40	Propulsion control systems	Refers to systems which monitor and/or control engine speed and performance.
	-50	Instrumentation	Refers to systems (hardware/software) which monitor/report on the operation of vehicle systems. It includes, for example, the drivers instrumentation panel, warning lights and condition monitoring systems

2.1.3 System B - Structure

Table 13 System B0 - Structure, General

System	Subsystem	Title	Definition
B0		**Structure, General**	
	-00	General	Framework and/or basic structural housing for a system, including load bearing components.

Table 14 System B1 - Hull/frame, General

System	Subsystem	Title	Definition
B1		**Hull/frame, General**	

System	Subsystem	Title	Definition
	-00	General	This element refers to the vehicles primary load bearing component which provides the structural integrity to withstand the operational loading stresses generated while traversing various terrain profiles. This element could be a simple wheeled vehicle frame or a more complicated combat vehicle hull which satisfies not only the structural requirements but also provides armor protection. It includes all structural subassemblies and appendages which attach directly to the primary structure. This element, for example, includes towing and lifting fittings, bumpers, hatches and grilles. It also includes provision to accommodate other subsystems such as mountings for suspension, weapons, turret, track body, cab, special equipment, loads etc.
	-10	Internal mountings	Refers to internal fitments mounted on the hull/frame. It includes brackets, stud welding, floors and insulation panels.
	-20	External mountings	Refers to the chassis and external fitments mounted on the hull/frame. It includes brackets, stud welding, steps, bumpers, mud-guards, windows, etc.
	-30	Doors/hatches	Refers to loading/entry hatches and doors in, or directly mounted on, the hull/frame assembly. It includes shell loading doors, driver and passenger doors, hatches, locks, handles, drivers/operators hoods, cowls and windshields, etc.
	-40	Seats	Refers to seating which is directly mounted on the hull/frame.
	-50	Drinking water tank	Refers to a system designed to provide drinking water for the driver and crew, which is directly mounted on the hull/frame. It includes tanks, filler necks, filters, pipes, seals, valves, vents, drainage, etc.
	-60	Access cover plates	Refers to access cover plates directly mounted on the hull/frame. It includes, for example, guards, plugs, drain/inspection covers. It can also include deck area assemblies.
	-70	Gun crutch/ depression rails	Refers to gun crutch and depression rails directly mounted on the hull/frame.
	-80	Skirting plates/ brackets/splash plates	Refers to skirting plates, brackets and splash plates directly mounted on the hull/frame. It includes the plates and associated fittings, brackets, towing attachments, etc.

Table 15 System B2 - Body/cab, General

System	Subsystem	Title	Definition
B2		**Body/cab, General**	
	-00	General	The body/cab elements refer to the major components to be mated to a chassis or frame to provide a complete vehicle having a defined mission capability. This element includes accommodation for personnel, cargo, and such subsystems as need to be placed in proximity of the operators.

System	Subsystem	Title	Definition
	-10	Internal mountings	Refers to internal fitments mounted on the body/cab. It includes panels, brackets, clips, fascia, instrument panels, stud welding, internal windows, etc.
	-20	External mountings	Refers to external fitments mounted on the body/cab. It includes the external cab assembly, panels, brackets, stud welding, steps, windows, cab tilt and locking mechanism, etc.
	-30	Doors/hatches	Refers to loading/entry hatches and doors in, or directly mounted on, the body/cab. It includes loading doors, driver and passenger doors, hatches, locks, handles, etc.
	-40	Seats	Refers to seating and associated fittings which are directly mounted on the body/cab. It includes, for example, seat belts and harnesses.
	-50	Drinking water tank	Refers to a system designed to provide drinking water for the driver and crew, which is directly mounted on the body/cab. It includes tanks, filler necks, filters, pipes, seals, valves, vents, drainage, etc.
	-60	Access panels	Refers to access panels directly mounted on the body/cab.
	-70	Load bay	Refers to load (or passenger) carrying areas in the body/cab and any soft/hard top covering, supports, etc.
	-80	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the body or cab.

Table 16 System B3 - Suspension/track/wheels, General

System	Subsystem	Title	Definition
B3		**Suspension/track/ wheels, General**	
	-00	General	This element refers to the means for generating tractive effort, thrust and lift, generally at or in proximity to the earth's surface and adapting the vehicle to the irregularities of the surface. It includes, for example, wheels, tracks and steering gears for traction and control functions. Also, it includes springs, shock absorbers, skirts and other suspension members such as track adjusting mechanisms. It does not include specific steering mechanisms.
	-10	Suspension unit	Refers to the means for adapting the vehicle to irregularities of the surface. It includes hydrogas units, shock absorbers, leaf and coil springs, pneumatic suspension units, etc. Also included is the lift mechanism, skirts, etc, for hovercraft.
	-20	Road wheel hub assembly	Refers to a means for distributing the nominal ground pressure of the vehicle. On wheeled vehicles, it includes wheels that transfer tractive effort to the surface and rolling wheels. It includes road wheels, hub assemblies, tires, valves, inner-tubes, etc.

System	Subsystem	Title	Definition
	-30	Sprocket wheel assembly	Refers to the sprocket drive wheels which transfer tractive effort to the track.
	-40	Track assembly	Refers to the track and associated linkages.
	-50	Idler wheels	Refers to the feed/guide mechanism(s) associated with track laying. It includes idler wheels and track tensioners.
	-60	Roller assembly	Refers to the track roller guide assemblies.
	-70	Axle	Refers to non-driving axles not covered under the transmission system. It includes axle arms, links, bearings, etc.

Table 17 System B4 - Turret assembly, General

System	Subsystem	Title	Definition
B4		**Turret assembly, General**	
	-00	General	The turret assembly refers to the structures and equipment installation required to provide the fighting compartment element of combat vehicles. This element includes turret armor, EMC shielding, turret rings, slip rings, attachments and appendages such as latches and cupolas, and accommodation for personnel, weapons and C^3I.
	-10	Internal mountings	Refers to internal fitments mounted in the turret. It includes drinking water installations, periscope mountings, panels, brackets, clips, stud welding, etc.
	-20	External mountings	Refers to external fitments mounted on the turret. It includes brush deflector assemblies, cooler boxes, gun covers, splash curtains, panels, brackets, stud welding, etc.
	-30	Hatches	Refers to loading/entry hatches in, or directly mounted on, the turret. It includes loading hatches, crew hatches and associated locks, handles, fittings, etc. It does not include cupolas.
	-40	Seats	Refers to seating which is directly mounted in the turret.
	-50	Ring assembly	Refers to a circular track and roller/ball-race assembly designed to facilitate turret rotation.
	-60	Cupola	Refers to a roof aperture and domed hatch assembly, primarily for observation purposes. It can be capable of rotation, and can also provide access for entry/exit.
	-70	Elevating/ traversing gearbox	Refers to elevating/traversing gearboxes mounted on the turret wall.
	-80	Turntable assembly	Refers to the turret turntable assembly. It includes drive and roller assemblies, RBJ mountings, etc.

System	Subsystem	Title	Definition
	-90	Ancillary	Refers to ancillary controls, items and associated systems in, or directly mounted on, the turret. It includes such items as wash/wipe equipment, turret and elevation locks, position indicators and adjustable mirrors, etc.

2.1.4 System C - Armaments

Table 18 System C0 - Armaments, General

System	Subsystem	Title	Definition
C0		**Armaments, General**	
	-00	General	A defensive or offensive system or equipment.

Table 19 System C1 - Gun control systems, General

System	Subsystem	Title	Definition
C1		**Gun control systems, General**	
	-00	General	The gun control element refers to that equipment (hardware/software) installed in the vehicle which provides intelligence necessary to power elevate and traverse the weapons systems and also to control via stabilization systems, and turret and gun drives, including gun position indicators and sensors.
	-10	Installation	Refers to the Gun Control Equipment (GCE) installation.
	-20	Control panel	Refers to control panels associated with FV GCE.
	-30	Power supply	Refers to power supply units associated with FV GCE.
	-40	Switch units	Refers to switch units associated with FV GCE. It includes trimming units, fire control switches, etc.
	-50	Gun controller	Refers to control systems associated with GCE. It includes controls for the gun, motor generators, metadynes, amplidynes, magnicons, and power amplifiers.
	-60	Power motors	Refers to gearbox drive motors, associated with GCE. It includes the power, elevation and traverse drive motors.
	-70	Gyroscope assembly	Refers to gyroscope assemblies associated with GCE.
	-80	Ancillary	Refers to ancillary GCE controls and associated systems. It includes such items as turnbuckle assemblies, traverse displacement units, fire control quadrants, inter-connecting boxes, wiring, connectors, etc.

Table 20 System C2 - Fire control systems, General

System	Subsystem	Title	Definition
C2		**Fire control systems, General**	
	-00	General	The fire control element refers to that equipment (hardware/software) installed in the vehicle which provides intelligence necessary for weapons delivery such as launching and firing. This element includes, for example, radar and other sensors necessary for search recognition, meteorological and/or tracking; controls and displays, fire control computers, and computer programs.
	-10	Computer/ interface	Refers to computer interface systems and equipment associated with fire control systems. It includes computer/interface units, program loading facilities, etc.
	-20	Control/monitor	Refers to control and monitoring equipment associated with the fire control systems.
	-30	Filter units	Refers to filter units associated with the fire control systems.
	-40	Sensors	Refers to sensors associated with the fire control systems. It includes sensors for elevation and traverse displacement, trunnion tilt, sighting angle, etc.
	-50	Firing handles	Refers to firing handles associated with the fire control systems.
	-60	Fire control boxes	Refers to control boxes associated with the fire control system. It includes the commander's, and gunner's control boxes, the loader's safety box, etc.
	-70	Ancillary	Refers to ancillary items and associated systems. It includes such items as junction boxes, cables, connectors, services, etc.

Table 21 System C3 - Thermal imaging, General

System	Subsystem	Title	Definition
C3		**Thermal imaging, General**	
	-00	General	This element refers to that equipment (hardware/software) which provides a thermal picture for the crew to use for surveillance and weapon guidance. It includes thermal imaging sensor heads, drive units, processors, power supply units, and display units.
	-10	Sensor	Refers to sensors specifically associated with thermal imaging systems. It includes scanner head assemblies, IR telescopes, tilt sensors, focal telescopes, etc.

System	Subsystem	Title	Definition
	-20	Processing	Refers to processing elements associated with thermal imaging systems. It includes symbology units, processors, etc.
	-30	Display	Refers to the display elements of a thermal imaging system. It includes binocular viewers, commander's and gunner's display units, display drive units, etc.
	-40	Control	Refers to the control elements of a thermal imaging system. It includes servo units, gunner's and commander's control units, etc.
	-50	Converter units	Refers to converter elements of a thermal imaging system. It includes isolating converter units, etc.
	-60	Structure and framework	Refers to framework and/or basic structural housing for a thermal imaging system, including load bearing components.
	-70	Ancillary	Refers to ancillary controls, items and associated systems related to thermal imaging systems. It includes such items as wash/wipe equipment, cables, connectors, services, etc.

Table 22 System C4 - Thermal imaging cooling systems, General

System	Subsystem	Title	Definition
C4		**Thermal imaging cooling systems, General**	
	-00	General	This element refers to that equipment which provides a cooling medium, for thermal images. It will include, for example, compressors, bottles, pipes, fans, mini coolers, air cleaning columns and sterling cycle cooling machines.
	-10	Compressors	Refers to the part of the system used to pressurize the cooling system. It includes motors, pumps, etc.
	-20	Storage	Refers to the part of the system used for storage of coolant. It includes tanks, filling systems, sumps, drains, etc.
	-30	Distribution	Refers to the part of the system used for distribution of coolant. It includes pipes, valves, etc.
	-40	Indicating	Refers to the part of the system used to monitor the condition of coolant (quantity, temperature and pressure). It includes transmitters, indicators, wiring, warning systems, etc.

Table 23 System C5 - Optical sighting systems, General

System	Subsystem	Title	Definition
C5		**Optical sighting systems, General**	
	-00	General	The optical element refers to the sighting systems for search, observation, identification, tracking, range-finding and will include sensors and displays associated with this system.
	-10	Surveillance	Refers to optical surveillance equipment. It includes such items as observation periscopes, etc.
	-20	Sighting	Refers to optical sighting equipment. It includes such items as sighting and aiming periscopes, etc.
	-30	Reticle image projector	Refers to a means for displaying a reticle image in/on the sighting device.
	-40	Sighting unit	Refers to a means for displaying a reticle image in the sighting device.
	-50	Ancillary	Refers to ancillary controls, items and associated systems related to optical sighting systems. It includes such items as wash/wipe equipment, cables, connectors, services, etc.

Table 24 System C6 - Weapon/gun, General

System	Subsystem	Title	Definition
C6		**Weapon/gun, General**	
	-00	General	The weapon/gun element refers to the means for the launcher to deliver fire on hostile targets or for logistics and other vehicles to exercise self-defense. This element includes, for example, the main gun/elevating mass and secondary armaments such as small arms and mortars. Fire control, gun control, and optical systems are excluded.
	-10	Barrel	The barrel assembly provides initial guidance for launch of projectiles.
	-20	Breech, housing and firing mechanism	Refers to a system which provides a means of access for the projectile/case to enter the barrel. It also provides a pressure seal and firing mechanism, together with the means by which the breech and firing mechanism are housed within the equipment. It includes all associated housing items.
	-30	Mountings	Refers to the means for attaching the barrel assembly and can include the mountlet assembly as well as the means to balance the armament system. It also includes tripods and bipods.
	-40	Recoil mechanism	Refers to systems which provide a means for absorbing energy created by projectile launch. It includes recuperator and recoil assemblies, etc.

System	Subsystem	Title	Definition
	-50	Smoke discharger	Refers to a means for dispersing smoke/fumes generated when a round is fired.
	-60	Secondary armaments installation	Refers to systems which provide a secondary armament installation.
	-70	Sights	Refers to a mechanical sighting system used on small arms, machine guns, man-portable launchers, etc.
	-80	Ancillary	Refers to ancillary items and associated systems. It includes, for example, such items as spare barrels and other parts, wallets, cleaning kits and sustained fire kits.

Table 25 System C7 - Automatic loading systems, General

System	Subsystem	Title	Definition
C7		**Automatic loading systems, General**	
	-00	General	The automatic loading element consists of that equipment (hardware/software) providing the means to select ammunition from a stored position in the vehicle, its transfer to and loading of the armament system. This element also includes the means to eject spent cases and misfired rounds. Components include all ammunition storage racks, transfer/lift mechanisms, ramming and ejecting mechanisms as well as specialized hydraulic and electrical controls.
	-10	Storage (ready round)	Refers to ammunition storage racks, bins, etc.
	-20	Transfer/lift	Refers to the means to select ammunition from a stored position in the vehicle and transfer it to the armament system. It includes transfer and lift mechanisms
	-30	Loading/ramming	Refers to the means to loading the armament system. It includes ramming and ejecting mechanisms.
	-40	Control	Refers to the means to control loading the armament system. It includes specialized hydraulic and electrical controls and safety devices.

2.1.5 System D - Electrical systems

Table 26 System D0 - Electrical systems, General

System	Subsystem	Title	Definition
D0		**Electrical systems, General**	

System	Subsystem	Title	Definition
	-00	General	A system or equipment for generation, distribution and/or control of electric power.

Table 27 System D1 - Electrical systems (engine/power pack), General

System	Subsystem	Title	Definition
D1		**Electrical systems (engine/power pack), General**	
	-00	General	This element refers to the electrical or electronic systems for the engine/power pack. It will include wiring harnesses, line replaceable units (LRUs), sensors, lighting, batteries, generators, etc.
	-10	Generating	Refers to generating systems and equipment in the engine/power pack compartment that are not directly mounted on the engine/power-pack. It includes such items as alternators, dynamos, generator panels, etc.
	-20	Batteries	Refers to battery equipment mounted in the engine/power pack compartment. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment mounted in the engine/power pack compartment. It includes such items as tachometers, speedometers, indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment mounted in the engine/power pack compartment. It includes such items as inspection lights, etc.
	-50	Wiring	Refers to wiring and cable looms mounted in the engine/power pack compartment. It includes looms, wires, harnesses, etc.
	-60	Electrical equipment	Refers to electrical equipment mounted in the engine/power pack compartment. It includes, for example, actuators, engine controls and ignition systems.
	-70	Distribution	Refers to electrical distribution systems and equipment mounted in the engine/power pack compartment. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment mounted in the engine/power pack compartment. It includes such items as fuses, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment mounted in the engine/power pack compartment. It includes such items as controllers, switches, relays, regulators, etc.

Table 28 System D2 - Electrical systems (hull/frame), General

System	Subsystem	Title	Definition
D2		**Electrical systems (hull/ frame), General**	
	-00	General	This element refers to the electrical or electronic systems for the hull and frame. It will include both internal and external wiring harnesses, junction and distribution boxes, line replaceable units (LRUs), sensors and lighting systems. It also includes the interfaces and connectors associated with the engine, power pack, generating and starting systems.
	-10	Internal electrical systems	Refers to the internal electrical or electronic systems mounted in the hull/frame. It will include, for example, wiring harnesses, LRUs, junction and distribution boxes. It also includes the interfaces and connectors associated with the engine, power pack, generating and starting systems.
	-20	Batteries	Refers to battery equipment related to the hull/frame. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Internal lights	Refers to lighting systems mounted internally in the hull/frame.
	-40	External electrical systems	Refers to the electrical or electronic systems mounted externally on the hull/frame. It will include, for example, external lighting systems, horns and flashing beacons.
	-50	Wiring	Refers to wiring, cable looms and clips related to the hull/frame or associated with connecting to the engine/power pack. It includes looms, wires, clips, harnesses, connectors, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the hull/frame. It includes, for example, actuators, wiper controls, heaters, cooking pots, horns, radio fittings and ancillary items.
	-70	Distribution	Refers to electrical distribution and interconnecting systems and equipment related to the hull/frame. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the hull/frame. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the hull/frame. It includes such items as controllers, switches, relays, regulators, etc.

Table 29 System D3 - Electrical systems (body/cab), General

System	Subsystem	Title	Definition
D3		**Electrical systems (body/cab), General**	
	-00	General	This element refers to the electrical or electronic systems for either the body/cab. It will include wiring harnesses, line replaceable units (LRUs), sensors and lighting systems.
	-10	Generating	Refers to generating systems and equipment related to the body/cab. It includes such items as generator control panels, etc.
	-20	Batteries	Refers to battery equipment related to the body/cab. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment related to the body cab. It includes such items as indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment related to the body cab. It includes such items as inspection lights, head lights, spot lights, tail/side lights, indicators, panel lights, convoy lights, etc.
	-50	Wiring	Refers to wiring and cable looms related to the body/cab. It includes looms, wires, harnesses, earthing straps, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the body/cab. It includes, for example, actuators, wiper controls, heaters, cooking pots and horns.
	-70	Distribution	Refers to electrical distribution systems and equipment related to the body/cab. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the body/cab. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the body/cab. It includes such items as controllers, switches, relays, regulators, etc.

Table 30 System D4 - Electrical systems (turret), General

System	Subsystem	Title	Definition
D4		**Electrical systems (turret), General**	

System	Subsystem	Title	Definition
	-00	General	This element refers to the electrical or electronic systems for the turret. It will include wiring harnesses, line replaceable units (LRUs), sensors and lighting systems.
	-10	Generating	Refers to generating systems and equipment related to the turret. It includes such items as generator control panels, etc.
	-20	Batteries	Refers to battery equipment related to the turret. It includes such items as battery containers, lagging kits, battery assemblies, connecting straps, etc.
	-30	Instrumentation	Refers to instrumentation systems and equipment related to the turret. It includes such items as indicating panels, electronic circuit panels, control transmitters, etc.
	-40	Lights	Refers to lighting systems and equipment related to the turret. It includes such items as inspection lights, panel lights, roof lights, spot lights, convoy lights, etc.
	-50	Wiring	Refers to wiring and cable looms related to the turret. It includes looms, wires, harnesses, earthing straps, etc.
	-60	Electrical equipment	Refers to electrical equipment related to the turret. It includes, for example, actuators, wiper controls, heaters and cooking pots.
	-70	Distribution	Refers to electrical distribution systems and equipment related to the turret. It includes such items as controllers, switches, relays, regulators, etc.
	-80	Protection	Refers to electrical protection systems and equipment related to the turret. It includes such items as fuses, fuse panels, fusible links, trip switches, etc.
	-90	Control	Refers to control systems and equipment related to the turret. It includes such items as controllers, switches, relays, regulators, etc.

2.1.6 System E - Communications system

Table 31 System E0 - Communications, General

System	Subsystem	Title	Definition
E0		**Communications, General**	
	-00	General	A system or equipment for transferring information.

Table 32 System E1 - Communication systems, General

System	Subsystem	Title	Definition
E1		**Communication systems, General**	

System	Subsystem	Title	Definition
	-00	General	The communications element refers to that equipment (hardware/software) which provides the means within the system for commanding, controlling and transmitting/receiving information and data to vehicle crew members and other personnel exterior to the operating vehicle. This element includes radio frequency equipment, microwave and optic communication links, networked equipment for multiple vehicle control and intercoms and external phones systems. It can include navigational system and data displays when these are integral with the equipment of crew stations or drivers for automotive display.
	-10	UHF/SHF/EHF	Refers to that portion of the system used for communications utilizing ultra, super and extra high frequency (UHF, SHF, EHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-20	VHF	Refers to that portion of the system used for communications utilizing very high frequency (VHF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-30	HF	Refers to that portion of the system used for communications utilizing high frequency (HF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-40	LF	Refers to that portion of the system used for communications utilizing low frequency (LF) carriers. It includes transmitters, receivers, control, antennas, etc.
	-50	Audio	Refers to that portion of the system used for voice communications. It includes such items as intercoms, headphones, loudspeakers, switching/control panels, etc.
	-60	Digital	Refers to that portion of the system used for digital/data communications. It includes modems, encryption devices, etc.
	-70	Satellite	Refers to that portion of the system used for communications via satellites. It includes transmitters, receivers, control, antennas, etc.
	-80	Optical	Refers to that portion of the system used for communications via line-of-site. It includes transmitters, receivers, control, signaling devices, etc.
	-90	Ancillary	Refers to ancillary controls and associated systems. It includes such items as wiring, connectors, etc.

Table 33 System E2 - Identification friend/foe (IFF), General

System	Subsystem	Title	Definition
E2		**Identification friend/foe (iff), General**	

System	Subsystem	Title	Definition
	-00	General	IFF equipment is common to all services and is therefore interactive with many other users. It covers the equipment (hardware software) that identifies friend or foe and transmits that information. It can use the vehicle communication system(s).
	-10	Transmitting	Refers to that part of the system which is used to send data.
	-20	Receiving	Refers to that part of the system which is used to receive IFF data.
	-30	Indicating	Refers to that part of the system which is used to display IFF data.

2.1.7 System F - Navigation system

Table 34 System F0 - Navigation, General

System	Subsystem	Title	Definition
F0		**Navigation, General**	
	-00	General	A system or equipment used to determine, conduct, manage or plot a position or course for the system.

Table 35 System F1 - Navigation systems, General

System	Subsystem	Title	Definition
F1		**Navigation systems, General**	
	-00	General	The navigation element refers to that equipment (hardware/software) installed in the vehicle which permits the crew to determine vehicle location and to plot the course of the vehicle. It includes navigation systems such as dead reckoning, inertial and global positioning systems. Landmark recognition algorithms and processors are also included.
	-10	Independent	Refers to that portion of the system (hardware/software) which provides information to determine position and is independent on ground installations or orbiting satellites. It includes inertial guidance systems, tracking systems, sextants, etc.
	-20	Dependant	Refers to that portion of the system (hardware/software) which provides information to determine position and is mainly dependant on ground installations or orbiting satellites. It includes GPS, radio compass, etc.

System	Subsystem	Title	Definition
	-30	Computing	Refers to that portion of the system (hardware/software) which combines/processes navigational data to compute or manage the vehicle's geographical position. It includes course computers, landmark recognition algorithms, processors, displays, etc.

2.1.8 System G - Surveillance system

Table 36 System G0 - Surveillance, General

System	Subsystem	Title	Definition
G0		**Surveillance, General**	
	-00	General	A system or equipment used to sense the environment.

Table 37 System G1 - Surveillance systems, General

System	Subsystem	Title	Definition
G1		**Surveillance systems, General**	
	-00	General	The surveillance element is defined as all equipment (hardware/software) and associated systems used to sense the surrounding environment and then process, display and record the resulting information. This can include, for example, Meteorological equipment. It does not include specific thermal imaging or meteorological/atmospheric systems.
	-10	Control	Refers to the processing, control and recording elements of the sensor systems. It includes central processors, analogue/digital converters, associated software, storage units, etc.
	-20	Indicating	Refers to the part of the system used to indicate/monitor sensor information. It includes data identification, indicators, displays panels, etc.
	-30	Recording	Refers to the part of the system used to record sensor information.
	-40	Optical/infra-red	Refers to that portion of a system that uses optical and/or heat-sensing devices to acquire information. It includes, for example, driver's, commander's and gunner's periscopes, infra-red scanners, heat sensors and image intensifiers. It does not include specific thermal imaging systems or sighting equipment.
	-50	Laser	Refers to that portion of a system that uses laser devices to acquire information. It includes distance measuring, target identification, etc.

System	Subsystem	Title	Definition
	-60	Radar	Refers to that portion of a system that uses radar devices to acquire information. It includes antennas, receivers, transmitters, indicators, etc.
	-70	Magnetic	Refers to that portion of a system that uses magnetic sensors to acquire information. It includes magnetometers, amplifiers, processors, indicators, etc.
	-80	Sonar	Refers to that portion of a system that uses sonar to acquire information. It includes modulators, transducers, processors, indicators, etc.
	-90	Acoustic	Refers to that portion of a system that uses sound to acquire information. It includes listening devices, amplifiers, processors, indicators, etc.

Table 38 System G2 - Meteorological/atmospheric research, General

System	Subsystem	Title	Definition
G2		**Meteorological/ atmospheric research, General**	
	-00	General	Refers to the systems and devices which furnish a means of providing, processing and recording meteorological data.
	-10	Weather	Refers to that portion of a system which is used to detect, measure, process or record weather (moisture, temperature, cloud, wind, etc) data. It includes hygrometers, thermometers, anemometers, etc.
	-20	Air turbulence	Refers to that portion of a system which is used to detect, measure, process or record air turbulence data.
	-30	Pollutants	Refers to that portion of a system which is used to detect, measure, process or record contaminated particles.
	-40	Magnetic/ gravitational	Refers to that portion of a system which is used to detect, measure, process or record the earth's magnetic or gravitational forces.

2.1.9 System H - Steering system

Table 39 System H0 - Steering, General

System	Subsystem	Title	Definition
H0		**Steering, General**	
	-00	General	A system or equipment used to guide or govern direction.

Table 40 System H1 - Steering systems, General

System	Subsystem	Title	Definition
H1		**Steering systems, General**	
	-00	General	This element refers to the devices (hardware/software) which are part of the vehicle not contained within the suspension system or driver controls that govern the vehicle's direction. This will include, for example, rudder and thrust devices and trim valves for amphibians.
	-10	Rudders	Refers to rudder devices designed to control the vehicle's direction.
	-20	Trim valves	Refers to trim valves designed to control the vehicle's direction.
	-30	Thrusters	Refers to thrust devices designed to control the vehicle's direction.

2.1.10 System J - Ventilation/heating/cooling system

Table 41 System J0 - Ventilation/heating/cooling, General

System	Subsystem	Title	Definition
J0		**Ventilation/ heating/cooling, General**	
	-00	General	A system or equipment used to provide a controlled environment.

Table 42 System J1 - Ventilation/heating/cooling systems, General

System	Subsystem	Title	Definition
J1		**Ventilation/ heating/cooling systems, General**	
	-00	General	This element refers to those subassemblies or components which provide a micro-climatic condition (heating or cooling), inside the vehicle, including personnel heating/cooling suits or components. It also covers purification systems not covered by NBC.
	-10	Compression	That portion of the system and its controls which supplies pressurized air/gas. Includes items such as controls and indicating systems related to pressure, gas-filled systems, etc.

System	Subsystem	Title	Definition
	-20	Distribution	That portion of the system used to induct and distribute air. It includes equipment rack cooling, seals, demisting, waveguide pressurization system and items of such systems, like blowers, ducting and inlets.
	-30	Heating	That portion of the system and its controls which supply heated air. It includes items such as heater units, wiring, etc.
	-40	Cooling	That portion of the system and its controls which supply cooled air. Includes items such as the cooling unit, indicating systems related to the cooler operation, wiring etc. It does not include temperature control and indicating systems.
	-50	Temperature control	That portion of the system used to control the temperature of the air. Includes items such as, thermal sensing devices, switches, indicators, wiring etc.
	-60	Moisture/air	That portion of the system used to contaminant control moisture in the air, to control ozone concentrations, to filter radioactive debris and chemical/biological contaminants, etc.
	-70	Liquid coolant	Those components required to supply liquid coolant to a cooling system.

2.1.11 System K - Hydraulic systems system

Table 43 System K0 - Hydraulic systems, General

System	Subsystem	Title	Definition
K0		**Hydraulic systems, General**	
	-00	General	A system or equipment for generation, distribution and/or control of hydraulic (or pneumatic) power.

Table 44 System K1 - Hydraulics, General

System	Subsystem	Title	Definition
K1		**Hydraulics, General**	
	-00	General	This element refers to a system or equipment (hardware/software) within the vehicle for the generation, distribution and/or control of hydraulic power.
	-10	Main	Refers to a system or equipment which is used to generate, store, distribute or control hydraulic power. It includes such items as tanks, valves, pumps, oil coolers, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.

System	Subsystem	Title	Definition
	-20	Auxiliary	Refers to that portion of the hydraulic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main hydraulic system.
	-30	Indicating	Refers to that part of the hydraulic system which is used to monitor the condition of the hydraulic system or fluid. It includes transmitters, indicators, warning systems, etc.

Table 45 System K2 - Pneumatic systems, General

System	Subsystem	Title	Definition
K2		**Pneumatic systems, General**	
	-00	General	This element refers to a system or equipment (hardware/software) within the vehicle for the generation, distribution and or control of pneumatic (including vacuum) power.
	-10	Main	Refers to a system or equipment which is used to generate, store, distribute or control pneumatic power. It includes such items as tanks, valves, pumps, plumbing, etc. It does not include user systems classified elsewhere, or their connecting valves.
	-20	Auxiliary	Refers to that part of the pneumatic system which is classified as auxiliary, emergency or standby and which is used to supplement, or replace the main pneumatic system.
	-30	Indicating	Refers to that part of the pneumatic system which is used to monitor the condition of the system. It includes transmitters, indicators, warning systems, etc.

2.1.12 System L - Electronic system

Table 46 System L0 - Electronic system, General

System	Subsystem	Title	Definition
L0		**Electronic system, General**	
	-00	General	A system or equipment using electronic/automated software and/or firmware elements not specifically included in other systems.

Table 47 System L1 - Electronics, General

System	Subsystem	Title	Definition
L1		**Electronics, General**	
	-00	General	This element refers to a system or equipment within the vehicle which uses electronic/automated software and/or firmware elements not specifically included in any other systems.

2.1.13 System M - Auxiliary system

Table 48 System M0 - Auxiliary, General

System	Subsystem	Title	Definition
M0		**Auxiliary, General**	
	-00	General	Subsidiary systems that provide services or support to main systems or equipment.

Table 49 System M1 - Auxiliary systems, General

System	Subsystem	Title	Definition
M1		**Auxiliary systems, General**	
	-00	General	This element refers to subsidiary systems (hardware/software) that provide services or support to main systems or equipment within the vehicle, not covered elsewhere.

2.1.14 System N - Survivability system

Table 50 System N0 - Survivability, General

System	Subsystem	Title	Definition
N0		**Survivability, General**	
	-00	General	A system or equipment used to provide hazard detection, protection, survivability and escape facilities.

Table 51 System N1 - Fire protection systems, General

System	Subsystem	Title	Definition
N1		**Fire protection systems, General**	

System	Subsystem	Title	Definition
	-00	General	This element refers to systems (hardware/software) that provide a warning to the crew that a possible fire hazard exists. It includes the suppression/fire fighting and heat sensors required for this system.
	-10	Detecting	Refers to that part of the system which is used to sense the presence of excessive heat, smoke or fire.
	-20	Indicating	Refers to that part of the system which is used to indicate the presence of excessive heat, smoke or fire.
	-30	Extinguishing	Refers to that part of the system, either fixed or portable, which is used to extinguish fire.

Table 52 System N2 - Nuclear, biological, chemical, General

System	Subsystem	Title	Definition
N2		**Nuclear, biological, chemical, General**	
	-00	General	The NBC element refers to those subassemblies or components which provide nuclear, biological and chemical detection, protection and survivability to the vehicle or crew, either individually or collectively, during an NBC attack. This includes a positive pressure system, purification system, ventilated face piece (mask), NBC detection and warning devices, decontamination equipment and chemical resistant coatings. It can also include environmental control equipment, such as heaters, coolers, etc.
	-10	Pack	Refers to NBC protection packs.
	-20	Control	Refers to NBC protection controls.
	-30	Pressure relief	Refers to pressure relief devices specifically fitted for NBC protection purposes.
	-40	Door assemblies	Refers to NBC protection fitted to doors and hatches.
	-50	Ancillary	Refers to ancillary controls and associated systems. It can include, for example, such items as wiring, connectors, heaters, coolers and ducting.

2.1.15 System P - Special equipment/systems, General

Table 53 System P0 - Special equipment/systems, General

System	Subsystem	Title	Definition
P0		**Special equipment/ systems, General**	
	-00	General	A system or equipment used to provide a special mission capability.

Table 54 System P1 - Special to type equipment, General

System	Subsystem	Title	Definition
P1		**Special to type equipment, General**	
	-00	General	This element refers to that special equipment (hardware/software) to be mated to a hull/turret or to a chassis/frame/body/cab assembly, to enable the achievement of a special mission capability. It includes blades, booms, cranes, winches, robotic arms, manipulators, etc.
	-10	Structure	Refers to that special hardware to be mated to a main assembly (hull, turret, chassis, frame, body or cab). It can include, for example, slide and tilt frames, launch frames and their winches, launch rails, bipods and platforms.
	-20	Electrical systems	Refers to electrical systems associated with special hardware that is mated to a main assembly. It can include, for example, launch/recovery mechanism electrical systems.
	-30	Hydraulics	Refers to hydraulic systems associated with special hardware that is mated to a main assembly. It can include, for example, the generation, distribution and control systems.
	-40	Handling equipment	Refers to handling equipment or systems that are mated to a main assembly. It can include, for example, cranes, winches, base stabilizers, support tools and actuators.
	-50	Ancillary	Refers to ancillary equipment for a system that is mated to a main assembly. It can include, for example, cradles, special tools, lifting beams and restraints.
	-60	Stowage	Refers to stowage provisions for operational equipment that are provided on a main assembly.

Table 55 System P2 - Special recovery equipment, General

System	Subsystem	Title	Definition
P2		**Special recovery equipment, General**	
	-00	General	This element refers to that special recovery equipment (hardware/software) to be mated to a hull turret or to a chassis/frame/body/cab assembly, to enable the achievement of a recovery capability. It includes cranes and towing equipment.

Table 56 System P3 - Special fit equipment, General

System	Subsystem	Title	Definition
P3		**Special fit equipment, General**	
	-00	General	This element refers to that special fit equipment (hardware/software) to be mated to a hull/turret or to a chassis/frame/body/cab assembly, to enable the achievement of a specialized capability. It will include supply, DROPS, lift trucks, side loaders, etc.

Table 57 System P4 - Special purpose equipment, General

System	Subsystem	Title	Definition
P4		**Special purpose equipment, General**	
	-00	General	This element refers to that special-to-purpose equipment (hardware/software) to be mated to a hull/turret or to a chassis/frame/body/cab assembly, for the achievement of a special mission purpose. It covers, for example, ISO container bodies and equipment for command or repair workshop, medical and other special purpose vehicles.

2.1.16 System Q - Outfit, furnishings and stowage, General

Table 58 System Q0 - Outfit, furnishings and stowage, General

System	Subsystem	Title	Definition
Q0		**Outfit, furnishings and stowage, General**	

System	Subsystem	Title	Definition
	-00	General	A function or equipment used to provide habitability, operability or stowage facilities that is not specifically included in other systems.

Table 59 System Q1 - Stowage, General

System	Subsystem	Title	Definition
Q1		**Stowage, General**	
	-00	General	This element is required to provide for personal equipment stowage as well as operational equipment stowage on the vehicle including hull and turret.
	-10	Charge bin	Refers to charge bin stowage facilities.
	-20	Shell stowage	Refers to shell stowage facilities.
	-30	Ammunition	Refers to stowage facilities for both secondary and personal ammunition.
	-40	Body/cab internal	Refers to stowage facilities within the body or cab.
	-50	Body/cab external	Refers to stowage facilities mounted on the body or cab.
	-60	Hull/frame internal	Refers to stowage facilities mounted internally to the hull or frame. It includes, for example, the drivers, fighting, crew and engine/transmission compartments.
	-70	Hull/frame external	Refers to stowage facilities mounted externally on the hull or frame.
	-80	Turret internal	Refers to stowage facilities mounted internally to the turret.
	-90	Turret external	Refers to stowage facilities mounted externally on the turret.

Table 60 System Q2 - Complete equipment schedule (CES), General

System	Subsystem	Title	Definition
Q2		**Complete equipment schedule (CES), General**	
	-00	General	This element refers to lists detailing the equipment required by the user to operate and maintain the system. It includes, for example, both fitted and loose items, spares, tools and operator manuals.
	-10	Production ces	This element refers to the production version of the CES.
	-20	Service ces	This element refers to the service version of the CES.

System	Subsystem	Title	Definition
	-30	Complex ces	This element refers to the complex version of the CES.

2.1.17 System R - Training, General

Table 61 System R0 - Training, General

System	Subsystem	Title	Definition
R0		**Training, General**	
	-00	General	The training element is defined as the deliverable training services, devices, accessories, aids, equipment and facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency. This element includes all effort associated design, development and production of deliverable training equipment as well as the execution of training services.

Table 62 System R1 - Training services, General

System	Subsystem	Title	Definition
R1		**Training services, General**	
	-00	General	The training services element refers to the deliverable training services, used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-10	Devices/ accessories/aids	The training devices/accessories/aids element refers to the deliverable devices, accessories and aids used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-20	Equipment	The training equipment element refers to the deliverable training equipment used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.
	-30	Facilities	The training facilities element refers to the deliverable training facilities used to provide instruction through which personnel will acquire sufficient concepts, skills and aptitudes to both operate and maintain the system with maximum efficiency.

2.1.18 System S - Repair Test and Support, General

Table 63 System S0 - Repair test and support, General

System	Subsystem	Title	Definition
S0		**Repair test and support, General**	
	-00	General	A system, equipment or facilities used to maintain operational capability.

Table 64 System S1 - Power pack repair facility, General

System	Subsystem	Title	Definition
S1		**Power pack repair facility (PPRF), General**	
	-00	General	This element refers to a facility which will allow unserviceable vehicle power packs to be repaired, including major assembly exchange, tested and returned to service use. PPRFs can be transportable and will include tools, jigs and fixtures commensurate with the type of equipment they are due to repair.
	-10	Mobile	This element refers to a mobile facility which will allow unserviceable vehicle power packs to be repaired, including major assembly exchange, tested and returned to service use. This section will not include the basic container body and its associated equipment.
	-20	Fixed	This element refers to a static facility which will allow unserviceable vehicle power packs to be repaired, including major assembly exchange, tested and returned to service use.

Table 65 System S2 - Sighting systems repair facility, General

System	Subsystem	Title	Definition
S2		**Sighting systems repair facility, General**	
	-00	General	This element refers to equipment (hardware/software) that enables the repair, test or calibration of the optical sighting equipment, including laser range finders for example.
	-10	Mobile	Refers to mobile (man-portable or vehicle mounted) equipment (hardware/software), which can be in a vehicle container or box body, that enables the repair, test and/or calibration of optical sighting equipment.

System	Subsystem	Title	Definition
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/software) that enables the repair, test or calibration of optical sighting equipment.

Table 66 System S3 - Thermal imaging repair facility, General

System	Subsystem	Title	Definition
S3		**Thermal imaging repair facility, General**	
	-00	General	To provide a transportable facility (hardware/software) whereby thermal imaging equipment including its associated cooling systems can be repaired, tested and returned to service. The equipment covered will include, for example, clean air equipment, jigs, fixtures, computer interface adapters and test equipment.
	-10	Mobile	Refers to mobile (man-portable or vehicle mounted) equipment (hardware/software), which can be in a vehicle container or box body, that enables the repair, test and/or calibration of thermal imaging equipment.
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/software) that enables the repair, test or calibration of thermal imaging equipment.

Table 67 System S4 - General purpose electronic repair facility, General

System	Subsystem	Title	Definition
S4		**General purpose electronic repair facility, General**	
	-00	General	This element refers to equipment (hardware/software) that enables unserviceable electrical/electronic items to be repaired, tested and returned to service use.
	-10	Mobile	Refers to mobile (man-portable or vehicle mounted) equipment (hardware/software), which can be in a vehicle container or box body, that enables the repair, test and/r calibration of general purpose electronic equipment.
	-20	Fixed	Refers to static (permanent or temporary) equipment (hardware/software) that enables the repair, test or calibration of general purpose electronic equipment.

Table 68 System S5 - Common support equipment, General

System	Subsystem	Title	Definition
S5		**Common support equipment, General**	
	-00	General	The common support equipment element refers to those items required to support and maintain the system or portions of the systems while not directly engaged in the performance of its mission, and which are presently in the MOD inventory for support of other systems. This element includes all efforts required to assure the availability of this equipment for support of the particular defense product item. It also includes the acquisition of additional quantities of this equipment if caused by the introduction of the defense material item into operational service.

Chapter 8.2.8

Maintained SNS - General sea vehicles

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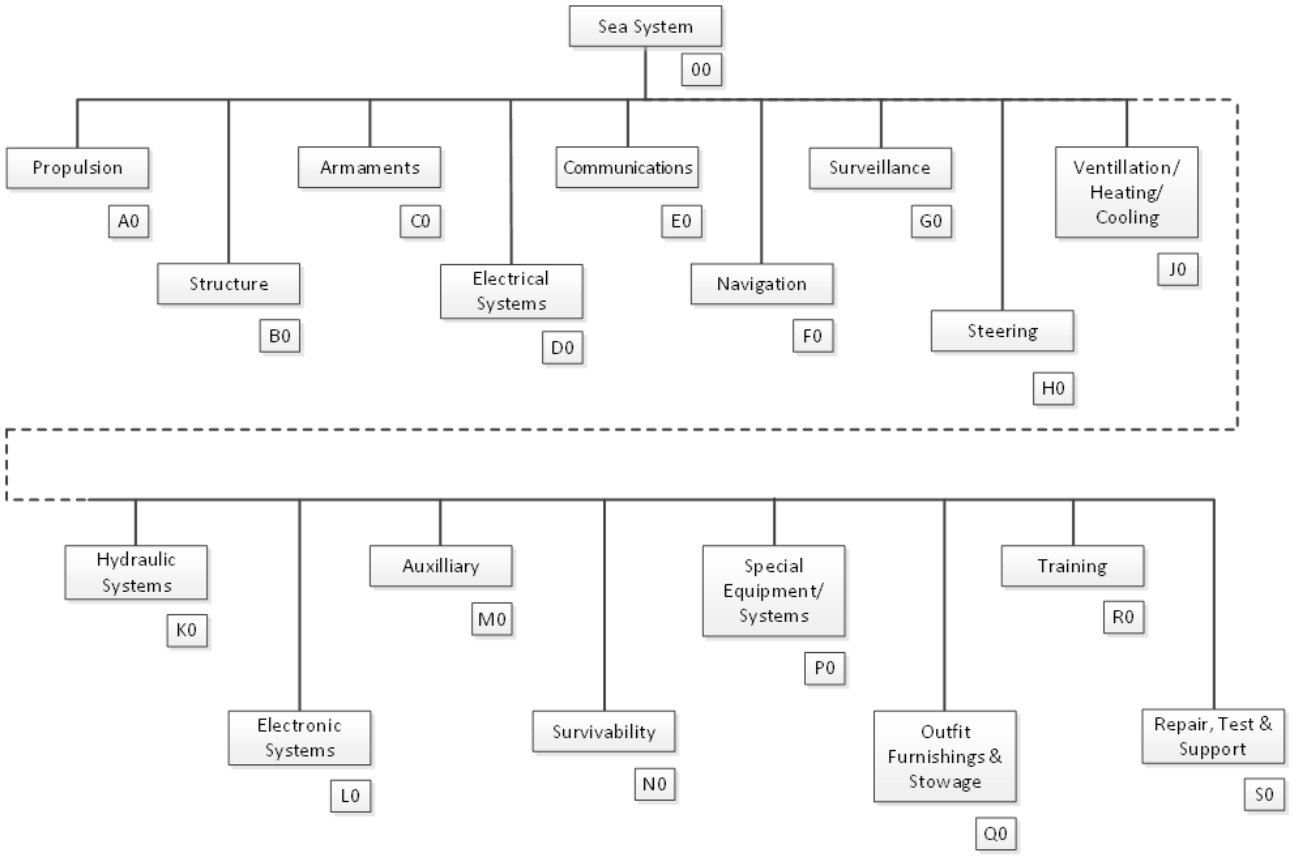
1 General

The SNS is used in this specification as a method to describe the functional and/or physical breakdown of items of the Product. Its position in the data module code and structure is defined in Chap 4.3.3. This is an SNS that will be maintained by the S1000D Steering Committee and is subject to normal CPF action in accordance with Chap 1.5.

This chapter gives the definitions which relate to systems and subsystems, for general sea vehicles. For details on how to use this SNS within the data module code, refer to Chap 4.3.3.

2 General sea vehicles SNS

The coding and definitions for the general sea vehicles SNS is appropriate for common and system level information for all Products and is described in Table 2 and shown in Fig 1. However, projects can decide not to use this generic SNS.



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Fig 1 Top level breakdown for a general sea vehicle

2.1 Main systems

This general sea vehicle SNS is divided into the 19 main systems.

Table 2 Top level breakdown for a general sea vehicle

System	Title
A0	Propulsion, General
B0	Structure, General
C0	Armaments, General
D0	Electrical power, General
E0	Communications, General
F0	Navigation, General
G0	Surveillance, General
H0	Steering, General
J0	Ventilation and air conditioning, General
K0	Hydraulics and pneumatics, General
L0	Electronic systems, General

System	Title
M0	Auxiliary, General
N0	Survivability, General
P0	Special equipment and systems, General
Q0	Outfit and furnishings, General
R0	Training, General
S0	Repair, test and support, General
T0	Management system
U0	Meteorological and oceanography system

2.2 Definitions of systems and subsystems

2.2.1 System A - Propulsion

Table 3 System A0 - Propulsion, General

System	Subsystem	Title	Definition
A0		**Propulsion, General**	
	-00	General	A system or equipment for producing and delivering power.

Table 4 System A1 - Power pack, General

System	Subsystem	Title	Definition
A1		**Power pack, General**	
	-00	Main propulsion drives, General	The propulsion prime mover. It includes, for example, nuclear, electrical, steam, gas turbine and diesel primary propulsion drives.
	-10	Propulsion nuclear	A nuclear fuelled propulsion prime mover
	-20	Propulsion electrical	An electrically powered propulsion prime mover.
	-30	Propulsion steam	A propulsion prime mover driven by steam. It includes, for example, boilers, hoppers and turbines.
	-40	Propulsion gas turbine	A gas turbine powered propulsion prime mover.
	-50	Propulsion diesel	A propulsion prime mover fuelled by diesel.

Table 5 System A2 - Secondary propulsion drives, General

System	Subsystem	Title	Definition
A2		**Secondary propulsion drives, General**	
	-00	Secondary propulsion drives, General	A secondary means of providing propulsion.

Table 6 System A3 - Emergency propulsion drives, General

System	Subsystem	Title	Definition
A3		**Emergency propulsion drives, General**	
	-00	Emergency propulsion drives, General	An emergency means of providing propulsion.

Table 7 System A4 - Propulsion transmission systems, General

System	Subsystem	Title	Definition
A4		**Propulsion transmission systems, General**	
	-00	Propulsion transmission systems, General	A system that transmits torque (main/secondary/emergency) to the platform's propulsion drive.
	-10	Propulsion gearing	A system that converts torque, speed or rotational direction between the propulsion and the drive system.
	-20	Propulsion clutches and couplings	A system that connects or removes the drive from the propulsion system.
	-30	Propulsion shafting	A means of transmitting drive from the propulsion system.
	-40	Propulsion bearings	A means of support for propulsion shafting.
	-50	Propulsion propulsors/ propellers	A means of converting propulsion energy into movement of the platform.

Table 8 System A5 - Propulsion support systems, General

System	Subsystem	Title	Definition
A5		**Propulsion support systems, General**	
	-00	Propulsion support systems, General	Ancillary systems in support of a platforms prime mover.
	-10	Circulating and cooling systems	This system includes cooling air ducting, coolant pumps, liquid filled radiators, fans and associated heat exchange equipment.
	-20	Uptakes and down takes	Refers to a system which supplies and filters air to the propulsion system and collects and removes exhaust gases from the propulsion system. It includes, for example, funnels, all filters, pipes, couplings, silencers, catalytic converters, ducting and combustion air systems.
	-30	Propulsion fuel systems	Equipment to provide fuel storage facilities, fuel filters, delivery pipes, drainage and cut-off valves, Fuel Injector Pumps (FIP) and injectors.
	-40	Propulsion lubricating systems	This system includes lubrication storage facilities. It includes delivery and return pipes, sumps and heat exchangers.
	-50	Propulsion lubrication transfer and purification	This system includes lubrication pumps and filters.

Table 9 System A6 - Propulsion control systems, General

System	Subsystem	Title	Definition
A6		**Propulsion control systems, General**	
	-00	Propulsion control systems, General	Systems designed to control the various propulsion modes of a platform.
	-10	Propulsion control systems automatic	Refers to those systems that automatically control propulsion.
	-20	Propulsion control systems manual	Refers to those systems that manually control propulsion.

Table 10 System A7 - Propulsion control systems, Alarms

System	Sub-system	Title	Description
A7		**Propulsion control systems - Alarms**	
	-00	Propulsion control systems - Alarms (General)	Systems that are designed to provide alarms on propulsion systems.
	-10	Automatically control propulsion - Alarms	Refers to those systems that automatically control propulsion.
	-20 thru -40	Not given	
	-50	Manually control propulsion - Alarms	Refers to those systems that manually control propulsion.
	-60 thru -90	Not given	

Table 11 System A8 - Propulsion control systems, Data logging

System	Sub-system	Title	Description
A8		**Propulsion control systems - Data logging**	
	-00	Propulsion control systems - Data logging (General)	Systems designed to control the various propulsion modes of a platform.
	-10	Automatically control propulsion - Data logging	Refers to data logger systems of automatically controlled propulsion.
	-20 thru -40	Not given	

System	Sub-system	Title	Description
	-50	Manually control propulsion - Data logging	Refers to data logger systems of manually controlled propulsion.
	-60 thru -90	Not given	

2.2.2 System B - Structure

Table 12 System B0 - Structure, General

System	Subsystem	Title	Definition
B0		**Structure, General**	
	-00	General	Framework and/or basic structural housing for a system, including load bearing components.

Table 13 System B1 - Hull, General

System	Subsystem	Title	Definition
B1		**Hull - General**	
	-00	Hull, General	Structured contained envelope providing the overall platform for systems, weapons and personnel.
	-10	Hull fittings	Fittings that are permanently attached to the hull of a platform.
	-20	Hydrofoils	A structure designed to raise the hull out of the water when in motion enabling it to travel fast and economically.

Table 14 System B2 - Body/cab, General

System	Subsystem	Title	Definition
B2		**Body/cab, General**	
	-00	Main supporting structures, General	Beams and columns that provide support for load bearing decks/bulkheads.
	-10	Transverse frames	Refers to a frame that runs athwart ships.
	-20	Longitudinal frames	Refers to a frame that runs fore and aft.

System	Subsystem	Title	Definition
	-30	Superstructure	Refers to a structure that is above deck level. This does not include masts, towers, derricks etc.

Table 15 System B3 - Special structures, General

System	Subsystem	Title	Definition
B3		**Special structures, General**	
	-00	Special structures, General	Structures that are not main supporting but are integral to platform design (eg, sonar domes).
	-10	Structural castings, forgings and welding	Refers to castings, forging and welding which form part of the structure.
	-20	Ballistic plating, sonar domes and stacks	Refers to armour plating, covers for sonar sensors and funnels.
	-30	Special purpose closures and structures	Refers to other structures not covered above.

Table 16 System B4 - Bulkheads/decks, General

System	Subsystem	Title	Definition
B4		**Bulkheads/ decks, General**	
	-00	Bulkheads/ decks, General	Vertical/horizontal structures, which divide the interior of the hull into compartments or spaces with provision for personnel/stores access.
	-10	Watertight/non watertight bulkheads	Refers to all bulkheads.
	-20	Main decks	Refers to all main decks.
	-30	Floors	Refers to a deck in a land-based structure.

Table 17 System B5 - Masts, General

System	Subsystem	Title	Definition
B5		**Masts, General**	

System	Subsystem	Title	Definition
	-00	Masts, General	Exterior vertical structures which carry those items of equipment (or stores) which by their nature require to be given height well above the deck areas of the platform.
	-10	Submarine masts and periscope integration	Refers to masts and periscopes fitted to a submarine.
	-20	Fixed masts	Refers to solid structures that are fixed to a superstructure.
	-30	Service platforms	Refers to service platforms that are mounted on masts.
	-40	Towers	Refers to lattice (mast type) structures.

Table 18 System B6 - Access, General

System	Subsystem	Title	Definition
B6		**Access, General**	
	-00	General	Refers to interior and exterior access points.
	-10	Doors	Refers to hinged or sliding covers for access points in a bulkhead. May be Watertight and/or Airtight.
	-20	Hatches	Refers to square or rectangular access point in the deck. May be Watertight and/or Airtight
	-30	Scuttles	Refers to round watertight openings and covers in a bulkhead.
	-40	Covers	Refers to something that protects hatches or scuttles. May be Watertight and/or Airtight.
	-50	Portable Plates	Refers to Removable Plates and/or Panels which are integral parts of the ships structure that are secured with bolts and/or screws to allow access for maintenance.

2.2.3 System C - Armaments

Table 19 System C0 - Armaments, General

System	Subsystem	Title	Definition
C0		**Armaments, General**	
	-00	General	A defensive or offensive system or equipment.

Table 20 System C1 - Gun systems, General

System	Subsystem	Title	Definition
C1		**Gun systems, General**	
	-00	Gun systems, General	An integrated system for platform protection and destruction of the aggressor. Additionally will include Small Arms for personal protection and aggression.
	-10	Gun mountings	Refers to that part of a weapons system that secures the barrel/breach assembly.
	-20	Directors	Refers to that part of a weapon system that allows for aiming of the gun.
	-30	Ancillaries	Refers to that part of a weapon system that is not described above.
	-40	Small arms	Refers to personal weapon systems.
	-50	Portable weapons	Refers to portable weapon systems.

Table 21 System C2 - Guided missile systems, General

System	Subsystem	Title	Definition
C2		**Guided missile systems, General**	
	-00	Guided missile systems, General	Equipment to deliver a self propelled warhead that can be guided through its flight to a target.
	-10	Control	Refers to that part of the guided weapon system that provides control.
	-20	Aerials	Refers to the aerials of the guided weapon system.
	-30	Radars	Refers to the target acquisition and guidance radar equipment within the guided weapon system.
	-40	Launchers	Refers to the launching equipment within the guided weapon system.
	-50	Ancillaries	Refers to all parts of the guided weapon system not described above.

Table 22 System C3 - Rocket systems and pyrotechnics, General

System	Subsystem	Title	Definition
C3		**Rocket systems and pyrotechnics, General**	
	-00	Rocket systems and pyrotechnics, General	Projectiles which are used as an aid, signal or illumination.
	-10	Signals	Refers to those projectiles used for signaling.

Table 23 System C4 - Aircraft related weapon systems, General

System	Subsystem	Title	Definition
C4		**Aircraft related weapon systems, General**	
	-00	Aircraft related weapon systems, General	For protection in the surveillance role and additionally equipment to provide the ability to deliver/fire weapons to selected targets.
	-10	Aircraft weapon systems	Refers to weapon systems mounted on an aircraft.
	-20	Aircraft weapon control	Refers to the control system of an aircraft mounted weapon system.

Table 24 System C5 - Fire control systems, General

System	Subsystem	Title	Definition
C5		**Fire control systems, General**	
	-00	Fire control systems, General	Equipment provided to fire weapons according to the protection or aggression scenario.
	-10	Weapon direction systems and sights	Refers to that part of a weapon system that directs fire to a given target.
	-20	Gun fire control systems	Refers to the control system of a weapon system.

System	Subsystem	Title	Definition
	-30	Missile fire control systems	Refers to the fire control systems for missiles.
	-40	Underwater fire control systems	Refers to fire control systems for underwater weapon Systems.

Table 25 System C6 - Torpedo systems, General

System	Subsystem	Title	Definition
C6		**Torpedo systems, General**	
	-00	General	The equipment provided for the discharge of torpedoes to their targets in a timely and controlled manner.
	-10	Submarine torpedo systems	Refers to the submarine torpedo systems.
	-20	Surface launch torpedo equipment	Refers to the surface launch systems for torpedoes.
	-30	Torpedo handling and stowage	Refers to the handling and stowage facilities for torpedoes.
	-40	Acoustic	That portion of the system that uses sound to acquire information. It includes listening devices, amplifiers, processors, indicators etc

Table 26 System C7 - Electronic warfare, General

System	Subsystem	Title	Definition
C7		**Electronic warfare, General**	
	-00	General	Those units and components which furnish a means of detecting, analyzing, jamming, or nullifying the effectiveness of defensive detection devices and communication links.
	-10	Active	That portion of the system consisting of receivers, transmitters, repeaters, blanking and modulating devices (eg, infra-red, laser).
	-20	Passive	That portion of the system that contains no active elements (eg, chaff).
	-30	Data processing	That portion of the system that processes and analyses received data.

2.2.4 System D - Electrical system

Table 27 System D0 - Electrical system, General

System	Subsystem	Title	Definition
D0		**Electrical system, General**	
	-00	General	A system or equipment for generation, distribution and/or control of electric power.

Table 28 System D1 - Electrical power generation, General

System	Subsystem	Title	Definition
D1		**Electrical power generation, General**	
	-00	General	Power produced to satisfy all electrical power requirements using a generator driven by a prime mover.
	-10	Turbo generators and control equipment	Refers to the control equipment for turbo generators.
	-20	Gas turbine generators and control equipment	Refers to the control equipment for gas turbine generators.
	-30	Diesel generators and control equipment	Refers to the control equipment for diesel generators.
	-40	Motor generators	Refers to motor generators.

Table 29 System D2 - Primary supply and distribution systems, General

System	Subsystem	Title	Definition
D2		**Primary supply and distribution systems, General**	
	-00	General	Refers to the primary supply and distribution systems of electrical power.

Table 30 System D3 - Electrical power converted supplies, General

System	Subsystem	Title	Definition
D3		**Electrical power converted supplies, General**	
	-00	General	Refers to the converted electrical power supplies.

Table 31 System D4 - Electrical power lighting, General

System	Subsystem	Title	Definition
D4		**Electrical power lighting, General**	
	-00	General	Lighting equipment that is powered from the mains electrical distribution systems.
	-10	Cabling	Refers to the cabling used in electrical power systems.

Table 32 System D5 - Electrical power support systems, General

System	Subsystem	Title	Definition
D5		**Electrical power support systems, General**	
	-00	General	The equipment that provides alternative/back-up electrical supplies for use with certain electrical circuits in the event of a power failure.

Table 33 System D6 - Electrical power emergency supplies, General

System	Subsystem	Title	Definition
D6		**Electrical power emergency supplies, General**	
	-00	General	Emergency supply systems for use in the event of 'normal' power supply failure.

Table 34 System D7 - Electrical control systems, General

System	Subsystem	Title	Definition
D7		**Electrical control systems, General**	
	-00	General	Systems designed to provide safe and effective control of electrical power requirements.

Table 35 System D8 - Batteries, General

System	Subsystem	Title	Definition
D8		**Batteries, General**	
	-00	General	Static and limited (dc) electrical power sources used to provide main, secondary, emergency and/or back-up supplies, additionally to provide supplies to certain portable electrical equipment.
	-10	Primary batteries	Refers to all primary batteries.
	-20	Secondary batteries	Refers to all secondary batteries.
	-30	Battery charging systems	Refers to the charging systems for all batteries.

2.2.5 System E - Communications system

Table 36 System E0 - Communications, General

System	Subsystem	Title	Definition
E0		**Communications, General**	
	-00	General	The communications element refers to that equipment fitted to a platform which provides the means to receive information from off-ship source, to transmit to off-ship receivers and to distribute information throughout the ship.

Table 37 System E1 - SHF/EHF, General

System	Subsystem	Title	Definition
E1		**SHF/EHF, General**	

System	Subsystem	Title	Definition
	-00	General	The shipboard communications system/equipment using super and extra high frequency carriers.
	-10	Aerials	Refers to the SHF/EHF aerials used in a communications system.
	-20	Aerial multi-couplers and tuners	Refers to the aerial multi-couplers and tuners of an SHF/EHF communications system.
	-30	Receivers	Refers to the receiver equipment of an SHF/EHF communications system.
	-40	Transmitters	Refers to the transmitter equipment of an SHF/EHF communications system.
	-50	Transceivers	Refers to the transceiver equipment of an SHF/EHF communications system.
	-60	Ancillaries	Refers to all parts of an SHF/EHF communications system not detailed above. It includes, for example, patching facilities, modems and other ancillary equipment.

Table 38 System E2 - UHF/VHF, General

System	Subsystem	Title	Definition
E2		**UHF/VHF, General**	
	-00	General	The shipboard communications system/equipment using very high frequency carriers.
	-10	Aerials	Refers to the UHF/VHF aerials used in a communications system.
	-20	Aerial multi-couplers and tuners	Refers to the aerial multi-couplers and tuners of a UHF/VHF communications system.
	-30	Receivers	Refers to the receiver equipment of a UHF/VHF communications system.
	-40	Transmitters	Refers to the transmitter equipment of a UHF/VHF communications system.
	-50	Transceivers	Refers to the transceiver equipment of a UHF/VHF communications system.
	-60	Ancillaries	Refers to all parts of a UHF/VHF communications system not detailed above. It includes, for example, patching facilities, modems and other ancillary equipment.

Table 39 System E3 - HF/MF, General

System	Subsystem	Title	Definition
E3		**HF/MF, General**	
	-00	General	The communication system/equipment using high and medium frequency carriers.
	-10	Aerials	Refers to the HF/MF aerials used in a communications system.
	-20	Aerial multi-couplers and tuners	Refers to the aerial multi-couplers and tuners of an HF/MF communications system.
	-30	Receivers	Refers to the receiver equipment of an HF/MF communications system.
	-40	Transmitters	Refers to the transmitter equipment of an HF/MF communications system.
	-50	Transceivers	Refers to the transceiver equipment of an HF/MF communications system.
	-60	Ancillaries	Refers to all parts of an HF/MF communications system not detailed above. It includes, for example, patching facilities, modems and other ancillary equipment.

Table 40 System E4 - LF/VLF, General

System	Subsystem	Title	Definition
E4		**LF/VLF, General**	
	-00	LF/VLF, General	The shipboard communications system/equipment using low and very low frequency carriers.
	-10	Aerials	Refers to the LF/VLF aerials used in a communications system.
	-20	Aerial multi-couplers and tuners	Refers to the aerial multi-couplers and tuners of an LF/VLF communications system.
	-30	Available for projects	
	-40	Receivers	Refers to the receiver equipment of an LF/VLF communications system.
	-50	Transmitters	Refers to the transmitter equipment of an LF/VLF communications system.
	-60	Transceivers	Refers to the transceiver equipment of an LF/VLF communications system.

System	Subsystem	Title	Definition
	-70	Ancillaries	Refers to all parts of an LF/VLF communications system not detailed above. It includes, for example, patching facilities, modems and other ancillary equipment.

Table 41 System E5 - Audio integration, General

System	Subsystem	Title	Definition
E5		**Audio integration, General**	
	-00	General	The shipboard communications system/equipment that is used for integration distribution and control of communications.
	-10	Control outfits	Refers to the control equipment for the shipboard communications system.

Table 42 System E6 - Digital, General

System	Subsystem	Title	Definition
E6		**Digital - General**	
	-00	General	The shipboard communications system/equipment that is used for digital data transmission and reception. It includes, for example, modems, encryption devices and teletypes.
	-10	Cryptographic receivers	Refers to the receiver encryption devices.
	-20	Cryptographic transmitters	Refers to the transmitter encryption devices.
	-30	Teletype/message handling	Refers to the teletype and message handling devices that form part of the shipboard communications system.
	-40	Tele-printers	Refers to the tele-printers used in a shipboard communications system
	-50	Modems	Refers to the modems used in a shipboard communications system.
	-60	Displays	Refers to the visual display equipment used in a shipboard communications system.

Table 43 System E7 - Internal, General

System	Subsystem	Title	Definition
E7		**Internal, General**	

System	Subsystem	Title	Definition
	-00	General	The shipboard communications system/equipment that provides communications within the confines of the platform.
	-10	Broadcasts	Refers to the shipboard broadcasting and public address systems.
	-20	Inter-communication	Refers to the shipboard intercommunications system.
	-30	Networks	Refers to all shipboard networks. It includes, for example, Local Area Networks (LAN), Wide Area Networks (WAN), etc.
	-40	Recreational	Refers to all shipboard domestic electronic devices. It includes, for example, radios, televisions and video recorders, etc.
	-50	Alarms	Refers to the shipboard alarm systems.
	-60	Control	Refers to the control equipment used for shipboard communications systems.
	-70	Telephones	Refers to the telephone equipment used on shipboard communications systems.

Table 44 System E8 - Flight Control and instrument landing systems, General

System	Subsystem	Title	Definition
E8		**Flight control and instrument landing systems, General**	
	-00	General	Communication equipment provided for the safe take-off, operation and landing of aircraft.

2.2.6 System F - Navigation system

Table 45 System F0 - Navigation, General

System	Subsystem	Title	Definition
F0		**Navigation, General**	
	-00	General	A system or equipment used to determine, conduct, manage or plot a position or course for the system.

Table 46 System F1 - Independent, General

System	Subsystem	Title	Definition
F1		**Independent, General**	
	-00	General	Refers to the navigation equipment fitted to a platform that is independent of ground stations and orbiting satellites (eg, NATO SINS, compasses, Log Systems, wind gear).
	-10	Gyro compasses	Refers to compasses using gyro principles.
	-20	Magnetic compasses	Refers to all compasses using magnetic principles.
	-30	Inertial	Refers to all aspects of inertial navigation. It includes, for example, inertial platforms and gyroscope assemblies, etc.
	-40	Speed and distance	Ship speed and distance systems.
	-50	Depth	Refers to shipboard depth determining systems.
	-60	Wind speed and direction	Systems to measure and indicate wind speed and direction. It includes, for example, standard wind gear and lightweight wind gear.

Table 47 System F2 - Dependent, General

System	Subsystem	Title	Definition
F2		**Dependent, General**	
	-00	General	Refers to the navigation equipment fitted to a platform that is dependent on ground stations and orbiting satellites. It includes, for example, Global Positioning System, Hyper fix, etc.
	-10	Satellite	Refers to the satellite navigation equipment fitted to a platform.
	-20	Radio	Refers to the radio navigation equipment fitted to a platform.
	-30	Radar	Refers to the radar navigation equipment fitted to a platform.

Table 48 System F3 - Computing, General

System	Subsystem	Title	Definition
F3		**Computing, General**	
	-00	General	Refers to the navigation equipment fitted to a platform which combines/processes navigational data to compute or manage the platforms geographical position. It includes the ship data distribution systems.

System	Subsystem	Title	Definition
	-10	Plotting	Refers to those navigational aids used for plotting.
	-20	Data distribution	Refers to that equipment used for the distribution of navigational data.
	-30	Data retransmission	Refers to the equipment used for the retransmission of navigational data.

2.2.7 System G - Surveillance system

Table 49 System G0 - Surveillance, General

System	Subsystem	Title	Definition
G0		**Surveillance, General**	
	-00	General	Refers to that portion of equipment fitted to a platform which senses, monitors and, where required provides alarms and environmental data. It includes, for example, radar, sonar, thermal, optical and environmental technologies.

Table 50 System G1 - Control, General

System	Subsystem	Title	Definition
G1		**Control, General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that processes and controls the sensor systems. It includes combat systems.
	-10	Data processing	Refers to the equipment used for the processing surveillance data.
	-20	Displays	Refers to that equipment used to visually display surveillance data.

Table 51 System G2 - Radar, General

System	Subsystem	Title	Definition
G2		**Radar, General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that uses radar devices to acquire information. It includes, for example, aerial outfits and surveillance radar.
	-10	Aerials	Refers to the aerials used as part of radar surveillance.
	-20	Receiver	Refers to the receiver equipment used as part of radar surveillance.

System	Subsystem	Title	Definition
	-30	Transmitter	Refers to the transmitter equipment used as part of radar surveillance.
	-40	Ancillaries	Refers to the ancillary equipment used as part of radar surveillance.
	-50	Distribution	Refers to the equipment used to distribute radar surveillance data.
	-60	Displays	Refers to the equipment used to visually display radar surveillance data.

Table 52 System G3 - Sonar, General

System	Subsystem	Title	Definition
G3		**Sonar, General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that uses sonar devices to acquire information
	-10	Transducers	Refers to the transducers used as part of sonar surveillance.
	-20	Receiver	Refers to the receiver equipment used as part of sonar surveillance.
	-30	Transmitter	Refers to the transmitter equipment used as part of sonar surveillance.
	-40	Ancillaries	Refers to the ancillary equipment used as part of sonar surveillance.
	-50	Distribution	Refers to the equipment used to distribute radar sonar data.
	-60	Displays	Refers to the equipment used to visually display sonar surveillance data.

Table 53 System G4 - Electromagnetic, General

System	Subsystem	Title	Definition
G4		**Electromagnetic, General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that is used to detect and identify EM emissions.
	-10	ESM aerials	Refers to aerials used for Electronic Surveillance Measures (ESM).
	-20	ESM receivers	Refers to receivers used for Electronic Surveillance Measures (ESM).

Table 54 System G5 - Optical, General

System	Subsystem	Title	Definition
G5		**Optical, General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that uses optical devices to acquire information. It includes, for example, periscopes and GPEOD.
	-10	Thermal imaging	This element refers to that equipment (hardware/software) which provides a thermal picture surveillance and weapon guidance. It includes thermal imaging sensor heads, drive units, processors, sights, power supply units, and display units.
	-20	Periscopes	Refers to the periscopes used as part of the optical surveillance equipment.

Table 55 System G6 - Digital, General

System	Subsystem	Title	Definition
G6		**Digital, General**	
	-00	General	Refers to that part of the surveillance equipment fitted to a platform that provides data transfer capabilities. It includes, for example, data highways and combat system highways.
	-10	Data highway	Refers to the digital data busses used as part of the surveillance system.

Table 56 System G7 - Identification systems, General

System	Subsystem	Title	Definition
G7		**Identification systems, General**	
	-00	General	Surveillance equipment provided for the selection and identification of friendly and hostile targets.
	-10	Radar aerials	Refers to the radar aerials used as part of the identification system.
	-20	Integrators transponders	Refers to the shipboard, built-in transponders used as part of the identification system of the surveillance system.

2.2.8 System H - Steering system

Table 57 System H0 - Steering, General

System	Subsystem	Title	Definition
H0		**Steering, General**	
	-00	General	Refers to those units and devices within the platform which govern movement and/or direction of assemblies. It includes, for example, motors, gearboxes, drives, thrusters and rudders.

Table 58 System H1 - Steering systems and control, General

System	Subsystem	Title	Definition
H1		**Steering systems and control, General**	
	-00	General	The system designed to transmit the requirements given at the steering position, to the receiver that controls the movements of the rudders or other steering mechanisms.

Table 59 System H2 - Thrusters, General

System	Subsystem	Title	Definition
H2		**Thrusters, General**	
	00	General	Power units fitted in the ship below the surface to give lateral thrust when maneuvering the ship.

Table 60 System H3 - Stabilizing systems and control, General

System	Subsystem	Title	Definition
H3		**Stabilizing systems and control, General**	
	00	General	The equipment provided to minimize the effect of wave movement on a ship.

Table 61 System H4 - Diving control systems, General

System	Subsystem	Title	Definition
H4		**Diving control systems, General**	.
	00	General	The system designed to control the submerged depth of a submersible

Table 62 System H5 - Hydroplanes, General

System	Subsystem	Title	Definition
H5		**Hydroplanes, General**	
	00	General	Equipment provided to control the attitude of a submersible underwater.

2.2.9 System J - Ventilation/heating/cooling system

Table 63 System J0 - Ventilation/heating/cooling, General

System	Subsystem	Title	Definition
J0		**Ventilation and air conditioning, General**	
	-00	General	A system or equipment used to provide a controlled environment

Table 64 System J1 - Climatic control systems, General

System	Subsystem	Title	Definition
J1		**Climatic control systems, General**	
	-00	General	Equipment provided to control climatic/environmental conditions within a given space.

Table 65 System J2 - Ventilation systems, General

System	Subsystem	Title	Definition
J2		**Ventilation systems, General**	

System	Subsystem	Title	Definition
	-00	General	Air supply and exhaust systems which provide habitable conditions in working and living spaces within a platform.

Table 66 System J3 - Air conditioning systems, General

System	Subsystem	Title	Definition
J3		**Air conditioning systems, General**	
	-00	General	Systems which control the humidity and temperature of living spaces, and some working spaces within a platform.
	-10	Compartment heating systems	That portion of the system and its controls which supply heat. It includes items such as heater units, wiring, etc.

Table 67 System J4 - Oxygen generating system, General

System	Subsystem	Title	Definition
J4		**Oxygen generating system, General**	
	-00	General	A machinery plant that generates oxygen which can be stored in liquid or gaseous form.

2.2.10 System K - Hydraulic system

Table 68 System K0 - Hydraulic system, General

System	Subsystem	Title	Definition
K0		**Hydraulic system, General**	
	-00	General	A system or equipment for generation, distribution and/or control of hydraulic power.

Table 69 System K1 - Main hydraulic power systems, General

System	Subsystem	Title	Definition
K1		**Main hydraulic power systems, General**	

System	Subsystem	Title	Definition
	-00	General	Equipment required to provide fluidic power for a prime mover/requirement.

Table 70 System K2 - Auxiliary hydraulics power systems, General

System	Subsystem	Title	Definition
K2		**Auxiliary hydraulics power systems, General**	
	00	General	Equipment required to provide fluidic power for the control of engineering systems and machinery.

Table 71 System K3 - Pneumatic system, General

System	Subsystem	Title	Definition
K3		**Pneumatic systems, General**	
	-00	General	Systems that are designed to move and store air under pressure.
	-10	Servo air systems	Systems that move under air under pressure.

2.2.11 System L - Electronic system

Table 72 System L0 - Electronic system, General

System	Subsystem	Title	Definition
L0		**Electronic systems, General**	
	-00	General	A system or equipment using electronic/automated software and/or firmware elements not included in other systems.

Table 73 System L1 - Cathodic protection, General

System	Subsystem	Title	Definition
L1		**Cathodic protection, General**	

System	Subsystem	Title	Definition
	-00	General	A system that uses electrolysis for the protection of a ships hull against wastage caused by the corrosive effect of salt water.

Table 74 System L2 - Degaussing, General

System	Subsystem	Title	Definition
L2		**Degaussing, General**	
	-00	General	A system designed to neutralize the magnetic field surrounding a platform.

2.2.12 System M - Auxiliary system

Table 75 System M0 - Auxiliary, General

System	Subsystem	Title	Definition
M0		**Auxiliary, General**	
	-00	General	Subsidiary systems that provide services or support to main systems or equipment.

Table 76 System M1 - Aircraft handling systems, General

System	Subsystem	Title	Definition
M1		**Aircraft handling systems, General**	
	-00	General	The equipment provided for the safe movement of aircraft within the hangar or to and from the flight deck or runway.
	-10	Aircraft handling systems servicing and stowage	Aircraft handling and associated support facilities.
	-20	Aircraft recovery support systems	Aircraft recovery and associated support facilities.

Table 77 System M2 - Sea water systems, General

System	Subsystem	Title	Definition
M2		**Sea water systems, General**	
	-00	General	Systems to provide firefighting, machinery cooling, controlled flooding of watertight compartments and some domestic services.
	-10	Firemain and flushing systems	Piping, firemain and flushing pumps, and controls.
	-20	Sprinkler systems	Sea water sprinkler systems.
	-30	Pre-wetting systems	Countermeasure pre-wetting systems.
	-40	Auxiliary sea water systems	Auxiliary machinery sea water system pumps and associated pipes, controls, etc.
	-50	Scuppers and deck drains	Refers to scuppers, deck drains and associated equipment.
	-60	Plumbing and drainage	Refers to drains, plumbing and associated pipes, control valves, etc.
	-70	Drainage and ballasting systems	Refers to piping, drainage and ballasting system, pumps and controllers.

Table 78 System M3 - Fresh water systems, General

System	Subsystem	Title	Definition
M3		**Fresh water systems, General**	
	-00	General	Refers to systems provided for domestic purposes and other services, where the corrosive effect of sea water would be unacceptable.
	-10	Distilling plant	Flash type, vapor compression, heat recovery and submerged tube type.
	-20	Auxiliary fresh water cooling	Cooling water, electronics, DW/CW.
	-30	Potable water	Refers to fresh and distilled water services. It includes, for example, drinking water supplies.

Table 79 System M4 - Fuels and lubricants systems, General

System	Subsystem	Title	Definition
M4		**Fuels and Lubricants Systems, General**	
	-00	General	Refers to systems that are designed to move and store propellant and lubricating fluids.
	-10	Ship fuel and fuel compensating systems	Ship fuel filling and transfer system pumps, fuel transfer systems and associated equipment.
	-20	Aviation and general purpose fuels	Piping aviation and general purpose fuel system pumps, aviation and general purpose fuel MOGAS handling and piping.
	-30	Aviation and general purpose lubricating oil	Lubricating oil systems, aviation and general purpose.
	-40	Auxiliary lubrication systems	Lubrication outboard and lubrication inboard.
	-50	Special fuel and lubricants handling and storage	Handling and storage systems for special fuel and lubricants.

Table 80 System M5 - Gas systems, General

System	Subsystem	Title	Definition
M5		**Gas systems, General**	
	-00	General	Systems that are designed to move and store air and certain gases, under pressure.
	-10	Compressed air systems	This element refers to a system or equipment (hardware/software) for the generation, distribution and/or control of pneumatic power and compressed air.
	-20	Compressed gases	Compressed gas system nitrogen.
	-30	Vacuum systems	This element refers to a system or equipment (hardware/software) for the generation, distribution and/or control of vacuum power.

Table 81 System M6 - Cargo handling replenishment systems, General

System	Subsystem	Title	Definition
M6		**Cargo handling replenishment systems, General**	
	-00	General	Cargo handling machinery and systems which are used for replenishment.
	-10	RAS systems	RAS Winches, RAS booms, rigging and hardware, control stations.
	-20	Vertical replenishment systems	VETREP systems.
	-30	Ships stores and equipment handling systems	Refers to ships stores and equipment handling systems.

Table 82 System M7 - Machinery, General

System	Subsystem	Title	Definition
M7		**Machinery, General**	
	-00	General	Any item of machinery other than those directly associated with weapons system not identified elsewhere.
	-10	Engineering and functional machinery	Refers to engineering and functional machinery.
	-20	Domestic machinery	Refers to machinery installed for domestic purposes.

Table 83 System M8 - Deck machinery

System	Subsystem	Title	Definition
M8		**Deck machinery**	
	-00	General	Any item of machinery other than those directly associated with deck machinery.
	-10	Cranes	Refers to cranes used on deck.
	-20	Winches	Refers to winches used on deck.

2.2.13 System N - Survivability system

Table 84 System N0 - Survivability, General

System	Subsystem	Title	Definition
N0		**Survivability, General**	
	00	General	A system or equipment used to provide hazard detection, protection, survivability and escape facilities

Table 85 System N1 - Damage control, General

System	Subsystem	Title	Definition
N1		**Damage control, General**	
	-00	General	Equipment for the limitation, control and repair (within the platform resources) of material damage however caused in peace and war.
	-10	Detection systems	Refers to equipment for the detection of material damage.

Table 86 System N2 - Escape facilities, General

System	Subsystem	Title	Definition
N2		**Escape facilities, General**	
	-00	General	The facilities that are fitted specifically to assist in escaping from danger or to prolong life in times of crisis. It includes, for example, BIBS and HIS

Table 87 System N3 - Firefighting systems, General

System	Subsystem	Title	Definition
N3		**Firefighting systems, General**	
	00	General	The equipment that provides the ability to limit the spread of fire, extinguish and prevent re-ignition. It includes, for example, detecting, indicating and extinguishing systems.

Table 88 System N4 - Nuclear, biological, chemical, General

System	Subsystem	Title	Definition
N4		**Nuclear, biological, chemical, General**	
	-00	General	The NBC element refers to those subassemblies or components which provide nuclear, biological and chemical detection, protection and survivability to the platform and crew, either individually or collectively, during an NBC attack. This includes positive pressure and purification systems, ventilated face pieces (masks), NBC detection and warning devices, decontamination equipment and chemical resistant coatings.

Table 89 System N5 - Salvage systems, General

System	Subsystem	Title	Definition
N5		**Salvage systems, General**	
	-00	General	Refers to systems for the performance of salvage operations.

Table 90 System N6 - Stability, General

System	Subsystem	Title	Definition
N6		**Stability, General**	
	-00	General	Refers to systems for the provision of stability, following damage to or flooding of compartments.

2.2.14 System P - Special equipment/system

Table 91 System P0 - Special equipment/system, General

System	Subsystem	Title	Definition
P0		**Special equipment/ system, General**	
	-00	General	A system or equipment used to provide a special mission capability.

Table 92 System P1 - Special to type equipment, General

System	Subsystem	Title	Definition
P1		**Special to type equipment, General**	
	-00	General	This element refers to that special equipment (hardware/software) to enable the achievement of a special mission capability.

Table 93 System P2 - Special recovery equipment, General

System	Subsystem	Title	Definition
P2		**Special recovery equipment, General**	
	-00	General	This element refers to that special recovery equipment (hardware/software) to enable the achievement of a recovery capability. It includes cranes, winches and towing equipment.

Table 94 System P3 - Special fit equipment, General

System	Subsystem	Title	Definition
P3		**Special fit equipment, General**	
	-00	General	This element refers to that special fit equipment (hardware/software) to enable the achievement of a specialized capability.

Table 95 System P4 - Special purpose equipment, General

System	Subsystem	Title	Definition
P4		**Special purpose equipment, General**	
	-00	General	This element refers to that special-to-purpose equipment (hardware/software) for the achievement of a special mission purpose. It covers, for example, equipment for repair workshops, medical and other special purpose platforms.

2.2.15 System Q - Outfit, Furnishings and stowage system

Table 96 System Q0 - Outfit and furnishings, General

System	Subsystem	Title	Definition
Q0		**Outfit and furnishings, General**	
	-00	General	A function or equipment used to provide habitability, operability or stowage facilities that is not specifically included in other systems.

Table 97 System Q1 - Preservations and coverings, General

System	Subsystem	Title	Definition
Q1		**Preservations and coverings, General**	
	-00	General	Coverings made from weatherproof fabrics, plastics and synthetics to protect items of exposed equipment and machinery from the elements (particularly salt water spray)

Table 98 System Q2 - Protective coatings, General

System	Subsystem	Title	Definition
Q2		**Protective coatings, General**	
	-00	General	Protective paint (usually oil based and anti fouling) applied to surfaces which are exposed to sea water or other corrosive elements.

Table 99 System Q3 - Storerooms, General

System	Subsystem	Title	Definition
Q3		**Storerooms, General**	
	-00	General	Spaces that are designed to hold stores of a long term or ready use nature (other than weapons, ammunition and food supplies.
	-10	Utility space	Spaces that are designed and specifically fitted out for the storage or provision of utilities.

Table 100 System Q4 - Bathrooms and toilets, General

System	Subsystem	Title	Definition
Q4		**Bathrooms and toilets, General**	
	-00	General	Spaces that are designed and specifically fitted out for the provision of bathroom and toilet facilities.

Table 101 System Q5 - Workshops, General

System	Subsystem	Title	Definition
Q5		**Workshops, General**	
	-00	General	Spaces that are designed and specifically fitted out for the maintenance of machinery and certain specialized equipment.

Table 102 System Q6 - Laboratories, General

System	Subsystem	Title	Definition
Q6		**Laboratories, General**	
	-00	General	Rooms that are used for carrying out scientific tests on items of equipment and some substances.

Table 103 System Q7 - Test areas, General

System	Subsystem	Title	Definition
Q7		**Test areas, General**	
	-00	General	Rooms that are used for carrying out tests on items of equipment.

Table 104 System Q8 - Galley/pantry scullery, General

System	Subsystem	Title	Definition
Q8		**Galley/pantry scullery, General**	
	00	General	Rooms that are used for preparation and serving of food and refreshments.

Table 105 System Q9 - Commissary, General

System	Subsystem	Title	Definition
Q9		**Commissary, General**	
	-00	General	Rooms that are used for storage of food and drink, sometimes with specialized storing requirements such as frozen food.

Table 106 System QA - Accommodation spaces, General

System	Subsystem	Title	Definition
QA		**Accommodation spaces, General**	
	-00	General	Spaces that are designed and fitted to provide habitable (living and recreational) accommodation.

Table 107 System QB - Offices, General

System	Subsystem	Title	Definition
QB		**Offices, General**	
	-00	General	Spaces in which work of an administrative nature is carried out.

Table 108 System QC - Control centers, General

System	Subsystem	Title	Definition
QC		**Control centers, General**	
	-00	General	Rooms that are used for the control of operations and/or processes.

Table 109 System QD - Machinery spaces, General

System	Subsystem	Title	Definition
QD		**Machinery spaces, General**	
	-00	General	Spaces that contain permanent and fixed items of machinery.

Table 110 System QE - Medical, dental and pharmaceutical spaces, General

System	Subsystem	Title	Definition
QE		**Medical, dental and pharmaceutical spaces, General**	
	-00	General	Rooms that are used for the provision of medical, dental and pharmaceutical facilities.

Table 111 System QF - Laundry, General

System	Subsystem	Title	Definition
QF		**Laundry, General**	
	-00	General	Spaces that are designed and specially fitted for the washing and drying of linen and fabrics.

2.2.16 System R - Training system

Table 112 System R0 - Training, General

System	Subsystem	Title	Definition
R0		**Training, General**	
	-00	General	A system or equipment used to provide training capabilities.
	-10	Training	The training element is defined as the deliverable training services, devices, accessories, aids, equipment and facilities used to enable instruction through which personnel will acquire sufficient concepts, skill and aptitudes to operate and maintain the system with maximum efficiency. This element includes all effort associated with the design, development and production of deliverable training equipment as well as the execution of training services.
	-20	Non weapon trainers and simulators	A system or equipment used to provide training capabilities for non weapon systems and simulators
	-30	Weapon systems trainers and simulators	A system or equipment used to provide training capabilities for weapon systems and simulators.

2.2.17 System S - Repair test and support system

Table 113 System S0 - Repair test and support, General

System	Subsystem	Title	Definition
S0		**Repair test and support, General**	
	-00	General	A system, equipment or facilities used to maintain operational capability.

2.2.18 System T - Management system

Table 114 System T0 - Management system

System	Subsystem	Title	Definition
T0		**Management system, General**	
	-00	General	A system, equipment or facilities used to manage the totality of complex integrated management systems.

Table 115 System T1 - Platform management system

System	Subsystem	Title	Definition
T1		**Platform management system, General**	
	-00	General	A system, equipment or facilities used to monitor and manage the totality of Power systems.
	-10	Operator facilities	Refers to the roles and facilities provided to the operator at the Consoles by the MMI
	-20	Data processing	Refers to equipment fitted to a platform, which combines and processes Power systems data
	-30	Consoles	Refers to the consoles fitted to the platform.
	-40	Monitor	Refers to the equipment fitted to the platform which monitors systems.
	-50	Cabinets	Refers to Equipment Cabinets, which can be configured with equipment units from multiple systems.
	-60	Maintainer facilities	Refers to the Maintainers and Diagnostic facilities fitted to the platform
	-70	Peripheral equipment	Refers to any peripheral support equipment fitted to the platform (eg; printers).

Table 116 System T2 - Not available for projects

System	Subsystem	Title	Definition
T2		Not available for projects	
	-00 thru -90	Available for projects	

Table 117 System T3 - Combat management and data transfer system, General

System	Subsystem	Title	Definition
T3		**Combat management and data transfer system, General**	
	-00	General	A system, equipment or facilities used to a platform which combines, processes, and distributes Central Maintenance System (CMS) Data.
	-10	Operator facilities	Refers to the roles and facilities provided to the operator at the Consoles by the MMI.
	-20	Combat management	Refers to equipment fitted to a platform, which combines and processes CMS data.
	-30	Consoles	Refers to the consoles fitted to the platform.
	-40	Data transfer	Refers to the DTS equipment fitted to the platform which distributes the CMS data.
	-50	Cabinets	Refers to Equipment Cabinets, which can be configured with equipment units from multiple systems.
	-60	Maintainer facilities	Refers to the Maintainers and Diagnostic facilities fitted to the platform
	-70	Peripheral equipment	Refers to any peripheral support equipment fitted to the platform (eg, printers).

2.2.19 System U - Meteorological and oceanography system

Table 118 System U0 - Meteorological and Oceanography systems, General

System	Subsystem	Title	Definition
U0		**Meteorological and Oceanography systems - General**	

System	Subsystem	Title	Definition
	-00	General	A platform system, equipment or facilities used to collect, process, and distribute meteorological and oceanographic data.

Table 119 System U1 - Meteorological systems, General

System	Subsystem	Title	Definition
U1		**Meteorological systems - General**	
	-00	General	A system, equipment or facilities used to collect, process systems, and distribute meteorological data.

Table 120 System U2 - Oceanography systems, General

System	Subsystem	Title	Definition
U2		**Oceanography systems - General**	
	-00	General	A system, equipment or facilities used to collect, process systems and distribute oceanographic data.

Table 121 System U3 - Data transmission, General

System	Subsystem	Title	Definition
U3		**Data transmission - General**	
	-00	General	A system, equipment or facilities used for the transmission and distribution of meteorological and oceanographic (METOC) data, including ship borne Ethernet.

Table 122 System U4 - Data processing, General

System	Subsystem	Title	Definition
U4		**Data processing - General**	
	-00	General	Refers to the equipment used for the collation and processing of METOC data.

Table 123 System U5 - Man-Machine Interfaces, General

System	Subsystem	Title	Definition
U5		**Man-Machine Interfaces - General**	
	-00	General	Refers to the equipment used for receiving non-ship borne (remote) METOC data (eg, consoles, laptops, etc).

Table 124 System U6 - Data receivers, General

System	Subsystem	Title	Definition
U6		**Data receivers, General**	
	-00	General	Refers to the equipment used for receiving non-ship borne (remote) METOC data.

Chapter 8.3

SNS, information and learn codes - Example SNS

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Table 1 References

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None	

1 General

To assist in the data module coding strategy, example SNS have been provided on www.s1000d.org. Projects can decide to use these SNS without modification or use part and modify those areas that do not suit their needs. If these example SNS or the maintained SNS do not suit a projects needs, then projects can decide to design their own complete SNS. The examples are not maintained by any of the S1000D committees.

2 Example SNS

The example SNS are:

- combat vehicle project
- MIL-STD-1808 based project
- Geräteaufgliederungsplan (GAPL) based project
- power provision project
- climate control project
- automated handling project
- artillery radar project
- software project
- training project
- electrical project
- communications project
- electronic project
- surveillance project
- navigation project
- deployable airbase project
- medical project

- command post project
- technical publications project

Chapter 8.4

SNS, information codes and learn codes - Information codes

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Table 1 References

Chap No./Document No.	Title
Chap 8.4.1	Information codes - Short definitions
Chap 8.4.2	Information codes - Full definitions

1 General

Information codes are used to describe the type of information related to the Product about which the data module has been written. Each code has a full definition and a short definition. The short definitions are normally used to populate the element <infoName>in the element <dmTitle>. Projects can allocate specific information codes following the rules in Para 2.1.

2 Allocating codes and definitions

2.1 Project specific information codes

Codes that are defined as "Not available for projects" are controlled by S1000D. It is important, when allocating definitions, that the hierarchy of information codes is maintained and that the new definitions are used in a consistent manner.

Information codes have a hierarchy which is defined in Chap 8.4.1 and Chap 8.4.2. The secondary code (2nd character) is a child of the primary code (1st character) and the tertiary code (3rd character) is a child of the secondary code.

Projects can define project specific information codes in accordance with the following:

– With the exception of codes “00A” thru “00Z” projects can allocate alpha characters to the tertiary code only if the primary and secondary codes are already defined in Chap 8.4.1 and Chap 8.4.2

- The hierarchy must be preserved when allocating information codes and definitions
- The project must agree to its own short and full definitions

Business rule decision point BRDP-S1-00550 - Allocation of project specific information codes:

- Decide and agree on allocation of project specific information codes and give them short and full definitions.

2.2 Use of information codes

The use of the detailed information code breakdown is applicable only where the appropriate extensive and detailed information needs to be provided or is needed for the sake of clarity. In simple cases, information must not be broken down unnecessarily. The information must be provided under the next higher information code in a summarized form. Should this still result in an unnecessary breakdown, all information must be furnished under the appropriate primary information code.

For general technical publications, some of the SNS (eg, systems 05 thru 12 of the SNS) already identify the requirement for the type of information for the data module (eg, subsystem 05-10 requires time limits), a standard information code "000" is used in these cases.

The hierarchy is organized into primary and secondary codes. The primary codes are defined at Para 2.3 and the secondary codes are defined at Chap 8.4.1 for short definitions and Chap 8.4.2 for full definitions.

2.3 Primary codes

The primary codes are defined as:

- 000 Function, data for plans and description
- 100 Operation
- 200 Servicing
- 300 Examinations, tests and checks
- 400 Fault report and isolation procedures
- 500 Disconnect, remove and disassemble procedures
- 600 Repairs and locally make procedures and data
- 700 Assemble, install and connect procedures
- 800 Storage procedures and data
- 900 Miscellaneous
- C00 Computer systems, software and data

3 Translation of information code definitions

A project can, by project decision, translate the definitions given to the information codes listed in Chap 8.4.1 and Chap 8.4.2. The translation must be a direct translation without any deviations in the scope of the definitions.

Business rule decision point BRDP-S1-00551 - Translation of information code definitions:

- Decide whether to translate and use the information code definitions in the languages adopted by the project.

Chapter 8.4.1

Information codes - Short definitions

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2.7 Primary code 500 - Disconnect, remove and disassemble procedures 17
2.8 Primary code 600 - Repairs and locally make procedures and data 18
2.9 Primary code 700 - Assemble, install and connect procedures 21
2.10 Primary code 800 - Package, handling, storage and transportation 23
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Table 1 References

Chap No./Document No.	Title
None	

1 General

The following tables contain the short definitions for information codes. Refer to default BREX rule BREX-S1-00180.

2 Short definitions

2.1 Primary codes

The identification elements are applicable to the Product, engine and equipment data modules.

Table 2 Primary codes

Primary code	Definition
000	Function, data for plans and description
100	Operation
200	Servicing
300	Examinations, tests and checks
400	Fault reports and isolation procedures
500	Disconnect, remove and disassemble procedures
600	Repairs and locally make procedures and data
700	Assemble, install and connect procedures
800	Package, handling, storage and transportation
900	Miscellaneous
C00	Computer systems, software and data

The short definitions are given in Table 3 thru Table 13.

.

2.2 Primary code 000 - Function, data for plans and description

Table 3 Code 000 - Function, data for plans and description

IC	Definition	Remarks
000	Function, data for plans and description	
001	Title page	
002	List of pages or data modules	See also code 00R and code 00S
003	Change record or highlights	See also code 00T and code 00U
004	Access illustration	
005	List of abbreviations	
006	List of terms	
007	List of symbols	

IC	Definition	Remarks
008	Technical standard record	
009	Table of contents	
010	General data	
011	Function	
012	General warnings and cautions and related safety data	
013	Numeric index	
014	Alphabetic and alphanumeric index	Used also for list of applicable publications
015	List of special materials	
016	List of dangerous materials	
017	List of related data	Refer to code 00V for LOASD
018	Introduction	
019	Supplier list	
020	Configuration	
021	Copyright	
022	Business rules exchange	
023	Administrative forms and data	
024	Business rules	
025	Export control policy	
026	Regulatory policy	
027	Not available for projects	
028	General	Refer to codes 010 and 018
029	Data structure	
030	Technical data	
031	Electrical standard parts data	
032	Not available for projects	
033	Technical data (functional breakdown)	
034	Technical data (physical breakdown)	
035 thru 039	Not available for projects	

IC	Definition	Remarks
040	Description	
041	Description of how it is made	
042	Description of function	
043	Description of function attributed to crew (functional breakdown)	
044	Description of function (physical breakdown)	
045	Designated use	
046	Dependence on peripheral systems/equipment	
047 thru 049	Not available for projects	
050	Diagram/List	
051	Wiring diagram	
052	Routing diagram	
053	Connection list	
054	Schematic diagram	
055	Location diagram	
056	Equipment list	
057	Wire list	
058	Harness list	
059	Maintenance envelope diagram	
060	Product support equipment, tools and software	
061	Special support equipment and tools	
062	Standard support equipment and tools	
063	Government supplied support equipment and tools	
064	Locally made support equipment and tools	
065	Software	
066	Support equipment and tools data	
067	Decals and instruction plates	
068 thru 069	Not available for projects	
070	Consumables, materials and expendables	Supplies = consumables, materials and expendables

IC	Definition	Remarks
071	Consumables	
072	Materials	
073	Expendables	
074	Data sheet for dangerous consumables and materials	
075	Parts list	
076	Fluid	
077	Data sheet for consumables and materials	
078	Fasteners	
079	Not available for projects	
080	Mixture and solution	
081	Chemical solution	
082	Chemical mixture	
083 thru 089	Not available for projects	
090	Software documentation	
091 thru 095	Not available for projects	
096	Safety critical items and parts	
097 thru 099	Not available for projects	
00A	List of illustrations	Normally used in front matter data modules
00B	List of support equipment	Normally used in front matter data modules
00C	List of supplies	Normally used in front matter data modules
00D	List of spares	Normally used in front matter data modules
00E	Functional item numbers common information repository	
00F	Circuit breakers common information repository	

IC	Definition	Remarks
00G	Parts common information repository	
00H	Zones common information repository	
00J	Access panels and doors common information repository	
00K	Organizations common information repository	
00L	Supplies - List of products common information repository	
00M	Supplies - List of requirements common information repository	
00N	Support equipment common information repository	
00P	Product Cross-reference Table (PCT)	
00Q	Conditions Cross-reference Table (CCT)	
00R	List of effective pages	Refer to code 002
00S	List of effective data modules	Refer to code 002
00T	Change record	Refer to code 003
00U	Highlights	Refer to code 003
00V	List of applicable specifications and documentation	
00W	Applicability Cross-reference Table (ACT)	
00X	Controls and indicators common information repository	
00Y	List of charts and forms	
00Z	List of tables	
0A1	Functional and/or physical areas repository	
0A2	Applicability repository	
0A3	Applicability cross-reference table catalog	
0A4	Warnings - List of warnings in the common information repository	
0A5	Cautions - List of cautions in the common information repository	
0A6 thru 0AZ	Not available for projects	
0B0	Maintenance planning information	
0B1	Time limits	
0B2	System maintenance/inspection tasks list	
0B3	Structure maintenance/inspection tasks list	

IC	Definition	Remarks
0B4	Zonal maintenance/inspection tasks list	
0B5	Unscheduled check	
0B6 thru 0BZ	Not available for projects	

2.3 Primary code 100 - Operation

Table 4 Code 100 - Operation

IC	Definition	Remarks
100	Operation	
101	List of consumables associated with operation	
102	List of materials associated with operation	
103	List of expendables associated with operation	
104	List of special support equipment and tools associated with operation	
105	List of support equipment and tools associated with operation	
106	List of software associated with operation	
107	Parts list associated with operation	
108 and 109	Not available for projects	
110	Controls and indicators	
111	Controls and indicators	This code is used for crew
112	Modes of operation	This code is used for crew
113 and 114	Not available for projects	
115	Displays and alerts	
116 thru 119	Not available for projects	
120	Pre-operation	
121	Pre-operation procedure	This code is used for crew

IC	Definition	Remarks
122	Siting	
123	Shelter	
124	Not available for projects	
125	Pre-operation procedures checklist	This code is used for crew
126	Conditions of readiness	
127	Establish operating position	
128 thru 129	Not available for projects	
130	Normal operation	
131	Normal operation procedure	This code is used for crew
132	Start-up procedure for maintenance	
133	Shutdown procedure for maintenance	
134	Aviation checklist	
135	Normal operation procedures checklist	This code is used for crew
136	Ground running check	
137	Not available for projects	
138	Ground running performance adjustment	
139	Nuclear, biological and chemical procedures	
140	Emergency procedure	
141	Emergency operation procedure	This code is used for crew
142	Operation under unusual conditions	
143	Radio interference suppression	
144	Jamming and electronic countermeasures (ECM)	
145	Emergency operation procedures checklist	This code is used for crew
146	Emergency shutdown operation procedure	
147 thru 149	Not available for projects	
150	Post-operation	

IC	Definition	Remarks
151	Post-operation procedure	This code is used for crew
152 thru 154	Not available for projects	
155	Post-operation procedures checklist	This code is used for crew
156	Not available for projects	
157	Establish maintenance position	
158 thru 159	Not available for projects	
160	Loading/Unloading procedure	
161	Special operation	
162	Non-tactical operation	
163 thru 168	Not available for projects	
169	Mass and balance	
170	Handling	
171	Lifting	
172	Jacking	
173	Shoring	
174	Towing	
175	Taxiing	
176	Lowering	
177	Stabilizing	
178	Tethering	
179	Debogging	
180	Dispatch deviation	
181	Deactivate for dispatch deviation	
182 thru 199	Not available for projects	

2.4 Primary code 200 - Servicing

Table 5 Code 200 - Servicing

IC	Definition	Remarks
200	Servicing	
201	List of consumables associated with servicing	
202	List of materials associated with servicing	
203	List of expendables associated with servicing	
204	List of special support equipment and tools associated with servicing	
205	List of support equipment and tools associated with servicing	
206	List of software associated with servicing	
207	Parts list associated with servicing	
208 and 209	Not available for projects	
210	Fill	
211	Refuel	
212	Fill with oil	
213	Fill with oxygen	
214	Fill with nitrogen	
215	Fill with air	
216	Fill with water	
217	Fill with hydrogen	
218	Fill with other liquid	
219	Fill with other gas	
220	Drain liquid and release pressure	
221	Defuel and drain fuel	
222	Drain oil	
223	Release oxygen pressure	
224	Release nitrogen pressure	
225	Release air pressure	
226	Drain water	
227	Release hydrogen pressure	
228	Drain other liquid	

IC	Definition	Remarks
229	Release other gas pressure	
230	Bleed and prime	
231	Bleed	
232	Prime	
233	Dry	
234	Facility requirements associated with servicing	
235	Flush	
236	Fill with inert gas/inert liquid	
237	Evacuate	
238 and 239	Not available for projects	
240	Lubrication	
241	Oil	
242	Grease	
243	Dry film	
244 thru 249	Not available for projects	
250	Clean and apply surface protection	
251	Clean with chemical agent	
252	Clean by abrasive blast	
253	Clean by ultrasonics	
254	Clean mechanically	
255	Purge	
256	Polish and apply wax	
257	Paint and apply marking	
258	Other procedure to clean	
259	Other procedure to protect surfaces	
260	Remove and prevent ice and remove contamination	
261	Remove ice	
262	Prevent ice	
263	Use disinfectant/Sanitize	
264	Remove contamination	

IC	Definition	Remarks
265 thru 269	Not available for projects	
270	Adjust, align and calibrate	
271	Adjust	
272	Align	
273	Calibrate	
274	Harmonize	
275	Grooming	
276	Rig	
277	Compensate	
278	Easily and quickly adjust after a battle damage repair	
279	Easily and quickly align after a battle damage repair	
280	Inspection	
281	Scheduled inspection	
282	Unscheduled inspection	
283	Special regular inspection	
284	Special irregular inspection	
285	Structure inspection for allowable damage limits	
286	Structure inspection for repair	
287	Not available for projects	
288	Overhaul and retirement schedule	
289	Check filling quantity	
290	Change of liquid/gas	
291	Not available for projects	
292	Change of oil	Code 222 + code 212
293	Change of oxygen	Code 223 + code 213
294	Change of nitrogen	Code 224 + code 214
295	Change of air	Code 225 + code 215
296	Change of water	Code 226 + code 216

IC	Definition	Remarks
297	Change of hydrogen	
298	Change of other liquid	Code 228 + code 218
299	Change of other gas	Code 229 + code 219

2.5 Primary code 300 - Examinations, tests and checks

Table 6 Code 300 - Examinations, test and checks

IC	Definition	Remarks
300	Examinations, tests and checks	
301	List of consumables associated with examinations, tests and checks	
302	List of materials associated with examinations, tests and checks	
303	List of expendables associated with examinations, tests and checks	
304	List of special support equipment and tools associated with examinations, tests and checks	
305	List of support equipment and tools associated with examinations, tests and checks	
306	List of software associated with examinations, tests and checks	
307	Parts list associated with examinations, tests and checks	
308 and 309	Not available for projects	
310	Visual examination	
311	Visual examination without special equipment	
312	Examination with a borescope	
313 and 314	Not available for projects	
315	QA requirements	
316 thru 319	Not available for projects	
320	Operation test	

IC	Definition	Remarks
321	Unit break-in	
322	Test and inspection	
323 thru 329	Not available for projects	
330	Test preparation	
331	Connection of test equipment	
332	Removal of test equipment	
333	Installation of the unit before the test	
334	Removal of the unit after the test	
335	Final measures	
336 thru 339	Not available for projects	
340	Function test	
341	Manual test	
342	Automatic test	
343	BIT	
344	Compatibility test	
345	System test	
346	Other check	
347	Start-up procedure for test	
348	Final acceptance test (FAT)	
349	Test records	
350	Structure test	
351	Test for surface cracks with dye penetrant	
352	Test for surface cracks with magnetic particles	
353	Test for cracks and other defects with eddy current	
354	Test for cracks and other defects with X-rays	
355	Test for cracks and other defects with ultrasonics	
356	Hardness test	
357	Gamma-ray test	
358	Resonance frequency test	
359	Thermographic test	

IC	Definition	Remarks
360	Design data/tolerances check	
361	Dimensions check	
362	Pressure check	
363	Flow check	
364	Leak check	
365	Continuity check	
366	Resistance check	
367	Electrical power check	
368	Signal strength check	
369	Other check	
370	Monitor the condition	
371	Oil analysis	
372	Vibration analysis	
373	Tracking check	
374	Fuel analysis	
375	Shooting accidental discharge analysis	
376	Check post application of adhesive	
377	Contamination analysis	
378 thru 389	Not available for projects	
390	Sample test	
391 thru 395	Not available for projects	
396	Flight control surface movement	
397	Landing gear movement	
398	Product configuration	
399	Not available for projects	

2.6 Primary code 400 - Fault reports and isolation procedures

Table 7 Code 400 - Fault reports and isolation procedures

IC	Definition	Remarks
400	Fault reports and isolation procedures	

IC	Definition	Remarks
401	List of consumables associated with fault diagnosis	
402	List of materials associated with fault diagnosis	
403	List of expendables associated with fault diagnosis	
404	List of special support equipment and tools associated with fault diagnosis	
405	List of support equipment and tools associated with fault diagnosis	
406	List of software associated with fault diagnosis	
407	Parts list associated with fault diagnosis	
408 and 409	Not available for projects	
410	General fault description	
411	Isolated fault	
412	Detected fault	
413	Observed fault	
414	Correlated fault	
415	Impact of fault	
416 thru 419	Not available for projects	
420	General fault isolation procedure	
421 thru 428	Fault isolation procedure	
429	Diagnostics	
430	Fault isolation task supporting data	
431 thru 439	Not available for projects	
440	Index	
441	Fault code index	
442	Maintenance message index	
443	Post-troubleshooting shutdown procedure	
444 thru 449	Not available for projects	

IC	Definition	Remarks
450 thru 499	Not available for projects	

2.7 Primary code 500 - Disconnect, remove and disassemble procedures

Table 8 Code 500 - Disconnect, remove and disassemble procedures

IC	Definition	Remarks
500	Disconnect, remove and disassemble procedures	
501	List of consumables associated with removal	
502	List of materials associated with removal	
503	List of expendables associated with removal	
504	List of special support equipment and tools associated with removal	
505	List of support equipment and tools associated with removal	
506	List of software associated with removal	
507	Parts list associated with removal	
508 and 509	Not available for projects	
510	Disconnect procedure	
511 thru 519	Not available for projects	
520	Remove procedure	
521	Return to basic configuration	Undressing
522	Remove support equipment/Remove from support equipment	
523	Preparation before removal	
524	Follow-on maintenance	
525	Ammunition unloading	
526	Deactivate launching device	
527 thru 529	Not available for projects	
530	Disassemble procedure	

IC	Definition	Remarks
531	Disassemble on operation site	
532 thru 539	Not available for projects	
540	Open for access procedure	
541 thru 549	Not available for projects	
550	Unload software procedure	
551	Fault monitoring storage readout (downloading)	
552	Data erasing	
553	Display, copy and print of data	
554 thru 559	Not available for projects	
560	Deactivation procedure	
561	De-energize electrical network	
562	Depressurize hydraulics	
563	Deactivation maintenance practice	
564 thru 599	Not available for projects	

2.8 Primary code 600 - Repairs and locally make procedures and data

Table 9 Code 600 - Repairs and locally make procedures and data

IC	Definition	Remarks
600	Repairs and locally make procedures and data	
601	List of consumables associated with repairs	
602	List of materials associated with repairs	
603	List of expendables associated with repairs	
604	List of special support equipment and tools associated with repairs	
605	List of support equipment and tools associated with repairs	
606	List of software associated with repairs	
607	Parts list associated with repairs	

IC	Definition	Remarks
608 and 609	Not available for projects	
610	Add material	
611	Insulation	
612	Metalize	
613	Pot	
614	Remetal	
615	Retread	
616 thru 619	Not available for projects	
620	Attach material	
621	Bond	
622	Crimp	
623	Braze	
624	Rivet	
625	Solder	
626	Splice	
627	Weld	
628 and 629	Not available for projects	
630	Change the mechanical strength/structure of material	
631	Anneal	
632	Case harden	
633	Cure	
634	Normalize	
635	Shot-peen	
636	Temper	
637	Not available for projects	
638	Other treatment	
639	Other process to change the mechanical strength/structure of material	
640	Change the surface finish of material	

IC	Definition	Remarks
641	Anodize	
642	Buff	
643	Burnish	
644	Chromate	
645	Hone	
646	Lap	
647	Plate	
648	Polish	
649	Cleanup of dents, cracks and scratches	
650	Remove material	
651	Abrasive blast	
652	Bore/drill/ream	
653	Electrical/electrochemical/chemical etch	
654	Broach	
655	Grind	
656	Mill	
657	Thread/tap	
658	Turn	
659	Other process to remove material	
660	Structure repair procedure and data	
661	Allowable damage	
662	Temporary repair procedure	
663	Standard repair procedure	
664	Special repair procedure	
665	Fly-in repair procedure	
666	Material classification	
667	Structure classification	
668	Allowable damage of composite structures	
669	Allowable damage of mixed structures	
670	Locally make procedure and data	
671	Making of parts	

IC	Definition	Remarks
672 thru 679	Not available for projects	
680	Battle damage repair procedure and data	
681	Damage repair symbol marking	
682	Identification of damaged hardware	
683	Damage assessment	
684	Utilization degradation	
685	Repair procedure	
686	Isolation procedure	
687	Function test after battle damage repair	
688	Battle damage repair kit	
689	Damage repair	
690	Miscellaneous	
691	Marking	
692	Connector repair	
693	Varnish	
694 thru 699	Not available for projects	

2.9 Primary code 700 - Assemble, install and connect procedures

Table 10 Code 700 - Assemble, install and connect procedures

IC	Definition	Remarks
700	Assemble, install and connect procedures	
701	List of consumables associated with installation	
702	List of materials associated with installation	
703	List of expendables associated with installation	
704	List of special support equipment and tools associated with installation	
705	List of support equipment and tools associated with installation	
706	List of software associated with installation	
707	Parts list associated with installation	

IC	Definition	Remarks
708 and 709	Not available for projects	
710	Assemble procedure	
711	Tighten procedure	
712	Lock procedure	
713	Pack procedure	
714	Assemble on operation site	
715 thru 719	Not available for projects	
720	Install procedure	
721	Build up to usable configuration	Dressing
722	Install support equipment/Install on support equipment	
723	Preparation before installation	
724	Follow-on maintenance	
725	Ammunition loading	
726	Activate launching device	
727	Site location plans	
728	Foundation preparation	
729	Not available for projects	
730	Connect procedure	
731 thru 739	Not available for projects	
740	Close after access procedure	
741 thru 749	Not available for projects	
750	Load software procedure	
751	Not available for projects	
752	Data loading	
753 thru 759	Not available for projects	
760	Reactivation procedure	

IC	Definition	Remarks
761	Energize electrical network	
762	Pressurize hydraulics	
763 thru 799	Not available for projects	

2.10 Primary code 800 - Package, handling, storage and transportation

Table 11 Code 800 - Package, handling, storage and transportation

IC	Definition	Remarks
800	Package, handling, storage and transportation	
801	List of consumables associated with storage	
802	List of materials associated with storage	
803	List of expendables associated with storage	
804	List of special support equipment and tools associated with storage	
805	List of support equipment and tools associated with storage	
806	List of software associated with storage	
807	Parts list associated with storage	
808 and 809	Not available for projects	
810	Preservation procedure	
811	Preparation for vehicle transportation	
812	Shipping and storage - General	
813 thru 819	Not available for projects	
820	Procedure to remove preservation material	
821 thru 829	Not available for projects	
830	Procedure to put item in containers	
831	Vehicle loading	
832	Procedure to pack items	

IC	Definition	Remarks
833 thru 839	Not available for projects	
840	Procedure to remove item from containers	
841	Vehicle unloading	
842	Procedure to unpack items	
843 thru 849	Not available for projects	
850	Procedure to keep item serviceable when in storage	
851 thru 859	Not available for projects	
860	Procedure to move item when in storage	
861 thru 869	Not available for projects	
870	Procedure to prepare item for use after storage	
871	Set on condition	
872 thru 879	Not available for projects	
880	Procedure when item got out of storage	
881 thru 889	Not available for projects	
890	Life data of item when in storage	
891 thru 899	Not available for projects	

2.11 Primary code 900 - Miscellaneous

Table 12 Code 900 - Miscellaneous

IC	Definition	Remarks
900	Miscellaneous	
901	Miscellaneous list of consumables	
902	Miscellaneous list of materials	
903	Miscellaneous list of expendables	

IC	Definition	Remarks
904	Miscellaneous list of special support equipment and tools	
905	Miscellaneous list of support equipment and tools	
906	Miscellaneous list of software	
907	Miscellaneous parts list	
908 and 909	Not available for projects	
910	Miscellaneous	
911	Illustration	
912	Handling procedure	Not to be used for new projects. Use IC 170 instead.
913	General maintenance procedure	
914	Container data module	
915	Facilities	
916	Maintenance allocation	
917	Non-S1000D publication	
918 and 919	Not available for projects	
920	Change = Remove and install	
921	Change = Remove and install a new item	
922	Change = Remove and install the removed item	
923	Change = Disconnect and connect an item	
924 thru 929	Not available for projects	
930	Service bulletin	
931	Service bulletin data	Not available for projects. (Used for service bulletins following the rules in Issue 4.0 or earlier issues.)

IC	Definition	Remarks
932	Planning information	Not available for projects. (Used for service bulletins following the rules in Issue 4.0 or earlier issues.)
933	Accomplishment procedure - Task set	
934	Material information	
935 thru 939	Not available for projects	
940	Provisioning data	
941	Illustrated parts data	IPD
942	Numerical index	IPD
943 thru 949	Not available for projects	
950	Composite information	
951	Generic process	
952	Generic learning content	
953 thru 960	Not available for projects	
961	Calculation worksheets	
962 thru 969	Not available for projects	
970	Approved vendor processes	
971 thru 979	Not available for projects	
980	Environmental protection, fire-fighting and rescue	
981	Air cleaning	For example, filtering to obtain clean air
982	Sewage treatment	
983 thru 988	Not available for projects	
989	Fire-fighting and rescue	

IC	Definition	Remarks
990	Neutralization and disposal	
991	Neutralization of ordnance	
992	Neutralization of substance	
993 thru 995	Not available for projects	
996	Disposal of ordnance	
997	Disposal of Product	
998	Disposal of substance	
999	Not available for projects	

2.12 Primary code C00 - Computer systems, software and data

Table 13 Code C00 - Computer systems, software and data

IC	Definition	Remarks
C00	Computer systems, software and data	
C01	Miscellaneous list of consumables associated with computer systems, software and data	
C02	Miscellaneous list of materials associated with computer systems, software and data	
C03	Miscellaneous list of expendables associated with computer systems, software and data	
C04	Miscellaneous list of special support equipment and tools associated with computer systems, software and data	
C05	Miscellaneous list of support equipment and tools associated with computer systems, software and data	
C06	Miscellaneous list of software associated with computer systems, software and data	
C07	Miscellaneous parts list associated with computer systems, software and data	
C08 thru C12	Not available for projects	
C13	Notes	
C14	Problem handling	
C15	Summary of content	

IC	Definition	Remarks
C16 thru C19	Not available for projects	
C20	System administration	
C21	System monitoring	
C22	Description of command	
C23	Connect hardware	
C24	Not available for projects	
C25	System recovery	
C26	Backup and restore	
C27	Reboot	
C28 and C29	Not available for projects	
C30	Coordinate	
C31	Defragmentation	
C32	Input/Output media	
C33	Disk mirroring	
C34	Clear interference	
C35	Time check	
C36	Compatibility check	
C37 thru C49	Not available for projects	
C50	Manage data	
C51	Move data	
C52	Manipulate/Use data	
C53	Description of data storage	
C54 thru C59	Not available for projects	
C60	Programming information	
C61	Program flow chart	
C62	Processing reference guide	

IC	Definition	Remarks
C63 thru C69	Not available for projects	
C70	Security and privacy	
C71	Not available for projects	
C72	Security information	
C73	Security procedures	
C74	List of security/classification codes	
C75	Access control	
C76 thru C89	Not available for projects	
C90	Miscellaneous	
C91	Quality assurance	
C92	Vendor information	
C93 and C94	Not available for projects	
C95	Naming conventions	
C96	Technical requirements	
C97 thru C99	Not available for projects	

Chapter 8.4.2

Information codes - Full definitions

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References

Table 1 References

Chap No./Document No.	Title
Chap 3.9.3	Authoring - Warnings, cautions and notes
Chap 3.9.4	Authoring - Front matter
Chap 5.3.1.3	Common requirements - Illustrated parts data

1 General

The following tables contain the full definitions for information codes.

2 Full definitions

2.1 Primary codes

The identification elements are applicable to the Product, engine and equipment data modules.

Table 2 Primary codes

Primary code	Definition
000	Function, data for plans and description
100	Operation
200	Servicing
300	Examinations, tests and checks
400	Fault reports and isolation procedures
500	Disconnect, remove and disassemble procedures
600	Repairs and locally make procedures and data
700	Assemble, install and connect procedures
800	Package, handling, storage and transportation
900	Miscellaneous
C00	Computer systems, software and data

The full definitions are given in Table 3 thru Table 13.

2.2 Primary code 000 - Function, data for plans and description

Table 3 Code 000 - function, data for plans and description

Primary code	Secondary code	Definition
000		Function, data for plans and description Code 000 data tells the user the function, operation, limits and location (if necessary) of the Product equipment or component. If the data is for more than one configuration or model, the differences are given. The code also includes more general data if this is necessary for operation and/or maintenance persons. This general data can be: – general warnings, cautions and related safety data – symbols and abbreviations used – all necessary material, support equipment, software and special tools.

Primary code	Secondary code	Definition
	001	Title page Code 001 gives information on a set of information (publication or a volume of publication). This information can be for example: – the title – issue number and date – change number and date
	002	List of pages or data modules Code 002 gives a list of pages or data modules in a set of information (publication or a volume of publication). The list can give for example: – document identifier – page number – page/document date – applicability The code is used for List of Effective Pages (LOEP) and List of Effective Data Modules (LOEDM), refer to Chap 3.9.4. For separate codes for LOEP and LOEDM, refer to code 00R and 00S respectively.
	003	Change record or highlights Code 003 gives information on the change state, including its history, of a set of information (publication or a volume of publication). It is also used for compilation of reason for changes of a set of information. The code is used for Change Record (CR) and Highlights. Refer to Chap 3.9.4. For separate codes for Change record and Highlights, refer to code 00T and 00U respectively.
	004	Access illustration Code 004 gives an illustration and its identification and status information used for graphical access.
	005	List of abbreviations Code 005 gives the abbreviations standards used in the data. Those abbreviations used that are not to the given standards are given in tables. This list also includes acronyms.
	006	List of terms Code 006 gives the terms used in the data. Those terms used that are not to the given standards are given in tables.
	007	List of symbols Code 007 gives the symbol standards from which symbols used on: – illustrations – wiring, routing and schematic diagrams. Those symbols used that are not to the given standards are given in tables.
	008	Technical standard record Code 008 gives information on incorporated technical changes in a set of information (publication or a volume of publication). The code is used for Technical Standard Record (TSR).

Primary code	Secondary code	Definition
	009	Table of contents Code 009 gives, in tabular format, the content of a set of information (publication or a volume of publication).
	010	General data Code 010 gives general data necessary for the operation and/or maintenance persons. This general data can be: – general warnings, cautions and related safety data – the symbols and abbreviations used – lists of special and dangerous materials – a list of related data not in the common source data base
	011	Function Code 011 gives the function for persons at command level, supervisors and other such users. With this data they can easily and quickly find what it does and how.
	012	General warnings and cautions and related safety data Code 012 gives general WARNINGS and CAUTIONS related to operation and/or maintenance. Refer to Chap 3.9.3 for definition and use of safety data.
	013	Numeric index Code 013 gives indexes in numeric order.
	014	Alphabetic and alphanumeric index Code 014 gives indexes in alphabetic or alphanumeric order. Used also for list of applicable publications.
	015	List of special materials Code 015 gives data on items made of metals and metal alloys which are easily damaged by corrosion (for example magnesium). The data is given in tables and identifies the item and its location.
	016	List of dangerous materials Code 016 gives data on materials which can damage a person's health. The data identifies the dangerous material and its location.
	017	List of related data Code 017 gives available data on standards, regulations, conversion factors, etc which the CSDB does not include. It is also used for List of Applicable Specifications and Documentation, (LOASD) For an explicit LOASD code, refer to code 00V.
	018	Introduction Code 018 gives introductory information on the content of a set of information (publication or a volume of publication). The information can include the purpose, scope, structure, special format and use of the information set. Information of a general nature, which is not specified in any other data module in the information set, can also be included.
	019	Supplier list Code 019 gives lists of suppliers providing products used for the maintenance of Product, engines or components and their equipment.
	020	Configuration Code 020 gives data on configuration or model differences.

Primary code	Secondary code	Definition
	021	Copyright Code 021 gives copyright statements.
	022	Business rules exchange Code 022 identifies the business rules exchange data module.
	023	Administrative forms and data Code 023 gives standard administrative forms required in technical data often located in front and rear matter (eg, promulgation letters, authentication information, warranty information).
	024	Business rules Code 024 identifies business rules data modules containing solutions to business rule decision points and other product related business rules that are used to produce the suite of publications created for the Product.
	025	Export control policy Code 025 gives export control policy statements.
	026	Regulatory policy Code 026 gives regulatory policy statements.
	027	Not available for projects
	028	General Code 028 gives information of general nature. For example, a summary of information in some accompanying data modules or an overview presentation of a Product. **Note** Code 018 must be used for introductory information of general nature for Information sets.
	029	Data structure Code 029 gives the project specific configuration and usage of each element of the wiring data description Schema for the associated wiring data Schema
	030	Technical data Code 030 is a list of data on the Product, system, equipment or component. The data is equivalent to (but can be more or less than) the examples of data that follow: – identification: name, type, model, part No., NATO stock No., etc – dimension and mass – performance data and tolerances: rating, input/output, consumption, operation speeds, thrust range, turning radius, etc – environmental limitations/requirements: ambient temperatures, humidity limits, coolant requirements (air/oil/water flow), etc – power supply requirements – operation materials: oils, fuels, coolant, etc – capacities – identification of sub-assemblies: name, type, model, part No., NATO stock No., etc.

Primary code	Secondary code	Definition
	031	Electrical standard parts data Code 031 gives the technical information for each defined electrical standard part.
	032	Not available for projects
	033	Technical data (functional breakdown) Code 033 represents the technical data in respect to the functional breakdown of the Product, system, equipment or component.
	034	Technical data (physical breakdown) Code 034 represents the technical data in respect to the physical breakdown of the Product, system, equipment or component
	035 thru 039	Not available for projects
	040	Description Code 040 gives information on how the object was made and the material used: the code also gives all the related data about its functions. This can also include descriptions, limitations, specifications and theory of operation.
	041	Description of how it is made Code 041 gives sufficient data for the user to know how the object was made and assembled. The data includes: – the materials the object is made of (steel, aluminum, magnesium, etc) – the manufacturing processes used to make the object (cast, machine, weld, etc) – the subject of disassembly.
	042	Description of function Code 042 gives sufficient data for the user to know the functions of the object so that he can do maintenance and failure isolation correctly. Where more than one subsystem or unit make a complete system, the relation is given.
	043	Description of function attributed to crew (functional breakdown) Code 043 gives a basic overview with sufficient detail for the crew to know the function of the systems and, if applicable, information on malfunction analysis and emergency operation. Information on operating limitations and characteristics in normal as well as in adverse weather and climatic conditions is also given. The information enables the crew to convert to and subsequently operate the Product safely and effectively without recourse to associated engineering documents. The information given under this code can also be used by maintainers.
	044	Description of function (physical breakdown) Code 044 gives a basic overview with sufficient detail for the maintainers to know the physical breakdown of the systems and, if applicable, information on malfunction analysis and emergency operation. Information on operating limitations and characteristics in normal as well as in adverse weather and climatic conditions is also given. The information enables the crew to convert to and subsequently operate the Product safely and effectively without recourse to associated engineering documents. The information given under this code can also be used by the crew.

Primary code	Secondary code	Definition
	045	Designated use Code 045 gives the short description of the designated use of a Product.
	046	Dependence on peripheral systems/equipment Code 046 gives the short description of the dependence on peripheral systems/equipment.
	047 thru 049	Not available for projects
	050	Diagram/List Code 050 gives the electrical, electronic and mechanical diagrams and lists for the Product, system, equipment or component. These diagrams and lists are necessary to do maintenance and with the code 042 data, help know the function. Refer to code 430 for data on failure symptom diagrams.
	051	Wiring diagram Code 051 gives the diagrams which show all the electrical and electronic circuits for the Product, system, equipment or component. The diagrams include the identification or wires and connections and the location of equipment and components. At the level of the Product, system, subsystem, sub-subsystem, the diagrams do not show the internal circuits of the equipment or components.
	052	Routing diagram Code 052 gives the diagrams which show the routing on the Product, system, equipment or component of all the pipes, hoses etc, and the electrical and electronic cables and harnesses. The diagrams also show the location of the components.
	053	Connection list Code 053 gives a full list of those connection points which are not a complete unit in the wiring diagrams. The connection points include high density connectors, bulkhead fairleads, distributors, strip connectors, ground connections etc.
	054	Schematic diagram Code 054 gives the diagrams which show how all the systems, equipment and components connect together. The diagrams give the complete operation to help the user isolate failures. The diagrams only show the internal circuit or equipment or components where necessary. Some systems have more than one level of diagrams: Block, simplified system schematic, system schematic, signal flow, pressure flow, etc.
	055	Location diagram Code 055 gives diagrams which show the location of all equipment and components such as circuit breakers, fuses, wire harnesses, etc, at system, subsystem or sub-subsystem level.
	056	Equipment list Code 056 gives a list of all equipment in the Product with details of each equipment or component.
	057	Wire list Code 057 gives a list of all wires in the Product with details of each wire and its connections.

Primary code	Secondary code	Definition
	058	Harness list Code 058 gives a list of all harnesses in the Product with salient details of each harness.
	059	Maintenance envelope diagram Code 059 gives the diagrams that identify the maintenance envelopes within the Product.
	060	Product support equipment, tools and software Code 060 is a general list of all necessary support equipment, tools and software
	061	Special support equipment and tools Code 061 is a list of all necessary support equipment and tools which have been made especially for the Product, equipment and component.
	062	Standard support equipment and tools Code 062 is a list of all necessary support equipment tools which have not been made especially for the Product, equipment and component.
	063	Government supplied support equipment and tools Code 063 is a list of all necessary support equipment tools supplied by the government for the Product, equipment, or component.
	064	Locally made support equipment and tools Code 064 is a list of drawings for all the necessary support equipment tools which the user has to make for the Product, equipment, or component.
	065	Software Code 065 is a list of all necessary computer software.
	066	Support equipment and tools data Code 066 gives information on support equipment tools. The equipment information includes, for example: – dimensions – mass – a parts list (normally a minimal list of parts that can be replaced by the user) – an illustration of the equipment.
	067	Decals and instruction plates Code 067 gives the illustrations and descriptions of decals and operating instruction plates located on the equipment, which are essential for operation.
	068 and 069	Not available for projects
	070	Consumables, materials and expendables Code 070 is a list of all necessary materials and contains safety data on those materials that are dangerous.
	071	Consumables Code 071 is a list of all the consumables (eg, oil, greases, sealants, safety wire) which help to do maintenance on the Product, system, equipment, or component (to make an item to repair damage). When necessary international equivalents are given.

Primary code	Secondary code	Definition
	072	Materials Code 072 is a list of all necessary materials (eg, sheet metal, rubber) required by the user to do maintenance on the Product, equipment or component (eg, to make an item to repair damage). When necessary international equivalents are given.
	073	Expendables Code 073 is a list of all items which the user must replace, or items which he cannot repair.
	074	Data sheet for dangerous consumables and materials Code 074 are data sheets for consumables and materials that are dangerous. The data sheet gives, for example: – the name – the manufacturer's name, address and NATO Code – the function – when it is dangerous and the cause – the safety precautions the user must follow (eg, safety equipment to use, medical first aid) – the precautions when you discard it – the type of fire extinguishers to use – how to keep it in storage – its flash point/radiation strength.
	075	Parts list Code 075 is a consolidated list of parts (other than expendables listed under code 073) identified in procedures and requiring data cross-referencing such as parts number.
	076	Fluid Code 076 gives data on fluids such as gases and water.
	077	Data sheet for consumables and materials Code 077 gives the list of data sheets for consumables and materials that are not dangerous.
	078	Fasteners Code 078 gives data (such as materials, specifications, sizes or procedures for installation) related to fasteners.
	079	Not available for projects
	080	Mixture and solution Code 080 gives information on solutions and mixtures and also gives safety data on those materials that are dangerous.
	081	Chemical solution Code 081 gives all information to prepare, use and regenerate a chemical solution.
	082	Chemical mixture Code 082 gives all information to prepare, use and regenerate a chemical mixture.

Primary code	Secondary code	Definition
	083 thru 089	Not available for projects
	090	Software documentation Code 090 gives sufficient data to help the user use the applicable computer software.
	091 thru 095	Not available for projects
	096	Safety items and parts Code 096 gives a list of safety critical items and parts.
	097 thru 099	Not available for projects
	00A	List of illustrations (normally used in front matter) Code 00A gives the list of illustrations for a publication.
	00B	List of support equipment (normally used in front matter) Code 00B gives the list of support equipment for a publication.
	00C	List of supplies (normally used in front matter) Code 00C gives the list of supplies for a publication.
	00D	List of spares (normally used in front matter) Code 00D gives the list of spares for a publication.
	00E	Functional item numbers common information repository Code 00E gives the list of all functional item numbers and their associated information.
	00F	Circuit breakers common information repository Code 00F gives the list of all circuit breakers and their associated information.
	00G	Parts common information repository Code 00G gives the list of all parts and their associated information.
	00H	Zones common information repository Code 00H gives the list of all zones and their associated information.
	00J	Access panels and doors common information repository Code 00J gives the list of all access panels and doors and their associated information.
	00K	Organizations common information repository Code 00K gives the list of all suppliers and their associated information.
	00L	Supplies - List of products common information repository Code 00L gives the list of all consumables and their associated information.
	00M	Supplies - List of requirements common information repository Code 00L gives the list of all consumables requirements or use cases and their associated information.

Primary code	Secondary code	Definition
	00N	Support equipment common information repository Code 00N gives the list of all tools and their associated information.
	00P	Product Cross-reference Table (PCT) Code 00P gives the values for product attributes and conditions for each product instance listed in a Products cross-reference table data module.
	00Q	Conditions Cross-reference Table (CCT) Code 00Q gives the conditions that have an effect on the applicability of data and is used to define the incorporation status for technical conditions.
	00R	List of effective pages Code 00R gives lists of pages or data modules in a set of information (publication or a volume of publication). Refer to Chap 3.9.4 for details.
	00S	List of effective data modules Code 00S gives lists of pages or data modules in a set of information (publication or a volume of publication). Refer to Chap 3.9.4 for details.
	00T	Change record Code 00T gives information on the change state, including its history, of a set of information (publication or a volume of publication). Refer to Chap 3.9.4 for details.
	00U	Highlights Code 00U gives a compilation of reason for changes of a set of information (publication or a volume of publication). Refer to Chap 3.9.4 for details.
	00V	List of applicable specifications and documentation Code 00V gives a List of Applicable Specifications and Documentation, (LOASD). Refer to Chap 3.9.4 for details.
	00W	Applicability Cross-reference Table (ACT) Code 00W gives the gives product attribute declarations to be used by the project in applicability statements within the applicability cross-reference table, together with links to the PCT and the CCT.
	00X	Controls and indicators common information repository Code 00X gives the list of controls and indicators
	00Y	List of charts and forms Code 00Y gives a list of charts and or forms that can be required in front matter. It can also be used to give actual charts and forms (eg, as required in air crew data).
	00Z	List of tables Code 00Z gives a list of tables for the technical data typically found in front matter.
	0A1	Functional and/or physical areas repository Code 0A1 gives the functional and/or physical breakdown of the functional and/or physical areas.
	0A2	Applicability repository Code 0A2 gives the applicability annotations used in all data modules.

Primary code	Secondary code	Definition
	0A3	Applicability cross-reference table catalog Code 0A3 gives the applicability cross-reference table catalog which supports multi-partner projects with several ACT/CCT/PCT sets. It provides relationships between the different ACT/CCT sets constituting the project.
	0A4	Warnings - List of warnings in the common information repository Code 0A4 gives the list of warnings that are stored in a warnings CIR data module and that are used in several other data modules.
	0A5	Cautions - List of cautions in the common information repository Code 0A5 gives the list of cautions that are stored in a cautions CIR data module and that are used in several other data modules.
	0A6 thru 0AZ	Not available for projects
	0B0	Maintenance planning information Code 0B0 gives the information necessary to define scheduled maintenance tasks.
	0B1	Time limits Code 0B1 gives recommended time limits for inspections, maintenance and overhaul of the Product, its systems, units and life of its parts.
	0B2	System maintenance/inspection tasks list Code 0B2 gives the list of scheduled tasks that shall be performed for Product systems and power plant. For each task a reference to the corresponding procedure can be provided.
	0B3	Structure maintenance/inspection tasks list Code 0B3 gives the list of scheduled tasks that shall be performed for structural components of a Product. For each task a reference to the corresponding procedure can be provided.
	0B4	Zonal maintenance/inspection tasks list Code 0B4 gives the list of scheduled tasks that shall be performed in a given major zone of a Product. For each task a reference to the corresponding procedure can be provided.
	0B5	Unscheduled check Code 0B5 allows to provide the list of unscheduled checks after particular events (eg, check after bird strike, hard/overweight landing). For each event/check the relevant references to inspection data modules can be provided.
	0B6 thru 0BZ	Not available for projects

2.3 Primary code 100 - Operation

Table 4 Code 100 - Operation

Primary code	Secondary code	Definition
100		Operation Code 100 gives all the procedure necessary to operate the Product, equipment, or component to do the specified task. The procedure includes data on the necessary controls and indicators, pre and post-operation procedure, operation and emergency procedure.
	101	List of consumables associated with operation
	102	List of materials associated with operation
	103	List of expendables associated with operation
	104	List of special support equipment and tools associated with operation
	105	List of support equipment and tools associated with operation
	106	List of software associated with operation
	107	Parts list associated with operation
	108 and 109	Not available for projects
	110	Controls and indicators Code 110 gives data on the applicable controls and indicators to operate the system, equipment or component.
	111	Controls and indicators Code 111 gives a crew-oriented view of controls and indicators showing their positions and relations to functionality. The information enables the crew to operate the Product safely and without recourse to associated engineering documents. The information given under this code can also be used by maintainers.
	112	Modes of operation Code 112 gives a crew-oriented description of the various modes of operation possible for each system or subsystem, including results and recovery actions. The information enables the crew to operate the Product safely and without recourse to associated engineering documents. The information given under this code can also be used by maintainers.
	113 and 114	Not available for projects
	115	Displays and alerts Code 115 gives data on system/equipment software displays and alerts.
	116 thru 119	Not available for projects

Primary code	Secondary code	Definition
	120	Pre-operation Code 120 gives in narrative and checklist form the procedures/conditions the user must follow/monitor before he operates the Product, equipment or component.
	121	Pre-operation procedure Code 121 gives, for crew members, in narrative and, if applicable, in checklist form, all pre-operation procedures/conditions preceding a journey. Information on the relevant switch positions and what the indicators must show before the start of the usual operation is given. Maintenance and self-test controls are included. The top and bottom limits of indicators such as dials (ie, those which have a range of indicators) are given. The initial conditions of related systems/equipment that can directly change the operation of the system/equipment are also given.
	122	Siting Code 122 gives siting descriptions and/or procedures. This can include descriptions of requirements concerning locations, proximity to power sources, effective ranges, terrain requirements to avoid screening reflections, ground clutter and other poor operational conditions due to terrain, technical requirements, etc.
	123	Shelter Code 123 gives shelter descriptions and/or procedures. This can include amount of floor, wall and height space required, a plan for a typical layout, required weight capacity of the building floor, dimensions required for installed equipment, environmental conditions (eg, venting), unusual requirements specific to equipment, such as air-conditioning, etc.
	124	Not available for projects
	125	Pre-operation procedures checklist Code 125 gives, for crew members, in listed form the checks pertaining to the procedures given by code 121.
	126	Conditions of readiness Code 126 gives descriptions of and procedures required for conditional readiness of the Product.
	127	Establish operating position Code 127 gives the necessary procedures to bring a device back into operating position after maintenance was performed.
	128 thru 129	Not available for projects
	130	Normal operation Code 130 gives in narrative and checklist form all normal procedures required to accomplish usage of the Product.

Primary code	Secondary code	Definition
	131	Normal operation procedure Code 131 gives, for crew members, in narrative and, if applicable, in checklist form, procedure and data to operate the Product, equipment or component correctly in all its modes. The procedure is given in a sequence of major or minor functions, alternative procedure, the usual procedure instructions and the results. The procedures to start the usual operation again if the operation stops and the procedure to stop and disconnect are given.
	132	Start-up procedure for maintenance Code 132 gives in narrative or checklist form, those procedures and data to start and operate equipment correctly for maintenance purposes. The procedures are given in a sequence of major or minor functions, including, where applicable, alternative procedures. They must include the procedures to start the operation again if it stops, including time and other limits as required.
	133	Shutdown procedure for maintenance Code 133 gives in narrative or checklist form, those procedures and data to stop and shut down equipment being run for maintenance purposes. The procedures are given in a sequence of major or minor functions, including, where applicable, alternative procedures.
	134	Aviation checklist Code 134 gives the aviation related checklists.
	135	Normal operation procedures checklist Code 135 gives, for crew members, in listed form the checks (drills) for normal operation of the Product. If applicable, the checks for handling of installed equipment are included. Operating data can be included, if relevant for safe and effective operation of the Product.
	136	Ground running check Code 136 gives the procedures and data for the performance of ground running checks. It does not cover the procedures for examinations, tests and checks given in information code 3xx.
	137	Not available for projects
	138	Ground running performance adjustment Code 138 gives the procedures for ground running performance adjustments. It does not cover the procedures for examinations, tests and checks given in information code 3xx.
	139	Nuclear, biological and chemical procedures Code 139 gives procedures related to Nuclear, Biological and Chemical (NBC) exposure or prevention. This is alternately referred to as Chemical, Biological and Radiological (CBR) procedures.
	140	Emergency procedure Code 140 gives in narrative and checklist form the procedures to be followed to meet any emergency that could reasonably be expected.
	141	Emergency operation procedure Code 141 gives, for crew members, in narrative and, if applicable, in checklist form, procedure and data for the emergency operation of the Product, equipment or component. The code also gives the special controls for emergency operation and how the use of these controls changes the usual operation of the system.

Primary code	Secondary code	Definition
	142	Operation under unusual conditions Code 142 gives descriptions and procedures related to operating the Product under unusual conditions. This can include operation in unusual weather, or degraded conditions.
	143	Radio interference suppression Code 143 gives procedures related to Radio interference suppression. This includes procedures for installation, testing and removal of suppression components.
	144	Jamming and electronic countermeasures (ECM) Code 144 gives procedures for operation of the equipment in an ECM environment through transmitted and reflected deception signals and through transmitted and reflected jamming.
	145	Emergency operation procedures checklist Code 145 gives, for crew members, in listed form the checks (drills) for emergency operation of the Product.
	146	Emergency shutdown operation procedure Code 146 gives, for crew members, in narrative and, if applicable, in checklist form, procedure and data for the emergency shutdown operation of the Product, equipment or component.
	147 thru 149	Not available for projects
	150	Post-operation Code 150 gives in narrative and checklist form the procedures/conditions the user must follow/monitor after he has operated the Product, equipment, or component.
	151	Post-operation procedure Code 151 gives, for crew members, in narrative and, if applicable, in checklist form, all post-operation procedures/conditions following usage. Information on the relevant switch positions and what the indicators must show when the system/equipment is stopped and disconnected after a usual or emergency operation is given.
	152 thru 154	Not available for projects
	155	Post-operation procedures checklist Code 155 gives, for crew members, in listed form the checks pertaining to the procedures given by code 151.
	156	Not available for projects
	157	Establish maintenance position Code 157 gives the necessary procedures to bring a device into maintenance position.
	158 thru 159	Not available for projects

Primary code	Secondary code	Definition
	160	Loading/Unloading procedure Code 160 gives the procedure and data applicable to load planning and loading/unloading of a Product equipped for carrying cargo.
	161	Special operation Code 161 gives, for crew members, in narrative and, if applicable, in checklist form, procedure and data for the special operation of the Product, equipment or component.
	162	Non-tactical operation Code 162 gives the procedure for non-tactical operation. It shall include, but not be limited to, such non-tactical operations as training exercises using dummy missiles and simulated targets, training and evaluation exercises using telemetering missiles and recording equipment.
	163 thru 168	Not available for projects
	169	Mass and Balance Code 169 gives information related to mass and balance of the Product. It can also include procedures for calculating mass and balance data.
	170	Handling Code 170 gives the procedures and data necessary for Product ground handling under normal and abnormal operational conditions.
	171	Lifting Code 171 describes lifting procedures using any authorized lifting equipment. It can be a partial lifting (eg, wheel change).
	172	Jacking Code 172 describes jacking procedures using any authorized jacking equipment. It can be a normal jacking, an auxiliary or a partial jacking.
	173	Shoring Code 173 describes shoring procedures using any authorized jacking equipment. It does not include lifting or jacking.
	174	Towing Code 174 describes towing or pushing procedures in normal or abnormal conditions, using any authorized towing or pushing equipment. It can be by nose or main landing gear or another attachment point.
	175	Taxiing Code 175 describes movement procedures using engine power.
	176	Lowering Code 176 describes lowering procedures applied after lifting or jacking.
	177	Stabilizing Code 177 describes actions to stabilize the Product.
	178	Tethering Code 178 describes actions to tether the Product
	179	Debogging Code 179 describes actions to remove the Product from bog with any means.

Primary code	Secondary code	Definition
	180	Dispatch deviation Code 180 gives procedures and data necessary for Product dispatch under the approved minimum equipment list.
	181	Deactivate for dispatch deviation Code 181 gives procedures and data necessary to deactivate systems for the purpose of continued flight under dispatch deviation.
	182 thru 199	Not available for projects

2.4 Primary code 200 - Servicing

Table 5 Code 200 - Servicing

Primary code	Secondary code	Definition
200		Servicing Code 200 gives procedures and data necessary to do servicing on the Product, equipment, or component. The servicing can be scheduled or not scheduled such as procedures to fill and drain containers, procedures to bleed, prime, lubricate, clean, adjust, align, calibrate, inspect, etc. Procedures to do servicing are complete instructions.
	201	List of consumables associated with servicing
	202	List of materials associated with servicing
	203	List of expendables associated with servicing
	204	List of special support equipment and tools associated with servicing
	205	List of support equipment and tools associated with servicing
	206	List of software associated with servicing
	207	Parts list associated with servicing
	208 and 209	Not available for projects
	210	Fill Code 210 gives the procedure and data necessary to fill containers with fuel, oil, oxygen, nitrogen, air, water and other fluids (gases or liquids).
	211	Refuel
	212	Fill with oil
	213	Fill with oxygen
	214	Fill with nitrogen
	215	Fill with air

Primary code	Secondary code	Definition
	216	Fill with water
	217	Fill with hydrogen
	218	Fill with other liquid
	219	Fill with other gas
	220	Drain liquid and release pressure Code 220 gives the procedure and data necessary to defuel, drain liquids and release gas pressure to a specified quantity.
	221	Defuel and drain fuel
	222	Drain oil
	223	Release oxygen pressure
	224	Release nitrogen pressure
	225	Release air pressure
	226	Drain water
	227	Release hydrogen pressure
	228	Drain other liquid
	229	Release other gas pressure
	230	Bleed and prime Code 230 gives the procedure and data necessary to: – bleed a system, equipment or component fill a system, equipment or component with a liquid to remove a gas – fill with an inert gas/inert liquid to increase the safety of a container in order to displace oxygen – remove gas/liquid or reactant to prepare a vacuum.
	231	Bleed Code 231 gives the procedure to bleed a system, equipment, or component.
	232	Prime Code 232 gives the procedure to fill a system, equipment, or component with a liquid to remove a gas.
	233	Dry Code 233 gives the procedure to dry a system, equipment, or component.
	234	Facility requirements associated with servicing Code 234 lists (in tabular form) the requirements for the facility to service the equipment. It should contain: – Work area, space and storage requirements – Shop machine, handling and support equipment.
	235	Flush Code 235 gives the procedure to flush a system, equipment, or component with a liquid to clean and or remove a liquid.

Primary code	Secondary code	Definition
	236	Fill with inert gas/inert liquid Code 236 gives the procedure and data necessary to fill with an inert gas/inert liquid to increase the safety of a fuel tank or other sealed or closed-in tanks/containers that contain highly inflammable material, by pumping nitrogen, steam, carbon dioxide, or some of other inert gas or vapor into its air space in order to displace oxygen.
	237	Evacuate Code 237 gives the procedure and data necessary to remove gas/liquid or the specific reactant completely to prepare a vacuum with support of special technical equipment.
	238 and 239	Not available for projects
	240	Lubrication Code 240 gives the procedure and data necessary to lubricate a system, equipment, component, or item.
	241	Oil
	242	Grease
	243	Dry film
	244 thru 249	Not available for projects
	250	Clean and apply surface protection Code 250 gives the procedure and data necessary to remove contamination mechanically, chemically or with ultrasonic. The code also gives procedure to: – apply wax and to polish (to protect surfaces) – paint and apply markings.
	251	Clean with chemical agent Code 251 describes the removal of surface deposits from a part, component, or Product by use of a chemical cleaning agent. The chemical agent dissolves or loosens the deposit, which is washed or rinsed away after a soaking period. Also included is power flushing with a chemical agent.
	252	Clean by abrasive blast Code 252 describes the removal of surface deposits from a part, component, or Product by wet or dry particle impingement.
	253	Clean by ultrasonics Code 253 describes the removal of surface deposits and entrapped material by use of high frequency sound waves to produce cavitations at the surface of the part, component, or Product. Cleaning is performed in a liquid bath that transmits the sound energy and keeps the removed material in suspension.

Primary code	Secondary code	Definition
	254	Clean mechanically Code 254 describes the use of a brush, fell bob, sandpaper or other hand (or machine) action to remove surface deposits from a part, component, or Product (eg, removal of paint or coatings by any authorized mechanical process from metallic and nonmetallic surfaces).
	255	Purge Code 255 gives the procedure necessary to remove contamination (eg, unwanted gas, liquids, materials) from a system, equipment, or component.
	256	Polish and apply wax
	257	Paint and apply marking Code 257 gives the procedure necessary to paint a surface and to identify it with letters, numbers, symbols, etc. The code also gives the procedure to apply transfers.
	258	Other procedure to clean Code 258 gives the procedure necessary to remove contamination which is not covered by codes 251 thru 255.
	259	Other procedure to protect surfaces Code 259 gives the procedure necessary to protect surfaces which is not covered by codes 256 and 257.
	260	Remove and prevent ice and remove contamination Code 260 gives the procedure and data necessary to remove ice and contamination and to prevent the start of ice on surfaces.
	261	Remove ice
	262	Prevent ice
	263	Use disinfectant/Sanitize Code 263 includes cleaning procedures given because of health (ie, purification of potable water system, etc).
	264	Remove contamination Code 264 gives the procedure to remove or to make neutral contamination (eg, radioactive, bacteriological and chemical).
	265 thru 269	Not available for projects
	270	Adjust, align and calibrate Code 270 gives the procedure and data necessary to adjust, align or calibrate a system, equipment or component.
	271	Adjust Code 271 gives the procedure to adjust a system, equipment, or component to a serviceable condition.
	272	Align Code 272 gives the procedure to align a system, equipment, or component to a serviceable condition.

Primary code	Secondary code	Definition
	273	Calibrate Code 273 gives the procedure to calibrate a system, equipment, or component to make sure it is serviceable.
	274	Harmonize Code 274 gives the procedure to align a system, equipment, or component in all axes.
	275	Grooming Code 275 gives the procedure and data necessary to groom a system, equipment, component, or item. It involves a combination of visual inspections and tolerance checks and their necessary corrections. It can be completed after a major repair just before functional testing. It can also be performed as part of general maintenance. It involves such activities as verifying connections are tight, bolts and nuts are torqued and equipment is clean.
	276	Rig Code 276 gives procedure to rig (hooking-up, arranging or adjusting) a component or accessory linkage for proper system operation.
	277	Compensate Code 277 gives the procedure to compensate the effects of an undesirable external influence on measurement devices (eg, compass).
	278	Easily and quickly adjust after a battle damage repair Code 278 gives the procedure necessary to adjust a system, equipment or component of a Product after a battle damage repair has been carried out. The adjustment procedure to make the Product serviceable is easily and quickly done but the Product can have a limit of operation.
	279	Easily and quickly align after a battle damage repair Code 279 gives the procedure necessary to align a system, equipment or component after a battle damage repair has been done. The procedure to make the Product serviceable is easily and quickly done but the Product can have a limit of operation.
	280	Inspection Code 280 gives the maintenance and overhaul inspections necessary to keep a Product, system, equipment or component serviceable.
	281	Scheduled inspection Code 281 gives the maintenance and overhaul inspections necessary to keep a Product, system, equipment or component serviceable. The inspections are done to a schedule at a specified time given by the manufacturer. The manufacturer also gives the lives of equipment, components, items, or parts.
	282	Unscheduled inspection Code 282 gives the maintenance and overhaul inspections necessary to keep a Product, system, equipment or component serviceable. These inspections are done at a specified time given by the manufacturer but cannot be included in a schedule (refer to code 281).

Primary code	Secondary code	Definition
	283	Special regular inspection Code 283 gives the maintenance and overhaul inspections necessary to keep a Product, system, equipment or component serviceable. They are special inspections at the time given by the manufacturer which cannot be included in a schedule (eg, time equipment operates, the number of rounds fired by a gun).
	284	Special irregular inspection Code 284 gives special irregular inspections which do not occur frequently and which cannot be included in a schedule (eg, heavy landing inspection, lightning strike inspection).
	285	Structure inspections for allowable damage limits Code 285 gives the procedure and data for required inspections following the assessment of allowable damage on the Product and that requires supplemental inspections to ensure continued mission worthiness. This procedure contains the reference to the allowable damage procedure, which causes the scheduled inspection; the applicability information, the procedures for inspection and test and the schedule. This procedure is associated with an allowable damage procedure.
	286	Structure inspections for repair Code 286 gives the procedure and data for required inspections following the embodiment of a structure repair on the Product that requires supplemental inspections to ensure continued mission worthiness. This procedure contains the reference to the repair procedure, which causes the scheduled inspection; the applicability information, the procedures for inspection and test and the schedule. This procedure is associated with a repair procedure.
	287	Not available for projects
	288	Overhaul and retirement schedule Code 288 gives the overhaul and retirement schedule for a part or Product. This can include overhaul and/or retirement interval hours, maximum operating time allowed on the part or the Product before it is to be overhauled, overhaul interval notes and any additional information required for the part or Product's overhaul and/or retirement interval of the Product.
	289	Check filling quantity Code 289 gives the procedure to check filling quantities.
	290	Change of liquid/gas Code 290 gives the combined procedures and data necessary for codes 220 and 210.
	291	Not available for projects
	292	Change of oil Code 292 gives the combined procedures and data necessary for codes 222 and 212.
	293	Change of oxygen Code 293 gives the combined procedures and data necessary for codes 223 and 213.
	294	Change of nitrogen Code 294 gives the combined procedures and data necessary for codes 224 and 214.

Primary code	Secondary code	Definition
	295	Change of air Code 295 gives the combined procedures and data necessary for codes 225 and 215.
	296	Change of water Code 296 gives the combined procedures and data necessary for codes 226 and 216.
	297	Change of hydrogen Code 297 gives the combined procedure and data necessary for codes 227 and 217.
	298	Change of other liquid Code 298 gives the combined procedures and data necessary for codes 228 and 218.
	299	Change of other gas Code 299 gives the combined procedures and data necessary for code 229 and 219.

2.5 Primary code 300 - Examinations, tests and checks

Table 6 Code 300 - Examinations, test and checks

Primary code	Secondary code	Definition
300		Examinations, tests and checks Code 300 gives procedures and data necessary to examine and to do tests and checks on, the Product, system, equipment, component or item.
	301	List of consumables associated with examinations, tests and checks
	302	List of materials associated with examinations, tests and checks
	303	List of expendables associated with examinations, tests and checks
	304	List of special support equipment and tools associated with examinations, tests and checks
	305	List of support equipment and tools associated with examinations, tests and checks
	306	List of software associated with examinations, tests and checks
	307	Parts list associated with examinations, tests and checks
	308 and 309	Not available for projects
	310	Visual examination Code 310 gives the procedure and data necessary to visually examine a Product, system, equipment, component equipment, component, or item for specific defects/failures.

Primary code	Secondary code	Definition
	311	Visual examination without special equipment Code 311 describes a thorough examination of a zone, system, subsystem, component or part, to a level defined by the manufacturer, to detect structural failure, deterioration or damage; and to determine the need for corrective maintenance.
	312	Examination with a borescope
	313 and 314	Not available for projects
	315	QA requirements Code 315 gives general descriptions of QA of the Product. This can include references to QA procedures, statement of responsibility, requirements for maintenance or calibration of tools and test equipment used for QA, certification requirements, etc.
	316 thru 319	Not available for projects
	320	Operation test Code 320 gives the procedure and data necessary to do operation tests of a system, equipment or component to make sure it is serviceable (ie, in the tolerances given by the manufacturer but not necessarily to the design standards). These tests require no special test equipment other than that installed on the Product, system, equipment or component.
	321	Unit break-in Code 321 gives the procedure and data necessary to initially operate a system or equipment under special operating at lower tolerances until the break-in period ends.
	322	Test and inspection Code 322 gives the procedure and data for testing and inspecting the Product, equipment or component.
	323 thru 329	Not available for projects
	330	Test preparation Code 330 gives the procedure and data necessary to prepare a Product, system, equipment or component to do operation tests, function tests or structure tests.
	331	Connection of test equipment Code 331 gives the procedure and data necessary to connect test equipment to a Product, system, equipment or component.
	332	Removal of test equipment Code 332 gives the procedure and data necessary to remove test equipment from a Product, system, equipment or component.
	333	Installation of the unit before the test Code 333 gives the procedure and data necessary to install an equipment or component to test equipment to do a test.

Primary code	Secondary code	Definition
	334	Removal of the unit after the test Code 334 gives the procedure and data necessary to remove an equipment or component from test equipment after the test is carried out.
	335	Final measures Code 335 gives procedures and checks which must be done following a test procedure. The content of this code exceeds the range of content of codes 332 and 334.
	336 thru 339	Not available for projects
	340	Function test Code 340 gives the procedure and data necessary to make sure a system, equipment, or component operates correctly. A function test is more complete than an operation test (code 320) and usually requires special test equipment. The procedure tells what to do and what the effects/indicators are. If the effects/indicators are incorrect, the procedure tells what to do (eg, refer to failure reports and isolation tables - code 400, adjust/align procedure - code 270). This must be possible without additional documents.
	341	Manual test Code 341 gives the procedure and data to do a function test of a system, equipment, or component. Special test equipment can be used but not automatic test equipment.
	342	Automatic test Code 342 gives the procedure and data to do a function test of a system, equipment, or component with automatic test equipment only.
	343	BIT Code 343 describes the Built-in Test procedure.
	344	Compatibility test Code 344 gives the procedure and data necessary to perform compatibility tests.
	345	System test Code 345 describes procedures containing all adjustment specifications and tolerances required to maintain system and/or unit performance at maximum efficiency and design specifications. It must be self-contained and can duplicate other tests. It is normally used at major maintenance periods.
	346	Other check Code 346 describes special checks such as smoke check, sniff check, audible checks, etc.
	347	Start-up procedure for test Code 347 gives, for crew members, in narrative and, if applicable, in checklist form, the procedure and data to perform a maintenance turn-on (test) of the Product, equipment or component.
	348	Final acceptance test (FAT) Code 348 provides instructions on how to perform and record a FAT and how to properly disseminate FAT results.

Primary code	Secondary code	Definition
	349	Test records Code 349 gives the description of test reports, test data sheets, test protocols, etc.
	350	Structure test Code 350 gives the procedure and data necessary to do tests for hardness and to detect faults such as cracks.
	351	Test for surface cracks with dye penetrant
	352	Test for surface cracks with magnetic particles
	353	Test for cracks and other defects with eddy current
	354	Test for cracks and other defects with X-rays
	355	Test for cracks and other defects with ultrasonics
	356	Hardness test Code 356 gives the procedure and data necessary to measure how hard a material is.
	357	Gamma-ray test
	358	Resonance frequency test
	359	Thermographic test Code 359 gives procedures and data necessary to describe a thermographic test, which can be performed on parts to detect certain local changes in materials that occur in homogenous parts. These can be considered typically (but not exclusively) as voids, inclusions, disbonds, liquid ingress or contamination, foreign objects and damaged or broken structural assemblies.
	360	Design data/tolerances check Code 360 gives the procedure and data necessary to make sure a system, equipment or component is correct to the design data/tolerances.
	361	Dimensions check Code 361 describes a detailed dimensional (visual/dimensional) inspection check, which is a comparison of the dimensional and material condition of parts.
	362	Pressure check Code 362 describes the measurement of pressure or the effect of pressure, or establishing the ability of a normally pressurized component or system to operate properly.
	363	Flow check
	364	Leak check Code 364 describes the ability of a component or system to operate without leaking or leaking within permissible limits.
	365	Continuity check
	366	Resistance check
	367	Electrical power check
	368	Signal strength check

Primary code	Secondary code	Definition
	369	Other check Code 369 gives the procedure and data for design data/tolerances checks not related to codes 361 thru 368 (eg, bonding check, frequency check, bandwidth check).
	370	Monitor the condition Code 370 gives the procedure and data necessary to monitor the condition of a Product, system, equipment or component: the condition is monitored by the analysis of oil, vibration, tracking, etc.
	371	Oil analysis Code 371 gives the procedure and data necessary to monitor the condition of a system, equipment, or component by an analysis of oil.
	372	Vibration analysis Code 372 gives the procedure and data necessary to monitor the condition of a Product, system, equipment or component by analysis of its vibration.
	373	Tracking check Code 373 gives the procedure and data necessary to monitor the precision of tracking.
	374	Fuel analysis Code 374 gives the procedure and data necessary to monitor the condition of a system, equipment or component by the analysis of fuel.
	375	Shooting accidental discharge analysis Code 375 gives the procedure and data necessary to analyze an accidental discharge incident of a weapon system.
	376	Check post application of adhesive Code 376 gives the procedure and data necessary to verify relevant system after a gluing.
	377	Contamination analysis Code 377 describes a test used to assist in identifying certain materials by electro-mechanically determining the presence or absence of known contamination elements.
	378 thru 389	Not available for projects
	390	Sample test Code 390 gives the procedure to ensure the quality of a process by checking it on a specimen or sample part.
	391 thru 395	Not available for projects
	396	Flight control surface movement Code 396 gives procedures to put or to make sure a flight control surface is in a prescribed position (eg, flap extended to 15°).

Primary code	Secondary code	Definition
	397	Landing gear movement Code 397 gives procedures to put or to make sure main, nose or complete landing gear is in a prescribed position.
	398	Product configuration Code 398 gives actions required to bring the Product, unit, or test equipment to a prescribed condition or position using normal functions and operations (eg, opening or closing circuit breakers or switches, positioning controls or control surfaces, calibration or operation of test equipment, pressurizing or depressurizing, raising or lowering landing gear, energizing electrical system). It includes packing flexible parts into normal pre-operation configuration (eg, oxygen masks, escape slides).
	399	Not available for projects

2.6 Primary code 400 - Fault reports and isolation procedures

Table 7 Code 400 - Fault reports and isolation procedures

Primary code	Secondary code	Definition
400		Fault reports and isolation procedures Code 400 gives the procedures and data necessary to get accurate reports on faults and malfunctions and to isolate the faults.
	401	List of consumables associated with fault diagnosis
	402	List of materials associated with fault diagnosis
	403	List of expendables associated with fault diagnosis
	404	List of special support equipment and tools associated with fault diagnosis
	405	List of support equipment and tools associated with fault diagnosis
	406	List of software associated with fault diagnosis
	407	Parts list associated with fault diagnosis
	408 and 409	Not available for projects
	410	General fault description Code 410 gives maintenance messages and symptoms of faults with information on and references to the isolation and/or corrective procedures.
	411	Isolated fault Code 411 gives the maintenance messages relative to an isolated fault which can be memorized by the Product centralized monitoring system. It provides the information and procedure necessary to correct each isolated fault.

Primary code	Secondary code	Definition
	412	Detected fault Code 412 gives the maintenance messages relative to a detected fault which can be stored by the Product centralized monitoring system. It provides the information and procedure necessary to isolate and correct each detected fault.
	413	Observed fault Code 413 gives all symptoms related to observed faults which can be reported by the crew. Symptoms are sorted by system/subsystem and must be simply and unambiguously described. It provides the information and procedure necessary to isolate and correct each observed fault.
	414	Correlated fault Code 414 gives the set of maintenance messages and warnings/malfunctions which have been correlated, and which can be recognized by the Product centralized monitoring system. It provides the information and procedures necessary to correct each correlated fault.
	415	Impact of fault Code 415 gives the criteria required to determine the impact of specific faults on combat system capabilities.
	416 thru 419	Not available for projects
	420	General fault isolation procedure Code 420 gives the procedure and data necessary to isolate the fault. Each fault isolation procedure contains all operations needed to isolate the fault and must terminate with instructions for correcting it.
	421 thru 428	Fault isolation procedure
	429	Diagnostics Code 429 gives procedures related to diagnostics of the Products. This is typically used with the process data module.
	430	Fault isolation task supporting data Code 430 contains explanations and diagrams which identify fault symptoms accurately and make the fault isolation easier.
	431 thru 439	Not available for projects
	440	Index
	441	Fault code index Code 441 contains a list of fault codes with references to the fault isolation procedures.
	442	Maintenance message index Code 442 contains a list of maintenance messages with references to the fault isolation procedures.

Primary code	Secondary code	Definition
	443	Post-troubleshooting shutdown procedure Code 443 gives the procedure and data for Post-troubleshooting shutdown procedure of the Product, equipment or component.
	444 thru 449	Not available for projects
	450 thru 499	Not available for projects

2.7 Primary code 500 - Disconnect, remove and disassemble procedures

Table 8 Code 500 - Disconnect, remove and disassemble procedures

Primary code	Secondary code	Definition
500		Disconnect, remove and disassemble procedures Code 500 gives the procedures and data necessary to disconnect, remove and disassemble equipment, components and items. Included in the procedures is how to install seals/caps.
	501	List of consumables associated with removal
	502	List of materials associated with removal
	503	List of expendables associated with removal
	504	List of special support equipment and tools associated with removal
	505	List of support equipment and tools associated with removal
	506	List of software associated with removal
	507	Parts list associated with removal
	508 and 509	Not available for projects
	510	Disconnect procedure Code 510 gives the procedure and data necessary to disconnect equipment, components or items. Included in the procedure is the installation of caps to protect disconnected equipment, components or items.
	511 thru 519	Not available for projects
	520	Remove procedure Code 520 gives the procedure and data necessary to remove equipment, components and items. The following codes can divide or add to code 520 when the necessary depth of detail needs a separate data module:

Primary code	Secondary code	Definition
	521	Return to basic configuration Undressing
	522	Remove support equipment/Remove from support equipment
	523	Preparation before removal
	524	Follow-on maintenance Code 524 is used only when the follow-on maintenance cannot be included in code 520.
	525	Ammunition unloading Code 525 gives the procedure and data necessary to unload ammunition from a weapon system.
	526	Deactivate launching device Code 526 gives the procedure and data necessary to deactivate launching devices as a preliminary requirement to any operation on a weapon system.
	527 thru 529	Not available for projects
	530	Disassemble procedure Code 530 gives the procedure and data necessary to disassemble equipment, components and items to the necessary level. Included in the procedure is the installation of caps to protect disconnected equipment, components or items.
	531	Disassemble on operation site Code 531 gives the procedures and data necessary to disassemble equipment on operation site.
	532 thru 539	Not available for projects
	540	Open for access procedure Code 540 gives the procedure and data necessary to open panels or doors when this procedure is not easily done and is necessary before the start of other maintenance tasks. Usually this is applicable to engine bay doors, landing gear doors, etc.
	541 thru 549	Not available for projects
	550	Unload software procedure Code 550 gives the description of the methods/devices/interfaces implemented to download the software from one item and the time required.
	551	Fault monitoring storage readout (downloading)
	552	Data erasing
	553	Display, copy and print of data Code 553 gives the description/procedures/data to display, copy and print data.

Primary code	Secondary code	Definition
	554 thru 559	Not available for projects
	560	Deactivation procedure Code 560 describes procedures to render a system inoperable for maintenance purposes or for operation under dispatch deviation procedures.
	561	De-energize electrical network Code 561 gives procedures to de-energize the Product electrical network regardless of the power source used (engine, APU, external).
	562	Depressurize hydraulics Code 562 gives procedures to de-pressurize hydraulic systems, sub-systems or components regardless of the power source used.
	563	Deactivation maintenance practice Code 563 gives procedures to deactivate equipment for the purposes of performing maintenance.
	564 thru 599	Not available for projects

2.8 Primary code 600 - Repairs and locally make procedures and data

Table 9 Code 600 - Repairs and locally make procedures and data

Primary code	Secondary code	Definition
600		Repairs and locally make procedures and data Code 600 gives the procedures and data necessary to repair a Product, equipment, component or item. Procedures and data necessary to locally make specified items are also given.
	601	List of consumables associated with repairs
	602	List of materials associated with repairs
	603	List of expendables associated with repairs
	604	List of special support equipment and tools associated with repairs
	605	List of support equipment and tools associated with repairs
	606	List of software associated with repairs
	607	Parts list associated with repairs
	608 and 609	Not available for projects
	610	Add material Code 610 gives the procedure and data necessary which add materials to repair a Product, equipment, component or item.

Primary code	Secondary code	Definition
	611	Insulation
	612	Metalize
	613	Pot
	614	Remetal
	615	Retread
	616 thru 619	Not available for projects
	620	Attach material Code 620 gives the procedure and data necessary which attach materials to repair a Product, equipment, component or item.
	621	Bond
	622	Crimp
	623	Braze
	624	Rivet
	625	Solder
	626	Splice
	627	Weld
	628 and 629	Not available for projects
	630	Change the mechanical strength/structure of material Code 630 gives the procedure and data necessary to change the mechanical strength/structure of materials.
	631	Anneal
	632	Case harden
	633	Cure
	634	Normalize
	635	Shot-peen
	636	Temper
	637	Not available for projects
	638	Other treatment Code 638 gives the procedure and data necessary to heat treat metal or metal alloys which are not in codes 631, 632, 634 and 636.
	639	Other process to change the mechanical strength/structure of material Code 639 gives the procedure and data necessary to change the mechanical strength/structure of material which are not in codes 633 and 635.

Primary code	Secondary code	Definition
	640	Change the surface finish of material Code 640 gives the procedure and data necessary to change the surface finish of material.
	641	Anodize
	642	Buff
	643	Burnish
	644	Chromate
	645	Hone
	646	Lap
	647	Plate
	648	Polish
	649	Cleanup of dents, cracks and scratches Code 649 gives information on negligible and/or minor dents, cracks, scratches and the description of the surface treatment after their repair.
	650	Remove material Code 650 gives the procedure and data necessary to remove material.
	651	Abrasive blast
	652	Bore/drill/ream
	653	Electrical/electrochemical/chemical etch
	654	Broach
	655	Grind
	656	Mill
	657	Thread/tap
	658	Turn
	659	Other process to remove material Code 659 gives the procedure and data necessary to remove material which is not in code 651 thru code 658.
	660	Structure repair procedure and data Code 660 gives the procedure and data necessary to repair damage and also gives the permitted damage.
	661	Allowable damage Code 661 describes allowable damage limits information regarding structures.
	662	Temporary repair procedure
	663	Standard repair procedure

Primary code	Secondary code	Definition
	664	Special repair procedure Code 664 gives the procedure and data necessary to do special structure repairs. Usually a special repair is a repair to a damaged area or item of structure which is not in code 663 and which the manufacturer has written to repair damage that has occurred.
	665	Fly-in repair procedure Code 665 gives the procedure necessary to carry out fly-in repairs to the structure of a Product, equipment, or component. Usually a fly-in repair is to permit transport to a base for a standard repair (code 663) or a special repair (code 664).
	666	Material classification Code 666 gives data necessary for material classification.
	667	Structure classification Code 667 gives data necessary for structure classification.
	668	Allowable damage of composite structures Code 668 describes allowable damage limits information regarding composite structures.
	669	Allowable damage of mixed structures Code 669 describes allowable damage limits information regarding mixed structures.
	670	Locally make procedure and data Code 670 gives the procedure and data necessary to locally make items, parts or equipment.
	671	Making of parts Code 671 gives the necessary information for making parts.
	672 thru 679	Not available for projects
	680	Battle damage repair procedure and data Code 680 gives the procedure and data necessary to perform battle-damage functions on a Product, system, equipment or component. The repair is easily and quickly done but the Product can have a limit of operation.
	681	Damage repair symbol marking Code 681 gives the rules and symbols to be used to clearly mark the damaged zones, areas, components and parts and indicate the action to be performed following the damage assessment.
	682	Identification of damaged hardware Code 682 gives information to establish a precise relationship between the observed damaged hardware and the coding of the data module providing its damage assessment data.

Primary code	Secondary code	Definition
	683	Damage assessment Code 683 gives, for a damaged and identified hardware, the necessary data and information to establish: – the effect of the hardware on the operation of the Product – if the hardware can be left damaged without repair or isolation – whether it can be repaired and/or isolated – the relevant action which must be applied – consequences of the actions on the Product utilization (mission, limitation, etc).
	684	Utilization degradation Code 684 gives the consequence on the Product utilization (mission, limitation, etc) of the actions performed on the damaged hardware if this information is not provided under code 683. **Note** It is recommended to provide utilization degradation under code 683 as last step of the damage assessment process.
	685	Repair procedure Code 685 gives the procedure to repair battle damaged hardware. Generally, the procedure is only performed with the hardware making up the battle damage repair kit.
	686	Isolation procedure Code 686 gives the procedure to isolate damaged portions of the system or one of its damaged components.
	687	Function test after battle damage repair Code 687 gives the procedure to ensure that repaired systems can fulfill the requirements of the mission. Generally, these procedures make full use of on-board test facilities. If a test leads to operating limits, they are noted in the procedure.
	688	Battle damage repair kit Code 688 gives the list of self-contained hardware (tools, materials, expendables and consumables) provided as a battle damage repair kit and necessary to perform the battle damage repairs.
	689	Damage repair
	690	Miscellaneous Code 690 gives the procedure and data on various processes necessary during refurbishment of materials which are not in code 610 thru code 680.
	691	Marking Code 691 gives the procedure and data to temporarily or permanently mark parts.
	692	Connector repair Code 692 gives the procedure and data necessary to repair connectors.
	693	Varnish Code 693 gives the procedures to varnish surfaces.

Primary code	Secondary code	Definition
	694 thru 699	Not available for projects

2.9 Primary code 700 - Assemble, install and connect procedures

Table 10 Code 700 - Assemble, install and connect procedures

Primary code	Secondary code	Definition
700		Assemble, install and connect procedures Code 700 gives the procedures and data necessary to assemble, install, connect and secure equipment, components or items.
	701	List of consumables associated with installation
	702	List of materials associated with installation
	703	List of expendables associated with installation
	704	List of special support equipment and tools associated with installation
	705	List of support equipment and tools associated with installation
	706	List of software associated with installation
	707	Parts list associated with installation
	708 and 709	Not available for projects
	710	Assemble procedure Code 710 gives the procedure and data necessary to assemble equipment, components and items from the disassembled level. Included in the procedure is the removal of caps, the installation of seals, the torque and make secure attaching parts.
	711	Tighten procedure Code 711 gives the procedure to tighten and to apply torque to threaded fasteners such as bolts, nuts and fittings.
	712	Lock procedure Code 712 gives the procedure to secure parts by use of safety wire or safety cable, cotter pin, tab washers, etc.
	713	Pack procedure Code 713 gives the procedure to pack equipment (eg, survival pack).
	714	Assemble on operation site Code 714 gives the procedures and data necessary to assemble equipment on operation site.
	715 thru 719	Not available for projects

Primary code	Secondary code	Definition
	720	Install procedure Code 720 gives the procedure and data necessary to install equipment, components and items. Included in the procedure are the removal of caps and the installation of seals.
	721	Build up to usable configuration Dressing
	722	Install support equipment/Install on support equipment Code 722 describes installation of any item of test equipment (ie, pitot static tester, flight control rigging quadrant, etc) used on the Product, system, unit to determine system, component condition or position. It can describe also installation of any item of support equipment (ie, fish pole hoist, hydraulic jeep, safety locks, special tools, etc) used on the Product, system, unit to assist in performing the procedure or step, excluding test equipment.
	723	Preparation before installation
	724	Follow-on maintenance Code 724 is only used when follow-on maintenance cannot be included in code 720.
	725	Ammunition loading Code 725 gives the procedure and data necessary to load ammunition on a weapon system.
	726	Activate launching device Code 726 gives the procedure and data necessary to activate launching devices on a weapon system.
	727	Site location plan Code 727 gives plans and drawings associated with the site (location) where equipment or a system is to be installed.
	728	Foundation preparation Code 728 gives preparation of foundation data supplemental to the installation drawings.
	729	Not available for projects
	730	Connect procedure Code 730 gives the procedure and data necessary to connect equipment, components and items. Included in the procedure is the removal of caps and the installation of seals
	731 thru 739	Not available for projects
	740	Close after access procedure Code 740 gives the procedure and data necessary to close panels or doors at the end of a maintenance task, when this procedure is not easily done and applies to different tasks. Usually this is applicable to engine bay doors, etc.
	741 thru 749	Not available for projects

Primary code	Secondary code	Definition
	750	Load software procedure Code 750 gives the description of the methods/devices/interfaces implemented to load software on the item and the time required.
	751	Not available for projects
	752	Data loading
	753 thru 759	Not available for projects
	760	Reactivation procedure Code 760 gives actions taken to restore a system to normal operation which has been previously deactivated.
	761	Energize electrical network Code 761 gives procedures to energize the electrical network regardless of the power source used (engine, APU, external).
	762	Pressurize hydraulics Code 762 gives procedures to pressurize the hydraulic systems, subsystems or components regardless of the power source used.
	763 thru 799	Not available for projects

2.10 Primary code 800 - Package, handling, storage and transportation

Table 11 Code 800 - Package, handling, storage and transportation

Primary code	Secondary code	Definition
800		Package, handling, storage and transportation Code 800 gives the procedures and data necessary to put Product, systems, equipment or components in storage, to keep them serviceable while in storage, to pack and transport them and to prepare them for transportation. Data of storage life is also included.
	801	List of consumables associated with storage
	802	List of materials associated with storage
	803	List of expendables associated with storage
	804	List of special support equipment and tools associated with storage
	805	List of support equipment and tools associated with storage
	806	List of software associated with storage
	807	Parts list associated with storage

Primary code	Secondary code	Definition
	808 and 809	Not available for projects
	810	Preservation procedure Code 810 gives the procedure and data necessary to protect Product, systems, equipment or components before they are put in storage. The servicing to be done on a Product, system, equipment or component and special data to move them is given if necessary.
	811	Preparation for vehicle transportation Code 811 gives the procedure and data necessary to prepare the vehicle for transportation.
	812	Shipping and storage - General Code 812 gives procedures related to general shipping and storage of the Product.
	813 thru 819	Not available for projects
	820	Procedure to remove preservation material Code 820 gives the information and data necessary to remove material and parts used to keep Products, systems equipment or components serviceable when in storage.
	821 thru 829	Not available for projects
	830	Procedure to put item in containers Code 830 gives the procedure and data necessary to install products, equipment or components in containers for storage and/or to move them by road, rail, air or sea.
	831	Vehicle loading Code 831 gives the procedure and data necessary to load a vehicle into another one for transportation.
	832	Procedure to pack items Code 832 gives the procedures and data necessary to pack equipment or components if no container exists for storing and/or moving them by road, rail, air or sea.
	833 thru 839	Not available for projects
	840	Procedure to remove item from containers Code 840 gives the procedure and data necessary to remove products, equipment or components from their containers. The procedure includes the removal of the material used for protection.
	841	Vehicle unloading Code 841 gives the procedure and data necessary to unload a vehicle from another one after transportation.

Primary code	Secondary code	Definition
	842	Procedure to unpack items Code 842 gives the procedures and data necessary to unpack equipment or components if no container exists for storing and/or moving them by road, rail, air or sea.
	843 thru 849	Not available for projects
	850	Procedure to keep item serviceable when in storage Code 850 gives the information and data necessary to make sure products, systems, equipment, or components stay serviceable when in storage.
	851 thru 859	Not available for projects
	860	Procedure to move item when in storage Code 860 gives the procedure and data necessary to move products, systems equipment or components by road, rail, air or sea after they are installed in containers.
	861 thru 869	Not available for projects
	870	Procedure to prepare item for use after storage Code 870 gives the procedure and data necessary to prepare products, systems, equipment or components for use after storage.
	871	Set on condition Code 871 gives the procedure and data necessary to set the vehicle on condition after transportation.
	872 thru 879	Not available for projects
	880	Procedure when item got out of storage Code 880 gives the procedure and data necessary to accept Products, systems, equipment or components from storage before they are prepared for use (code 870).
	881 thru 889	Not available for projects
	890	Life data of item when in storage Code 890 gives the information on how long the Product can be kept in a storage condition and stay safe/serviceable.
	891 thru 899	Not available for projects

2.11 Primary code 900 - Miscellaneous

Table 12 Code 900 - Miscellaneous

Primary code	Secondary code	Definition
900		Miscellaneous
	901	Miscellaneous list of consumables
	902	Miscellaneous list of materials
	903	Miscellaneous list of expendables
	904	Miscellaneous list of special support equipment and tools
	905	Miscellaneous list of support equipment and tools
	906	Miscellaneous list of software
	907	Miscellaneous parts list
	908 and 909	Not available for projects
	910	Miscellaneous
	911	Illustration Code 911 gives an illustration and its identification and status information. The code can be used for storing and transmission of illustrations in the form of data module.
	912	Handling procedure Code 912 gives the general handling procedure and standard practices not specifically identified in other codes. This code covers procedure for the careful handling of components that can be easily damaged. It can apply to any component. **Note** Not to be used for new projects. Use code 170 instead.
	913	General maintenance procedure Code 913 gives the general maintenance procedure and standard practices not specially identified in other codes. This code is used to identify procedure where the maintenance is general. That is in order to cover very small assembly/ clean/inspect/repair/disassembly etc. procedures that are too small to warrant their own data module or are always performed together.
	914	Container data module Code 914 indicates a container data module that refers to or includes different kinds of information and so cannot be covered by another dedicated information code.
	915	Facilities Code 915 gives the description of facilities required for operation, maintenance, repairs, or storage of the Product.
	916	Maintenance allocation Code 916 gives Maintenance allocation information for the Product.

Primary code	Secondary code	Definition
	917	Non-S1000D publication Code 917 gives a Non-S1000D publication (eg, legacy manual in PDF) as a standard data module, in which the legacy is considered as a figure.
	918 and 919	Not available for projects
	920	Change = Remove and install Code 920 gives the combined procedures and data for code 520 Remove and code 720 Install.
	921	Change = Remove and install a new item Code 921 gives the combined procedures and data for code 520 Remove and code 720 Install a new item.
	922	Change = Remove and install the removed item Code 922 gives the combined procedures and data for code 520 Remove and code 720 Install again the removed item.
	923	Change = Disconnect and connect an item Code 923 gives the combined procedures and data to disconnect code 510 and connect a removed item code 730.
	924 thru 929	Not available for projects
	930	Service bulletin Code 930 gives the necessary administrative and material provisioning information and accomplishment procedures to implement a service bulletin (Product modification, inspection or change of operational characteristics).
	931	Service bulletin data Code 931 is Not available for projects (It is used for service bulletins following the rules in Issue 4.0 or earlier issues).
	932	Planning information Code 932 is Not available for projects (It is used for service bulletins following the rules in Issue 4.0 or earlier issues).
	933	Accomplishment procedure – Task set Code 933 gives the procedures, in the form of a task set, to accomplish the work required by a service bulletin. The task set refers to procedural data modules which are part of the Service bulletin.
	934	Material information Code 934 gives the information regarding the material and components required to accomplish the service bulletin, their interchangeability and disposition data.
	935 thru 939	Not available for projects
	940	Provisioning data Code 940 gives data necessary for provisioning and to identify support items and spare parts.

Primary code	Secondary code	Definition
	941	Illustrated parts data Code 941 gives data necessary to identify support items and spare parts relating to Product, equipment or components. Data are prepared in accordance with Chap 5.3.1.3. Related illustrations associated to the data are also included under this code.
	942	Numerical index Code 942 contains Illustrated Parts Data (IPD) cross reference index information, which identifies all IPD items.
	943 thru 949	Not available for projects
	950	Composite information Code 950 gives a compilation of information on a range of different types that together are needed to support the user in a given activity or process. These information codes must only be used when this type of information cannot be covered by another, specific, dedicated information code.
	951	Generic process Code 951 indicates a process data module that refers to or includes different kinds of information and so cannot be covered by another dedicated information code.
	952	Generic learning content Code 952 gives a description of maintenance or operational learning goals or of a range of information in a SCO Content data module. It is only used when no other information code adequately describes this information.
	953 thru 960	Not available for projects
	961	Calculation worksheets Code 961 gives a calculation worksheets forms. For example, to be used by the recovery team during the recovery of a disabled Product.
	962 thru 969	Not available for projects
	970	Approved vendor processes Code 970 describes processes that can be proprietary and controlled by a particular manufacturer, or by non-proprietary and approved for application by conforming vendors.
	971 thru 979	Not available for projects
	980	Environmental protection, fire-fighting and rescue Gives descriptions, procedures and operating instructions for environmental protection, fire-fighting and rescue

Primary code	Secondary code	Definition
	981	Air cleaning Code 981 gives descriptions, procedures and operating instructions for air cleaning (eg, filtering to obtain clean air).
	982	Sewage treatment Code 982 gives descriptions, procedures and operating instructions for sewage treatment.
	983 thru 988	Not available for projects
	989	Fire-fighting and rescue Code 989 gives descriptions, procedures and operating instructions for fire protection, fire-fighting and rescue.
	990	Neutralization and disposal Code 990 gives the procedure and data necessary for neutralization of ordnance and substances and for the disposal of ordnance, material, equipment, or substances.
	991	Neutralization of ordnance Code 991 gives the procedure and data necessary to make ordnance (eg, missiles, weapons and ammunition, safe or inert to prevent operation and/or explosion).
	992	Neutralization of substance Code 992 gives procedure and data necessary to destroy the distinctive or active property of the chemical substance (eg, neutralization of an acid).
	993 thru 995	Not available for projects
	996	Disposal of ordnance Code 996 gives the procedure and data necessary to dispose of ordnance, such as missiles, weapons, or ammunition by explosion, fire, physical destruction, making inert, disassembly, etc. This code covers destruction of ordnance to prevent enemy use.
	997	Disposal of Product Code 997 gives the procedure and data necessary to dispose of Product such as Product, equipment, components, etc (eg, by destruction, disassembly and/or recycling of its materials). This code also covers the destruction of Product to prevent enemy use.
	998	Disposal of substance Code 998 gives the procedure and data necessary to dispose of substance, such as chemicals, radioactive material, waste material, etc, by recycling, permanent storage in a safe place, cleaning for reuse, etc.
	999	Not available for projects

2.12 Primary code C00 - Computer systems, software and data

Table 13 Code C00 - Computer systems, software and data

Primary code	Secondary code	Definition
C00		Computer systems, software and data
	C01	Miscellaneous list of consumables associated with computer systems, software and data
	C02	Miscellaneous list of materials associated with computer systems, software and data
	C03	Miscellaneous list of expendables associated with computer systems, software and data
	C04	Miscellaneous list of special support equipment and tools associated with computer systems, software and data
	C05	Miscellaneous list of support equipment and tools associated with computer systems, software and data
	C06	Miscellaneous list of software associated with computer systems, software and data
	C07	Miscellaneous parts list associated with computer systems, software and data
	C08 thru C12	Not available for projects
	C13	Notes Code C13 gives notional information required by the user or maintainer of the software or hardware Product.
	C14	Problem handling Code C14 gives problem handling procedures required by the user or maintainer of the software or hardware Product.
	C15	Summary of content Code C15 gives a summary of the content contained in the scope of the software or hardware Product technical information.
	C16 thru C19	Not available for projects
	C20	System administration Code C20 gives system administration procedures or data required by the administrator of the software, hardware, or data product.
	C21	System monitoring Code C21 gives procedures and data related to monitoring the software or hardware Product.
	C22	Description of command Code C22 gives descriptions and data related software or hardware commands.

Primary code	Secondary code	Definition
	C23	Connect hardware Code C23 gives procedures and data related to connecting computer hardware.
	C24	Not available for projects
	C25	System recovery Code C25 gives procedures and data related to computer hardware and software system recovery.
	C26	Backup and restore Code C26 gives procedures and data related to backup and restore of software and data.
	C27	Reboot Code C27 gives procedures and data related to reboot of a computer system.
	C28 and C29	Not available for projects
	C30	Coordinate Code C30 gives procedures and data related to coordination of computer hardware, software and data.
	C31	Defragmentation Code C31 gives procedures and data related to defragmenting a computer hard drive.
	C32	Input/Output media Code C32 gives procedures and data related to computer data storage media.
	C33	Disk mirroring Code C33 gives procedures and data related to mirroring computer disks.
	C34	Clear interference Code C34 gives procedures and data related to clearing interference.
	C35	Time check Code C35 gives procedures and data related to computer hardware and software time check.
	C36	Compatibility check Code C36 gives procedures and data related to computer hardware and software compatibility check.
	C37 thru C49	Not available for projects
	C50	Manage data Code C50 gives procedures and data related to management of data stored and accessed on a computer.
	C51	Move data Code C51 gives procedures and data related to movement of data stored and accessed on a computer.

Primary code	Secondary code	Definition
	C52	Manipulate/Use data Code C52 gives procedures and data related to use and manipulation of data stored and accessed on a computer.
	C53	Description of data storage Code C53 gives descriptions of data stored and accessed on a computer.
	C54 thru C59	Not available for projects
	C60	Programming information Code C60 gives information and data related to software programming associated with the Product.
	C61	Program flow chart Code C61 gives information and data related to software programming flow charts associated with the Product.
	C62	Processing reference guide Code C62 gives information and data related to computer software and hardware processing.
	C63 thru C69	Not available for projects
	C70	Security and privacy Code C70 gives procedures and data related to management and use of computer hardware, software and data security and privacy controls.
	C71	Not available for projects
	C72	Security information Code C72 gives data related to computer hardware, software and data security.
	C73	Security procedures Code C73 gives procedures related to computer hardware, software and data security.
	C74	List of security/classification codes Code C74 gives lists of security and classification codes associated with computer hardware, software and data.
	C75	Access control Code C75 gives procedures and data related to access control of computer hardware, software and data.
	C76 thru C89	Not available for projects
	C90	Miscellaneous
	C91	Quality assurance Code C91 gives quality control procedures and data related to computer hardware, software and data.

Primary code	Secondary code	Definition
	C92	Vendor information Code C92 gives vendor information related to computer hardware, software and data.
	C93 and C94	Not available for projects
	C95	Naming conventions Code C95 gives naming conventions related to computer hardware, software and data
	C96	Technical requirements Code C96 gives technical requirements related to computer hardware, software and data.
	C97 thru C99	Not available for projects

Chapter 8.5

SNS, information codes and learn codes - Learn codes

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Chap 1.3	How to use the specification
Chap 8.5.1	Learn codes - Human performance technology codes
Chap 8.5.2	Learn codes - Training codes

1 General

Learn codes are used in learning data modules to consistently identify a type of human performance data or training content. Learn code selections are determined as information about an organization, its workers and its material and products for accomplishing work that are collected during a Performance Analysis (PA) or as information about workers' instructional requirements as collected during a Training Needs Analysis (TNA). Together, the SNS, information code and learn code represent human performance data or training requirements for successful maintenance and operation activities on a product. For example, animated demonstrations of a procedure for use as learner guidance during a training event can be represented by a single learn code within the data module code.

2 Learn codes

Learn codes are used in the data module code for learning data modules. There are two types of learn codes:

- Human performance technology codes, which always start with an "H". Refer to Chap 8.5.1.
- Training codes, which always start with a "T". Refer to Chap 8.5.2.

H learn codes are used to identify information, requirements, or specifications that affect human performance for maintenance or operation activities on the system. For example, if the results of a PA reveals that a maintenance task can only be successfully completed with the use of a multimeter, then this requirement can be captured in a data module assigned an H18 learn

code. In this example, H18 represents requirements resulting from an analysis of the work environment. Each H code has a short definition and a full definition. Refer to Chap 8.5.1.

T learn codes are used to identify training content intended for a training product. For example, if a TNA reveals the requirement for a technician to wear an Electro-Static Device (ESD) strap when performing a maintenance task, then the instructional designer may decide that a demonstration of proper ESD grounding is warranted in technician training. This training content would then be identified in a data module assigned a T32 learn code. In this example, T32 represents a demonstration of ESD strap use, which can be used within a training intervention to help a technician recall proper technique for ESD strap use. Each T code has a short definition and a full definition. Refer to Chap 8.5.2.

Learn codes that are defined as "Not available for projects" are controlled by S1000D Steering Committee. Refer to Chap 1.3.

3 Translation of learn code definitions

A project can, by project decision, translate the definitions given to the learn codes listed in Chap 8.5.1 and Chap 8.5.2. The translation must be a direct translation without any deviations in scope of the definitions.

Business rule decision point BRDP-S1-00552 - Translation of learn code definitions:

– Decide whether to translate and use the learn code definitions in the languages adopted by the project.

Chapter 8.5.1

Learn codes - Human performance technology codes

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Table 1 References

Chap No./Document No.	Title
Chap 4.3.9	Data module code - Learn code
Chap 4.3.10	Data module code - Learn event code

1 General

Learning data modules that contain the results of a Performance Analysis (PA) are used to establish human performance requirements for maintenance and operation activities on a system. The addition of the human performance technology codes to the data module code allows human performance technologists to create data modules that can:

- assist in the planning of technical data module and training data module requirements
- evaluate the effectiveness of technical data modules and training data modules created to support the human performance system or training system requirements of a project
- map requirements to assessments and other content

The data module coding framework for human performance technology content in a learning data module is derived from an industry-recognized human performance technology model developed by Darlene M. VanTiem, James L. Moseley, and Joan Conway Dessinger.

All human performance technology learn codes have the first character set to "H", followed by two alphanumeric characters.

Learn codes are used in conjunction with a learn event code, as defined in Chap 4.3.10.

2 Human performance technology definitions

2.1 Short definitions

The short definitions of the alphanumeric characters for human performance technology data modules are given in Table 2. These are used to populate the optional attribute `learnCode` of the element <`dmCode`>. Refer to Chap 4.3.9.

Table 2 Human performance technology codes - Short definitions

Learn code	Definition	Remarks
H00 thru H0Z	Not available for projects	
H10	Performance analysis	
H11	Organizational analysis	
H12	Gap analysis	
H13 thru H16	Not available for projects	
H17	Environmental analysis - Organizational environment	Society, stakeholders, competition, etc.
H18	Environmental analysis - Work environment	Resources, tools used, policies, etc.
H19	Performer analysis - Worker	Knowledge, skill, motivation, role, etc.
H1A thru H1Z	Not available for projects	
H20	Cause Analysis	
H21	Environmental factor	
H22	Internal factor	
H23 thru H2Z	Not available for projects	
H30	Intervention definition	Generic intervention definition
H31	Performance support intervention	
H32	Job/Work design intervention	
H33	Personal development intervention	
H34	Human resource development intervention	
H35	Organizational communication intervention	
H36	Organizational design and development intervention	

Learn code	Definition	Remarks
H37	Training intervention	
H38	Non-training intervention	Only used if a non-training intervention type other than H31 thru H36 is required.
H39 thru H3Z	Not available for projects	
H40	Intervention implementation	
H41 thru H4Z	Not available for projects	
H50	Performance evaluation	
H51	Formative evaluation	
H52	Summative evaluation	
H53 thru H5Z	Not available for projects	

2.2 Full definitions

The full definitions of the alphanumeric codes for human performance technology data modules are given in Table 3. These are used to populate the optional attribute `learnCode` of the element <`dmCode`>. Refer to Chap 4.3.9.

Table 3 Human performance technology codes - Full definitions

Learn code	Definition	Remarks
H00 thru H0Z	Not available for projects	
H10	Performance analysis Technical analysis of a human performance need or opportunity for improvement from the perspective of the organization. The result is a clearly defined and measurable statement of the organization's optimal end state when the identified need or opportunity is realized.	This analysis is conducted from the organization's perspective.

Learn code	Definition	Remarks
H11	Organizational analysis A set of technical analysis subtasks required to complete a comprehensive Performance Analysis (PA). The organization analysis subtasks can result in the following information related to the human performance system: – Vision statement - The highest level statement describing the long-term end-state of an organization. Used to state a measurable, valued outcome in relation to society. – Mission statement - A high level statement describing the mid-term end-state of an organization. Used to state a measurable, valued outcome in relation to and aligned with an organization's vision statement. – Values - Statements that describe the ethical boundaries within which an organization operates to achieve its purpose in society – Goal statement - A broad, measurable statement that describes what an organization must achieve as the result of some campaign or initiative. For example, a goal can involve increasing the ship fleet by 30% within eight years. – Objective statement(s) - A specific, measurable statement that describes what an organization must do to achieve its goal. For example, one objective could be to acquire three new destroyers within five years. Another could be to acquire five frigates within eight years.	This analysis is conducted from the organization's perspective.
H12	Gap analysis A technical analysis subtask required to complete a comprehensive PA. This analysis can result in one or more performance gap statements. Each gap statement is objectively measurable and defines the delta between an organization's desired end state and its current state. Generally stated in relation to organizational goal and objective statements.	These are performance gaps, not training gaps. May or may not be direct result of humans in the system.
H17	Environmental analysis - Organizational environment A technical analysis subtask required to complete a comprehensive PA. Describes internal and external forces that can influence an organization's ability to meet its vision, mission, goals and objectives. Some examples include: special interest groups in society, enterprise stakeholders, competitors, laws, and internal politics.	
H18	Environmental analysis - Work environment A technical analysis subtask required to complete a comprehensive PA. Describes work design factors that can influence an organization's workers' abilities to meet its vision, mission, goals and objectives. Such factors are external to the workers. Some examples include: material resources, tools used, work flow, job hierarchy, location, policies and procedures enforced.	
H19	Performer analysis - Worker A technical analysis subtask required to complete a comprehensive PA. Describes factors internal to an organization's workforce that can influence its abilities to meet its vision, mission, goals and objectives. Some examples include: knowledge, skills, motivation, and physical capabilities.	

Learn code	Definition	Remarks
H1A thru H1Z	Not available for projects	
H20	Cause analysis Technical data containing the root causes of a potential or observed human performance gap. Used to document the results of a cause analysis.	
H21	Environmental factor Identifies a specific cause of a potential or observed human performance gap. These factors are external to the performers subject to the cause analysis.	A category of cause.
H22	Internal factor Identifies a specific cause of a potential or observed human performance gap. These factors are internal to the performers subject to the cause analysis.	A category of cause.
H23 thru H2Z	Not available for projects	
H30	Intervention definition Technical data that describes the type and attributes of an intervention that will be designed to remedy the causes of a potential or observed human performance gap.	
H31	Performance support intervention Technical data that describes a performance support type of intervention that will be designed to remedy the causes of a potential or observed human performance gap.	
H32	Job/Work design intervention Technical data that describes an intervention that will require the re-design of a job's responsibilities, processes, placement within the organization, reporting structure, etc, to remedy the causes of a potential or observed human performance gap. It could also describe the requirements of completely new job or work flow, versus modification of an existing one.	
H33	Personal development intervention Technical data that describes an intervention that will target the improvement of existing personnel through knowledge, skill, physical, etc, development to remedy the causes of a potential or observed human performance gap.	
H34	Human resource development intervention Technical data that describes an intervention that will target the creation or modification of personnel selection processes to remedy the causes of a potential or observed human performance gap.	
H35	Organizational communication intervention Technical data that describes an intervention that will re-design or establish communication patterns in an organization to remedy the causes of a potential or observed human performance gap.	

Learn code	Definition	Remarks
H36	Organizational design intervention Technical data that describes an intervention that will re-design or establish the divisions, departments, etc, needed by an organization to remedy the causes of a potential or observed human performance gap.	
H37	Training intervention Technical data that describes and defines the requirements for a training intervention.	
H38	Non-training intervention Technical data that describes and defines the requirements for a non-training intervention of any type that cannot be assigned a learn code of H31 thru H36.	
H39 thru H3Z	Not available for projects	
H40	Intervention implementation Technical data regarding requirements for successful release and use of an intervention among the target population. For example, process consulting requirements, end user development needs, communication methods or channels required to inform about/release the intervention, etc. This data module will reference a "3x" type of human performance technology data module.	
H41 thru H4Z	Not available for projects	
H50	Performance evaluation Technical data regarding the requirements for an evaluation instrument or plan that will determine the success of an intervention. This data module will reference a "3x" type of human performance technology data module.	
H51	Formative evaluation Technical data regarding the requirements for an evaluation instrument or plan that will be used during the development and testing of an intervention to determine how successful an intervention will be before its final release or implementation. This data module will reference a "3x" type of human performance technology data module.	

Learn code	Definition	Remarks
H52	Summative evaluation A technical analysis subtask required to complete a comprehensive performance evaluation. This data module will reference a "3x" type of human performance technology data module. The summative evaluation subtask can result in the following information related to an intervention's effect within the human performance system: – Immediate performance competence -Technical data regarding the requirements for an evaluation instrument or plan that determines whether an intervention resulted in the desired immediate effect on performance. – Job transfer - Technical data regarding the requirements for an evaluation instrument or plan that determines whether an intervention resulted in the desired effect on performance in the work environment, and that effect is sustained after initial release of the intervention. – Organizational impact/ROI -Technical data regarding the requirements for an evaluation instrument or plan that determines whether an intervention resulted in the desired effect on overall performance of the organization (not just at the worker or job level).	
H53 thru H5Z	Not available for projects	

Chapter 8.5.2

Learn codes - Training codes

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Chap 4.3.9	Data module code - Learn code
Chap 4.3.10	Data module code - Learn event code

1 General

Training data modules can be defined within a project to capture and identify training information, requirements and specifications resulting from an Training Needs Analysis (TNA). They can also be used as a project progresses to identify and capture content intended for a training product.

The data module coding framework for training data modules is derived from a theory of instruction by Robert Gagne, known as the Nine Events of Instruction. Trained or certified Instructional Systems Design (ISD) professionals should to be familiar with these events of instruction and relevant theory application as a framework for designing training systems and products. Other well-established theories of instruction, learning, and/or motivation are also reflected in the training learn codes to facilitate their use and understanding across ISD professionals.

All training learn codes have their first character set to "T", followed by two alphanumeric characters.

Learn codes are used in conjunction with a learn code event code, as defined in Chap 4.3.10.

2 Training code definitions

2.1 Short definitions

The short definitions of the alphanumeric characters for training data modules are given in Table 2. These are used to populate the attribute `learnCode` of the element <dmCode>. Refer to Chap 4.3.9.

Table 2 Training codes - Short definitions

LC	Definition	Remarks
T00 thru T0Z	Not available for projects	
T10	Attention	The attention category (T1x) could be used as overview events.
T11	Perceptual - Concrete example	
T12	Perceptual - Incongruity/Conflict	
T13	Inquiry - Incongruity/Conflict	
T14	Inquiry - Participatory exercise	
T15	Inquiry - Relevance	
T16 thru T1Z	Not available for projects	
T20	Learning objectives	
T21	Terminal objective - Intellectual skill - Discriminations	
T22	Terminal objective - Intellectual skill - Concepts	
T23	Terminal objective - Intellectual skill - Rules/Principles	
T24	Terminal objective - Intellectual skill - Processes	
T25	Terminal objective - Intellectual skill - Procedures	
T26	Terminal objective - Intellectual skill - Higher order rules	Problem solving
T27	Terminal objective - Verbal information - Facts	
T28	Terminal objective - Motor skill	
T29	Enabling objective - Intellectual skill- Discriminations	
T2A	Enabling objective - Intellectual skill- Concepts	
T2B	Enabling objective - Intellectual skill- Rules/Principles	
T2C	Enabling objective - Intellectual skill- Processes	
T2D	Enabling objective - Intellectual skill- Procedures	
T2E	Enabling objective - Intellectual skill- Higher order rules	Problem solving

LC	Definition	Remarks
T2F	Enabling objective - Verbal information - Facts	
T2G	Enabling objective - Motor skill	
T2H thru T2Z	Not available for projects	
T30	Recall	The recall category (T3x) could be used as overview events.
T31	Analogy	
T32	Demonstration	
T33	Informative practice	
T34	Comparative organizer	
T35	Metaphoric device	
T36	Prerequisite concept review	
T37	Question/problem	
T38	Similar-task review	
T39 thru T3Z	Not available for projects	
T40	Content	
T41	Static content - Discrimination	Expositive
T42	Static content - Fact	Expositive
T43	Static content - Concept	Expositive
T44	Static content - Rule/Principle	Expositive
T45	Static content - Procedure	Expositive
T46	Static content - Higher order rule	Expositive
T47	Static content - Processes	Expositive
T48	Animated content - Discrimination	Expositive Animation/Video
T49	Animated content - Fact	Expositive Animation/Video
T4A	Animated content - Concept	Expositive Animation/Video
T4B	Animated content - Rule/Principle	Expositive Animation/Video

LC	Definition	Remarks
T4C	Animated content - Procedure	Expositive Animation/Video
T4D	Animated content - Higher order rule	Expositive Animation/Video
T4E	Animated content - Processes	Expositive Animation/Video
T4F	Interactive content - Discrimination	Exploratory Simulation/ Animation/Video
T4R	Interactive content - Fact	Exploratory Simulation/ Animation/Video
T4G	Interactive content - Concept	Exploratory Simulation/ Animation/Video
T4H	Interactive content - Rule/Principle	Exploratory Simulation/ Animation/Video
T4J	Interactive content - Procedure	Exploratory Simulation/ Animation/Video
T4K	Interactive content - Higher order rule	Exploratory Simulation/ Animation/Video
T4L	Interactive content - Processes	Exploratory Simulation/ Animation/Video
T4M thru T4Z	Not available for projects	
T50	Learning guidance	
T51	Analogy	
T52	Metaphoric device	
T53	Drill and practice/informative practice	
T54	Case study	
T55	Comparative organizer	
T56	Concept map	
T57	Demonstration	
T58	Example/non-example	
T59	Game	

LC	Definition	Remarks
T5A	Mnemonic device	
T5B	Problem solving	
T5C	Simulation	
T5D	Story	
T5E thru T5Z	Not available for projects	
T60	Performance	
T61	Drag-and-drop/matching exercise	
T62	Multiple-choice - One selection	
T63	Multiple-choice -Multiple selection	
T64	Short answer free text	Fill in the blank
T65	Simulation	
T66	Game	
T67 thru T6Z	Not available for projects	
T70	Feedback	
T71	Knowledge of correct response	For discriminations, concepts, rules, principles, procedures
T72	Knowledge of correct solution	For rules, principles, procedures, problem solving, processes
T73	Knowledge of consequence	For rules, principles, procedures, problem solving, processes
T74 thru T7Z	Not available for projects	
T80	Assessment	Map to/or reference an assessment strategy element defined within the learn plan branch

LC	Definition	Remarks
		of the learning schema.
T81	Drag-and-drop/matching exercise	
T82	Multiple-choice - One selection	
T83	Multiple-choice - Multiple selection	
T84	Short answer free text	
T85	Simulation	
T86	Game	
T87	Pre-test	
T88	Post-test	
T89	Hot spot	Example: an image map/href attached to an illustration.
T8A thru T8Z	Not available for projects	
T90	Retention and transfer	To be used for summary events.
T91	Drill and practice/informative practice	
T92	Case study	
T93	Comparative organizer	
T94	Demonstration	
T95	Example/non-example	
T96	Game	
T97	Problem solving	
T98	Simulation	
T99	Story	
T9A thru T9Z	Not available for projects	

2.2 Full definitions

The full definitions of the alphanumeric characters for training data modules are given in Table 3. These are used to populate the attribute `learnCode` of the element <`dmCode`>. Refer to Chap 4.3.9.

Table 3 Training codes - Full definitions

LC	Definitions	Remarks
T00 thru T0Z	Not available for projects	
T10	Attention Abrupt stimulus designed to activate learner's internal process of reception and alertness to the forthcoming technical information.	
T11	Perceptual - Concrete example Attention technique that uses novelty, surprise or uncertainty in the learner to gain their attention. Media are used as anchors for specific, tangible representations of content to be learned.	
T12	Perceptual - Incongruity/Conflict Attention technique that creates incongruity or contradiction in the learner to gain their attention. Media are used to provide a different perspective on the content to be learned.	
T13	Inquiry - Incongruity/Conflict Attention technique that creates incongruity or contradiction in the learner, followed by a question or problem that will unfold throughout the learning event, to gain their attention. Media are used to provide a different perspective on the content to be learned.	
T14	Inquiry - Participatory exercise Attention technique that creates incongruity or contradiction in the learner, followed by a problem or challenge the learner must actively solve throughout the learning event, to gain their attention. Media are used to provide a different perspective on the content to be learned.	
T15	Inquiry - Relevance Attention technique that assists the learner in connecting the content to their personal or professional interests. Media are used to provide the learner with "what's in if for me" to gain attention.	
T16 thru T1Z	Not available for projects	
T20	Learning objectives States the action, condition, behavior and standard expected of the learner by the end of a learning event.	
T21	Terminal objective - Intellectual skill - Discriminations Highest level learning objective. States the action, condition, behavior and standard expected of the learner to distinguish critical, physical attributes.	
T22	Terminal objective - Intellectual skill - Concepts Highest level learning objective. States the action, condition, behavior and standard expected of the learner to recognize and classify based on knowledge of critical attributes.	

LC	Definitions	Remarks
T23	Terminal objective - Intellectual skill - Rules/Principles Highest level learning objective. States the action, condition, behavior and standard expected of the learner to specify relationships among multiple concepts.	
T24	Terminal objective - Intellectual skill - Processes Highest level learning objective. States the action, condition, behavior and standard expected of the learner to describe how a system or organization operates.	
T25	Terminal objective - Intellectual skill - Procedures Highest level learning objective. States the action, condition, behavior and standard expected of the learner to apply prescribed sequences of learned rules or principles to defined problems.	
T26	Terminal objective - Intellectual skill - Higher order rules Highest level learning objective. States the action, condition, behavior and standard expected of the learner to apply unique combinations of learned rules or principles to ill-defined problems.	Problem solving, troubleshooting.
T27	Terminal objective - Verbal information - Facts Highest level learning objective. States the action, condition, behavior and standard expected of the learner to recall rote information or facts.	
T28	Terminal objective - Motor skill Highest level learning objective. States the action, condition, behavior and standard expected of the learner to perform physical actions.	
T29	Enabling objective - Intellectual skill - Discriminations Subordinate level learning objective. States the action, condition, behavior and standard expected of the learner to recognize and classify critical attributes.	
T2A	Enabling objective - Intellectual skill - Concepts Subordinate level learning objective. States the action, condition, behavior and standard expected of the learner to recognize and classify based on knowledge of critical attributes.	
T2B	Enabling objective - Intellectual skill - Rules/Principles Subordinate level learning objective. States the action, condition, behavior and standard expected of the learner to specify relationships among multiple concepts.	
T2C	Enabling objective - Intellectual skill - Processes Subordinate level learning objective. States the action, condition, behavior and standard expected of the learner to describe how a system or organization operates.	
T2D	Enabling objective - Intellectual skill - Procedures Subordinate level learning objective. States the action, condition, behavior and standard expected of the learner to apply prescribed sequences of learned rules or principles to defined problems.	

LC	Definitions	Remarks
T2E	Enabling objective - Intellectual skill - Higher order rules Subordinate level learning objective. States the action, condition, behavior and standard expected of the learner to apply unique combinations of learned rules or principles to ill-defined problems.	Problem solving, troubleshooting.
T2F	Enabling objective - Verbal information - Facts Subordinate level learning objective. States the action, condition, behavior and standard expected of the learner to recall rote information or facts.	
T2G	Enabling objective - Motor skill Subordinate level learning objective. States the action, condition, behavior and standard expected of the learner to perform physical actions.	
T2H thru T2Z	Not available for projects	
T30	Recall Stimulus designed to aid learner in retrieving relevant information expected to be encoded in long-term memory to working memory for the purpose of aiding semantic meaning on the forthcoming technical information.	
T31	Analogy A strategy for stimulating learner recall of previously learned content by stating similarities between attributes of the learned and to-be-learned content.	
T32	Demonstration A strategy for stimulating learner recall of previously learned content by showing the learner what will be accomplished and how the task is performed.	
T33	Informative practice A strategy for stimulating learner recall of previously learned content that provides the learner specific component knowledge (previously learned in parts) while performing a new task.	
T34	Comparative organizer A strategy for stimulating learner recall of previously learned content by generating a table or grid that lists the attributes, key points, etc, of previously learned content and compares new content on the same attributes, key points, etc.	
T35	Metaphoric device A strategy for stimulating learner recall of previously learned content by referring to the to-be-learned content as if it were something else (usually something more familiar to the learner).	
T36	Prerequisite concept review A strategy for stimulating learner recall of previously learned content by engaging in a review type of event where the learner re-examines component concepts in context of a new or more advanced application for the root concepts.	

LC	Definitions	Remarks
T37	Question/problem A strategy for stimulating learner recall where a question or problem relevant to the purpose of to-be-learned content is presented to the learner that requires the learner to apply previously learned content.	
T38	Similar-task review A strategy for stimulating learner recall of previously learned rules or procedures that have similar steps, tasks, or purposes as those found in the to-be-learned content.	
T39 thru T3Z	Not available for projects	
T40	Content A data module that contains the information intended for use in the learning event. It is training content that has been modified for instructional purpose from the authoritative technical source. This is the raw content and is often complemented with a T5x data module (Learning Guidance).	
T41	Static content - Discrimination Expositive, inactive media used to support the learner in developing the knowledge required to form a discrimination.	
T42	Static content - Fact Expositive, inactive media used to provide the learner with specific facts to be learned.	
T43	Static content - Concept Expositive, inactive media used to provide the learner with examples and non-examples of concepts to be learned.	
T44	Static content - Rule/principle Expositive, inactive media used to provide the learner with a rule or principle to be learned.	
T45	Static content - Procedure Expositive, inactive media used to provide the learner with a procedure to be learned.	
T46	Static content - Higher order rule Expositive, inactive media used to provide the learner with an example of higher order rules to be learned.	
T47	Static content - Processes Expositive, inactive media used to provide the learner with a process to be learned.	
T48	Animated content - Discrimination Expositive, active animation or video used to provide the learner in developing the knowledge required to form a discrimination.	
T49	Animated content - Fact Expositive, active animation or video used to provide the learner with specific facts to be learned.	

LC	Definitions	Remarks
T4A	Animated content - Concept Expositive, active animation or video used to provide the learner with examples and non-examples of concepts to be learned.	
T4B	Animated content - Rule/Principle Expositive, active animation or video used to provide the learner with a rule or principle to be learned.	
T4C	Animated content - Procedure Expositive, active animation or video used to provide the learner with a procedure to be learned.	
T4D	Animated content - Higher order rule Expositive, active animation or video used to provide the learner with an example of higher order rules to be learned.	
T4E	Animated content - Processes Expositive, active animation or video used to provide the learner with a process to be learned.	
T4F	Interactive content - Discrimination Exploratory interactive simulation, animation or video used to support the learner in developing the knowledge required to form a discrimination.	
T4R	Interactive content - Fact Exploratory interactive simulation, animation or video used to provide the learner with specific facts to be learned.	
T4G	Interactive content - Concept Exploratory interactive simulation, animation or video used to provide the learner with examples and non-examples of concepts to be learned.	
T4H	Interactive content - Rule/Principle Exploratory interactive simulation, animation or video used to provide the learner with a rule or principle to be learned.	
T4J	Interactive content - Procedure Exploratory interactive simulation, animation or video used to provide the learner with a procedure to be learned.	
T4K	Interactive content - Higher order rule Exploratory interactive simulation, animation or video used to provide the learner with an example of higher order rules to be learned.	
T4L	Interactive content - Processes Exploratory interactive simulation, animation or video used to provide the learner with a process to be learned.	
T4M thru T4Z	Not available for projects	

LC	Definitions	Remarks
T50	Learner guidance An instructional strategy designed to support the learner's internal process of encoding the information contained in a T4x (Content) data module. For example, this data module could contain a mnemonic device designed to help the learner encode the steps of a procedure contained in a T45 data module.	
T51	Analogy An instructional strategy for improving learner comprehension and encoding that uses the similarities in attributes between familiar and to-be-learned content.	
T52	Metaphoric device An instructional strategy for improving learner comprehension and encoding that uses a more familiar concept or schema and refers to it as if it were the to-be-learned content. For example, "Life is a box of chocolates."	
T53	Drill and practice/informative practice An instructional strategy for improving learner comprehension and encoding provides the learner specific component knowledge while practicing a new task.	
T54	Case study An instructional strategy for improving learner comprehension and encoding that requires the leaner to respond to problems wrapped in the context of a realistic situation, by applying newly learned concepts, rules, principles, etc.	
T55	Comparative organizer An instructional strategy for improving learner comprehension and encoding that requires the learner to generate (or complete) a table or grid that lists the attributes, key points, etc, of familiar content and compare them on the same attributes, key points, etc, to the newly learned content.	
T56	Concept map/trees An instructional strategy for improving learner comprehension and encoding that uses a hierarchical or spidering representation of newly learned content for the learner to generate, complete or review.	
T57	Demonstration An instructional strategy for improving learner comprehension and encoding that presents to the learner the steps required to accomplish a task and how the steps are expected to be performed.	
T58	Example/non-example An instructional strategy for improving learner comprehension and encoding that provides the learner with an array of representative examples of the newly learned content simultaneously with counter-examples.	

LC	Definitions	Remarks
T59	Game An instructional strategy for improving learner comprehension and encoding that places the newly learned content in a competitive format and scores the learner. (Note: Such scoring is usually in relation to the game, not the learning objective.)	
T5A	Mnemonic device An instructional strategy for improving learner comprehension and encoding that provides the learner with a memory device that relates to the newly learned content to make it more memorable. For example, "Stalactites hold tight to the cave ceiling…"	
T5B	Problem solving An instructional strategy for improving learner comprehension and encoding that requires the leaner to respond to a specific problem by applying newly learned concepts, rules, principles, etc.	
T5C	Simulation An instructional strategy for improving learner comprehension and encoding that places the learner in an activity (possibly as a character) that mimics reality and allows the learner to complete tasks or solve problems as they would in the real world, by applying newly learned concepts, rules, principles, etc.	
T5D	Story An instructional strategy for improving learner comprehension and encoding that wraps newly learned content in the context of story (fictional or non-fictional) or anecdote.	
T5E thru T5Z	Not available for projects	
T60	Performance A practice exercise designed to ensure that the learner's encoding of information received from a T4x data module will be stable and lasting in long-term memory. This is often complemented with aT7x data module (Feedback).	
T61	Drag-and-drop/matching exercise A practice exercise data module that contains objects that the learner must match appropriately.	
T62	Multiple-choice - Single select A practice exercise data module that provides the learner with a question or statement, and then requires their response to be a selection of one item from a set of provided answers.	
T63	Multiple-choice - Multi-select A practice exercise data module that provides the learner with a question or statement, and then requires their response to be a selection of one or more items from a set of provided answers.	

LC	Definitions	Remarks
T64	Short answer free text A practice exercise data module that provides the learner with a question or statement, and then requires their response to be the entry of a typed response in a blank field embedded in or following the question/statement.	
T65	Simulation A practice exercise module that provides the learner with in an activity that mimics reality and requires the learner to complete a task or solve a problem as they would in the real world.	
T66	Game A practice exercise data module that provides the learner with a competitive format and scores the learner in relation to the corresponding learning objective.	
T67 thru T6Z	Not available for projects	
T70	Feedback A data module containing the necessary information about the degree of correctness regarding a learner's response to a T6x data module. The content of this data module is designed to reinforce or adjust the learner's mental representation of the content being learned.	
T71	Knowledge of correct response Data module used to inform the learner whether their response was correct or incorrect and provide explanatory information. Used for objectives providing discrimination, concept, rule, principle, or procedure learning.	
T72	Knowledge of correct solution Data module used to provide the learner with information relevant to their response. Learner uses this data module to determine their own correctness of response and possible changes in cognitive strategy. Used for objectives providing rule, principle, procedure, problem solving, or process learning.	
T73	Knowledge of consequence Data Module used to provide an example of consequence to the learner in relation to their response/action. Degree of correctness is inherent. Used for objectives providing rule, principle, procedure, problem solving, or process learning.	
T74 thru T7Z	Not available for projects	

LC	Definitions	Remarks
T80	Assessment A test -designed to determine the learner's ability to retrieve and apply information from long-term memory to meet the standard set by a corresponding T2x (Objectives) data module. The purpose of this data module's content is to ensure the learner's capability is complete and stable.	Map to or reference an assessment strategy element defined within the learn plan branch of the learning schema.
T81	Drag-and-drop/matching exercise An assessment data module that contains objects that the learner must match appropriately.	
T82	Multiple-choice - Single select An assessment data module that provides the learner with a question or statement, and then requires their response to be a selection of one item from a set of provided answers.	
T83	Multiple-choice - Multi-select An assessment data module that provides the learner with a question or statement, and then requires their response to be a selection of one or more items from a set of provided answers.	
T84	Short answer free text An assessment data module that provides the learner with a question or statement, and then requires their response to be the entry of a typed response in a blank field embedded in or following the question/statement.	
T85	Simulation An assessment data module that provides the learner with in an activity that mimics reality and requires the learner to complete a task or solve a problem as they would in the real world.	
T86	Game An assessment data module that provides the learner with a competitive format and scores the learner in relation to the corresponding learning objective.	
T87	Pre-test An assessment data module that provides multiple, potentially varied, assessment types designed to evaluate a learner in relation to one or multiple corresponding learning objectives prior to exposure to the content.	
T88	Post-test An assessment data module that provides multiple, potentially varied, assessment types designed to evaluate a learner in relation to one or multiple corresponding learning objectives following exposure to the content.	
T89	Hot Spot An assessment data module that provides the learner with an image or illustration, and then requires their selection of an area in response to a given stimulus.	

LC	Definitions	Remarks
T8A thru T8Z	Not available for projects	
T90	Retention and transfer A data module designed to provide more advanced or complex content, practice, or guidance than a learner originally experienced in a related T4x, T5x, or T6x data module. The purpose of this data module content is to reinforce the learner's retrieval ability of encoded information and increase likelihood of applying it to novel situations.	
T91	Drill and practice/informative practice A strategy for enhancing the retention and/or transfer of learned content by applying it to a task that varies in complexity and context from the initial learning task(s). Throughout the task, specific component knowledge is provided to the learner as reinforcement.	
T92	Case study A strategy for enhancing the retention and/or transfer of learned content that requires the leaner to respond to problems wrapped in the context of a realistic situation and apply learned concepts, rules, principles, etc, to the problems.	
T93	Comparative organizer A strategy for enhancing the retention that requires the learner to generate (or complete) a table or grid that lists the attributes, key points, etc, of familiar content and compare them on the same attributes, key points, etc, to the learned content.	
T94	Demonstration A strategy for enhancing the retention and/or transfer of learned content that provides the learner a holistic view of the steps required to accomplish a task and how the steps are expected to be performed.	
T95	Example/non-example A strategy for enhancing the retention and/or transfer of learned content that provides the learner with or requires the learner to generate an array of representative examples of learned content simultaneously with counter-examples.	
T96	Game A strategy for enhancing the retention and/or transfer of learned content by placing it in a competitive format and scores the learner in relation to the corresponding learning objectives.	
T97	Problem solving A strategy for enhancing the retention and/or transfer of learned content that requires the leaner to respond to a specific problem by applying learned concepts, rules, principles, etc.	

LC	Definitions	Remarks
T98	Simulation A strategy for enhancing the retention and/or transfer of learned content that places the learner in an activity (possibly as a character) that mimics reality and allows the learner to complete tasks or solve problems, as they would in the real world, by applying learned concepts, rules, principles, etc.	
T99	Story A strategy for enhancing the retention and/or transfer of learned content by wrapping learned content in the context of story (fictional or non-fictional) or anecdote.	
T9A thru T9Z	Not available for projects	

Chapter 9

Terms and data dictionary

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Chap 9.2	Terms and definitions - Terms, acronyms and subject index	S1000D-A-09-02-0000-00A-040A-A	All
Chap 9.2.1	Terms, acronyms and subject index - Glossary of terms	S1000D-A-09-02-0100-00A-040A-A	All
Chap 9.2.2	Terms, acronyms and subject index - Abbreviation and acronyms	S1000D-A-09-02-0200-00A-040A-A	All
Chap 9.2.3	Terms, acronyms and subject index - Subject index	S1000D-A-09-02-0300-00A-040A-A	All
Chap 9.3	Terms and definitions - Schema documentation	S1000D-A-09-03-0000-00A-040A-A	All

Chapter 9.1

Terms and definitions - Introduction

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Chap 9.2	Terms and definitions - Terms, acronyms and subject index
Chap 9.3	Terms and definitions - Schema documentation

1 General

Chap 9.2 provides a comprehensive glossary of terms used in this specification. It also includes a list of abbreviations and acronyms used within S1000D. These include all specific S1000D definitions, abbreviations and some basic abbreviations to be used when authoring data modules. A subject index is included for easy access to specific functions and concepts given in the specification.

The content of the electronic Schema documentation is presented in Chap 9.3. The complete Schema documentation is downloadable for easy use off line from www.s1000d.org. You can search for elements in a specific Schema or just for elements and attributes.

Chapter 9.2

Terms and definitions - Terms, acronyms and subject index

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Chap 9.2.2	Terms, acronyms and subject index - Abbreviations and acronyms
Chap 9.2.3	Terms, acronyms and subject index - Subject index

1 General

This chapter provides a glossary of terms (Chap 9.2.1), a list of acronyms and abbreviations (Chap 9.2.2) and a subject index (Chap 9.2.3).

Chapter 9.2.1

Terms, acronyms and subject index - Glossary of terms

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Chap 2.5.3	Business rules - Business rule decision points index
Chap 3.4	Information generation - Zoning and access
Chap 3.9.2	Authoring - Illustration rules and multimedia
Chap 3.9.5	Authoring - Data modules
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Chap 4.3	Information management - Data module code
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Chap 4.15.2	Learning information - Coding SCORM content package modules
Chap 5.2.1.16	Common information sets - Service bulletins
Chap 6.4.1	Functionality - Background and explanation
Chap 7.5	Information processing - Information interchange
Chap 8	SNS, information codes and learn codes
S2000M	International specification for material management - Integrated data processing
S3000L	International specification for Logistics Support Analysis - LSA
SCORM	SCORM 2004

1 Glossary of terms

access illustration	An access illustration is a data module with one or more illustrations used to support the navigation of an interactive publication.
access point	The door, panel, hatch, fillet, fairing, internal floor or ceiling panels, cargo hold linings, etc, which has to be opened in order to give access to an item as defined in Chap 3.4.
airborne equipment	A component necessary in the air to operate the air vehicle.
air vehicle	A generic term for aircraft, airships, gliders, spacecraft, missiles, etc.

animation	An illusion of movement, resulting from the change in object behavior within a 2D or 3D scene. This can be a result of user interaction or running a predetermined script
applicability	The identification of the context for which an information object, or parts thereof, is valid. This context is often associated with the physical or logical configuration of the Product but can include other aspects such as availability of resources and environmental conditions.
Applicability Cross-reference Table (ACT)	A cross-reference table which gives Product attribute definitions to be used by the project in applicability statements, together with links to the PCT and the CCT.
assembly	A number of items that are connected for a specified function. Refer to Fig 1.
basic part	A part that cannot be further disassembled without destruction of its function.
Business Rule (BR)	A rule that has been applied by a project or an organization about how to implement a particular aspect of S1000D and is normally the result of a business rule decision.
business rule decision	A decision answering the question or task posed by a business rule decision point. BR decisions define business rules, which must be followed by project and/or organization, in order to implement S1000D according to project/organization requirements. A BR decision can also be an already existing rule inside a project or organizational documentation produced before the generation of the given BR documentation set began. Default BREX rules are S1000D business rules decisions.
Business Rule Decision Point (BRDP)	A place in S1000D that indicates where a decision must be made, the results of which is captured in the business rules of a given project and/or organization.
business rules category	A unique grouping that describes rules applicable to product definition, maintenance philosophy, concepts of operation, security, business processes, data creation, data exchange, data integrity, data output and/or legacy data conversion, management, handling and other issues.
business rules checker	A software tool (or part of a software application) that validates S1000D data for a project against business rules applicable to a certain project and/or organization.
business rule decision point priority	A BRDP priority indicates the sequence of addressing business rules decision points within BR generation process. In other words, it defines which business rule decision points must be addressed first and which later. BRDP priority is applied during BR generation process.

business rules document data module	A data module that provides information about the project and/or organizational business rules. It can contain definitions, guidance material, examples, as well as information on the progress of the business rules production process. The information captured in a BR data module can be used to create a BREX data module.
Business Rules EXchange (BREX)	The S1000D concept for exchange of the business rules adopted by a project or an organization implementing the specification. The BREX data module provides a structure for standardized formal exchange and unambiguous definition of such rules
business rules layer	A level of stakeholders within the hierarchy to which the business rules apply.
business rules production tool	A software tool (or part of a software application) that is used to produce business rules publications and their components (including BR data modules, BREX data modules and accompanying information) that are in response to business rules decision points defined in S1000D and/or project/organizational documents.
business rules publication	The set of data modules holding the business rule documentation for a project or an organization. A business rule publication can be produced at various layers within a given hierarchy.
business rules reports	The reports generated or created during business rule generation and use processes. The content and structure of these reports are not specified by S1000D.
business rule severity	The level of BR severity indicating what happens if a certain BR decision is not followed. It is applied during the business rule use process.
business rule template data module	A document that contains all of the BRDP defined by the specification. The business rules template can be amended with addition of project specific BRDP. Any BRDP which do not apply to the project, must be addressed ("Not used", "Does not apply", etc) so that every decision point is accounted for. When the business rules template is filled-in with decisions for each BRDP, it can be used as the basis for a project and/or organization specific business rules document data module. Refer to Chap 2.5.3 and Chap 4.10.1.
category 1 container	Reusable container designed to be used as a shipping and storage container without impairment of its protective function and which can be repaired and/or refitted.
chapterized IPD	An IPD in which the data module codes are based on the SNS of the Product as given in Chap 8.

Commercial and Government Entity code (CAGE code)	The CAGE code is a unique identifier assigned to organizations and establishments, such as contractors, suppliers and customers. CAGE codes provide a standardized method of identifying a given facility at a specific location. It is for example used to identify senders and receivers when exchanging data. **Note** The CAGE code is sometimes known as the NATO CAGE code (NCAGE).
Common Source DataBase (CSDB)	A conceptual and non-implementation specific information store for the storage of all objects required to produce the technical publications within a project.
common source database object	An object (data module, etc) in the form required by S1000D when it is exchanged from a CSDB management system.
Common source database (management) system	A tool that assists the management of a CSDB in terms of defining, creating, managing and delivery of CSDB objects**.**
company	A business organization that makes, buys, or sells goods or provides services in exchange for money. Note Used as a synonym to enterprise when a business organization is referred to. Note The terms manufacturer (Product manufacturer, equipment manufacturer, aircraft manufacturer) and supplier are used when needed in context.
compliance	The state of being compliant.
compliant	A process step, a procedure, or the like, is compliant to S1000D if and only if it is carried out in accordance with what is specified by S1000D, and does not violate the criteria in Chap 1.4.2 (eg, the assignment of codes to denote responsible partner companies can be compliant).
component	Any self-contained parts, combination of parts, subassemblies or units that do a specified function for the correct operation of a system. Equivalent term: Unit. Refer to Fig 1.
condition	A property other than a product attribute that has an effect on the applicability of data. Conditions differ from product attributes in that values of a condition are more likely to change throughout service life of a product instance or are often not tracked against a product instance. Conditions can be associated with the physical configuration of the Product, with maintenance conditions, with weather conditions or any other condition that has an effect on the applicability of data.
Conditions Cross-reference Table (CCT)	A cross-reference table which describes condition types that affect the applicability of data and define the incorporation status for technical conditions.
conformance	The state of being conformant.

conformant	An object, or a set of related objects, is conformant to S1000D if and only if it fulfills the form requirements of such an object, as specified by S1000D, for example a data module can be conformant.
consumable	Supply required to maintain the Product (eg, oils, greases, locking wire).
content section	The second part of a data module containing text and illustrations.
content sensitive help	Help information based on the data being presented or the tasks being performed. Refer to Chap 6.4.1.
context related BREX rule	A BREX rule that exclusively constrains how an element or attribute, or a combination of such, can be included and/or populated in an XML object in the CSDB. Refer to context independent BREX rule.
context independent BREX rule	A BREX rule that does not exclusively apply to how an element or attribute, or a combination of such, can be included and/or populated in an XML object in the CSDB. Refer to context related BREX rule.
customer	The individual or corporate identity using the Product and/or receiving post delivery services for such products.
database	A store for data modules.
Data Module (DM)	A self-contained unit of data for the description, operation, identification of parts or maintenance of the Product and its support equipment. The unit of data consists of an identification and status section and contents section and is produced in such a form that it can be input into and retrieved from, a database using the data module code as the identifier.
Data Module Code (DMC)	A 17 to 41 character alphanumeric code identifying to which part or function of the Product a data module is related and what type of data it contains, thus enabling it to be input into and retrieved from, a database. The DMC is part of the unique identifier of a data module. Refer to Chap 4.3.
Data Module code - Extended (DME)	An extended data module code identifying one of many (eg, customized instances of a data module). The data module code is extended by the attributes given in the element <identExtension>. Refer to Chap 4.12.
data update file	An S1000D object to be used as an exchange file for incremental update of Common Information Repository (CIR) data modules.
data UPdate File code (UPF)	A 17 to 37 character alphanumeric code identifying a data update file. The UPF is part of the unique identifier of a data update file. Refer to Chap 4.13.2.
data UPdate file code - Extended (UPE)	An extended data UPdate File code (UPF) identifying one of many (eg, customized instances of an update file). The UPdate File code is extended by the attributes given in the element <identExtension>. Refer to Chap 4.12.

disassembly code	The fourth (together with disassembly code variant) part of the data module code. Consists of 2 characters. Identifies the breakdown condition of an assembly to which information applies. Refer to Chap 4.3.4.
disassembly code variant	The fourth (together with disassembly code) part of the data module code. Consists of 1, 2 or 3 characters. Identifies alternative items of equipment or components differing slightly in design, but not enough to warrant a change of the system difference code. Refer to Chap 4.3.5.
document	A generic term used to describe the presentation of the content of one data module irrespective of the media of presentation or the content of specially created information for a paper publication (eg, front matter).
elapsed time	The estimated total time (elapsed) necessary to do the task (in hours and hundredths of hours).
Electrical Structure Network (ESN)	The ESN is a distributed high conductivity network, located inside the pressurized fuselage only, and intended to provide a shared resource to several systems in order to ensure several electrical and environmental functions.
Electronic Performance Support System (EPSS)	A component of a software package or application in which training and educational information is embedded. An (EPSS) can include a tutorial, expert system and hypertext jumps to reference material.
Enabling Learning Objective (ELO)	A statement in behavioral terms of what is expected of the student in demonstrating mastery at the knowledge and skill level necessary for achievement of a Terminal Learning Objective (TLO) or another ELO.
Engineering Order (EO)	Equivalent to a Service bulletin, except that the customer defines the "design change". The engineering order can be defined based on a manufacturer Service bulletin or from scratch.
engine module number	The number allocated to an engine module. Modules are defined for engines of modular design and each module is a combination of assemblies, subassemblies and parts, contained in one package, or so arranged as to be installed in one maintenance action.
enterprise	A generic term when a company and/or organization is referred to. **Note** The terms manufacturer (Product manufacturer, equipment manufacturer, aircraft manufacturer) and supplier are used when needed in context.
equipment	The items necessary to operate and maintain the Product and its support equipment. Includes training items and tools.

Equivalent Full Charge (EFC)	The EFC is a weighted vector whose value is determined by the type and amount of explosive charge in the munitions. It is based on the most powerful (and therefore erosive) charge used in the gun. The aim is to gage the wear effect of munitions on the weapon. Different types of munitions might have different wear factors depending on their powder charges. Subsequently a calculation is performed to estimate the remaining number of EFC rounds that may be fired.
expendable	An item of supply required to maintain the Product (eg, O-rings, gaskets, tab washers).
figure	One or more illustration sheets and the figure reference line. The figure is the image (or view), which will be presented to the reader.
figure number	A sequential number given to a figure within a data module.
figure reference line	A line of text in a data module consisting of a figure number and, if necessary, a title. The figure reference line follows the last line of the text portion to which the figure relates.
Functional Check (FNC)	A quantitative check to determine if one or more functions of an item perform within the specified limits.
functional item number	A functional item number allows to uniquely identifying an item performing a function in a system at a given position.
Hard Time (HT)	A primary maintenance process under which an item must be removed from service at or before a previously specified time.
help, content sensitive	Refer to content sensitive help.
human-readable	A format that is a representation of data or information that can be naturally read by humans
identification and status section	The first part of a data module containing identification elements (DMC, title, issue number and date, etc) and status elements (applicability, technical standard, QA status, etc) for the management of the data module.
illustration	A graphical representation of hardware or a process. Includes diagrams, schematics, graphs and photographs. If the graphical presentation cannot be shown within a specified page image area, it can be divided into two or more illustration sheets.
illustration reproduction area	The illustration reproduction area is the area on the presentation media in which the graphic, diagrammatic, photograph, or photo-realistic computer generated images are placed.
illustration sheet	The visible presentation of an illustration, or part of an illustration, including its specified illustration reproduction area. Each illustration sheet has its own information control number.

Information Control Number (ICN)	A number (set of characters), which gives the address of an illustration sheet or a multimedia object in the CSDB.
information code	The fifth (together with information code variant) part of the data module code. Consists of 3 characters. Identifies the type of information within a data module. Refer to Chap 4.3.6.
information code variant	The fifth (together with information code) part of the data module code. Consists of 1 character. Identifies any variation in the activity defined by the information code. Refer to Chap 4.3.7.
information object	An object stored, managed, addressable and exchangeable in the CSDB. The following objects are available: – data modules as defined in Chap 3.9.5 – illustrations, multimedia and other data associated with and called up by data modules as defined in Chap 3.9.2 – data management lists as described in Chap 4.5 – comments as described in Chap 4.6 – publication modules as described in Chap 4.9 – data update file as described in Chap 4.13.2.1 – data dispatch notes as described in Chap 7.5
information set	The required information in a defined scope and depth (author view) in the form of data modules managed in the CSDB. A project data management requirement list lists all required data modules and publications for that project.
Instruction Management System (IMS)	An IT application used to create and manage training material to be used on e-Learning environments.
Interactive Electronic Technical Publication (IETP)	A set of information needed for the description, operation and maintenance of the Product, optimally arranged and formatted for interactive screen presentation to the end user on an electronic display system. IETP includes conditional branching mechanisms, which can be based on user feedback. Parameters are evaluated at runtime and their values can depend on context and specific user input.
item	Any level of an assembly (eg, system, subsystem part, component, unit, tool). Refer to Fig 1.
item location code	The last part of the data module code. Consists of one character. Identifies the situation to which the information is applicable, for example where the maintenance task will be carried out in terms of a Product. Refer to Chap 4.3.8.
Job Instruction (JI)	A detailed step-by-step procedure. Each special support equipment, tool, software, consumable and material are referenced in the procedure at the applicable step. Their identification and coding if any, in the text and illustrations must be in accordance with the relevant information given in the content of the data module. Refer to Chap 3.9.5.2.3.

learn code	First optional code, after the item location code, that is applied only to Human Performance Technology (HPT) and training data modules for those projects that have a requirement to be SCORM conformant or wish to use the functionality brought about by the LC. It describes the type of HPT or training information that is in the content of the data module. Consists of two alphanumeric characters. Refer to Chap 4.3.9.
learn event code	Second optional code that is applied only to Human Performance Technology (HPT) or training data modules for those projects that have a requirement to be SCORM conformant or wish to use the functionality brought about by the LEC. Defines which branch of the Learning Schema is used. Consists of one alpha character. Refer to Chap 4.3.10.
learning	The process of enhancing and/or increasing knowledge and skills through an event or activity.
Learning Management System (LMS)	A software application or Web-based technology used to plan, implement and assess a specific learning process.
line check	A routine check, inspection and malfunction rectification performed at en-route and base stations during transit, turn-around or night stop.
Line Replaceable Unit (LRU)	An item, which can be readily changed on the Product during line maintenance operation.
Logistics Support Analysis (LSA)	The selective application of scientific and engineering efforts undertaken during the development process, as part of the system engineering and design process, to assist in complying with supportability and other Logistics Support Analysis (LSA). This is achieved by the use of, for example, S3000L or MIL-STD-1388 employing a repetitive process of definition, synthesis, trade-off, test and evaluation.
main procedure	The core of the procedure to fulfill a task. It excludes the tasks given in Required conditions and Requirements after job completion.
maintenance	The servicing and/or the repair of the Product, its support and training equipment to keep it serviceable.
maintenance task	Start-to-finish, step-by-step, procedural data arranged in a logical sequence to do maintenance.
manufacturer	An enterprise manufacturing an item (eg, Product manufacturer, equipment manufacturer, aircraft manufacturer).
manufacturing batch number	The sequential number allocated by the manufacturer to an individual manufacturing batch or production lot of the Product.
manufacturing part number	A combination of characters assigned by the manufacturer to identify, without ambiguity, an item manufactured to a certain specification.

manufacturing serial number	The manufacturer assigned sequential number identifying the individual manufactured part by its rank in the series production batch of equal parts having identical part numbers.
material	A supply required to maintain the Product. For example gasket sheet, sheet metal, plastic, copper.
material set	Set of items used to maintain or modify the Product. The items are grouped by sets to ease ordering process, shipping process, manufacturing process, Product modification preparation process, etc.
model identification code	The first part (2 to 14 characters) of the data module code. Identifies the Product to which the data applies. The code is allocated by NSPA (formerly NAMSA) and is used to identify the Product. Refer to Chap 4.3.1.
modification (Mod)	A "design change" defined by the manufacturer and implemented (embodied) before or after product delivery.
multimedia	A generic term referring to any combination of integrated digital media, such as sound, video, animation, graphics or text, hyperlinked from within an electronic document or software presentation or product.
munitions	A general term covering bombs, fuses, missiles, rockets, pyrotechnics, launchers, dispensers and items such as impulse cartridge jettison charges, training items, ammunitions and other inventory items considered similar or relative to munitions, including accessories which have been pre-loaded.
NATO Item Identification Number (NIIN)	The identification number within NATO for an item of supply. It forms the last nine digits of the NATO Stock Number (NSN). **Note** NIN is used as the Text Element Identifier (TEI) for NIIN.
NATO/National Stock Number (NSN)	The unique identification of an item of supply by a number assigned by the national codification bureau to each approved item identification. It comprises the NSC followed by the NIIN.
NATO Supply Class (NSC)	The supply classification assigned under the NATO/National Codification system to an item of supply, an item of production and/or a homogeneous area of commodities in respect to their physical or performance characteristics. It forms the first four characters of the NATO/National stock number (NSN).
non-chapterized IPD	An IPD in which the data module codes are based on a specific SNS as given in Chap 4.3.3.
On Condition (OC)	An item that is maintained on condition and is not subjected to a limit whatsoever.

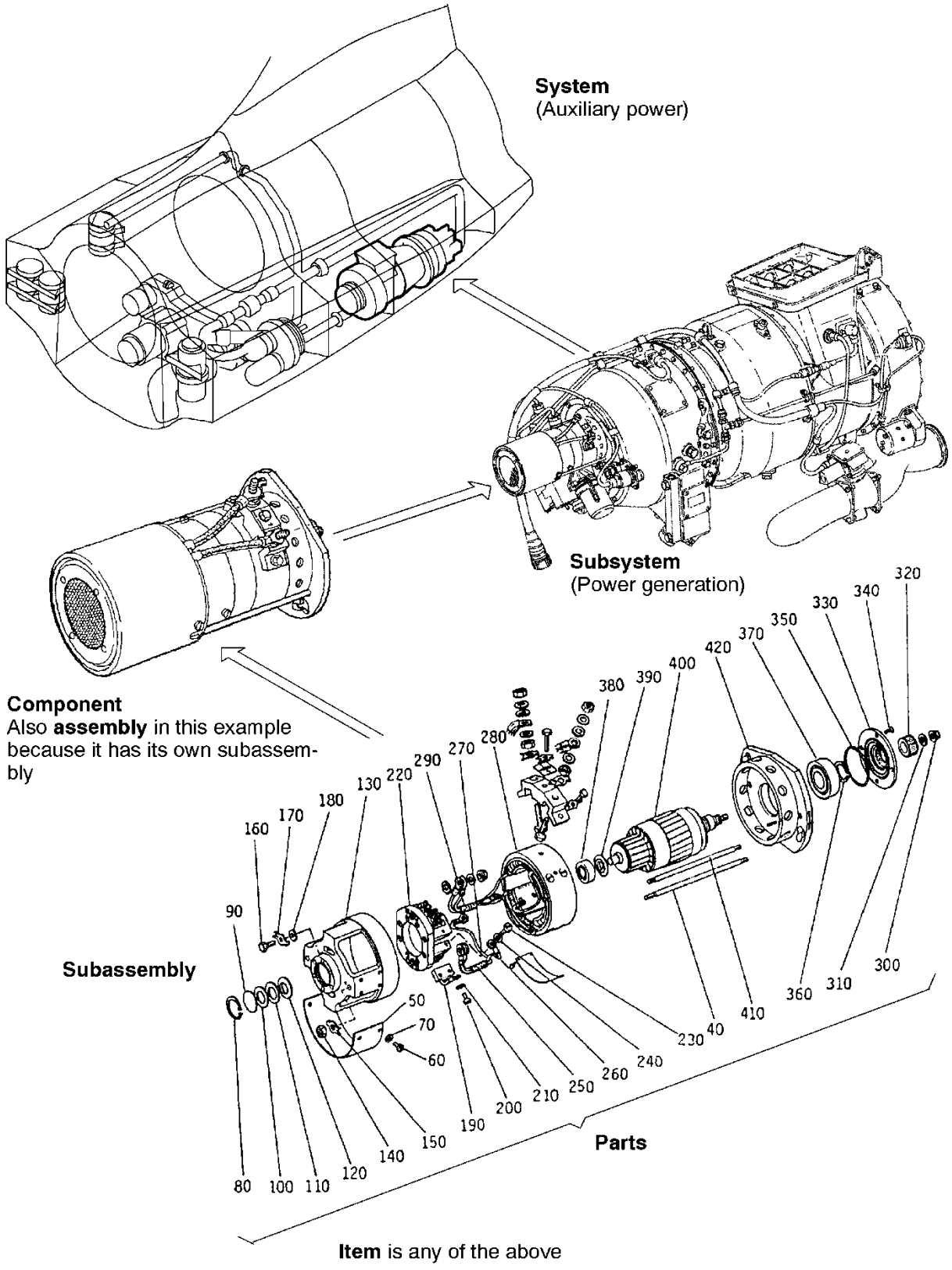
Operational Check (OPC)	A task to determine that an item is fulfilling its intended purpose. The check does not require quantitative tolerances. This is a failure finding task.
Operation Limit	This is the maximum time an item can operate before change or repair at O- or I-level.
organization	An administrative or functional structure (such as a business or a government body) implementing an S1000D project.
page image area	The page image area is the area on the presentation media other than the header and footer in which information can be placed.
Para	A piece of information (text paragraphs, lists and graphics) with a numbered title. A Para can be cross-referenced.
paragraph	A part of a piece of writing that usually deals with one subject, that begins on a new line, and that is made up of one or more sentences.
part	An item of Product, forming part of an assembly or subassembly, which is not normally broken down further. Refer to Fig 1.
post engineering modification	The configuration or build standard of the Product after a particular engineering modification is incorporated.
post Service bulletin	The configuration or build standard of the Product after a particular Service bulletin requirement is incorporated.
pre engineering modification	The configuration or build standard of the Product before a particular engineering modification is incorporated.
pre Service bulletin	The configuration or build standard of the Product before a particular Service bulletin requirement is incorporated.
product, the Product	Any platform, system or equipment (air, sea, land vehicle, equipment or facilities, civil or military). The term the Product is used in this specification to mean platforms, systems, subsystems, sub-subsystems, assemblies, equipment, LRU, components, parts, etc.
product attribute	A property of the Product that can affect the applicability of technical data. Product attributes are properties of the Product that are typically set at the time of manufacture of a product instance and will usually not change throughout the service life of a product instance. Examples of product attributes are model, series and serial number.
Product Cross-reference Table (PCT)	A cross-reference table which identifies the product instances and the values for product attributes and conditions for each product instance.
product instance	A single physical occurrence of the Product.
project	The task to develop, maintain and dispose of the Product.
prompting label	A specific text that can be used to create a dialog in order to obtain values for product attributes or conditions from an end user.

publication (*noun, count*)	A generic term used to describe the presentation of a compilation of data modules, which have been arranged to make a publication, checklist, guide, catalog, etc, on a particular subject, irrespective of the media of presentation (eg, paper or screen). A publication can be a subset of or equal to an information set, but it can also be a superset of several information sets or parts of them.
publication (*noun, non-count*)	The act or process of compilation of information, and making it available for, for example a customer. The compilation can be an IETP, a paper publication compiled from DM or a publication containing legacy data. Refer to publication module.
publication module	The publication module defines the content (references to data modules, other publication modules or legacy data) of a publication and its structure. Uses the publication module code as the identifier. Refer to Chap 4.9.1.
Publication Module Code (PMC)	A 12 to 24 character standardized and structured identifier of a publication module or a final deliverable publication. The PMC is part of the unique identifier of a publication module. Refer to Chap 4.9.2.
Publication Module code - Extended (PME)	An extended Publication Module Code (PMC) identifying one of many (eg, customized instances of a publication module). The publication module code is extended by the attributes given in the element <identExtension>. Refer to Chap 4.12.
publish	To publish information is to make it known to the public. Refer to publication (noun, non-count).
repository-dependent data module	The delivery of the common information repository data modules and the data modules to the customer or end user (or an IETP application). The customer, end user or the IETP has to resolve any links before use or during use of the IETP viewer/browser. Refer to self-contained data module.
SCORM Content Aggregation Model (SCORM CAM)	A learning-taxonomy neutral means for designers and implementers of instruction to aggregate learning resources for the purpose of delivering a desired learning experience to a LMS. The SCORM CAM is one of the books in the SCORM specifications. It describes the components used in a learning experience, how to package those components for exchange from system to system, how to describe those components to enable search and discovery and how to define sequencing information for the components. Refer to SCORM at www.adlnet.org.
SCORM content package	A self-contained ZIP file containing content defined by the SCORM standard. The file is known as a Package Interchange File (PIF) and it contains all files needed to deliver the content package via a SCORM runtime environment and/or learning management system (LMS).

SCORM Content Package Module (SCPM)	A module that aggregates and arranges learning data modules and maintenance modules in preparation for courses, lessons or performance support
SCORM content package Module Code (SMC)	A SCORM content package module code is the standardized and structured identifier of an S1000D SCORM content package module. The SMC is part of the unique identifier of a SCORM content package module. Refer to Chap 4.15.2.
SCORM content package Module code - Extended (SME)	An extended SCORM content package Module Code (SMC) identifying one of many (eg, customized instances of a SCORM content package module). The SCORM content package module code is extended by the attributes given in the element <identExtension>. Refer to Chap 4.12.
self-contained data module	A self-standing data module ready to be delivered for use to the customer or end user. For projects that use repositories, all links from repository data modules are resolved and the data module is in a form that is ready to be delivered to the customer or end user. Refer to repository-dependent data module.
Service Bulletin (SB)	A "design change" defined by the manufacturer but implemented (applied) after product delivery to the customer. Service bulletins are applied on already delivered Product. Refer to Chap 5.2.1.16.
servicing	Any act of replenishment for the purpose of maintaining the inherent design operating capabilities of an item.
Since Last Maintenance (SLM)	This is the time elapsed to next same maintenance task. For example borescope check of the engine each 200 hours of operation.
software program edition	An identification allocated to a software program or a combination of software programs, which identifies it as to its purpose and relates it to a certain level of development.
Shop Replaceable Unit (SRU)	An item, which can be only changed at shop level.
Standard Numbering System (SNS)	The third part of the data module code. Consists of three groups of characters. Intended to provide standardization in the arrangement or addressing of the Product. Refer to Chap 4.3.3.
store	A generic term covering non-munitions items carried externally on or internally in the Product such as fuel tanks, reconnaissance pods, chaff and flares dispensers, transportation pods, missile warning system pods.
subassembly	An assembly, which is part of a larger assembly. Refer to Fig 1.
subsystem	A major functional part of a system, which contributes to operational completeness of a system. Refer to Fig 1.

supplier	An enterprise providing an item to a customer or another enterprise.
supplies	Consumables, material and expendables required to maintain the Product.
support equipment	A general term for an item of equipment required to maintain the Product in its operational state. It includes, for example, test equipment such as test benches, voltmeters, signal generators, ladders, platforms, torque wrenches with a particular value range, standard tools (refer to tool, standard), special tools (refer to tool, special (special-to-type)) and related computer programs. Support equipment can be special (specific-to-type) or standard. Refer to standard and special tool.
system	A combination of inter-related items arranged to perform a specific function. Refer to Fig 1.
system difference code	The second part (1 to 4 characters) of the data module code. Identifies alternative versions of the system and subsystem/sub-subsystem identified by the SNS without affecting the type, model or variant identity. Refer to Chap 4.3.2.
task set	A listing of several procedures as procedural steps including any complementary individual steps by the use of a Procedural Schema. When used for accomplishment instruction of a Service bulletin, a task set is defined as a safe and complete set of maintenance activities to accomplish before the Product returns into service.
Terminal Learning Objective (TLO)	A statement of the instructor's expectations of student performance at the end a specific lesson or unit.
Text Element Identifier (TEI)	The text element identifier is a code (three characters) assigned to identify S2000M data elements.
Time Between Overhaul (TBO)	The maximum interval that the subject part is permitted to operate between scheduled overhauls. The interval as qualified by the time/cycle code is expressed as unit flight hours, operating cycles or aircraft landing cycles.
tool, standard	A general term covering those general hand tools such as screwdrivers, spanners, pliers, etc, which do not require special identification. As a general rule, such tools form part of a typical tradesman's toolkit. It also includes, based on project decision, for example basic test equipment such as voltmeters or signal generators, but also torque wrenches with particular value ranges **not** specific to the Product.
tool, special (special-to-type)	A general term covering those hand tools or other devices which have been manufactured specifically to enable the tradesman to correctly accomplish a given action, task or procedure. Includes tools specific to the Product. Such tools must be positively identified (usually by Part No. or other identifying code).

training	The activities designed to facilitate learning and development of new and existing skills.
training content package	A generic term for a collection of SCPMs, Learning and Maintenance modules intended for use in a non-SCORM environment. S1000D does not require that learning data modules be transformed into SCORM for all use cases.
Training Equipment (TE)	The equipment necessary to train personnel on how to operate and maintain the Product and its support equipment.
training information	Information used in the development of, and during, activities that facilitate learning and the development of new and existing skills.
Training Needs Analysis (TNA)	An analysis of the occupational and industrial training requirements both quantitatively and qualitatively in a particular cluster of occupations.
unit	A component that normally does one function.
version rank	The manufacturer assigned number identifying the Product for a specific customer.
video	The term video means a linear sequence of changing images in single file. Video can also include audio.
work area	The location or area where work is accomplished.
Work Sheet (WS)	Chronological sequence of instructions, JI and/or WS, necessary to perform complex work on an assembly, a component, etc.
zone	The global geographical localization of an item on the Product as defined in Chap 3.4.
3D component	The items of a 3D scene, such as part, assembly (objects of real life).
3D object	The set of data representing a 3D scene (IT/digital).



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Fig 1 Relationship of the breakdown of the Product

Chapter 9.2.2

Terms, acronyms and subject index - Abbreviations and acronyms

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Chap 2.2	Documentation process - Use of standards
Chap 3.9.1	Authoring - General writing rules
SCORM	SCORM 2004

1 Abbreviations and acronyms

1.1 General

When there is doubt whether an abbreviation or acronym will be understood or whenever there is ample space to write in full, the term must be written out rather than abbreviated. Refer to Chap 3.9.1.

1.2 Word combination - Acronym

Abbreviations for word combinations, acronyms, must be used as such and not separated for use singly, unless authorized singly.

Single abbreviations can be combined when necessary if there is no abbreviation listed for the combination.

1.3 Tense and number

The same abbreviation must be used for all tenses, possessive cases, singular and plural forms of a given word.

1.4 Abbreviation and acronym list

AC	Alternating Current
ACCP	Air vehicle Corrosion Control Publication

ACLP	Air vehicle Cargo Loading Publication
ACRW	Aircrew (Information set)
ACRWP	Aircrew Publication
ACSP	Air vehicle Cross Servicing Publication
ACT	Applicability Cross-reference Table
ADF	Automatic Direction Finding
ADL	Advanced Distributed Learning
AECMA	The European Association of Aerospace Industries. AECMA has since April 2004 changed its name to ASD. Refer to ASD.
AFIP	Air vehicle Fault Isolation Publication
AIA	Aerospace Industries Association of America
AIP	Air vehicle Inspection Publication
AM	Amplitude Modulation
AMBP	Air vehicle Mass and Balance Publication
AMP	Air vehicle Maintenance Publication
ANA	Air force - Navy Aeronautical
ANDTP	Air vehicle Non Destructive Testing Publication
Apr	April
ARCP	Air vehicle Role Change Publication
ARP	Air vehicle Recovery Publication
ACSG	Air vehicle Cross Servicing Guide (Information set)
ASCII	American Standard Code for Information Interchange
ASD	AeroSpace and Defence Industries Association of Europe
ASDP	Air vehicle Schematic Diagrams Publication
ASLP	Air vehicle Stores Loading Publication
ASP/AS	Air vehicle Storage Publication
ASR	Air vehicle Structure Repair (Information set)
ASRP	Air vehicle Structure Repair Publication
ATA	Air Transport Association of America
Aug	August
AWDP	Air vehicle Wiring Data Publication
AWLP	Air vehicle Weapon Loading Publication
BDAR	Battle Damage Assessment and Repair (Information set)
BR	Business Rule

BRDP	Business Rule Decision Point
BREX	Business Rules EXchange
C1C	Category 1 Container
CAD	Computer-Aided Design
CAGE Code	Commercial And Government Entity Code
CALS	Continuous Acquisition and Life-cycle Support
CAM	Refer to SCORM CAM
CC	Corrosion Control (Information set)
CCITT4	Comité Consultatif International Téléphonique et Télégraphique Groupe 4
CCT	Conditions Cross-reference Table
CID	Common Information and Data (Information set)
CIDP	Common Information and Data Publication
CIR	Common Information Repository
c.g.	center of gravity
CGM	Computer Graphics Metafile
Chap	Chapter
CL	Cargo Loading (Information set)
CM	Component Maintenance (Information set)
CMS	Central Maintenance System
CMP	Component Maintenance Publications
CPF	Change Proposal Form
CR	Change Record
CRT	Cathode Ray Tube
CSDB	Common Source DataBase
CSL	CSDB Status List
CSN	Catalog Sequence Number
C-W	Continuous Wave
DC	Direct Current
DCAS	Digital Core Avionic System
DDN	Data Dispatch Note
Dec	December
DEF STAN	Defence Standard (UK MOD)
deg	degree

DMC	Data Module Code
DME	Data Module code - Extended
DML	Data Management List
DMRL	Data Management Requirement List
dpi	dots per inch
D&O	Description and Operation
EFC	Equivalent Full Charge
ECU	Engine Change Unit
eg	For example
EDMP	Engine Depot Maintenance Publication
EHF	Extra High Frequency
EO	Engineering Order
EPSS	Electronic Performance Support System (Training information)
EPWG	Electronic Publications Working Group
ESM	Engine Shop Maintenance (Information set)
ES	Engine Shop (Information set)
ESN	Electrical Structure Network
ESP (1)	Engine Shop Publication
ESP (2)	Engine Standard Practices (Information set)
ESPP	Engine Standard Practices Publication
ETOPS	Extended-range Twin engine aircraft Operational Performance Standards ExTended Operational Performance Standards Extended Twin-engine OPerationS
ETP	Electronic Technical Publication
etc	and others, especially of the same kind
Feb	February
FI	Fault Isolation
Fig	Figure
FNC	Functional Check
FM	Frequency Modulation
FWD	Forward
HF	High Frequency
HIGH	HIGHlights (Front matter)

HPT	Human Performance Technology
HQ	Headquarters
HT	Hard Time
HTML	HyperText Markup Language
IATA	International Air Transport Association
IC	Information Code
ICCAIA	International Coordinating Council of Aerospace Industries Associations
ICN	Information Control Number
ie	that is (id est se)
IETP	Interactive Electronic Technical Publication
IFF	Identification Friend or Foe
IFR	In-Flight Refueling
ILS (1)	Instrument Landing System
ILS (2)	Integrated Logistics Support
IMS	Instruction Management System
in.	inch
IPC	Illustrated Parts Catalog
IPD	Illustrated Parts Data (Information set)
IPP	Initial Provisioning Project
IPPN	Initial Provisioning Project Number
IPR	In-Process Review
ISD	Instructional System Design
ISN	Item Sequence Number
ISO	International Standards Organization
ITE	Illustrated Tool and Equipment (Information set)
ITEP	Illustrated Tool and Equipment Publication
Jan	January
JPEG	Joint Photographic Experts Group
JI	Job Instruction
Jul	July
Jun	June
LF	Low Frequency
LH	Left Hand

LMS	Learning Management System
LOA	List of Abbreviations
LOAP	List of Applicable Publications
LOASD	List of Applicable Specifications and Documentation
LOC	List of Cautions
LOEDM	List of Effective Data Module
LOEP	List of Effective Pages
LOI	List of Illustrations
LOM	Learning Object Metadata
LOMOD	List of MODifications
LORAN	Long Range Navigation
LOS	List of Symbols
LOSE	List of Support Equipment
LOSP	List of Spares
LOSU	List of Supplies
LOT	List of Terms
LOV	List of Vendors
LOW	List of Warnings
LOX	Liquid Oxygen
LRU	Line Replaceable Unit
LSA	Logistics Support Analysis
MAC (1)	Mean Aerodynamic Chord
MAC (2)	Maintenance Allocation Chart
Mar	March
May	May
MB	Mass and Balance (Information set)
MD	Material Data (Information set)
MDP	Material Data Publication
mm	millimeter
Mk	Mark
Mod	Modification
MoD	Ministry of Defence
MP	Maintenance Planning (Information set)

MSG (MSG-3)	Maintenance Steering Group. Refer to Chap 2.2.
MTA	Maintenance Task Analysis
NATO	North Atlantic Treaty Organization
NDT	Non-Destructive Testing
NIIN	NATO Item Identification Number. Refer to NIN.
NIN	NATO Item identification Number (the Text Element Identifier (TEI) for NIIN, used in the Illustrated parts data). Refer to NIIN.
No.	Number
Nov	November
NSC	NATO Supply Class
NSN	NATO/National Stock Number
NSPA	NATO Support Agency
OC	On Condition
Oct	October
OPC	Operational Check
OTL	Operational Limit
PA (1)	Passenger Address
PA (2)	Performance Analysis (Training information)
Para	Paragraph
PCT	Product Cross-reference Table
PDF (pdf)	Portable Document Format
PI	Part Identifier
PIF	Package Interchange File (Refer to SCORM content package). Refer to SCORM at www.adlnet.org.
PLCS	Product LifeCycle Support (ISO 10303-239). Refer to Chap 2.2.
PLM	Product Lifecycle Management
PMC	Publication Module Code
PME	Publication Module code - Extended
PMCS	Preventive Maintenance Checks and Services
PPB	Power Plant Build-up (Information set)
PPBP	Power Plant Build-up Publication
pt	Point, a typographical term for a unit of measure which is equivalent to 1/72 of an inch.
QA	Quality Assurance
Qty	Quantity

R	Recovery (Information set)
RC	Role Change (Information set)
RCM	Reliability Centered Maintenance
RDF/DC	Resource Description Framework/Dublin Core metadata
RH	Right Hand
RPM	Revolutions per Minute
S	Storage (Information set)
SB	Service Bulletin
SCO	Sharable Content Object. Refer to SCORM at www.adlnet.org.
SCORM	Sharable Content Object Reference Model. Refer to SCORM at www.adlnet.org.
SCORM CAM	SCORM Content Aggregation Model. Refer to SCORM at www.adlnet.org.
SCPM	SCORM Content Package Module
SD	Schematic Diagrams
SE	Support Equipment (Information set)
Sep	September
SHET	S1000D Heavy Email Traffic
SHF	Super High Frequency
SI	Système International d'Unites
SL	Stores Loading (Information set)
SLM	Since Last Maintenance
SMC	SCORM content package Module Code
SME	SCORM content package Module code - Extended
SN	Serial Number
SNS	Standard Numbering System
SR	Structural Repair (Information set)
SRU	Shop Replaceable Unit
STE	Simplified Technical English® (ASD-STE100)
SWR	Standing Wave Ratio
TBD	To Be Determined
TBO	Time Between Overhaul
TE	Training Equipment (Information set)
TEI	Text Element Identifier

TEP	Training Equipment Publication
TIFF	Tagged Image File Format (ISO 12639)
TNA	Training Needs Analysis
TOC	Table of Contents
thru	up to and including
TSR	Technical Standard Record
UHF	Ultra High Frequency
UPE	data UPdate file code - Extended
UPF	data UPdate File code
US	The United States
VHF	Very High Frequency
VLF	Very Low Frequency
VOR	VHF Omni directional and Radio Range
vs	versus
W	Wiring
WD	Wiring Data (Information set)
WDD	Wiring Data Description
WP	Wiring Publication
WL	Weapon Loading (Information set)
WS	Work Sheet
XML	Extensible Markup Language
XSL	Extensible Stylesheet Language

Chapter 9.2.3

Terms, acronyms and subject index - Subject index

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1 General 1
2 Definition 1
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List of tables

1 References 1

References

Table 1 References

Chap No./Document No.	Title
None	

1 General

The goal of this chapter is to provide to S1000D users an index of subjects defined/described by S1000D.

2 Definition

The entries in the given index are listed in alphabetical order. Each entry contains the following information:

- Name of the subject and its abbreviation/acronym if available
- Indication of related topics, whether it is an information set and/or whether it is supported by a separate Schema definition, etc
- Chapter number where the given subject is defined and/or described
- A list of the related chapters

Note 1

The chapter numbers correspond to the status in the present Issue of S1000D. Chapter numbers in earlier issues can differ.

Note 2

The lists of related chapters contain only major chapters (eg, Chap 1, Chap 2, Chap 3). This is done in order to minimize the volume, to decrease complexity and to increase readability of this chapter. An exception is done for Chap 3.9 "Information generation - Authoring", which is listed separately, because of its considerable volume and importance for S1000D users.

Note 3

There are a number of abbreviations and/or acronyms which relate to multiple subjects. These are: ACT, BREX, CCT, CIR, CSDB, IPD, IETP, PCT and SCORM. For the purpose of readability and usability, these multiple subjects were grouped together. Full definitions of these abbreviations and acronyms refer to the place they can be found within the subject index. Example for Applicability Cross-reference Table: Refer to "ACT" subjects. Example for a subject not containing the given abbreviation but relating to it, context independent rules: Refer to "BREX data module - Context independent rules".

3 Subject index

access (functionality definition)	**Definition:** Chap 6.4.1 "Functionality - Background and explanation" **Related chapters:** Chap 6, Chap 7
access illustration	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
access information	**Definition:** Chap 3.4 "Information generation - Zoning and access" **Related chapters:** Chap 5
access point	**Definition:** Chap 3.4 "Information generation - Zoning and access" **Related chapters:** Chap 3.9, Chap 4, Chap 8, Chap 9
access point repository	**Definition:** Chap 3.9.5.2.11.5 "Common information repository - Access points" **Related chapters:** Chap 3.9
Applicability Cross-reference Table, ACT, concept	**Definition:** Chap 4.14.1 "Applicability - Applicability cross-reference table" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
ACT data module (supported by Schema)	**Definition:** Chap 3.9.5.3.1 "Applicability - Applicability cross-reference table" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9

ACT catalog concept	**Definition:** Chap 4.14.4 "Applicability - Applicability cross-reference table catalog" **Related chapters:** Chap 3.9, Chap 4, Chap 7
ACT catalog data module (supported by Schema)	**Definition:** Chap 3.9.5.3.4 "Applicability - Applicability cross-reference table catalog" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
airborne equipment	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3, Chap 5
air vehicle	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 4, Chap 5, Chap 8
Aircrew, ACRW (air specific information set)	**Definition:** Chap 5.2.2.7 "Air specific information sets - Aircrew information" **Related chapters:** Chap 3.9, Chap 5
Aircrew Publication, ACRWP	**Definition:** Chap 5.3.2.1 "Air specific publications - Aircrew information" **Related chapters:** Chap 3.9, Chap 5
air specific information set	**Definition:** Chap 5.2.2 "Information sets - Air specific information sets" **Related chapters:** Chap 5
air specific publication	**Definition:** Chap 5.3.2 "Publications - Air specific publications" **Related chapters:** Chap 5

Air vehicle Cross Servicing Guide, ACSG	**Definition:** Chap 5.3.2.2 "Air specific publications - Cross servicing guide" **Related chapters:** Chap 5
air vehicle cross servicing information (air specific information set)	**Definition:** Chap 5.2.2.3 "Air specific information sets - Cross servicing information" **Related chapters:** Chap 5
Air vehicle Structure Repair, ASR (air specific information set)	**Definition:** Chap 5.2.2.2 "Air specific information sets - Structure repair information" **Related chapters:** Chap 5
alternates concept	**Definition:** Chap 4.13.3 "Optimizing and reuse - Alternates concept" **Related chapters:** Chap 3.9, Chap 4
animation (multimedia)	**Definition:** Chap 3.9.2.4 "Illustration rules and multimedia - Multimedia, General" **Related chapters:** Chap 3.9, Chap 7, Chap 8, Chap 9
annotation (functionality definition)	**Definition:** Chap 6.4.1 "Functionality - Background and explanation" **Related chapters:** Chap 3.9, Chap 6
applicability	**Definition:** Chap 4.14 "Information management - Applicability" **Related chapters:** Chap 3.9, Chap 4, Chap 6, Chap 7, Chap 9
applicability annotation	**Definition:** Chap 4.14 "Information management - Applicability" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7
applicability (authoring)	**Definition:** Chap 3.9.5.3 "Data modules - Applicability" **Related chapters:** Chap 3.9, Chap 4, Chap 6, Chap 7, Chap 9

Applicability Cross-reference Table, ACT	Refer to "ACT" subjects.
assembly	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
assembly code	**Definition:** Chap 4.3.3 "Data module code - Standard numbering system" **Related chapters:** Chap 3.9, Chap 4
attribute	**Definition:** Chap 3.9.6 "Authoring - Attributes" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
audio (multimedia)	**Definition:** Chap 3.9.2.4 "Illustration rules and multimedia - Multimedia, General" **Related chapters:** Chap 3.9, Chap 5, Chap 6, Chap 7, Chap 8
Battle Damage Assessment and Repair, BDAR (common information set)	**Definition:** Chap 5.2.1.14 "Common information sets - Battle damage assessment and repair information" **Related chapters:** Chap 3.9, Chap 5, Chap 6
BREX, Business Rules EXchange, concept	**Definition:** Chap 4.10 "Information management - Business rules" **Related chapters:** Chap 2, Chap 4, Chap 7, Chap 9.2.1
BREX data module (supported by Schema)	**Definition:** Chap 4.10.2 "Business rules- BREX data module" **Related chapters:** Chap 3.9, Chap 4, Chap 7
BREX data module - Context independent rule	**Definition:** Chap 4.10.2.3 "BREX data module - Context independent rules" **Related chapters:** Chap 3.9, Chap 4

BREX data module - Context related rule	**Definition:** Chap 4.10.2.2 "BREX data module - Context related rules" **Related chapters:** Chap 3.9, Chap 4
BREX data module - SNS rules	**Definition:** Chap 4.10.2.1 "BREX data module - SNS rules" **Related chapters:** Chap 3.9, Chap 4
BREX data module, default	**Definition:** Chap 4.10.3 "Business rules- Default BREX data module" **Related chapters:** Chap 3.9, Chap 4, Chap 7, Chap 8
BREX data module, layered	**Definition:** Chap 4.10 "Information management - Business rules" **Related chapters:** Chap 7
BREX processing	**Definition:** Chap 7.9 "Information processing - Business rules processing" **Related chapters:** Chap 2, Chap 4
building of publications	**Definition:** Chap 4.9.3 "Publication management - Building of publications" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 7
building of SCO	**Definition:** Chap 4.15.3 "Learning information - Building SCORM content package modules" **Related chapters:** Chap 3.9, Chap 4
Business Rule, BR	**Definition:** Chap 2.5 "Documentation process - Business rules" **Related chapters:** Chap Copyright, Chap 1, Chap 2, Chap 4, Chap 7, Chap 9.2
business rules concept	**Definition:** Chap 4.10 "Information management - Business rules" **Related chapters:** Chap 2, Chap 2.5.2, Chap 4, Chap 7

business rule decision	**Definition:** Chap 4.10.1 "Business rules - Business rules document data module" **Related chapters:** Chap 2.5.2, Chap 9.2.1
Business Rule Decision Point, BRDP	**Definition:** Chap 2.5.3 "Business rules - Business rule decision points index" **Related chapters:** Chap 2, Chap 3, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9.2
business rule decision points index	**Definition:** Chap 2.5.3 "Business rules - Business rule decision points index" **Related chapters:** Chap 2.5.2
business rule decision point priority	**Definition:** Chap 2.5.2 "Business rules - Generation and use" **Related chapters:** Chap 4.10.1, Chap 9.2.1
business rules document data module, concept	**Definition:** Chap 4.10.1 "Business rules - Business rules document data module" **Related chapters:** Chap 2.5.2, Chap 2.5.3, Chap 4.10
business rules document data module (supported by Schema)	Definition: Chap 4.10.1 "Business rules - Business rules document data module" Related chapters: Chap 2.5.2, Chap 2.5.3, Chap 4.10, Chap 9.2.1
Business Rules Exchange, BREX	Refer to "BREX" subjects.
business rules layer	**Definition:** Chap 2.5.1 "Business rules - Categories and layers" **Related chapters:** Chap 4, Chap 9
business rules processing	**Definition:** Chap 7.9 "Information processing - Business rules processing" **Related chapters:** Chap 2

business rule severity	**Definition:** Chap 2.5.2 "Business rules - Generation and use" **Related chapters:** Chap 4.10.1
business rule template data module	**Definition:** Chap 4.10.1 "Business rules - Business rules document data module" **Related chapters:** Chap 2.5.2, Chap 2.5.3, Chap 4.10
caption (group)	**Definition:** Chap 3.9.5.2.1.4 "Common constructs - Caption groups" **Related chapters:** Chap 3.9, Chap 6, Chap 7
Cargo Loading, CL (common information set)	**Definition:** Chap 5.2.1.11 "Common information sets - Cargo loading information" **Related chapters:** Chap 5, Chap 6, Chap 8
Catalogue Sequence Number, CSN	**Definition:** Chap 3.9.5.2.7 "Content section - Parts information" **Related chapters:** Chap 4, Chap 5, Chap 7
captions / caption group	**Definition:** Chap 3.9.5.2.1.4 "Common constructs - Caption groups" **Related chapters:** Chap 3.9, Chap 5, Chap 6, Chap 7, Chap 8
Category 1 Container	**Definition:** Chap 3.9.5.2.7 "Content section - Parts information" **Related chapters:** Chap 5, Chap 9
cause analysis (training)	**Definition:** Chap 3.9.7 "Authoring - Human performance technology and training" **Related chapters:** Chap 3.9
caution	**Definition:** Chap 3.9.3 "Authoring - Warnings, cautions and notes" **Related chapters:** Chap 1, Chap 3, Chap 3.9, Chap 5, Chap 6, Chap 7, Chap 8

caution repository	**Definition:** Chap 3.9.5.2.11.14 "Common information repository - Cautions" **Related chapters:** Chap 3.9
Conditions Cross-reference Table, CCT, concept	**Definition:** Chap 4.14.2 "Applicability - Conditions cross-reference table" **Related chapters:** Chap 3.9, Chap 4, Chap 6, Chap 7, Chap 8, Chap 9
CCT data module (supported by Schema)	**Definition:** Chap 3.9.5.3.2 "Applicability - Conditions cross-reference table" **Related chapters:** Chap 3.9, Chap 4, Chap 6, Chap 7, Chap 8, Chap 9
certification	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 4, Chap 5, Chap 8
change indicator	Refer to "CIR data modules - incremental update - change indicators".
change marking (change mark)	**Definition:** Chap 3.9.5.2.1.1 "Common constructs - Change marking" **Related chapters:** Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7
Change Proposal Form, CPF	**Definition:** Chap 1.5 "Request for change" **Related chapters:** Chap 1, Chap 8
Change Record, CR	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 4, Chap 5, Chap 6, Chap 8
circuit breaker	**Definition:** Chap 3.9.5.2.11.2 "Common information repository - Circuit breakers" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 7, Chap 8

circuit breaker repository	**Definition:** Chap 3.9.5.2.11.2 "Common information repository - Circuit breakers" **Related chapters:** Chap 3.9
CIR, Common Information Repository, concept	**Definition:** Chap 4.13.1 "Optimizing and reuse - Common information repository concept" **Related chapters:** Chap 1, Chap 3, Chap 3.9, Chap 4, Chap 7, Chap 8, Chap 9
CIR data module (supported by Schema)	**Definition:** Chap 3.9.5.2.11 "Content section - Common information repository" **Related chapters:** Chap 1, Chap 3.9, Chap 4, Chap 7, Chap 8, Chap 9
CIR data modules - incremental update	**Definition:** Chap 4.13.2 "Optimizing and reuse - Incremental update of common information repository data modules" **Related chapters:** Chap 1, Chap 4
CIR data modules - incremental update - change indicator	**Definition:** Chap 4.13.2.1 "Incremental update of Common information repository data modules - Principles" **Related chapters:** None identified
CIR data modules - incremental update - source CIR data module	**Definition:** Chap 4.13.2.1 "Incremental update of Common information repository data modules - Principles" **Related chapters:** None identified
CIR data modules - incremental update - target CIR data module	**Definition:** Chap 4.13.2.1 "Incremental update of Common information repository data modules - Principles" **Related chapters:** Chap 3.9, Chap 4
CIR-dependent data module	**Definition:** Chap 1.3 "How to use the specification" **Related chapters:** Chap 3.9, Chap 4, Chap 9

comment (supported by Schema)	**Definition:** Chap 4.6 "Information management - Comment" **Related chapters:** Chap 3, Chap 3.9, Chap 4
Commercial and Government Entity code, CAGE code	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 7, Chap 9
common information	**Definition:** Chap 3.9.5.2.1.12 "Common constructs - Common information" **Related chapters:** Chap 3.9
Common Information and Data, CID (common information set)	**Definition:** Chap 5.2.1.18 "Common information sets - Common information and data" **Related chapters:** Chap 5, Chap 6
Common Information Repository, CIR	Refer to "CIR" subjects.
common information sets	**Definition:** Chap 5.2.1 "Information sets - Common information sets" **Related chapters:** Chap 5
common requirements (to publications)	**Definition:** Chap 5.3.1 "Publications - Common requirements" **Related chapters:** Chap 5
Common Source DataBase, CSDB	Refer to "CSDB" subjects.
compliant/compliance	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 3.9, Chap 4, Chap 6, Chap 7, Chap 9
Component Maintenance, CM (common information set)	**Definition:** Chap 5.2.1.9 "Common information sets - Equipment information" **Related chapters:** Chap 5

Component Maintenance Publications, CMP	**Definition:** Chap 5.3.1.4 "Common requirements - Component maintenance" **Related chapters:** Chap 3, Chap 3.9, Chap 5, Chap 6, Chap 9
Computer Graphics Metafile, CGM (S1000D CGM profile)	**Definition:** Chap 7.3.2 "CSDB objects - Graphics" **Related chapters:** Chap 2, Chap 3.9, Chap 4, Chap 7
condition	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
Conditions Cross-reference Table, CCT	Refer to "CCT" subjects.
conformant/conformance	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 3.9, Chap 4, Chap 6, Chap 7, Chap 9
Corrosion Control, CC (common information set)	**Definition:** Chap 5.2.1.3.4 "Maintenance information - Corrosion control" **Related chapters:** Chap 3.9, Chap 5, Chap 6
consumable (see also supplies)	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 8
container data module (supported by Schema)	**Definition:** Chap 3.9.5.2.12 "Content section - Container data module" **Related chapters:** Chap 1, Chap 3.9, Chap 4, Chap 7, Chap 8
container data module concept	**Definition:** Chap 4.13.4 "Optimizing and reuse - Container data module" **Related chapters:** Chap 3.9, Chap 8

content section	**Definition:** Chap 3.2 "Information generation - Data modules" **Related chapters:** Chap 1, Chap 3, Chap 3.9, Chap 4, Chap 7, Chap 9
content sensitive help	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 6
content specific data	**Definition:** Chap 4.16 "Information management - Content specific data and quantity data" **Related chapters:** Chap 3.9, Chap 4
context independent rule	Refer to "BREX data module - context independent rules".
context related rule	Refer to "BREX data module - context related rules".
controlled content	**Definition:** Chap 3.9.5.2.1.11 "Common constructs - Controlled content" **Related chapters:** Chap 3.9, Chap 4, Chap 7
controls and indicator	**Definition:** Chap 3.9.5.2.11.11 "Common information repository - Controls and indicators" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 8
controls and indicators repository	**Definition:** Chap 3.9.5.2.11.11 "Common information repository - Controls and indicators" **Related chapters:** Chap 3.9
core criteria (conformance and compliance)	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 3.9, Chap 4, Chap 7
crew/operator descriptive information (land/sea specific information set)	**Definition:** Chap 5.2.3.1 "Land/sea specific information sets - Crew/Operator descriptive information" **Related chapters:** Chap 3, Chap 3.9, Chap 9

crew/operator fault detection, isolation and resolution information (land/sea specific information set)	**Definition:** Chap 5.2.3.4 "Land/sea specific information sets - Crew/Operator fault detection, isolation and resolution information" **Related chapters:** Chap 3, Chap 3.9, Chap 9
crew/operator information (common information set)	**Definition:** Chap 5.2.1.1 "Common information sets - Crew/Operator information" **Related chapters:** Chap 5
crew/operator information / data module (supported by Schema)	**Definition:** Chap 3.9.5.2.6 "Content section - Crew/Operator information" **Related chapters:** Chap 1, Chap 3, Chap 3.9, Chap 5, Chap 6, Chap 7
crew/operator operation information (land/sea specific information set)	**Definition:** Chap 5.2.3.2 "Land/sea specific information sets - Crew/Operator operation information" **Related chapters:** Chap 3, Chap 3.9, Chap 9
crew/operator sequential operation information (land/sea specific information set)	**Definition:** Chap 5.2.3.3 "Land/sea specific information sets - Crew/Operator sequential operation information" **Related chapters:** Chap 3, Chap 3.9, Chap 9
criteria on aspect options (conformance and compliance)	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 4, Chap 6, Chap 7
cross-reference	**Definition:** Chap 3.9.5.2.1.2 "Common constructs - Referencing" **Related chapters:** Chap 3, Chap 3.9, Chap 6, Chap 7
CSDB, Common Source DataBase, concept	**Definition:** Chap 4.2 "Information management - Common source database" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9

CSDB object / common source database object	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** All
CSDB object criteria (conformance and compliance)	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
CSDB delivery criteria (conformance and compliance)	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 4, Chap 6, Chap 7
CSDB (management) system / common source (management) system	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
CSDB object	**Definition:** Chap 7.3 "Information processing - CSDB objects" **Related chapters:** Chap 3.9, Chap 4, Chap 6, Chap 7
CSDB Status List, CSL	**Definition:** Chap 4.5 "Information management - Data management lists" **Related chapters:** Chap 2, Chap 4, Chap 7
customer	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap Copyright, Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
database	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7

data dictionary	**Definition:** Chap 9.3 "Terms and definitions - Schema documentation" **Related chapters:** Chap 3.9
Data Dispatch Note, DDN (supported by Schema)	**Definition:** Chap 7.5.1 "Information interchange - File based transfer" **Related chapters:** Chap 2, Chap 3, Chap 4, Chap 7, Chap 8, Chap 9
data exchange	**Definition:** Chap 1.3 "How to use the specification" **Related chapters:** Chap 1, Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 9
Data Management List, DML	**Definition:** Chap 4.5 "Information management - Data management lists" **Related chapters:** Chap 1, Chap 2, Chap 3.9, Chap 4, Chap 7
Data Management Requirement List, DMRL	**Definition:** Chap 4.5 "Information management - Data management lists" **Related chapters:** Chap 2, Chap 3, Chap 4, Chap 7
data module (supported by various Schemas)	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 7, and generally throughout the Specification
Data Module Code, DMC	**Definition:** Chap 4.3 "Information management - Data module code" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
Data Module code - Extended (DME) (= identification extension)	**Definition:** Chap 4.12 "Information management - Multiple instances of CSDB objects" **Related chapters:** Chap 3.9, Chap 4, Chap 7, Chap 9

data module identification	**Definition:** Chap 4.12 "Information management - Multiple instances of CSDB objects" **Related chapters:** Chap 7
data module instance	**Definition:** Chap 4.12 "Information management - Multiple instances of CSDB objects" **Related chapters:** Chap 3.9, Chap 4, Chap 7
data module instance identification	**Definition:** Chap 4.12 "Information management - Multiple instances of CSDB objects" **Related chapters:** Chap 3.9, Chap 7
data module Schema	**Definition:** Chap 7.3.1 "CSDB objects - Data module Schema" **Related chapters:** Chap 7
data module version control	Refer to "version control of data modules".
Data update file object (supported by Schema)	**Definition:** Chap 4.13.2.2 "Incremental update of common information repository data modules - Data update file content" **Related chapters:** Chap 3.9, Chap 4, Chap 9
data Update File code (UPF)	**Definition:** Chap 4.13.2.1 "Incremental update of Common information repository data modules - Principles" **Related chapters:** Chap 4, Chap 7, Chap 9
data Update file code Extension (UPE)	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 4, Chap 9
data update file principle	**Definition:** Chap 4.13.2.1 "Incremental update of Common information repository data modules - Principles" **Related chapters:** Chap 1, Chap 3.9, Chap 4, Chap 9
default BREX data module	Refer to "BREX data module, default".

Delivery and distribution (functionality definition)	**Definition:** Chap 6.4.1 "Functionality - Background and explanation" **Related chapters:** Chap 4
delivery of media objects	**Definition:** Chap 3.9.2 "Authoring - Illustration rules and multimedia" **Related chapters:** Chap 3.9, Chap 7
descriptive information / data module (supported by Schema)	**Definition:** Chap 3.9.5.2.2 "Content section - Descriptive information" **Related chapters:** Chap 1, Chap 3.9, Chap 5, Chap 7
diagnostics and prognostics (functionality definition)	**Definition:** Chap 6.4.1 "Functionality - Background and explanation" **Related chapters:** Chap 3.9, Chap 5, Chap 7
dialog (in process data module)	**Definition:** Chap 3.9.5.2.10.2 "Process data module - Dialogs" **Related chapters:** Chap 3, Chap 3.9, Chap 6, Chap 7
disassembly code	**Definition:** Chap 4.3.4 "Data module code - Disassembly code" **Related chapters:** Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 7, Chap 8, Chap 9
disassembly code variant	**Definition:** Chap 4.3.5 "Data module code - Disassembly code variant" **Related chapters:** Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 9
disassembly principle	**Definition:** Chap 3.8 "Information generation - Disassembly principles" **Related chapters:** Chap 4
document	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap Copyright, Chap 1, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8

documentation process criteria (conformance and compliance)	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 3.9, Chap 7
Enabling Learning Objective, ELO	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 5
Engineering Order, EO	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 4
e-learning	**Definition:** Chap 3.9.2.6 "Illustration rules and multimedia - e-learning and SCORM" **Related chapters:** None identified
Electronic Performance Support System (EPSS)	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9
Electronic Publications Working Group, EPWG	**Definition:** Chap 1.1 "Purpose" **Related chapters:** Chap 7
Electronic Technical Publication, ETP (see also IETP)	**Definition:** Chap 6.4.1 "Functionality - Background and explanation" **Related chapters:** None identified
element (in XML context: mandatory, optional, etc)	**Definition:** Chap 1.3 "How to use the specification" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9

engine module number	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** None identified
Engine Shop, ES (air specific information set)	**Definition:** Chap 5.2.2.6 "Air specific information sets - Engine standard practices" **Related chapters:** Chap 5
Engine Shop Maintenance, ESM (air specific information set)	**Definition:** Chap 5.2.2.4 "Air specific information sets - Engine maintenance information" **Related chapters:** Chap 5, Chap 8
Electrical Structure Network, ESN	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 5.2.1.16
Engine Standard Practices, ESP (air specific information set)	**Definition:** Chap 5.2.2.6 "Air specific information sets - Engine standard practices" **Related chapters:** Chap 5
enterprise information repository	**Definition:** 3.9.5.2.11.6 "Common information repository - Enterprise information" **Related chapters:** Chap 3.9
equipment	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
Equivalent Full Charge, EFC	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** None identified
exchange	Refer to "data exchange".

expendable	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 8
export control	**Definition:** Chap 3.9.5.1.1 "Identification and status section - Export control" **Related chapters:** Chap 3, Chap 3.9, Chap 4, Chap 6
expression (in process data module)	**Definition:** Chap 3.9.5.2.10.3 "Process data module - Expressions, variables, external applications" **Related chapters:** Chap 3.9, Chap 7
extended data module code	**Definition:** Chap 4.12 "Information management - Multiple instances of CSDB objects **Related chapters:** Chap 3.9, Chap 4, Chap 7, Chap 9
external application (in process data module)	**Definition:** Chap 3.9.5.2.10.3 "Process data module - Expressions, variables, external applications" **Related chapters:** Chap 3.9, Chap 7
externalization	**Definition:** Chap 3.9.5.2.1.13 "Common constructs - Externalization" **Related chapters:** Chap 3.9, Chap 4
externalized applicability annotations	**Definition:** Chap 3.9.5.2.11.12 "Common information repository - Externalized applicability annotations" **Related chapters:** Chap 3.9, Chap 4, Chap 7
external processes (functionality definition)	**Definition:** Chap 6.4.1 "Functionality - Background and explanation" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 7

fault information (supported by Schema)	**Definition:** Chap 3.9.5.2.4 "Content section - Fault information" **Related chapters:** Chap 4, Chap 6, Chap 7
Fault Isolation, FI (common information set)	**Definition:** Chap 5.2.1.3.2 "Maintenance information - Fault isolation" **Related chapters:** Chap 3.9, Chap 5, Chap 6, Chap 7, Chap 8
figure, Fig	**Definition:** Chap 3.9.5.2.1.7 "Common constructs - Figures, multimedia and foldouts" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 9
figure number	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6
figure reference line	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 6
file based transfer	**Definition:** Chap 7.5.1 "Information interchange - File based transfer" **Related chapters:** Chap 4, Chap 7
flattened Schema package	**Definition:** Chap 7.2 "Information processing - Basic concepts" **Related chapters:** Chap 7
foldout	**Definition:** Chap 3.9.5.2.1.7 "Common constructs - Figures, multimedia and foldouts" **Related chapters:** Chap 2, Chap 3.9, Chap 4, Chap 6, Chap 7
footnote	**Definition:** Chap 3.9.5.2.1.10 "Common constructs - Text elements" **Related chapters:** Chap 3, Chap 3.9, Chap 6

front matter	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
front matter (common requirements to publications)	**Definition:** Chap 5.3.1.1 "Common requirements - Front matter" **Related chapters:** Chap 3.9, Chap 5, Chap 6
front matter information / data module (supported by Schema)	**Definition:** Chap 3.9.5.2.16 "Content section - Front matter" **Related chapters:** Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6
functional and/or physical repository	**Definition:** Chap 3.9.5.2.11.10 "Common information repository - Functional and/or physical areas" **Related chapters:** Chap 3.9
Functional Check, FNC	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 5, Chap 8
functional item number	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 7, Chap 8
functional item repository	**Definition:** Chap 3.9.5.2.11.1 "Common information repository - Functional items" **Related chapters:** Chap 3, Chap 4
functionality	**Definition:** Chap 6.4.1 "Functionality - Background and explanation" **Related chapters:** Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9

functionality matrix	**Definition:** Chap 6.4.2 "Functionality - Functionality matrix" **Related chapters:** Chap 6
general criteria (conformance and compliance)	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 2, Chap 4, Chap 7
generation of publications	**Definition:** Chap 7.4 "Information processing - Generation of publications" **Related chapters:** Chap 7
graphics functionality (functionality definition)	**Definition:** Chap 6.4.1 "Functionality - Background and explanation" **Related chapters:** Chap 3, Chap 3.9, Chap 5, Chap 6, Chap 7
granularity	**Definition:** None identified, but in a number of related chapters the following wording reflects the granularity definition: "The granularity of data modules is to follow the breakdown reflected by the SNS." Thus, refer to "Standard Numbering System, SNS". **Related chapters:** Chap 2, Chap 3.9, Chap 4
help, content sensitive	Refer to "content sensitive help".
HIGHlights, HIGH (front matter)	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 3.9, Chap 6
hotspot	**Definition:** Chap 3.9.5.2.1.8 "Common constructs - Hotspots" **Related chapters:** Chap 2, Chap 3.9, Chap 6, Chap 7
Hard Time, HT	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9

identification and status section	**Definition:** Chap 3.9.5.1 "Data modules - Identification and status section" **Related chapters:** Chap 1, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 9
identification extension	Refer to "Publication Module code - Extended, PME" and "Data Module Code - Extended (DME)"
IETP, Interactive Electronic Technical Publication, concept	**Definition:** Chap 6.3 "Information presentation/use - Interactive electronic technical publications" **Related chapters:** Chap 1, Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 9
IETP delivery criteria (conformance and compliance)	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 4, Chap 7
IETP presentation criteria (conformance and compliance)	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 6
Illustrated Parts Data, IPD	Refer to "IPD" subjects.
Illustrated Tool and Equipment, ITE (common information set)	**Definition:** Chap 5.2.1.15 "Common information sets - Illustrated tool and support equipment information" **Related chapters:** Chap 5, Chap 6
illustration	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
illustration reproduction area	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 4, Chap 6

illustration sheet	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7
implementation guide	**Definition:** Chap 2.4 "Documentation process - Implementation guide" **Related chapters:** Chap 2
incorporation status list (CCT data module)	**Definition:** Chap 4.14.2 "Applicability - Conditions cross-reference table" **Related chapters:** Chap 3.9, Chap 4
incremental update	Refer to "CIR data modules - incremental update".
information code	**Definition:** Chap 4.3.6 "Data module code - Information code" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
information code variant	**Definition:** Chap 4.3.7 "Data module code - Information code variant" **Related chapters:** Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 7, Chap 9
Information Control Number, ICN	**Definition:** Chap 4.4 "Information management - Information control number" **Related chapters:** Chap 3.9, Chap 4, Chap 9
information interchange	**Definition:** Chap 7.5 "Information processing - Information interchange" **Related chapters:** Chap 7
information name	**Definition:** Chap 3.9.5.1 "Data modules - Identification and status section" **Related chapters:** Chap 2, Chap 8

information set	**Definition:** Chap 3.3 "Information generation - Information sets" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 8, Chap 9
Initial Provisioning Project, IPP	**Definition:** Chap 3.9.5.2.7 "Content section - Parts information" **Related chapters:** None identified
Initial Provisioning Project Number, IPPN	**Definition:** Chap 3.9.5.2.7 "Content section - Parts information" **Related chapters:** Chap 3.9, Chap 5
In-Process Review, IPR	**Definition:** Chap 3.7 "Information generation - Quality assurance" **Related chapters:** None identified
Integrated Logistics Support (number), ILS	**Definition:** Chap 3.9.5.2.7 "Content section - Parts information" **Related chapters:** Chap 1, Chap 5, Chap 8, Chap 9
Interactive Electronic Technical Publication, IETP	Refer to "IETP" subjects.
interchange of data modules	**Definition:** Chap 4.8 "Information management - Interchange of data modules" **Related chapters:** Chap 3.9, Chap 7
international, national and regulatory scheduled check information (land/sea specific information set)	**Definition:** Chap 5.2.3.5 "Land/sea specific information sets - International, national and regulatory scheduled check information" **Related chapters:** Chap 3, Chap 3.9, Chap 9
interoperability	**Definition:** None identified **Related chapters:** Chap 2, Chap 3.9, Chap 7

intervention (training)	**Definition:** Chap 3.9.7 "Authoring - Human performance technology and training" **Related chapters:** Chap 3.9
Illustrated Parts Data, IPD, common information set	**Definition:** Chap 5.2.1.5 "Common information sets - Illustrated parts data" **Related chapters:** Chap 5, Chap 8
IPD data module (supported by Schema)	**Definition:** Chap 3.9.5.2.7 "Content section - Parts information" **Related chapters:** Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7
IPD publication	**Definition:** Chap 5.3.1.3 "Common requirements - Illustrated parts data" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
item	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 7, Chap 8
item location code	**Definition:** Chap 4.3.8 "Data module code - Item location code" **Related chapters:** Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 7, Chap 9
Item Sequence Number, ISN	**Definition:** Chap 3.9.5.2.7 "Content section - Parts information" **Related chapters:** Chap 3.9, Chap 5, Chap 7
Job instruction, JI	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 5

land/sea specific information set	**Definition:** Chap 5.2.3 "Information sets - Land/Sea specific information sets" **Related chapters:** Chap 5
land/sea specific publication	**Definition:** Chap 5.3.3 "Publications - Land/Sea specific publications" **Related chapters:** Chap 5
layered BREX data module	Refer to "BREX data modules, layered".
layout elements in page-oriented publications	**Definition:** Chap 6.2.2 "Page-oriented publications - Typography - Layout elements" **Related chapters:** Chap 3.9, Chap 6, Chap 7
learn code	**Definition:** Chap 4.3.9 "Data module code - Learn code" **Related chapters:** Chap 1, Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 7, Chap 8, Chap 9
learn event code	**Definition:** Chap 4.3.10 "Data module code - Learn event code" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 7, Chap 8, Chap 9
learning	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
learning assessment	**Definition:** Chap 3.9.5.2.13.5 "Content section - Learning assessment information" **Related chapters:** Chap 2, Chap 3.9
learning content	**Definition:** Chap 3.9.5.2.13.3 "Content section - Learning content information" **Related chapters:** Chap 2, Chap 3.9

learning information concept	**Definition:** Chap 4.15 "Information management - Learning information" **Related chapters:** Chap 3.9, Chap 4
learning information / data module (supported by Schema)	**Definition:** Chap 3.9.5.2.13 "Content section - Learning data module" **Related chapters:** Chap 1, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7
learning overview	**Definition:** Chap 3.9.5.2.13.2 "Content section - Learning overview information" **Related chapters:** Chap 2, Chap 3.9
learning plan	**Definition:** Chap 3.9.5.2.13.1 "Learning data module - Learning plan information type" **Related chapters:** Chap 2, Chap 3.9
Learning Management System, LMS	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 2, Chap 3.9, Chap 4, Chap 5
Learning Object Metadata, LOM	**Definition:** Chap 7.5.4 "Information interchange – Learning Object Metadata" **Related chapters:** Chap 1, Chap 2, Chap 4
learning summary	**Definition:** Chap 3.9.5.2.13.4 "Content section - Learning summary information" **Related chapters:** Chap 2, Chap 3.9
legacy information	**Definition:** Chap 7.4.3 "Generation of publications - Inclusion of legacy information" **Related chapters:** Chap 1, Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 7, Chap 9

levelled paragraph	**Definition:** Chap 3.9.5.2.2 "Content section - Descriptive information " **Related chapters:** Chap 3, Chap 3.9
line check	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** None identified
Line Replaceable Unit, LRU	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 5, Chap 8
List of Abbreviations, LOA	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 3.9, Chap 5, Chap 6, Chap 8, Chap 9
List of Applicable Publications, LOAP (common information set)	**Definition:** Chap 5.2.1.20 "Common information sets - List of applicable publications" **Related chapters:** Chap 1, Chap 4, Chap 5, Chap 9
List of Applicable Specifications and Documentation, LOASD	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 5, Chap 6, Chap 8
List of Cautions, LOC	**Definition:** None identified **Related chapters:** Chap 3.9, Chap 6, Chap 8, Chap 9
List Of Effective Data Module, LOEDM	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 5, Chap 6, Chap 8
List of Effective Pages, LOEP	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 5, Chap 6, Chap 8

List of Illustrations, LOI	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 3.9, Chap 5, Chap 8
List of MODifications, LOMOD	**Definition:** None identified **Related chapters:** Chap 3.9, Chap 6, Chap 9
List of SPares, LOSP	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 8
List of SUpplies, LOSU	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 8
List of Support Equipment, LOSE	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 8
List of Symbols, LOS	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 3.9, Chap 5, Chap 6, Chap 8
List of Terms, LOT	**Definition:** Chap 3.9.4 "Authoring - Front matter" **Related chapters:** Chap 3.9, Chap 5, Chap 6, Chap 8
List of Vendors, LOV	**Definition:** None identified **Related chapters:** Chap 3.9, Chap 6, Chap 9
List of Warnings, LOW	**Definition:** None identified **Related chapters:** Chap 3.9, Chap 6, Chap 8, Chap 9

list	**Definition:** Chap 3.9.5.2.1.3 "Common constructs - Lists" **Related chapters:** Chap 3.9, Chap 5, Chap 6, Chap 7, Chap 8
logic engine (in process data module)	**Definition:** Chap 3.9.5.2.10.4 "Process data module - Logic Engine" **Related chapters:** Chap 3.9, Chap 4, Chap 6, Chap 7
Logistics Support Analysis, LSA	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 2, Chap 3.9, Chap 4, Chap 5
maintenance	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
maintenance checklists and (maintenance) inspections (supported by Schema and information set)	**Definition:** Chap 3.9.5.2.14 "Content section - Maintenance checklists and inspections" **Related chapters:** Chap 1, Chap 3.9, Chap 5, Chap 8
maintenance information (information set)	**Definition:** Chap 5.2.1.3 "Common information sets - Maintenance information" **Related chapters:** Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 8
maintenance planning information / data module (supported by Schema)	**Definition:** Chap 3.9.5.2.5 "Content section - Maintenance planning information" **Related chapters:** Chap 1, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
Maintenance Planning information, MP (common information set)	**Definition:** Chap 5.2.1.6 "Common information sets - Maintenance planning information" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 8, Chap 9

maintenance procedures (common information set)	**Definition:** Chap 5.2.1.3.1 "Maintenance information - Maintenance procedures" **Related chapters:** Chap 4, Chap 5, Chap 8
maintenance task	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 8
(manufacturing) batch number	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** None identified
(manufacturing) part number	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 5, Chap 6, Chap 7, Chap 8
(manufacturing) serial number	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7
Mass and Balance, MB (common information set)	**Definition:** Chap 5.2.1.7 "Common information sets - Mass and balance information" **Related chapters:** Chap 3.9, Chap 5, Chap 6, Chap 8
material	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
material set	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** None identified

mathematical expression	**Definition:** Chap 6.2.2 "Typography, layout elements - Mathematical expressions and highlighted text " **Related chapters:** Chap 2, Chap 3.9
Material Data, MD (common information set)	**Definition:** Chap 5.2.1.17 "Common information sets - Material data" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
model	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
model identification (code)	**Definition:** Chap 4.3.1 "Data module code - Model identification code" **Related chapters:** Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 7, Chap 9
modification - Mod	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 5
modularized Schema package	**Definition:** Chap 7.2 "Information processing - Basic concepts" **Related chapters:** Chap 7
multimedia	**Definition:** Chap 3.9.2.4 "Illustration rules and multimedia - Multimedia, General" **Related chapters:** Chap 1, Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
munition	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 5, Chap 8

NATO/National Stock Number, NSN	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 5
navigation and tracking (functionality definition)	**Definition:** Chap 6.4.1 "Functionality - Background and explanation" **Related chapters:** Chap 3.9, Chap 6, Chap 7
Non-Destructive Testing, NDT (common information set)	**Definition:** Chap 5.2.1.3.3 "Maintenance information - Non-destructive testing" **Related chapters:** Chap 5, Chap 6, Chap 8
Note	**Definition:** Chap 3.9.3 "Authoring - Warnings, cautions and notes" **Related chapters:** Chap 1, Chap 3, Chap 3.9, Chap 5, Chap 6, Chap 7, Chap 8
On Condition, OC	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 5, Chap 8
Operational Check, OPC	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 3.9, Chap 5
organization	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** All
quantity data	**Definition:** Chap 4.16 "Information management - Content specific data and quantity data" **Related chapters:** Chap 3.9

package interchange file (Refer to "SCORM content package")	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** None identified
page image area	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 6
page layout in page-oriented publications	**Definition:** Chap 6.2.1 "Page-oriented publications - Page layout, paper publications, headers and footers" **Related chapters:** Chap 3.9, Chap 6
page-oriented publication	**Definition:** Chap 6.2 "Information presentation/use - Page-oriented publications" **Related chapters:** Chap 1, Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7
page-oriented format publication criteria (conformance and compliance)	**Definition:** Chap 1.4.2 "How to tailor for a specific project - Conformance and compliance" **Related chapters:** Chap 6
parameter	**Definition:** Chap 3.9.5.2.1.8 "Common constructs - Hotspots " **Related chapters:** Chap 2, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
part	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 2, Chap 3, Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8
Part Identifier, PI	**Definition:** Chap 5.2.2.4 "Air specific information sets - Engine maintenance information" **Related chapters:** Chap 3.9, Chap 5

part repository	**Definition:** Chap 3.9.5.2.11.3 "Common information repository - Parts" **Related chapters:** Chap 3.9
parts information (supported by Schema)	**Definition:** Chap 3.9.5.2.7 "Content section - Parts information" **Related chapters:** Chap 3, Chap 3.9, Chap 4, Chap 6, Chap 7
Product Cross-reference Table, PCT, concept	**Definition:** Chap 4.14.3 "Applicability - Products cross-reference table" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
PCT data module (supported by Schema)	**Definition:** Chap 3.9.5.3.3 "Applicability - Products cross-reference table" **Related chapters:** Chap 3.9, Chap 4, Chap 5, Chap 6, Chap 7, Chap 8, Chap 9
performance analysis (training)	**Definition:** Chap 3.9.7 "Authoring - Human performance technology and training" **Related chapters:** Chap 3.9
post engineering modification	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** None identified
post service bulletin	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 6
Power Plant Build-up, PPB (air specific information set)	**Definition:** Chap 5.2.2.5 "Air specific information sets - Power plant build-up information" **Related chapters:** Chap 5, Chap 8

pre engineering modification	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** None identified
preliminary requirements	**Definition:** Chap 3.9.5.2.1.9 "Common constructs - Preliminary requirements and requirements after job completion" **Related chapters:** Chap 3.9, Chap 5, Chap 6, Chap 7
preplanning	**Definition:** Chap 3.9.7 "Authoring - Human performance technology and training" **Related chapters:** Chap 2, Chap 3.9
pre service bulletin	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** None identified
Preventive Maintenance Checks and Services, PMCS (common information set)	**Definition:** Chap 5.2.1.21 "Common information sets - Maintenance checklists and inspections" **Related chapters:** Chap 3.9
printing (functionality definition)	**Definition:** Chap 6.4.1 "Functionality - Background and explanation" **Related chapters:** Chap 4, Chap 6
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product instance	**Definition:** Chap 9.2.1 "Terms, acronyms and subject index - Glossary of terms" **Related chapters:** Chap 1, Chap 3.9, Chap 4, Chap 7, Chap 8
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Chapter 9.3

Terms and definitions - Schema documentation

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1 General

Descriptions of all element types declared within all the S1000D Schema are available on the S1000D web site on www.s1000d.org.

2 Data dictionary

The complete Schema documentation is downloadable for easy use offline. You can search for elements in a specific Schema or just for an element. The following information can be found:

- **element** gives the name of an element within the start-tag delimiters (as it would be used within the data module instance)
- **group** gives the name of an element group (element groups do not appear within a data module instance)
- **complexType** gives the name of a complex type (complex types are used for schema management and do not appear within a data module instance)
- **simpleType** gives the name of a simple type (simple types are used for schema management and do not appear within a data module instance)
- **attributeGroup** gives the name of an attribute group (attribute groups do not appear within a data module instance)
- **diagram** gives a graphical representation of the content of an element, group, complexType, simpleType, or attributeGroup using symbols as defined in Chap 3.9.5
- **namespace** gives the namespace of an element, simpleType, or attributeGroup which is defined outside of the S1000D namespace
- **type** gives whether an element is a simpleType or complexType
- **properties** gives information about the element, simpleType or complexType such as whether mixed content is allowed, the base type, and whether simple or complex content is allowed
- **children** gives the list of elements contained by this element, group, or complexType

- **used** by gives the list of elements, groups, complexTypes and attributes containing this element, group, complexType, simpleType, or attributeGroup
- **attributes** gives the list of attributes contained by this element further divided into the following fields:
  - **Name** gives the name of the element
  - **Type** gives the simpleType of the attribute
  - **Use** gives the cardinality of the attribute
    - No value indicates the attribute is optional
    - **required** indicates the attribute is required
  - **Default** gives a default value for the attribute which can be overridden
  - **Fixed** gives a value for the attribute which cannot be overridden
  - **Annotation** is not used
- **facets** gives any restrictions on the content of an element or simpleType expressed as a pattern of allowable values
- **source** gives the schema fragment defining this element, group, complexType, simpleType, or attributeGroup

The HyperText Markup Language (HTML) Schema documentation can be found at www.s1000d.org.