International specification for in-service data feedback

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Issue No. 2.0

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The language to be used in the arbitral proceedings shall be English.

Highlights

The following tables summarize the changes that have been included in the highlighted chapters.

Note

Changes to tables and illustrations are indicated by a change marks against the table/illustration title.

List of tables

Table 1 Chapter 1

Para	Summary of changes
1	Updated list of participants ad added date of first issue.
4	Updated organization of the specification to reflect new chapter.

Table 2 Chapter 2

Para	Summary of changes
All	Editorial corrections.

Para	Summary of changes
5	Updated table to reflect latest SX000i process and new chapter
5,6	Removed reference to SX000i that is no longer applicable
10 & Table 1	Added reference to IDEF0
11	Added several references to Chap 19.
11.6	Paragraph rewritten to reflect actual status.

Table 3 Chapter 3

Para	Summary of changes
Refs, 1	Updated chapter numbers due to the restructuring of the document.
All	Editorial corrections.

Table 4 Chapter 4

Para	Summary of changes
All	Editorial corrections.
All	Added two new use cases.
5	Additional text related to non-scheduled maintenance actions.

Table 5 Chapter 5

Para	Summary of changes
All	Editorial corrections.

Table 6 Chapter 6

Para	Summary of changes
All	Editorial corrections.
5	Added new use case

Table 7 Chapter 7

Para	Summary of changes
All	Editorial corrections.
Table 2	Update of content

Table 8 Chapter 8

Para	Summary of changes
Refs, 1	Updated chapter numbers due to the restructuring of the document.
All	Editorial corrections in order to make text more understandable.

Table 9 Chapter 9

Para	Summary of changes
All	Editorial corrections.

Table 10 Chapter 10

Para	Summary of changes
All	Editorial corrections.

Table 11 Chapter 11

Para	Summary of changes
Refs, 1	Updated chapter numbers due to the restructuring of the document.
All	Editorial corrections.

Table 12 Chapter 12

Note

There are no change marks in this chapter.

Para	Summary of changes
All	New chapter. **Note** No change marks in this chapter.

Table 13 Chapter 13 (former Chapter 12)

Para	Summary of changes
Chapter number	Changed chapter number due to restructuring of the document.
Refs, 1.1	Changed chapter number due to restructuring of the document.
All	Editorial corrections.

Table 14 Chapter 14 (former Chapter 13)

Para	Summary of changes
Chapter number	Changed chapter number due to restructuring of the document.
Refs, 2	Updated chapter numbers due to the restructuring of the document.
4	Added use case for export control information and use case for labor rates and mapping table between contracting activities and use cases.

Table 15 Chapter 15 (former Chapter 14)

Para	Summary of changes

Para	Summary of changes
Chapter number	Changed chapter number due to restructuring of the document.
Refs, 2	Updated chapter numbers due to the restructuring of the document.
All	Editorial changes for better understanding.
4	Added use cases for export control information and use case for labor rates and mapping table between contracting activities and use cases.

Table 16 Chapter 16.0 (former Chapter 15.0)

Para	Summary of changes
Chapter number	Changed chapter number due to restructuring of the document.
Refs	Changed data module references due to chapter renumbering.

Table 17 Chapter 16.1 (former Chapter 15.1)

Para	Summary of changes
Chapter number	Changed chapter number due to restructuring of the document.
Refs, 1.1	Updated chapter numbers due to the restructuring of the document.
All	Editorial changes for better understanding.

Table 18 Chapter 16.2 (former Chapter 15.2)

Para	Summary of changes
Chapter number	Changed chapter number due to restructuring of the document.
Refs	Updated chapter numbers due to the restructuring of the document.
All	Editorial changes for better understanding.

Table 19 Chapter 16.3 (former Chapter 15.3)

Para	Summary of changes
Chapter number	Changed chapter number due to restructuring of the document.
Refs	Updated chapter numbers due to the restructuring of the document.
All	Editorial changes for better understanding.
2	Updated list of used CDM primitives
3	Updated list of used CDM S-Series compound attributes
4	Updated list of used CDM units of functionality
5	Updated list of modifications to the CDM.

Para	Summary of changes
6	New Para on Impact of latest CDM change to S5000F.

Table 20 Chapter 16.4 (former Chapter 15.4)

Note

There are no change marks in this chapter due to the amount of change.

Para	Summary of changes
All	All Paras renumbered in order to maintain alphabetical order of the UoFs despite the addition/deletion of several UoFs.
All	All UoFs updated to be compliant with SX002D (CDM) Issue 2.0 and new UML modeling guidelines, as well as simplification of existing UoFs by removing redundant information already indicated in other UoFs.
All	All descriptions and Para structures changed to comply with new data model templates.
2	New Para. describing grouping of units of functionality (UoF).
2.3	Deleted Para on S5000F-specific primitives, as now only common data model (CDM) primitives are used.
3	Changed title to “Special UoFs” so as to cover not only compound attributes, but also class specializations and project-specific attributes.
4	Added all CDM UoFs used by S5000F, in order not to make external references to SX002D.

Para	Summary of changes
4	Added the following UoFs: – S5000F UoF Actual Fault Indication – S5000F UoF Availability – S5000F UoF Breakdown Structure – S5000F UoF Budget – S5000F UoF Capability – S5000F UoF Change Information – S5000F UoF Change Request – S5000F UoF Cost Breakdown – S5000F UoF Damage – S5000F UoF Data Sets – S5000F UoF Digital File – S5000F UoF Environment – S5000F UoF Equipment Calibration Certificate Information – S5000F UoF Export Control License – S5000F UoF Export Control Requirement – S5000F UoF Expression Evaluation – S5000F UoF Fleet Definition – S5000F UoF Infrastructure – S5000F UoF Infrastructure Availability – S5000F UoF Operational Times – S5000F UoF Person Competences and Labor Rates – S5000F UoF Remark – S5000F UoF Reportable Metric – S5000F UoF Requirement – S5000F UoF Software – S5000F UoF Supply Item – S5000F UoF Support Equipment – S5000F UoF Transportable Item – S5000F UoF Transporting Asset – S5000F UoF Work Breakdown
4.4	Moved to Para 3.2
5	S5000F UoF Actual Serialized Product Variant Configuration renamed to S5000F UoF Serialized Product Variant Configuration
6	S5000F UoF Applicability Assignment Item renamed to S5000F UoF Applicability Statement Item to reflect change in SX002D (CDM) Issue 2.0.
8	S5000F UoF AttributeTypeSelect deleted, as it is now covered by the S-Series Base Object Definition in SX002D (CDM) Issue 2.0.
13	S5000F UoF Comment Items deleted due to the use of the new CDM BaseObject in the Comment Definition.
14	S5000F UoF Contract Breakdown simplified and divided into: – S5000F UoF Budget – S5000F UoF Contract Breakdown – S5000F UoF Work Breakdown
15	S5000F UoF Cost Entry included as part of S5000F UoF Cost Breakdown
16	S5000F UoF Document aligned with SX002D (CDM) Issue 2.0.

Para	Summary of changes
17	S5000F UoF Document Assignment Items deleted, as it is now covered by the S-Series Base Object Definition in SX002D (CDM) Issue 2.0.
26	S5000F UoF Logbook Entry renamed to S5000F UoF Logbook
43	S5000F UoF Product Allowed Configuration removed because it is now covered by CDM UoF Product Design Configuration
48	Moved to Para 3.3.
50	S5000F UoF Reporting renamed to S5000F UoF Report
57	S5000F UoF Serialized Product Operational Period renamed to S5000F UoF Operational Period
60	S5000F UoF Service Level Agreement Clause deleted, as it is now covered by S5000F UoF Service Contract management and more generic S5000F UoF Expression Evaluation
63	S5000F UoF Technical Data Package (TDP) Message renamed to S5000F UoF Message and redefined in order to maintain consistency with SX002D (CDM) Issue 2.0.

Table 21 Chapter 16.5 (former Chapter 15.5)

Para	Summary of changes
Chapter number	Changed chapter number due to restructuring of the document.
Refs	Changed references due to chapter renumbering.
new	New Para 2 about usage of UoFs for specific use cases
all	Added unique reference numbers to all use cases.
all	Added new use cases from all chapters.
all	Re-created all tables with references to all new UoFs.

Table 22 Chapter 17 (former Chapter 16)

Para	Summary of changes
Chapter number	Changed chapter number due to restructuring of the document.
All	Updated chapter numbers due to the restructuring of the document.
All	Editorial changes for better understanding.

Table 23 Chapter 18 (former Chapter 17)

Para	Summary of changes
1	Updated chapter numbers due to the restructuring of the document.
2	Re-generated full list of data elements, including data element descriptions from SX002D Issue 2.0 and new data elements defined.

Table 24 Chapter 19 (former Chapter 18)

Para	Summary of changes
3.2.1, 3.2.3, 4.1.7, 4.1.10, 4.3	Updated chapter numbers due to the restructuring of the document.
2	Expanded on tailoring description.
4.4	Added text on stepwise implementation of S5000F.
5	New section with a practical tailoring example

Table 25 Chapter 20 (former Chapter 19)

Para	Summary of changes
1	Updated chapter numbers due to the restructuring of the document.
2	Added new use cases and re-generated all tables to reflect changed/deleted/new classes and new use cases.
3	Removed mapping of data elements against use cases, as this proved counter-productive in the specification implementation. Guidelines for data element selection provided instead.

Table 26 Chapter 21 (former Chapter 20)

Para	Summary of changes
Chapter number	Changed chapter number due to restructuring of the document.

Table of contents

The listed documents are included in Issue 2.0, dated 2018-12-31, of this publication.

Chapter	Data module title	Data module code	Applic
Chap 19	Tailoring and contracting against S5000F	S5000F-A-19-00-0000-00A-040A-A	All
Chap 20	Data required for the different use cases	S5000F-A-20-00-0000-00A-040A-A	All
Chap 21	Terms, abbreviations and acronyms	S5000F-A-21-00-0000-00A-040A-A	All

Chapter 1

Introduction to the specification

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References

Table 1 References

Chap No./Document No.	Title
Chap 17	Data exchange
S1000D	International specification for technical publications using a common source database
S2000M	International specification for material management - Integrated data processing for military equipment
S3000L	International procedure specification for Logistics Support Analysis LSA
S4000P	International specification for developing and continuously improving preventive maintenance
SX000i	International specification for Integrated Product Support (IPS)
SX002D	Common data model for the S-Series IPS specifications
www.SX000i.org/CPF	Web portal for managing change to the S-Series IPS specifications
IPSC-2018-001	Governance of the S-Series IPS specifications
ISO 10303-239 (AP239)	Product Life Cycle Support (PLCS)

1 Purpose

1.1 General

This chapter provides information on the background of S5000F.

1.2 Purpose

Collection of in-service data feedback is one of the most important functions of in-service support. It enables fleet and support managers and technical system manufacturers to perform a thorough analysis of operational and maintenance performance, as well as to improve the global support service.

The results of this analysis can be the basis for:

- Enhancement of the maintenance and support concept
- Improvement of the Product by modifications and retrofit activities
- Sophisticated operational and support planning
- Detailed information regarding to the lifecycle cost (LCC)
- Complex support contract management

The overall aim to be achieved by using in-service data feedback is the increase of Product and fleet availability and optimization of effectiveness, as well as improvement of the Product life-cycle cost.

In addition, feedback information is an industry requirement for agreement, so that in-service contracts, such as Performance Based Logistics (PBL), can be managed, and their obligations, in regard to Product liability, fulfilled.

The purpose of using S5000F, alone or together with other S-Series IPS specifications, is to obtain a structured way to handle the in-service data feedback from or to the operator. The S5000F data model has been built on the Common Data Model (CDM) for the S-Series, SX002D, to ensure interoperability with the other S-Series IPS specifications.

S5000F can be used for any kind of Product, whether military or civilian, land, sea, air or space.

1.3 Background

During 2008, the plans for developing S5000F were drawn up within the ASD/AIA organization. At that time, some specifications were already in place. These specifications were:

- S1000D for Technical publications
- S2000M for Material management
- S3000L for Logistic Support Analysis (LSA)

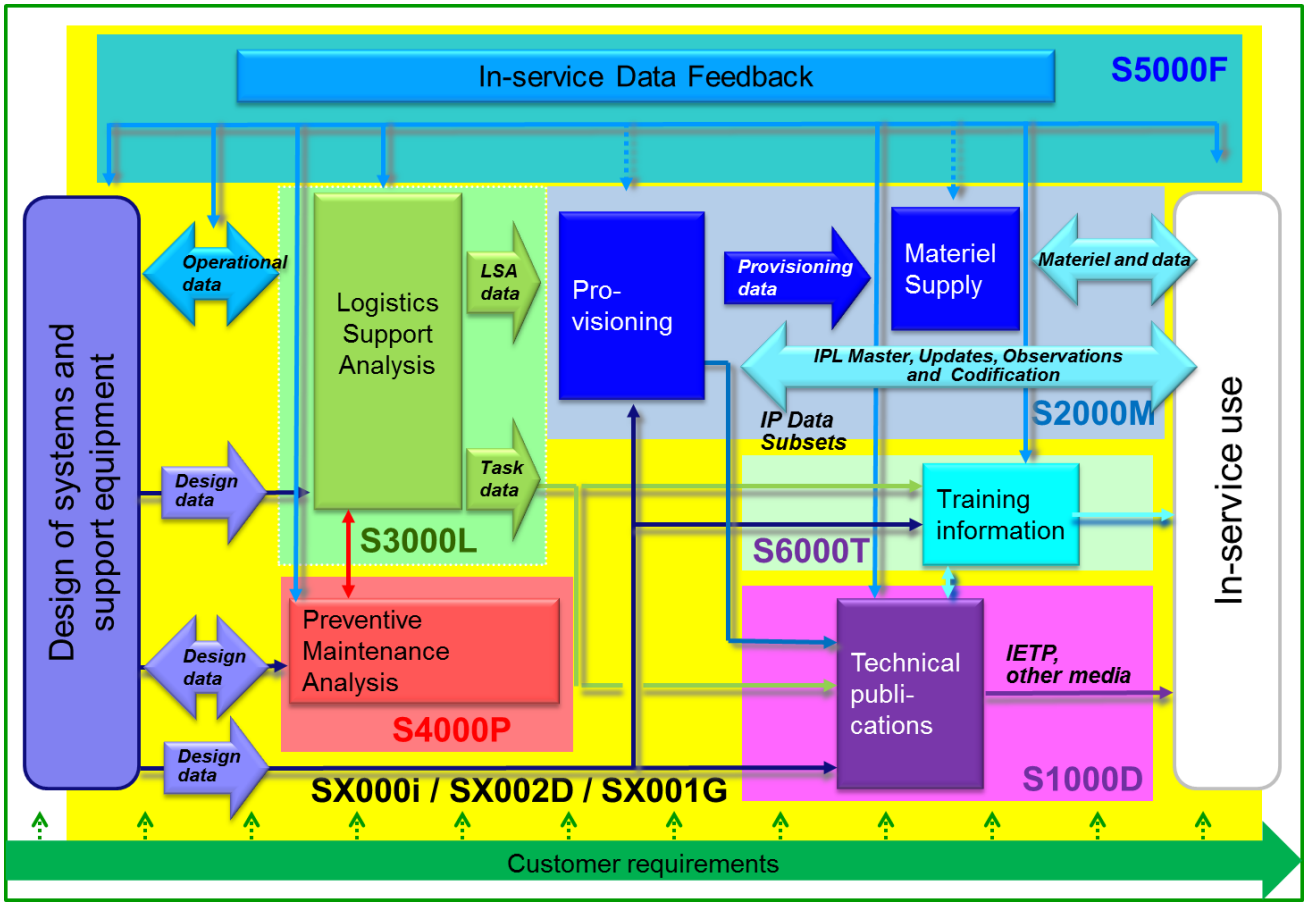

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Fig 1 Schematic overview of the S-Series specifications

The ASD/AIA organization noticed that there was a need for a specification handling in-service data feedback from the operational field to the maintainer and/or the original equipment

manufacturer (OEM). As shown in Fig 1, the scope of S5000F is to handle in-service data feedback to the other S-Series IPS specifications.

It was decided that S5000F specification must:

- Take the activity model given by ISO 10303-239 into account and support data exchange compatible with PLCS
- Include process application guidelines and rules for information exchange
- Be tailorable and include guidelines for tailoring
- Take current ISO/EN baseline documents into account
- Enable online interfaces to the suite of the S-Series IPS specifications, ie S1000D, S2000M, S3000L, S4000P, S6000T or SX000i

The kick-off meeting was held in October 2008 in Munich and the purpose and the scope of S5000F was presented to interested industries and organizations (eg, armed forces and authorities).

The first issue was published in September 2016.

The development work was then allocated to an international team of experts working under the joint chairmanship of AIA and ASD representatives. The following companies/organizations contributed to the S5000F work:

- Airbus Defense & Space — Germany & Spain
- Andromeda Systems — United States
- BAE Systems — UK
- Boeing — United States
- Bundeswehr — Germany
- Cimpa — France
- Dassault Aviation — France
- ESG — Germany
- Leonardo — Italy
- NHIndustries — France
- Nexter Group — France
- OCCAR — Europe (based in Germany)
- O'Neil & Associates — USA
- Rolls-Royce — UK
- Saab AB — Sweden
- Shipdex Consulting — Italy
- UK MoD — United Kingdom

2 Scope

The scope of S5000F is to handle information from the in-service operation of a Product (from the operator to the OEM and/or the maintainer and vice-versa). The processes in the specification focus mainly on operational and maintenance feedback information and other activities that take place during the operational phase of the life cycle of the Product. The Product life cycle is divided into five phases (refer to SX000i):

- Preparation
- Development
- Production
- In service
- Disposal

In service and disposal, are the phases that mainly are within the scope of S5000F. Nevertheless, the specification can be also used for data exchange at any time during the life cycle of the Product. For example, to provide feedback during the development phase when

performing tests, field-trials and prototyping. This would allow reusing the same protocols and data processing infrastructure as for the in-service phase, thus reducing the need for additional IT systems.

S5000F can be used for exchange of information from the operational site to the OEM or vice versa, as well as between the OEM and its suppliers. The flow of data can be multidirectional, thus allowing for the usage of S5000F in complex in-service contracts.

Note

The internal systems used by the different actors are not affected using S5000F, as this is used exclusively for information exchange purposes.

This is illustrated in Fig 2.

More information, regarding exchange of data and data storage, is given in Chap 17.

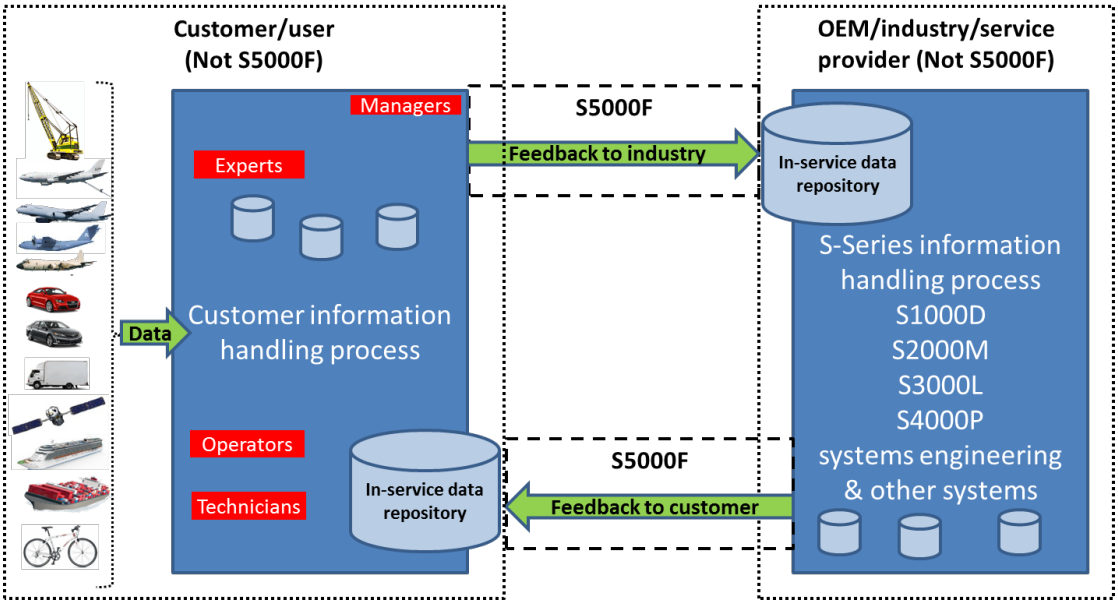

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Fig 2 Outline of data exchange and in-service databases

It should be highlighted that, though it is recommended to store all in-service data in a single repository, this is not required by the specification. Multiple repositories can co-exist, for example due to security restrictions. Similarly, S5000F does not mandate a specific data structure for such repository, only for the data exchange. However, if such a repository is created from scratch, it can be convenient to use the S5000F data model as the baseline for such a repository, in order to simplify the conversion that is required for the data exchange.

Fig 3 shows activities and situations that takes place in the in-service phase (to the right) of the system or Product that require an activity in the IPS processes (to the left). The feedback data is sent to the organization of interest using the S5000F XML schema.

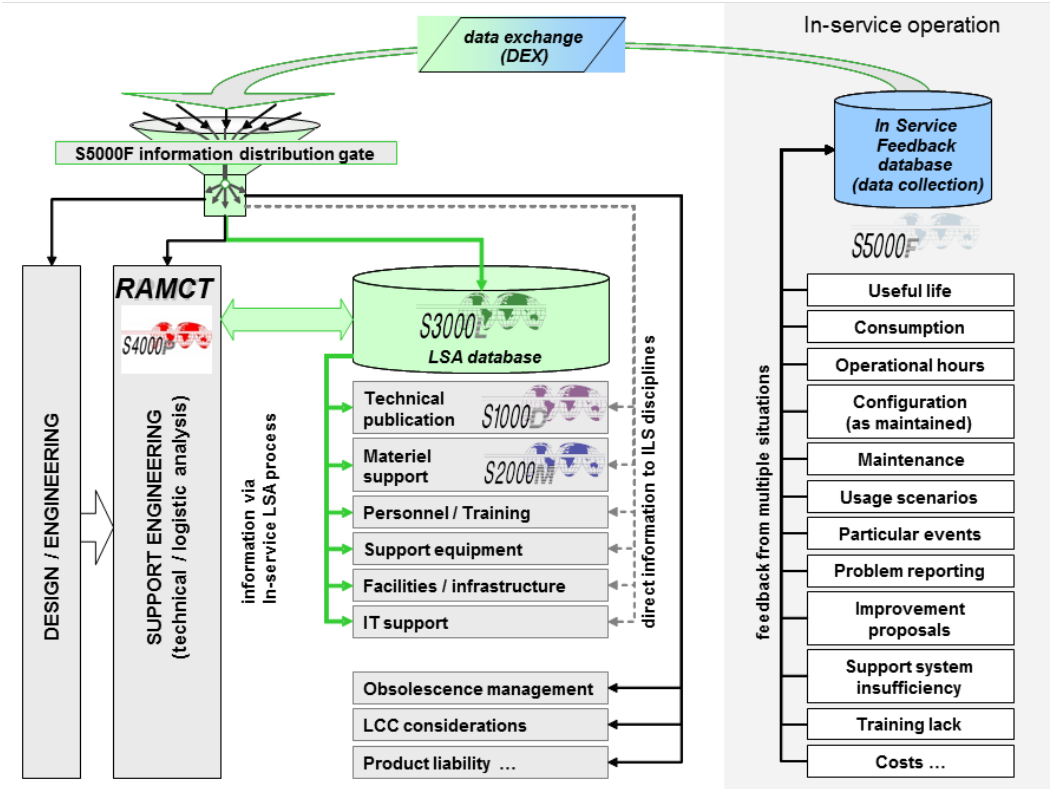

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Fig 3 Activities in the in-service use that requires activities in the IPS process

3 How to use the specification

3.1 Tailoring of S5000F processes

In order to ensure efficient application, S5000F has been developed to allow users to select functionality that is appropriate to their specific need for feedback or specific projects or applications.

Note

S5000F can be used in its entirety or tailored to specific use cases. Refer to Chap 19.

3.2 Acronyms and basic definitions

Throughout S5000F, a set of common acronyms is used to aid in the understanding and to minimize duplication. These acronyms are only explained in the chapter where they are used for the first time. The same abbreviation is used for all tenses, the possessive case and singular and plural forms of a given word. A complete list of abbreviations, acronyms and definitions is given in Chap 21.

Some common acronyms and basic definitions are shown in Table 2.

Table 2 Some common acronyms and definitions

Acronym/definition	Description
AIA	Aerospace Industries Association of America
ASD	AeroSpace and Defense Industries Association of Europe
IPS	Integrated Product Support

Acronym/definition	Description
LRU	Line Replaceable Unit
MRO	Maintenance, Repair and Overhaul
OEM	Original Equipment Manufacturer
PLCS	Product Life Cycle Support
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
SRU	Shop Replaceable Unit

4 Organization of the specification

S5000F is organized into chapters. The nature of the project using S5000F will determine the range of deliverables that are required and hence the depth to which S5000F needs to be tailored.

4.1 Chapter 1 - Introduction to the specification

Chap 1 gives a basic overview of S5000F specification. The chapter also provides information of the background of the document and companies involved.

4.2 Chapter 2 - The in-service data feedback business process

Chap 2 provides an outline of the operational and maintenance feedback process that provides the framework for S5000F. Chap 2 is directed at fleet managers, Integrated Product Support (IPS) managers, Maintenance, repair and Overhaul (MRO) managers and other groups dealing with System optimization and operations for both the customer and the contractor. It also provides a mapping of the feedback to different support activities and the different specifications. Refer to SX000i.

4.3 Chapter 3 - Feedback data for RAMCT analysis

Chap 3 covers the more common activities involved, the basic definitions and basic data fields involved in the gathering of user data for Reliability, Availability, Maintainability, Capability and Testability (RAMCT) analysis. It directed at anyone who requires engineering performance indicators to be produced for engineering or operational monitoring, changes to engineering design and spares provisioning

4.4 Chapter 4 - Feedback of data for maintenance analysis

Chap 4 defines the maintenance data feedback process. It also provides a guideline on the process and the information to be exchanged in order to provide appropriate data for maintenance analysis.

4.5 Chapter 5 - Feedback of safety data

Chap 5 defines the feedback data for safety analysis. It also identifies several use cases about the data to be exchanged for this purpose.

4.6 Chapter 6 - Feedback of data for supply support

Chap 6 complements the exchange of information defined in S2000M, providing additional supply support information required for the management of service contracts that is not covered in the traditional provisioning process.

4.7 Chapter 7 - Feedback for Life Cycle Cost analysis

Chap 7 describes how to identify and populate a Cost Breakdown Structure (CBS) with cost elements associated to the in-service phase and the disposal phases. It explains that the benefit

of using life cycle costing should be considered not as a one time event, when developing or purchasing a Product or system, but as an on-going activity throughout the life cycle.

4.8 Chapter 8 - Feedback of data for warranty analysis

Chap 8 describes warranty data feedback and how it could be used to provide a set of information in order to analyze the correctness of warranty statements and relative actions to manage defects.

4.9 Chapter 9 - Feedback data for Product health and usage monitoring

Chap 9 identifies common activities, basic definitions and basic data fields involved in the gathering and feeding back of usage and health monitoring data. It is directed at anyone who requires engineering performance indicators to be produced by usage and health monitoring systems for engineering or operational monitoring, changes to engineering design, condition monitoring and the provisioning of spares.

4.10 Chapter 10 - Feedback of data to support obsolescence management

Chap 10 describes how obsolescence management is used to assure the Product can be produced, supported and if necessary replaced for the expected life. The process consists of planned and co-coordinated activities for providing availability of the Product during its intended life.

4.11 Chapter 11 - Feedback of data for integrated fleet management

Chap 11 provides an outline of the data necessary to carry out the activities associated to the management of a fleet of Products.

4.12 Chapter 12 - Feedback of data for software support

Chap 12 provides the necessary information to perform any activities related to software and data, such as providing bug reports or performance information for software changes or improvements, information about loaded or retrieved mission data or captured data used for data analytics purposes.

4.13 Chapter 13 - Feedback of configuration management data

Chap 13 provides the information about how to provide different Product configuration aspects with the information required for configuration control purposes, the initial configuration information to be provided to the customer (including updates), and the information that must be provided to the original OEM, or other design authority, for logistic, technical and legal purposes.

4.14 Chapter 14 - Feedback of data to support in-service contracts management

Chap 14 can be used to construct generic performance parameters for managing and measuring the progress of in-service contracts, both by the contractor and by the contracting party.

4.15 Chapter 15 - Feedback of non-predefined information

Chap 15 provides the information about how to provide feedback of information from the in-service domains that is not covered elsewhere in S5000F, either because the corresponding data elements have not been defined, or because the information cannot be mapped to data elements (eg, unstructured data).

4.16 Chapter 16 - Data model

Chap 16 defines a coherent data model for the data that can be exchanged for the in-service data feedback and related business processes.

4.17 Chapter 17 - Data exchange

Chap 17 defines a coherent set of guidelines for the implementation of the data exchange required for the operational and maintenance data feedback, including a global process description and recommendations for storage of feedback data.

4.18 Chapter 18 - Data element list

Chap 18 defines all data elements that are used as classes or attributes in the S5000F data model and in the S5000F data exchange, refer to Chap 16. It also provides the mapping to the S-Series CDM and a cross-reference to the chapters and use cases where these data elements are used.

4.19 Chapter 19 - Tailoring of and contracting against S5000F

Chap 19 contains guidelines for the use of S5000F, including directives for tailoring and how to use it within a contractual framework.

4.20 Chapter 20 - Data required for the different use cases

Chap 20 contains a set of tables that define the data that is required for each individual use case.

4.21 Chapter 21 - Terms, abbreviations and acronyms

Chap 21 contains definitions, abbreviations and acronyms used throughout the document.

5 Maintenance of the specification

At publication of the first issue of S5000F, a maintenance organization will be put in place, comprising representatives from the nations involved in the preparation and use of the specification.

Any proposals relating to changes to the specification will be managed by the group as change proposals.

5.1 Commenting on the S5000F™ suite of information

In order to improve this specification in future issues, the working group developing S5000F invite users to provide comments regarding the content of the specification A web portal will be used to manage changes and clarifications proposed by others as a result of specification use or review. The steering committee developing S5000F would appreciate comments regarding the content of the specification, in order to improve it in future issues. To manage the changes and clarifications proposed by others when reviewing the specification, a web portal will be used. How to access the portal is described in Para 5.2. Comments to the specification should be raised by creating an issue against the specification in the aforementioned portal.

5.2 Questions regarding the content in the Issue 2.0 of the S5000F™ suite of information

Issue 2.0 of S5000F™ suite of information or how to suggest changes and clarifications should be raised through the web portal mentioned in Para 5.1. Web portal. A common process for change proposals and requests for clarification, a web portal has been implemented for all S-Series IPS specifications. The link to access the portal is www.SX000i.org/CPF.

At the first access to the web portal the signup for a login username is required. For this purpose, the function "*Signup for a new account*" must be used. Refer to Fig 4.

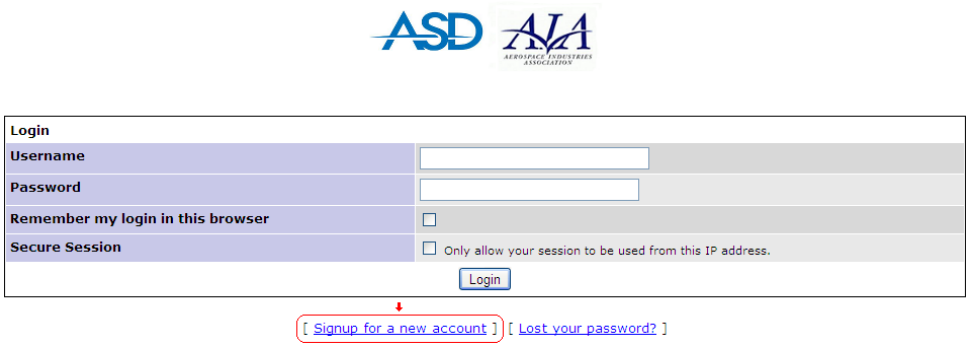

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Fig 4 Login screen for S-Series IPS specification maintenance web portal

To create a user account, follow the instructions on the screen after selecting "*Signup for a new account*". Enter your favored username (one word only) and your email address, confirm the control code and click on the "Signup" button. For easy user identification (especially if you must be assigned to one of the specification groups), it is suggested that you use a meaningful username. Refer to Fig 5.

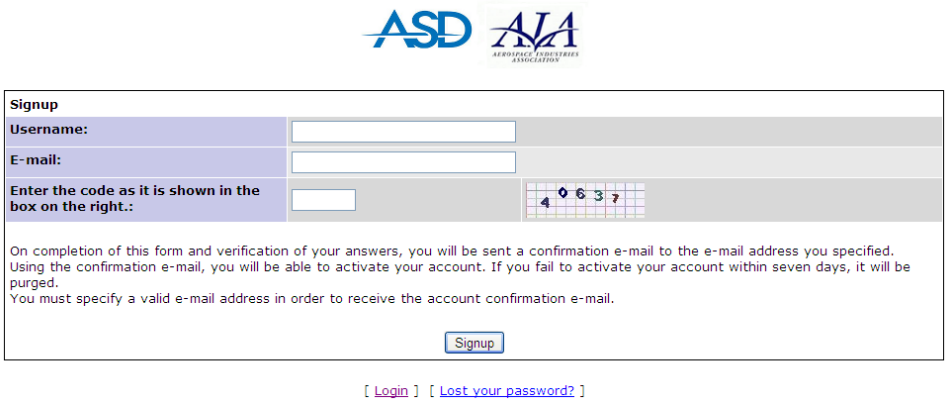

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Fig 5 Sign up for an account

The signup will be confirmed automatically by email and the creation of a password is requested. To complete the signup process, the password must be assigned to the new user account; the provided email contains a corresponding link for this purpose. After the successful password assignment, the login to the web portal is enabled and change proposals or requests for clarification can be reported as "issues" to the ASD/AIA IPS community.

5.3 Change process

The change process of S5000F is as defined in [IPSC-2018-001], so that the interoperability with the other S-Series IPS specifications is maintained.

5.4 Training

ASD and AIA are currently developing formal training courses for S5000F, which will be provided by reputed educational institutions. In addition, certain individuals have been granted the status of certified trainers due to their knowledge and contribution to the development of the specification. The list of certified trainers is published on the S5000F website and you can contact them through the contact form on the same website.

Note

Anyone NOT on this list cannot claim to be certified.

Chapter 2

The in-service data feedback business process

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References

Table 1 References

Chap No./Document No.	Title
Chap 16	Data exchange
Chap 19	Tailoring and contracting against S5000F
S1000D	International specification for technical publications using a common source database
S3000L	International procedure specification for Logistics Support Analysis LSA
SX000i	International specification for Integrated Product Support (IPS)
FIPS 183	IDEF0; modeling language. National Institute of Standards and Technology.

1 Introduction

The introduction of a new Product usually requires Product surveillance in order to fulfil the Product liability regulations and to ensure a proper and optimal exploitation of the Product capabilities. This requires a process for information feedback so that cost-efficient and optimized operation of the Product is ensured. Over the life cycle of a Product, support costs are much higher than acquisition costs. Therefore, this specification is a prerequisite for cost saving and optimized Product exploitation. It describes the relevant data flow for the involved parties and information feedback when the data is analyzed and turned into recommendations.

2 Scope

This chapter provides an outline of the in-service data feedback process that provides the framework for S5000F. This chapter is directed at fleet managers, Integrated Product Support (IPS) managers, Maintenance, Repair and Overhaul (MRO) managers and other groups dealing with Product optimisation and operations for both the customer and the contractor. Operational and maintenance feedback enables the implementation of efficient and powerful Product improvements as well as valuable support in the usage of Products with respect to availability, affordability and maintainability. Additionally, monitoring and control functions can be achieved, and decision-making support improved by using the feedback process. With the incorporation of various analysis results, it can be assured that customer needs for operability, supportability and readiness can be achieved.

The in-service data feedback business process document provides a guideline on how the following chapters are structured to define the data feedback for the different tasks. Since all chapters follow the described guideline, it is a handy reference for users of the specification, helping them to find the rules and requirements for the data feedback task they are looking for.

It is expected that users of this specification know the tasks they have to work on, and they will find the required data and descriptions for their tasks on the basis of the corresponding data in S5000F. Therefore, the process description in this chapter enables the user to obtain a clear overview of the structure and of how to use S5000F.

3 Feedback sources

Throughout the life cycle of a Product, several sources will need different information and data. There are a variety of reasons for requesting data. With respect to the focus and tasks, the user must look at structured and detailed feedback on various data, and the data requester needs information in order to carry out their daily business. S5000F focuses on the operational and maintenance data which are derived from the following main aspects of Product usage:

– Existence of Products	existence
– Usage of Products	operation
– Conservation of value (scheduled)	maintenance
– Maintenance (un-scheduled)	maintenance
– Upgrades	maintenance
– Integration	operation

4 In-service data feedback process

The in-service data feedback process is described by means of the top-level diagram shown at Fig 1. The blue boxes represent the technical activities, which, depending on the contractual basis, can be performed by the customer, by the OEM or by a third party. The green boxes represent contractual activities. Normally, each of the boxes holds its own process. Since the processes differ from Product to Product and from user to user, it is not possible to describe all variations in this chapter. However, S5000F provides the instructions on how to support the applied processes with the relevant data in an efficient and standardised way. It is up to the user to apply the specified rules, instructions and definitions from S5000F to their own

processes. The process must be applied during the in-service phase, and the user must decide which data set he needs to support that process.

The main goal is to provide the relevant data/information and to receive data from the different operators for analytical or planning purposes.

S5000F allows a global distribution of data with the purpose of enabling all participating users to undertake comparisons or detailed analyses. This includes users who only hold a subset of a Product's data. Furthermore, it is possible to share the results of the analysis and compare them in cases where the complete data set cannot be sent to all parties for one reason or another.

S5000F allows users to share data and reports, exchange experiences and analysis results of Products. Furthermore, S5000F is intended to support contractual needs by delivering the relevant data and information for the different parties.

Finally, a data model will support the whole process and will ease the usage of the data set.

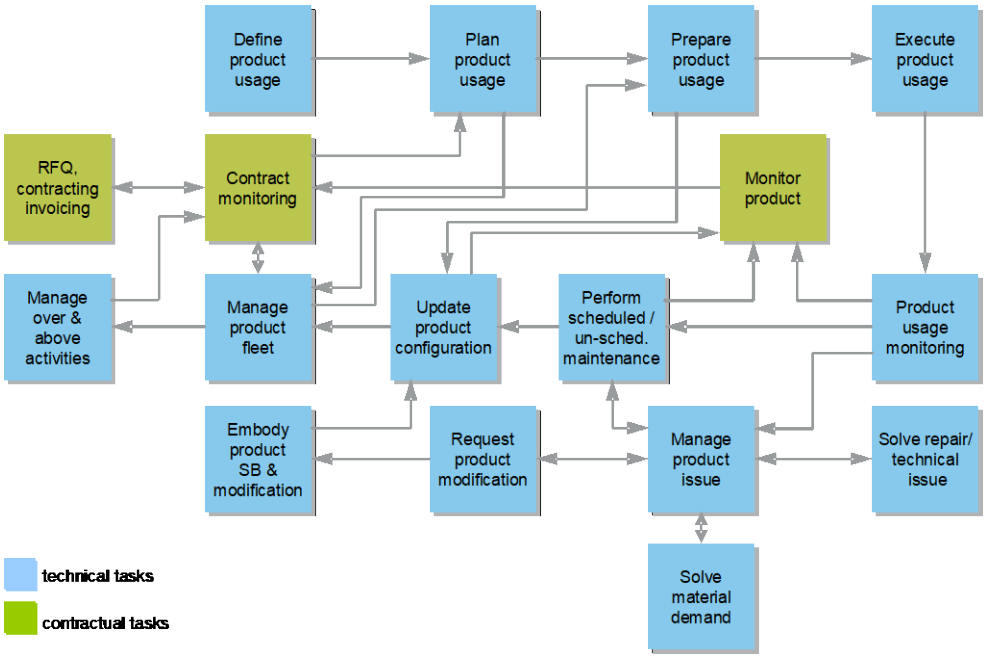

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Fig 1 Working process

The working process as it is shown explains the main tasks of operating a Product. Together with the activity list, it helps the user of the document to define the necessary data feedback for the required investigations or planning.

5 Feedback for the global IPS process

The in-service data are used for multiple activities as part of the global IPS process, as defined in SX000i. Table 2 provides the mapping of the individual chapters to the different S-Series IPS specifications and all the IPS activities defined as part of the global IPS process.

Table 2 Mapping of S5000F chapters to the S-Series IPS specifications and global IPS process from SX000i

	ASD /AIA S-Series deliverables			S-Series Specifications coverage									
	IPS Element	Activity	Deliverables	S1000D	S2000M	S3000L	S4000P	S5000F	S6000T	SX000i	SX001G	SX002D	STE-100
Life Cycle Sustainment Management	Logistic related operations	Analyse handling and usage aspects	Handling and usage report			P		I*		T			
		Analyse PHS&T Requirements	PHS&T Plan		S	P		3,9		T			
		Execute logistic related operations	Feedback data (operations)	Recommended				I*	to use	T	internal processes		
	Maintenance	Develop Maintenance Concept	Maintenance Concept			F	S	14		T			
		Develop Maintenance Plan	Maintenance Plan		S	F	I	3,4		T			
		Develop preventive maintenance task requirements	PMTR			I	F	3,4,9		T			
		Execute Maintenance Activities	Maintenance Report Feedback data	S	S	Recommended		3,4,9	to use	T	internal processes		
		Perform Diagnostics, Prognostics and Health Management (D&PHM) Analysis	Testability Report					9		T			
		Perform in-service maintenance optimization (ISMO)	In-Service PMTR				F	3,4,9		T			
		Perform Level of Repair Analysis	LORA Report			F		3,7		T			
		Perform Maintenance Task Analysis (MTA)	MTA Report			F		3,4		T			
		Perform Software Support Analysis (SSA)	SSA report			F		12,13		T			
		Perform Supportability Safety Analysis	Supportability Safety Analysis Report					5		T			
	Product Support Management	Analyze alternatives	Support Concept Usage Requirements Document (URD) Operational Requirements Document (ORD) Product support requirements		S	P		14		P			
		Develop IPS plan	IPS Plan		S	S		14		F			
		Document Lessons Learned	Lessons Learned database	Recommended				I*	to use	T	internal processes		
		Manage Configuration	Allowed configuration As-is configuration	I *	S	P		P (13)		T		S	
		Manage contract	Management reports Support Contract		S			14		F			
		Manage Fleet	Fleet Performance Report					F (11)		T			
		Manage In-service IPS activities	Management reports (in-service)		S			P (14)		F			
		Perform obsolescence management	Obsolescence Report		S	F		10		T			
	Supply Support	Manage stocks / stores	Inventory reports		I	Recommended		6	to use	T	internal processes		
		Manage warranty	Warranty reports		I	P	Extend	P (8)	with	T	internal processes		
		Perform Material Supply	Quotation Provisioning Order Delivery Invoice		F			3,6,8,11,13,14		T			
		Provide provisioning data	Provisioning data Initial Provisioning List (IPL) Spares Parts List (SPL)		F	I		3,6,8		T		S	
Technical Management	Computer Resources	Manage Computer Resources for IPS program	IPS program Computer Resources Plan (part of IPS Plan)					12,13,14		F			
		Perform Computer Resource Analysis	Computer Resources Plan (for Product)			P		10,12,13		T			
		Provide Computer Resources	Computer Resources Computer Resources Report	Recommended to use						T	internal processes		
	Design influence	Perform Life Cycle Cost (Affordability) Analysis	LCC Report		I	P		7,8,14		T			
		Perform Logistic Support Analysis (LSA)	LSA database		S	F	I	3,4,8,9,10,12,13		T		S	
		Perform Support Engineering Analysis	Support Engineering Reports			I	I	3,4		T			
	Sustaining Engineering	Perform engineering technical analysis	Feedback information			P		3,4,5,9,10.11.12,13,15		T		S	
		Develop & provide engineering disposition & recommend design changes	Engineering Change Request	S		P	P	3,4,5,9,10.11.12,14,15		T			
		Evaluate operational suitability	Operational Suitability Report					11		T			
		Manage disposal	Product disposal file Feedback data (disposal)		I	P		I*		T			
	Technical Data	Develop Technical Data Package	Technical data package		I	Recommended		13	to use	T	internal	S	processes
		Produce Technical Publications	Technical publications	F	I	I		3,4,15		T			S
Infrastructure Management	Facilities and Infrastructure	Perform F&I Analysis	F&I Plan			P		14		T			
		Provide Facilities and Infrastructure	F&I F&I Report	Recommended				14	to use	T	internal processes		
	Manpower & Personnel	Perform Manpower & Personnel Analysis	Manpower & Personnel Report			P		4,14		T			
	Support Equipment	Analyse Support Equipment Requirements	Support Equipment Plan			P		4,14		T			
		Provide Support Equipment	Support Equipment Support Equipment Report		I	Recommended to use				T	internal processes		
	Training and Training Support	Analyse Training Equipment requirements	Training equipment plan			I		I*	F	T			
		Deploy Training	Training Course Training Course Report	S				I*		T			
		Develop Training Plan	Training Plan	S				I*	F	T			
		Perform Training Development	Courseware	S		I		I*	F	T			
		Perform Training Need Analysis (TNA)	TNA Report			I		I*	F	T			
		Provide Training Equipment	Training Equipment Training Equipment Report	Recommended to use						T	internal processes		

	LEGEND	
Note 1:	Activities in yellow are newly identified and will be included in SX000i Issue 2.0.	
Note 2:	A star indicates that this is intended to be included in a future issue of the specification	
Note 3 (*):	Configuration is documented in technical publications, and it is known that certain entities use S1000D to extract configuration information.	

F	FULL IN-DEPTH COVERAGE
P	PARTIAL IN-DEPTH COVERAGE
I	NO COVERAGE BUT INFORMATION IS SUPPLIED BY THE SPECIFICATION
S	SUPPORT
T	TOP-LEVEL COVERAGE
	NO COVERAGE

6 Support of in-service activities

All in-service activities considered in this document correspond to one chapter or another described in S5000F.

Table 3 lists a selection of activities which are considered in the different chapters of this document, as well as the fact that the data sets of different chapters often overlaps. This fact must be considered in data modelling, which makes it rather complex. Derived from the activities, the data elements are defined in the following chapters to enable users of the specification to identify the right data cluster and element when they wish to support one of the listed activities.

Table 3 Overview of considered activities

Main-activity	Sub-activity	Chap 3 – RAMCT analysis	Chap 4 – Maintenance analysis	Chap 5 - Safety analysis	Chap 6 – Supply support	Chap 7 - Life cycle cost	Chap 8 - Settlement of warranty issues	Chap 9 - Platform health & usage monitoring	Chap 10 - Obsolescence management	Chap 11 - Integrated fleet management data	Chap 12: Software feedback	Chap 13 - Product configuration	Chap 14 - Management of in-service contracts	Chap 15 - Non-predefined information
Buy commercially	Perform RFQ, contracting & invoicing				X	X		X					X	
	Monitor contract				X		X		X				X	
	Purchase	X			X	X	X		X		X		X	
Engineering design	Studies	X	X	X		X	X	X	X	X	X	X		X
	Simulation	X	X	X				X		X	X	X		
	Design & development engineering	X	X	X		X		X	X		X	X		
	Design changes	X	X	X	X	X	X	X	X		X	X	X	X
	Human factors interfacing	X	X	X				X			X	X		X
	Design intent		X	X		X		X	X		X	X		
	Design the Product	X	X	X		X		X	X	X	X	X	X	
	Environmental protection		X	X	X									
Engineering disposal	Perform disposal		X	X	X				X			X	X	

Main-activity	Sub-activity	Chap 3 – RAMCT analysis	Chap 4 – Maintenance analysis	Chap 5 - Safety analysis	Chap 6 – Supply support	Chap 7 - Life cycle cost	Chap 8 - Settlement of warranty issues	Chap 9 - Platform health & usage monitoring	Chap 10 - Obsolescence management	Chap 11 - Integrated fleet management data	Chap 12: Software feedback	Chap 13 - Product configuration	Chap 14 - Management of in-service contracts	Chap 15 - Non-predefined information
Engineering management	Manage over & above activities		X					X					X	X
	Business strategy & planning				X	X		X	X	X		X	X	
	Performance & risk management	X	X	X	X	X	X	X	X	X	X	X	X	
Engineering monitor	Performance monitoring	X	X	X	X	X	X	X	X	X	X	X	X	X
	Information management	X	X	X	X	X	X	X	X	X	X	X	X	X
Engineering obsolescence	Obsolescence management	X	X	X	X	X	X	X	X	X	X	X	X	
Engineering safety	Manage Product safety	X		X		X		X		X	X	X		X
Engineering sustain Support	Technical support services	X	X	X	X	X	X	X	X	X	X	X	X	X
	Sustain engineering support	X	X	X	X	X	X	X	X	X	X	X	X	X
	Finance recording				X	X							X	
Engineering test	Assess and acceptance test	X	X	X		X	X	X			X	X		X
	Demonstration and evaluation trials	X		X	X	X	X	X			X		X	
	Operational environment assessment	X	X	X	X	X	X	X		X	X	X		X

Main-activity	Sub-activity	Chap 3 – RAMCT analysis	Chap 4 – Maintenance analysis	Chap 5 - Safety analysis	Chap 6 – Supply support	Chap 7 - Life cycle cost	Chap 8 - Settlement of warranty issues	Chap 9 - Platform health & usage monitoring	Chap 10 - Obsolescence management	Chap 11 - Integrated fleet management data	Chap 12: Software feedback	Chap 13 - Product configuration	Chap 14 - Management of in-service contracts	Chap 15 - Non-predefined information
	Event recording	X	X	X		X	X	X		X	X	X	X	X
Fleet and asset management	Update& manage Product configuration / system integration	X	X	X	X	X		X	X	X	X	X	X	X
Fleet and asset management	Manage Product fleet	X	X	X	X	X		X	X	X	X	X	X	
	Configuration management		X	X	X	X		X	X	X	X	X	X	
	System integration	X		X		X		X	X		X	X		
	Installation	X	X	X	X	X	X				X	X		
	Asset management	X	X	X	X	X	X	X	X	X	X		X	
	Defense strategy & planning	X	X		X	X		X	X	X	X	X		
	Engineering governance		X	X		X					X	X		
	Role change		X	X				X			X	X		
	Health and usage monitoring	X	X	X				X			X	X		X
	Analysis	X	X	X	X	X	X	X	X	X	X	X		
	Perform maintenance / Maintenance management	X	X	X	X	X	X	X	X	X	X	X	X	X
Operate	Maintenance management	X	X	X	X	X	X	X	X	X	X	X	X	X
	Restoration		X	X	X		X	X	X	X	X	X	X	X

Main-activity	Sub-activity	Chap 3 – RAMCT analysis	Chap 4 – Maintenance analysis	Chap 5 - Safety analysis	Chap 6 – Supply support	Chap 7 - Life cycle cost	Chap 8 - Settlement of warranty issues	Chap 9 - Platform health & usage monitoring	Chap 10 - Obsolescence management	Chap 11 - Integrated fleet management data	Chap 12: Software feedback	Chap 13 - Product configuration	Chap 14 - Management of in-service contracts	Chap 15 - Non-predefined information
	Plan customer maintenance program	X	X	X	X	X	X	X	X			X	X	
	Operator maintenance program	X	X	X	X		X	X	X	X		X	X	
	Perform scheduled maintenance				X							X		
	Perform unscheduled maintenance	X	X	X	X	X	X	X	X		X	X	X	X
	Manufacturing			X	X		X		X			X		
	Define Product mission	X				X				X				
	Plan Product mission							X		X	X	X		
	Prepare Product mission		X			X		X		X	X	X		
	Product mission debriefing	X				X		X		X	X			
	Perform operation													
	Plan deployment	X	X		X	X				X	X	X	X	
	Perform deployment	X	X		X			X		X		X		
	Operator profile			X										
	Supply support management	X	X		X	X	X		X	X		X	X	
	Replenishment of consumables		X		X	X	X		X	X				
	Supply spares	X	X		X	X	X	X	X	X	X	X	X	
	Security		X	X	X	X		X		X	X			

Main-activity	Sub-activity	Chap 3 – RAMCT analysis	Chap 4 – Maintenance analysis	Chap 5 - Safety analysis	Chap 6 – Supply support	Chap 7 - Life cycle cost	Chap 8 - Settlement of warranty issues	Chap 9 - Platform health & usage monitoring	Chap 10 - Obsolescence management	Chap 11 - Integrated fleet management data	Chap 12: Software feedback	Chap 13 - Product configuration	Chap 14 - Management of in-service contracts	Chap 15 - Non-predefined information
Security	Selling commercially				X	X	X		X		X		X	
Sell	Manage & update technical publications	X	X	X				X	X		X	X	X	X
Sustain engineering support	Technical publication management			X					X			X	X	
	Tooling		X		X	X								
	Facilities management		X		X	X				X			X	
	PHST			X	X	X	X				X		X	
	Modification kit procurement & installation		X	X	X	X	X		X	X	X	X	X	
	Software support	X	X	X	X	X		X	X	X	X	X	X	
	Design through-life support	X	X	X		X	X	X	X	X	X	X		
	Manage repair shops		X	X	X	X	X		X				X	
	Manage Product issue	X	X	X	X	X	X	X	X	X	X	X	X	X
Sustain engineering support technical issues	Solve/repair technical issue	X	X	X	X	X	X	X	X	X	X	X	X	X
	Request Product modification	X	X	X	X	X	X	X	X	X	X	X	X	
	Embody Product modification		X	X	X	X		X	X	X	X	X	X	
	Training management		X	X		X		X	X				X	

Main-activity	Sub-activity	Chap 3 – RAMCT analysis	Chap 4 – Maintenance analysis	Chap 5 - Safety analysis	Chap 6 – Supply support	Chap 7 - Life cycle cost	Chap 8 - Settlement of warranty issues	Chap 9 - Platform health & usage monitoring	Chap 10 - Obsolescence management	Chap 11 - Integrated fleet management data	Chap 12: Software feedback	Chap 13 - Product configuration	Chap 14 - Management of in-service contracts	Chap 15 - Non-predefined information
Sustain engineering support transport	Movement				X	X	X			X			X	

7 Data flow

The entire data flow principles are shown in Fig 2. The populating process describes the dataflow from the originator to the in-service feedback database, whereas the data extracting process is either the data request from the S-Series IPS specifications or from other partners or main tasks.

The data will be automatically transferred, according to the defined schedule from the Guidance Conference (GC) as described in Para 11.1. The GC must define the selected data model for this information which will be based on Chap 16. This will be also the format used for data exchange.

If a stakeholder intends to perform analysis on the in-service data, he will request the relevant data from the in-service database. The data exchange process, (refer to Para 10.1) provides the requested data in the Data Exchange format. These data sets can be used for analysis of in-service figures and comparison to design figures. The S-Series IPS specifications define which data must be delivered for the requested analysis (refer to Chap 19). If analysis is defined outside the S-Series IPS specifications, the datasets will be defined elsewhere in S5000F.

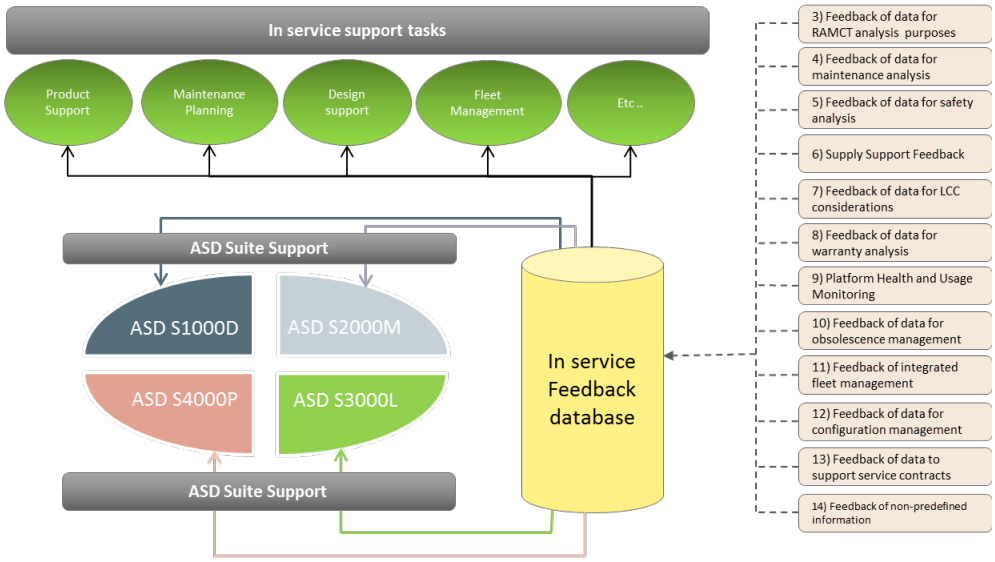

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Fig 2 Data flow principles

8 Use cases

S5000F defines the information which must be exchanged to support the associated process, based on use cases, which can differ depending on the major activities involved in the process.

Table 4 Use case overview - Example use case for each chapter

Chap No	Feedback for (short name)	Example Use case(s)
3	RAMCT	Monitoring the performance of equipment
4	Maintenance analysis	Manufacturer maintenance schedule
5	Safety	Report safety issue
6	Supply support	Stock in warehouses
7	LCC	Estimating cost and effect of modifications or upgrades
8	Warranty issues	Evaluate maintenance impact on warranty
9	Health and usage monitoring	Vibration monitoring of rotating parts
10	Obsolescence management	Determine obsolescence candidates Perform obsolescence risk assessment
11	Fleet management	Produce & update fleet plan Perform fleet tasking
12	Software support	Feedback of installed and allowed software used on the Product

Chap No	Feedback for (short name)	Example Use case(s)
13	Configuration management	Feedback of an "as operated" Product configuration Feedback of updated "as allowed" configuration
14	Management of service contracts	Provide work breakdown structure Report key performance indicators
15	Non-predefined data	Feedback of photograph of a crack Feedback of project-specific information

9 Stakeholders

Each chapter of this document defines the relevant information which must be transferred to support the required process and supports the demanding stakeholders.

The stakeholders involved in the activities between chapters, subjects, in-service activities (refer to Para 5), countries and branches, can vary. Therefore, the stakeholders involved must be identified at the start of a project.

In principle, stakeholders can differ depending on the activity. Furthermore, the data flow required for the pre-analysis process is different from that needed for the post-analysis process. Since it is not obvious which analysis will be prepared and which results will be sent back via the feedback process, only the pre-analysis data feedback specified in this document will be provided for the first step.

Fig 3 shows a typical inter-correlation of data and tasks in the feedback process before the data are computed and the required information and recommendation are generated based on the algorithm and/or logic. The process assumes that the major feedback data will be gathered by the operator and distributed to the different activities or stakeholders.

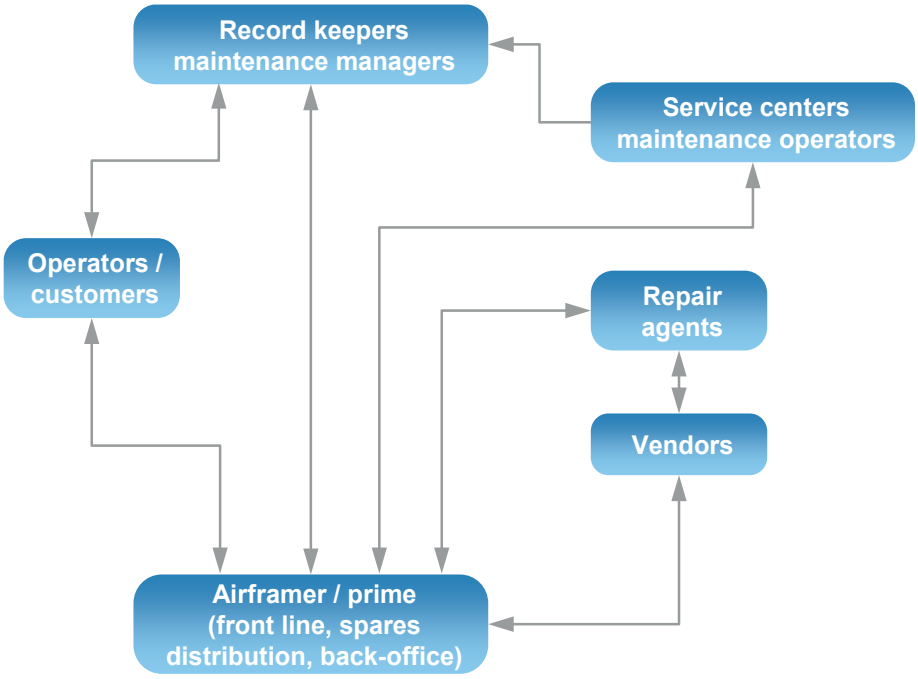

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Fig 3 Process dependencies for maintenance (example)

The example above shows a selection of data responsibilities and data sources. In principle, there are various different main data sources:

- Supplier
- OEM
- Customer/operator of the Product
- Maintenance agent

The data required for the different types of analysis must be transferred from the originating data source to the contractor conducting the analysis. Since the OEM is the developer of the system, the greatest part of the data should be transferred via the OEM so that plausibility checks can be carried out. The OEM distributes the requested data to those conducting the analysis, which can be either a process or a company. The detailed delivery process must be defined at the beginning of the analysis project in the GC (refer to Para 11.1).

To illustrate the process, various use cases are defined. A general overview of the RM&T process explains, as an example, what the breakdown should look like. Furthermore, the example shows the data requested for the calculation of some relevant Key Performance Indicators (KPI) to generate RM&T feedback data, which enables the user to compare it with the extant Product data. The intent here is to set up a process which allows the operator and OEM to compare the operation world with the design world and systems with one another.

10 Process description

The process is built up as an Inputs, Outputs, Controls, and Resources (ICOR) process which is divided into different levels.

Note

ICOR is an internationally accepted process analysis method that defines the inputs, outputs, controls, and resources for high-level processes and sub-processes alike. Some processes look impossibly complex when examined in their entirety. It's only when they are broken into their individual components that the real causes of problems become apparent.

ICOR is a box-based diagrammatical approach that can simplify the complexities by splitting the transactional processes to indicate the relationships between them.

Note

The most common ICOR-based functional modelling language is IDEF0 [FIPS 183].

ICOR level 0 shows the global view of the process and describes the:

- Inputs (I)
- Constraints (C)
- Outputs and (O)
- Resources (R)

The overall data process is split into two sub-processes, namely the activity process and the feedback process. The activity process is defining the analysis based on the data feedback out of S5000F whereas the feedback process is defining the necessary data and their exchange to support the activities. S5000F supports the feedback process and therefore the activity process is mentioned just for the sake of completeness and will not be described in detail in this document.

Level 0 shows the front end of the data process. It reflects the activity but not yet the feedback process. The Input for the activity process deals with the data acquisition on the operational site, at the end where the raw data are generated and gathered. The Output side provides the data which will be required for the feedback process as an input.

Fig 4 illustrates the lower levels of the ICOR process which are related to the feedback process.

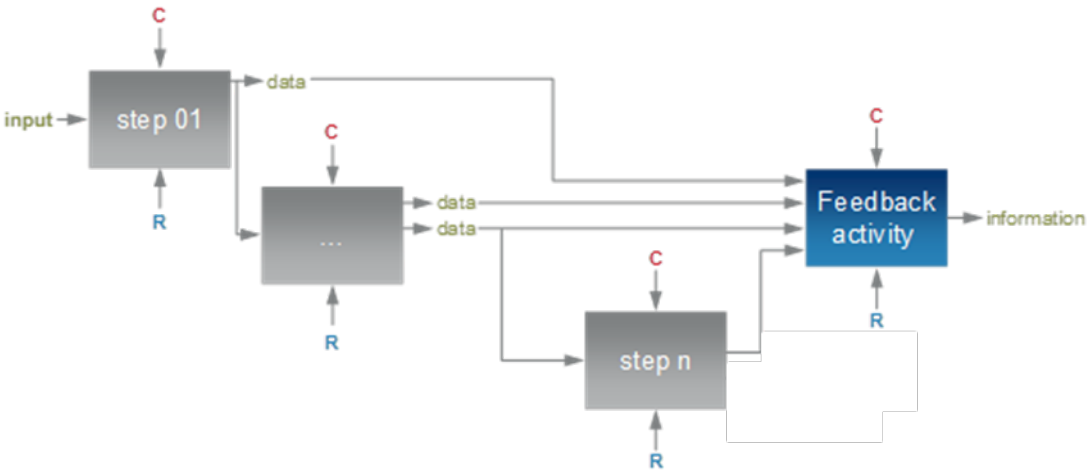

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Fig 4 ICOR levels with feedback activity

Fig 5 explains how the different levels contribute to the feedback process. All requested information will become part of the feedback and is dependent on the activity which must be supported.

Each level of the ICOR process describes a sub-process (child process) of the parent process. It is not intended to build up the complete process loop. Fig 5 shows the process steps of the data feedback within the different levels. This data communication is not part of this specification. Furthermore, the process of calculating eg, KPI, is also not a subject of S5000F. These processes do not reflect a closed control loop and purely describe a straightforward data flow from data generation to data delivery. The calculation of eg, relevant RMT figures, will be described in the corresponding data analysis specification or dedicated S-Series IPS specifications. For example. the calculation of an in-service MTBF will be carried out with the in-

service data provided by S5000F. The algorithm, however, will be defined in the S3000L or by the task which requires the in-service MTBF figure.

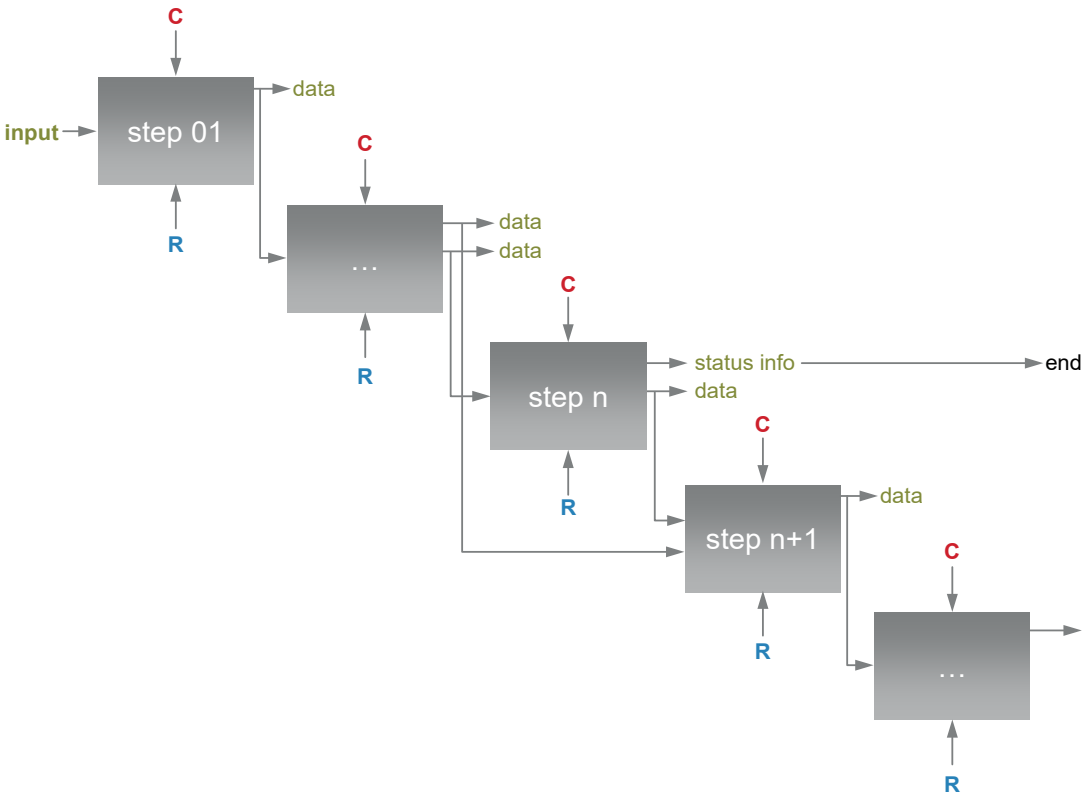

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Fig 5 ICOR level 1and lower

10.1 Example Use case RMT

For illustration purposes, the following sub-paragraph gives an example of an applied process. The description of a subset of RMT activities explains the process and contributes to the evaluation and analysis by preparing and providing the relevant data set.

In Fig 6 a typical interaction of different disciplines and stakeholders based on the RMT activities is shown. The necessary data set will be provided by the involvement of different stakeholders and usage scenarios. The requesting RMT task manager receives the relevant data set from the in-service feedback database in XML format. The LSA process (eg, that initiated by S3000L) uses the input data for the LSA analysis and distributes the result to the corresponding IPS specifications or relevant processes. Since S3000L was, in this case, the initiator of the in-service LSA task, S3000L is responsible for the distribution of the results to the different stakeholders. S5000F is not aware of the intention behind this activity and therefore the result of the calculation will not be transferred by S5000F - the distribution of the result is under the responsibility of the data requester.

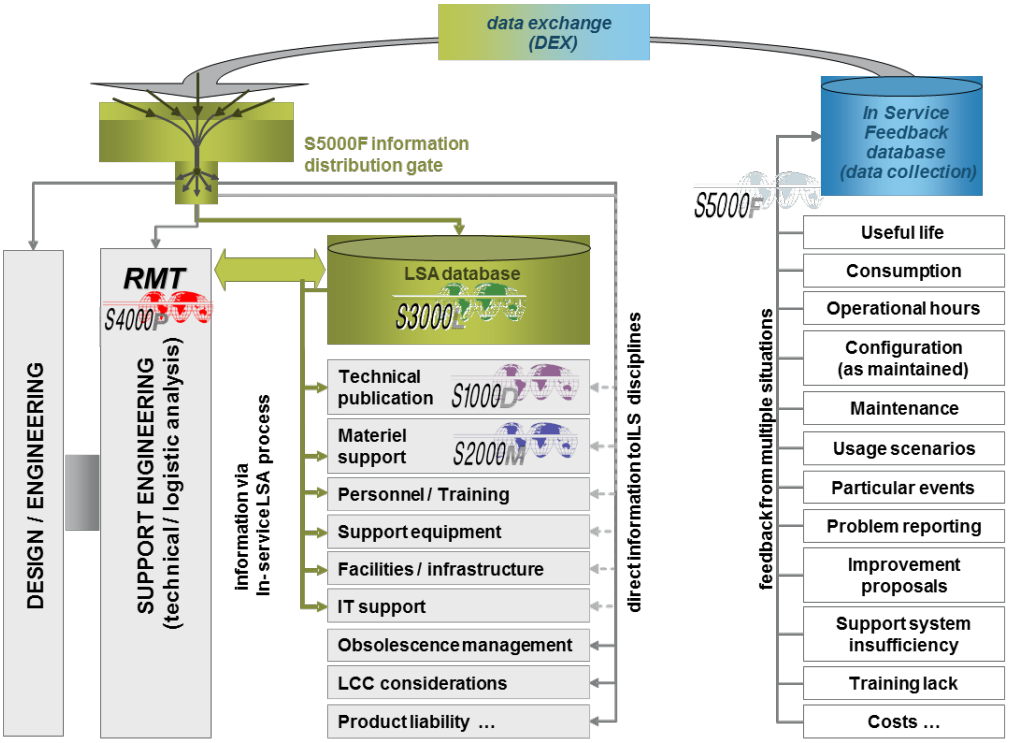

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Fig 6 In-service data analysis process as an example of S3000L feedback

The data feedback for the initial request is shown in the next figures. The ICOR 0 level represents the data generation (raw data) and the first processing of the data. This level is mostly embedded in the environment of the system operator. S5000F process starts with the ICOR 1 level (refer to Fig 7).

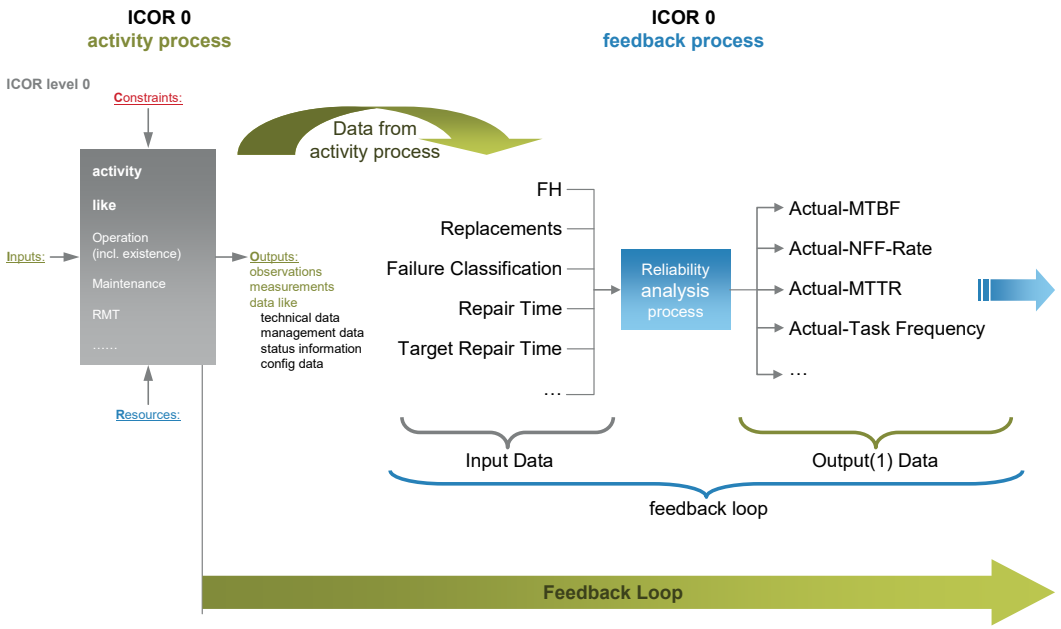

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Fig 7 Data feedback (Step 1)

To explain the ICOR principles an example for an RMT analysis is drawn in various levels in Fig 8, Fig 9 and Fig 10.

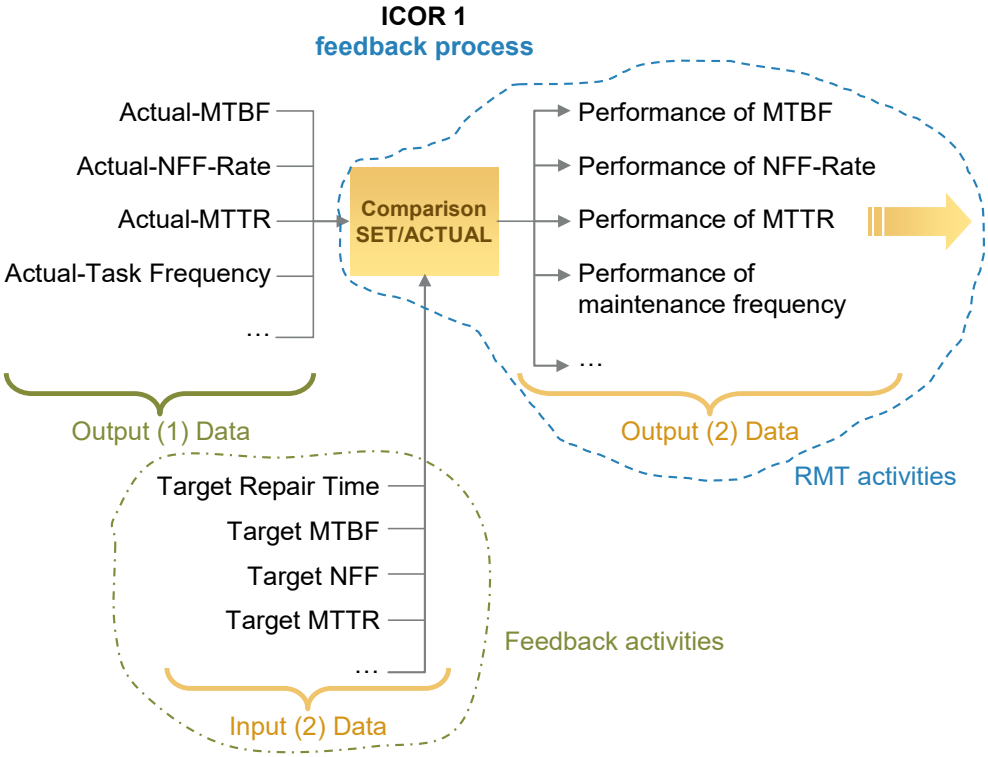

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Fig 8 Data feedback with RMT comparison (Step 2)

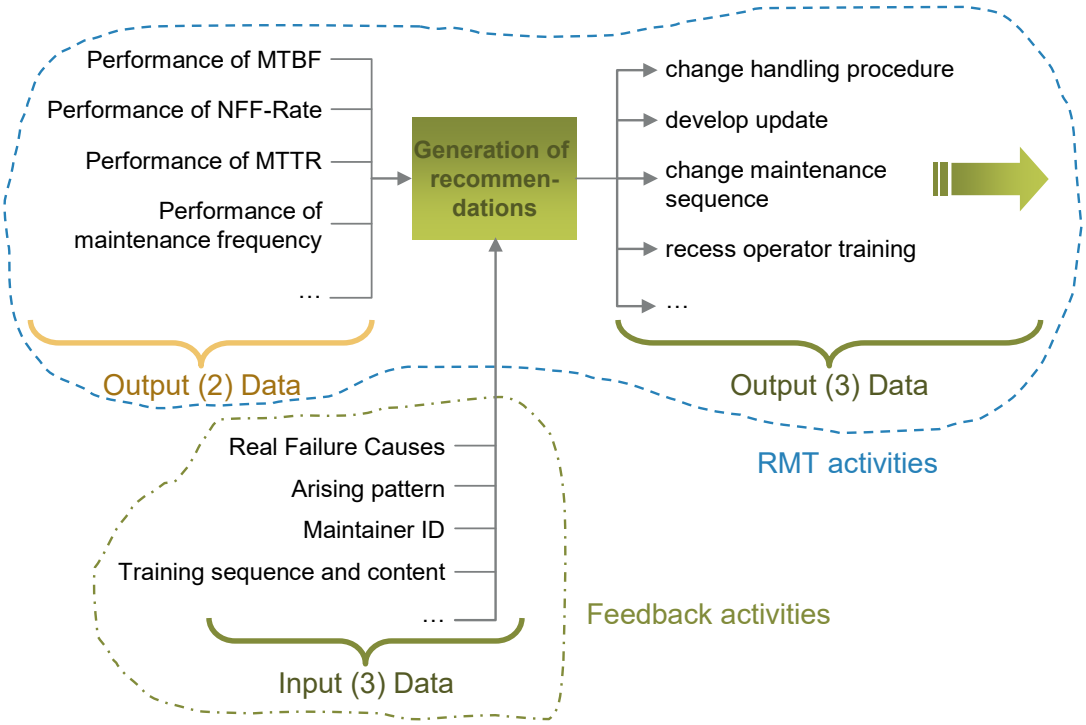

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Fig 9 Data feedback with generation of RMT recommendations (Step 3)

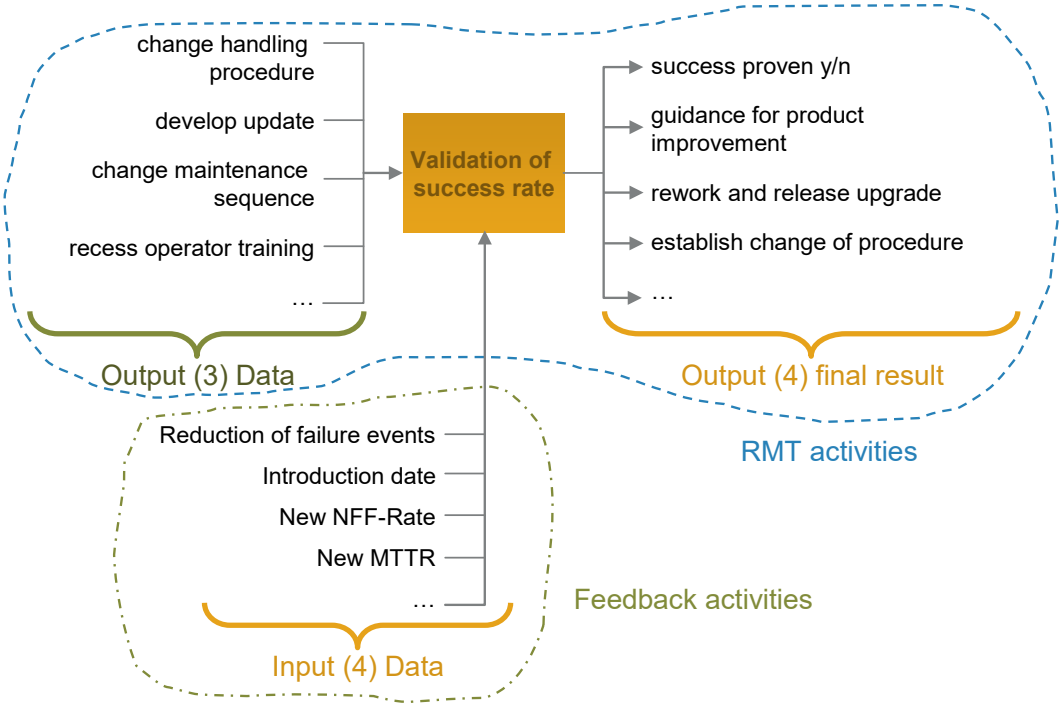

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Fig 10 Data feedback with validation of RMT recommendations (Step 4)

11 Business process

The entire Business process is split into 5 phases. These are:

- Kick off phase
- Definition phase
- Specification phase
- Data handling phase and
- Analysis phase

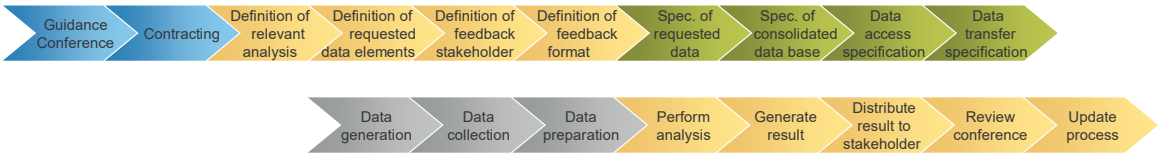

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Fig 11 Business process steps

The Business process, shown in Fig 11, starts with a GC, which is a kick off meeting where all relevant decisions must be made to initialize the data feedback as specified. Before entering in the Definition phase, the GC, as the launching meeting, is followed by the contracting. Before all necessary specifications will be generated, the definitions of the required analyses, the purpose and involved companies must be established. After the data are generated and collected the analysis phase can be started.

11.1 Guidance Conference

Before a contract is concluded, a GC should be held. The GC should be a central event with participation of management staff and specialists on sites, customer and contractor. At this conference, the binding agreements for the performance of the work process must be established. To ensure the best possible outcome of this conference, it is necessary to have

prepared inputs and to have clear expectations of the results and final agreements. It is strongly recommended to have checklists for the GC preparations and expectations.

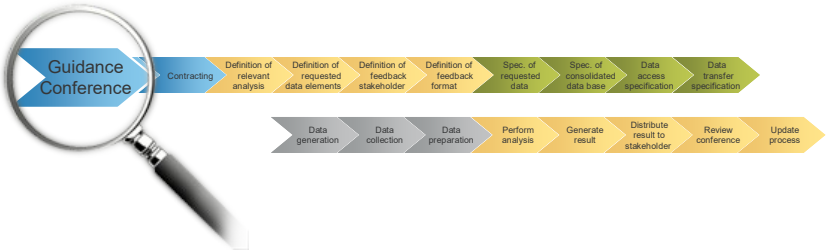

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Fig 12 Guidance conference step of the business process

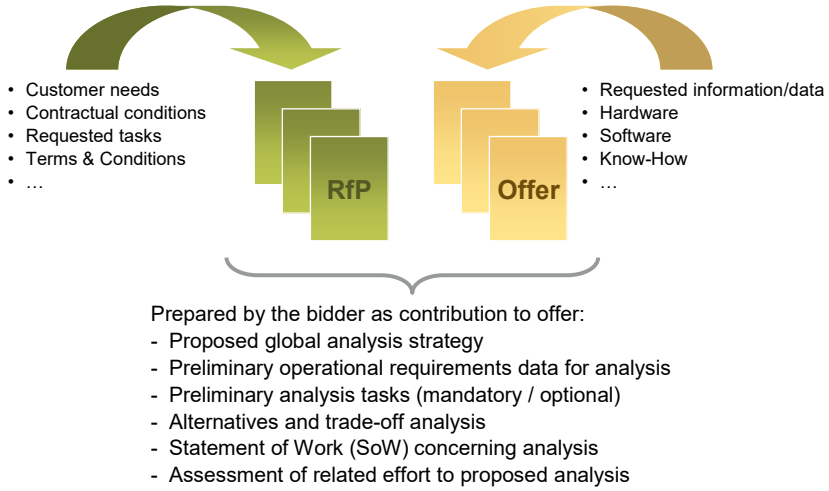

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Fig 13 Preparation of request for proposal and offer

It should be clearly pointed out that most essential decisions influencing the feedback effort must be negotiated before the GC. Usually, the feedback process begins while an offer is created and will be similar to the final version contained in the corresponding contract. This applies to any feedback-relevant aspect within the contract (eg, related Statement of Work) as well as to contractual details such as deliverable items, indispensable specified values or major milestones. This implies a series of investigations to be carried out prior to the contractual offer (eg, identification of activities including feedback considered as mandatory, recommended or voluntary, depending on early strategy judgment and/or the kind of data, systems and equipment to be handed over and assessed). By defining the requested analysis, the necessary data will be defined usually by the use cases. In case the data quality and the data completeness are not as it is requested the GC should define the necessary consequences and actions to be installed to improve both, quality and completeness. In addition to the data itself, the data storage, the data transfer (media, frequency, etc) and the data access rights must be defined in the GC.

The GC serves as a means for communicating to the customer the work that will be done in detail, along with the associated rules and time schedules, based on the contractual requirements and further agreements as noted above. The GC also clarifies any questions the customer can have regarding effort and feedback. Nevertheless, changes to the work effort must be allowed to a certain extent during the GC without the need for contract changes and changes in the cost of the effort. Considering the iterative nature of contracted activities, customisation (tailoring) must be possible in order to be flexible.

According to the working process described in Para 4 the GC must identify each relevant process step. Since the projects will have different goals and prospects not all of the drawn main tasks of the working process must be considered generally. Once the main tasks of the working process are identified the activity list of Para 5 will show all of the tasks which are supported by S5000F. The selected activities together with the corresponding KPI will guide the user of this specification to the relevant chapter and the data set he will need for the desired in-service data analysis.

11.2 Contracting

The contracting follows the GC where all relevant definitions were established. The contract itself reflects and summarizes the decisions and definitions from the GC. The contract describes the content of the activities which must be supported and indicates the stakeholders concerned. In addition, it defines the time frame and the sequence of data delivery. Furthermore, the contract provides details of the data transfer in terms of data provision responsibility. Refer to Chap 19.

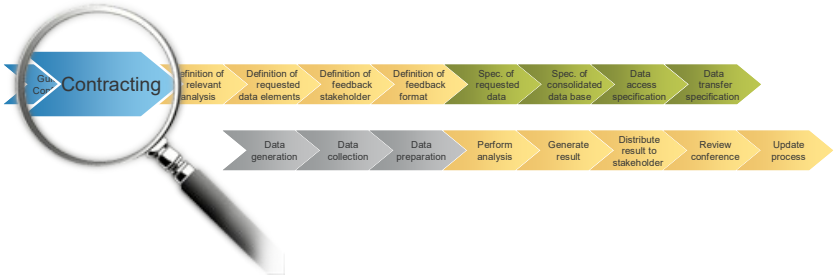

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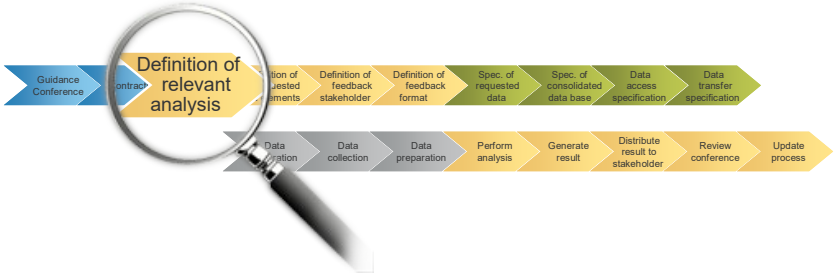
Fig 14 Contracting step

11.3 Definition of relevant analysis

In order to support the required analysis with the necessary data, the requested analysis must be identified. Based on the defined analysis, this specification describes which data must be transferred by the process. The defined activities belong to a specific chapter which defines the data set that must be provided. Therefore, it is necessary for the contractor to define the activities/analysis as detailed as possible.



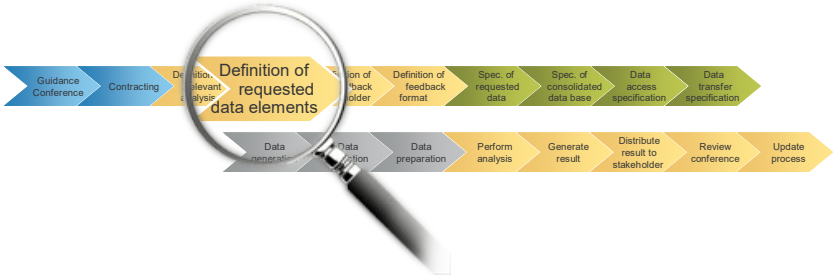
ICN-B6865-5000F02015-001-01

Fig 15 The definition of relevant analysis step

Since the specific analyses define the data set needed the stakeholders must define the required analyses at the beginning of the feedback process. Therefore, it must be known which investigations must be supported by this specification. It is recommended to check the activities in Para 5 to find out if the required analysis can be supported by S5000F. If the requested analysis is listed in the overview, the necessary data elements and data set are defined in the corresponding chapter and appendix of this document

11.4 Definition of requested data elements

This task defines the data elements based on the activities defined in the GC. Either the documentation of the GC contains the required analysis, or the contract describes all activities which must be supported. Refer to Chap 19



ICN-B6865-5000F02016-001-01

Fig 16 The definition of requested data elements step

11.5 Definition of feedback to stakeholders

Since there are two kinds of data delivery process involved, the different stakeholders must be defined in advance. According to the process description, a data gathering process and a data providing process must be established.

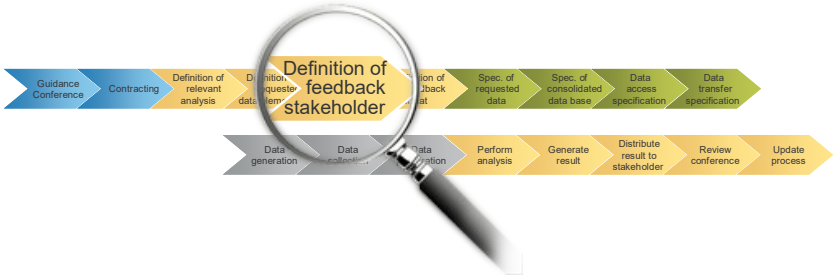


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Fig 17 Definition of feedback to stakeholder step

The data gathering process is responsible for the collection of data from different data sources such as the supplier, OEM, operator, etc. The stakeholders can vary depending on the data providing process. In this case, the stakeholders are the different S-Series specifications such as S3000L, S1000D, etc, and the community dealing with in-service data analysis in general. The different stakeholders are clearly defined by the overall IPS process as documented in SX000i. With regard to analysis, the stakeholders differ from case to case and must be clearly identified in the GC. Furthermore, the frequency of the data transfer must be defined. Usually, the in-service data analysis is a standing task. Based on this, it is important to define the time period in which the data set must be delivered in a continuous way.

11.6 Definition of feedback format

Another important definition which must be established during the GC is that of the feedback format. It must be defined in which form the data must be transferred. S5000F provides the XML schema for the exchange, but this provides a lot of flexibility. For example, it is possible to exchange one single use case or multiple use cases at the same time. If the analyst requires the data in a different format from the one recommended, this must be requested in advance. Ideally, this will be announced in the GC. Refer to Chap 19.

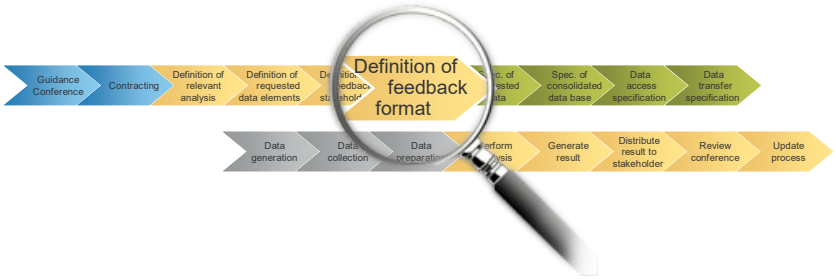

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Fig 18 Definition of feedback format

11.7 Specification of requested data

The data elements that are required in addition to those identified in this specification must be specified to contribute to the requested analysis. In this case, the data format, data source and data transfer must be described in a specification. The in-service database must be enhanced to provide the relevant data needed for the required analysis.

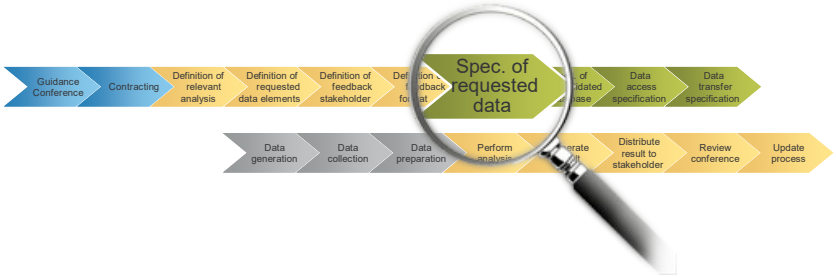

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Fig 19 Specification of requested data

The additional data either must be provided by a separate data set which does not belong to this specification, or it must be added. The responsible S-Series community must decide whether these data elements will be added to that document later. If so, the concerned chapters also must be updated. If these data belong to an unconsidered activity, the activity itself must be described in one of the following chapters. Refer to Chap 19.

11.8 Specification of consolidated database

The gathered data must be consolidated before they are loaded into the in-service database. Each stakeholder in the data gathering process must make sure that the data elements are consolidated and checked for duplicates, uniqueness, correctness, etc. All data stored in the in-service database will have their status validated and proved so that the data requesting party can rely on the data received.

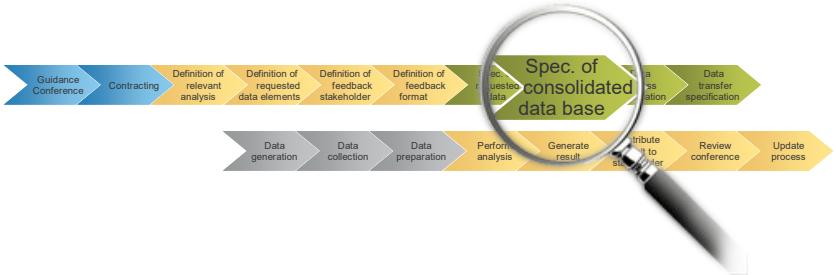

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Fig 20 Specification of consolidated database

S5000F defines the format and availability of the data elements. The incoming data will be consolidated by the parties responsible for data sources. Before the data is uploaded to the in-service database it must be consolidated once more because the data set will not be delivered by one stakeholder only. The data set will be fragmented and therefore it is necessary to consolidate the data before storage in the database.

11.9 Data access specification

Usually the data access must be restricted to a certain group of persons or at least to defined companies and/or departments. Due to this requirement it is necessary to implement a certain security level to avoid any access of un-certified people. Since the cleared people will depend on the project and the security request from the data owner the applied security concept must be discussed and defined in the GC. In principal there are three different groups of access rights to be defined.

- Data delivery
- Data storage and administration
- Data demand

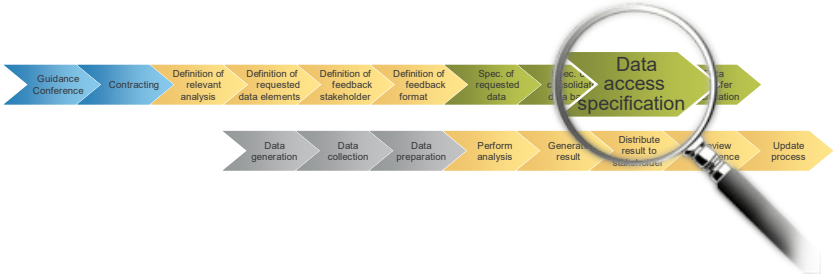

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Fig 21 Data access specification

The group of data delivery are sending permanently the data updates to the designed common database. To avoid irrelevant or wrong data sets the deliverer must be announced and will be equipped with certain access rights. For the data checks and the storage of the data into the common database there is a data administrator necessary who needs full access rights to the data. The third group is special because this group is allowed to receive the consolidated data from the common database for evaluation and analysis purposes. Therefore, the GC must assign the persons and their rights to demand and receive data. The clearance of each designated person must be described in detail to fulfil the data security requirements. The appointed software and architecture must be decided by the participating companies and owner of data. The data security must be ensured for the entire process.

11.10 Data transfer specification

The data transfer must be defined when the process is launched by means of a technical data exchange document or specification, refer to Chap 19.The quality of the in-service data analysis is very much dependent on the completeness and the quality of the data transferred. The technical data exchange document or specification ensures that the data is contributed at the right time and in the right format via the defined medium and secure delivery mechanism. All participating stakeholders must agree on the data delivery specifications to ensure a complete data set and the necessary data quality.

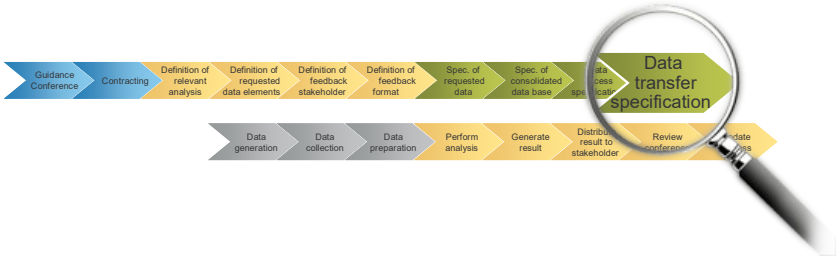

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Fig 22 Data transfer specification

11.11 Data generation

The definition of how the data will be generated is not part of this specification. However, this chapter describes the data transfer from the different data sources via the in-service database to the user of the data set but not how the data are generated. In principle, these data are generated by the used systems or applied processes and vary greatly from system to system.

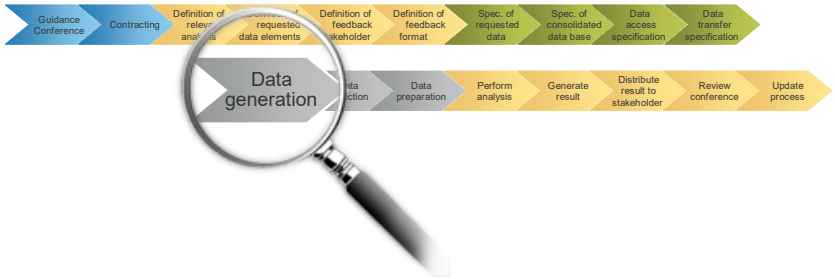

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Fig 23 Data generation

11.12 Data collection

The relevant data elements described in the following chapters will be collected in an in-service database. Considering the data format, transfer and consolidation process, the data will be stored in the database. At the beginning of the process, a wide range of settings and definitions must be agreed on before the data can be collected in the in-service database. The data will be provided by different stakeholders and data sources. The data elements required depend on the analysis requested. Refer to Chap 19.

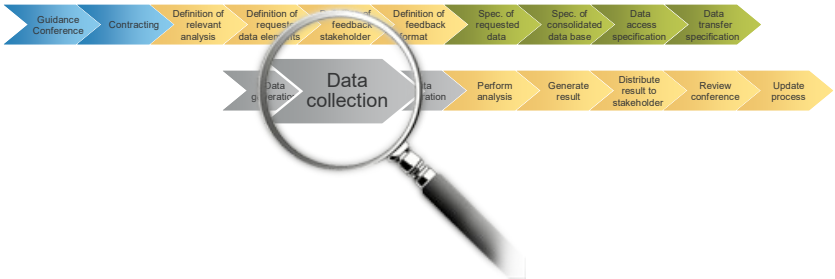

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Fig 24 Data collection step

The envisaged database is not part of S5000F. Since the data scheme is highly dependent on the system and the in-service data required, it cannot be part of this document.

11.13 Data preparation

The raw data must be converted to provide the requested information for the analysis. Therefore, some of the data must be prepared and converted before being stored in the in-

service DB. For example, it is not always the case that the data are not available in the PLCS format. In this case, the data element must be re-formatted in the appropriate way in order to ensure format consistency.

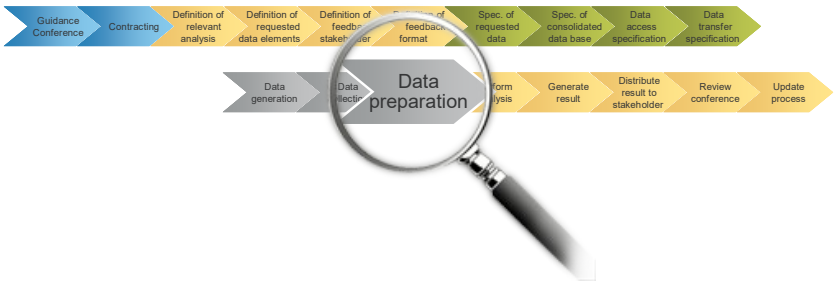

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Fig 25 Data preparation step

The data preparation will be performed either by the party responsible for the source data or the responsible in-service database group, before the data are stored in the in-service database. In any case, a quality check must be performed before loading into the in-service database. Note that data quality issues must be considered, as explained in Chap 16.

11.14 Perform analysis

The description on which analysis must be performed, and how, is not part of S5000F and therefore not explained this document. The analysis itself is described in the relevant S-Series specifications or the in-service date requestor.

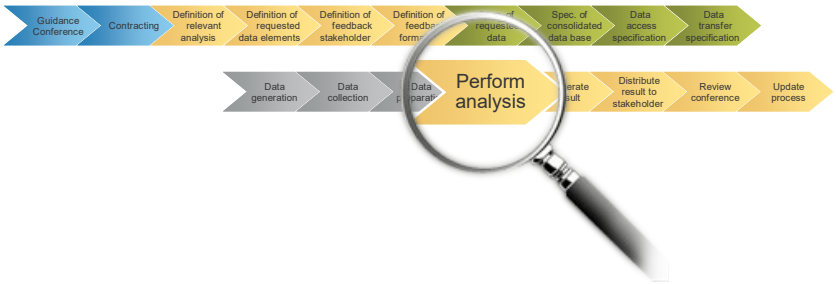

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Fig 26 The perform analysis step

11.15 Generate results

The results of this analysis are not described in this document. It depends very strongly on the analysis task which result can be expected. Describing the relevant output of the different analyses is therefore a task of the initiating S-Series IPS specifications or other applied analysis specifications.

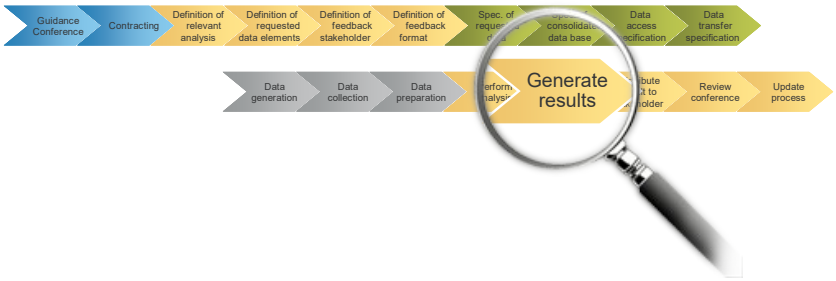

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Fig 27 Generate results step

The available specifications dealing with analysis are listed in the individual chapters. The reflection of the available specifications and specifications does not require completeness. There are certainly some specifications and analysis descriptions published which are not mentioned in S5000F. Nevertheless, the requirement regarding the data distribution can be applied to that document as well.

11.16 Distribute results according to definition

The results of the in-service analysis are generated by the different S-Series IPS specifications and other applied specifications. The relevance of the data for other specifications is described in each individual specification. Therefore, it is useful that each specification describes the relevance of the results to the corresponding specifications. Due to this fact, the distribution is not included in this specification. The distribution of the outcome of the performed analysis must be looked up in the document in which the analysis is specified.

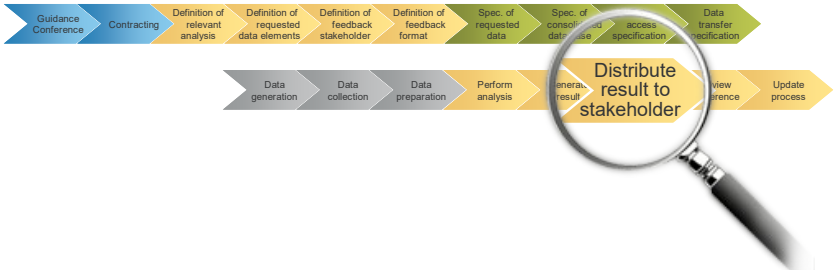

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Fig 28 The distribute results according to definition step

11.17 Review conference

The described process is intended to be a standing process for the complete in-service period of the systems. It is recommended to set up review conferences which reflect the definitions of the GC according to the experience and results gained. Usually, the in-service phase of the considered systems in the defence business is very long. Thus, it can be expected that there will be some changes in data gathering and data set provisioning. The review conference is the right place to discuss and agree on the required changes with all participating stakeholders. In the case of changes, the process described in this document must be reviewed from Para 11.3 onwards. If the contract is affected by the changes, the review process starts from Para 5. Refer to Chap 19.

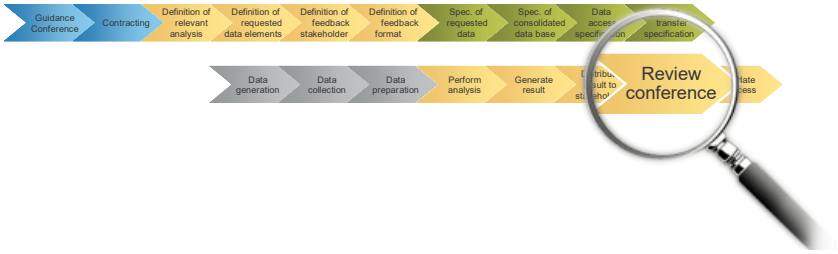

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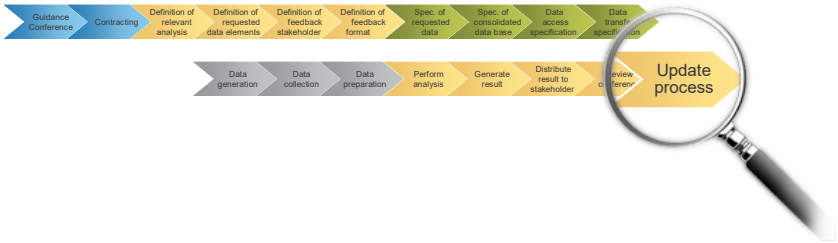
Fig 29 The review conference step

11.18 Update process accordingly

The process of in-service data feedback is a living process and must be updated from time to time. It is obvious that the data elements and the process itself are strongly dependent on the analysis and even on the systems which should be investigated and observed during the in-service phase.



ICN-B6865-5000F02030-001-01

Fig 30 The update process accordingly step

Chapter 3

Feedback data for RAMCT analysis

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References

Table 1 References

Chap No./Document No.	Title
Chap 20	Data required for the different use cases
Chap 21	Terms, abbreviations and acronyms

1 Introduction

The five system performance characteristics Reliability, Availability, Maintainability, Capability and Testability (RAMCT) should be monitored by an operator or owner, as they impact the effectiveness of a system, its safety, its supportability, the way the operator executes the mission and the morale of the operator. Effective monitoring requires relevant data that includes a sufficient range of data elements and sufficient quality and quantity of data is gathered. This enables the identification of potential engineering changes.

The relationship between the five RAMCT performance characteristics are shown in Fig 1.

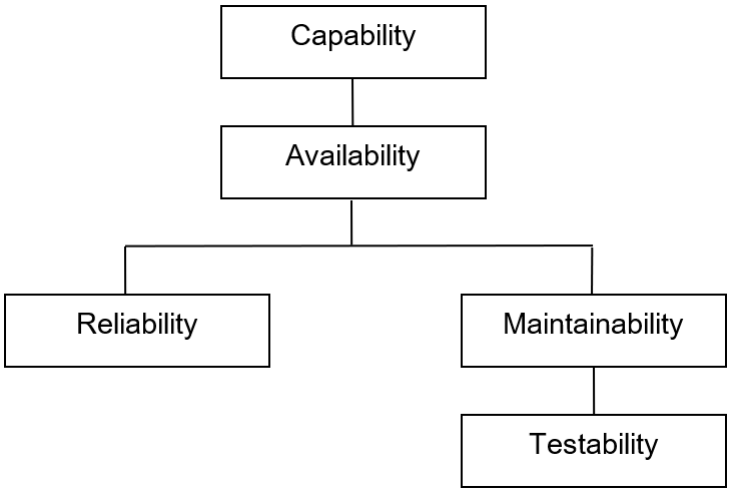

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Fig 1 RAMCT Relationship

2 Scope

There are common activities, basic definitions and basic data fields involved in gathering user data for RAMCT analysis. These will be of interest to anyone who requires engineering performance indicators to be produced for engineering or operational monitoring, changes to engineering design and spares provisioning.

3 Definitions

The field of dependability covers system RAMCT. The definitions of these terms and other terms derived from them are listed in Chap 21.

4 Reliability

The term Reliability covers:

- what constitutes a failure to perform as required (a failure)
- how it affects the mission (mission reliability)
- whether it affects the logistic system (basic failure)

Other reliability terms, such as Failure Rate and MTBF can be further amplified according to user and Product requirements by reference to more specific definitions given elsewhere. Consequently, definitions such as intrinsic or inherent reliability, primary and secondary failures, time to failure and time between failures, will all vary according to circumstances that must be taken into account when selecting the correct reliability term.

4.1 Reliability objectives

4.1.1 Reliability monitoring

The objectives of reliability monitoring must first be determined and from these objectives, the necessary activities are derived. The definition of the activities to be performed enables the identification of the required fundamental data classes and related data elements.

4.1.2 Reliability data gathering

The objectives of reliability data gathering includes but are not limited to:

- Monitor the performance of the equipment
- Predict trends
- Identify problem areas that may result in damage and hence minimize unscheduled repair and the need for support

- Identify failure modes, their causes and failure mechanisms
- Gather evidence for root cause investigation
- Issue warnings and report increased risk
- Influence future designs

4.2 Reliability activities

The activities involved in reliability monitoring include but are not limited to:

- Validating the reliability specified
- Reporting the reliability achieved
- Predicting future reliability
- Investigating anomalies and defects
- Identify risks including those to the environment and those involving safety
- Produce anomaly/defect/failure reports including those caused by software and packaging, handling, storage and transport (PHST)
- Provide information for engineering change requirements including changes to publications

4.3 Reliability metrics

There are many different types of reliability analysis, such as monitoring growth, simulations, Pareto, fault tree, Failure Mode, Effects and Criticality Analysis (FMECA) or Markov analysis. Hence the metrics used in any performance analysis will depend on which best meet the Product requirements. The metrics can be calculated at the Product, fleet, system or item levels.

A summary of the metrics that can be derived from obtaining relevant reliability data fields is:

- Failure rate ie, the total number of failures/total use
- MTBF

4.4 Reliability data classes and elements

There are data classes and elements for reliability that are derived from the required objectives, activities and metrics. Refer to Chap 20.

Note

Other data elements could be required depending on the system or domain (land, sea, air and space) specific operating requirements.

The data classes and elements should cover:

- Clear identification of the product
- The start state of the product (configuration)
- The operating conditions such as might be provided by Usage and Health Monitoring Systems
- The usage eg, time, distance, operating time/cycles, etc
- The environmental conditions in which the mission was carried out
- The number of failures and their effects
- Details of provision of any external resources such as maintenance support

Note

The environmental conditions in which a Product is used, form critical limiting factors and must be considered and recorded. They will have a major impact on the reliability availability and performance. For example: vibration, terrain, altitude, temperature, dust and humidity and include other factors such as biological hazards, atmospheric electricity, radiation, legislation, skill sets etc.

4.5 Reliability use cases

The reliability use cases provide an indication of the data required to determine achieved reliability. It is possible that data obtained needs to be compared against the design or performance specifications and the operational requirements.

For a detailed definition of the data to be used for each of these use cases, refer to Chap 20.

4.5.1 Use case UC50301: Monitor the performance of equipment

This use case covers the exchange of data between those with an interest in the achieved reliability. Equipment performance can be obtained by comparing the equipment specification against:

- Configuration - operational and as designed
- Reliability characteristics
- Equipment issues
- Operational history
- Operation undertaken
- Performance characteristics
- Safety issues
- Product status
- Product information

4.5.2 Use case UC50302: Influencing future designs

This use case covers the exchange of data between those groups with an interest in changing the current design. The information required for this use case includes:

- Clear identification of the Product
- Operational history
- Equipment issues
- Operational issues
- Support equipment/ documentation issues
- Operational configuration
- Safety issues
- Warranty issues
- Operational costs
- Support costs
- Product changes
- Product information

4.5.3 Use case UC50303: Trends, FMECA, Root Cause Analysis, Damage and Event Analysis and Issue Warnings

This use case covers the exchange of data between those groups with an interest in monitoring the reliability of the Product or Product range. Information for this use case can be obtained by comparing the equipment specification against:

- Operational role
- Investigations
- Configuration (operational, role and as-maintained configurations)
- Product issues
- Product changes
- Operational costs
- Product information
- Operator competence
- Safety issues

5 Availability

There are many variations of the term availability, stemming from the applicable definitions of up-time and down-time. While the basic definition of availability of a Product or fleet of Products is the ability to be in a state to perform as required under given conditions at a given instance or over a given interval, other definitions can be used. Associated terms include:

- Operational Availability
- Inherent Availability (intrinsic availability)
- Instantaneous Availability (point availability),
- Average Availability
- Steady State Availability
- Achieved Availability
- Standby Availability
- Effective Availability
- Availability of Service

5.1 Availability objectives

5.1.1 Availability monitoring

The objectives of availability monitoring must first be determined and from these objectives, the necessary activities are derived. The definition of the activities to be performed enables the identification of the required fundamental data classes and related data elements.

5.1.2 Availability data gathering

The objectives of availability data gathering are to:

- Improve performance and increase the availability of equipment
- Provide the basis of contracting for availability
- Provide information for fleet and asset management
- Assist in maintenance management
- Improve operations and deployment activity
- Improve through-life support

Availability indicates the usability of a Product provided the basis upon which it is calculated is fully understood. It is frequently used as a measure of contractor efficiency.

The availability must be that perceived by the user.

Availability can be measured in different ways. For example:

A system is required to operate three hours every day but fails to start up and takes three hours to fix, resulting in the three-hour operation requirement not being met.

This could be perceived as a 0% (0/3) or 87.5% (21/24) availability.

5.2 Availability activities

The principal activities involved in availability performance monitoring include but are not limited to:

- Identifying the availability requirement
- Predicting future availability
- Reporting the availability achieved

5.3 Availability metrics

A summary of the availability metrics that can be derived from obtaining relevant availability data fields is:

– Inherent availability:

$$MTBF/(MTBF + MTTR)$$

Note
This excludes logistic delays.

– Operational availability in the required operating period:

$$OT + ST/(OT + ST + TCMT + TPMT + ALDT)$$

- where:
  - OT is Operating Time
  - ST is Standby Time
  - TCMT is Total Corrective Maintenance Time
  - TPMT is Total Preventive Maintenance Time
  - ALDT is Administrative and Logistic Delay Time

5.4 Availability data classes and elements

There are data classes and elements for availability that are derived from the required objectives, activities and metrics. Refer to Chap 20.

Note
Other data elements could be required depending on the system or domain (Land, Sea, Air and Space) specific operating requirements.

The data classes and elements for availability should cover:

– The original status of the product
– Mean up time - operating time and standby time
– Mean down time - The time the product is not available (ie, total corrective maintenance time, preventive maintenance time, waiting time and administrative and logistic delay time
– The number of failures occurring
– The effects of failures on the availability achieved of the end item
– The environmental conditions

It is important for availability to ensure the data can be synchronized and will arrive in time to be useful. Reports and performance indicators will therefore require their own time scale to be set according to whether they are incident, demand, usage or time based.

5.5 Availability use cases

The availability use cases provide an indication of the data required to determine achieved availability. It is possible that the data obtained needs to be compared against the design or performance specifications and the operational requirements.

For a detailed definition of the data to be used for each of these use cases, refer to Chap 20.

5.5.1 Use case UC50304: Operations and deployment support, through-life support and equipment availability

This use case covers the exchange of data between those with an interest in monitoring the availability of the product. Operations information etc, can be obtained by comparing the equipment specification against:

– Maintenance support (facilities, staff and equipment)
– Operational role
– Equipment and support issues
– Maintenance requirements

- Operation undertaken
- Support issues
- Costs
- Configuration operational
- Operational environment
- Usage and scrap rates
- Safety issues
- Product ID (unit to be tested, product)
- Product quantity (suitable for operation or not)
- Consumed support (equipment, staff time, shipping and storage)

5.5.2 Use case UC50305: Maintenance management and contracting for availability

This use case covers the exchange of data between those with an interest in monitoring maintenance management and effectiveness of the contract. The effectiveness of maintenance or the contract can be obtained by comparing the equipment specification against the following:

- Maintenance support (facilities, staff and equipment)
- Operational role
- Maintenance requirements
- Operational activity
- Support issues
- Costs
- Configuration
- Operational environment
- Product ID (unit to be tested, product)
- Product Status (suitable for operation or not

6 Maintainability

The term maintainability is used when the user wants to refer to how easy it is to return an item to its serviceable condition. Associated definitions include:

- Preventive Maintenance (Scheduled Maintenance)
- Corrective Maintenance
- Software Maintenance
- Maintenance Time
- Repair Time and Mean Time to Restore

These generic definitions are further amplified using other domain or system definitions given elsewhere, such as fault detection time, maintenance man-hours, lines and levels of maintenance, etc.

6.1 Maintainability objectives

6.1.1 Maintainability monitoring

The objectives of maintainability monitoring must first be determined and from these objectives, the necessary activities are derived. The definition of the activities to be performed enables the identification of the required fundamental data classes and related data elements.

6.1.2 Maintainability data gathering

The objectives of maintainability data gathering include but are not limited to:

- Improve maintenance activities including scheduled maintenance and the relationship to Human factors
- Improve the cost effectiveness of repair
- Assist software maintainability
- Predict trends and identify areas that are unacceptable and need to be improved

6.2 Maintainability activities

The principal activities associated with maintainability include but are not limited to:

- Validating specified maintenance periods
- Reporting maintenance carried out
- Predicting the future maintenance required
- Identifying maintenance costs
- Sustaining engineering support associated with maintenance
- Reporting findings from scheduled and non-scheduled inspections

6.3 Maintainability metrics

A summary of the maintainability metrics that can be derived from obtaining relevant maintainability data fields is:

- Maintenance Man-Hours (MMH)
- Mean Repair Time (MRT) or Mean Active Corrective Maintenance Time
- Mean Time Between Preventive Maintenance (MTBPM)
- Time to upload software
- Mean Time To Repair (MTTR):

$$APT + AFIT + ADT + AIT + ART + AAT + ACT + AST$$

  - where:
    - APT is Average Preparation Time
    - AFIT is Average Fault Isolation Time
    - ADT is Average Disassembly Time
    - AIT is Average Interchangeable Time
    - ART is Average Reassemble Time
    - AAT is Average Alignment Time
    - ACT is Average Checkout Time
    - AST is Average Start-up Time

6.4 Maintainability data classes and elements

There are data classes and elements for maintainability that are derived from the required objectives, activities and metrics. Refer to Chap 20.

Note

Other data elements could be required depending on the system or domain (Land, Sea, Air and Space) specific operating requirements.

The data classes and elements should cover:

- The maintenance (scheduled and un-scheduled) tasks and procedures along with their corresponding interval or threshold as listed in the technical documents
- The maintenance time taken broken down into its constituent elements
- The resources used and the training / skills required
- The conditions experienced e.g. the environment and the level of repair
- Software maintenance details

6.5 Maintainability use cases

The maintainability use cases provide an indication of the data required to determine achieved maintainability. It is possible that the data obtained needs to be compared against the design or performance specifications, technical instructions and the operational requirements.

For a detailed definition of the data to be used for each of these use cases, refer to Chap 20.

6.5.1 Use case UC50306: Maintenance activities, effectiveness of repairs, specified maintenance, predict maintenance periods, product status

This use case covers the exchange of data between those with an interest in monitoring maintenance and repairs. The information required for this use case includes:

- Maintenance instructions
- Spares availability
- Appropriate equipment and facilities
- Configuration (role, as maintained, operational and current design standard)
- Competent and capable staff
- Maintenance schedule
- Product status (suitable for operation or not)
- Warranty
- Environment
- Usage Information
- Product operational issues
- Maintenance costs (time, spares, staff, etc)

6.5.2 Use case UC50307: Retaining performance, support manuals and support infrastructure

This use case covers the exchange of data between those with an interest in the supporting infrastructure and on-going performance. The information required for this use case includes:

- Product performance
- Maintenance instructions (technical documentation)
- Spares availability
- Product issues
- Maintenance environment
- Time to undertake maintenance (obtaining spares, suitable staff and equipment)

7 Capability

A Product's capability is defined as its ability to perform a specified task in a given environmental or operational context. Associated terms include:

- Combat capability
- Operational readiness
- System effectiveness
- Durability
- Supportability

Capability can be measured by the time that a Product is fully capable or partly mission capable and can perform all its tasks without endangering the lives of crew or operators. It is difficult to measure as the Product's performance must be clearly identified in circumstances that can frequently change. It should not be confused with the term mission success.

7.1 Capability objectives

7.1.1 Capability monitoring

The objectives of capability monitoring must first be determined and from these objectives the necessary activities are derived. The definition of the activities to be performed enables the identification of the required fundamental data classes and related data elements.

7.1.2 Capability data gathering

The objectives of capability data gathering include but are not limited to:

- To monitor the performance of a product against its specification
- To identify capability shortfalls
- To improve the time a product is mission capable

– To improve cost efficiency

7.2 Capability activities

The principal activities associated with capability monitoring include but are not limited to:

– Validating the specified capability
– Monitoring products performance against specification
– Feedback of performance into engineering design
– Predicting the performance possible
– Reporting Life Cycle Costs (LCC)
– Predicting the LCC to sustain that capability

7.3 Capability metrics

A summary of the capability metrics that can be derived from obtaining relevant capability data fields is:

– Percentage of performance specification met

Special techniques often used to make the output clear include maturity models, go/no go indicators, traffic light systems etc.

7.4 Capability data classes and elements

There are data classes and elements for maintainability that are derived from the required objectives, activities and metrics. Refer to Chap 20.

Note

Other data elements could be required depending on the system or domain (Land, Sea, Air and Space) specific operating requirements.

The data classes and elements should cover:

– Detailed description of the capability required (performance specification) and the mission to be performed including the expected environment
– The performance achieved
– The environment experienced
– A definition of a capability (performance) loss
– The expected response when capability is lost and how the performance can be restored
– Mission to be performed and details of any unusual events

7.5 Capability use cases

The capability use cases provide an indication of the data required to determine capability. The data obtained might need to be U comparison ompared against the design or performance specifications, technical instructions and the operational requirements.

For a detailed definition of the data to be used for each of these use cases, refer to Chap 20.

7.5.1 Use case UC50308: Mission capable, capability shortfalls

This use case covers the exchange of data between those with an interest in determining product capability. The information required for this use case includes the following:

– Maintenance infrastructure (facilities, staff, equipment, documentation)
– Operational role
– Operational status
– Mission issues
– Achieved performance
– Error detection
– Support cost (logistics, staff, parts, infrastructure)

- Environmental conditions
- Maintenance support required (time, staff, parts)
- Configuration operational
- Staff (quantity, ability)
- Usage (issues, experienced)

7.5.2 Use case UC50309: Efficiency, performance against specification

This use case covers the exchange of data between those with an interest in knowing the effectiveness of the product. The information required for this use case includes the following:

- Activity - assessed
- Operation - achieved
- Maintenance - achieved
- Reliability - achieved
- Error reports
- Costs
- Support documentation
- Fault detection and isolation
- Product ID (unit to be tested, product)
- Usage - operations undertaken, failed and not started
- Repairs undertaken

8 Testability

Testability is the capability of an equipment or system to be tested under stated conditions. It is most frequently used in a context of Built in Test (BIT) but can also be used with test and evaluation, prognostics, etc.

8.1 Testability objectives

8.1.1 Testability monitoring

The objectives of testability monitoring must first be determined and from these objectives the necessary activities are derived. The definition of the activities to be performed enables the identification of the required fundamental data classes and related data elements.

8.1.2 Testability data gathering

The objectives of testability data gathering include but are not limited to:

- Provide reports and information that confirm how best to test a product
- Confirm the test equipment requirements, the level and cost effectiveness of testing
- Confirm confidence in the test results
- Determine whether automatic test equipment can be utilized
- Determine if faults are being diagnosed correctly
- Determine if faults are identified in a reasonable period

8.2 Testability activities

The principal activities associated with testability include but are not limited to:

- Identifying that product functions can be tested
- Gather information on items that are difficult to test
- Test recording and reporting
- Validating the testability specified

8.3 Testability Metrics

The ability to test a product can change as technology develops or as access becomes limited.

A summary of the testability metrics that can be derived from obtaining relevant testability data fields is:

- Time to undertake test
- Ease of access
- Ability to locate fault
- Ease of understanding test results

8.4 Testability data classes and elements

There is no precise minimum data class for testability other than product state, as the proposed testing process should be evaluated, and a judgment based on risk before starting to determine what product criteria to test.

There is no precise minimum data class for testability. It is important, therefore, that any proposed testing process be assessed, based on risk, before determining the criteria under which a Product will be tested.

The testing process selection will be affected by:

- The dominant failure modes and the resulting severity if they are not tested
- The environment
- The time taken and the ease of testing

A selection of data classes and elements is shown at Chap 20.

8.5 Testability use cases

The testability use cases provide an indication of the data required to determine testability. It is possible that the data obtained needs to be compared against the design or performance specifications, technical instructions and the operational requirements.

For a detailed definition of the data to be used for each of these use cases, refer to Chap 20.

8.5.1 Use case UC50310: Can product be tested

This use case covers the exchange of data between those with an interest in how easy it is to gain access and test the product. The information required for this use case includes:

- Environment for conducting test
- Error reports
- Availability (suitable staff, test equipment, support equipment)
- Location of product and device to be tested
- Period for undertaking test - achieved
- Test equipment - operational issues
- Product ID (unit to be tested, product)
- Configuration (test equipment, device to be tested, product)
- Safety issues (access, working conditions)

8.5.2 Use case UC50311: Fault diagnosis, fault identification

This use case covers the exchange of data between those with an interest in ease of functionally testing the product. The information required for this use case includes:

- Issues (time to find, issue, relevance, cause)
- Time (duration of test)
- Configuration (test equipment, device to be tested, product)
- Achieved performance (time to find a fault)

Chapter 4

Feedback of data for maintenance analysis

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List of tables

References

Table 1 References

Chap No./Document No.	Title
Chap 18	Data element list
Chap 20	Data required for the different use cases
S3000L	International procedure specification for Logistics Support Analysis (LSA)
S4000P	International specification for developing and continuously improving preventive maintenance

1 Introduction

Regular maintenance is critical to ensure the safety, reliability, comfort and longevity of a Product and includes all actions which have the objective of retaining or restoring an item in or to a state in which it can perform its required function. There are two types of maintenance in use:

- Scheduled and preventive maintenance
- Corrective maintenance

Maintenance data is the basic information necessary to analyze and maintain Product performance during its life cycle. Through this information, affected organizations will improve safety, reliability, availability of the Product and maintenance practices carried out on it. Maintenance data will be collected, analyzed and resulting conclusions can be embodied optimizing the maintenance applied to each specific product.

2 Scope

This chapter defines the maintenance data feedback process. This chapter provides a guideline on the process and the information to be exchanged in order to provide appropriate data for maintenance analysis or maintenance control of the affected product.

The aim of this chapter is not to provide analysis of collected data, it is to provide reference of information to be exchanged to improve Product maintenance.

3 Use cases

Table 2 provides the relationship between the use cases developed under this chapter and who will provide the data to whom (industry to Product user, Product user to industry, maintenance organization to Product user).

Table 2 Use cases

Use case	Definition	Industry to product user	Product user to industry	Maintenance organization to product user
UC50401	Manufacturer maintenance schedule	X		
UC50402	Product user maintenance program		X	
UC50403	Maintenance performed		X	X
UC50404	Product performance		X	
UC50405	New modifications for product	X		
UC50406	Technical queries (questions and answers)	X	X	X
UC50407	Component shop findings	X	X	X
UC50408	Structural damages		X	X

3.1 Manufacturer scheduled maintenance

It is the manufacturer's responsibility to identify the minimum scheduled maintenance tasks that form part of the initial instructions recommended to maintain the Product to a required level of safety and availability. Maintenance schedule development is based on design requirements, maintainability analysis and experience during the in-service phase of the product. Refer to S4000P.

Each affected organization must establish and maintain a system for monitoring the effectiveness of their recommended maintenance schedules.

Affected organizations will analyze in-service information provided by the Product user and will amend the maintenance schedule if necessary. This is feedback data from the manufacturer to the Product user.

In service information related to scheduled maintenance is recorded by Product users and must be provided to the affected organization in order to optimize the scheduled maintenance document. This is feedback data from the Product user to the manufacturer.

Revisions to the scheduled maintenance must be periodically raised by the manufacturer. Revisions will come from in service experience data provided by Product users, and/or maintenance organizations.

The scheduled maintenance must align with applicable regulatory requirements.

For more information related to manufacturer scheduled maintenance developing, refer to S3000L and S4000P .

This use case identifies the useful information to assure all schedule maintenance requirements defined by the industry are performed in accordance with the correct procedures and when required. Additionally, the use case identifies the information that should be provided to improve and help the Product user to plan and perform those maintenance activities.

3.2 Product user maintenance program

The manufacturer scheduled maintenance is developed to be applied to a Product family in different environments or usage profiles. If a Product is going to be used outside of the manufacturers' identified usage profiles, adjustment to the scheduled maintenance can be required.

The Product user maintenance program must include the requirements applicable to their specific Product, considering each specific configuration of each Product. It must also contain the information from the different sources issued by Product manufacturer, the authorities and the in-service experience the Product user has collected.

Additionally, the schedule maintenance program of each Product user can be adapted considering the specific operation of the product, environment, and maintenance capability.

The Product user maintenance program is a living document. From the first day of working in-service, the Product user maintenance program must be reviewed and amended with in-service experience inputs from Product usage.

The Product user maintenance program must provide information to S3000L and S4000P among any other analysis performed by S5000F users.

The purpose of this use case is to exchange information about schedule maintenance requirements performed by the Product user that differ from those initially recommended by the manufacturer, considering the specific conditions of Product use and the in-service experience of the user.

3.3 Maintenance performed

A Product user, or a contracted maintenance organization, performs maintenance on request due to Product failure (corrective maintenance) or carries out preventive maintenance. This use case establishes the feedback data for any scheduled or unscheduled maintenance event performed on the Product. This information must be used to analyze the effectiveness of the maintenance program, using a reliability program and an in-service maintenance optimization process. Refer to S3000L and S4000P.

3.4 Product performance

In order to follow Product evolution and performance, this use case will provide information about Product performance (time consumption, Product availability).

This use case covers information about Product performance, operational environment and profile data that can impact in Product performance and maintenance and systems degradations.

3.5 New modifications for in-service products

In order to perform new modifications on the Product, industry will provide the Product user with instructions on how to evaluate and perform modifications on the Product. For maintenance purposes, such information will provide enough data to implement it in the product. For more information related to in service changes. Refer to S3000L.

3.6 Technical queries

In some cases, a Product user will have technical queries for industry to help solve maintenance related questions. Industry will answer related questions.

3.7 Component shop findings

This use case can be considered a subtype of the maintenance performed use case.

The Product user, or the contracted maintenance organization, removes component installed on a Product and sends it to the manufacturer or an authorized maintenance repair shop because a scheduled preventive maintenance action is requested or because of a problem with the Product after troubleshooting or after an inspection has been performed.

This use case covers the information about component status exchanged when the Product is received in the shop for the work performed on it.

3.8 Structural damages

The Product user must control any structural damage that the Product can suffer during its life. Those damages can be within limits defined by the manufacturer that do not require any actions, can request corrective actions in accordance with standard repair instructions in the technical manuals issued by the manufacturer, or can be out of the scope of those standards, causing the need for a request for a specific analysis and repair instructions to be carried out and raised by an approved design organization.

In this case, the Product user must have identified the type, extent and location of the damage in order to preserve configuration control and any change in the design and the maintenance requirements that can be impacted by that damage.

The maintenance organization must provide the information to the Product user in the same manner as any other finding reported as part of the maintenance performed. The same applies from the Product user to the manufacturer. All necessary information must be provided to correctly identify the damage and, in case specific repairs instructions must be defined, to ensure that the correct instructions are provided.

4 Data required for use cases

Specific data is required for each use case.

Data elements list. Refer to Chap 18.

Data required for the different use cases. Refer to Chap 20.

4.1 Manufacturer scheduled maintenance

Product manufacturer must provide the necessary information to maintain the product. It is responsible to provide the preventive and scheduled maintenance recommendation to be performed on the Product. Refer to Para 5.1.

4.2 Product user maintenance program

Data that must be provided is the difference between the schedule maintenance program defined by the manufacturer and that defined in Para 5.1.

4.3 Maintenance performed

Product user maintenance reports (eg, operator reports) are all maintenance reports recorded by the Product user into a Product logbook, either in electronic or paper format. These reports are not restricted to Product failures but can also include information for maintenance, about system status or in usage Product data (eg, engine monitoring, damage assessment. etc).

One of the potential results of this data will be the reported defect number and type per operating time (eg, engine cycles).

Analysis of data feedback will allow the defect rate per usage rate and variations in performance compared to Product from the same family to be established. There are many types of

scheduled and unscheduled maintenance data that could be fed back, including but not limited to:

- Work order/package data. Refer to Para 4.4.
- Product performance. Refer to Para 4.5.1.
- Operational profile data. Refer to Para 4.5.2.
- New modifications for in-service products. Refer to Para 4.5.3.
- Technical queries. Refer to Para 4.6.
- Component shop findings. Refer to Para 4.7.
- Structural damages. Refer to Para 4.8.

The manufacturer can analyze this data and determine whether maintenance schedule assumptions are as established (eg, maintenance programs, intervals for scheduled maintenance, thresholds could be checked through removals and installations reports, unscheduled findings and/or scheduled task findings).

4.4 Work order/package data

Work requested to a maintenance organization to perform preventive or corrective maintenance on a Product (for maintenance both on and off the Product) will be performed under work order/package instruction. The Product user must release a work order/package in order to inform the maintenance organization about the maintenance tasks that must be performed on the Product at an identified time and Product maintenance manual revision to be used. Once maintenance tasks have been carried out, they should be registered in the Product logbook. All discrepancies or defects must be recorded in the work order/package report (sometimes also in Product maintenance logbook), including all information necessary to identify which maintenance tasks detected such discrepancy, components changes, and reference to the instruction used. It is assumed that the Product user will perform (or subcontract) Product maintenance activities. The Product user will be able to collect all information from Product maintenance activities.

Details of data that the Product user should interchange with industry is described at Para 5.3 and Para 5.3.5. For component off Product maintenance, repair and overhaul activities refer to Para 5.4.2.

4.5 Product performance

4.5.1 Product operational environment data

Product operational environment data will include the time in which the Product has been working in a specific environment (eg, desert, saline, continental, ice, etc)

Product actual and past environment usage will help the manufacturer to understand specific degradations in systems and components due to operation in such environments. Also, defects reported due to Product operation environment when a maintenance task is carried out.

Analysis for different environments will improve the maintenance program and it will allow the customization of the maintenance program for each Product user intending to operate in these specific environments.

4.5.2 Operational profile data

Usage profile data will include each different profile used by an operator (military missions' profile, civil profile, training profile)

Product actual and past usage profile will help the manufacturer to understand specific degradations on systems and components. Also, inputs from maintenance task discrepancies, (eg, finding of a defect), will appear due to Product specific usage.

Analysis for different usage profiles will improve the maintenance program and it will allow customization of the maintenance program for each Product user, intending to use a specific usage profile.

Additional details of data that should be interchanged with the industry by the Product user are included in Para 5.3 of this chapter.

4.5.3 New modifications for in-service products

Data required to perform a modification in a Product that is in-service is described at Para 5.1.

4.6 Technical queries

Technical queries are questions raised during in service support phase from the Product user and/or any maintenance organization supporting the Product to the manufacturer or operator. The scope of these queries will depend of each situation and includes but is not limited to:

- Queries for issues not included in the manufacturer's manual. For example, repairs not included in the structural manual, figures not included in manuals, procedures not included in manuals
- Queries for issues included in manufacturer's manuals but not clear to the Product user
- Queries for issues included in manufacturer's manuals, clear but not fully understood by Product user
- Queries for issues related to reliability analysis (eg, mismatch between manufacturer reliability and Product user reliability)
- Queries for issues related to additional modifications issued by manufacturer or for issues related to additional modifications requested by Product user

It is essential that good communications between the Product user and the manufacturer and the maintenance organizations and the manufacturer are established in order to understand each query. If not, misunderstanding will affect the quick solution of each problem and hence Product availability. Through a deep analysis of each query and/or group of queries for the same issue, the manufacturer manuals and processes will be amended and improved.

It is also important that the Product user archives the queries and the Product manufacturer archives the answers in a database, allowing to quickly find similar or related queries from the same of different Product user(s) or maintenance organization(s) and the answers. A similar case is that of all Product user(s) who collect and manage the information of technical queries raised by them. This will impact in the time required to solve a query.

4.7 Component shop findings

The component manufacturer or the repair shop must generate a report of the job performed, including information of tasks performed, component changes, and, if any finding is detected, the information of the root cause, how it failed and corrective action performed.

In some cases, after a check of the functionality of the component, no defects are found, although initially that component was removed considering it was the root cause of the problem in the product. In those case, it is necessary that the repair organization provides the feedback that no fault has been detected (No Fault Found (NFF) report), including information about the inspection and test performed to report that NFF.

Detailed information of data that should be interchanged with the industry by the Product user and by the maintenance organization are included in Para 5.4.2 of this chapter.

4.8 Structural damages

The Product user must have identified the type, dimensions and location of the damage in order to assure the control of the configuration and any change in the design and the maintenance requirements that can be impacted by that damage.

The maintenance organization must provide the information to the Product user as any other finding reported as part of the maintenance performed and the same from the Product user to industry. All the necessary information must be provided to correctly identify the damage and, in case specific repairs instructions are needed, to assure the correct instructions are provided. Refer to Para 5.3.

5 Inputs and outputs of data for use cases

Main owners and users of maintenance data will be located within the following groups:

- Manufacturers (Systems as product, subsystems as engines and lower levels as LRUs)
- Product users
- Maintenance organizations (either full Product and/or lower level maintenance repair shops)
- Regulatory authorities (eg, North Atlantic Treaty Organization (NATO), Federal Aviation Authority (FAA), European Aviation Safety Agency (EASA),UK Civil Aviation Authority (UKCAA), French Direction générale de l'aviation civile (DGAC), etc)

Inputs and outputs from these groups will be mainly directed to:

- Manufacturer scheduled maintenance
- Product user maintenance programs
- Authorities special requirements
- Maintenance performed
- Component shop findings
- Structural damage

Table 3 Owner/provider information shows who the owner of the information is and who the user of such information is. As described in Para 5, there are document owners and document users. For example, a manufacturer is the owner of the manufacturer scheduled maintenance. A Product user will have inputs from manufacturer scheduled maintenance to perform the Product user maintenance program. Also, the maintenance organization will have inputs from manufacturer scheduled maintenance to perform his maintenance. Finally, Authority will receive inputs from manufacturer scheduled maintenance to approve its Product maintenance program. Additionally, non-scheduled maintenance actions can be required to repair or correct any malfunction. Interaction between the manufacturer, whose provide instructions to and received feedback from the Product user and or maintenance organization, the Product user that requested the activity to be done to the maintenance organization and provide information to the manufacturer and the maintenance organization.

Table 3 Owner/provider information

Owner deliverable	Manufacturer	Product user	Maintenance organization	Authority
Manufacturer scheduled maintenance	Owner	Inputs<-> Outputs (findings)	Outputs (findings)	Inputs<-> Outputs (approval)
Product user maintenance program	Inputs	Owner	Inputs<-> Outputs (findings)	Inputs<-> Outputs (approval)
Authorities special requirements	Input <-> Output	Input <-> Output	Input <-> Output	Owner
Maintenance performed	Inputs	Inputs<-> Outputs (findings)	Outputs (findings)	Inputs
Component shop findings	Input <-> Output	Input <-> Output	Input <-> Output	Inputs
Structural damage	Input <-> Output	Input <-> Output	Input <-> Output	Inputs

Any maintenance analysis can be done in various ways depending on the Product user and manufacturer requirements and depending on collected data available. The following Paras provide examples of data that can be provided by the affected organizations.

5.1 Data required from the manufacturer

5.1.1 Related to use case UC050401 - Manufacturer schedule maintenance

The Product manufacturer must provide the necessary information to maintain the product. The manufacturer is responsible for providing the preventive and scheduled maintenance recommendation to be performed on the Product. This information must include, at least:

- The maintenance program to be performed with:
  - Tasks number reference
  - Task description
  - Task due interval counter metrics (time, Product usage)
  - Reference to the detailed instructions to perform the task
- Maintenance policies for specific products (eg, overhaul, life limits, etc)

In addition, other information should be provided to cover:

- Expected task duration (Mean Elapsed Time (MET))
- Expected working time of the personnel (Mean Man Hours (MMH))
- Expected number of technicians
- Skills required to perform the tasks in order to facilitate planning of the activities

If this information is not provided as part of the maintenance program, it at least must be included in the maintenance instructions the material (components, consumable, expendable, special tools, etc) required and identification of any specific skill.

The manufacturer must provide Product manuals with the instructions to perform the maintenance activities, troubleshooting, diagnostic information (call outs/codes), including:

- Amendment to maintenance programs
- Specific instructions
- Technical information with impact on maintenance
- Product Mean Time Between Unscheduled Removal (MTBUR) and Mean Time Between Failure (MTBF)

Product user/maintainer must be able to follow the maintenance planning with this information.

5.1.2 Related to use case UC050405 - New modifications for in-service products

Identification of the Products' the new modification is applicable to:

- Identifying the impact in configuration data
- Providing instructions to perform the modification
- Identifying the impact in interchangeability or mixability of components
- Providing information of material and tools required to perform the work
- Providing information about expected task duration and skills required

5.1.3 Related to use case UC050406 - Technical queries

Answers to Technical queries from customer.

5.1.4 Related to use case UC050408 - Structural damage

In addition to the information included in this point related to use case 5, a structural repair can be considered a type of modification, it should be provided by the impact this damage can have in the use case 1 - Manufacturer schedule maintenance. A structural damage can require modifications in current maintenance requirements, introduction of new inspections and it should be provided to the Product user

5.2 Data required from the authorities

Regulations and specific instructions (eg, national specific requirements)

5.3 Data required from Product user

5.3.1 Related to use case UC050402 - Product user maintenance program

Related to the information identified in Para 5.1, the Product user can provide to the industry the differences it has had to introduce in the maintenance program for the Product compared with the one proposed by the manufacturer.

5.3.2 Related to use case UC050403 - Maintenance performed

The Product user can collect data related to the operation and maintenance performed on the Product. Improvement in the Product use and maintenance practices will depend on the collected data.

Data provided by the Product user to the manufacturer should be filtered to avoid sharing the wrong data with industry. Pre-analysis of draft data by the Product user would avoid misunderstanding and assure highest level of effectivity in the analysis performed by the manufacturer.

Reports provided by the users should include the information related to:

- Unscheduled maintenance
- Scheduled maintenance
- Operation data reports

Unscheduled maintenance reports should include:

- Source of failure (eg, pilot report, maintenance report)
- Failure description
- Date of failure, actual Product and/or component usage when failure occurred (working time, and Product usage time)
- Product family and Product registration
- Reference of maintenance task used to solve the failure, if applicable identification of troubleshooting performed
- Component removed and installed with reference to manufacturer and P/N and, if applicable, S/N, component life (if applicable)
- Measured task duration and measured working time of the personal used to solve the failure
- If possible, information of diagnostics callouts performed
- Information about component repairs:
  - Cause of failure
  - Parts impacted by the repair
  - Cost of repair if possible
- Working time
- Working cycles
- Working age (time)

Scheduled maintenance reports should include work orders/work package findings/data that is not included in unscheduled maintenance reports

- Task data (reference, description)
- MET and MMH required to perform the task (if possible)
- Product metrics and date when task has been performed, task date when it was due and Product metrics when task due
- Associated discrepancies when task has been performed (open action, close action and/or deferred action, troubleshooting and diagnostic call outs performed)

- Associated information of component being changed as part of maintenance actions (P/N and S/N if applicable), material requirements (if applicable), material consumption (as forecast for each work package)

Information regarding when a task is performed if a finding is detected or not must always be notified by the Product user, including:

- Specific data (eg, oil consumption, hydraulic consumption, fuel consumption)
- Feedback on trouble-soothing, procedures and technical manuals
- Also, modifications must be included in this information (eg, Service Bulletin embodiment, Modification embodiment, etc), in order to give the manufacturer information about the Product configuration)

5.3.3 Related to use case UC050404 - Product performance

Product performance feedback must include:

- Product working environmental conditions.
- Product working profiles.
- Product dispatch availability when a failure appears. Such as:
  - No impact in Product usage
  - Some impact in Product usage but still Product can perform its planned work
  - Product cannot perform its planned work because of the failure
  - Product planned usage is delayed because of the failure
  - Product cannot be used for planned work because of the failure

5.3.4 Related to use case UC050406 - Technical queries

Technical queries to manufacturer.

5.3.5 Related to use case UC050408 - Structural damage:

If a structural damage is detected, in addition to the information related to use case 3 - Maintenance performed, information should be provided to the Manufacturer by the Product user to include:

- Method of inspection used (eg, visual Inspection, eddy current check, etc)
- Type of damage (eg, corrosion, cracks, dents, etc)
- Extent of Damage (ie, length, width, depth)
- Location of the damage:
  - Zone
  - Between stringer X and stringer Y
  - Between rib X and rib Y
  - Between frame X and frame Y
  - Spare
  - Whether the damage is external, internal or both
  - Station
- Material type

In case of corrosion, it is useful to provide:

- Corrosion level
- Corrosion type
- Temporary protection system applied (ie, if applied or not, whether it is visible, current and previous type)

Provide the reference of the repair instruction used. This instruction can be a standard included in the manuals or a specific one issued by an approved organization to correct a specific defect.

If the defect cannot be corrected using a standard practice of an instruction included in the manufacturer manual, the information included above must be provided to the manufacturer or to the approved organization to generate the corrective instructions. Supporting information, such as photos, will help to identify the correct action and instructions to be done.

5.4 Data required from maintenance organizations

5.4.1 Related to use case UC050403 - Maintenance performed

Maintenance reports should be recorded by maintenance personnel into Product maintenance logbook, either in electronic or paper format.

Maintenance reports will be used to identify actions to solve Product user reports, all deferred defects, scheduled and unscheduled maintenance performed for maintenance level on product, component removal and installation (and reason) with P/N and S/N in and out if applicable.

The Product user will update Product configuration with this information, with configuration status and modification status information and analyses of the effectivity of the maintenance program.

Maintenance reports that inform of any issue related to maintenance instructions must be provided to the Product user and Product manufacturer. This includes technical queries.

Maintenance organizations, when different to the Product user, must provide maintenance reports to the Product user with the information described at Para 5.3 related in unscheduled maintenance reports and scheduled Maintenance Reports,

5.4.2 Related to Use case UC050408 - Structural damages

Maintenance organization should provide to the Product user and manufacturer the information included in Para 5.3 related to this use case.

5.5 Data required from repair shop

5.5.1 Related to use case UC050407 - Maintenance performed

In off Product maintenance, repair and overhaul activities, repair shops must issue reports per each component, which has been maintained, repaired and/or overhauled at its facilities. All activities performed by repair shop on the product, including the information that identify the Product (part number, serial number or batch number, as applicable) must be recorded in this report.

Either findings or NFF reports from repair shops will help the Product user and manufacturer to understand failure patterns in components and/or wrong maintenance patterns for trouble shooting.

Requirement of improvements issued to component manufacturers will be speedy if component manufacturers have all fault information. Improvements in trouble shooting manuals will also be speedy if it is detected through NFF reports from manufacturers. Also, Product user wrong usage patterns could be detected and improved.

Shop reports must include information about work performed, defect or NFF information, parts used, elapsed time required for repair, workload, cost.

Maintenance information of parts used (life limit part installed with its consumed life or remaining potential or any other parameter required to track the maintenance requirements of that part or subpart installed).

Information on the availability of the parts to perform the maintenance activity or repair and, if applicable, the time spent waiting for the parts to perform the repair is useful information to be included on the report to be used internally by the repair shop. That information will enable the improvement of their internal process of material management that will have an impact in the elapsed time required to perform the maintenance activity on the product.

5.6 Other required data not included in data set

From the manufacturer: Product manuals and other engineering documentation with the instructions to perform the maintenance activities will be required to be provided to the Product user or maintainer.

From Product/maintainers users: additional information not already described, such as photos of defects found during maintenance activities are value added information.

Chapter 5

Feedback of safety data

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Table 1 References

Chap No./Document No.	Title
None	

1 Introduction

Safety covers all activities aimed at prevention of accidents and incidents, trying to reduce risks in the operation of a Product and its environment, through the analysis of events occurred at any stage of its life (from conceptual design through its service life) or others deemed to constitute a potential hazard. Activities addressed to analyse, define, develop, review, produce and control modifications to overcome or mitigate the problems identified in the Product and its

systems that could cause or have caused incidents or accidents related to Safety constitute the concept of Product safety.

The use of a Product during its service life by the operators is a valuable source of information for capturing events affecting safety. S5000F as standard means to feed information back from the field about maintenance and operational aspects provides data about events potentially affecting the Product safety.

2 Scope

The events that may affect the Product safety may come from very different areas and activities as well as other external agents related to operations. These events can provide valuable information for the prevention of incidents or accidents and everyone should be reported. This chapter provides information about capture of events in in-service phase affecting the Product safety. On the other hand, the feedback from industry to the operators and/or maintenance organizations in order to inform about limitations due to safety issues and/or provide instructions to solve safety issues is also covered.

3 Purpose of safety data feedback

3.1 Objectives

Safety Data Feedback supports the Product safety process. The main objectives to be ensured can be summarized as:

- All events that may impact on the safety of a Product are captured and analysed, regardless of where and when they occurred
- All lessons learned from previous events are identified and taken into account for the Product in service, developing and future projects, ensuring the application of the continuous legal regulated principles and the review of legal regulations of design if required
- All significant improvements in the various processes involved in the Product life (from conceptual design to its service life), which contribute to the prevention of accidents are identified and valued
- All safety related issues are adequately addressed in a multidisciplinary way among all the basic functions of the organization, making decisions collectively through committees established for that purpose
- All decisions and actions taken are properly registered, providing the required traceability at any stage

In this context, tasks take part of safety data feedback process. These tasks include but are not limited to:

- Capture and identification of events
- Keep traceability between safety events and the corresponding decisions and actions taken
- Spread of safety-related data to the corresponding organizations in industry and customer sides
- Report about safety issues, operational limitations associated and/or instructions and procedures to address and solve safety problems

3.2 Activities to support objectives

3.2.1 Capture and identification of events

The objective of this stage is to ensure that the capture of all events (anomalies, occurrences, incidents and accidents) from which lessons can be learned that will result in Safety improvements.

The events that can affect the Product safety can come from very different areas and activities (design, engineering, manufacturing, operation, maintenance, training, etc) as well as other external agents related to operations.

Safety issues raised by operators need to be registered in order to be identified and analysed. S5000F has a data model where the operator feedback is downloaded, and this information can be exchanged with other business processes. This data model is the core that enables third parties to achieve the required traceability.

3.2.2 Traceability

Traceability is required for:

- Initial register and closure of events and improvements
- Actions register and management
- Support Product safety process at industry and/or customer sides

At data management level, traceability is required between:

- Product configuration data
- Maintenance events data
- Usage data

In order to support traceability, safety data feedback, safety events during in-service phase and integrating configuration, maintenance and usage data feedback are registered. In that sense, traceability between safety issues raised by operators, safety instructions to solve safety problems raised and operational limitations found, are possible between industry and customer.

3.2.3 Spread of safety-related data

Safety data feedback is required to communicate safety issues to the corresponding organizations in both industry and the customer. Safety issues from operations, safety warnings, operational limitations and solutions to issues previously raised, need to be exchanged.

A repository based on the S5000F data model and data exchange mechanism provides support for communicating safety related data. This communication ensures traceability, consistency and integrity of safety related data, between parties involved.

3.2.4 Reporting

Reporting is a means of communication that covers:

- Instructions. A document describing and enabling an action affecting the systems or structure of a Product or affecting the Product operations.
- Information. A document helping customers to operate or maintain their Product more efficiently. Any recommendation leading to a change of Product configuration or maintenance task/interval should refer to the proper instruction document.

The purpose of reporting is:

- For transmitting general information
- For transmitting maintenance information, maintenance instructions or for an urgent transmission of information or instructions dealing with a legal regulation related in-service issue
- For an urgent action to be performed on a Product by the operator, and with a potential impact on the legal regulations of the Product

4 Reporting of safety information

Safety related data can be exchanged between industry and customer in both directions:

- Reporting about safety warnings and/or safety limitations being sent to the operators of the affected Product.
- Safety events raised in operation being communicated to industry

Safety related reported data consists of:

- Reporting type. The report category, such as:
  - General communication
  - Advice
  - Operational recommendation
  - Legal regulations
- Organization data. Data related to reporter and distribution list for the report including information such as:
  - Organization
  - Department
  - Telephone
  - Fax
  - Addresses
  - Dates
- Operational environment and location data. Where the event took place and information about environmental conditions under which the Product were operated. Place, incident/event location and operational phase are examples of this kind of data.
- Operating conditions data. Data such as weight, number of equipment installed, etc
- Maintenance data. Data related with the transmission of maintenance information or maintenance instructions that are part of recommendations or technical answers to an operator or a Product Maintainer Organization (PMO) request. In many cases a technical document such as a service bulletin is attached in order to enable operators or PMA to perform modifications, substitution of parts, special inspections/checks, reduction of existing life limits, etc.
- Product data. Data such as affected Product type, applicability, manufacturer serial number, etc.
- Configuration data. Data related with parts affected by the safety event such as part-name, part-number, serial-number, etc.
- Event data. Data related with a safety event such as:
  - Event description
  - Event type
  - Event severity
  - Event frequency
  - Event condition of detection.
  - Narrative for event causes
  - Determining and contributing event factors

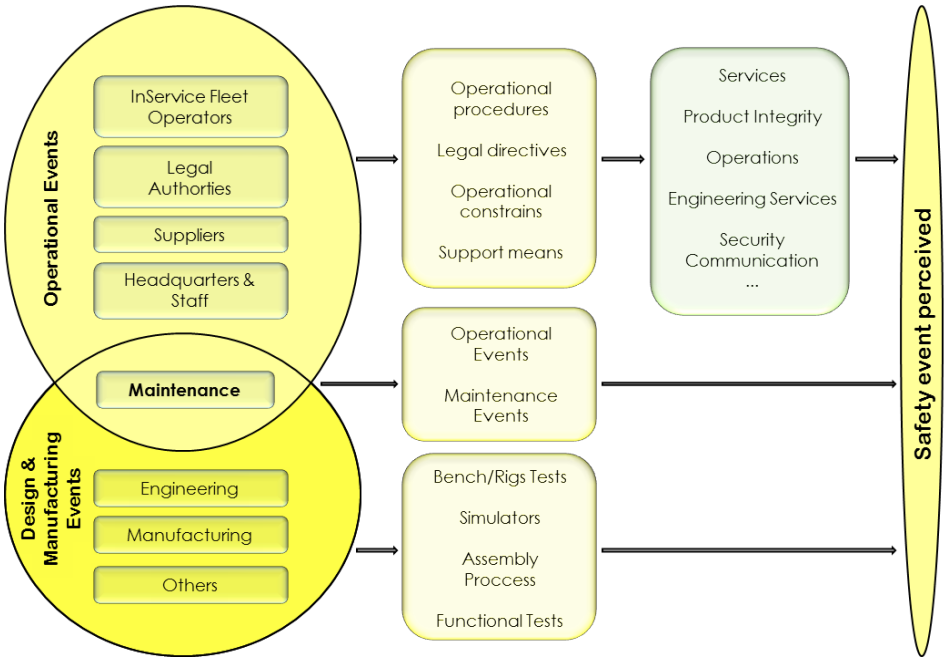

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Fig 1 Major organizations and sources reporting safety events

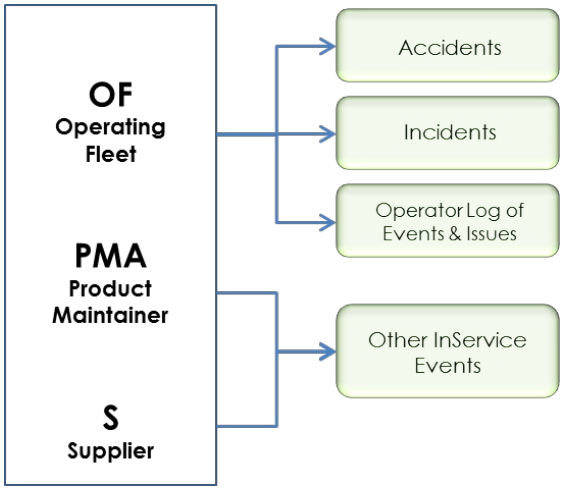

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Fig 2 Main actors of in-service safety data process

5 Use cases

Three use cases have been defined for the exchange of safety data. The first one consists of a feedback from operations to industry; the last two show feedback from industry to operations.

The data and documentation reported in these use cases correspond with the safety data categories listed above.

5.1 Use case UC050501: Report safety issue

The objective of this use case is to compile information regarding any incidence affecting safety from operations. It provides a rapid means of transmitting details of occurrences among operators and between operators and industry. Operators can include PMA organizations.

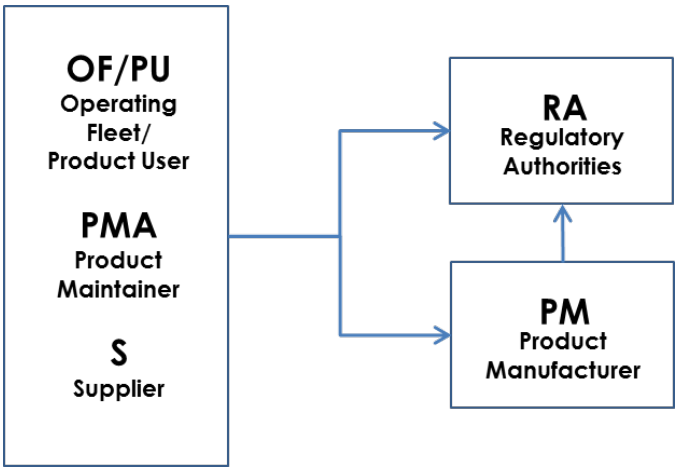

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Fig 3 Report safety issue interfaces

5.2 Use case UC050502: Report safety warning with recommendations

The objective of this use case is to inform operators about operational limitations due to safety issues that must be put in place until a solution for those issues is found. Warnings are to advise others of deficiencies that seriously threaten safety and require immediate attention. To assist other operators, a technical warning report must detail any action considered necessary to reduce the risk. Refer to figure Fig 4.

5.3 Use case UC050503: Provide special safety instructions

The objective of this use case is to provide special safety instructions that must be carried out by the operator in order to address and resolve a safety issue. Special instructions must advise of potential safety failures, which require a change and must be dealt with as immediate demands. Refer to figure Fig 4.

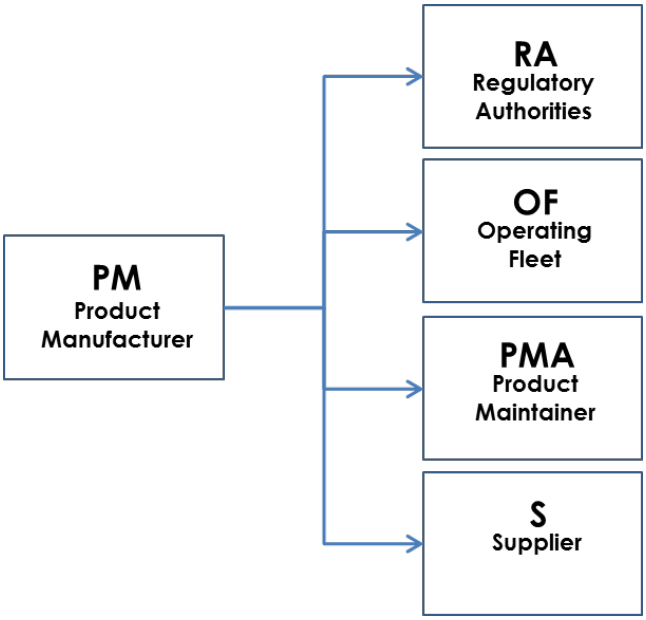

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Fig 4 Report safety warning with recommendations and provide safety special instructions interfaces

Chapter 6

Feedback of data for supply support

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References

Table 1 References

Chap No./Document No.	Title
S2000M	International specification for material management - Integrated data processing for military equipment

1 Introduction

The objective of supply support, as one of the IPS elements for Product support strategy, is to plan for the procurement of forecasted repair parts, spares, and all classes of supply to ensure the best equipment/capability is available to support the Product and the maintainer when it is needed while also minimizing the Total Ownership Cost (TOC) to sustain the Product over its life.

2 Objective

The objective of the supply support feedback is to ensure that all aspects of the supply support strategy is accounted for within the feedback loop to ensure that any changes made to the deployed assets, initial forecast for consumption of spares/consumables, supply chain and inventory management, remain optimized for maximum asset availability while minimizing the cost to sustain the same assets.

3 Scope

The scope is to include all activities except those that overlap with S2000M and aspects covered elsewhere herein.

4 Supply support description

Supply support consists of the management actions, procedures and techniques necessary to acquire, catalogue, receive, store, transfer, issue and dispose of, spares, repair parts, and supplies. Supply support includes initial provisioning, acquiring, distributing, and replenishing inventories, as reflected in the supply chain management strategy. Supply support management results in having all the right spares, repair parts, and all classes of supplies available, in the right quantities, at the right place, at the right time and at the right price.

Key activities of supply support include but are not limited to:

- Global spares pool visibility and management
- Routine replenishment management, including buffer and safety stock management
- Logistics response time
- Demand forecasting and Readiness Based Sparing (RBS)
- Bills of Material (BOM) management and maintenance
- Cataloging (Source, Maintenance and Recovery (SM&R) codes, NATO/National Stock Numbers (NSN))
- Transportation, receiving and storage
- Repair management
- Shelf life management
- Warranty management
- Supply chain assurance
- Supply Chain Management (SCM)
- Plan for transport

5 Use cases

Table 2 summarizes the relevant use cases and their reference to other specifications and those that are addressed elsewhere herein.

Table 2 Use case summary

Activity	Reference
Spares ordering	S2000M
Invoicing	S2000M
Cataloging	S2000M
Obsolescence	Chap 10
Warranty	Chap 8 & S2000M
Inventory management	Use case UC50601 (Ref Para 5.1)
Shelf Life management	Use case UC50602 (Ref. Para 5.2)
Spares & Support Equipment (SE) pool management	Use case UC50603 (Ref. Para 5.3)
Logistics response time	Use case UC50604 (Ref. Para 5.4)

Facilities management & maintenance	Use case UC50605 (Ref. Para 5.5)
Transport	Use case UC50606 (Ref. Para 5.6)

5.1 Use case UC50601: Inventory management

One of the key objectives of the OEM developed maintenance program is to successfully maintain an optimal stockage of spares and consumables.

Note

Ordering and invoicing of spare parts are in accordance with S2000M.

This use case models the continuous optimization needed from the initial provisioning effort. The entities required for this use case are:

- Fleet Data
  - Number of Products
  - Usage data
  - Configuration
  - Number of locations
  - Availability
- Part Usage
  - Part number
  - Manufacturer ID
  - Serial number
  - Consumption over time
  - Mean Time Between Unscheduled Removals (MTBUR)
  - Failure locations
- Inventory
  - Part number
  - Manufacturer ID
  - Number of spares on hand
  - Price last purchased
  - Purchase lead time
  - Transfer data
  - Disposal information

5.2 Use case UC50602: Shelf life management

Shelf life is defined as part of initial provisioning. However, changes in environmental conditions, packaging, and material condition can alter the expected shelf life and impact the warranty. Therefore, information related to shelf life must be updated for continued procurement of same parts. This information is:

- Warehouse
  - Average part storage time
  - Average humidity
  - Average temperature
  - Air quality (if applicable)
- Parts in warehouse
  - Part number
  - Manufacturer ID

- Serial number
- Expiry date
- Shelf life
- Batch/Lot number

5.3 Use case UC50603: Spares and SE pool management

Products that have global customers and deployed locations can have a global spare and/or SE pool model where multiple countries/customers procure and manage the spares and SE but still allow the parts to be moved as demand fluctuates between customer nations. Continuously monitoring these parts movement and procurement can help reduce the overall sustainment cost of the Product. Data that can be tracked for this use case include but is not limited to:

- Number of countries in the global spare and SE pool
- Number of warehouses and operational bases in each country
- Part information and procurement data
- Number of times a part is moved within the spare and SE pool

5.4 Use case UC50604: Logistics response time

Information regarding total Logistics response time is a critical factor in ensuring that the Product availability targets are met. This time is defined as from when a failure is recorded till when it is fixed, and the Product is operational again. Feedback of this data can influence location of supply centers, purchase cycles and even the maintenance tasks/times recorded to perform the repair.

- Repaired parts data
  - Part numbers
  - Manufacturer IDs
  - Serial numbers (faulty, new and cannibalized parts)
  - Transportation time from supply center (warehouse or cannibalized part location)
  - Repair time
  - Purchase price

5.5 Use case UC50605: Facilities management and maintenance

The objective of this use case is to update and maintain the facility infrastructure details including environmental and security requirements, equipment condition, space usage, location effectiveness and feedback, to improve the tracked attributes. The data for this use case will use:

- Warehouse/Facility
  - Utility usage
  - Facility expenses over time
  - Security incidents
  - Storage utilization
  - Equipment usage
  - Equipment Maintenance costs
  - Environmental data

5.6 Use case UC50606: Plan for transport

The objective of this use case is to enable the assessment of the capabilities of existing assets to transport different sets of items.

Note

The planning does not include the transport itself.

The data that is required for this planning includes:

- Transporting assets (items that can transport things)
- Items to be transported

Chapter 7

Feedback for Life Cycle Cost analysis (LCC)

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References

Table 1 References

Chap No./Document No.	Title
Chap 14	Feedback of data to support the management of in-service contracts
S3000L	International procedure specification for Logistics Support Analysis LSA

1 Introduction

LCC is defined as the cumulative cost of a Product over its life cycle from concept to retirement as determined by a process of economic analysis that allows for the assessment of the total cost of acquisition, ownership and disposal of the Product. It consists of all direct costs plus indirect-variable costs associated with the procurement, Operation and Support (O&S) and disposal of the system.

The LCC estimation process consists of a set of activities aiming mainly at the estimation of the LCC for a Product. This process is influenced by the nature and complexity of the Product, the scope of the cost estimation, the availability of cost data and the phase of the life cycle. The life cycle of a Product is divided into five phases:

- Definition
- Preparation
- Development
- In-service
- Disposal

This chapter emphasizes the role of in-service feedback as related to the cost data elements that are captured during the O&S phase of the product that can then be used to refine the LCC of the product which was estimated at the design phase of the product.

The in- service LCC estimation process consists of a clear definition of aims and objectives for updating the LCC costing boundaries and methodology to be used to update the structure of the life cycle cost framework.

An update of LCC estimate during the in-service phase gives an insight into the major cost factors and it can also help to compare alternative solutions. It highlights the magnitude of the costs and identifies areas for potential cost savings as well as areas for technical and organizational improvements.

LCC is more precisely defined in each project by the list of all the cost elements to be considered in its calculation. This list is usually described by a Cost Breakdown Structure (CBS). The content of a CBS can often be different between organizations or sometimes even between programs in the same organization.

For more information about the five phases, refer to S3000L and Chap 14.

1.1 Scope

Life cycle costing should be considered as an on-going activity throughout the project life cycle.

The LCC estimation consists of the following major activities:

- Cost element definition. Refer to S3000L and Chap 14.
- Identification of cost elements for each life cycle phase of the Product

– Population of the identified cost elements within the CBS
– Calculation of LCC based on cost elements and CBS

The scope of this chapter is the identification and population of cost elements associated to the in-service phase and the disposal phases.

1.2 Objectives

A cost element is always associated to a resource used by an activity performed on a Product in a certain time located to a certain station. These characteristics can be considered five dimensions (refer to Fig 1). Each dimension can be broken down into different domains that can be specific for the single life cycle phase (eg, a design domain can be considered specific for the development phase) or common to different phases (eg, the training domain).

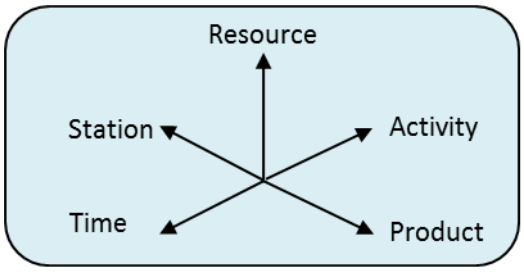

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Fig 1 The five dimensions of LCC for a cost element

The objectives of this chapter are to define all possible domains inside the five dimensions (ie, resources, activities, products, time and stations) during the in-service phase and the disposal phase aimed to the identification of cost elements.

The large variety of activities performed during the in-service phase represents an obstacle against rapid identification and population of cost elements. Consequently, the broad range of real activities will be replaced by a narrower range of generic activities which covers all real activities with the advantage of grouping based on similarity. In order to perform the generic activity, specific resources must be used as result of a specific Product.

2 Typical applications

In the in-service phase, the Product will operate at the intended in-service sites to deliver the required capability to fulfill the requirements of the customer. By continuously monitoring the Product and the in-service feedback of usage and support costs, the LCC can be optimized by analyzing and correcting the cost degraders.

Examples of this can be the need for a major modification or upgrade to the Product from a change in operating environment, a deficiency identified in the Product, a maintenance change recommendation from the operators leading to an opportunity to reduce costs. When modifications or changes for upgrade are identified as necessary, the Product can re-enter the definition phase or the development phase.

During the in-service phase the support concept should be refined and validated. A key role in this process is the optimization of costs.

2.1 Typical cost data usage

Examples of use cases that show when it could be useful to do life cycle cost analysis during the in-service phase include, but are not limited to:

- Estimating maintenance costs. To evaluate maintenance alternatives and support system redesign if replacing a unit or support equipment.
- Monitoring in-service requirements on a cost basis. Carried out to analyze how changes in requirements regarding in-service profiles or mission capability will affect LCC.
- Estimating cost and effect of modifications or upgrades. To analyze the effect that a suggested modification will have on the Product.
- Optimize costs for in-service support. Evaluation and comparison of different approaches for replacement, rehabilitation/life extension or disposal of Products.

3 Input

In order to pursue a cost-effective operation of the Product, input data is required.

This data can consist of information from the earlier phases, (eg, the development phase or a use study made earlier in the definition phase). Other information needed is:

- In-service requirements
- Information of how to support the Product
- Information related to costs for support personnel
- Training of the support personnel
- Infrastructure and facilities
- Spare and repair parts
- Documentation
- Test/ support equipment and tools
- Packaging, Handling, Storage and Transportation (PHST)
- Contract data
- Assumptions and data related to deployment

Finally, during the in-service phase, information from users, (eg, user satisfaction, operating and supporting experience and other in use feedback data) will be gathered.

4 Output

The main outputs of cost analyses from the in-service phase are the costs related to operation and support of the Product. The output will support decision makers to forecast future costs, manage existing budgets and undertake options analysis where necessary.

The forecasting of future expenditure requires a sound knowledge of the actual in-service profiles. Actual costs can also be compared with earlier estimates. By analysing the result of the analysis (ie, the output) together with the user, will form a base for a cost-effective operation of the Product.

5 Cost breakdown structure

A generic CBS is described in S3000L.

The role of the CBS in the LCC process is twofold:

- It must support the overall scope of the cost estimation process
- It must facilitate the calculation and estimation of the relevant costs

In addition, the CBS will also have a practical administrative function as a checklist of the costs that must be estimated. To be useful for these purposes, the LCC must be broken down in a structured way into individual cost elements.

The CBS includes all cost elements defined through the five dimensions (activity, resource, Product, time and station). Inside each dimension different domains related to different system phases can be defined.

In order to identify the cost elements specific to in-service phase and the disposal phase, the main domains inside the five dimensions for these phases are described in detail.

During the in-service phase it is possible to perform LCC analysis for any level within the breakdown of the Product.

5.1 Activity dimension in the in-service phase

Table 2 gives a list of the domains and associated data that can be considered as part of activity dimension during the in-service and retirement phases.

Table 2 Domains and data elements for dimension activity

Dimension	Domain	Associated data	Comments
Activity A1	Operation	– Annual operating rate (Differentiate rates for training, testing or operating) – Skill levels to operate the system	
Activity A2	Mission support	– Management and supervision (global and organizational leads) – Administration (administrative lead) – Control of operation (in-service lead) – Planning and scheduling of activities – Safety (In-service and out of service) – Quality control – Security and relative skill levels – Logistics – Energy (electricity, fuel, gas, etc) – Additional handling support (ammunitions for defense systems, radioactive substance for nuclear plants, any substance/subsystems required) – Simulator operations (training) – Communications (post, media, etc) – Personnel services (life support, leisure, medical care, etc) – Defense and economical intelligences	– Costs that are taken into account must fit to the system considered in the analysis
Activity A3	Maintenance	– Preventive maintenance of the primary system (all levels) – Corrective maintenance of the primary system (all levels) – Fault detection and relative equipment – Test and calibration of system and relative equipment – Functional and/or physical inspection – Trouble shooting – Prevention – Overhaul – Usage of the associated support equipment – Replacement of Spare Parts and/or components – Maintain the associated support equipment and relative training	– Maintenance levels include maintenance made (by end user, by specialist repair personnel, by a depot or agency and industry (interim or continuous))
Activity A4	Replenishment	– Re-provisioning to maintain an acceptable stock level – Provisioning new spares/components after introduction of a new equipment (initial provisioning) – Adaptation to new rules (new annual operating rate, new maintenance skills or change of maintenance levels, etc)	

Dimension	Domain	Associated data	Comments
Activity A5	Training	– Initial training for new users – In-service training – Maintenance training for maintainers – Training for trainers – Recurrent training – Continuous training	– This domain includes training of the trainers and other initial training courses through which personnel will learn to operate and maintain the system
Activity A6	PHST	– Packaging (type, volume, water resistance, shock resistance, wet resistance, etc) – Handling – Storing – Transporting (type, duration, transfers, etc)	– For primary mission and support equipment, repair parts, secondary items, POL, and ammunition to and from operation and training areas. It can also include transportation of items procured or shipped by the unit. Excluded are PHST costs for repairable items acquired through stock fund reimbursements
Activity A7	Sustaining Engineering Support	– Continued engineering and program management oversight to: – Maintain the integrity of the system – Maintain system reliability – Allow high level for in-service availability – Approve design changes – Ensure conformance with established specifications and standards	– This can include, but is not limited to, government and/or contract engineering services, technical advice, and training for component or system installation, operation, maintenance, and support
Activity A8	Modification kit procurement and installation	– Procurement for modifications – Installation of modification kits – Initial spares for modification after production – related support – Related training equipment	– This includes only those modification kits needed to achieve acceptable safety levels, overcome mission capability deficiencies, improve reliability, or reduce maintenance costs – It excludes modifications undertaken to provide additional in-service capability not called for in the original design or performance specifications
Activity A9	Software Maintenance	– Update or upgrade – Maintain – Modification	– This excludes major redesigns, new development of large

Dimension	Domain	Associated data	Comments
	Support	– Integration – Configuration management – In-service availability – Diagnostic – Training equipment – Support equipment	interfacing software, or modifications that change functionality
Activity A10	Restoration	– Restoration or renovation at midlife or after incident – Modifications to improve: – Reliability – In-service availability – Capability – Performance specifications – Life duration of the system	– This could be considered as a new procurement occurring during the in-service phase of the system
Activity A11	Disposal	– Ranking of forbidden substances/products – Detoxification – Long term storage – Specific training – Use or reuse of part of the system	
Activity A12	Design Change	– Design change concerns the possible evolutions of the system design appearing both before and after the initial deployment	
Activity A13	Performance Monitoring	– Collection of metrics to provide numerical gauges to be evaluated and monitored logistics support activities for: – Planning purposes – Scheduling purposes – Develop award fee criteria – Evaluate support solutions	
Activity A14	Facilities	– Procurement management – New building or facilities – New site – Conversion or expansion – Maintenance management – In-service management real estate for: developing, producing and testing (operation and support)	– This includes facilities to handle or store hazardous materials or waste including underground storage tanks
Activity A15	Other	– Any significant sustaining support not otherwise accounted for	– Examples can include follow-on in-service tests and evaluation, such as test range use, test support, data reduction, and test reporting. This includes any activities not otherwise accounted for

5.2 Product dimension in the in-service phase

Table 3 proposes a list of the main domains and associated that can be considered as part of the Product dimension during the in-service and retirement phases.

Table 3 Domains and data elements for dimension Product

Dimension	Domain	Associated data	Comments
Product P1	The main system	– Hardware as deliverable end item – Software as deliverable end item	– This is very different for air, land and sea equipment. It therefore cannot be described in a generic document
Product P2	The support elements	– Data: all deliverable data and publications, eg, manuals, engineering data, management data, logistic data (LSAR/LPD) and maintenance plan – Spare parts: components, assemblies, and subassemblies used for replacement purposes during maintenance – Support equipment: Equipment and computer software required to maintaining, testing or operating a Product or facility in its intended environment (Built-in equipment is not included, this is generally considered part of the main system) – Training equipment and material: all training equipment (simulators, etc) and devices (course materials, etc), accessories and aides used to facilitate instruction for the operation and the maintenance of the system. This does not include training activities – PHST: all means needed for packaging (eg, containers), handling, storage and transportation of the main system and other support systems – Facilities and infrastructure: industrial or government furnished facilities necessary for the operation and maintenance of the main system and its support systems	– Whatever the Product, the different categories of support elements are broadly common for all kinds of systems
Product P3	The specific means	– Elements designed, developed, manufactured, modified for the system that can be used for the procurement or support of the system: – Tools of simulation and relative support elements – Assembly facilities and relative support elements – Test and trial facilities and relative support elements	– Specific means can be provided by Government or Contractor. In the first case, they are usually Government Furnished Facilities (GFF)

5.3 Resource dimension in the in-service phase

The dimension resource can be broken down into the domains as shown in Table 4.

Table 4 Domains and data elements for dimension resource

Dimension	Domain	Associated data	Comments
Resource R1	Personnel	– Operator – Maintainer or personnel that support discrete in-service system – Personnel necessary to meet readiness for the system (training, administrative requirements)	– Direct costs: costs usually associated to operators and maintainers of the system. For personnel that

Dimension	Domain	Associated data	Comments
		– For each data set, the following data can be included: – Basic salary – Social security contributions – Retired pay accrual – Allowances for housing, clothing, duty travels, foreign station, bonuses, etc	operate or maintain more than one type of system, costs are allocated on a relative (pro rata) workload basis – Indirect costs: costs usually associated with personnel required for unit command, administration, supervision, operation control, planning, scheduling, safety, fuel energy ammunitions handling for defense systems, etc, and are not so easily allocated to a specific system
Resource R2	Equipment	– Means (usually) support equipment that are used to operate or maintain the system but are not considered as a Product of the program because they are shared between several systems	– For example, a piece of test equipment developed in the framework of a program and used only for the acquired system is considered as a Product of this program. But a piece of test equipment already in use for other existing systems and used by the new one is considered as a resource for the new system. – In both cases, the test equipment will be considered as a resource by the maintainer
Resource R3	Consumables	– Consumables are all resources that are not considered as a Product of the program and that are consumed in order to operate or to support the main system. They include: – Petroleum, oil and lubricants (POL) – Energy – Ammunitions – Non repairable parts that are not included in initial spare parts and are usually included in replenishment – Raw materials and standard tools – Water, food clothing, etc	
Resource R4	Infrastructure and facilities	– This resource refers to installations and facilities that are not considered as a Product of the program, and that are used to support	

Dimension	Domain	Associated data	Comments
		the systems throughout its life cycle: – Permanent assets: buildings, roads – Quasi-permanent assets – Temporary assets – Mobile assets: naval bases	
Resource R5	Services	– Assistance by contractors – Assistance by sub-contractors – Transportation (if not included in PHST)	
Resource R6	Information	– Copyright information for which a fee is required or GFI	
Resource R7	The public and private sectors	– There can be a difference between activities performed by the public (personnel in various categories, consumables, services, etc.) and private sectors (financial aspect is the more important)	

5.4 Time dimension in the in-service phase

The dimension time can be broken down into the domains shown in Table 5.

Table 5 Domains and data elements for dimension time

Dimension	Domain	Data element	Comments
Time T1	Calendar duration	– Hours – Week – Months – Years – Mission duration – Flying hours	
Time T2	In-service duration	– Number of operating cycles	

5.5 Station dimension in the in-service phase

The list of generic stations that could be applied to a cost-element during its life cycle is given in Table 6:

Table 6 Domains and data elements for dimension station

Dimension	Domain	Data element	Comments
Station S1	Station	– Unit – Depot – Workshop – Industry – Organization – Nation – Organizational unit – Cost center – Account – Cost object	

6 Identification and population of cost elements

The identification of cost elements or data from the field has been carried out considering the list of activities defined, combined with applicable resources and then applying them to the three domains of the Product dimensions:

- the main system (which can be divided into hardware and software)
- the support elements
- the specific means

If the list of in-service activities and resources is correct and comprehensive, the list of all possible cost elements can be derived by applying each generic activity to each Product element. Each cost element must be completed by the specification of the two dimensions time (eg, year 20YY, month MM, etc) and station (eg, nation X, operating base Y, etc).

The CBS can include cost elements referred to different system phases or different phase in the same phase (eg, any design change has considered on 2020). These cost elements can be left as dormant (empty cell) and populated when the data feedback become available (eg, design change happens on 2021). It is suggested to leave these cost elements on the CBS and use them as reminders when the cost is generated,

The CBS must be customized according to the system type (eg, airplane, ship, car, etc), the contractual requirement, cost boundaries definition (ie, customer specific activity not included in the previous list), etc.

7 Data exchange use cases

Five use cases have been defined for the feedback of cost data for different LCC analysis purposes.

7.1 Use case UC50701: Provide cost breakdown structure

This use case consists of the exchange of a cost breakdown structure between two parties, usually for cost monitoring or contractual purposes, or for a better categorization of LCC data.

Note

This use case is shared with the use case of the same name in Chap 13.

7.2 Use case UC50702: Estimate maintenance costs

This use case covers the need to receive maintenance cost information (manpower, material, etc) so that estimations of maintenance costs can be performed.

7.3 Use case UC50703: Costs due to in-service requirements

This use case covers the provision of the necessary information so that the costs associated to in-service requirements can be identified.

7.4 Use case UC50704: Cost of modifications or upgrades

This use case covers the provision of the required information to identify the cost associated to modifications or upgrades.

7.5 Use case UC50705: Costs of in-service support

This use case covers the reporting of costs incurred during in-service support.

Chapter 8

Feedback of data for warranty analysis

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References

Table 1 References

Chap. No./Document No.	Title
S2000M	International specification for material management - Integrated data processing for military equipment

1 Introduction

For all transactions, if any, warranty is one assurance by the contractor to the customer that information, requirements, and conditions of use are respected or that they will be. The warranty sets out the rights that the customer has if the Product or Service is partially or fully damaged or

does not work. There is no standard clause for warranty, but rather a wide range of options agreed between the contractor and the customer in order to define the scope of warranty, its duration, and applicability to the Product.

Contractual warranties that can be adopted are:

- No warranty
- Limited warranty
- Implied warranty
- Lifetime warranty
- Media warranty
- Repair warranty

Examples of warranty include, but are not limited to:

- Warranty for operation and resilience of the delivered Product
- Storage warranty, which includes delivery and related packaging and handling
- Warranty for provisioning and assembly, which covers building the Product by a contractor.
- Warranty for conformity with contractual requirements as well as conformity with standard rules for assembling, qualifying, and testing the Product.

1.1 Purpose

The purpose of warranty data feedback is to provide information for analyzing the correctness of warranty statements and the corresponding actions for managing defects.

1.2 Objectives

The main objectives of warranty data feedback are:

- To provide a means of evaluating maintenance activities:
  - Are they within the scope of the warranty?
  - Are they efficient?
  - Are they completed within an acceptable period of time?
  - Do they require spare parts and are these available on time, etc?
- To provide a means of recording the costs of warranty, from activities required to restore availability to additional actions necessary to make corrective measures possible (eg, repairs, packaging, handling, etc)
- To provide a means of determining the misuse of warranty
- To identify items that pose a risk to the warranty program
- To gain experience and improve standard warranty rules and processes for future programs

1.3 Related activities

Table 2 lists the activities related to each of these objectives.

Table 2 Activities related to supporting warranty data feedback objectives

Objective	Activities
Provide a means of evaluating maintenance activities	Document Product failure notifications
	Isolate faulty equipment(s) and determine the corresponding corrective actions
	Collect facts associated with failures to determine whether the fault is within the scope of warranty provision
Provide a means of	Perform corrective actions tracking actual costs for materials

Objective	Activities
recording costs	and labor Document actual costs for reimbursement Transmit cost data with failure data supporting warranty claim
Provide a means of determining the misuse of warranty	Document faults and/or failures not within the scope of the warranty Identify and register cases of misuse and the reasons for these
Identify items that pose a risk to the warranty program	Register risky items (eg, component data, assess if failure rate of component exceeds budgeted loss rate) Trace where in the warranty process such risky items pose a risk
Improve standard warranty rules and processes	Identify lack of warranty process and define corresponding improvements Organize and register feedback Manage communications between stakeholders

2 Warranty data feedback

Fig 1 is a process diagram that illustrates which data can be created by both the customer and contractor within the warranty process. This process diagram is for illustration purposes only, in order to identify the necessary feedback data, and is therefore not a S5000F-defined process.

Note

The warranty claim and management process can be as agreed between customer and contractor, as S5000F only defines the data to be exchanged. A defined process for spares warranties can be found in S2000M.

Note

Official communications are usually considered necessary for such a process, given that dates, technical, and legal decisions can have an impact on the warranty duration.

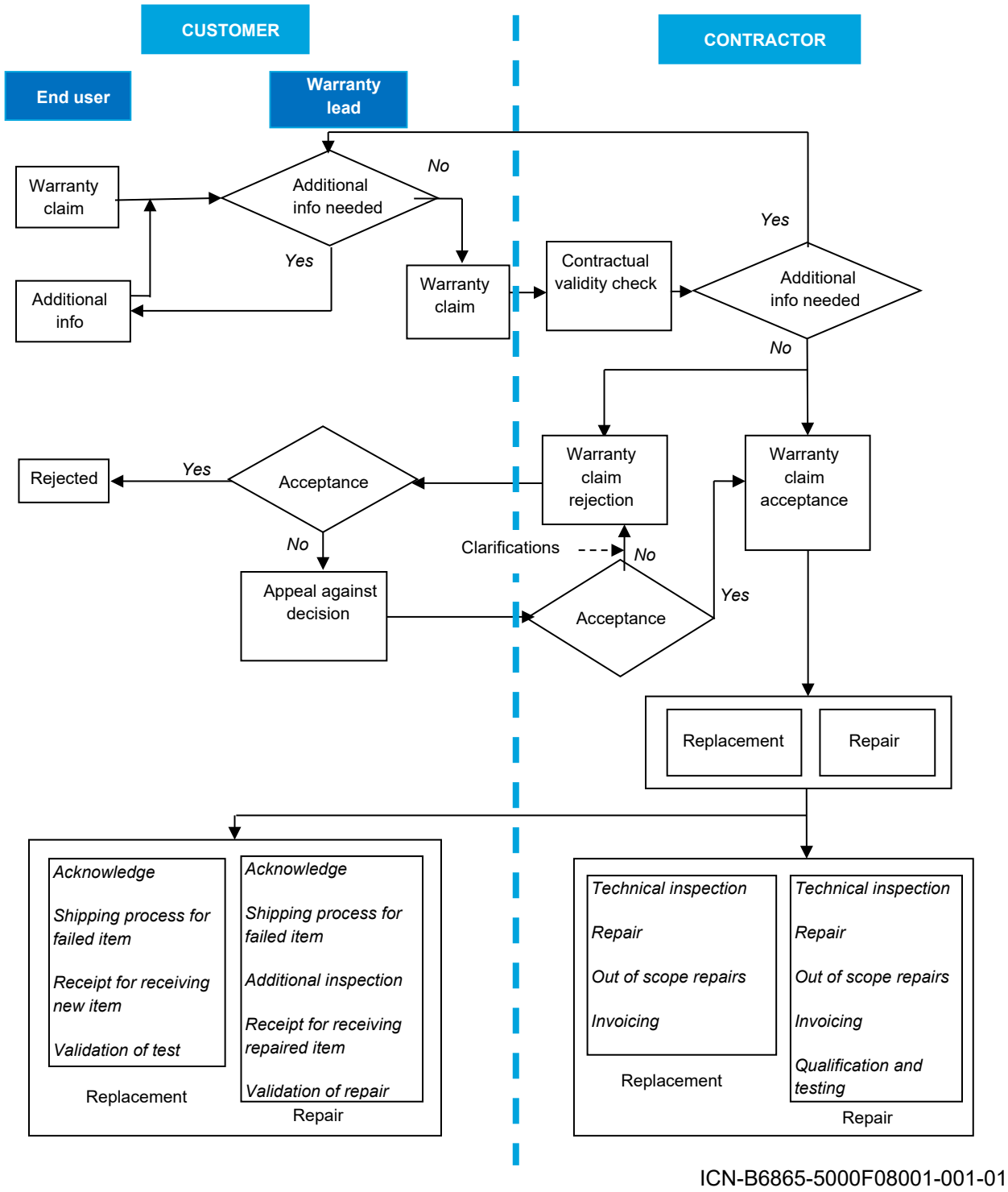

Fig 1 Use case of warranty data feedback

2.1 Warranty analysis feedback data for defined use cases

The following tables identify one use case for each objective along with the related activities, as well as the feedback data that is required for this purpose.

3 Use cases

Five use cases have been defined for the exchange of warranty data. These use cases cover a broad spectrum of the area of warranty. They deal with what is required for decision support concerning warranty, and help with gathering usage data relevant to warranty issues. The necessary feedback data comes from the OEM and mostly from the user or operator, as well as from the maintenance personnel.

The data list for supporting these use cases is defined in Chap 20.

3.1 Use case UC50801: Evaluating maintenance activities

The purpose of this use case is to compile information on maintenance activities that are required for warranty acceptance. In this case, all necessary and required maintenance of Products and parts will be reviewed. The result of the use case clearly indicates whether the operator, maintainer, or owner of the Product has followed all maintenance instructions, rules, and regulations before and during Product damage. Therefore, all maintenance activities must be checked to see if they have been performed correctly, completely, and within the given timelines. The use of suitable tools and properly trained personnel being used to carry out the maintenance work must be demonstrated.

Table 3 Objective 1: Provide a means of evaluating maintenance activities

Group	Data group name	Information needed	Data supplier
4.1.1	Document Product failures during warranty	Date and time of claim Type of failure (eg, functional, physical) Hardware, software, other Origin: by human, within operating conditions, external sourcing damage (eg, shock, virus, etc) Duration of warranty claim, from initial claim to restoring full availability	Customer
4.1.2	Identify fault and active warranty actions	Duration for identifying fault location Additional technical inspections required or not? Defining actions to be taken (eg, repair, standard exchange, change of configuration, evolution of subsystem or equipment, etc) Line replaceable unit – Part number – Configuration ID – Serial number	Contractor
4.1.3	Acceptance of warranty claim	Claim within contractual scope Timely filing of claim	Customer Contractor

3.2 Use case UC50802: Recording warranty costs

This use case gathers data on all costs related to a specific warranty issue. Knowing the costs of warranty issues is essential for management purposes. Cost is an important factor for management decisions on how to avoid or reduce warranty cases in future. Since there are usually different ways to improve a Product, the decision on which solution to apply is dependent on the cost for warranty cases. Therefore, when choosing an improvement, there is a focus on the expected warranty expenses. This use case records all the relevant costs regarding a warranty case, not only with regard to materials, but also costs for labor, shipment, replacement, recourse, etc. Management must be aware of the costs for warranty cases as early as possible so that they can decide on countermeasures before the situation deteriorates.

Table 4 Objective 2: Provide a means of recording costs

Group	Data group name	Information needed	Data supplier
4.2.1	Costs for warranty maintenance activities	Labor hours Labor rates Spare parts required Consumables required	Customer
4.2.2	Document actual costs for reimbursement	Costs out of scope in comparison with global costs	Customer and Contractor
4.2.3	Cost and failure data	Numbers of operating hours/cycles since acceptance or last failure Level of impact on Product availability: – Nil - Low – Low - Medium – Medium - High – High - Very High	Customer and Contractor

3.3 Use case UC50803: Determining the misuse of warranty

This use case looks at the necessary checks for determining whether a warranty claim should be rejected based on the improper use of a Product. For a warranty request to be handled correctly, it is important to examine the validity of the warranty request and whether the Product has been used according to Product specifications. This information is of relevance to the operator and the warranty manager for decision support.

Table 5 Objective 3: Provide a means of determining the misuse of warranty

Group	Data group name	Information needed	Data supplier
4.3.1	Items not within the scope of warranty	Number of items/items of equipment or subsystems that are not taken into account for warranty Total number of items/items of equipment and subsystems that make up the Product	Contractor
4.3.2	Failures not within the scope of	Number of warranty claims Number of warranty claims	Customer

Group	Data group name	Information needed	Data supplier
	warranty	rejected	
4.3.3	Identify warranty misuse cases	Classification within list: Not within material scope Not within commercial/legal scope Not within the warranty period	Customer and Contractor

3.4 Use case UC50804: Identifying items that pose a risk to the warranty program

This use case helps to identify Products that pose a certain risk to the warranty program. Essentially, it is about finding out which elements have a high potential of warranty risk. This involves checking the actual failure rate and comparing it with the predicted failure rate. Furthermore, analyses are made to try and determine the conditions under which the failure occurs. The findings will help the Product provider to be pro-active and avoid high warranty expenses.

Table 6 Objective 4: Identify items that pose a risk to the warranty program

Group	Data group name	Information needed	Data supplier
4.4.1	Risky items for warranty	Failure rate of item Level of impact on Product availability: – Nil - Low – Low - Medium – Medium - High – High - Very High (See group 4.2.3 Price of item Mean time between failures	Customer
4.4.2	Specific risk to warranty	It must be determined if the item requires specific actions, like: Conditioning (eg, chemical or radioactive components, non-waterproof, etc) Mean time to repair Mean time to replacement Provisioning Time	Contractor

3.5 Use case UC50805: Improving standard warranty rules and processes

The application of warranty rules and processes is essential for both the Product provider and the operator. During Product support, rules and processes must be adapted with respect to changes in operational conditions. The operational environment usually changes for Products used in the long-term, so the rules must be adapted accordingly.

Table 7 Objective 5: Improve standard warranty rules and processes

Group	Data group name	Information needed	Data supplier
4.5.1	Efficiency of warranty chain	Duration of warranty claim Duration of repair/replacement of faulty item/equipment	Customer
4.5.2	Submit warranty claim	Duration of validation for warranty claim within the customer's organization: – Date when the end user submits the warranty claim – Date when the warranty claim is received by the contractor	Customer
4.5.3	Initial handling of warranty claim	Date when the warranty claim is received by the contractor Date when final acceptance or final rejection is declared	Contractor
4.5.4	Feedback for warranty	Number of warranty claims accepted Average duration for warranty claim Average duration for repairs	Contractor or Customer
4.5.5	Warranty information exchange	Number of warranty claims accepted after initial rejection Number of warranty claims rejected after two rounds	Customer
4.5.6	Means of transmission for warranty	Email Fax Mailing address	Customer or Contractor

Chapter 9

Feedback data for Product health and usage monitoring

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References

Table 1 References

Chap No./Document No.	Title
Chap 18	Data element list

1 Introduction

Health and Usage Monitoring Systems (HUMS) can offer data that could assist with the following:

- Prognostics
- Diagnostics
- Self-diagnosis
- Product monitoring
- Reducing maintenance costs
- Improving safety
- Identifying logistics requirements
- Recording actual usage data
- Useful life

Health and usage can be reported, as required, but for coherency the data should be standardized and contain a minimum data set which has a baseline for configuration control and analysis. Data and information logged should be of sufficient quality to allow transfer from the acquisition system to the analysis system for processing.

HUMS can provide:

- Real time reporting (to the operator or fleet manager)
- Data storage
- Data transmission
- Data recording and entry

Any maintenance that could affect what is being monitored should be recorded; this could involve manual data entry onto the HUMS. Due consideration should be given to the transfer of manual data onto the logging system.

HUMS can identify characteristics that allow a Product to self-diagnose, increase recording rate, automatically report through integrated systems or log data for processing by non-integrated systems.

The analyzed output from the HUMS can impact on the logistics requirement of the Product by offering data relating to:

- Condition monitoring
- Running cost
- Planned maintenance
- Usage
- Usage of consumables
- Fitness to operate
- Performance

In making management decisions, the Product owner, operator or maintainer must identify:

- The parts of the Product need monitoring
- How parts are going to be monitored
- How will data be gathered and synchronized
- How will data be reported
- How will data be verified
- How will data be entered into a system for analysis or transmission
- Where and who should undertake analysis of the data
- Where and how data will be retained
- How will data or information will be accessed
- How the information will be used

HUMS could detect false alarms and this concept is considered. (ie, a false alarm being the erroneous detection of an anomaly that does not exist).

1.1 Definitions

Product health and usage monitoring are terms given to systems that utilize data collection and analysis techniques to help ensure and improve availability, reliability, performance and safety of Products. Health and usage monitoring activities could be integrated or be a separate part of the Products. Some HUMS self-diagnose and amend operating characteristics to protect the Product by reducing defined functionality. Self-diagnosis systems could highlight how an anomaly can affect the ability of the Product to complete a task and how this anomaly would affect the logistic system.

1.2 Scope

There are common activities, basic definitions and basic data fields involved in the gathering and feeding back of health and usage monitoring data. These activities should be of interest to anyone who requires engineering performance indicators to be produced by HUMS for engineering or operational monitoring, changes to engineering design, condition monitoring and the provisioning of spares.

While it is impossible to list all the user information necessary to report health and usage, the baseline data sets required are defined. Items not covered are:

- Those actions that normally take place outside the Product itself
- Specific stakeholders' requirements such as detailed alarm settings to monitor their Product for warranty or logistic support reasons
- Security implications

1.3 Objective

The objective of health and usage monitoring is to capture appropriate data that will allow either parts of or an entire system to be monitored for analysis and action if required at the time of occurrence or for retrospective analysis and subsequent action if required.

2 Health and usage monitoring systems elements

2.1 Elements

The elements of a health and usage monitoring system are:

- A network of sensors
- Onboard storage or processing (integrated)
- Off board analysis (non-integrated)

2.2 Components of a HUMS

The functions of health and usage monitoring are recording, reporting and responding of which, a HUMS can consist of one or more. Refer to Fig 1.

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Fig 1 Respond, report, record and relationship

3 Record

The objective of recording data is to retain information for the purpose of analysis. In order to identify the data to be recorded for analysis by the user, the objectives of the recording must be determined. From these, the means to achieving the objectives can be derived. Then, from these activities, the fundamental data classes and elements can be developed.

3.1 Record objectives

The objectives of monitoring and recording data are to:

- Enable analysis
- Enable analysis to identify an issue
- Enable analysis to determine performance

3.2 Record activities

The activities involved in recording are:

- Determine what to record
- Determine the frequency of data recording
- Determine the amount of data to be recorded
- Identify the storage medium
- Identify the method of accessing the data
- Identify the method for analyzing the data
- Identify data retention periods
- Identify a data back-up process

3.3 Record metrics

There are various attributes that can contribute to assuring activities associated with data being recorded. These include, but are not limited to:

- Ease of recording
- Ease of access to recorded data
- Detected error rate
- Suitability of storage
- Update and transfer
- Accuracy and consistency

3.4 Record data classes and elements

The data classes and elements for recording/recorded information that are derived from the objectives, activities and metrics are described in Chap 18. Although this list is as complete as possible, other data elements could be required depending on the system or domain (ie, land, sea, air, space, etc) specific operating requirements.

The data classes and elements should, as a minimum, cover:

- Configuration
- Environment parameters
- Error or fault codes and descriptions
- Component functional status
- System functional status
- Usage profile
- System operating parameters

The data recorded could be used to assist assessment of Reliability, Availability, Maintainability, Capability, and Testability (RAMCT) and logistics support analysis.

A summary of the information that could be derived from obtaining relevant data fields are:

- Storage conditions - temp, humidity, vibration, shock, specified storage conditions, conditions seen that are outside of limits, time stored in appropriate conditions, total time stored, wind speed
- Use of Product - wear rates, usage of consumables and usage of material
- Fitness to operate

3.5 Use case UC50901: Record usage and health data

The use case provides an indication of the data required to determine operational characteristics. The data obtained can be compared to the design or performance specifications and the operational requirements.

The recording of the data could be used to support RAMCT, logistics support analysis and safety issues. The information required for this use case includes:

- Configuration - operational and as designed
- Achieved reliability including equipment issues
- Operational history
- Performance achieved
- Product status
- Product information
- Equipment availability

4 Report

The objective of reporting data is to inform users or other parts of a system of how the system is operating, the status of the system and whether there is a requirement for spares. In order to define the reports that are required from the integral or non-integral system, the objectives of the reporting must be determined and from these objectives, the activities necessary are derived. From these activities the fundamental data elements required by the user from the reports can be developed.

4.1 Report objectives

The objectives of reporting data are to:

- Identify recommendations
- Provide analyzed data
- Identify areas of concern

- Provide usable information
- Provide a record
- Provide an understandable output
- Provide the current system status
- Indicate system or subsystem life

4.2 Report activities

The principal activities involved in reporting are:

- Identifying how the report will be used
- Identifying who will use the report
- Identifying what the report will be used for
- Providing factual information
- Providing information on what has happened
- Providing output for use by other systems

4.3 Report metrics

There are various attributes that can contribute to assuring activities associated with the data being collated and output as a report. These include, but are not limited to:

- Time to generate report
- Accuracy of the report
- Usability of the information
- Number of reports generated

4.4 Report data classes and elements

The data classes and elements for reporting information derived from the objectives, activities and metrics are described in Chap 18. Although this list is as complete as possible, other data elements could be required depending on the system or domain (land, sea, air, space, etc) specific operating requirements.

The data classes and elements should, as a minimum, cover:

- Configuration
- Environment parameters
- Error or fault codes and descriptions
- Component functional status
- System functional status
- System operating parameters

The data recorded could be used to assist assessment of RAMCT and logistics support analysis.

A summary of the information that could be derived from obtaining relevant data fields are:

- Environmental - temperature, humidity, pressure, shock, vibration, particulates (eg, corrosive dust, sand, acidity, alkalinity)
- Maintenance - maintenance state, operational state, configuration state, next scheduled service, time in maintenance
- Product Overload - Operating outside normal parameters, vibration, shock, temperature

4.5 Use case UC50902: Report usage information

This use case provides an indication of the data required to determine the operational performance characteristics. The data obtained can be compared to the design or performance specifications and the operational requirements.

While reporting the performance of equipment to operators or other parts of the system, the data reported can already have had analysis performed on it by the project. This use case be supporting a warning for an operator or a subsystem identifying to a parent system that it is not functioning correctly. These reports must be recorded and available should further analysis be required, regardless of how they are generated.

This use case covers the recording and reporting of data that could be used to support RAMCT, logistics support analysis and safety issues. The information required for this use case includes:

- Configuration - operational and as designed
- Achieved reliability including equipment issues
- Operational history
- Performance achieved
- Product status
- Product ID
- Location information
- Environment
- Operational events
- Equipment availability

5 Respond

The objective of responding is to alert the complete system, or parts of the system, of any issues that can be about to arise or have already arisen. In order to define the responses that are required from the integral or non-integral system, the objectives of being able to analyze and respond to data must be determined and from these objectives, the necessary activities are derived. From these activities the fundamental data elements and activities required by the user from the analysis responses can be developed.

5.1 Respond objectives

The objectives of analyzing and responding to data are:

- To be able to self-determine if a fault is present
- To take appropriate action in the presence of a fault
- To reduce the chance of Product damage
- To reduce the chance of a Product failure
- To alert the user that a fault has been detected
- To alert the user that action has been taken to reduce the impact of a fault
- To alert the user of any degradation in performance
- To alert the user to any changes in Product performance
- To provide the current system status
- To indicate system or subsystem life

In some instances, an analyzed or non-analyzed response that results in a reduction of Product performance is not always an appropriate response. In these cases, the user should be alerted and able to make an informed decision.

5.2 Respond activities

The main activities involved in responding are:

- Identifying the responses required
- Identifying what the responses can do
- Identifying what the response will be used for
- Ensuring response is factual
- Determining the interface with other system components
- Determining how to notify the user
- Determining how to notify other systems

- The recording of all response activities
- The storage of response activities
- Identify issues to other systems or operators
- Retention of data that led to the response action

5.3 Respond metrics

There are various attributes that can contribute to assuring activities associated with responding to operational issues. These include, but are not limited to:

- Time to respond to an issue
- Usability of the information
- Number of valid responses
- Number of erroneous responses
- Number of responses
- Time to ship a part Mean Logistic Delay Time (MLDT)

5.4 Respond data classes and elements

The data classes and elements for respond information derived from the objectives, activities and metrics are described in Chap 18. Although this list is as complete as possible, other data elements could be required depending on the system or domain (land, sea, air, space, etc) specific operating requirements.

The data classes and elements should, as a minimum, cover:

- Error resolution
- Configuration
- System status
- Error or fault codes
- Error or fault description
- Alarm Indication
- System functional status
- System operating parameters

The data recorded could be used to assist assessment of RAMCT and logistics support analysis.

A summary of the information that could be derived from obtaining relevant data fields are:

- Functional condition - operations undertaken, alignment of operating outputs with specification, number of operating cycles, number of operating cycles allowed, configuration, maintenance state, etc
- Use of Product - usage of consumables, kilometers per liter, hours per liter, quantity of Product used (oil, fuel, rounds, filters, tires, etc)
- Reduced effectiveness - reduced power output, reduced fuel flow (air, fuel or water), bearing vibration, change of operating environment (altitude, dust, temperature), excess use of other on-board systems BIT/BITE, increased operating temperature
- RAMCT information, Mean Time Between Failures (MTBF), failure rate, etc

5.5 Use case UC50903: Respond to usage information

This use case provides an indication of how a set of conditions were responded to and a means of determining the operational performance characteristics. The data obtained can be compared to the design or performance specifications and the operational requirements.

- While responding to the current performance of equipment and identifying issues to operators or other parts of the system, the response can already have been determined or implemented from the analysis performed on the system. This use case can be seen as

providing an action that has been taken in response to a set of defined circumstances. These responses must be recorded and available should further analysis be required.

The responding and reporting of data could be used to support RAMCT, logistics support analysis and safety issues. The information required for this use case includes:

- Configuration - operational and as designed
- Achieved reliability including equipment issues
- Operational history
- Performance achieved
- Product status
- Product ID
- Location information
- Environment
- Operational events
- Issue reports
- Action to issues
- Equipment availability

Chapter 10

Feedback of data to support obsolescence management

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References

Table 1 References

Chap No./Document No.	Title
DIN EN 62402	Guidance of Obsolescence Management

IEC 62402Ed. 1.0	Guide to managing obsolescence
STANAG 4597	Obsolescence Management
STANAG 4598	Guidance on the use of Commercial Off the Shelf (COTS) Technology
IEC 56/874/NP (UK)	Guide to managing obsolescence
ARMP-6 (Edition 3)/Annex I	Obsolescence Management
ASD SpecificationS3000L/ Chapter. 15	Obsolescence Analysis
US DoD Guidebook SD-22	Diminishing Manufacturing Sources and Material Shortages - A Guidebook of Best Practices and Tools for Implementing a DMSMS Management Program

1 Introduction

Obsolescence is caused by technological progress and the gradual introduction of more capable Products, to fulfill the same or new functions. The rate at which materiel becomes obsolete usually depends on industry and is particularly prevalent in electronics/avionics. Obsolescence affects all equipment, software, tools, processes, support Products, training, standards and specifications. It impacts upon all stages of the life of equipment at system, sub-system, assembly or component level. It is inevitable, can be expensive and cannot be ignored, but its impact and costs can be minimized by forethought and careful planning. Commercial of The Shelf (COTS) Products, project specific parts, new design tools and production processes tend to have much shorter life than those traditionally used before. With the increased use of commercial materiel (both hardware and software) it is essential that obsolescence management is included within program plans from the earliest stages and to consider obsolescence contractually already in the procurement contract.

Obsolescence management is the process of assuring the Product is manufacturable and supported for the expected life. The process consists of planned and co-coordinated activities for providing availability of Product during its intended life, by the economic and practicable provision of replacement parts and support activities. The management of obsolescence is essential to achieve optimum cost effectiveness throughout the whole Product life cycle.

2 Obsolescence management

2.1 General

The objective of obsolescence management is to ensure that obsolescence is managed as an integral part of design, development, production and in-service support in order to minimize its cost and impact throughout the Product life cycle. Where necessary, Product specific special requirements for qualification and certification must be taken into account. Refer to Fig 1.

In order to minimize the cost and impact of obsolescence on a Product, throughout its life cycle, it is essential to establish a formal process for obsolescence management. Detailed planning and activities must take place during procurement, to ensure that an effective process is established before equipment enters service.

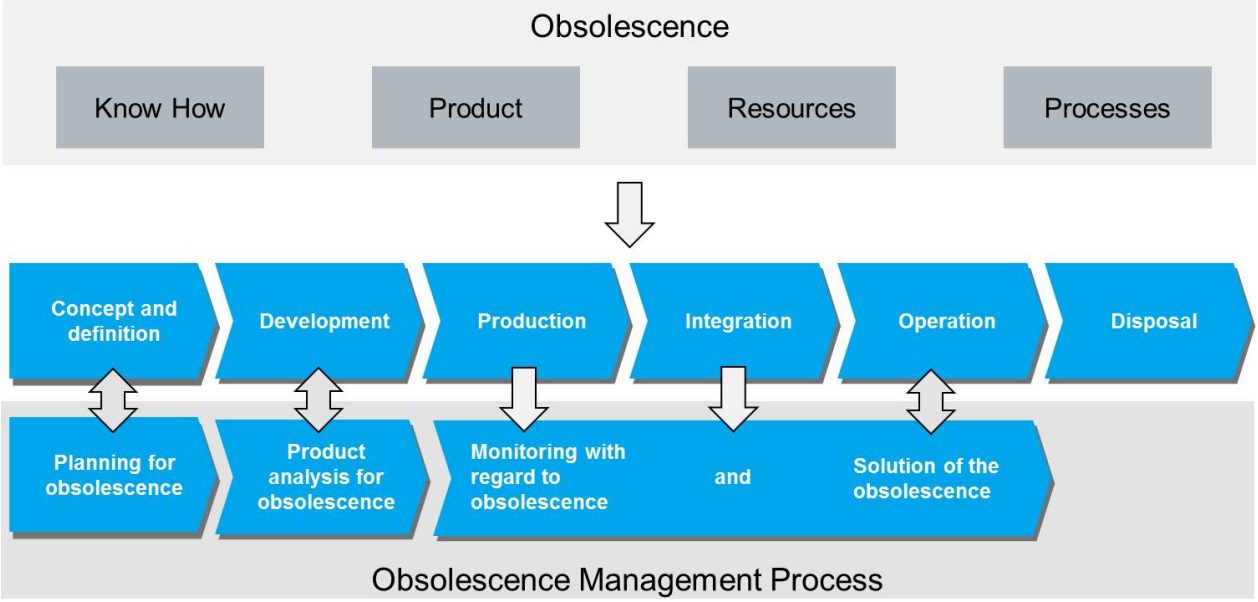

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Fig 1 Obsolescence management process - Generic

This generic management process, starting already in the earliest phase of a Product, can be used as a basis for the in-service phase/phase of operation.

2.2 Obsolescence management during the in-service phase

Affected organizations must be pro-active in managing obsolescence since its increasing incidence is likely to be a significant factor in cost, supportability and Product life cycle. Refer to Fig 2.

Judgments are required on how obsolescence can interact with the support strategy of the project. The obsolescence manager must analyze the equipment and support arrangements already decided and in place. Based on experience and the analysis, the manager must consider the operational risks over the life of the equipment associated with obsolescence:

The general steps of activities are as follows:

- Planning
- System analysis
- Monitoring
- Solutions/proposals to solve obsolescence

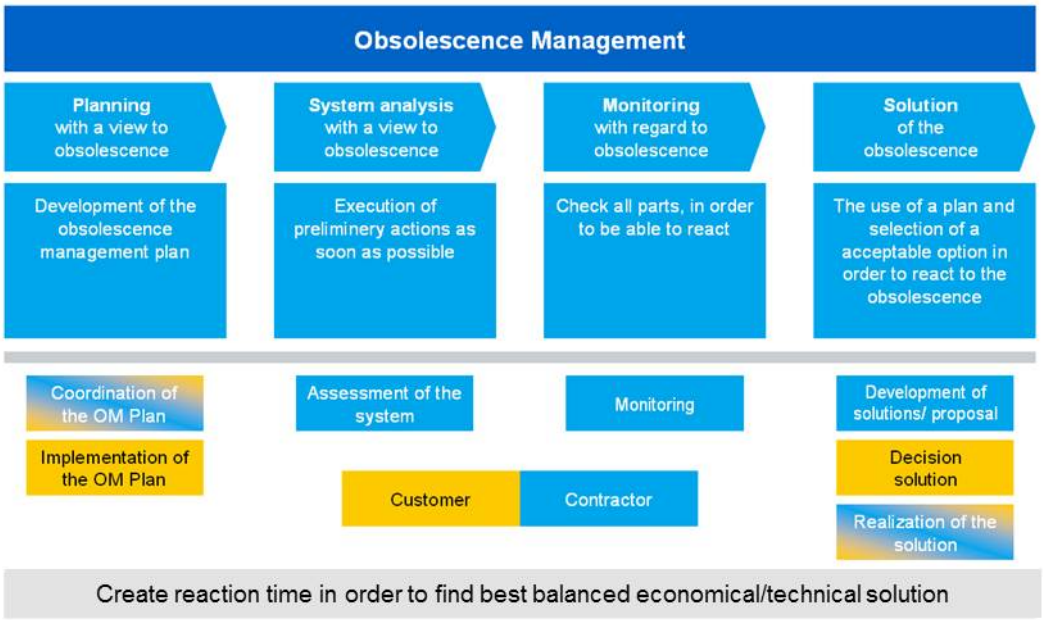

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Fig 2 Obsolescence management during in-service phase

3 Business process

For a better understanding which feedback data is necessary to support obsolescence management during the in-service phase and to understand the use-cases a short description of the obsolescence management process is provided.

3.1 Obsolescence management planning

In the framework of the in-service management, an obsolescence management plan should be used to ensure adequate selection and timely implementation of relevant obsolescence activities. The objective of an obsolescence management plan is to describe strategies for identification and mitigation of the effects of obsolescence. Refer to Fig 3.

The aim of the plan is to:

- Achieve the optimum compromise between life cycle cost, performance and availability of a Product
- Include all materiel regardless of whether it has been developed specifically for a customer or whether it is a COTS Product
- Be compatible with the customer's current support arrangements
- Describe the choice of strategy
- Describe the implementation of obsolescence management

The plan should further identify:

- The scope
- Objectives of all obsolescence activities
- The obsolescence management roles and responsibilities of the affected organizations
- The periodicity of reviews, obsolescence monitoring and reporting

For each item under consideration:

- Item name, identifiers from the customer, Original Component Manufacturer (OCM) and Original Equipment Manufacturer (OEM)
- OCM, OEM and reference to further information about them

- Product, equipment the item is used in
- Customers and relevant contractual arrangements
- Risk evaluation for strategies
- Selection of strategies (eg, reactive (ie, do nothing until the need arises) or proactive (ie, develop an obsolescence management plan/program for the case that obsolescence will happen)

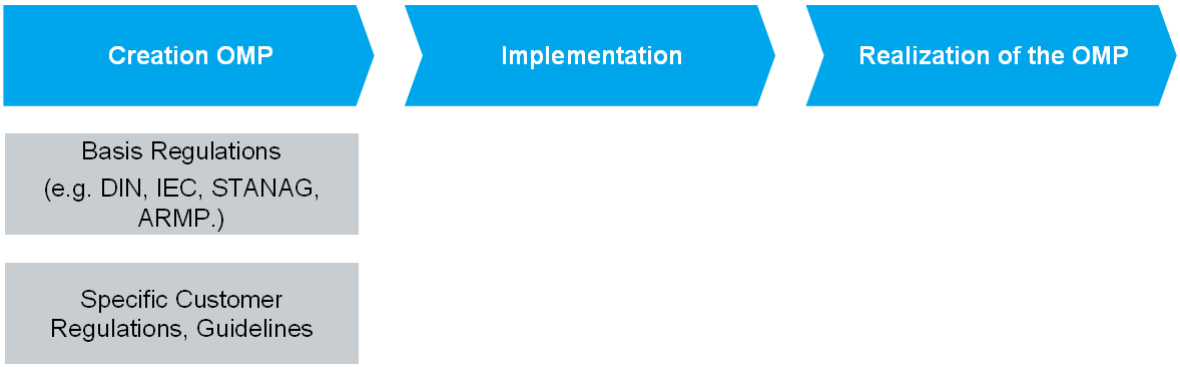

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Fig 3 Obsolescence management planning

3.2 Determine obsolescence candidates/perform risk assessment

The first step is to take over all data and information for the Product as described in the scope of the OMP in a structured manner (Product break down) and store this information in an obsolescence data base. Based on a set of criteria and information on the items under consideration, obsolescence candidates are identified. The risk (impact, costs and probability) of these candidates is assessed and a strategy of obsolescence management for each one determined. Refer to Fig 4.

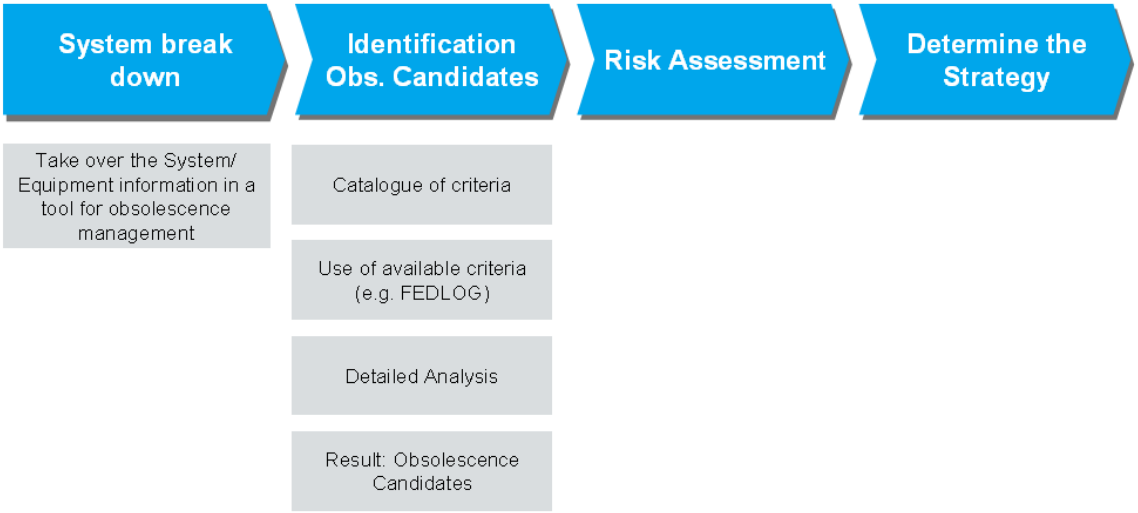

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Fig 4 Obsolescence analysis steps

3.3 Determine the obsolescence strategy

For the obsolescence candidates, a risk assessment concerning impact, cost and probability must be carried out. Each assessment must be classified into three levels of severity (low, medium and high) and a strategy (reactive or proactive, as appropriate), and the related obsolescence management activity for the in-service phase must be developed. Refer to Fig 5.

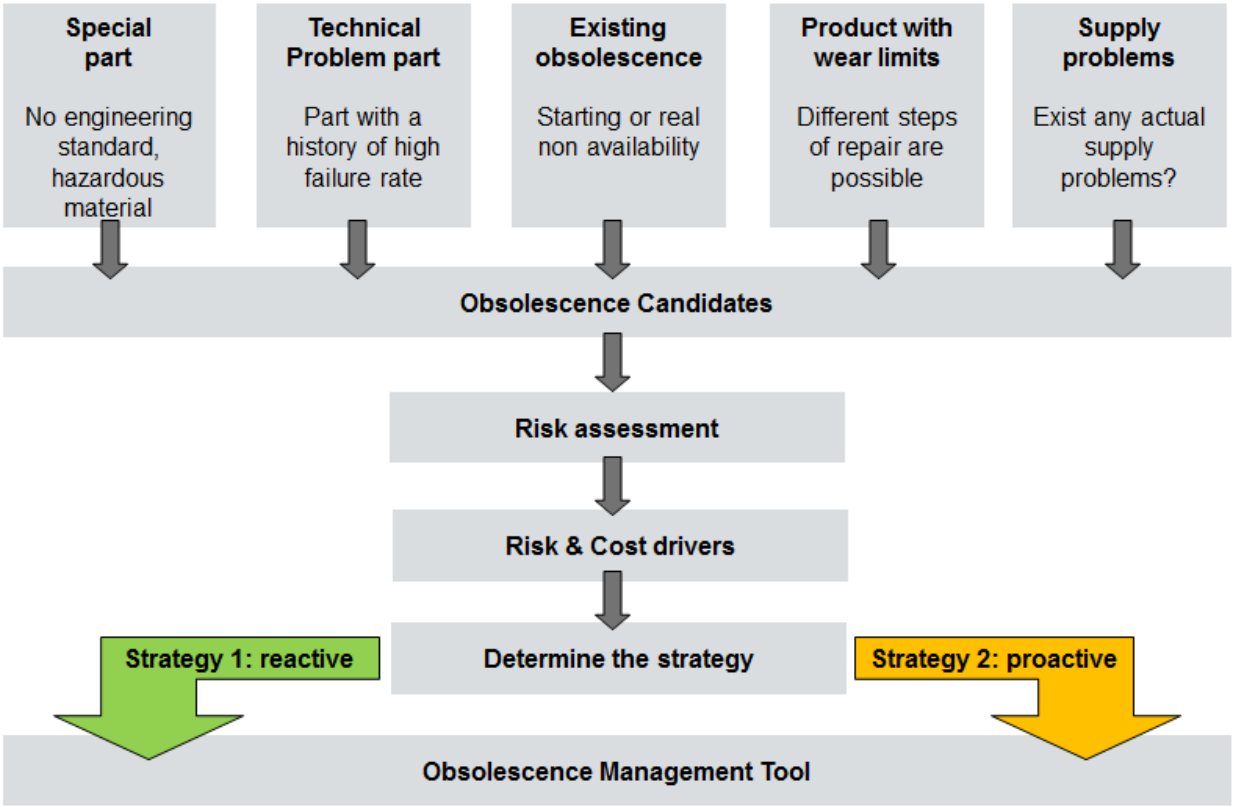

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Fig 5 Obsolescence analysis process

The two main strategy options that should be considered on candidate component level are (refer to Fig 6).

- Reactive strategy means to react to problems of obsolescence as and when they occur.
- Proactive strategy means to provide forecasts of obsolescence events and dates. These are needed to develop/adapt the overall strategy.
- The forecast of obsolescence events provides the basis to develop/adapt the overall obsolescence strategy. The aim of the overall strategy is to prevent or mitigate the risk of unavailability, end of support and high cost. For example, is the scheduling of design refreshes carried out before an obsolescence event occurs.

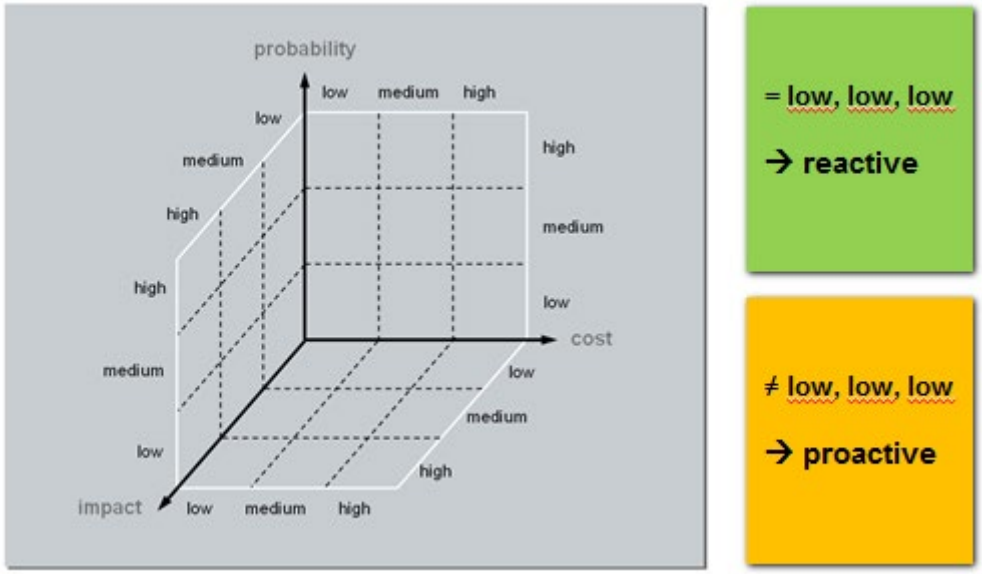

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Fig 6 Obsolescence strategy

3.3.1 Reactive strategy

When the triplet impact, cost and probability indicate small risk, this option can be selected. A reactive strategy can be chosen in one or more of the following situations:

- The Product has been procured to satisfy an operational need, has a finite duration of in-service life and no further purchase is planned
- The probability of obsolescence is very low, (eg, low technology Products)
- The Product has a high reliability and can be supported throughout its service life from available spares
- There are reliable OCM guarantees

3.3.2 Proactive strategy

In contrast to the reactive strategy the proactive strategy provides forecasts of obsolescence events: These can be a stop of sale of hardware components or the end of service/technical support for software.

For Products comprising of hardware and software, the functional dependencies between hardware and software force the Product management to examine the coupled hardware and software elements together rather than independently. Constraints like hardware/software compatibility must be observed and addressed when providing the forecast.

3.3.3 Overall strategy

This strategy considers the overall integrated picture on top level (not component level) including expected lifetime, operating hours, upgrade strategy in combination with reactive and proactive strategies. Contractual considerations are also part of the overall strategy. A strategic management approach considers. For example:

- Requirements for availability and cost
- Inherent design characteristics like reliability, maintainability
- Functional dependencies between hardware and software
- Design refreshes Product upgrades
- Last time buys
- Combinations of last time buys and design refreshes
- Collaborative procurement

– Support policy

3.4 Monitoring of obsolescence

Obsolescence monitoring is a further step in the obsolescence management process, and it is essential when a proactive strategy is adopted. Obsolescence monitoring involves tracking the processes, materials and components used in a design. It involves taking an action to provide alternatives when any approach or reach obsolescence, especially if that would prejudice the support of the Product. Refer to Fig 7, Fig 8 and Fig 9.

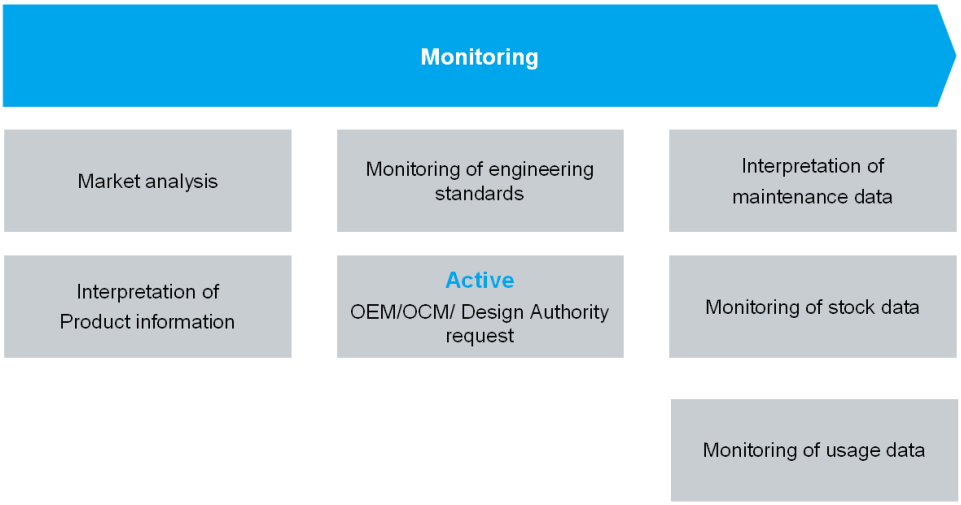

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Fig 7 Monitoring of obsolescence

Obsolescence monitoring should be considered:

– for Products where the cost of obsolescence is expected to be high relative to the support budget
– where there is a single source
– when the use of scarce skills is involved
– where the component/part performs a safety critical function
– when there is a large number of a particular Product to be maintained in service

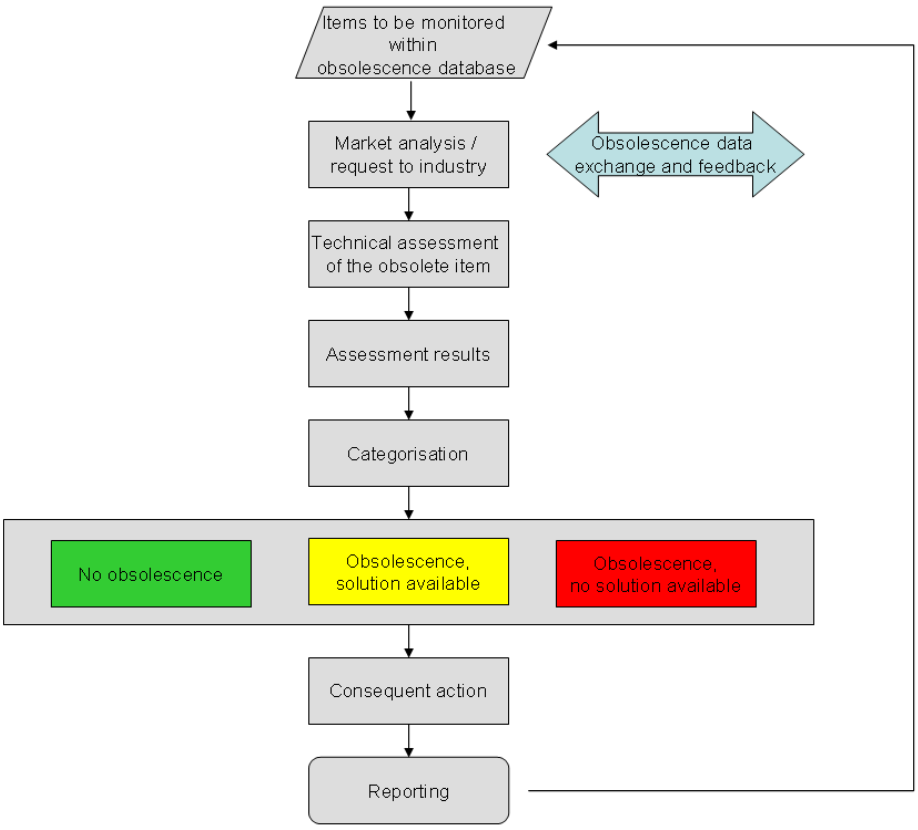

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Fig 8 Monitoring and status accounting of obsolescence

3.5 Solutions/proposals to solve obsolescence

Based on the analysis of obsolescence and the strategy taken, manifold activities can be chosen to minimize the risk of obsolescence or to soften the impact when obsolescence occurs. These activities should be clearly defined and should lead after a life-cycle cost analysis and a trade-off analysis to a cost-effective proposal to the customer. The selection and realization of the proposals rest with the customer.

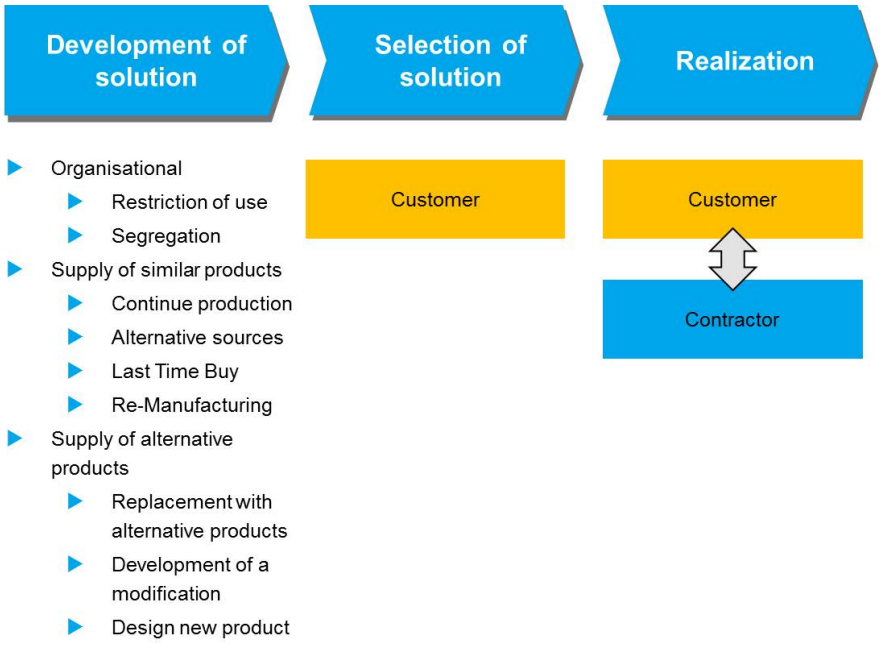

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Fig 9 Development of solutions, selection and realization

4 Use cases

4.1 Use case UC51001: Create basis for obsolescence management planning

This use case provides the breakdown structure/operational configuration of the Product for which obsolescence management is performed. This is needed to identify the extent of the task. Refer to Para 3.1.

4.2 Use case UC51002: Determine obsolescence candidates/perform risk assessment

This use case provides information necessary to determine the obsolescence candidates and perform the risk assessment for these candidates. Refer to Para 3.2. Items which can be procured quickly from many sources, and which are reliable are not necessarily considered as obsolescence candidates. Therefore, the set of criteria to determine the obsolescence candidates and risk assessment is based, for each item, on:

- Reliability data that provides the probability of failures
- Maintainability data that indicates which maintenance activities are required for the item, and how often these activities are carried out
- Information that indicates when an item can be produced (eg, Last Time Buy (LTB))
- Information that indicates when technical support stops (eg, End Of Service Life (EOSL)
- The period of time that an item can be stored, with conditions for storage (eg, shelf life)
- Purchase and repair costs of the items allowing cost-based decisions
- Lead times that indicate how quickly an item can be procured and the minimum order quantities

4.3 Use case UC51003: Determine obsolescence strategy

This use case provides information necessary to determine the obsolescence strategy. Refer to Para 3.3.For a decision on selecting either a reactive strategy or a proactive strategy, the reliability and cost data can be used. Refer to Para 4.2. A source of information concerning the impact can be the Failure Mode Effects and Criticality Analysis (FMECA).

For the overall strategy, the start and end point of the useful life of a Product must be known. If a long-term sustainment for a Product is envisaged, a last time buy strategy can be very expensive and inefficient, whereas for a short-term sustainment it can be the correct decision. Further useful data is start and end points for Product upgrades in conjunction with information on the items which are affected by these Product upgrades. The planning for using a mixture of last time buys and upgrades can be cost effective and knowing the planned upgrade schedule can provide a calculation basis for last time buys.

As the overall strategy is dependent on a target, which can be an availability figure, a mean waiting time or any other target figure that can be measured and verified. Therefore, the requirements or changes of requirements that influence the obsolescence strategy must be known. The obsolescence strategy must be in accordance with these requirements (eg, the quantities purchased during a last time buy being dependent on the desired Product availability).

4.4 Use case UC51004: Monitoring

Monitoring is essential if a proactive strategy is chosen. The aim of monitoring is to provide forecasts of obsolescence events and dates. Therefore, this monitoring includes:

- Monitoring the usage data by collecting the start and end points used for each serialized Product
- Monitoring the stock data by collecting the time points and quantities of identified item stock removals and additions
- Monitoring the maintenance processes by collecting the repair/replace start and end points, and collecting the times that identified items are discarded

4.5 Use case UC51005: Solutions/proposals to solve obsolescence

In order to harmonize Product activity and obsolescence activity, it is useful to know when Product down time starts and ends for each serialized Product, in order to implement a solution accordingly (eg, use the down time of a major servicing of an airplane to implement an obsolescence solution).

Chapter 11

Feedback of data for integrated fleet management

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Chap 4	Feedback of data for maintenance analysis
Chap 9	Feedback data for Product health and usage monitoring

1 Introduction

Integrated Fleet Management (IFM) includes all the necessary tasks to plan and schedule the operation of the Product fleet and individual Products, taking into account the necessary maintenance, Product configuration and all availability factors to meet operational needs.

IFM has not been previously described within the S-Series IPS specifications. The reason for this is that fleet management occurs only in service.

2 Scope

This chapter provides an outline of the data necessary to carry out the IFM activity; it covers the different types of fleet that can exist:

- Single operator - with single type of Products all operating within the same scenario
- Single operator - with multiple Products all operating within the same scenario
- Single operator - with multiple Products operating in several different scenarios
- Single operator - with single type of Products operating in several different scenarios
- Support Provider/OEM -providing support to a single operator
- Support Provider/OEM -providing support to multiple operators

3 Objectives of integrated fleet management

The principal objective of IFM is to guarantee the availability and capabilities of the Product to satisfy the client's needs. IFM allows to fully utilize the Products in the fleet and operate them efficiently. By storing the results data and developing trend methods, unusual behavior can be detected, and errors corrected.

One of the key aspects of IFM is communication. IFM interfaces with all other disciplines involved in delivering Product availability (eg, client, operator, OEM, maintainer, etc) to coordinate and integrate their service deliveries to achieve the customer/operator's requirements within agreed contractual service level.

4 Processes of integrated fleet management

IFM involves several activities mainly centered on operations and Product management, some of which can be carried out by different stakeholders.

The following sections aim to describe the minimum processes that IFM shall include for a correct performance of the fleet along with the data to be exchanged.

The activities performed by the client and maintenance are not described in detail since it is not the scope of this chapter but are mentioned since they are necessary.

4.1 Product requirements management

This process is carried out by the customer and it implies the establishment of what he needs to accomplish a task. This will later be translated into Product characteristics and availability that match the customer's needs. It is usual that the service has already been defined in a contract previously agreed with the IFM provider, so the requirements will be included in it. This contract can evolve in time.

4.2 Product usage

Product usage is the use of the Product by the customer/operator. Operations monitoring can be performed in real-time (using on board tools connected to ground equipment) or an evaluation can be performed when the Product is disposed. Some Products can even include a Health and Usage Monitoring System (HUMS) that can gather more accurate information on the Product performance, life usage and failures that occurred during its operation. Refer to Chap 9. In any case, feedback from the operator is always needed to have a clearer view of the situation and perform a more exact troubleshooting process.

4.3 Operations management

Operations management comprises all operational activities that revolve around the Product, such as:

- Operations planning and monitoring
- Updating Product availability
- Assigning a Product to a task taking into account the customer's feedback
- Establishing the preparation of the Product to carry out a task (eg, filling the gas tank, providing tools for a deployment, etc)
- Gathering data from the usage of the Product

4.4 Product management

Product management comprises all the activities related to the Product itself and any modifications needed for it to be ready to use. It also includes the disposal of the Product and the inspections carried out to determine its status (a logbook can be used for this purpose).

4.5 Product maintenance

Product maintenance covers the creation and updating of the maintenance plan of the Product, maintenance tasks to be performed (scheduled and un-scheduled) and modifications to be embodied. Refer to Chap 4.

4.6 Product design

Product design involves all processes and activities carried out before the creation of a Product and during its improvement and support period. The manufacturer is responsible for these activities and provides the necessary data, mainly reference data, to monitor the Product and ensure it is well maintained.

4.7 Contracts

A high-level description of contract management within an IFM process is given at Fig 1. The green boxes show the contract management activities and highlight the importance of having a service level agreement, but it is not compulsory to include it.

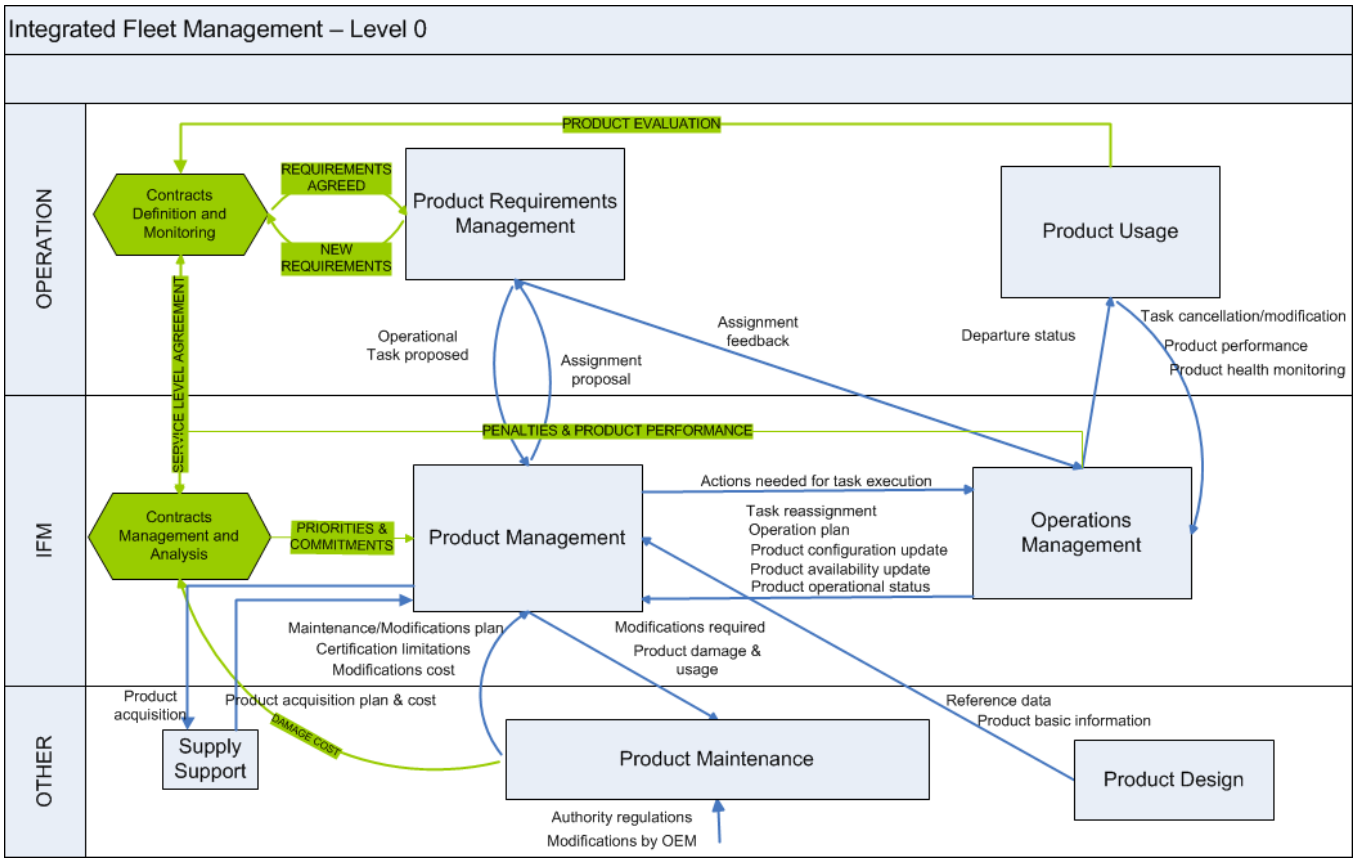

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Fig 1 Integrated fleet management - Level 0

Fig 2 provides a more detailed diagram of how IFM processes can be subdivided, showing operation and maintenance activities and how information is exchanged.

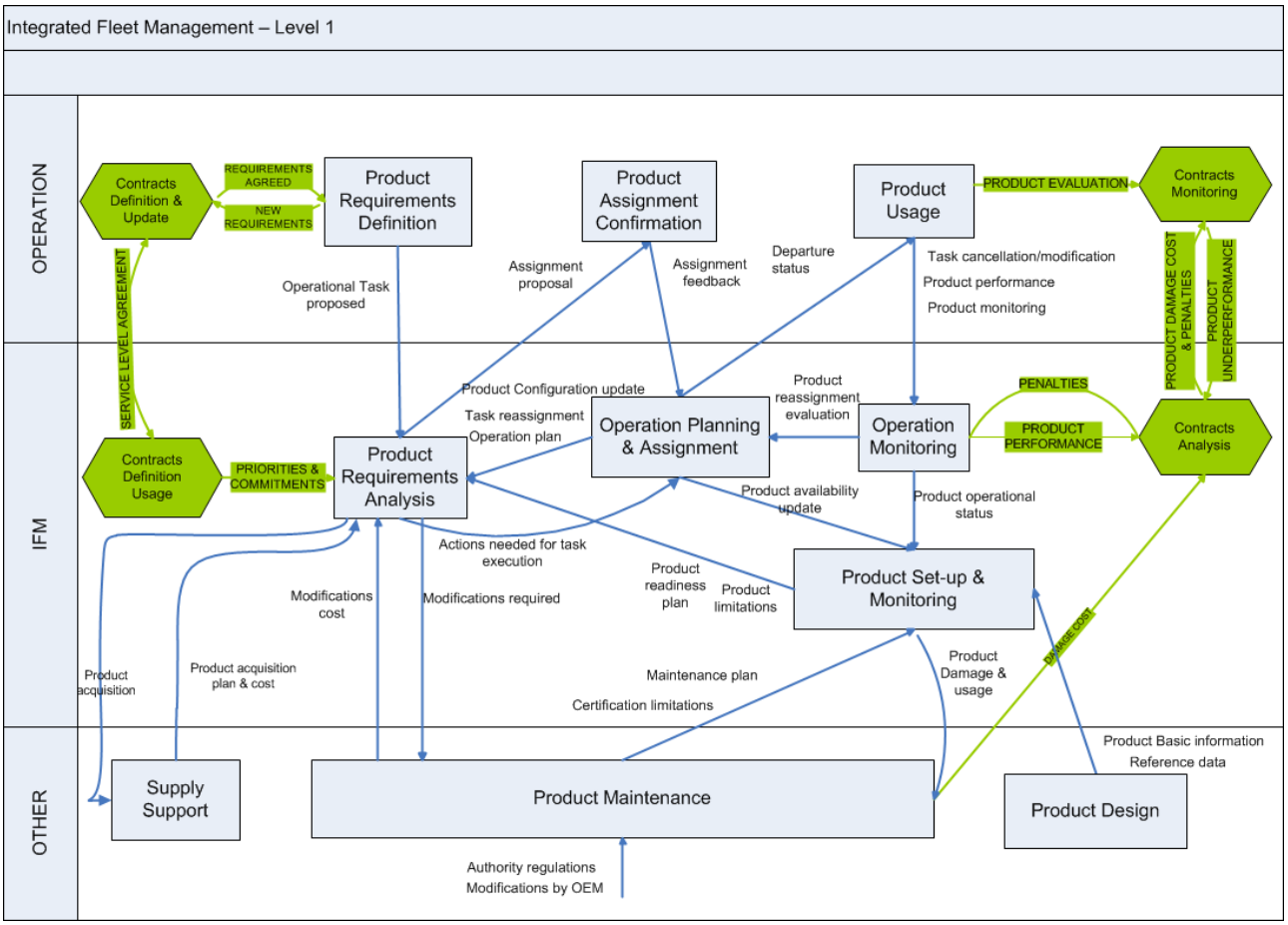

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Fig 2 Detail of an IFM main processes - Level 1

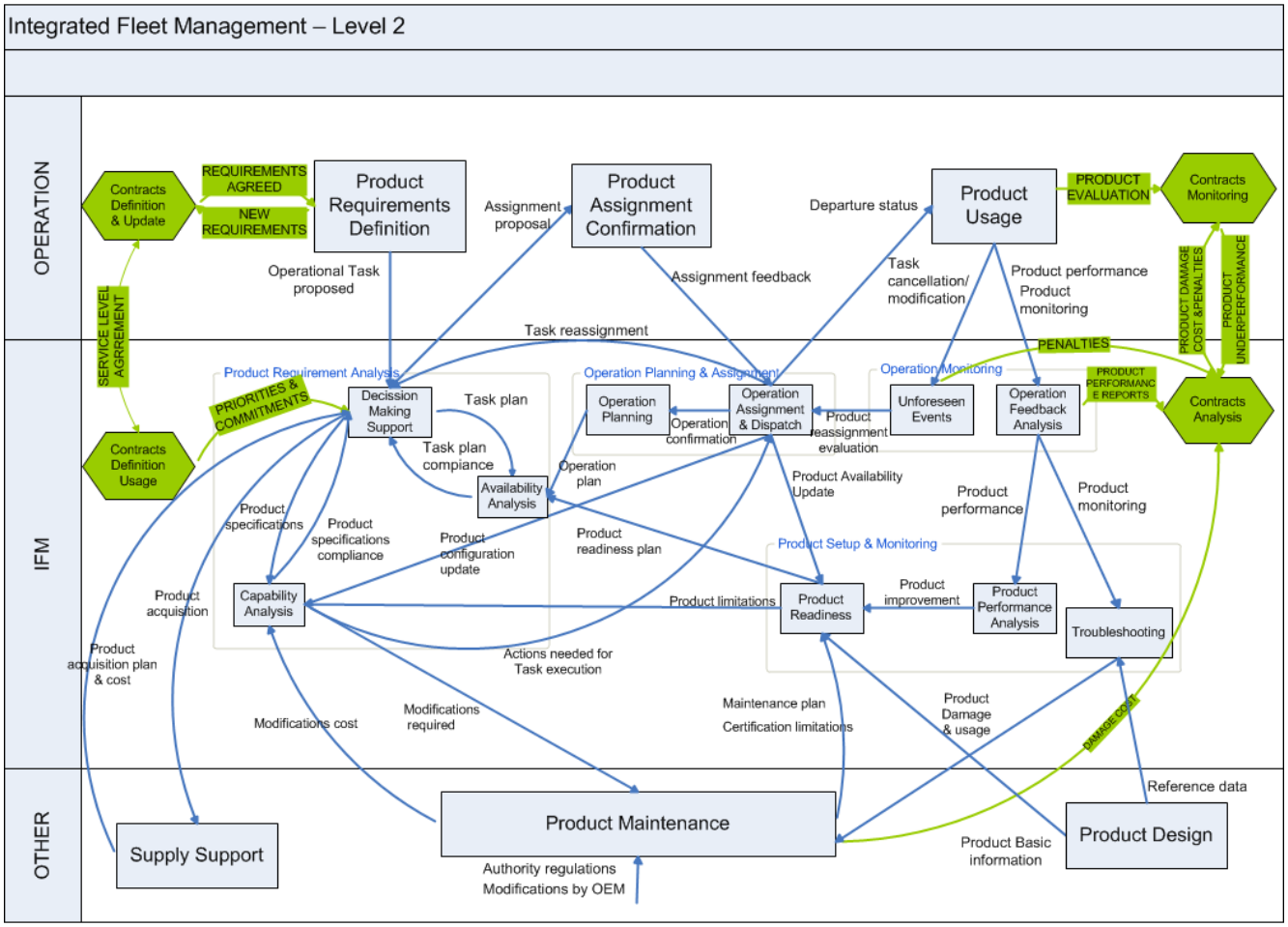

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Fig 3 Detail of an IFM main processes - Level 2

Using the example of a car rental company, a customer (and operator) enters the office, asks for a car (the Product) with given characteristics (eg, manual/automatic, size, diesel/gas/electric, air conditioning, GPS, etc), the length of time the Product will be required, insurance service and other add-ons. Then the employee offers the customer the available Products that fit those requirements, along with their prices.

The Product is then given an initial inspection prior to acceptance by the customer. If the customer agrees with the status of the Product, it is assigned and prepared (eg, tank is filled, car is cleaned). The customer uses the Product and at the conclusion of the contract period, returns the Product to the rental company.

The employee then checks the Product for damages and, if necessary, applies the contract and the insurance penalties. If the Product has been damaged, it is taken to a repair shop. Typically, if the damages are minor, and the car is operational, maintenance tasks can be deferred to the next check.

The Product rental company will determine how to adapt its car fleet so that there is always a Product available, depending on the quantity and types of customers received.

4.8 Product requirements management

4.8.1 Product requirements definition

This activity is carried out by the customer who is responsible for defining the requirements and transmitting them to IFM.

An output of this process would be "Operational Task". This information includes the type of task the customer is going to perform, dates, duration, etc, (ie, all information relevant to complete the task).

4.8.2 Product assignment confirmation

Once the customer has defined his requirements, IFM will generate an "Assignment proposal" containing the Product or Products that best comply with them. The customer will then reply to this proposal, stating acceptance or not, which is an output "Assignment feedback". This can lead to a negotiation process between customer and IFM until an agreement is reached.

4.9 Product usage

This process implies the execution of the task defined by the customer resulting in the Product usage. Several situations can happen here.

If the Task is cancelled/modified due to Product problems, there is the possibility of a Product substitution ("Product reassignment evaluation"). However, the customer can cancel the task for any other reason. In this case, there can be a clause in the contract regarding this type of event that results in "Penalties" to the customer.

When the task is executed, IFM receives information on Product performance. This information can be gathered in real time or at the end of the task, when the Product is returned. HUMS information is described in Chap 9.

Additionally, the customer can perform an evaluation on the Product to update the contracts terms.

4.10 Operations management

4.10.1 Operations planning and assignment

This process centers on planning the different operations carried out by the fleet and optimizing it. It can be subdivided in two activities.

"Operation planning" focuses on optimizing the schedule of the operations to be carried out by the Product fleet, taking into account all customer's operations and Service Level Agreements (SLA) for the requirements IFM must fulfill (related to availability).

"Operation Assignment and Dispatch" includes all the necessary activities related to the preparation of the Product to carry out an operational task effectively. For example, in the case of a car rental company, it would include filling the gas tank of the car, if the contract agreement states so.

4.10.2 Operations monitoring

The outputs of the "Product Usage" process go directly to the "Operation monitoring" process carried out by IFM. Situations can be grouped in two types:

- Task is cancelled or modified
- Task is performed

In the case the task is performed, an evaluation of the Product arrival status and its performance is carried out.

If the Product has undergone any damage, its repairing cost will be estimated and if it applies, passed to the customer. Otherwise, its performance is evaluated to assess a possible improvement or replacement.

In the case of task modification or cancellation, the status or the Product is updated and, if necessary, assign a new Product to the modified task. Depending on the contract terms, a penalty can apply.

4.11 Product management

4.11.1 Product requirements analysis

This process analyses the customer's requirements to find the Product that best fits them. It can provide decision-making support based on terms such as availability and requirements compliance, taking into account the SLA established with the customer in the contract in terms of requirements agreed.

It is possible that there is no Product that fits exactly the customer's requirements and therefore some modifications can be needed. These modifications have a cost associated. Additionally, related to this, an affordability analysis can be carried out, if the customer establishes a budget per operational task.

In terms of availability, this process integrates the operation and the Product readiness plans to create a "Fleet availability plan".

As a result of the "Decision making support" a list containing all Product candidates for each task will be produced and provided to the customer in an "Assignment proposal". Along with it, a quotation can be proposed.

This process also performs an analysis in case a "Task reassignment" is needed.

4.11.2 Product set-up and monitoring

This process is centered on "Product readiness" by ensuring that the Product is completely functional at a given time.

It also includes the evaluation of the current fleet and the analysis that results in a decision on whether or not to acquire new Products to improve it.

It communicates with a "Product maintenance" process to obtain the latest maintenance related information, such as upgrades and maintenance plan, airworthiness limitations and time limits.

It is responsible for maintaining the "Product readiness plan" and communicating the "Product limitations" (eg, if the actual Product configuration provides the Product with certain capabilities but a recent damage makes it not fully operative) to the "Capability analysis" process.

4.12 Contractual processes

These processes exist to support all agreements reached prior to a task execution. They involve both customer and IFM; first to reach an SLA, then to evaluate the Product performance based on metrics previously defined. They also support tasks cancellations/modifications and damage to the Product.

4.13 Product maintenance

This process is described in other chapters of this standard, so it will not be detailed here. Nevertheless, it appears due to the information interchange with IFM.

5 Use cases

5.1 Use case UC51101: Assignment proposal generation

IFM must be able to receive, integrate and manage punctual or periodic operator tasks requirements. The operator must provide all available and required information on planned tasks so IFM can generate an assignment that best fits the operator's needs.

Once IFM has all the information required, a process of analysis is performed. This analysis involves checking if Product availability coincides with the period of the planned tasks. Other aspects that are considered are the capability and configuration of the Product. It must be able to perform the task while meeting its requirements.

If there is a previous contract/SLA, the analysis must factor this into the process, given the economical and level of service restrictions this can imply.

If necessary, the Budget factor can also be added to the analysis.

Once the suitable Products have been found, IFM prepares a draft Product-task assignment to give to the operator.

5.1.1 Assignment proposal feedback OK

If the operator agrees with the "Assignment proposal", the Products availability must be updated to unavailable.

5.1.2 Assignment proposal feedback not OK

In this case, the procedure would be the same as Para 5.1. The analysis would be performed again to generate another "Assignment proposal". If the result is not satisfying, the process can be ended and operator and IFM would not reach an agreement. The operator must include the reasons for the proposal rejection.

5.2 Use case UC51102: Task cancellation

Once a Product has been assigned, the operator can still cancel the tasks. Depending on the contract this can have consequences. A task can also be cancelled due to Product problems. In this case, a new Product can be assigned or, if that is not possible, penalties can be applied to IFM depending on the contract.

5.3 Use case UC51103: Task modification

There are many reasons for which the customer can decide to modify a task. Task modifications can occur because for example:

- A task is delayed
- The Product is not fit for the task
- The tasks need to be re-planned due to cost or availability reasons

In any case, like task cancellation, the modification of a task can result in penalties.

5.4 Use case UC51104: Fleet availability plan generation

This is the main advantage of using IFM. An integrated fleet plan that shows when a Product is available or not, and that can be used to predict forecast usage must be generated. To prepare this plan, the fleet manager must collate the different activities a Product is going to undertake (operational and maintenance) and always have its latest status and capabilities:

- Operational plan
- Maintenance plan
- Current status
    - Remaining life
    - Configuration
    - Capabilities

5.5 Use case UC51105: Task evaluation

After having performed a task, depending on the contract previously established with the customer/operator, it can be necessary to evaluate it to deduce if it has been successful or not.

This activity is also carried out to improve the assignment process and the route calculation.

5.6 Use case UC51106: Product preparation

Before performing a task, a Product must be ready to ensure a successful performance. This includes carrying out all Product pre-operation maintenance checks.

If the Product does not have the specific configuration needed for the task, it can be modified. This is part of the "Product preparation".

5.7 Use case UC51107: Product recovery

When the task is complete, the Product must be inspected for any failures. All the feedback received from the onboard HUMS and the operator and maintenance crew is used during the "Troubleshooting process".

6 Metrics of IFM

The main metrics used in IFM are related to:

- Forecasted Product availability
- Actual Product availability
- Specification meeting the requirements
- Product performance

This feedback information is required in order to calculate these metrics, but it does not necessarily include the calculation itself.

7 Example

7.1 Travel and leisure bus services

This example demonstrates that IFM can be used with any kind of vehicle or Product. It illustrates the different requirements a customer can have and the wide range of Products the operator and/or owner must meet those requirements.

The main actors identified in this case are:

- Operator. The operator has drivers and operates the Products.
- Owner. Buses owned by a bank and leased to the operator.
- OEM. Maintenance provided by the OEM.
- Regulator. Specifically, the regulations related to the Product and not the customer.
- Customers. Four different types of customer have been identified:
    - VIP travel agency
    - Sightseeing tour company
    - Suburban travel company
    - Inter-city travel agency

The relationship between these actors is depicted in Fig 4.

The vehicles owned by the bank are of four different types (all maintained by the OEM):

- Buses for sightseeing
- Buses for suburban transport
- Buses for inter-city transport
- VIP buses

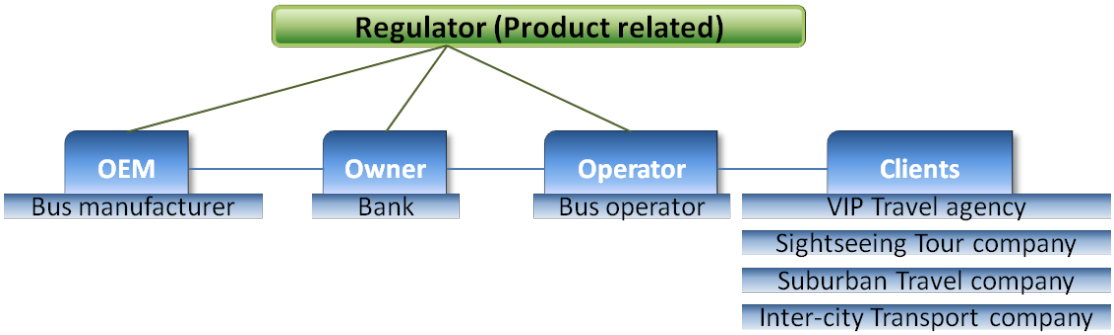

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Fig 4 Relationship between different actors

Some use cases derived from these Products and customers are the following:

- **Sightseeing Tour scheduled.** Open-topped with tour guide (guide provided by customer). Customers hop on and off, no booking but pre-pay.
- **Scheduled suburban transport.** Utilitarian and can accommodate handicapped customers. Customers hop on and off and pay on entry.
- **Scheduled inter-city transport.** Customers pre-book and pre-pay. Bus has TV, toilet, air conditioning and space for baggage etc.
- **VIP Transport random/casual/corporate etc.** Specification changes depending on the customer, completely customizable. All pre-paid.

Applying IFM to the suburban transport use case, we would need on one hand information about the suburban buses , such as how many of them are available, how many under maintenance, fuel status, type of bus (eg, brand, automatic or manual, etc) to find drivers that can drive that specific bus, etc. On the other hand, we will receive requirements from the customer. In this case, it can perfectly be the time schedule of the buses and their routes.

After having all this information IFM would be able to assign one or several buses, with its driver, to a route. Examples of task monitoring would be to be in contact with drivers to be updated about any works or accidents along the road to be able to react and change somehow the route to complete the task on time. Also, we can know if there are more buses needed for a given route (eg, more people, bus break down, etc). After the service, the information retrieved can be analyzed to incorporate modifications and improvements to the service.

8 Data required for integrated fleet management

This section aims to enumerate the information needed to manage the entire fleet of one or more types of Product, whether it is an input or an output. Table 2 shows the inflows and outflows of information between processes are listed.

Table 2 Fleet management source of inputs and recipient of outputs for fleet management

Process	Sub-process	I/O	Information exchanged
Product Requirements Management	Product Requirements Definition	I	**Requirements agreed**
		O	**New requirements**
			Operational Task Proposed
	Product Assignment Confirmation	I	Assignment proposal
		O	Assignment feedback
Product Usage	Product Usage	I	Departure Status
		O	Task cancellation/ modification
			Product monitoring

Process	Sub-process	I/O	Information exchanged
			Product performance
			Product Evaluation
Operations Management	Operation Planning and Assignment	I	Assignment feedback
			Actions needed for task execution
			Product Reassignment evaluation
		O	Departure Status
			Product Availability Update
			Product Configuration Update
			Operation Plan
			Task reassignment
	Operation Monitoring	I	Task cancellation/ modification
			Product performance
			Product monitoring
		O	Product Reassignment evaluation
			Product Operational Status
			Product Performance reports
			Penalties
Product Management	Product Requirements Analysis	I	Operational Task Proposed
			Product configuration update
			Task reassignment
			Operation Plan
			Product readiness plan
			Product Limitations
			Modifications cost
			Product acquisition plan and cost
			Priorities and Commitments
		O	Assignment proposal
			Modifications required
			Product acquisition
			Actions needed for task execution
	Product Setup and Monitoring	I	Product Operational Status
			Reference data
			Product Availability Update
			Maintenance plan
			Certification limitations
			Product basic information
		O	Product damage and usage
			Product limitations

Process	Sub-process	I/O	Information exchanged
			Product readiness plan
Supply Support	Supply Support	I	Product acquisition
		O	Product acquisition plan and cost
Product Maintenance	Product Maintenance	I	Product damage and usage
			Modifications required
		O	Maintenance plan
			Certification limitations
			Modifications cost
			Damage cost
Product Design	Product Design	O	Product basic information
			Reference data
Contracts Definition and Monitoring	Contracts Definition and Update	I	**New requirements**
			Service Level Agreement
		O	**Service Level Agreement**
			Requirements agreed
	Contracts Monitoring	I	**Product evaluation**
			Product Damage cost and Penalties
		O	**Product underperformance**
Contracts Management and Analysis	Contracts Definition Usage	I	**Service Level Agreement**
		O	**Service Level Agreement**
			Priorities and Commitments
	Contracts Analysis	I	**Penalties**
			Product underperformance
			Damage cost
			Product performance
		O	**Product Damage cost and Penalties**

Chapter 12

Feedback of data for software support

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References

Table 1 References

Chap No./Document No.	Title
S3000L	International procedure specification for Logistic Support Analysis (LSA)

1 Introduction

Software is often associated with just executable code, but in practice almost any electronic information associated with such executable code can be considered software. Thus, mission data, configuration files, databases and similar electronic data, are also often considered to be software.

Software size and complexity has continued to grow exponentially in the last several decades in modern Products as well as software applications that perform operational supporting roles.

Software has become a fundamental enabler for many advanced and complex technological capabilities. It is evident that many functions of any Product have some element of software to fulfil the designed capability. Embedded, operational and support software elements are ubiquitous in all parts of a modern integrated Product. Similarly, the usage of data associated with these software products has grown significantly. These include, but are not limited to, executable code that:

- uses mission data r databases in order to operate correctly
- can generate or collect extensive datasets, (eg, Built-In Test (BIT) data, log files, etc)

Not only the design, but also the sustainment of these software products now poses a wide range of challenges and issues. These include, but are not limited to:

- Definition
- Governing policy
- Organization
- Management of software during the in-service phase.

Similarly, software support and its core logistics requirements are not always identified to the level of detail that hardware is, leaving gaps that are not fully addressed in the support feedback contracts.

The distinction between hardware and software acquisition and sustainment is often not clear and so software feedback must be an essential part of the life cycle sustainment of the Product.

2 Objective

The objective of the Software Support feedback information herein is to ensure adequate criteria and use case guidance is provided to ensure software is treated as the same level as hardware for in-service feedback requirements.

3 Scope

The scope of this chapter is to address the challenges that are peculiar to software sustainment support and logistics requirements that are often overlooked in Product support, some of which are addressed in S3000L.

4 Software types

Software can be divided into executable software and data. These two can be further divided into sub-categories, which can often depend on the Product, industry or contractual terms. For example, executable software is often further divided into system and application software for corporate systems, or into airborne and ground software for aerospace systems. Similarly, a distinction can be made between resident or embedded software (often called firmware) and loadable software. It is also possible to categorize the format of the software, such as source code, executable code, library, etc.

Data can be also further categorized as, for example, mission data, configuration data, diagnostic data, logs, database, etc.

It is important to address the type of software, as it can influence the criticality and level of details needed in the feedback loop for Product availability and operational needs.

5 Software lifecycle support requirements

It is considered that software defects, corruption, viruses, computer hardware/network interoperability and obsolescence, usability, enhancements are examples related to software that need the same attention as hardware from a feedback perspective albeit with different data

element requirements. This is not only true for executable code, it applies in the same way to data.

6 Software feedback requirements

S3000L defines the requirements for software support. These requirements encompass software functional and physical breakdown, level of support, maintenance requirements and the support framework, etc, that will be used to define the use cases and relevant feedback data elements.

7 Use cases

The use cases to feedback for software support are based on the software support activities defined in S3000L.

Each use case entry is an activity candidate for feedback from either the users of the deployed software products or by the vendors who produced it. The activities are:

- Feature request. Refer to Para 7.1.
- Error reporting. Refer to Para 7.2.
- Usability. Refer to Para 7.3.
- Documentation errors. Refer to Para 7.4.
- Software and hardware interoperability. Refer to Para 7.5.
- Installation/loading/erasure. Refer to Para 7.6.
- Configuration. Refer to Para 7.7.
- Maturity (frequency of change). Refer to Para 7.8.
- Help desk tickets. Refer to Para 7.9.
- Delivery, deployment and servicing. Refer to Para 7.10.
- Data loading for software operations. Refer to Para 7.11.

Note

These use cases apply to both executable software and data (including feedback data).

Table 2 Use case summary

Activity/Feedback report/Use case	S3000L Chap 13 Reference	Para
Request S/W feature	4.3.3	7.1
Report S/W error	4.3.4	7.2
Report S/W usability	5.3.3	7.3
Report S/W documentation errors	5.3.2, 6.X	7.4
Report S/W & H/W interoperability	3.2.2, 3.2.3, 4.3.2	7.5
Report S/W installation/loading/erasure	3.2.1, 3.2.2, 6.2, 6.4	7.6
Report S/W configuration	3.1.x, 3.2.x, 5.0.x	7.7
Report S/W maturity (change frequency)	5.3.3, 6.X	7.8
Report S/W Help desk tickets	5.1.X, 5.2.X	7.9

Report S/W delivery, deployment & servicing	5.3.1	7.10
Report data loading for S/W operations	3.5, 4.3.1,	7.11

7.1 Use case UC51201: Request S/W feature

A software feature request is initiated when the current capability is either insufficient or needs adjustment for improved operational performance.

Key feature request feedback data elements include, but are not limited to:

- Date submitted
- Reporter name and email
- Product version
- Feature request summary
- Feature request description

Example:

New functionality, new data field, new parameter

7.2 Use case UC51202: Report S/W error

Software errors are caused by bugs in the code or an incorrect interpretation of the requirement.

Key error reporting feedback data elements include, but are not limited to:

- Date submitted
- Reporter name and email
- Product version
- Severity
- Summary
- Description
- Hardware platform
- Operating System (OS) version as applicable

7.3 Use case UC51203: Report S/W usability

Software usability can be defined as a measure of effectiveness, efficiency and satisfaction in the ease of use of the software product/application. The term can also be used as method of improving the ease-of-use of the Product. Software vendors can submit survey questions and users can document the request and provide feedback and/or usability improvements.

Key usability feedback data elements include, but are not limited to:

- Date submitted
- Requester/reporter name and email
- Product version
- Severity (optional)
- Feature name (screen, report, interface, etc)
- Feature use questions or feedback list

7.4 Use case UC51204: Report S/W documentation errors

Software documentation is a critical part of developing, using and supporting a software application. Types of documentation can include requirements, technical, test plans, release notes, user and implementation manuals.

Key documentation feedback data elements include, but are not limited to:

- Date submitted
- Requester/reporter name and email
- Product version
- Severity
- Documentation type
- Error location
- Error description

7.5 Use case UC51205: Report software and hardware interoperability

Software and hardware interoperability can occur whenever there are changes to software capabilities and/or the hardware's operating system software. Software and/or hardware changes must take into account the effects on interoperability and this must be communicated at all levels.

Key software and hardware interoperability feedback data elements include, but are not limited to:

- Date submitted
- Requester/reporter name and email
- Software version changes
- Hardware version changes
- OS version changes
- Severity
- Reason for changes
- Impact assessment and regression testing requirements

7.6 Use case UC51206: Report S/W installation/loading/erasure

Software installations and the need to erase software from hardware are functions that need to be regularly performed. Accurate documentation of results and issues found during these activities must be communicated to all stakeholders.

Key software installation, unloading and erasure feedback data elements include, but are not limited to:

- Date submitted
- Requester/reporter name and email
- Software version
- Type of action performed
- Results and discrepancies

7.7 Use case UC51207: Report S/W configuration

Hardware configuration is essential in ensuring accurate traceability to LRU/SRU in maintenance tasks. The same applies to software and so configuration controls over software versions must be maintained and communicated between all stakeholders.

Key software configuration feedback data elements include, but are not limited to:

- Date submitted
- Requester/reporter name and email
- Computer Software Configuration Item (CSCI) and version
- Hardware on which it is loaded
- Hardware part number and revision on which the software runs
- Superseding software version
- Superseding hardware part number

7.8 Use case UC51208: Report S/W maturity

The effects of software maturity are of interest to all Product stakeholders so that minimal impact on operations and Product availability can be ensured. Agile methodology, critical bugs and scheduled maintenance can impact the frequency of software releases. Information on release dates and notes must be communicated to all stakeholders so that the necessary planning can be put in place for timely upgrade and actual embodiment in accordance with a required schedule.

Key software configuration feedback data elements include, but are not limited to:

- Software CSCI
- Date submitted
- Requester/reporter name and email
- LOG report of release number and dates over a duration

7.9 Use case UC51209: Report help desk tickets

Software help desk tickets are used to manage the recording and resolution of all software and documentation errors. These help desk tickets can be used as a mechanism in conjunction with all the use cases described above.

Key software configuration feedback data elements include, but are not limited to:

- Ticket number
- Date created
- Reporter name and email
- Ticket category
- Priority
- Severity
- Issue description
- Digital attachment

7.10 Use case UC51210: Report S/W delivery, deployment and servicing

With advances in technology and the internet, there are many options for software delivery and deployment. For example, security requirements can impact cloud infrastructure, web services, web portal (for software use), and download functionalities compared to physical delivery by media, such as DVD, SSD, USB, etc.

Key delivery, deployment & and servicing feedback data elements include, but are not limited to:

- Date submitted
- Requester/reporter name and email
- Software CSCI and version
- Release date
- Delivery method

- Security status
- Deployment instructions

7.11 Use case UC51211: Report data loading for software operations

Data needed for a software application to a function of the Product or to operate the Product is considered a separate activity from installing and deploy the software. Data format and method of loading the data must be communicated.

Key data loading for software operations feedback data elements include, but are not limited to:

- Loaded software
- Loading times
- Preparation times
- Used support equipment

Chapter 13

Feedback of configuration management data

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References

Table 1 References

Chap No./Document No.	Title
S1000D	International specification for technical publications using a common source database
S3000L	International procedure for Logistics Support Analysis

1 Introduction

The configuration in-service for a given Product is one of the most important elements that affect the Product operation, not only for operational reasons but also to ensure the Product safety and to comply with the regulations affecting that particular Product (eg, airworthiness regulations).

2 Scope

Configuration management data feedback covers information about how to provide the different Product configuration, aspects, the information that is required for configuration control purposes, the initial configuration information provided to the customer, (including its updates), and the information that must be provided to the Original Equipment Manufacturer (OEM), or other design authority, for logistics, technical and legal (eg, to ensure continuous airworthiness) purposes.

3 Peculiarities of the in-service configuration

The in-service configuration is characterized by the fact that it focusses on individualized physical configurations. During the design phase, a Product has a generic configuration and parts are considered generically (eg, by means of a part number). However, during the in-service phase, each Product is unique, and individual parts can require their separate identification (eg, a serial number) so that they can be controlled separately due to limited life, the need to control their individual reliability, high cost and control of ownership, or due to legal

reasons. Given that the individual parts change due to maintenance tasks, the in-service configuration must be flexible and maintained in real time.

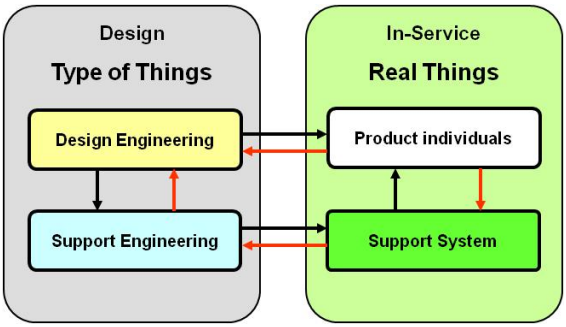

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Fig 1 Difference between design and in-service

Though the physical configuration control can be also performed during manufacturing phase, the elements that are considered at that time are not usually the same as those used during the in-service phase. During manufacturing the building blocks used for configuration are constituent assemblies, which are a set of physical elements that are manipulated as a single entity for the final assembly, such as a wing, an engine, a chassis or a rack of equipment. Importantly, the constituent assemblies are used for the maintenance tasks, which are usually structured around components associated to individual systems. Often a constituent assembly corresponds to a maintenance item (eg, an engine), it is further decomposed into its lower-level elements (eg, a valve, a sensor, a pipe, etc), which can require their separate maintenance actions and are ignored during the assembly process because they are delivered in an assembled condition.

The objectives of the in-service configuration, therefore, are to provide enough information so that:

- The operator can manage, control, operate and maintain the Product, during its operational phase, in an adequate manner, while complying with potential legal requirements
- The manufacturer knows whether the Product in-service behavior is as expected or requires post-manufacturing changes. This serves as the baseline to propose improvements so that the capacity, effectivity and maintainability of the Product, and even a reduction of the operating and maintenance costs, can be improved.

When considering these two objectives, a common language for both the operator and manufacturer is necessary. Similarly, as the manufactured Product is at the beginning of the in-service phase, and the operational configuration is mapped to the design by the manufacturer, it is necessary to ensure the traceability between the design, manufacturing and operation phases, (or between the operator and the manufacturer) is sufficient to ensure the manufacturer's support capability and continuous improvement are correct.

Given that the relationship between the Product OEM and the operator that ensures a coherent infrastructure, is the IPS discipline, the identification of the in-service Configuration Item (CI) must be linked to that established in S3000L, so that a common link for the in-service data exchange is achieved.

4 Configuration principles

Configuration Management is a discipline that:

- Identifies and documents the physical and functional characteristics of a Product which, due to its high cost, complexity, operational essentiality, safety aspects, maintainability (eg,

life limit, periodic checks, etc) and/or any other reason, can require a specific control and an adequate logistic support
- Controls the changes applied to the individual elements, so that their impact can be determined, and their implementation can be controlled
- Allows the optimization of information flows that facilitate error correction and, the collection of all available information, and hence ensuring traceability and enabling an understanding of a dynamic Product configuration
- Is used for contractual verification to verify that the requirements are met

The Configuration Identification is common for the set of items that a manufacturer builds and presents as a model. Though different versions of this model can exist, they will have sufficient common elements so that a single configuration can be established, and this configuration will reflect the specificities by means of the applicability or effectivity of the CIs.

4.1 Configuration tree

The configuration tree is a representation of a Product configuration. It is formed by blocks and structured hierarchically. Each block represents a configuration element.

The configuration tree hierarchy has usually two levels, a functional level with no more than three levels that depicts the configuration of its system, subsystem and sub-subsystem, and a physical level below it corresponding to equipment and components. Equipment (eg, an engine) can have no functional level, in which case the hierarchy reflects its physical breakdown. Functional items can exist in this configuration tree, to indicate, for example, a hardware-software combination. Refer to Para 7.

A CI reflects a function within a Product, which can be a single physical item. When, a single item performs more than one function, the configuration tree must show that a part can perform functions for more than one system.

A classic approach to create the configuration tree is to use the CIs for the first two levels, in the same way as the Standard Numbering Systems (SNS) in S1000D, and for the remaining levels use the Product Breakdown Element Identifier (BEI) from S3000L. If neither of those are available, then create a breakdown that reflects the breakdown of the item.

The first CI of the functional/physical level will be the one where the function specified for the item is performed by a part that can be physically identified, and that can be directly disassembled from the Product. This kind of item is often called Line Replaceable Item (LRI) or Line Replaceable Unit (LRU).

For simplicity, the Configuration Tree of a Product will only cover those parts that can be directly disassembled as a final element (which can be considered as a Product by its own right). It can occur that certain parts can require to be subjected to Configuration Control, but if their disassembly requires the prior disassembly of the item to which they belong, then these parts will form part of the physical tree of the sub-Product to which they belong. This implies that if a sub-Product is disassembled, it takes with it its own internal configuration tree.

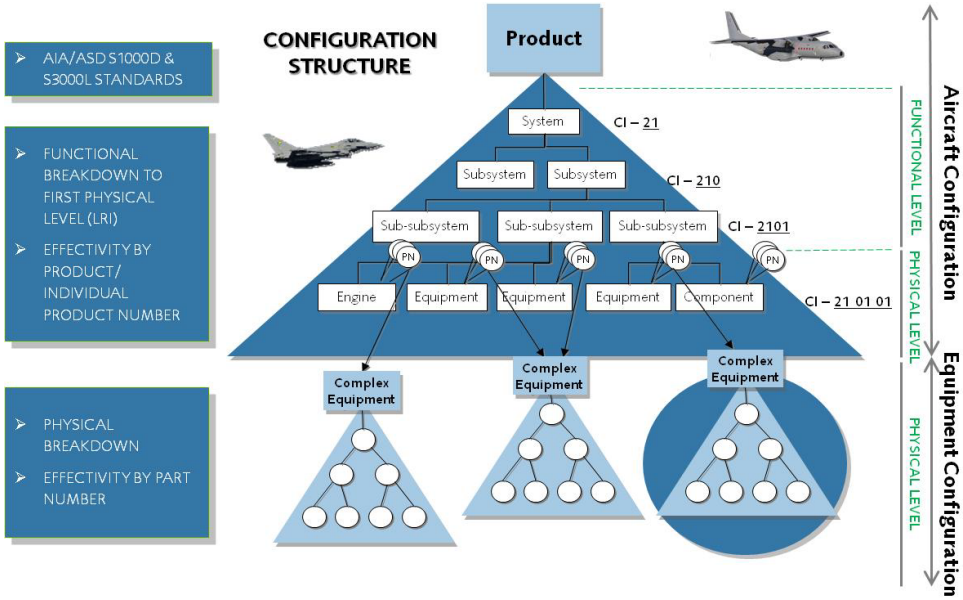

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Fig 2 Abstract configuration tree breakdown

Each CI will have its own identifier, with a structure and coding based on S1000D (for the first two configuration levels) and the Breakdown Element Identifier (BEI) of S3000L.

Note

The configuration tree distinguishes not only between the different elements, but also their positions.

Therefore, the item code identifying any item within a Product, apart from identifying its function, needs to include in its coding the:

- Hierarchy level within the tree where it is located
- Item position

Given that the configuration tree is based on a specific model, it is necessary to keep in mind the exceptions at all levels and positions. That is, it is necessary to differentiate those parts or items that are only applicable to some Products of a same model. This concept is called effectivity. All CIs must have specified the Products to which they are applicable. At the physical-functional level, the effectivity must be assigned to the concept position-part, given that the part can be different in different positions for each individual Product.

The physical configuration identifies a breakdown of a specific part. Contrary to the breakdown performed in design or manufacturing, the in-service structure breakdown only needs to contain the necessary information to operate or maintain the part. It is essential to have a minimum recommended breakdown, including at least the LRI or LRU parts requiring a specific life control, that are subject to periodic inspections or life limits. The rest of components are usually agreed between the manufacturer and the customer, depending on the type of maintenance that is going to be performed on the Product. Items whose reliability will be monitored should also be included in this breakdown.

The physical configuration is represented as a structure of father-child relationships, as at this level the items cannot be associated to a specific function.

4.2 Configuration item identification

The CI identification is an identification code of an element or set of elements, hardware, software or a combination of both, or any of their discrete parts, which perform a final function, and which are subject to configuration control. It is one of the blocks forming the configuration tree.

There are many ways to generate this identification code; most of them will depend on the project requirements, but the S-Series IPS specifications do not mandate a specific one, they allow any kind of identifier to be used, whether project-specific or not.

One method that has been used in the past in order to reflect the first three concepts (level, hierarchy and dependency), was to use a numeric identifier, with a maximum of eight characters, in such a way that a code identified:

- Two positions: a system
- Three positions: a sub-system
- Four positions: a sub-sub-system
- Six positions: an equipment
- Eight positions: a component

The relationship between elements of intermediate level is in this example obtained from the own item structure and coding, given that the immediately upper identifier of an item will be the one matching the identifying characters of the immediately upper level, that is, the one obtained when removing the item-specific characters. The lower (child) items will be those that contain in their root the identifier of the item in question and additional digits identifying their level within the hierarchy.

It is not advised to use the 8-position code (component) if using the Product functional and physical breakdown structure. As explained in Para 4.1, the physical structure represents the part breakdown of a sub-Product, and would imply a redundancy of the first equipment level breakdown, as it would be represented in both structures.

Any characteristic associated to the item function should be identified at this level.

In some cases, parts are mounted on other parts that do not belong to the function of the main part (sub-Product). For example, the temperature controllers of an engine, which iaw an example of S3000L belong to chapter 78, are installed in the propulsion system, which is identified as belonging to chapter 38. In this case, we should code the controllers as part of chapter 72 when creating the structure. This will allow using it during maintenance, and to disassemble them at the same time as the engine itself, but an item referencing system needs to be created so as not to lose their original coding, as there are other functions or support elements (eg, documentation) that use that other reference.

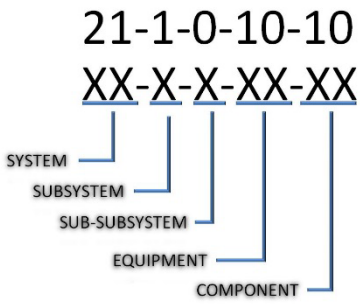

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Fig 3 Example configuration item codification

This CI identification is generated usually as part of the LSA work, and in that case, this should refer to the configuration identification rules used within S3000L. However, if no LSA is performed on a specific program, it becomes necessary that such identification is performed by the OEM, to be able to map back the data feedback to its own design. Note that S3000L does not mandate a specific identifier format.

In any case, independent of the coding mechanism or methodology, it is essential that all parties exchanging data share the same identifiers.

4.3 Configuration item position

The CI must identify the function and clearly indicate in the functional/physical breakdowns the slot (position) in the Product where the CI performs that function.

A CI in a generic Product can exist more than once if the same function is performed by several parts. For example, a Head-Up Display (HUD) can exist twice in a same vehicle, performing the same function for a pilot and a co-pilot. In this case, it is necessary to identify unambiguously which item is specifically mentioned within a specific configuration slot (eg, right/left, forward/aft, top/bottom, etc).

For this reason, and to consider the items that have multiple installations though performing a same function, we can completely identify a slot by adding a code identifying the different possible positions.

The most used codes are:

- Geometric codes, such as for example, left or right, or top and down, etc. This approach is the default one provided the symmetry is represented always from a clearly identified point.
- Color coding, when geometry cannot unambiguously identify an item. An example is the identification of propeller blades, as their exact position at a given moment is unknown, as it will depend on where the engine stops.

Each gap in a Product, identified by the CI and position code, will have the different identifications of the items that can perform the corresponding function. These identifications will be generally the part number and manufacturer code. The individual item filling that gap will also be identified by the serial number, if applicable.

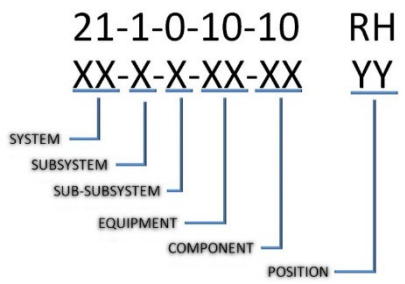

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Fig 4 Sample configuration item position

The advantage of using this structure, if provided by the OEM iaw S3000L, is that it will allow an unambiguous identification of an item, including its position on the Product. This is important not only for reliability studies (a same sub-Product, when installed in different locations, can fail very differently), but also to assist the OEM in providing more adequate support and to allow him to better focus on the Product improvement as he will have a direct traceability to the original design.

Note

None of the coding provided here as examples is mandatory; any other agreed coding that unambiguously identifies an item and its position is perfectly usable for data feedback. The only requirement is that these are the same codes used by both the entity providing feedback and the one receiving it.

4.4 Effectivity management

The concept of effectivity refers to the restrictions of the applicability of a CI or a part assigned to a CI within a Product; that is, it is not applicable to all Products of a same model.

When a functional type CI or a part associated to a functional/physical item is not applicable to all Products, the effectivity will be recorded by indicating the identifiers of the Products to which it is applicable as follows:

- If applicable to one or several models, but not all, it will identify those to which it is applicable
- If within one model a CI or part should not be applicable to all individual Products of that model, in addition to the model it will also include the range of individual Product identifiers for which it applicable (with initial and last identifier), the use of multiple ranges being allowed

For example, an effectivity (A7, 30-40) of an item could mean that it is can only be installed on the serial number 7 of model A and serial numbers 30 to 40 for all models of a specific Product.

For functional level CIs, the effectivity is directly linked to the CI. For functional/physical CIs, the effectivity is associated to the identification of the parts assigned to the CI, and the effectivity of the CI will be therefore the sum of the effectivity of the parts it has assigned.

Example: A CI C has two items C1 and C2, with C1 having an effectivity (10-50) and C2 having an effectivity (7,15, 30-60). The effectivity for C will be therefore (15, 30-50).

Another important aspect to be considered regarding the effectivity is when it is affected by a modification performed on the item configurations. In this case, it will be necessary to consider the applicability based on whether the modification has or not been embodied. The final update of the configuration structure will be then performed when the modification has been embodied on all items for which it was applicable.

This handling of the effectivity also allows recording any peculiarity in the generic configuration of a model, and therefore obtaining the configuration tree at any level, from the most general one for the whole model down to the most particular one for a specific reference identifier.

5 Configuration information feedback

Fig 5 gives an overview of the configuration information that flows between the different in-service stakeholders. These stakeholders are:

- OEM: This stakeholder is responsible for the configuration of the Product
- Customer/operator: This stakeholder is responsible for operating and for the operational aspects of the Product
- Maintenance, Repair and Overhaul (MRO): This stakeholder is often a third party, responsible for either embodying a modification or performing some specific maintenance

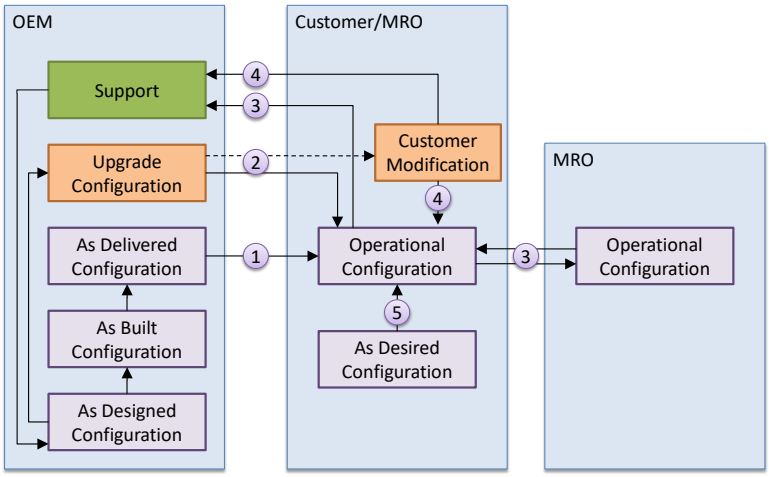

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Fig 5 Configuration information flows

Note

The configuration flows within the OEM have been identified in Fig 5 only for completeness.

There are five configuration information flows, which are:

- As-delivered configuration. Refer to Para 5.1.
- Upgraded configuration. Refer to Para 5.2.
- Operational configuration. Refer to Para 5.3.
- Customer modification information. Refer to Para 6.3.
- As-desired configuration. Refer to Para 5.4.

5.1 As-delivered configuration

The as-delivered configuration (marked as ① in Fig 5) is the configuration of the Product at the moment that it is handed over to the customer. The as-delivered configuration must be sufficient for the operator to manage the Product. The appropriate level of detail in the information must be agreed with the customer. At a minimum level of information must cover the items referenced in the maintenance plan.

Regardless the level of detail, the type of information is generally the same. The as-delivered configuration consists of:

- The allowed configuration. This consists of the CIs that define the Product, represented by their item breakdown. This must include:
  - The list of CIs on the Product in its different configurations including:
    - The different basic configurations of the Product and the different capacities that these configurations can provide
    - All the possible operational configurations of the Product, representing different roles or missions that the Product can perform (eg, aircraft in transport or tanker configuration, ship in passenger, transport or medevac role)
  - All interchangeable parts that have been identified at CI level:
    - All positive (necessity) or negative (incompatibility) compatibility rules that have been defined

    Note

    For compatibility rules, refer to Para 5.1.3.2.

  - Any other data that can indicate differences between multi-applicable or multi-installation parts at CI level, such as life correction factors

- The actual configuration. This is the list of items with their corresponding serial numbers installed on a specific final Product and associated to the corresponding slot in accordance with the defined allowed configuration structure. The actual configuration will be complemented with additional information that describes each serialized item, which on delivery will include:

  - Life consumption or overhaul potential (due to industrial tests)
  - Concessions, if any, and the limit, if established, for the use or rework of the item that are granted (by waivers or deviations) to the manufacturer, when the Product does not correspond to the agreed specifications

- Industrial modification. The list of modifications introduced during Product manufacturing. At a minimum, the list must include those modifications that have been requested by the customer and have been embodied before the Product is delivered in its customized configuration.

  Note
  These normally would be handled post-delivery as Service Bulletins, but do not follow the usual post-delivery process because they are embodied before the Product delivery.

- Concessions. Deviations or incomplete work on the delivered Product that must be accompanied by an action and a limited period for execution.
- Delivery configuration of additional sub-Products or items that can be fitted to the Product (also known as loose items) but are not installed at the time of delivery (eg, medevac kit)

The as-delivered configuration is important to the customer because:

- It provides a contractual listing of everything that is fitted on the Product
- It provides a contractual listing of potential waivers and deviations to the approved design
- It is the starting point (T0) of the operational configuration

5.1.1 Allowed configuration

The allowed configuration is the basic Product configuration approved by design. It is delivered to the customer at the agreed level of detail, based both on the maintenance plan applied to the Product, and to the maintenance level(s) performed by the maintainer. All items on this list will be monitored throughout the whole Product life cycle. The allowed configuration includes all allowed operational configurations.

The information about the items on this list must be sufficient to define the level of usage restrictions, authorization, limitations or any other useful data related to the operation, maintenance or logistics.

The allowed configuration is the generic configuration that is applicable to all Products of a same model, and it will contain a functional and physical breakdown section. Refer to Para 4.

When developing the allowed configuration, all parts within the physical level of the structure must be identified as serialized control.

Note
Serialized control is a flag or marker that indicates which serialized parts must be monitored to ensure compliance with the allowed configuration.

This configuration will be the template on which the actual configuration will be constructed, and where any event along the Product life cycle will be tracked such as those recorded in the Operational Configuration flow. Refer to Para 5.3.

For an item configuration, the item type is typically used to identify those items that form part of the basic configuration and that are required for the Product to perform its main function. For an operational configuration, the mission or operation type is typically. Refer to Para 5.3).

At the item configuration level, the minimum information that must be provided for each item is:

– Identifier
– Quantity

Note

If the quantity is greater than 1, the position of each individual item must also be provided (eg, center, left hand, right hand). Refer to Para 4.3

– Essentiality type

Note

In the case of mission or operational mode this must include the mission or operation type.

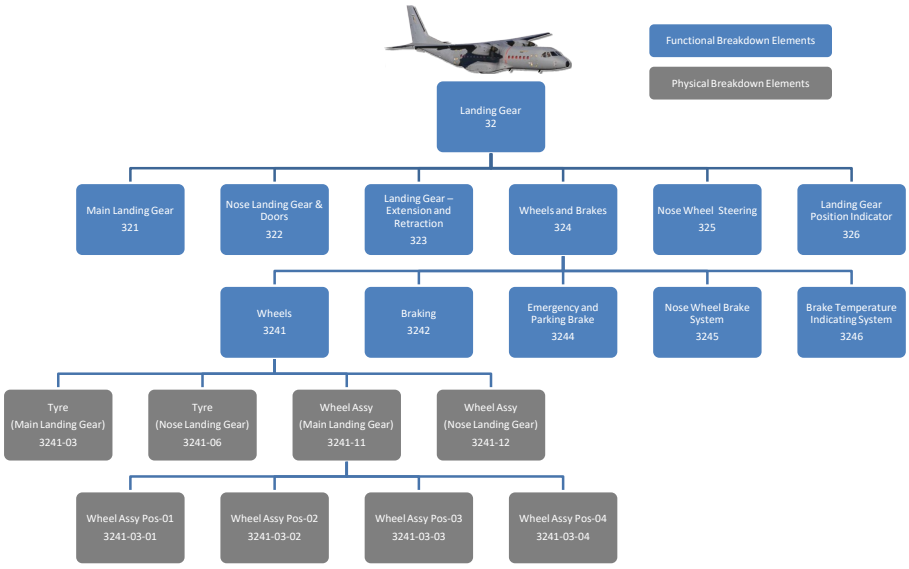

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Fig 6 Allowed configuration tree example

Note

The essentiality information is provided by the OEM. It indicates the degree to which a failure or fault in a CI affects the operating capability of the Product. There are six degrees of failure:

1 Does not affect the Product capability (ie, the Product can perform all missions or tasks for which it has been configured).

2 Does not affect the Product capability but affects safety.

3 Does not affect the Product capability but does affect specific requirements for operation (eg, legal, environmental, etc).

4 Partially affects the Product capability (ie, the Product cannot perform at least one of the missions or tasks for which it has been configured).

5 Requires the performance of a physical action, other than the item repair, to restore the Product capability.

6 The Product has no capability to perform any of the missions or tasks for which it has been configured.

Once the set of CIs has been defined, the CIs of the functional/physical type must be associated with the parts performing the function of the CI.

These parts are associated with their location in the breakdown hierarchy and are identified by a part number and manufacturer code, so that they can be uniquely identified.

Note
Sometimes the manufacturer code is implicit.

All items that the manufacturer specifies as being able to perform the function are identified, independently of the interchangeability, effectivity, etc, which are documented separately.

The concept of effectivity refers to applicability restrictions to a CI, or a part assigned to a CI (ie, the item or part is not applicable to all configurations of a Product.

When a functional CI, or a part associated to an item of functional/physical type, is not applicable to all Products, the numbers or the range(s) to which it is applicable will be recorded. Refer to Para 4.4.

The effectivity of the functional CIs is directly linked to the CI, while in the case of the functional/physical CIs the effectivity is associated to the identification of the parts assigned to a CI. In this latter case, the effectivity of the CI is the sum of the effectivities of the parts assigned to it.

Another important aspect to be considered in the effectivity is when this is affected by a modification performed to the Product configuration, as it will be necessary to consider the applicability based on whether the modification has or has not been embodied. It is also necessary to perform the final update of the configuration structure when the configuration has been embodied on the items to which it was applicable. Refer to Para 5.2.

This handling of the effectivity allows also recording any peculiarity in the generic Product configuration, and therefore obtaining the configuration tree at any level, from the most general one to the most particular one for a specific item.

5.1.2 Baseline configuration

The baseline configuration is the basic allowed configuration to which all potential operational configurations need to refer, so that a change from one configuration to another is possible. This baseline configuration cannot be changed, except by means of a service bulletin or other authorized engineering document. Refer to Para 5.3.2.

5.1.3 Operational configuration

It is necessary to record the operational configurations separately from the ones that are specific for each CI.

The recorded information will allow determining the CIs that must appear in a Product so as to be in a specific operational configuration and to be able to carry out the corresponding Product task or mission.

A CI that has no operational configuration associated to it is understood to be valid for all of them, and the associated essentiality class will determine the level of essentiality.

It is however important to realize that even if a CI is valid for a specific operational configuration, there are relationships with other items that will disallow the use of this CI in a specific operational configuration.

There are two configuration relationships:

- Interchangeability
- Compatibility

5.1.3.1 Interchangeability

Interchangeable relationships are those physical items that without having the same identification as the item that they are going to replace have been homologated by the manufacturer to comply with the required functional specifications.

The interchangeability will be recorded as the relationship between all parts that are applicable to a same gap.

The interchangeability is not specific information of the CI, but rather a relationship between two or more parts to be installed in a same gap identified by its CI, including their position if necessary.

The interchangeability codes indicate the type of interchangeability relationship between pairs of parts occupying a same gap.

Should no interchangeability code be indicated, then it will be assumed that all parts are totally interchangeable because they are associated to the same gap.

These codes are as follows:

- Not interchangeable or interchangeability not studied
- Totally interchangeable, but the first one being preferred (possibly because the second is obsolete)
- The interchangeability relationship is only in one direction, in such a way that the part appearing in the first position of the relationship can be replaced by the second one, but not the other way around
- When the interchangeability is total between two items, but these are not completely identical
- If the interchangeability is qualified, that is, there are conditions to it, and the interchangeability condition must be specified
- Totally interchangeable

5.1.3.2 Compatibility

The compatibility relationships reflect those of specific interfaces between two CIs.

The compatibility relationships will be recorded in those cases where the installation of a part is conditioned by the need of one or more other ones, or the impossibility to have them together. Therefore, in addition to the elements affected by the compatibility, a code will be associated that indicates whether the compatibility relationship implies that the items need to be installed together or not be installed simultaneously on the same Product. The compatibility relationship is not understood as the existing relationship of items belonging to the same configuration branch.

The compatibility can be recorded on three levels:

- Between CIs, which will indicate the compatibility relationship at CI level, and that will include all parts associated to all gaps of the CIs and the CIs below them, if any
- If there is a compatibility relationship between gaps, their compatibility relationship will be indicated, covering all parts that are applicable to them
- The compatibility between parts will be recorded between the part numbers-manufacturer associated to the different gaps

The compatibility can be:

– positive, requiring additional CIs to be installed to enable the interchangeability

Example of positive compatibility:

"A_2 can replace A_1 if C is installed" (eg, C is required because it is a special controller for A_2)

Example of negative compatibility (incompatibility):

"A_2 can replace A_1 if B_1 is not installed" (eg, because B_1 will cause A_2 to work incorrectly)

Complex conditional rules can be broken down into elementary aggregated positive and negative conditional interchangeability rules:

"A_2 can replace A_1 if B_1 is not installed and C is installed" could be broken down into the two above examples

– negative (also called incompatibility), prohibiting the installation of the CI with certain other CIs

Note

The positive compatibility is unidirectional, meaning that the fact that one CI requires a second one does not mean that this latter requires the former (in the first example, C does not necessarily require A_2).

On the other hand, the incompatibility (negative compatibility) is always bidirectional (in the second example, B_1 and A_2 should never be installed simultaneously, independently from which one was installed first).

The term compatibility is also sometimes referred to as mixability, to highlight how different items can be mixed.

5.1.4 Actual configuration

The actual configuration is made up of the allowed configuration as applied to a specific item at a specific moment, indicating in each position the serial number occupying it.

In addition to this particularized representation, each serialized item number will have an associated set of information that will define it. This is called the item logbook.

Upon delivery, or immediately after being manufactured, it will only have information about:

– Consumed life, if controlled, due to any functional test if this was performed before delivery
– Concessions, if the manufacturing process has suffered deviations to the original design or has pending work to be performed on the item so as to finish its complete manufacturing process
– Should these concession mandate limitations of use of the item, then these must be specified, as well as their expiration date or the condition for these to disappear

5.1.5 Industrial modifications

This refers to the list of the modifications that will define the final Product, either regarding the capacity or the definition of a model in respect to another one.

This list will be information only for reference purposes; as such definition or capacities are part of the Product.

5.1.6 Concessions

These are deviations of the manufacturing process with respect to the original design or pending work to the item so as to finish its manufacturing process.

Should such concessions imply limitations to the use of the item, it is necessary to specify these, as well as their expiration date or condition that will imply the end of such concessions.

5.1.7 Loose items

The configuration of the loose items covers the delivery configuration of all elements which, though they could be potentially fitted on the Product and form part of the basic Product configuration, cannot be physically installed on the Product with the configuration that is actually delivered to the customer.

Loose items are usually mission or role equipment that are delivered simultaneously with the Product but cannot be fitted on it because the mission configuration that the customer requests on delivery prevents this. It is however perfectly possible that the customer changes the role during the Product acceptance, or shortly after accepting the Product, and hence needs the associated configuration information to be delivered at the same time as that of the Product itself.

For example, a military transport could potentially be used for paratrooper launch and medevac missions. If the delivery is performed with the paratrooper seats installed, the medical equipment (eg, stretchers, etc) would require delivery as loose items because of the incompatibility of both roles.

Note

The next aircraft could have the roles reversed and provide the paratrooper seats as loose items.

5.2 Upgraded configuration

The upgraded configuration is the evolution of the allowed configuration as supplied by the OEM due basically to the introduction of Product improvements.

It will be made up of the same information as indicated in Para 5.1.1 and the proposed modification.

5.2.1 Evolution of allowed configuration

Once the baseline configuration has been established, modifications to the record can appear to correct anomalies, include new CIs or to implement changes performed on the actual configuration, such as new interchangeability relationships, issue of modifications affecting the configuration structure, etc.

For this reason, the identification of the configuration in effect will be the one approved initially, plus all changes introduced into the configuration structure during the Product operating life.

As explained, a change in the configuration identification can be caused by two different reasons:

- Due to the issue of a modification by the OEM, either because of legal requirements or Product improvements (eg, Airworthiness Directives or service bulletins for aerospace Products)
- To perform a correction or improvement to the existing configuration

In addition of considering the change, the system must control at any moment the information flow, from the moment that the need for change is generated until it is rejected or approved and implemented.

Given that the configuration structure is core information for others, it is essential that the study and incorporation of any change in the structure is performed in such a way that it allows ensuring the information integrity.

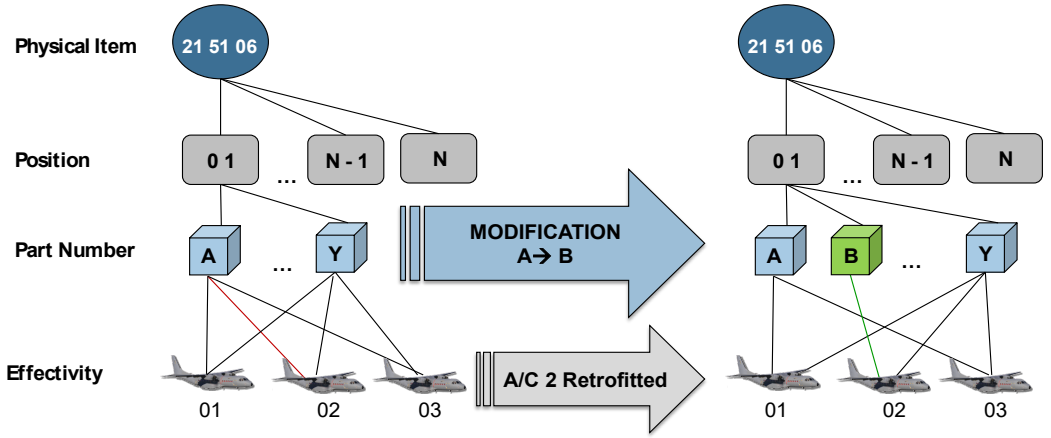

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Fig 7 Configuration changes

Within the changes that are caused due to a request for embodiment, it is possible to distinguish the following cases:

1 Those cases where the modification embodiment status will depend on whether a specific part is or not applicable; in these cases, a provisional structure will be created that will be in effect while the modification is not embodied into all affected Products.

The provisional structure will have the following form:

Outgoing part:

Associated to the part identification in the gap where it is applicable, it will be necessary to record the effectivity, the identification of the modification and with the Before/After the modification it is necessary to indicate the code corresponding to before. This indicates that the part is applicable if the individual Product where it must be installed has the modification not yet embodied.

Incoming part:

The part identification will be entered in the corresponding gap with the associated effectivity, the identification of the modification and with the Before/After the modification it is necessary to indicate the code corresponding to after. This indicates that the part is applicable if the individual Product where it must be installed has the modification already embodied.

2 The changes caused by a modification that do not change the configuration structure itself, such as for example changes in the relationships of interchangeability, compatibility, effectivity, etc.

The former will cause a change in the configuration identification at the moment of emitting the modification, which is when the provisional structure is generated, and another when it is fully embodied, and the provisional structure becomes definitive. The changes of the second type will usually only affect the structure when it is created.

The embodiment of a modification must be reported by the operator, updating as necessary the provisional structures that the manufacturer reported when the modification was launched.

5.2.2 Modifications

It is necessary to perform the global tracking of the modifications so as to determine the ones that have been embodied or pending for each Product.

In addition of the identification, each modification must specify whether it is:

- It is a non-recurrent modification
- A recurrent modification. In this case, it is necessary to document the type of embodiment interval and the indicator (eg, every 50 operating hours), as well as the action that will close the modification.

In addition, it will be necessary to clearly specify the obsolescence or cancellation of the materials affected by the modification, as well as the affected documentation and the modification kit required to perform the modification.

Note

Non-standard information such as drawings or CAD files, sometimes require distribution together with the modification.

5.3 Operational configuration

The operational configuration, often called as-maintained configuration (marked as ③ in Fig 5), is a snapshot of the Product configuration at one given moment. The operational configuration is continuously changing due to the fact that there are Product role changes that require removal and installation of specific equipment, that specific CIs are replaced by other ones due to failure, scheduled maintenance or overhaul, that service bulletins are embodied, or that specific elements have been removed due to the need for cannibalization so as to make another Product operational.

The basis for the operational configuration is an allowed configuration called baseline configuration. This baseline configuration is the common denominator of all allowed configurations, and one operational configuration will always include the baseline configuration. Often changing from one operational configuration to another implies returning the Product to the baseline configuration, and then adding CIs to achieve the operational configuration.

The trigger for a change in the operational configuration is a work order. The operational configuration needs to be reported to the Product owner (if performed by a third party), the operational command and usually also to the OEM, either to obtain specific support or for legal reasons. The operational configuration is also provided with the Product when it is sold or handed over for a major overhaul or returns from it. In this case, it is provided in a similar way as the as-delivered configuration described in Para 5.1.

5.3.1 Removal/installation of equipment without replacement

The removal/addition of a Product in a next-higher assembly (eg, equipment that is installed on or removed from a Product) is in principle not affected by the interchangeability requirements, as it is not exchanged for another item.

However, it must be kept in mind that the installation/removal of such Product must comply with the compatibility rules of the next-higher Product:

1. In the event of removal, a positive compatibility can be violated (another Product should not remain installed because it requires the removed Product to be present).
2. In the event of installation, it can violate an incompatibility rule (the installed Product should not be installed simultaneously with another Product that is already installed).

Thus, the removal or installation of equipment without a replacement action requires compliance with the compatibility rules outlined in Para 5.1.2.

5.3.2 Embodiment of service bulletin

The embodiment of a service bulletin is the execution of a modification on an item that is already in-service. The service bulletin is associated to one or more design changes that define a new baseline configuration. The service bulletin contains the necessary instructions about

how to carry out such modification on an existing item and usually also the material (and possibly also the tools) required.

Once a service bulletin has been embodied, the affected part(s) change their part number to reflect the modification that has been `performed on them. If the parts are installed on a Product, the Product operational configuration needs to be updated to reflect that it now contains new parts. Refer to Para 6.2.

5.3.3 Actions or performed work

The list of actions performed on an item. These are classified into:

– Unscheduled maintenance:

This is the work that has been performed to correct a failure or problem. These are not predictable and sometimes the failure is not documented in the technical documentation of the manufacturer. For this reason, it is necessary to document:

- Failure definition (eg, symptom, when it occurred, etc)
- The possible system that is failing or the part, if it is possible to isolate at this level

Note

In this case it is important to document the CI identification, including the location.

- The corrective action that has been performed and has corrected the failure or made the problem disappear
- If such action implies replacement of components, these must be specified, and the actual configuration must be updated to reflect these replacements if such items are under configuration control
- The date and any other reference of interest

– Scheduled maintenance. These tasks are the ones recommended by the manufacturer's manual. Usually these tasks are grouped into sets of tasks called inspections or checks. It is necessary to document that these have been carried out following the manufacturer's instructions:

- Definition of the check (list of tasks comprising the check)
- Possible findings found during the inspection
- In case that this action implies the replacement of components not listed in the instructions of the manual, then these must be specified
- The date and any other reference of interest

5.3.4 Concessions

Usage limitations can appear during the usage of an item, or the wear can change physical characteristics that must be studied. This is called operational concession.

Once it has been studied, the result can be:

– The item is still fully operational (eg, changes of color of metallic elements that, when studied, it is determined that the operating capacity is not affected)
– Item usage limitations can be established; these limitations must be specified and the possibility that these can disappear
– There is no solution to the problem, and an expiration date for the item must be established, after which the item must be either replaced or redesigned

5.4 As desired configuration

The as desired configuration (marked as ⑤ in Fig 5) is the configuration that the operator wants to have at a certain moment in time so as to perform a certain mission with the Product. Thus, the as desired configuration is (one of) the allowed configuration(s) that allow to perform a

specific mission. The purpose of any action to be taken by the maintenance organization is to ensure that the operational configuration matches the as desired configuration, so that the mission can be performed.

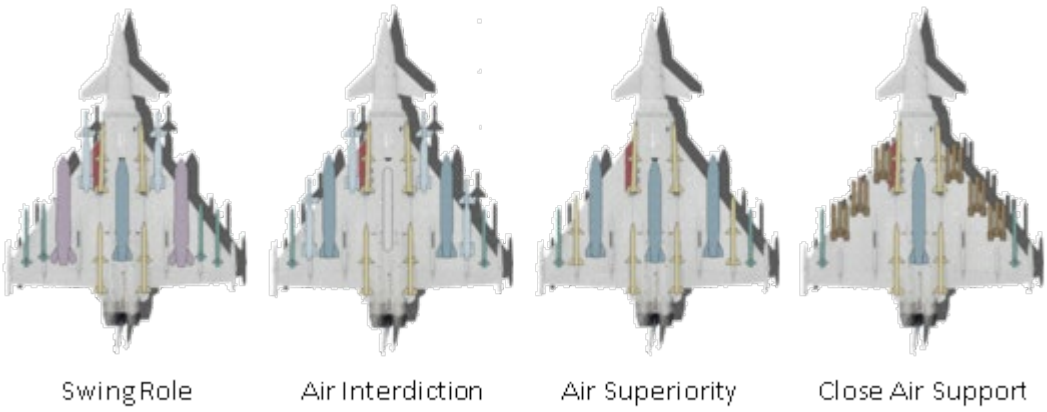

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Fig 8 Example of as-desired configurations

The challenge in this case is that the Product is usually in a different role configuration and needs to be brought to the desired role configuration. Even in those cases where the Product is in the operational configuration baseline, changes must be made to obtain the desired role configuration.

Though in theory to perform the role change basically consists in bringing back the Product to the operational configuration baseline, and then performing the necessary maintenance actions by removing or adding items so as to obtain the desired role configuration, in practice this can imply a duplication of work, as some of the disassembled Products could require installing again as they co-exist in both configurations.

A role change matrix is used for this purpose, which identifies the differences between the two role configurations, and therefore identifies which individual Products should be removed or fitted onto the final Product. Note that the role change matrix should be generated automatically at the moment of performing this as desired configuration, given that both the original and desired role configurations can have variants (eg, due to the use of interchangeable equipment, and the consequent application of interchangeability and compatibility rules), and it is therefore not possible to generate all possible combinations beforehand.

6 Configuration changes

6.1 Changes to allowed configurations

The operational configuration baseline is updated by the Product OEM engineering department. The allowed configuration is unique to an individual Product due to its individual history.

6.1.1 Modifications to the baseline configuration

Any modification to the baseline configuration can be only performed by means of a service bulletin, which includes the authorization of the OEM Engineering to modify the Product.

The critical changes to the baseline configuration are characterized by the fact that they:

1 Affect the Product type certificate.

2 Are mandatory (eg, due to an Airworthiness Directive).

3 Are non-reversible (it is not possible to return to a previous operational configuration baseline).

The baseline configuration must be updated with the embodied service bulletins, so as to reduce the complexity of the calculation of the allowable configurations, but this requires that a feedback is provided to the OEM about which service bulletins have been embodied into which Product.

Note

Any modification to the baseline configuration also implies that all operational configurations based on this baseline configuration will be affected.

6.2 Service bulletins

Service bulletins (also known as Technical Orders) are changes approved by the OEM Engineering that can be embodied into a Product that is in-service. Service bulletins can be either mandatory or optional. The main characteristic of a service bulletin is that it represents a modification to the baseline configuration of an individual Product. Service bulletins typically consist of a documentation set (explaining how to embody the change), necessary parts or material, and sometimes also the necessary tools to carry out the modification.

Mandatory service bulletins are usually generated due to safety-critical issues associated to the Product and define a timeframe for their implementation. Optional service bulletins usually are design improvements to the Product that the operator can or not wish to implement.

The implementation of the change outlined in the service bulletin on a Product is called embodiment of the service bulletin. This is usually performed as part as the standard maintenance activities, when the Product is not due to operate. Once such embodiment has been performed, the baseline configuration will have changed, and all maintenance will have to refer to the new baseline configuration.

The embodiment of a service bulletin should be reported back to the OEM (marked as ③ in Fig 5). The reason for this is that the baseline configuration of the Product has changed and, apart from issues such as delivering inadequate spares, any support from the OEM could lead to serious mistakes or even accidents if the OEM is not aware of such configuration change.

6.3 Customer modifications

Once the Product has been released to the customer, it cancan occur that the customer performs modifications to the Product, either himself or through a third party. This, obviously, modifies the configuration and the Product maintenance, and can also impact the support provided by the OEM (eg, there can be an incompatibility with other CIs, or interference with the maintenance tasks defined by the OEM). This data set (marked as ⑤ in Fig 5) needs therefore to be reported to both the maintainer and OEM.

6.4 Maintenance changes

Many maintenance actions, such as cleaning, greasing, etc, do not have any impact on the Product configuration. However, the replacement of parts can imply a configuration change. This does not mean that every replacement action affects the configuration: the replacement of an O-ring obviously does not imply a configuration change. This is because though every item has been defined in the design configuration, the operational configuration usually manages only specific items, called in-service configuration-controlled items. These items are defined by design.

Lesser items (such as O-rings) are checked for compliance with the design configuration (as defined in the maintenance manuals), but their configuration is not managed any further. However, changes to the in-service configuration-controlled items must be documented, as usually these items present special challenges. Typically, all in-service configuration-controlled items have a serial number, so that they can be tracked individually.

The change of these in-service configuration controlled items is managed as part of the operational configuration (Ref. Para 5.3). This includes the change of part numbers, but also the

change of serial numbers for a same part number, so as to obtain the traditional as maintained configuration for the configuration status accounting.

7 Handling of software

Traditionally, software has been considered an anomaly within the operational configuration. This is mainly because software changes more often than hardware, and no specific rules have been established about how to address this aspect.

An additional disturbance factor is that documents such as [RTCA/DO-178] identify software to be executable code, data and associated documentation. Though this is perfectly reasonable for software design, the rules are different during the in-service, and the management of software can be greatly simplified.

The present section explains how to incorporate software into the global in-service configuration process, to handle it just like another CI.

7.1 Executable code

Three basic rules need to be considered:

1 Software is part of the Product functionality; hence a software change also changes the Product configuration.

2 In order to simplify the configuration propagation, software must be considered a CI of the next-higher assembly where it is loaded.

3 Software has a part number, but not a serial number.

The rules have the following consequences:

1 Each software version must have its own part number, as its functionality has changed (however slightly).

2 If software is installed in a non-final Product (meaning a Product such as equipment that is later installed in another Product (eg, a bicycle, car, tank, aircraft) before it is installed in the next-higher assembly, then the part number of the non-final Product should also change, as its functionality has changed. In this case, the software is a physical item that is part of the non-final Product and will be part of its own configuration tree.

3 So-called field-loadable software (ie, software that is loaded in a final Product and not in the non-final Product where it operates) must be considered a Product by its own right and be a CI of the final Product. In this case, software must be considered as a functional/physical CI within the final Product configuration tree that is different from the functional/physical CI where it can reside or execute.

Example:

If the software for airborne equipment is loaded into the equipment off-aircraft, then it should be considered a shop-replaceable item, and a change of this software should also imply a change in the equipment P/N. This is because the software is contained within the equipment and thus forms part of its inherent functionality, and such functionality cannot be altered once the equipment is fitted on the aircraft. The software forms part of the physical equipment breakdown.

If the same software for the same equipment is loaded on-aircraft (field-loadable software), then that software should be considered a line-replaceable item and thus a CI of the aircraft by its own right, as it will change the configuration of the next-higher assembly. In this case, the hardware P/N would not change due to a software load.

If the software can be loaded both on and off-aircraft, then it still should be considered an aircraft CI, as in-service it could never be guaranteed that the hardware has a specific software loaded into it, apart from the fact that it is not feasible to re-identify the hardware with a new P/N every time a new software version is loaded on-aircraft.

7.2 Data

There is an on-going debate whether data (eg, configuration files, mission data, databases, etc) should or not be part of the Product configuration itself.

From a pragmatic point of view, the identification of such data is necessary as part of the logistics process (S3000L) so as to be able to identify the necessary resources to generate, load/unload it and if necessary post-process it.

From the operational point of view, it is convenient to include data in the configuration, so as to be able to associate maintenance, operational and/or role change tasks to them. This is especially important if a specific mission requires loading of a special data set, or a role change implies changing a parameter file. In this latter case. especially if safety is involved- the identification of this element as a CI should be mandatory.

An additional benefit of including data in the configuration is that data format changes can be easily managed by assigning such data a different part number - that will easily prevent loading incompatible data formats in systems where the software can change with a certain frequency.

The difference regarding executable software is that data changes are not infrequent - data changes almost continuously. The assignment of a part number to every single data set becomes both unrealistic and economically unfeasible, apart from the fact that it does not provide any additional value.

One approach that has worked well in the past is to identify data sets (eg, a role-specific configuration file) by a dummy part number. The same dataset used for different purposes would then receive different part numbers, as well as different data formats. Assigning interchangeability and compatibility rules to these dummy part numbers would ensure that the proper data set would be used on each occasion. The content of the data would change, but not its purpose or format.

This allows on one side to associate data to a specific variant configuration and also to ensure that the necessary tasks that need to be performed to switch to that particular variant configuration are carried out, thus preventing to forget updating a set of data which can be in some cases even safety-critical.

The only exception to this method is that of a fixed data set that is associated to a specific configuration and that does not require modification, so that it could be assigned a permanent part number.

Data placed under configuration, whether using dummy part numbers or not, should be then managed in a similar way as software.

7.3 Software compatibility matrix

A software compatibility matrix was used in the past to indicate the allowable software-software and software-hardware combinations. While useful, this method becomes unmanageable when the number of software items installed on the Product grows significantly.

However, with the approach described in Para 7.1 the software-compatibility matrix becomes unnecessary as such compatibility is automatically derived from the interchangeability and compatibility rules described in Para 5.1.2.

Nevertheless, for backwards compatibility purposes, such compatibility matrix can be generated from the above rules and, vice-versa, positive compatibility rules can be generated from existing software compatibility matrices.

Note

In order to simplify the overall matrix, it is convenient to group the different allowable software combinations as software configurations, with the compatibility matrix mapping these software configurations against specific hardware.

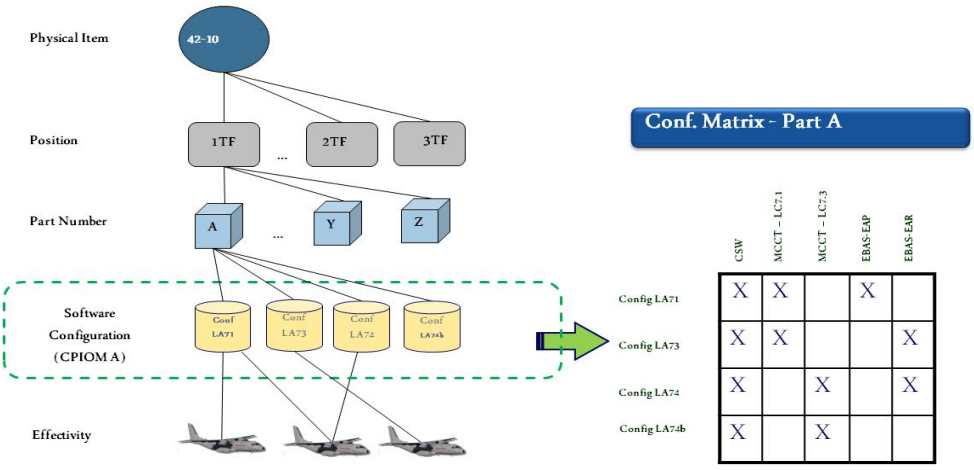

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Fig 9 Example sample hardware-software compatibility matrix

8 Configuration status accounting

Note that for the purpose of configuration accounting, and in particular for the use by organizations such as Continuous Airworthiness Management Organization (CAMO), a configuration is allowed if:

- It is possible to come back to the operational configuration baseline exclusively by exchanging, adding and/or removing equipment while complying with all the exchangeability and compatibility rules
- It is possible to achieve this configuration from the operational configuration baseline exclusively by exchanging, adding and/or removing equipment while complying with all the exchangeability and compatibility rules

Note

The fact that a configuration is allowed does not necessarily imply that it is fit to perform a specific role or mission.

9 Configuration feedback use cases

The Configuration feedback use cases become evident from Fig 5. The use cases basically consist in the need to provide the necessary information for the five identified configuration information flows, though in some cases the same information exchange is performed between different stakeholders.

9.1 Use case UC51301: Provide as-delivered configuration

This use case covers the transfer of the configuration of a Product at the moment it is delivered to the customer. The information required for this use case includes:

- Allowed configuration identification
- Delivered installed configuration: Serial numbers (for all serialized items) and potentials

- Modifications
- Waivers
- Product-related supplied equipment (loose items)

9.2 Use case UC51302: Provide as-allowed configuration

This use case covers the delivery of the allowed configuration of a Product to the customer. The information required for this use case includes:

- Full configuration tree structure, including applicability
- Operational configuration baseline
- Alternative configurations
- Rule set to identify item position(s)
- Interchangeability rules
- Compatibility/mixability rules
- Essentiality rules

9.3 Use case UC51303: Provide operational configuration

This use case covers the exchange of the operational configuration of a Product between different stakeholders involved in the maintenance (eg, from a customer to an MRO when the Product is sent for overhaul, and from the MRO to the customer when the Product is returned after the overhaul). The information required for this use case includes:

- Structure of the delivered Product
- Config. Changes, including:
  - Item replacement by another with the same part number
  - Item replacement by another with a different part number
  - Removal / installation of equipment without replacement
  - Embodiment of service bulletin
  - Dates for all changes

9.4 Use case UC51304: Provide customer modification

This use case covers the delivery of customer modifications to the maintainers and the Product OEM to ensure that future OEM modifications keep in mind these customer changes. The information required for this use case includes:

- Customer modification description
- Operational configuration baseline
- Alternative configurations
- Rule set to identify item position(s)
- Interchangeability rules
- Compatibility/mixability rules

9.5 Use case UC51305: Provide as-desired configuration

This use case covers the delivery of the as-desired configuration of a Product to the maintenance organization, so as to indicate the status of the Product that is desired for a required task. The information required for this use case includes:

- Specific configuration that is requested for a specific mission
- Dates when the as-desired configuration is required, and period during which this configuration needs to be maintained

Chapter 14

Feedback of data to support in-service contracts management

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References

Table 1 References

Chap No./Document No.	Title
Chap 7	Feedback for Life Cycle Cost analysis

Chap No./Document No.	Title
Chap 19	Tailoring and contracting against S5000F
MIL-HDBK-502	Department of Defense Handbook – Acquisition Logistics, May 1997, Section 5.1 and 6.
MIL-STD-881	Work Breakdown Structures (WBS) for Defense material items

1 Introduction

Performance Based Logistics (PBL) was instituted by the U.S. Department of Defence (DoD) to optimize Product readiness and meet performance goals of individual Products. Currently it has been adopted worldwide by industries as well as by military organizations.

PBL consists of long-term partner agreements between the customer (eg, government) and supplier (eg, industry) based on logistics metrics. PBL performance metrics focus on the needs of the customer to have a Product that is operationally available, reliable end effective while having a minimal logistics footprint at a reasonable cost.

PBL-type contracts are often demanding, but there are other types of in-service contracts which can be even more demanding, such as service contracts where the contractor provides a full service of duties that were traditionally performed by the customer. These kind of service contracts can range from managing a canteen to transport cargo or even perform airborne aircraft refueling. In these latter kinds of contracts, the measure is often not performance, but “mission success”.

The effectiveness and compliance of these complex in-service contracts can only be measured by establishing quantitative measures that provide numerical gauges and evidence by which one can evaluate and monitor in-service activities for planning and scheduling purposes, develop award fee criteria, evaluate alternative support solutions and many other reasons.

These measurements allow both the customer and the contractor to implement their most efficient practices in whatever field they operate. Maintenance, reliability and sustainment improvements accrue monetary returns for both contractor and customer.

The management of in-service contracts, however, is not restricted to the collection of metrics. Organizational aspects, planning, management of resources, control of costs and non-contractual work are also key to the success of any in-service contract and the necessary information to the in-service contract management is critical for the contract succeed.

2 Scope

The definition of the necessary data to be exchanged between the different actors involved in an in-service contract so that the contract can be properly managed are described herein. This includes only the exchange of specific contractual metrics and not the metric themselves, as they can vary from contract to contract.

3 Objectives

The main objective is to furnish the bases, in terms of data feedback, for the management of in-service contracts.

In order to support the management of in-service contracts, in terms of feedback, it is necessary to describe the performance-based approach. Once the in-service contract approach has been defined, the definition of metrics (data feedback) that allow the in-service contract to be applied and managed can proceed.

3.1 Description of performance-based approach

In PBL and similar contracts the performance is defined in terms of objectives established using criteria as reliability, mission success, availability, etc. When the appropriate performance requirements have been specified for the Product, these requirements can be allocated to the various logistic support elements, using a top-down approach. By using PBL, the provider is incentivized and empowered to meet objectives or performance requirements to improve the support effectiveness while reducing total ownership costs.

The first step in using logistics algorithms is to establish a baseline so that each metric, performance measure, or figure of merit can be compared and linked to the highest level of the support system requirements.

It is essential for PBL that supportability factors are integrated elements of program performance specifications. However, support requirements are not to be stated as distinct logistics elements, but instead as performance requirements that relate to a system's operational effectiveness, operational and life cycle cost reduction. Refer to MIL-HDBK 502.

Note

All specified requirements must be tailored to the project, measurable and traceable back to the Product-level requirement.

3.2 Definition of in-service contract metrics

Metrics are calculated values that measure the level of success of an activity or contractual commitment. Metrics are only valid within a specific program and program context. A metric that is excellent in one context can imply a bad result in a different context.

The metrics represent the lowest measurable data needed to evaluate the logistic performance parameters or service level agreements. Such metrics used for the performance parameters definition, must be meaningful to all users (ie, contractually defined). Values must be presented in a way that is understandable and similarly interpreted by everyone involved.

Metrics should be controllable and linked to existing contractor and customer logistics performance reporting system(s).

Since the collection of feedback data (metrics) represents a cost for the provider as well as for the customer, every metric must be justified by the need to measure the achievement of an objective or compliance of an agreed service level.

Metrics should be either defined and agreed during the contractual negotiations or during the guidance conference. Refer to Chap 19.

Note

Contractual or service level compliance can vary from contract to contract reflecting customer needs. Only the means to feedback contract metrics data to either the contractor or customer are provided herein.

4 Management of in-service contracts

Management in businesses and organizations is the function that coordinates the efforts of people to accomplish goals and objectives using available resources efficiently and effectively.

The management of in-service contracts implies the need to provide the necessary information so that the people performing the tasks associated to a contract and the necessary resources to be able to perform it in an efficient and cost-effective manner, can be managed.

Traditionally, management operates through five basic functions:

- Planning: Deciding what needs to happen in the future and generating plans for action (deciding in advance)
- Organizing: Making sure the human and nonhuman resources are put into place

- Coordinating: Creating a structure through which an organization's goals can be accomplished
- Commanding: Determining what must be done in a situation and getting people to do it
- Controlling: Checking progress against plans

These functions can be grouped into two broad categories, which are preparation and execution. Preparation covers the functions and planning, organizing and coordinating and execution covers commanding and controlling.

Note

In order to execute these functions, there is first a need for something to happen, which usually is the fulfilment of a contract.

This contract sets the requirements for what needs to be done.

The information required to manage in-service contracts must address:

- Contractual requirements
- Contractual framework preparation
- Contract execution

4.1 Contractual requirements

The contractual requirements include all the information associated to the contract itself, and the role and responsibilities of the contractor. This information must be exchanged between multiple parties, so that all stakeholders knows what must be done and when.

In order to allow for the proper management of the feedback of in-service contracts, it is necessary to have relevant information available, which is:

- Contract and contract duration
- Contracting parties
- Contract terms and Service Level Agreement (SLA)
- Relationship with other contracts
- Work items (activities to be performed) and Work Breakdown Structure (WBS)
- Location(s) of where the contract must be executed
- Contract volume

This information can later be mapped to the preparation and execution aspects for contract implementation and execution in line with the contractual requirements.

Note

Contracts can evolve over time, so it is necessary to accurately maintain this information.

The information for this function is covered by use cases 1 (refer to Para 5.1), 2 (refer to Para 5.2) and (refer to Para 5.9).

4.2 Contract preparation

As stated in Para 4, the contract preparation consists of the following main functions:

- Planning
- Organizing
- Coordinating

Note

The three functions are not necessarily sequential and can overlap.

4.2.1 Contract planning

Contract planning requires knowing what must be provided and when, so that all elements are in place in accordance with the program timescales and the proper action plans are generated. The information required for contract planning includes but is not limited to:

- Contract and contract duration
- Contracting parties
- Relationship with other contracts
- Work items (ie, activities to be performed) and WBS
- Activity planning
- Labor rates

The information for this function is covered by use cases 1 (refer to Para 5.1), 2 (refer to Para 5.2), 5 (refer to Para 5.5), 9 (refer to Para 5.9) and 14 (refer to Para 5.14).

4.2.2 Contract organizing

In order to organize a contract, it is essential that the human and material resources are in place. The information required for contract organizing includes but is not limited to:

- Contract and contract duration
- Contracting parties
- Relationship with other contracts
- Organizational breakdown structure (OBS)
- Cost breakdown structure (CBS)
- Contract planning
- Location(s) of where the contract must be executed
- Security classification
- Export control information
- Labor rates

The information for this function is covered by use cases 1 (refer to Para 5.1), 3 (refer to Para 5.3), 4 (refer to Para 5.4), 5 (refer to Para 5.5), 9 (refer to Para 5.9), 12 (refer to Para 5.12), 13 (refer to Para 5.13) and14 (refer to Para 5.14).

4.2.3 Contract coordinating

The contract coordination implies creating a structure through which an organization's goals can be accomplished. The information required for contract coordinating includes but is not limited to:

- Contract duration
- Contract terms and SLA
- Relationship with other contracts
- Work items (ie, activities to be performed) and WBS
- OBS
- Contract planning
- Location(s) of where the contract must be executed
- Information about the infrastructure used for the contract
- Security classification
- Export control information

The information for this function is covered by use cases 1 (refer to Para 5.1), 2 (refer to Para 5.2), 4 (refer to Para 5.4), 5 (refer to Para 5.5), 9 (refer to Para 5.9), 12 (refer to Para 5.12) and13 (refer to Para 5.13).

4.2.4 Contract execution

As stated in Para 4, the contract execution consists of:

- Commanding
- Controlling

Note
The two functions are not necessarily sequential and can overlap.

Controlling is usually carried out as the result of the commanding function, but this latter can be also triggered by detecting an anomaly during the controlling function.

4.2.5 Contract commanding

Contract commanding implies evaluating the contractual situation and taking the necessary actions so that all necessary steps to ensure contract compliance are taken. The information required for contract commanding includes but is not limited to:

- Contracting parties
- Contract terms and SLA
- Relationship with other contracts
- WBS
- Activity planning
- OBS
- SLA compliance
- Incurred contract costs
- Service requests
- Usage of existing infrastructure or resources from/by third parties
- Status reports
- Location(s) of where the contract is executed

The information for this function is covered by use cases 1 (refer to Para 5.1), 2 (refer to Para 5.2), 4 (refer to Para 5.4), 5 (refer to Para 5.5), 6 (refer to Para 5.6), 7 (refer to Para 5.7), 8 (refer to Para 5.8), 9 (refer to Para 5.9), 10 (refer to Para 5.10) and 11 (refer to Para 5.11).

4.2.6 Contract controlling

Contract controlling implies monitoring progress against the plans including the timing, budget spending, compliance with SLAs, penalizations, etc. The information required for contract controlling includes but is not limited to:

- Contract terms and SLA
- Work items (ie, activities to be performed) and WBS
- Planning
- Activities performed
- CBS
- Incurred contract costs
- Service request
- Use of existing infrastructure or resources from/by third parties
- Security classification
- Export control information
- Labor costs

The information for this aspect is covered by use cases 2 (refer to Para 5.2), 3 (refer to Para 5.3), 5 (refer to Para 5.5), 6 (refer to Para 5.6), 7 (refer to Para 5.7), 10 (refer to Para 5.10), 11 (refer to Para 5.11), 12 (refer to Para 5.12), 13 (refer to Para 5.13) and 14 (refer to Para 5.14).

5 Use cases

Fourteen use cases have been defined that cover the activities defined in Para 4:

- Provide contractual information

- Provide WBS
- Provide CBS
- Provide OBS
- Provide/update activity planning
- Report SLA compliance
- Provide incurred contract costs
- Provide contract status report
- Provide information about locations and infrastructure
- Manage service request
- Request/grant/deny usage of resource
- Assign security classification
- Manage export control information
- Provide labor rates
- Provide documentation traceability

The mapping of the individual use cases against the contract management activities is shown in Table 2.

Table 2 Mapping of contracting activities to use cases

		Use Cases														
Contracting activity		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Preparation	Planning	X	X			X				X					X	X
	Organizing	X		X	X					X			X	X	X	X
	Coordinating	X	X		X	X				X			X	X		X
Execution	Commanding	X	X		X	X	X	X	X	X	X	X				
	Controlling		X	X		X	X	X			X	X	X		X	X

5.1 Use case UC51401: Provide contractual information

This use case covers the exchange of contract-specific information, including contract dates, parties involved, relationship with other contracts and associated contract clauses, relationship with a project and the subject/purpose of a contract.

5.2 Use case UC51402: Provide work breakdown structure (WBS)

This use case covers the exchange of a WBS between two or more parties, that clearly defines the work that must be performed by each party. This WBS can be in accordance with MIL-STD-881 or equivalent.

5.3 Use case UC51403: Provide cost breakdown structure (CBS)

This use case covers the exchange of a CBS between two or more parties, that clearly identify the concepts for incurring contract costs.

Note

This use case is shared with the use case of the same name in Chap 7.

5.4 Use case UC51404: Provide organizational breakdown structure (OBS)

This use case covers the exchange of an OBS between two or more parties involved in a contract, so that the relationships between the parties is documented.

5.5 Use case UC51405: Provide/update activity planning

This use case covers the provision and/or update of the planning of activities that must be carried out as part of a contract.

5.6 Use case UC51406: Report service level agreement (SLA) compliance

This use case covers the provision of information about the compliance or non-compliance with an SLA and associated claim for a bonus or penalty.

5.7 Use case UC51407: Provide incurred contract costs

This use case covers the collection of cost data to control and manage contractual costs.

5.8 Use case UC51408: Provide status report

This use case covers the exchange of status data against a contract or specific activity, that is required by a contract or internal management guidelines.

5.9 Use case UC51409: Provide information about contract locations and infrastructure

This use case covers the exchange of information about contract locations and infrastructure, so that their support and management of this infrastructure, as part of the contractual obligations, can be planned.

5.10 Use case UC51410: Manage service request

This use case covers the request of one party to another party to perform a service and the information that is necessary to proceed with that service.

5.11 Use case UC51411: Request/grant/deny usage of resource

This use case covers the request of one party to another party for permission to use a specific resource, or the granting and/or denial of the usage of that resource (eg, workshop, hangar, simulator).

5.12 Use case UC51412: Assign security classification

This use case covers the assignment and management of security aspects at the project level by allowing the application of security classifications to documents, services, infrastructure, items and other elements used on a project.

5.13 Use case UC51413: Provide export control information

This use case covers the provision of information associated with export control at the project level, by providing the possibility to tag information and items with export control information, that enable the tracking and management of the items and data. Export controlled items can be physical items, electronic data, software or services.

Note

Due to different national regulations, this use case covers only export control license requests. The means to ensure that proper data is provided so that submitted data can be controlled, regarding export control issues, is covered. Compliance with regulations and verification of compliance is not covered.

5.14 Use case UC51414: Provide labor rates

This use case covers the provision of labor rates at project level, both to enable project cost projections and controlling, as well for its use in life-cycle costing.

5.15 Use case UC51415: Provide documentation traceability

This use case provides the capability to track documentation and ensure that it is up to date for any specific purpose.

Chapter 15

Feedback of non-predefined information

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Table 1 References

Chap No./Document No.	Title
Chap 19	Tailoring and contracting against S5000F
SX002D	Common data model for the S-Series IPS Specifications
ASD-SSG-001	Technical Data Package (TDP) Message

Chap No./Document No.	Title
ISO 10303-239 PLCS (AP 239)	Product Life-Cycle Support (PLCS)
MIL-STD-31000	Standard practice, Technical Data Packages

1 Introduction

S5000F specifies a standard means to feed information back from the field about maintenance and operational aspects. As such, it defines a set of data elements that can be selected for different purposes (eg, LCC, reliability studies, maintenance improvement, PBL contract management, etc). However, being realistic, no standard can cover the wide variety of information and its many aspects (binary files, photos, scanned paper documents, etc) that can be required to provide feedback or to request support from another organization.

2 Scope

This chapter provides the necessary information about how to provide feedback of information from the operational or maintenance domains that is not covered elsewhere in this specification, either because the corresponding data elements have not been defined, or because the information can simply not be mapped to data elements.

3 Non-predefined feedback information

No specification can cover all potential feedback, as there are always aspects that cannot be subject to standardization. Examples of these can be for example binary built-in-test files (peculiar to a specific product), or structured data that is currently not covered by this specification. Two broad categories of feedback information have been identified that could be required to be sent as feedback, either as data in its own right or as supplements/attachments to other feedback information (eg, as structured and non-structured data).

3.1 Non-predefined structured data

Non-predefined structured data refers to data constructs covering data elements that do not form part of this specification but are related to the in-service data feedback process. Typically, this is information that is peculiar to a specific project or Product. This set of information can include elements such as:

- Product-specific data (eg, engine parameters)
- Process-specific information (eg, sequencing information of activities)
- Contract-specific data (eg, contract status information)
- General technical data (eg, test results)
- Data generated based on a non-S-Series IPS specification (eg, IEEE 1636 for test data)
- Other data (eg, geo-location information)

The characteristic of non-predefined structured data is that they will have a data structure that corresponds to a data model of their own, which can be incompatible with the S5000F data model. These non-predefined structured data can have a variety of formats, ranging from flat files to XML schemas, and can be delivered in one or multiple (related) files.

There are two different cases of non-predefined structured data:

- Individual values that can be associated to the S5000F data model
- Structured data that do not follow the S5000F data model

3.1.1 Additional attributes that can be associated to the S5000F data model

In order to allow for the simple extension of the S5000F data model without the need to misuse existing data model constructs and attributes, the S-Series IPS specifications has agreed to

define a common mechanism across the S-Series to add project-specific attributes. This mechanism is defined in SX002D, specifically in the S-Series Base Object Definition and is extended in this specification by means of S5000F (Unit of Functionality (UoF) S-Series Base Object Definition.

Note

If the project-specific extensions are defined during the Guidance Conference and incorporated in the technical data exchange document as defined in Chap 19, these become automatically defined data and can be therefore processed like any other S5000F data. However, as these data are also clearly marked as being project-specific, they will not interfere with the data consolidation across different projects. This ensures data consistency across multiple projects, while still allowing the inclusion of specific project needs.

Should a specific data set appear across multiple projects, it is recommended that a change request is raised against S5000F to ensure its inclusion in the data model, as highlighted in Chap 1.

3.1.2 Additional enumeration values not covered by S5000F

A project can use enumerations or classifications that do not correspond to the values listed in S5000F and its XML schema. This is considered normal and does not change the data model nor the compliance with the specification. In order to incorporate these values or classifications (or remove undesired ones), a tailoring of S5000F needs to be performed. Refer to Chap 19.

3.1.3 Structured data that do not follow the S5000F data model

By their own definition, these data cannot be processed by the S5000F data model. Thus, if the exchange of such data is required, it is recommended to exchange such data in file format and process these files in the same way as indicated for non-predefined unstructured data in Para 3.2.

These data can be associated to data defined elsewhere in this specification. If such association with S5000F data exists, this association should be embedded in the non-predefined structured data itself (eg, engine parameters should include a field that identifies the engine to which they correspond, using the corresponding S5000F identifier for that engine), or externally to the data itself, in the same way as for non-predefined unstructured data.

3.2 Non-predefined unstructured data

Non-predefined unstructured data refers to information related to operational and maintenance data feedback that because of its own nature cannot be structured as a set of data elements. This set of information can include elements such as:

- Multimedia files (eg, photograph of cracks, video of malfunction)
- Documents (eg, scanned handwritten paper, PDF reports, word processor documents)
- Drawings (eg, graphics, CAD files)
- Binary data (eg, BIT and diagnostic information, SHM files)
- Other information (eg, application log files, spectrometer data)

The characteristic of non-predefined unstructured data is that:

- They do not have a data structure of their own
- Their format and size cannot be determined in advance
- They can come from a great variety of data sources, some of which have not even been designed on publication of this specification

This kind of data, due to its great variety, must, in principle, be considered a black box whose content is unknown by this specification and that tools implementing this specification will unlikely be able to understand.

These data can be associated to data defined elsewhere in this specification. If such association with S5000F data exists, this association cannot be included in the unstructured data itself because of its unknown nature. Such association must therefore be performed outside such data, tagging such data externally in such a way that the internal tools (or people) of the receiving organization can reconstruct the association. Thus, while the data itself would not adhere to the S5000F specification, it could be processed in a similar way as an attached file to an e-mail can be processed by an e-mail program, independent of whether the e-mail program knows what it is or not.

4 Provision of non-predefined feedback information

4.1 Problem statement

The delivery of non-predefined feedback information encounters several issues that must be tackled so that the seamless integration of the information with the rest of the S5000F specification is ensured, but also that this information can be properly processed.

Given that the non-predefined feedback information is, by its own nature, unknown to implementations of this specification, it is necessary to create a wrapper around it that is compatible with S5000F. It is irrelevant whether this information contains one or multiple files, as well as the nature of such files, provided the wrapper can be properly understood by S5000F data-processing tools. Given that the S5000F information should be also be able to be exchanged by means of ISO 10303-239 PLCS (AP239), this means that the wrapper must be also interoperable with PLCS.

In addition, as the wrapped information is, in principle, a black box, the wrapper must contain information about who sent the information, what it is, for whom it is intended, routing instructions (if necessary) and, given that the information that is sent within the wrapper, does not adhere to the standard data exchange rules or security rules that prevent an inadequate use (eg, by means of encryption).

For this reason, S5000F recommends the usage of the ASD-SSG Technical Data Package (TDP) message specification to transfer such non-predefined information in such a way that it is compatible with the rest of S5000F and can be also mapped back to such information.

Note

This method allows mapping of non-predefined information also to data of the other S-Series IPS specifications.

4.2 Technical Data Package

A TDP is defined as a technical description of an item adequate to exchange information during development, manufacturing development, production, engineering, and support throughout an item's lifecycle. This technical description defines the required design configuration and procedures required to ensure adequacy of item performance.

A TDP is comprised of a variety of data that will define the item. The categories of data that can be included in a TDP include, but are not limited to:

- Product definition data
- Engineering drawings
- Associated lists
- Specifications
- Standards
- Performance requirements
- Quality assurance provisions
- Reliability data
- Packaging details
- Modeling data
- Other information

The basic TDP is therefore a set of combined product data that is submitted in one single package. The TDP concept has been extensively used in engineering. A specification defining the TDP that is commonly used is MIL-STD-31000.

4.3 Technical Data Package message

Though in principle the TDP message was originally designed for the transport of Product Data Management (PDM) data, it is well suited for the transport of non-predefined support information. The purpose of the TDP message is to collect information for secured transportation of TDP files between different organizations and their applications.

A TDP can be regarded as a container/carrier file, which collects all relevant data for file transmission. The TDP consists of:

- A data dispatch note (the TDP message)
- Product metadata
- Product data files (1 to n digital files to be securely transported to the corresponding destination systems). These files will often be encrypted in a compressed file.

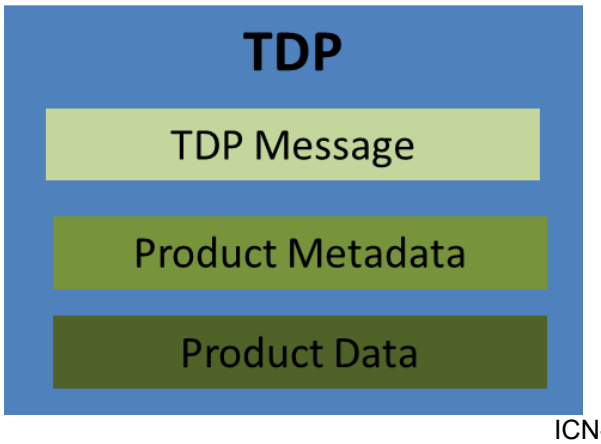

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Fig 1 Structure of the Technical Data Package with TDP Message

The TDP message is part of a package whose header includes a message that allows a hub system to identify the destination to which the corresponding file should be sent. The content of the TDP must be securely transported, with the complementary metadata file describes all the files of the TDP, sender and receiver plus security related information. Refer to in Fig 2.

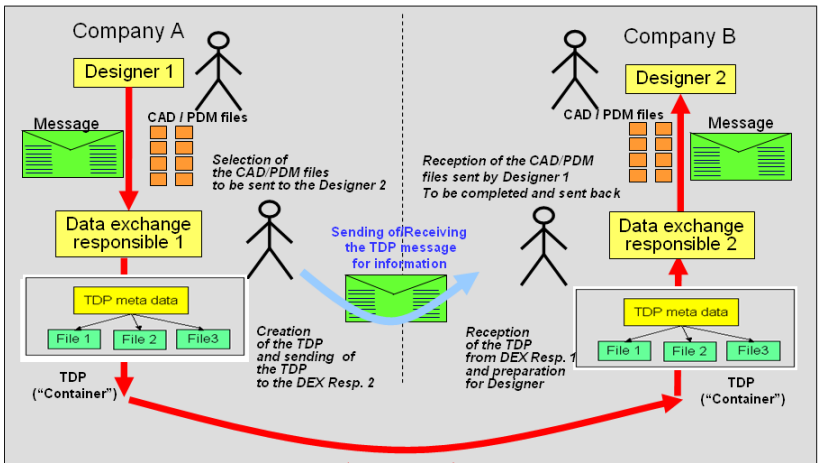

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Fig 2 *Overview of the Technical Data Package Message*

- Therefore, the actors involved are:
- The customer, which acts as TDP producer application
- The destination systems, which act as TDP consumer applications
- The Integration Platform, which acts as a hub system providing secured transportation capability for the content of the TDP, and associated traceability.

4.3.1 TDP Message data

The data within the TDP Message would then include amongst others:

- Sender
- Receiver
- List of non-predefined data files
- Nature of those files
- Data routing
- Acknowledgement of receipt
- Validation of transportation and its content
- Encryption information

4.3.2 Product metadata

The product metadata within the TDP would contain a link to other S-Series IPS specification information (eg, data elements that are used as keys for association).

4.3.3 Product data

The product data would be the files corresponding to the information listed in Para 3.1.2 and Para 3.2.

Note

The TDP message does not make any kind of assumption about the actual content of the product files that are contained in the TDP, nor the standard that it adheres to.

4.4 Sending Non-predefined information with S5000F

S5000F by itself does not send non-predefined information, but this information can be sent either separately or by means of a TDP package where the S5000F data is encapsulated.

S5000F has however a mechanism to reference non-predefined information, or be referenced by it, by means of the Common Data Model (CDM) UoF Digital File, as defined in SX002D. S5000F extends the referenced and referencing classes, so that this mechanism can be also used for all S5000F classes.

5 S5000F Chapters requiring non-predefined information

Table 2 lists the main S5000F chapters that could require the transfer of non-predefined information. This list is not exclusive and is provided for information purposes only.

Table 2 Example of chapters in S5000F that might require non-predefined information

Chapter	Title	Examples of non-predefined information
4	Feedback for maintenance analysis	BIT data, SHM files, drawings
5	Feedback of data for safety analysis	Event video, event location maps, CAD files, drawings, scanned reports, audio files
8	Feedback of data to support the settlement of warranty issues	Damage photographs
9	Feedback for the purpose of product	Binary health monitoring system files

	health and usage monitoring	
14	Feedback of data to support the management of service contracts	Contracts, reports, certificates, scanned documents
Other uses	Systems engineering data feedback	SHM files, test data, BIT data

6 Use cases

Two use cases have been defined for the exchange of non-predefined data:

- Exchange of project-specific values
- Exchange of non-predefined information

6.1 Use case UC51501: Provide project-specific values

This use case covers the exchange of values to additional fields that have been added by a specific project to one of the S5000F data classes. This information corresponds to the one listed in Para 3.1.1.

6.2 Use case UC51502: Provide non-predefined information

This use case covers the exchange of data that is not included in S5000F and cannot be added to existing classes as project-specific values or, by its own nature, cannot be included in a data model. This information corresponds to that listed in Para 3.1.3 and Para 3.2.

Chapter 16

Data model

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Chapter 16.1

Data model - General

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Table 1 References

Chap No./Document No.	Title
Chap 16.5	Data model - Mapping of use cases to individual UoF
Chap 17	Data exchange
Chap 18	Data element list
S2000M	International specification for material management – Integrated data processing for military equipment
S3000L	International procedure specification for Logistic Support Analysis (LSA)
SX000i	International guide for the use of the S-Series Integrated Logistics Support (IPS) specifications
SX002D	Common Data Model for the S-Series IPS specifications
SX004G	Unified Modeling Language (UML) model readers' guidance
ISO 10303-239 (AP239)	Product Life Cycle Support (PLCS)
http://www.uml.org	Unified Modeling Language (UML)

1 General

1.1 Introduction

This chapter defines a coherent data model for the data that can be exchanged for the operational and maintenance data feedback and related business processes. These business

processes can be either processes related to the feedback itself, in-service processes that generate the operational and maintenance information to be fed back, or processes used to exploit the data that is provided as part of this specification.

This data model can be also used to create a coherent in-service data repository.

The data model is described using the UML (Unified Modeling Language) version 2 class model (http://www.uml.org). Refer to SX004G for guidance on how to read the S5000F UML data model.

Each attribute in the UML class model is defined in Chap 18.

The data model itself is based on the Common Data Model (CDM) (refer to SX002D). It will be mapped to ISO 10303-239 Product Life Cycle Support (PLCS), in order to simplify the use of PLCS for the actual data exchanges. Refer to Chap 17.

The feedback data model has been defined on the basis of use cases. These use cases define the main uses of data in the different chapters of this specification. This allows the selection of a subset of the data required by this specification for specific purposes, using both the chapters (domains of information) and use cases (usage of the data for specific activities). The mapping of the individual use cases to the different model sections is provided in Chap 16.5.

1.2 Objective

The objective of this chapter is to define a coherent data model for the data that can be exchanged as part of the operational and maintenance data feedback by its related business processes.

1.3 Scope

The scope of the data model includes all data related to the operational and maintenance data feedback outlined in this specification, as well as necessary related master data that are required to place this operational and maintenance information into context.

1.4 Out of scope

The data model does not cover all data required to perform all in-service activities; it simply covers the information that is likely to be exchanged between different in-service stakeholders. Thus, any implementation of the data model into a software package that aims to cover all or at least a sub-set of in-service activities will require that the data model is complemented with additional information and implement an application model to support these activities.

1.5 Interoperability

This data model is fully compatible with the Common Data Model (CDM) Issue 2.0 (refer to SX002D), so as to ensure the interoperability of S5000F with the other S-Series specifications. S5000F is therefore be fully interoperable with S2000M, S3000L and SX002D.

Chapter 16.2

Data model - Overview

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Table 1 References

Chap No./Document No.	Title
Chap 16.5	Data model - Mapping of use cases to individual UoF Mapping of the use cases to the data model
SX001G	Glossary for the S-Series IPS specifications
SX002D	Common data model for the S-Series IPS specifications

1 Model overview

The S5000F data model is defined using the Unified Modeling Language (UML). It consists of two major segments:

- A segment that is common to other S-Series IPS specifications, also called the Common Data Model (CDM)
- A segment that is specific to feedback

The CDM is a model that does not belong to any specific S-Series IPS specification, because it covers all elements that are common to two or more specifications. Individual specifications do not necessarily use the full CDM, but only a part of it. However, the CDM is the core of the S-Series IPS specifications, as it provides the means for interoperability between all the specifications.

The CDM is developed and maintained by the Data Modeling and Exchange Working Group (DMEWG) and is published as SX002D. The dictionary of the CDM can be found in SX001G. All specification data modelers are members of the DMEWG, so that all the DMEWG is coordinated across all S-Series IPS specifications.

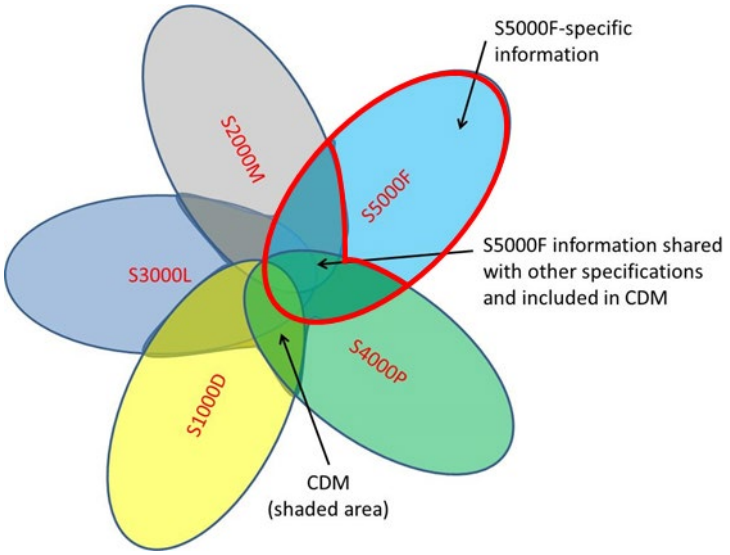

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Fig 1 Overview of CDM scope

The change process for the CDM and all specification specific data models follow the rules established for all specifications, which ensures that interoperability across the S-Series IPS specifications is maintained.

The feedback data model is organized into a set of Units of Functionality (UoF), which splits the overall data model into a set of smaller data models. This presents information about the data model in small and coherent portions enabling a reader to more easily gain an understanding of the complete data model.

There are two types of UoF:

- Generic UoF that depict a specific functionality group
- UoF that have been created specifically to cover a particular use case

The reason for this dual approach is the need to be able to contract against S5000F use cases. In some cases, using the generic functionality groups can require providing more information than would normally be required for a specific use case. This can also mean that, in some cases, there is an overlap between two UoF. However, the benefits of being able to contract to a specific list of UoFs are considered to outweigh the overlap. For the mapping of the use cases against the individual UoF, refer to Chap 16.5.

Chapter 16.3

Data Model - Common Data Model (CDM) units of functionality

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Table 1 References

Chap No./Document No.	Title
Chap 16.4	Data model - Units of functionality
SX002D	Common Data Model for the S-Series IPS specifications

1 Introduction

This chapter describes the Units of functionality (UoF) of the Common Data Model (CDM) (refer to SX002D) for the S-Series IPS specifications used in S5000F, as well as the primitives defined in the CDM and reused in this specification.

Note

All CDM UoFs start with CDM.

The basis for S5000F Issue 2.0 has been Issue 2.0 of the CDM. Refer to Para 5 for the modifications to the CDM.

This chapter provides the necessary information to identify potential overlaps and touch points with other S-Series IPS specifications. The integration with those other specifications need only consider the CDM UoFs that have been used as is or have been extended. The usage of the CDM ensures the interoperability between the different S-Series IPS specifications.

2 CDM S-Series Primitives

S5000F uses all the primitives defined in the CDM and does not define primitives of its own.

3 CDM S-Series Compound Attributes

S5000F uses the CDM S-Series Compound Attributes and includes some additional S5000F compound attributes. Refer to Chap 16.4.

4 CDM Units of functionality

The S5000F currently uses the following CDM UoFs (in alphabetic order) unchanged:

- CDM UoF Applicability Statement
- CDM UoF Aggregated Element
- CDM UoF Digital File
- CDM UoF Document
- CDM UoF Hardware Element
- CDM UoF Part Definition
- CDM UoF Product Design Configuration
- CDM UoF Product Usage Context
- CDM UoF Software Element

The following CDM UoFs have been extended and are listed as S5000F UoFs:

- CDM UoF Applicability Statement (Applicability Statement Items) (renamed as S5000F UoF Applicability Statement Items)
- CDM UoF Breakdown Structure (extended with S5000F UoF Breakdown Item)
- CDM UoF Change Information (renamed as S5000F UoF Change Information
- CDM UoF Remark (renamed as S5000F UoF Remark)
- CDM UoF Digital File DigitalFileReferencedItem (renamed as S5000F UoF Digital File DigitalFileReferencedItem)
- CDM UoF Digital File DigitalFileReferencingItem (renamed as S5000F UoF Digital File DigitalFileReferencingItem)
- CDM UoF Message (renamed as S5000F UoF Message and extended with S5000F UoF Message Content and S5000F UoF Message Context Item)
- CDM UoF Security (renamed as S5000F UoF Security)
- CDM UoF Serialized Product Variant Configuration (renamed as S5000F UoF Serialized Product Variant Configuration)
- CDM UoF Zone Element

CDM UoFs that have been extended in scope are described in Chap 16.4. None of the relationships defined in the CDM have been changed, so that the full interoperability with other specifications is maintained.

5 Modifications to the CDM

A few changes have been made in S5000F that do not affect the interoperability of the specifications and remain compatible with the latest version of the CDM:

- The *Contract* class implements the *DocumentItem* *<select>*, so that it can be referenced as a *Document* and the data model can be simplified. It also includes additional attributes that are not considered in the CDM
- In S5000F, the following classes of the CDM, have been extended, hence that they have been included in S5000F UoF Specializations:
    - BatchHardwarePart
    - ChangeRequest
    - Contract
    - Document

- DocumentIssue
- Facility
- FacilityOperator
- HardwarePartAsDesigned
- Organization
- Product
- ProductVariant
- SerializedHardwarePart
- SerializedProductVariant
- SoftwarePartAsReleased

Note

When used in the data model, these specializations show the complete set of attributes, including the inherited ones.

– Some CDM interfaces such as *LegalParty*, *FacilityOperatorItem* or *ContractItem* have been extended to include more classes implementing the same interface
– The *Threedimensional* <<compoundAttribute>> has been associated to a <<select>> interface *Dimensions*, so as to be able to select either two-dimensional (area) and three-dimensional measures

S5000F is therefore fully compliant with CDM Issue 2.0.

6 Impact of latest CDM change to S5000F

The publication of CDM Issue 2.0 has forced some changes to S5000F. Many of the changes incorporated in CDM Issue 2.0 will not be noticed, as these were already incorporated in Issue 1.0 of S5000F or have been caused by a change request performed by S5000F. Thus, the changes to S5000F resulting from the changes from the CDM 1.1 to CDM 2.0 do not have a major impact.

Some of the relationships to interfaces previously used have been changed, for example from *Party* to *LegalParty* or *FacilityOperatorItem*. Though the generated XML will almost be the same, this change in the data model allows additional restrictions on the new interface to be placed. Thus, a *LegalParty* cannot be just any party (such as a department), but it can be forced that they have a legal capability, which will be important once business rules are in place.

Nonetheless, there are some changes that do affect S5000F. Not all the changes are listed, but the most important one is the modification to the project-specific attributes, which are now part of the base class definition. With this change in the CDM, any class can now have project-specific attributes associated to it, so the UoF that previously covered this capability has therefore disappeared from S5000F. The introduction of the base class definition also implies that *AnyClass* disappears, as all classes are included in the definition of the base class (*BaseObject*).

Other changes affecting S5000F include, for example, the new <<compoundAttribute>> *ThreeDimensional* (which modifies the former *3DDimension* <<compoundAttribute>>.

The remaining CDM changes will affect all specifications. Though these changes obviously affect interoperability between specification versions, this major change to the CDM was necessary to ensure that all S-Series IPS specifications will now be fully interoperable with each other.

Chapter 16.4

Data Model - Units of functionality

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Table 1 References

Chap No./Document No.	Title
SX002D	Common data model for the S-Series ILS specifications
SX004G	Unified Modeling Language (UML) model readers' guidance

1 Introduction

This section describes the Units of Functionality (UoF) that are used by S5000F. The UoFs that are shared with other specifications are listed in Chap 16.3.

The basis for S5000F Issue 2.0 has been Issue 2.0 of the CDM. The current data model is fully compatible with SX002D Issue 2.0.

The conventions used for this data model are described in SX004G.

The UoF are listed in alphabetic order, though the compound attributes used throughout the model are described first, so that the reader has a full understanding of the attributes used for the different classes. Specializations of classes defined in SX002D are defined after the compound attributes in order not to confuse the reader who is already familiar with SX002D and so as to provide visibility of the extensions added by S5000F to those base classes.

2 UoF grouping

The UoFs in the data model have been broadly grouped into two major blocks: "Special UoFs" which extend SX002D by adding additional <<compoundAttributes>> or extend the classes defined in the CDM (refer to Para 3), and the business-related UoFs (refer to Para 1).

Given the great number of business UoFs included in S5000F, these have been grouped in the model into functional domains, and these have been further broken down into functional areas. This allows the reader to focus quickly on a specific set of information, instead of having to search through the whole set of UoFs refer to Para 1.

Note

This grouping is for referencing purposes only and does not affect the data model itself.

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Fig 1 UoF domains

2.1 S5000F Domain - Configuration

Configuration domain is a grouping within the data model that covers all the information associated to the Product configuration.

This domain includes the following UoFs and functional areas:

- CDM UoF Aggregated Element
- CDM UoF Product Design Configuration
- CDM UoF Zone Element
- S5000F UoF Applicability Statement
- S5000F UoF As-desired Configuration
- S5000F UoF Breakdown Structure

- S5000F FG Actual Configuration
  The Actual Configuration functional area allows to control the actual configuration of a serialized ProductVariant during the in-service phase.

  The Actual Configuration functional area consists of the following UoFs and functional areas:

  - S5000F UoF Product Defined Operational Configuration
  - S5000F UoF Serialized Product Variant Configuration

- S5000F FG Change Request and Embodiment
  The Change Request and Embodiment functional area allows compiling together all information associated to a Change.

  This functional area includes the following UoFs:

  - S5000F UoF Change Embodiment
  - S5000F UoF Change Embodiment Planning
  - S5000F UoF Change Embodiment Reporting
  - S5000F UoF Change Embodiment Strategy
  - S5000F UoF Change Information
  - S5000F UoF Change Request

2.2 S5000F Domain - Elements

The Elements domain is a grouping within the data model that covers all the information associated to individual hardware and software elements.

This domain includes the following UoFs and functional areas:

- CDM UoF Hardware Element
- CDM UoF Part Definition
- S5000F UoF Equipment
- S5000F UoF Equipment Calibration Certificate
- S5000F UoF Part As Realized
- S5000F UoF Serialized Item
- S5000F UoF Support Equipment

- S5000F FG Software and Data
  The Software and Data functional area provides the capability to define the environment(s) on which software and data are used or that generate such data. This functional area includes the following UoFs:

  - CDM UoF Software Element
  - S5000F UoF Data Sets
  - S5000F UoF Software

2.3 S5000F Domain - Environment and Infrastructure

Environment and infrastructure domain is a grouping within the data model that covers all the information associated to the environment and infrastructure around which a Product will operate.

This domain includes the following UoFs and functional areas:

- S5000F UoF Environment
- S5000F UoF Facility
- S5000F UoF Local Position
- S5000F UoF Location, Address and Locator
- S5000F UoF Operating Base

- S5000F FG Infrastructure
  The Infrastructure functional area allows to combine all information related to the infrastructure. This functional area includes the following UoFs:

  - S5000F UoF Infrastructure
  - S5000F UoF Infrastructure Availability

2.4 S5000F Domain - Events and Consequences

Events and Consequences domain is a grouping within the data model that covers all the information associated to events that have occurred in relationship with a Product and associated consequences.

This domain includes the following UoFs and functional areas:

- S5000F UoF Damage
- S5000F UoF Event
- S5000F FG Fault and Failure
  The Fault and Failure functional area allows to combine all information associated to failures and fault detection. This functional area includes the following UoFs:
  - S5000F UoF Actual Fault Indication
  - S5000F UoF Failure Detection and Location

2.5 S5000F Domain - Fleet

Elements domain is a grouping within the data model that covers all the information associated to a set of SerializedProductVariants that operate together.

This domain includes the following UoFs and functional areas:

- S5000F UoF Fleet Definition
- S5000F UoF Fleet Monitoring
- S5000F FG Fleet Planning and Tasking
  The Fleet Planning and Tasking functional grouping allows to combine all information associated to the management of a Fleet. This functional area includes the following UoFs:
  - S5000F UoF Fleet Planning and Product Assignment
  - S5000F UoF Fleet Task
  - Cancellation

2.6 S5000F Domain - Information

Information domain is a grouping within the data model that covers all the information that can be associated to individual items.

This domain includes the following UoFs and functional areas:

- S5000F UoF Comment
- S5000F UoF Logbook
- S5000F UoF Remark
- S5000F FG Document
  The Document functional area allows to combine all the information related to documents. This functional area includes the following UoFs:
  - CDM UoF Document
  - S5000F UoF Document

2.7 S5000F Domain - Maintenance

Maintenance domain is a grouping within the data model that covers all the information associated to the maintenance of serialized Products or equipment.

This domain includes the following UoFs and functional areas:

- S5000F UoF Maintenance Facility Planning
- S5000F UoF Maintenance Organization

- S5000F UoF Maintenance Program
- S5000F UoF Shop Findings

- S5000F FG Maintenance Execution
  The Maintenance Execution functional area compiles all the information associated to the execution of a maintenance activity. This functional area includes the following UoFs:

  - S5000F UoF Maintenance Activity
  - S5000F UoF Maintenance Work Order Source

2.8 S5000F Domain - Management

Management domain is a grouping within the data model that covers all the information related to project or contract management.

This domain includes the following UoFs and functional areas:

- S5000F FG Budget and Cost
  The Budget and Cost function group allows to compile together all the information required for cost and budgeting purposes. This functional area includes the following UoFs:

  - S5000F UoF Budget
  - S5000F UoF Cost Breakdown

- S5000F FG Contract Organization
  The Contract Organization functional area permits to compile all the information associated to organizational aspects associated to a Contract. This functional area includes the following UoFs:

  - S5000F UoF Contract Breakdown
  - S5000F UoF Organizational Breakdown Structure
  - S5000F UoF Project and Contract
  - S5000F UoF Work Breakdown

- S5000F FG Reporting
  The Reporting functional area permits to compile all the information associated to reporting aspects. This functional area includes the following UoFs:

  - S5000F UoF Report
  - S5000F UoF Reportable Activity
  - S5000F UoF Reportable Metric

- S5000F FG Service Contracts
  The Service Contracts functional area permits to compile all the information associated to ServiceContracts. This functional area includes the following UoFs:

  - S5000F UoF Resource Usage Request
  - S5000F UoF Service Contract Management
  - S5000F UoF Service Contract Penalty
  - S5000F UoF Service Request

2.9 S5000F Domain - Material

Material domain is a grouping within the data model that covers all the information associated to the storage and transport of individual hardware items.

This domain includes the following UoFs and functional areas:

- S5000F UoF Obsolescence Management Candidates
- S5000F UoF Supply Item
- S5000F UoF Warehouse and Spare Pool

- S5000F UoF Warranty
- S5000F FG Transport
  The Transport functional area allows all the information about items that can be transported and the items that can transport them, including potential limitations in the transport to be associated. This functional area includes the following UoFs:
  - S5000F UoF Transport Anchoring Point
  - S5000F UoF Transportable Item
  - S5000F UoF Transporting Asset

2.10 S5000F Domain - Message

Message domain is a grouping within the data model that covers all the information associated to the data exchange of data.

This domain includes the following UoFs and functional areas:

- S5000F UoF Digital File
- S5000F UoF Message

2.11 S5000F Domain – Miscellaneous

Miscellaneous domain is a grouping within the data model that covers all the information providing auxiliary capabilities that are indirectly associated to the support of a Product.

This domain includes the following UoFs:

- S5000F UoF Availability
- S5000F UoF Capability
- S5000F UoF Expression Evaluation
- S5000F UoF MeasurementPoint
- S5000F UoF Project-Specific Class Attributes
- S5000F UoF Requirement

2.12 S5000F Domain - Operations

Operations domain is a grouping within the data model that covers all the information associated to the actual operation of a SerializedProductVariant.

This domain includes the following UoFs:

- S5000F UoF Operational Environment
- S5000F UoF Operational Event
- S5000F UoF Operational Period
- S5000F UoF Operational Roles
- S5000F UoF Operational Times
- S5000F UoF Operator
- S5000F UoF Product Usage Phase

2.13 S5000F Domain - People and Organizations

People and Organization domain is a grouping within the data model that covers all the information associated to individuals and organizations involved in the support of a Product.

This domain includes the following UoFs:

- S5000F UoF Maintenance Personnel
- S5000F UoF Party
- S5000F UoF Person Competences and Labor Rates

2.14 S5000F Domain - Product

Product domain is a grouping within the data model that covers all the global information associated to a Product.

This domain includes the following UoFs and functional areas:

- CDM UoF Product Usage Context
- S5000F FG Serialized Product
  The Serialized Product functional area allows the grouping of all the information associated to a Serialized Product. This functional area includes the following UoFs:
  - S5000F UoF Serialized Product Health Monitoring
  - S5000F UoF Serialized Product Variant

2.15 S5000F Domain – Regulatory

Regulatory domain is a grouping within the data model that covers all the information associated to regulatory or security aspects.

This domain includes the following UoFs and functional areas:

- S5000F UoF Policies and Regulations
- S5000F UoF Security Classification
- S5000F FG Export Control
  The Export Control Functional area provides the capability to exchange export control classifications and manage export control requirements for objects that need special handling for protection against unauthorized access or distribution in accordance with export control laws. This functional area includes the following UoFs:
  - S5000F UoF Export Control License
  - S5000F UoF Export Control Requirement

2.16 S5000F Domain - Safety

Safety domain is a grouping within the data model that covers all the information associated to the safety of a Product. This domain includes the following UoF:

- S5000F UoF Safety
  Safety UoF identifies how safety issues and safety documents are related.

3 Special UoFs

This paragraph covers the extensions to the Common Data Model (CDM) SX0002 that are not strictly related to the business-specific data model. This includes the <<compoundAttributes>> being used, the extensions to CMD classes and the definition of project-specific attributes.

For easy understanding, all compound attributes (including the global S-Series compound attributes) have been included. For the S-Series primitives, refer to SX002D.

3.1 S-Series Compound Attributes

3.1.1 Description

A compound attribute is a combination of attributes, which establishes a pattern that can be reused in different contexts.

3.1.2 Graphical description

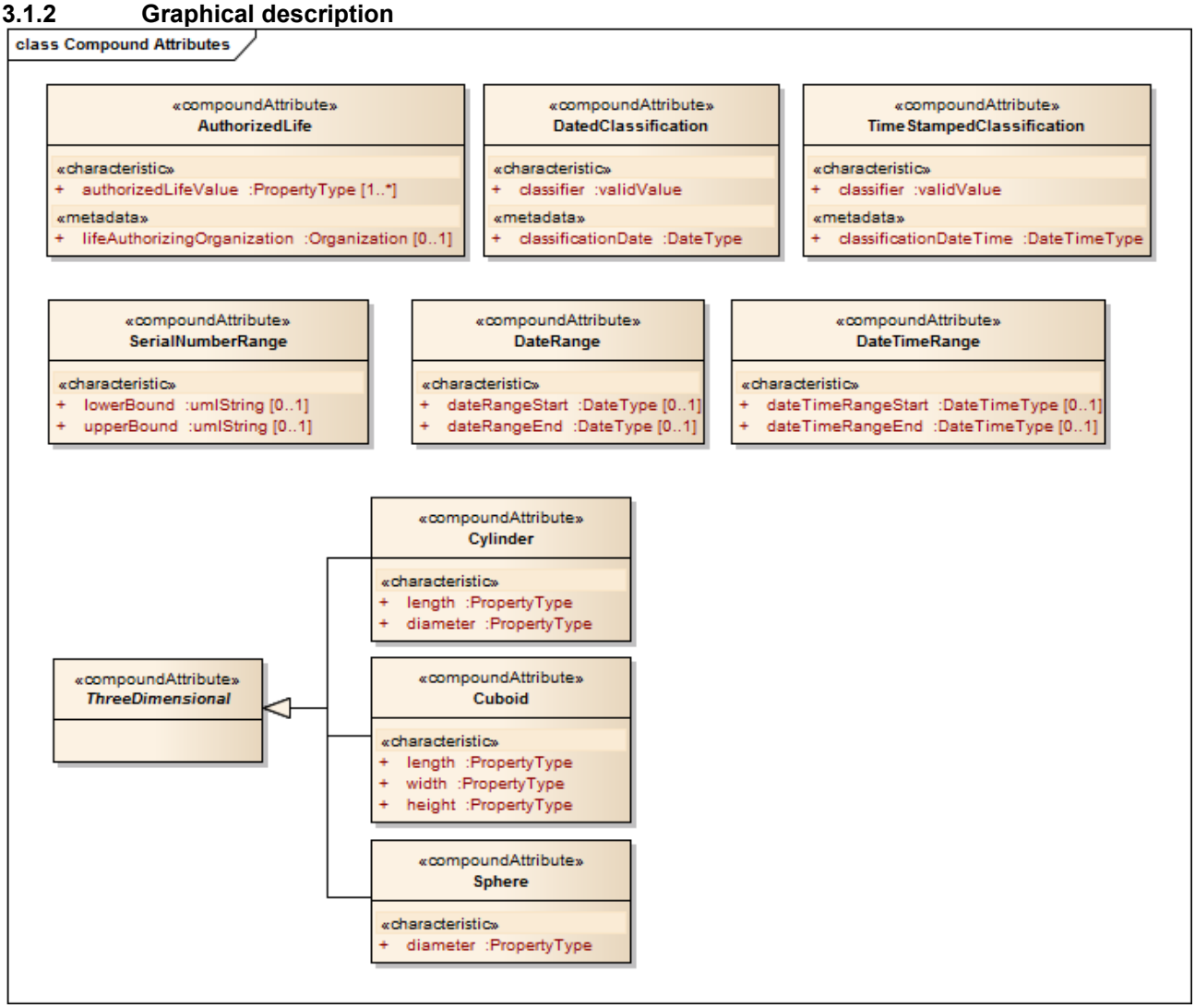

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Fig 2 Compound Attributes

3.1.3 Class definition

3.1.3.1 AuthorizedLife

AuthorizedLife is a <<compoundAttribute>> that identifies the maximum usage limit and upon reaching this limit any further usage of the item must be re-authorized.

3.1.3.1.1 Attribute(s)

This class has the following attributes:

- authorizedLifeValue, one or many
- lifeAuthorizingOrganization, optional

3.1.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- CommentItem (See S5000F UoF Comment, Para 4.23)
- RemarkItem (See S5000F UoF Remark, Para 4.72)

3.1.3.1.3 *Selects*
This class is a member of the following <<select>> interfaces:

- ProjectSpecificAttributeValue (See S5000F UoF Project Specific Attribute Definition, _)
- SafetyItem (See S5000F UoF Safety, Para 4.78)

3.1.3.2 Cuboid
Cuboid represents a three-dimensional object where all its faces are rectangles and all angles are right angles.

3.1.3.2.1 *Attribute(s)*
This class has the following attributes:

- height
- length
- width

3.1.3.2.2 *Implementations*
This class implements the following <<extend>> interfaces:

- CommentItem (inherited from ThreeDimensional) (See S5000F UoF Comment, Para 4.23)
- RemarkItem (inherited from ThreeDimensional) (See S5000F UoF Remark, Para 4.72)

3.1.3.2.3 *Selects*
This class is a member of the following <<select>> interfaces:

- ProjectSpecificAttributeValue (inherited from ThreeDimensional) (See S5000F UoF Project Specific Attribute Definition,)

3.1.3.3 Cylinder
Cylinder represents a three-dimensional object with straight parallel sides and a circular section.

3.1.3.3.1 *Attribute(s)*
This class has the following attributes:

- diameter
- length

3.1.3.3.2 *Implementations*
This class implements the following <<extend>> interfaces:

- CommentItem (inherited from ThreeDimensional) (See S5000F UoF Comment, Para 4.23)
- RemarkItem (inherited from ThreeDimensional) (See S5000F UoF Remark,)

3.1.3.3.3 *Selects*
This class is a member of the following <<select>> interfaces:

- ProjectSpecificAttributeValue (inherited from ThreeDimensional) (See S5000F UoF Project Specific Attributes,)

3.1.3.4 DatedClassification
DatedClassification is a <<compoundAttribute>> that represents a classification in conjunction with its recording date.

3.1.3.4.1 *Attribute(s)*
This class has the following attributes:

- classifier
- classificationDate

3.1.3.4.2 Implementations

This class implements the following <<extend>> interfaces:

- CommentItem (See S5000F UoF Comment,)
- RemarkItem (See S5000F UoF Remark,)

3.1.3.4.3 Selects

This class is a member of the following <<select>> interfaces:

- ProjectSpecificAttributeValue (See S5000F UoF Project Specific Attribute Definition,)

3.1.3.5 DateRange

DateRange is a <<compoundAttribute>> that identifies an interval of dates.

3.1.3.5.1 Attribute(s)

This class has the following attributes:

- dateRangeEnd, optional
- dateRangeStart, optional

3.1.3.5.2 Implementations

This class implements the following <<extend>> interfaces:

- CommentItem (See S5000F UoF Comment, Para 4.23)
- RemarkItem (See S5000F UoF Remark,)

3.1.3.5.3 Selects

This class is a member of the following <<select>> interfaces:

- ProjectSpecificAttributeValue (See S5000F UoF Project Specific Attribute Definition,)

3.1.3.6 DateTimeRange

DateTimeRange is a <<compoundAttribute>> that identifies an interval of date and times.

3.1.3.6.1 Attribute(s)

This class has the following attributes:

- dateTimeRangeEnd, optional
- dateTimeRangeStart, optional

3.1.3.6.2 Implementations

This class implements the following <<extend>> interfaces:

- CommentItem (See S5000F UoF Comment, Para 4.23)
- RemarkItem (See S5000F UoF Remark, Para 4.72)

3.1.3.6.3 Selects

This class is a member of the following <<select>> interfaces:

- ProjectSpecificAttributeValue (See S5000F UoF Project Specific Attribute Definition,)

3.1.3.7 SerialNumberRange

SerialNumberRange is a <<compoundAttribute>> that identifies an interval of serialized items.

Note

The range pattern may be open-ended.

3.1.3.7.1 Attribute(s)

This class has the following attributes:

- lowerBound, optional

– upperBound, optional

3.1.3.7.2 Implementations

This class implements the following <<extend>> interfaces:

– CommentItem (See S5000F UoF Comment, Para 4.23)
– RemarkItem (See S5000F UoF Remark, Para 4.72)

3.1.3.7.3 Selects

This class is a member of the following <<select>> interfaces:

– ProjectSpecificAttributeValue (See S5000F UoF Project Specific Attribute Definition,)

3.1.3.8 Sphere

Sphere represents a three-dimensional object where every point on its surface is equidistant from its center.

3.1.3.8.1 Attribute(s)

This class has the following attributes:

– diameter

3.1.3.8.2 Implementations

This class implements the following <<extend>> interfaces:

– CommentItem (inherited from ThreeDimensional) (See S5000F UoF Comment, Para 4.23)
– RemarkItem (inherited from ThreeDimensional) (See S5000F UoF Remark, Para 4.72)

3.1.3.8.3 Selects

This class is a member of the following <<select>> interfaces:

– ProjectSpecificAttributeValue (inherited from ThreeDimensional) (See S5000F UoF Project Specific Attribute Definition,)

3.1.3.9 ThreeDimensional

ThreeDimensional is a <<compoundAttribute>> that represents spatial magnitudes.

3.1.3.9.1 Implementations

This class implements the following <<extend>> interfaces:

– CommentItem (See S5000F UoF Comment, Para 4.23)
– RemarkItem (See S5000F UoF Remark, Para 4.72)

3.1.3.9.2 Selects

This class is a member of the following <<select>> interfaces:

– ProjectSpecificAttributeValue (See S5000F UoF Project Specific Attribute Definition,)

3.1.3.10 TimeStampedClassification

TimeStampedClassification is <<compoundAttribute>> that represents a classification in conjunction with its recording time stamp.

3.1.3.10.1 Attribute(s)

This class has the following attributes:

– classifier
– classificationDateTime

3.1.3.10.2 Implementations

This class implements the following <<extend>> interfaces:

– CommentItem (See S5000F UoF Comment, Para 4.23)
– RemarkItem (See S5000F UoF Remark, Para 4.72)

3.1.3.10.3 Selects

This class is a member of the following <<select>> interfaces:

– ProjectSpecificAttributeValue (See S5000F UoF Project Specific Attributes,)

3.2 S5000F Compound Attributes

3.2.1 Description

Compound Attributes UoF defines reusable data patterns which are used for declaring data types for class attributes in the S5000F specification.

3.2.2 Graphical description

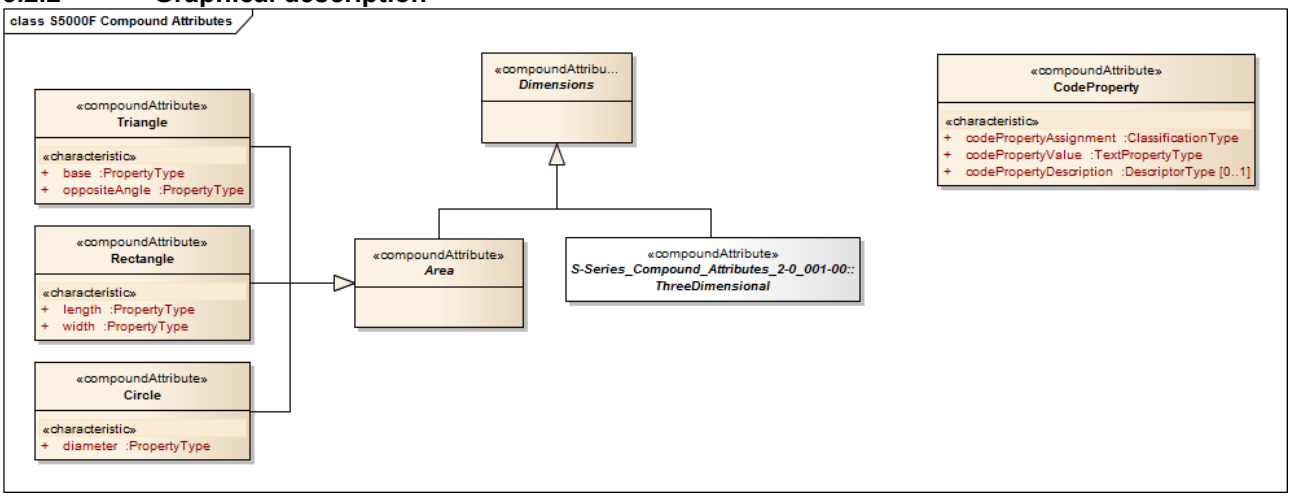

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Fig 3 S5000F Compound Attributes

3.2.3 Class definition

3.2.3.1 Area

Area is a <<class>> that represents the extent or measurement of a surface.

3.2.3.1.1 Implementations

This class implements the following <<extend>> interfaces:

– CommentItem (See S5000F UoF Comment, Para 4.23)
– RemarkItem (See S5000F UoF Remark, Para 4.72)

3.2.3.1.2 Selects

This class is a member of the following <<select>> interfaces:

– ProjectSpecificAttributeValue (See S5000F UoF Project Specific Attributes,)

3.2.3.2 Circle

Circle is a <<class>> representing a geometrical round plane figure whose boundary (the circumference) consists of points equidistant from a fixed point (the center).

3.2.3.2.1 Attribute(s)

This class has the following attributes:

– diameter

3.2.3.2.2 Implementations

This class implements the following <<extend>> interfaces:

- CommentItem (inherited from Area) (See S5000F UoF Comment, Para 4.23)
- RemarkItem (inherited from Area) (See S5000F UoF Remark, Para 4.72)

3.2.3.2.3 Selects

This class is a member of the following <<select>> interfaces:

- ProjectSpecificAttributeValue (inherited from Area) (See S5000F UoF Project Specific Attributes,)

3.2.3.3 CodeProperty

CodeProperty is a compoundAttribute representing an alphanumeric code with the classification of the assigning specification.

3.2.3.3.1 Example(s)

- 'es' (IANA internet top-level domain code)
- '+34' (ITU-T E.164)
- 'SP' (FIPS10-4)

3.2.3.3.2 Attribute(s)

This class has the following attributes:

- codePropertyAssignment
- codePropertyDescription, optional
- codePropertyValue

3.2.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- CommentItem (See S5000F UoF Comment, Para 4.23)
- RemarkItem (See S5000F UoF Remark, Para 4.72)

3.2.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- ProjectSpecificAttributeValue (See S5000F UoF Project Specific Attributes,)

3.2.3.4 Dimensions

Dimensions is a <<compoundAttribute>> that represents a set of values that define the measurable extent of a particular kind for a specific item.

3.2.3.4.1 Example(s)

- area
- volume

3.2.3.5 Rectangle

Rectangle is a <<class>> representing a geometrical plane figure with four straight sides and four right angles, especially one with unequal adjacent sides, in contrast to a square.

3.2.3.5.1 Attribute(s)

This class has the following attributes:

- length
- width

3.2.3.5.2 Implementations

This class implements the following <<extend>> interfaces:

- CommentItem (inherited from Area) (See S5000F UoF Comment, Para 4.23)
- RemarkItem (inherited from Area) (See S5000F UoF Remark, Para 4.72)

3.2.3.5.3 *Selects*
This class is a member of the following <<select>> interfaces:

- ProjectSpecificAttributeValue (inherited from Area) (See S5000F UoF Project Specific Attributes,)

3.2.3.6 Triangle
Triangle is a <<class>> representing a geometrical plane figure with three straight sides and three angles.

3.2.3.6.1 *Attribute(s)*
This class has the following attributes:

- base
- oppositeAngle

3.2.3.6.2 *Implementations*
This class implements the following <<extend>> interfaces:

- CommentItem (inherited from Area) (See S5000F UoF Comment, Para 4.23)
- RemarkItem (inherited from Area) (See S5000F UoF Remark, Para 4.72)

3.2.3.6.3 *Selects*
This class is a member of the following <<select>> interfaces:

- ProjectSpecificAttributeValue (inherited from Area) (See S5000F UoF Project Specific Attributes,)

3.3 S5000F Project Specific Attribute Definition

3.3.1 Description

Project Specific Attribute Definition UoF extends the CDM ProjectSpecificAttributeValues so as to enable the assignment of project specific attributes to S5000F-specific <<compoundAttributes>>.

3.3.2 Graphical description

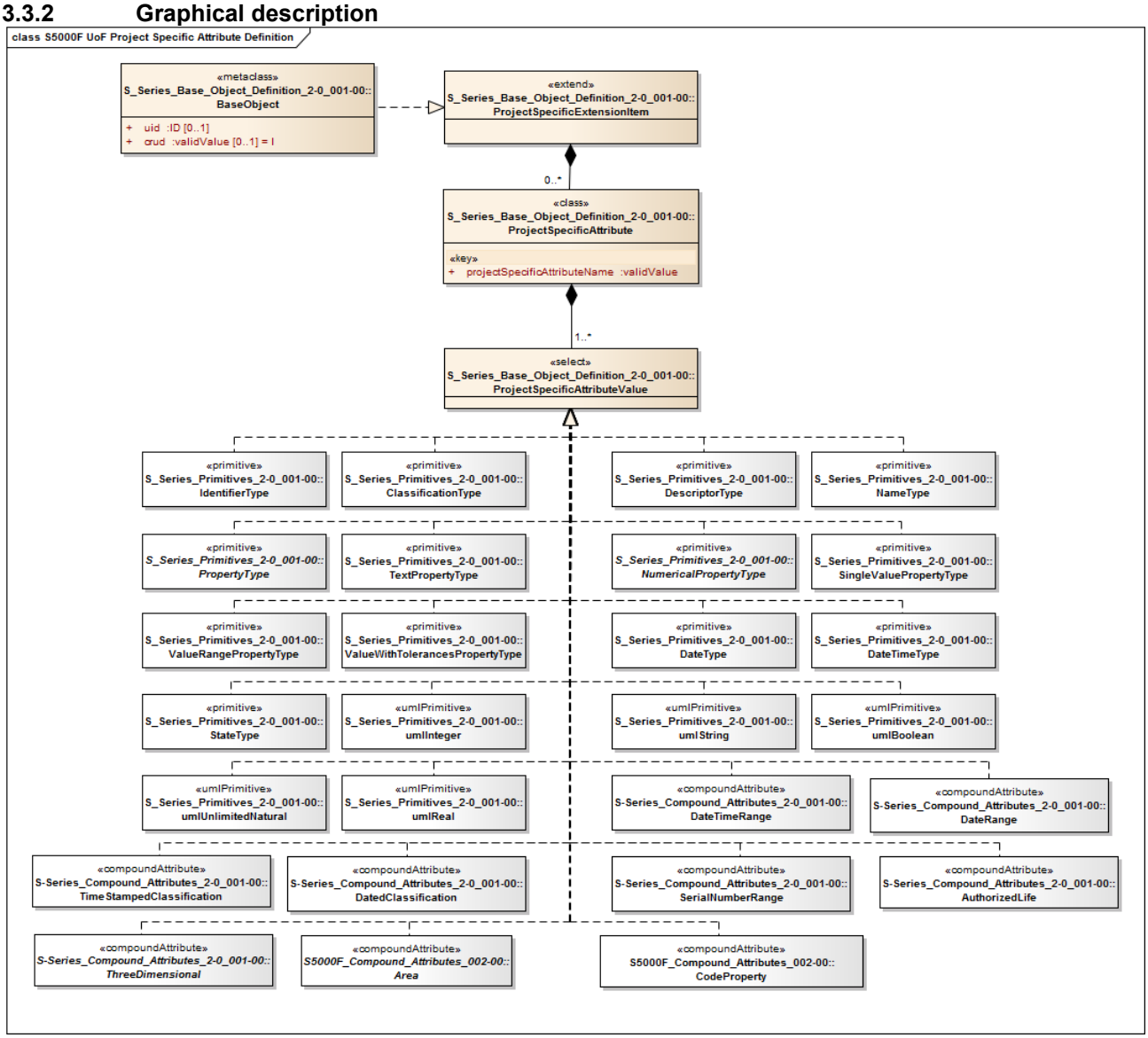

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Fig 4 S5000F UoF Project Specific Attribute Definition

3.4 S5000F Specializations

3.4.1 Description

S5000F specializations provides the specializations of classes from other ASD specifications (mainly SX002D) for the purpose of S5000F.

3.4.2 Graphical description

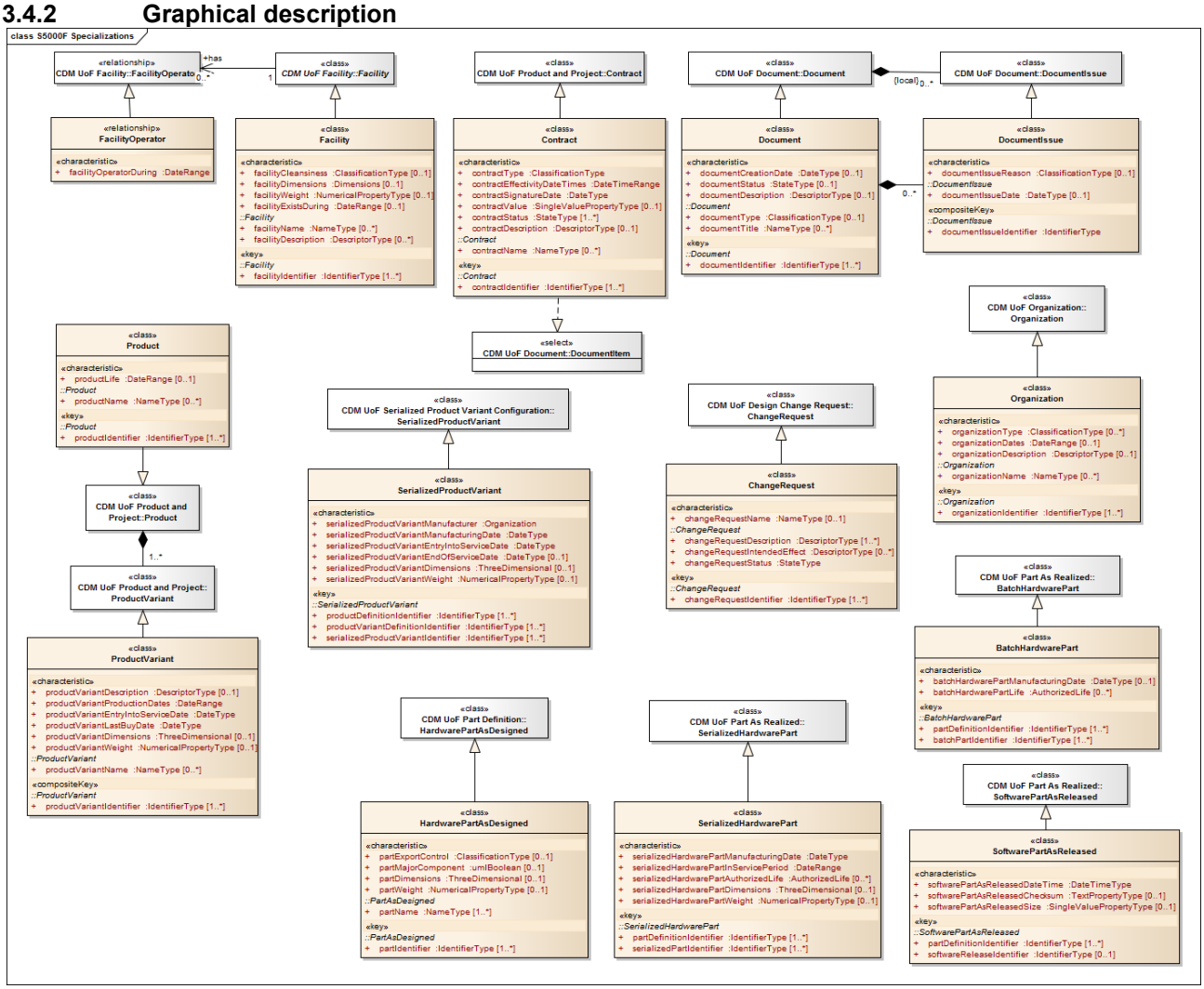

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Fig 5 S5000F Specializations

3.4.3 Class definition

3.4.3.1 BatchHardwarePart

BatchHardwarePart is a <<class>> that represents actual physical parts which can be identified by their batch membership.

3.4.3.1.1 Attribute(s)

This class has the following attributes:

- batchPartIdentifier, one or many
- partDefinitionIdentifier, one or many
- batchHardwarePartLife, zero, one or many
- batchHardwarePartManufacturingDate, optional

3.4.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (inherited from BatchHardwarePart) (See S5000F UoF Digital File, Para 4.28)
- StoredPart (See S5000F UoF Warehouse and Spare Pool, Para 4.95)

3.4.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from BatchHardwarePart) (See S5000F UoF Digital File, Para 4.28)
- PoolItem (See S5000F UoF Warehouse and Spare Pool, Para 4.95)
- RealizedPart (inherited from BatchHardwarePart) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)

3.4.3.2 ChangeRequest

ChangeRequest is a <<class>> that represents a formal proposal for a modification to a configuration item upon a given baseline.

3.4.3.2.1 Attribute(s)

This class has the following attributes:

- changeRequestIdentifier, one or many
- changeRequestDescription, one or many
- changeRequestIntendedEffect, zero, one or many
- changeRequestStatus
- changeRequestName, optional

3.4.3.2.2 Associations

This class has the following associations:

- A composition association, respondsTo, zero, one or many, to child objects of type ChangeAuthorization
- An association to object(s) of type ChangeRequestCause
- An association to object(s) from classes that are members of ChangeRequestItem
- An association to object(s) from classes that are members of Party

3.4.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

3.4.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- SafetyItem (See S5000F UoF Safety, Para 4.78)

3.4.3.3 Contract

Contract is a <<class» that represents a binding agreement between two or more parties

3.4.3.3.1 Example(s)

- leasing contract
- procurement contract
- service contract
- subcontract

3.4.3.3.2 Attribute(s)

This class has the following attributes:

- contractIdentifier, one or many

- contractName, zero, one or many
- contractDescription, optional
- contractEffectivityDateTimes
- contractSignatureDate
- contractStatus, one or many
- contractType
- contractValue, optional

3.4.3.3.3 Associations

This class has the following associations:

- A composition association, poolUsageCoveredBy, zero, one or many, to child objects of type Pool
- An association to object(s) of type ContractItemDetails
- An association to object(s) of type ContractParty
- An association to object(s) of type ContractRelationship

3.4.3.3.4 Implementations

This class implements the following <<extend>> interfaces:

- BudgetingItem (See S5000F UoF Budget, Para 4.15)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (inherited from Contract) (See S5000F UoF Digital File, Para 4.28)
- OrganizationalBreakdownStructure (See S5000F UoF Organizational Breakdown Structure, Para 4.64)
- PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
- ReportableMetricItem (See S5000F UoF Reportable Metric, Para 4.75)
- SecurityClassificationItem (inherited from Contract) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

3.4.3.3.5 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ChangeRequestReasonItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from Contract) (See S5000F UoF Applicability Statement, Para 4.11)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (See CDM UoF Document, Para 4.2)
- MessageContextItem (inherited from Contract) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- SubjectOfPoliciesAndRegulations (See S5000F UoF Policies and Regulations, Para 4.68)

3.4.3.4 Document

Document is a <<class>> that represents a compiled set of information that serves a purpose.

Note

Document is an abstract class, ie, it must be instantiated by one of the classes implementing it.

3.4.3.4.1 Example(s)

- drawing
- manual
- report

3.4.3.4.2 Attribute(s)

This class has the following attributes:

- documentIdentifier, one or many
- documentTitle, zero, one or many
- documentType, optional
- documentCreationDate, optional
- documentDescription, optional
- documentStatus, optional

3.4.3.4.3 Associations

This class has the following associations:

- An association to object(s) of type DocumentRelationship

3.4.3.4.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

3.4.3.4.5 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)

3.4.3.5 DocumentIssue

DocumentIssue is a <<class>> that represents a specific release of a Document

3.4.3.5.1 Attribute(s)

This class has the following attributes:

- documentIssueIdentifier
- documentIssueDate, optional
- documentIssueReason, optional

3.4.3.5.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type Document
- An aggregate association, zero, one or many, to related object(s) of type ExportControlRegulation
- An aggregate association, zero, one or many, to related object(s) of type ExternalDocument
- An aggregate association, zero, one or many, to related object(s) of type FleetTaskCancellationNotice

- An aggregate association, zero, one or many, to related object(s) of type MaintenanceProgram
- An aggregate association, zero, one or many, to related object(s) of type PoliciesAndRegulations
- An aggregate association, zero, one or many, to related object(s) of type Report
- An aggregate association, zero, one or many, to related object(s) of type SafetyDocument
- An aggregate association, zero, one or many, to related object(s) of type SafetyIssue
- An aggregate association, zero, one or many, to related object(s) of type SafetyRequirementsDocument
- An aggregate association, zero, one or many, to related object(s) of type SafetyWarning
- An aggregate association, zero, one or many, to related object(s) of type SCORMContentPackage
- An aggregate association, zero, one or many, to related object(s) of type ServiceBulletin
- An aggregate association, zero, one or many, to related object(s) of type SpecialSafetyInstruction

3.4.3.5.3 Implementations

This class implements the following <<extend>> interfaces:

- ChangeControlledItem (inherited from DocumentIssue) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from DocumentIssue) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from DocumentIssue) (See S5000F UoF Export Control Requirement, Para 4.35)

3.4.3.5.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- DigitalFileReferencedItem (inherited from DocumentIssue) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from DocumentIssue) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)

3.4.3.6 Facility

Facility is a <<class>>that represents an infrastructure which exists, or is intended to be built or installed, and is established to serve a particular purpose.

3.4.3.6.1 Attribute(s)

This class has the following attributes:

- facilityIdentifier, one or many
- facilityDescription, zero, one or many
- facilityName, zero, one or many
- facilityCleansiness, optional
- facilityDimensions, optional
- facilityExistsDuring, optional
- facilityWeight, optional

3.4.3.6.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type FacilityLocation

- An association to object(s) of type FacilityOwner
- An association to object(s) of type FacilityRelationship. Each Facility can be related to from zero, one or many other Facilities (via the FacilityRelationship <<relationship>> class)
- An association, zero, one or many, to object(s) from classes that are members of LocationItem

3.4.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28) InfrastructureCompliantItem (inherited from Facility) (See S5000F UoF Facility, Para 4.37)
- InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement,)
- MaintenanceProgramItem (See S5000F UoF Maintenance Program, Para 4.52)
- PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

3.4.3.6.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Facility) (See S5000F UoF Digital File)
- EventItem (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
- MaintenanceItem (See S5000F UoF Maintenance Activity, Para 4.48)
- MessageContextItem (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)
- ReferencedPositionItem (See S5000F UoF Local Position, Para 4.45)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (See S5000F UoF Safety, Para 4.78)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)
- SubjectOfPoliciesAndRegulations (See S5000F UoF Policies and Regulations, Para 4.68)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (See S5000F UoF Warranty, Para 4.96)

3.4.3.7 FacilityOperator

FacilityOperator is a <<relationship>> that identifies the party responsible for running the Facility

3.4.3.7.1 Example(s)

- The FacilityOperator has leased the Facility from the FacilityOwner.

3.4.3.7.2 Attribute(s)

This class has the following attributes:

– facilityOperatorDuring

3.4.3.7.3 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of FacilityOperatorItem

3.4.3.7.4 Implementations

This class implements the following <<extend>> interfaces:

– ApplicabilityStatementItem (inherited from FacilityOperator) (See S5000F UoF Applicability Statement, Para 4.11)

3.4.3.7.5 Selects

This class is a member of the following <<select>> interfaces:

– SafetyItem (inherited from FacilityOperator) (See S5000F UoF Safety, Para 4.78)

3.4.3.8 HardwarePartAsDesigned

HardwarePartAsDesigned is a PartAsDesigned that is to be realized as physical items (hardware) including non-countable material.

3.4.3.8.1 Example(s)

– Examples of non-countable materials are: oil, sealant, paint.

3.4.3.8.2 Attribute(s)

This class has the following attributes:

– partIdentifier (inherited from PartAsDesigned), one or many
– partName (inherited from PartAsDesigned), one or many
– partDimensions, optional
– partExportControl, optional
– partMajorComponent, optional
– partWeight, optional

3.4.3.8.3 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
– An association to object(s) of type AlternatePartAsDesigned
– An association to object(s) of type ContainedSubstance

3.4.3.8.4 Implementations

This class implements the following <<extend>> interfaces:

– ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11))
– ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
– CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
– DetectionMean (See S5000F UoF Failure Detection and Location, Para 4.38)
– DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
– DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
– ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
– MaintenanceProgramItem (See S5000F UoF Maintenance Program, Para 4.52)

- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- TrackablePart (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

3.4.3.8.5 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductOperationalConfigurationItem (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
- MessageContextItem (See S5000F UoF Message, Para 4.55)
- ObsolescenceItem (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)
- SupplyItem (See S5000F UoF Supply Item, Para 4.89)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)

3.4.3.9 Organization

Organization is a <<class>> that represents an administrative structure with a particular purpose belonging to a legal entity.

3.4.3.9.1 Example(s)

- Government department
- International agency
- company

3.4.3.9.2 Attribute(s)

This class has the following attributes:

- organizationIdentifier, one or many
- organizationName, zero, one or many
- organizationDates, optional
- organizationDescription, optional
- organizationType, zero, one or many

3.4.3.9.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- BudgetingItem (See S5000F UoF Budget, Para 4.15)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
- OrganizationalBreakdownStructure (See S5000F UoF Organizational Breakdown Structure, Para 4.64)
- PartyItem (See S5000F UoF Party, Para 4.66)
- PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityAssignmentParty (See S5000F UoF Security Classification, Para 4.79)

3.4.3.9.4 Selects

This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (inherited from Organization) (See S5000F UoF Applicability Statement, Para 4.11)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- FacilityOperatorItem (inherited from Organization) (See S5000F UoF Facility, Para 4.37)
- LegalParty (inherited from Organization) (See S5000F UoF Project and Contract, Para 4.71)
- MessagePartyItem (inherited from Organization) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityAttribution (See S5000F UoF Availability, Para 4.13)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- Party (See S5000F UoF Party, Para 4.66)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ReportingParty (See S5000F UoF Report, Para 4.73)
- SafetyItem (See S5000F UoF Safety, Para 4.78)
- SubjectOfPoliciesAndRegulations (See S5000F UoF Policies and Regulations, Para 4.68)

3.4.3.10 Product

Product is <<class>> that represents a family of items which share the same underlying design purpose.

3.4.3.10.1 Example(s)

- Aegis Class Destroyer
- Airbus A340
- Ford Fusion
- iPhone 7
- Pegasus engine
- Stryker

3.4.3.10.2 Attribute(s)

This class has the following attributes:

- productIdentifier, one or many
- productName, zero, one or many
- productLife, optional

3.4.3.10.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

3.4.3.10.4 Implementations

This class implements the following <<extend>> interfaces:

- BreakdownItem (inherited from Product) (See S5000F UoF Breakdown Structure, Para 4.14)
- CapabilityItem (inherited from Product) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Product) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from Product) (See S5000F UoF Digital File, Para 4.28)
- PoliciesAndRegulationsCompliantItem (inherited from Product) (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityClassificationItem (inherited from Product) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from Product) (See S5000F UoF Work Breakdown, Para 4.97)

3.4.3.10.5 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Product) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from Product) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from Product) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Product) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Product) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureRequiringItem (inherited from Product) (See S5000F UoF Infrastructure Availability, Para 4.44)
- MessageContextItem (inherited from Product) (See S5000F UoF Message, Para 4.55)
- ObsolescenceItem (inherited from Product) (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- ReportContextItem (inherited from Product) (See S5000F UoF Report, Para 4.73)
- SerializedAssertItem (inherited from Product) (See S5000F UoF Applicability Statement, Para 4.11)
- SubjectOfPoliciesAndRegulations (inherited from Product) (See S5000F UoF Policies and Regulations, Para 4.68)

3.4.3.11 ProductVariant

A ProductVariant is a <<class>> that defines a member of a Product family which is configured for a specific purpose and is made available to the market.

Note

A product variant is often known as a model.

3.4.3.11.1 Example(s)

- Boeing 787-800 versus 787-900
- Ford Fusion S versus SE versus SEL

3.4.3.11.2 Attribute(s)

This class has the following attributes:

- productVariantIdentifier, one or many
- productVariantName, zero, one or many
- productVariantDescription, optional
- productVariantDimensions, optional
- productVariantEntryIntoServiceDate
- productVariantLastBuyDate
- productVariantProductionDates

– productVariantWeight, optional

3.4.3.11.3 Associations

This class has the following associations:

– An association to object(s) of type MaintenanceFacilitySlotAccomodation
– An association to object(s) of type NestedProductVariant
– An association to object(s) of type ProductVariantSupportedByPool. A ProductVariant can be associated with zero, one or many part Pools (via the ProductVariantSupportedbyPool <<relationhsip>>) that support it

3.4.3.11.4 Implementations

This class implements the following <<extend>> interfaces:

– ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
– BreakdownItem (inherited from ProductVariant) (See S5000F UoF Breakdown Structure, Para 4.14)
– CapabilityItem (See S5000F UoF Capability, Para 4.16)
– ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
– DigitalFileReferencingItem (inherited from ProductVariant) (See S5000F UoF Digital File, Para 4.28)
– InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
– ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
– MaintenanceProgramItem (See S5000F UoF Maintenance Program, Para 4.52)
– OperationalTimeItem (See S5000F UoF Operational Times, Para 4.62)
– PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
– ProductUsagePhaseItem (See S5000F UoF Product Usage Phase, Para 4.70)
– ReportableMetricItem (See S5000F UoF Reportable Metric, Para 4.75)
– SecurityClassificationItem (inherited from ProductVariant) (See S5000F UoF Security Classification, Para 4.79)
– TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)
– TransportingAsset (See S5000F UoF Transporting Asset, Para 4.93)
– WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

3.4.3.11.5 Selects

This class is a member of the following <<select>> interfaces:

– ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
– ClassInstanceAssertItem (inherited from ProductVariant) (See S5000F UoF Applicability Statement, Para 4.11)
– ContractItem (inherited from ProductVariant) (See S5000F UoF Project and Contract, Para 4.71)
– CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
– DigitalFileReferencedItem (inherited from ProductVariant) (See S5000F UoF Digital File, Para 4.28)
– ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
– InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
– InfrastructureRequiringItem (See S5000F UoF Infrastructure Availability, Para 4.44)
– MessageContextItem (inherited from ProductVariant) (See S5000F UoF Message, Para 4.55)
– ObsolescenceItem (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
– ReferencedPositionItem (See S5000F UoF Local Position, Para 4.45)
– ReportContextItem (See S5000F UoF Report, Para 4.73)
– ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
– SafetyItem (See S5000F UoF Safety, Para 4.78)

- SerializedAssertItem (inherited from ProductVariant) (See S5000F UoF Applicability Statement, Para 4.11)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)
- SubjectOfPoliciesAndRegulations (See S5000F UoF Policies and Regulations, Para 4.68)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)

3.4.3.12 SerializedHardwarePart

SerializedHardwarePart is <<class>> that represent an actual physical part which can be identified as an individual.

Note

A SerializedHardwarePart may evolve due to modifications. The actual build standard at a given moment is defined through the relationship SerializedPartDesignAssociation.

Note

A SerializedHardwarePart is usually referred to as "Equipment". This name has not been used in the data model so as to distinguish between the generic equipment and the individual ones.

3.4.3.12.1 Attribute(s)

This class has the following attributes:

- partDefinitionIdentifier, one or many
- serializedPartIdentifier, one or many
- serializedHardwarePartAuthorizedLife, zero, one or many
- serializedHardwarePartDimensions, optional
- serializedHardwarePartInServicePeriod
- serializedHardwarePartManufacturingDate
- serializedHardwarePartWeight, optional

3.4.3.12.2 Associations

This class has the following associations:

- An association to object(s) of type EquipmentOperation
- An association to object(s) of type EquipmentOwner
- An association to object(s) of type ModificationOf
- An association to object(s) of type SerializedPartDesignAssociation. A SerializedHardwarePart must be associated to one or many HarwarePartAsDesigned (via the SerializedPartDesignAssociation <<relationship>>)

3.4.3.12.3 Implementations

This class implements the following <<extend>> interfaces:

- AvailabilityItem (See S5000F UoF Availability, Para 4.13)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (inherited from SerializedHardwarePart) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
- ItemDamage (See S5000F UoF Damage, Para 4.26)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from SerializedHardwarePart) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- SerializedItem (See S5000F UoF Serialized Item, Para 4.80)
- StoredPart (See S5000F UoF Warehouse and Spare Pool, Para 4.95)

- TrackablePart (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

3.4.3.12.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from SerializedHardwarePart) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DamagedItem (See S5000F UoF Damage, Para 4.26)
- DigitalFileReferencedItem (inherited from SerializedHardwarePart) (See S5000F UoF Digital File, Para 4.28)
- EventItem (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
- MaintenanceItem (See S5000F UoF Maintenance Activity, Para 4.48)
- MessageContextItem (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- ObsolescenceItem (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- PoolItem (See S5000F UoF Warehouse and Spare Pool, Para 4.95)
- RealizedPart (inherited from SerializedHardwarePart) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReleasedDataSetItem (inherited from SerializedHardwarePart) (See S5000F UoF Data Sets, Para 4.27)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (See S5000F UoF Warranty, Para 4.96)

3.4.3.13 SerializedProductVariant

SerializedProductVariant is a <<class>> that represent an actual product variant which is identified as an individual.

Note

A SerializedProductVariant must be manufactured in accordance with its definition as defined by its productVariantIdentifier.

3.4.3.13.1 Attribute(s)

This class has the following attributes:

- productDefinitionIdentifier, one or many
- productVariantDefinitionIdentifier, one or many
- serializedProductVariantIdentifier, one or many
- serializedProductVariantDimensions, optional
- serializedProductVariantEndOfServiceDate, optional
- serializedProductVariantEntryIntoServiceDate
- serializedProductVariantManufacturer
- serializedProductVariantManufacturingDate
- serializedProductVariantWeight, optional

3.4.3.13.2 Associations

This class has the following associations:

- An association to object(s) of type MajorComponent
- An association to object(s) of type NestedSerializedProductVariant
- An association to object(s) of type PlannedPartInstallationLocation
- An association to object(s) of type SerializedProductOperationalPeriod
- An association to object(s) of type SerializedProductVariantConfigurationConformance
- An association to object(s) of type SerializedProductVariantEnvironment
- An association to object(s) of type SerializedProductVariantInFleet
- An association to object(s) of type SerializedProductVariantOperatingBase
- An association to object(s) of type SerializedProductVariantOperator
- An association, zero, one or many, to object(s) of type OperationalRole

3.4.3.13.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (See S5000F UoF Availability, Para 4.13)
- BreakdownItem (See S5000F UoF Breakdown Structure, Para 4.14)
- CapabilityItem (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (inherited from SerializedProductVariant) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
- ItemDamage (See S5000F UoF Damage, Para 4.26)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from SerializedProductVariant) (See S5000F UoF Part As Realized, Para 4.65)
- OperationalTimeItem (See S5000F UoF Operational Times, Para 4.62)
- PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
- ProductUsagePhaseItem (See S5000F UoF Product Usage Phase, Para 4.70)
- ReportableMetricItem (See S5000F UoF Reportable Metric, Para 4.75)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- SerializedItem (See S5000F UoF Serialized Item, Para 4.80)
- TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)
- TransportingAsset (See S5000F UoF Transporting Asset, Para 4.93)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

3.4.3.13.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from SerializedProductVariant) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DamagedItem (See S5000F UoF Damage, Para 4.26)
- DigitalFileReferencedItem (inherited from SerializedProductVariant) (See S5000F UoF Digital File, Para 4.28)
- EventItem (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
- InfrastructureRequiringItem (See S5000F UoF Infrastructure Availability, Para 4.44)
- MaintenanceItem (See S5000F UoF Maintenance Activity, Para 4.48)

- MessageContextItem (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- ObsolescenceItem (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- ReferencedPositionItem (See S5000F UoF Local Position, Para 4.45)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (See S5000F UoF Safety, Para 4.78)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)
- SubjectOfPoliciesAndRegulations (See S5000F UoF Policies and Regulations, Para 4.68)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (See S5000F UoF Warranty, Para 4.96)

3.4.3.14 SoftwarePartAsReleased

SoftwarePartAsReleased is <<class>> that represents actual build of a software which is delivered.

3.4.3.14.1 Attribute(s)

This class has the following attributes:

- partDefinitionIdentifier, one or many
- softwareReleaseIdentifier, optional
- softwarePartAsReleasedChecksum, optional
- softwarePartAsReleasedDateTime
- softwarePartAsReleasedSize, optional

3.4.3.14.2 Associations

This class has the following associations:

- An association to object(s) of type SoftwareOS
- An association to object(s) of type SoftwarePlatform
- An association, optional, to object(s) of type DataSetAsDesigned
- An association, optional, to object(s) of type SoftwarePartAsDesigned

3.4.3.14.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (See S5000F UoF Failure Detection and Location, Para 4.38)
- InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
- TrackablePart (See S5000F UoF Change Embodiment Planning, Para 4.18)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

3.4.3.14.4 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductOperationalConfigurationItem (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- EventItem (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)

- InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
- MessageContextItem (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- ObsolescenceItem (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from SoftwarePartAsReleased) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReleasedDataSetItem (See S5000F UoF Data Sets, Para 4.27)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ReportingParty (See S5000F UoF Report, Para 4.73)
- SupplyItem (See S5000F UoF Supply Item, Para 4.89)
- WarrantyItem (See S5000F UoF Warranty, Para 4.96)

4 Data model units of functionality

4.1 CDM UoF Aggregated Element

4.1.1 Description

The Aggregated Element UoF provides the capability to specify that an element within a breakdown represents a collection of elements for an identified purpose.

4.1.2 Graphical description

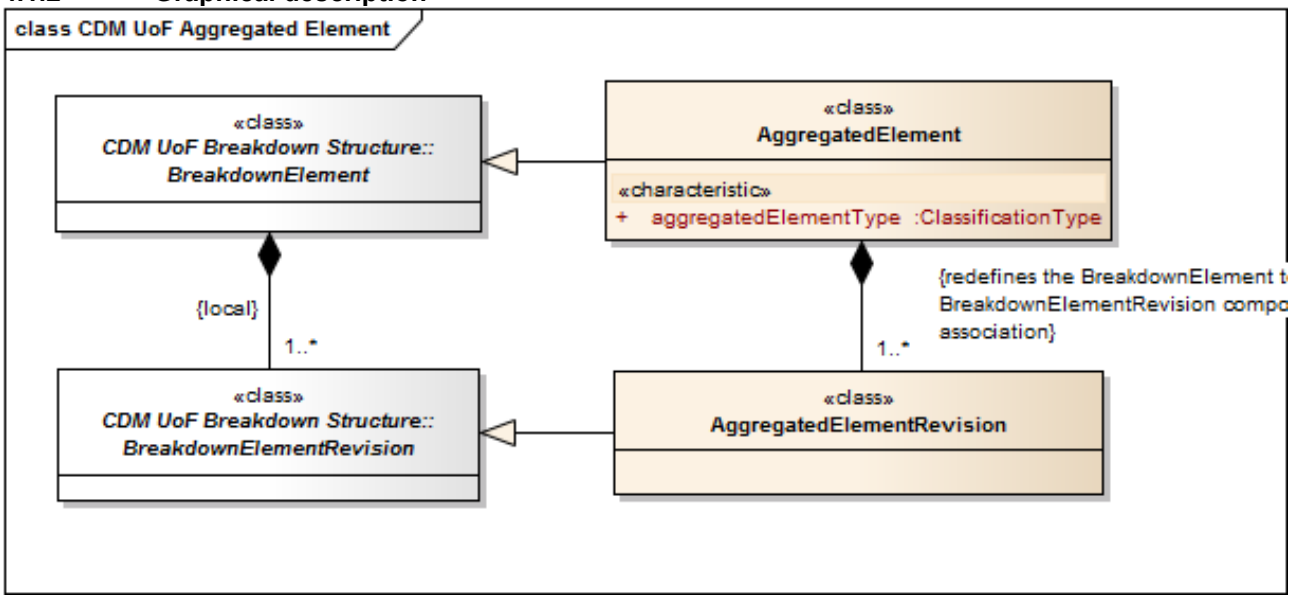

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Fig 6 CDM UoF Aggregated Element

4.1.3 Class definition

4.1.3.1 AggregatedElement

AggregatedElement is a BreakdownElement that is a container for a collection of BreakdownElements which are grouped for an identified purpose.

4.1.3.1.1 Attribute(s)

This class has the following attributes:

- breakdownElementIdentifier (inherited from BreakdownElement), one or many
- breakdownElementEssentiality (inherited from BreakdownElement), optional
- breakdownElementName (inherited from BreakdownElement), zero, one or many
- aggregatedElementType

4.1.3.1.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.1.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

– BreakdownElementInZoneItem (inherited from BreakdownElement) (See CDM UoF Zone Element, Para 4.8)
– CostBreakdownContext (inherited from BreakdownElement) (See S5000F UoF Cost Breakdown, Para 4.25)
– MeasurementPointItem (inherited from BreakdownElement) (See S5000F UoF Part As Realized, Para 4.65)
– SecurityClassificationItem (inherited from BreakdownElement) (See S5000F UoF Security Classification, Para 4.79)
– WorkBreakdownContext (inherited from BreakdownElement) (See S5000F UoF Work Breakdown, Para 4.97)

4.1.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

– BreakdownElementRevisionRelationshipItem (inherited from BreakdownElement) (See S5000F UoF Breakdown Structure, Para 4.14)
– ClassInstanceAssertItem (inherited from BreakdownElement) (See S5000F UoF Applicability Statement, Para 4.11)
– DigitalFileReferencedItem (inherited from BreakdownElement) (See S5000F UoF Digital File, Para 4.28)

4.1.3.2 AggregatedElementRevision

AggregatedElementRevision is a BreakdownElementRevision representing an iteration applied to an AggregatedElement.

4.1.3.2.1 Attribute(s)

This class has the following attributes:

– breakdownElementRevisionIdentifier (inherited from BreakdownElementRevision)
– breakdownElementRevisionStatus (inherited from BreakdownElementRevision), optional
– maintenanceSignificantOrRelevant (inherited from BreakdownElementRevision)

4.1.3.2.2 Associations

This class has the following associations:

– An aggregate association, one or many, to related object(s) of type AggregatedElement
– An association to object(s) of type BreakdownElementRevisionRelationship

4.1.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

– BreakdownElementInZoneItem (inherited from BreakdownElementRevision) (See CDM UoF Zone Element, Para 4.8)
– ChangeControlledItem (inherited from BreakdownElementRevision) (See S5000F UoF Change Information, Para 4.21)
– DetectionMean (inherited from BreakdownElementRevision) (See S5000F UoF Failure Detection and Location, Para 4.38)
– MeasurementPointItem (inherited from BreakdownElementRevision) (See S5000F UoF Part As Realized, Para 4.65)

4.1.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- BreakdownElementRevisionRelationshipItem (inherited from BreakdownElementRevision) (See S5000F UoF Breakdown Structure, Para 4.14)
- Detector (inherited from BreakdownElementRevision) (See S5000F UoF Failure Detection and Location, Para 4.38)

4.2 CDM UoF Document

4.2.1 Description

The Document UoF provides the capability to identify a physical document or a digital file and their associated metadata.

4.2.2 Graphical description

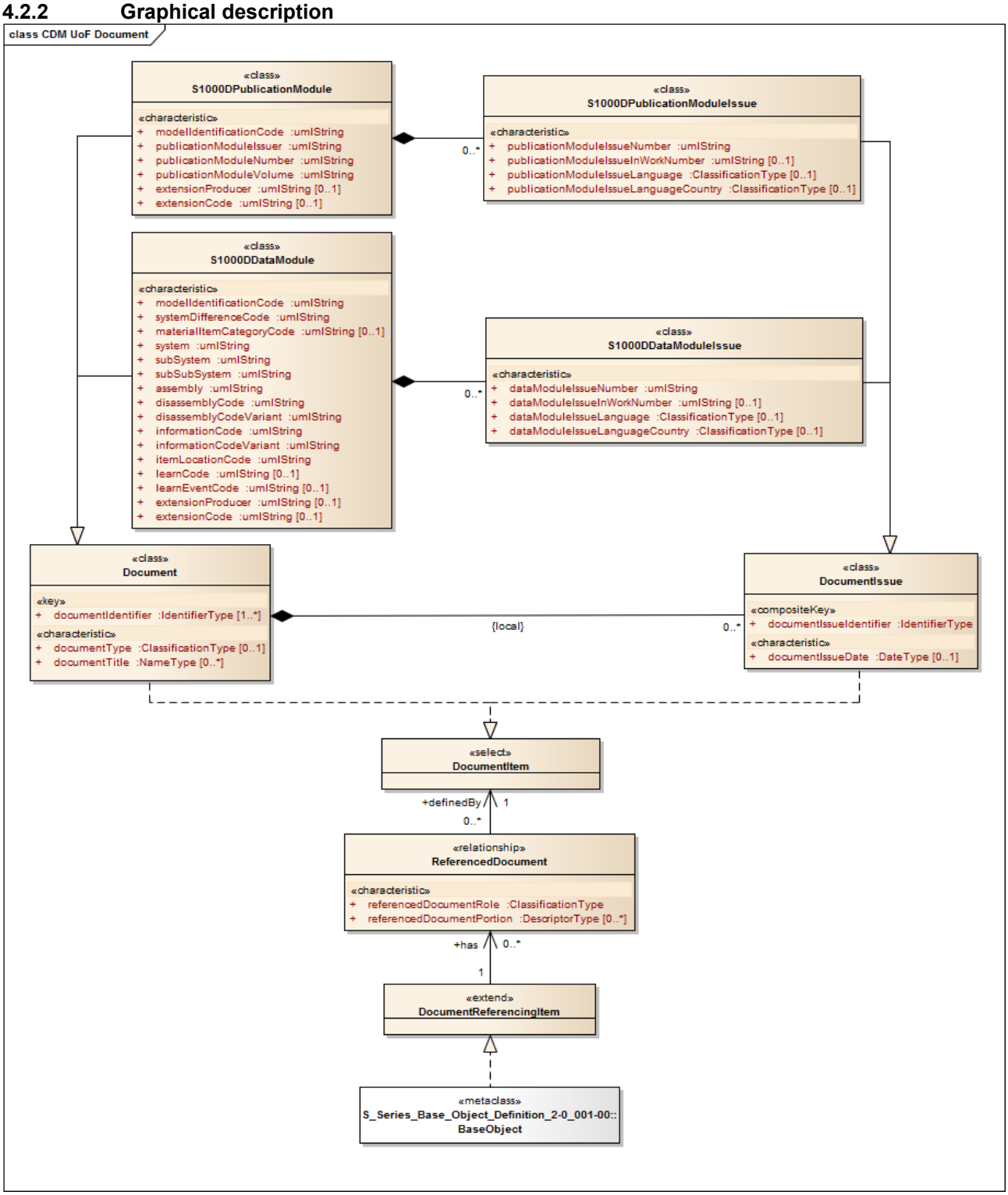

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Fig 7 CDM UoF Document

4.2.3 Class definition

4.2.3.1 Document

Document is a <<class>> that represents a compiled set of information that serves a purpose.

4.2.3.1.1 Attribute(s)
This class has the following attributes:

- documentIdentifier, one or many
- documentTitle, zero, one or many
- documentType, optional

4.2.3.2 DocumentIssue
DocumentIssue is a <<class>> that represents a specific release of a Document

4.2.3.2.1 Attribute(s)
This class has the following attributes:

- documentIssueIdentifier
- documentIssueDate, optional

4.2.3.3 DocumentItem
DocumentItem is a <<select>> interface that identifies items which can be selected as Document.

4.2.3.3.1 Associations
This class has the following associations:

- A composition association, supportedBy, zero, one or many, to child objects of type Penalty

4.2.3.4 DocumentReferencingItem
DocumentReferencingItem is an <<extend>> interface that provides its associated data model to those classes that implement it.

4.2.3.4.1 Associations
This class has the following associations:

- An association to object(s) of type ReferencedDocument

4.2.3.5 ReferencedDocument
ReferencedDocument is a <<relationship>> where one DocumentReferencingItem relates to a DocumentItem.

4.2.3.5.1 Attribute(s)
This class has the following attributes:

- referencedDocumentPortion, zero, one or many
- referencedDocumentRole

4.2.3.5.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of DocumentItem

4.2.3.5.3 Implementations
This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)

4.2.3.5.4 Selects
This class is a member of the following <<select>> interfaces:

- SafetyItem (See S5000F UoF Safety, Para 4.78)

4.2.3.6 S1000DDataModule

S1000DDataModule is a Document that identifies a document written in accordance with an S1000D schema.

4.2.3.6.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- assembly
- disassemblyCode
- disassemblyCodeVariant
- extensionCode, optional
- extensionProducer, optional
- informationCode
- informationCodeVariant
- itemLocationCode
- learnCode, optional
- learnEventCode, optional
- materialItemCategoryCode, optional
- modelIdentificationCode
- subSubSystem
- subSystem
- system
- systemDifferenceCode

4.2.3.6.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.2.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.2.3.6.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document)

4.2.3.7 S1000DDataModuleIssue

S1000DDataModuleIssue is a DocumentIssue that identifies a specific issue of a data module produced in accordance with S1000D.

4.2.3.7.1 Attribute(s)

This class has the following attributes:

- documentIssueIdentifier (inherited from DocumentIssue)
- documentIssueDate (inherited from DocumentIssue), optional
- dataModuleIssueInWorkNumber, optional

- dataModuleIssueLanguage, optional
- dataModuleIssueLanguageCountry, optional
- dataModuleIssueNumber

4.2.3.7.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type S1000DDataModule

4.2.3.7.3 Implementations

This class implements the following <<extend>> interfaces:

- ChangeControlledItem (inherited from DocumentIssue) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from DocumentIssue) (See S5000F UoF Digital File, Para 4.28)
- ItemUnderExportControl (inherited from DocumentIssue) (See S5000F UoF Export Control Requirement, Para 4.35)

4.2.3.7.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from DocumentIssue) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from DocumentIssue)

4.2.3.8 S1000DPublicationModule

S1000DPublicationModule is a Document that identifies a publication published in accordance with S1000D

4.2.3.8.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- extensionCode, optional
- extensionProducer, optional
- modelIdentificationCode
- publicationModuleIssuer
- publicationModuleNumber
- publicationModuleVolume

4.2.3.8.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.2.3.8.3 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.2.3.8.4 *Selects*
This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document)

4.2.3.9 S1000DPublicationModuleIssue
S1000DPublicationModuleIssue is a DocumentIssue that identifies a specific issue of a publication module published in accordance with S1000D.

4.2.3.9.1 *Attribute(s)*
This class has the following attributes:

- documentIssueIdentifier (inherited from DocumentIssue)
- documentIssueDate (inherited from DocumentIssue), optional
- publicationModuleIssueInWorkNumber, optional
- publicationModuleIssueLanguage, optional
- publicationModuleIssueLanguageCountry, optional
- publicationModuleIssueNumber

4.2.3.9.2 *Associations*
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type S1000DPublicationModule

4.2.3.9.3 *Implementations*
This class implements the following <<extend>> interfaces:

- ChangeControlledItem (inherited from DocumentIssue) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from DocumentIssue) (See S5000F UoF Digital File, Para 4.28)
- ItemUnderExportControl (inherited from DocumentIssue) (See S5000F UoF Export Control Requirement, Para 4.35)

4.2.3.9.4 *Selects*
This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from DocumentIssue) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from DocumentIssue)

4.3 CDM UoF Hardware Element

4.3.1 Description

The Hardware Element UoF provides the capability to specify that an element within a breakdown is hardware and can be associated with the hardware part(s) that fulfill the requirement.

4.3.2 Graphical description

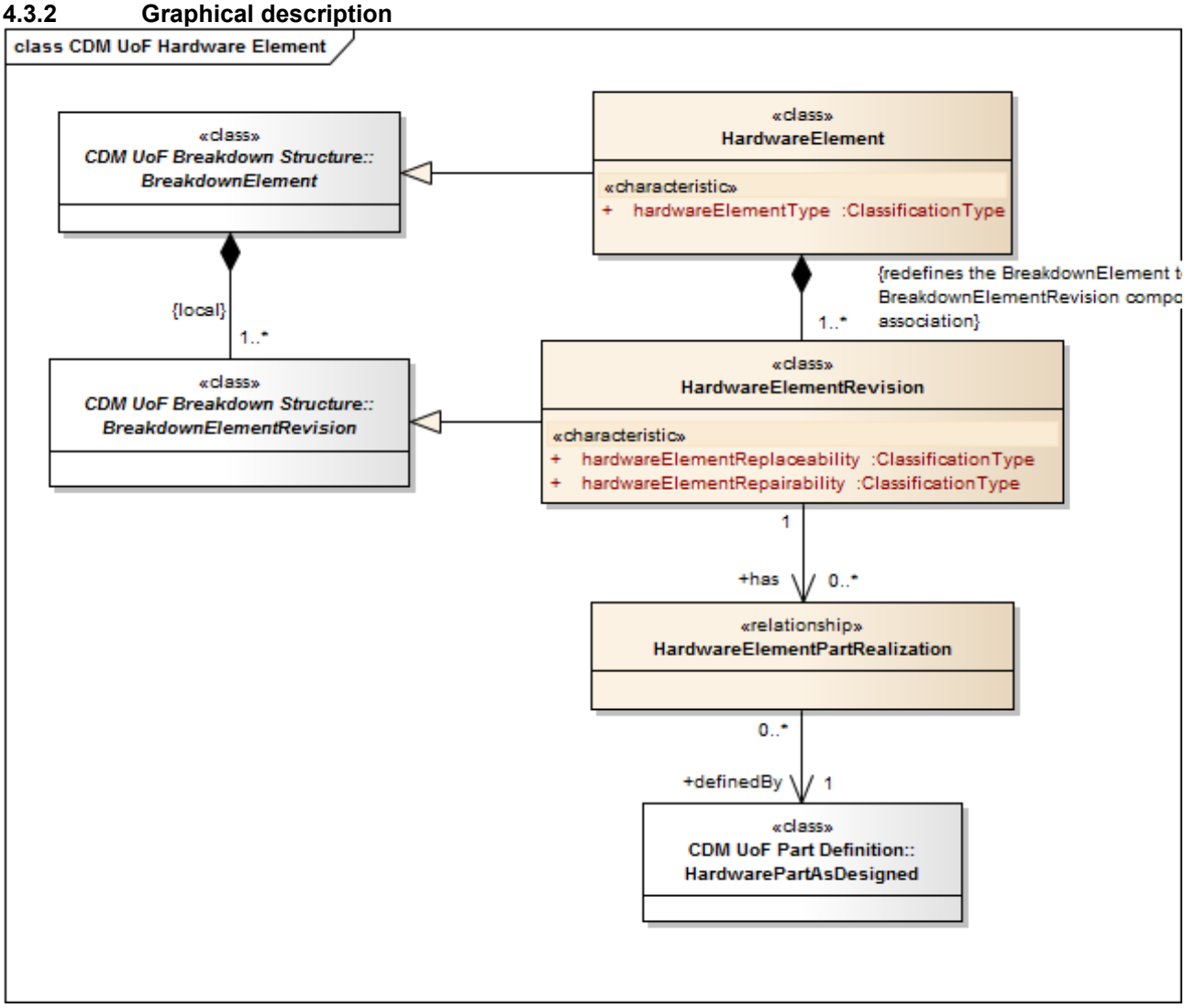

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Fig 8 CDM UoF Hardware Element

4.3.3 Class definition

4.3.3.1 HardwareElement

HardwareElement is a BreakdownElement that is realized as a HardwarePartAsDesigned.

4.3.3.1.1 Attribute(s)

This class has the following attributes:

- breakdownElementIdentifier (inherited from BreakdownElement), one or many
- breakdownElementEssentiality (inherited from BreakdownElement), optional
- breakdownElementName (inherited from BreakdownElement), zero, one or many
- hardwareElementType

4.3.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.3.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- BreakdownElementInZoneItem (inherited from BreakdownElement) (See CDM UoF Zone Element, Para 4.8)
- CostBreakdownContext (inherited from BreakdownElement) (See S5000F UoF Cost Breakdown, Para 4.25)
- InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
- MeasurementPointItem (inherited from BreakdownElement) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from BreakdownElement) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from BreakdownElement) (See S5000F UoF Work Breakdown, Para 4.97)

4.3.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- BreakdownElementRevisionRelationshipItem (inherited from BreakdownElement) (See S5000F UoF Breakdown Structure, Para 4.14)
- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from BreakdownElement) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencedItem (inherited from BreakdownElement) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
- InstallationLocationDefinitionItem (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)

4.3.3.2 HardwareElementPartRealization

HardwareElementPartRealization is a <<relationship>> where a HardwareElementRevision relates to an instance of HardwarePartAsDesigned which fulfills the HardwareElement specification.

4.3.3.2.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Accelerometer
- An association, zero, one or many, to object(s) of type AllowedProductConfigurationHardwarePartAsDesigned
- An association, zero, one or many, to object(s) of type HardwarePartAsDesigned
- An association, zero, one or many, to object(s) of type PressureSensor
- An association, zero, one or many, to object(s) of type SensorType
- An association, zero, one or many, to object(s) of type StrainGauge
- An association, zero, one or many, to object(s) of type SupportEquipment
- An association, zero, one or many, to object(s) of type Tachometer
- An association, zero, one or many, to object(s) of type TemperatureSensor

4.3.3.2.2 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- EffectiveOnProductConfigurationItem (See CDM UoF Product Design Configuration, Para 4.5)
- UsableOnItem (See CDM UoF Product Design Configuration, Para 4.5)

4.3.3.2.3 *Selects*
This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (See S5000F UoF Applicability Statement, Para 4.11)
- SafetyItem (See S5000F UoF Safety, Para 4.78)

4.3.3.3 HardwareElementRevision
HardwareElementRevision is a BreakdownElementRevision representing an iteration applied to a HardwareElement.

4.3.3.3.1 *Attribute(s)*
This class has the following attributes:

- breakdownElementRevisionIdentifier (inherited from BreakdownElementRevision)
- breakdownElementRevisionStatus (inherited from BreakdownElementRevision), optional
- maintenanceSignificantOrRelevant (inherited from BreakdownElementRevision)
- hardwareElementRepairability
- hardwareElementReplaceability

4.3.3.3.2 *Associations*
This class has the following associations:

- An aggregate association, one or many, to related object(s) of type HardwareElement
- An association to object(s) of type BreakdownElementRevisionRelationship
- An association to object(s) of type HardwareElementPartRealization

4.3.3.3.3 *Implementations*
This class implements the following <<extend>> interfaces:

- BreakdownElementInZoneItem (inherited from BreakdownElementRevision) (See CDM UoF Zone Element, Para 4.8)
- ChangeControlledItem (inherited from BreakdownElementRevision) (See S5000F UoF Change Information, Para 4.21)
- DetectionMean (inherited from BreakdownElementRevision) (See S5000F UoF Failure Detection and Location, Para 4.38)
- MeasurementPointItem (inherited from BreakdownElementRevision) (See S5000F UoF Part As Realized, Para 4.65)

4.3.3.3.4 *Selects*
This class is a member of the following <<select>> interfaces:

- BreakdownElementRevisionRelationshipItem (inherited from BreakdownElementRevision) (See S5000F UoF Breakdown Structure, Para 4.14)
- Detector (inherited from BreakdownElementRevision) (See S5000F UoF Failure Detection and Location, Para 4.38)

4.4 CDM UoF Part Definition

4.4.1 Description

The Part Definition UoF provides the capability of defining hardware and software parts, their characteristics, and associated parts lists.

4.4.2 Graphical description

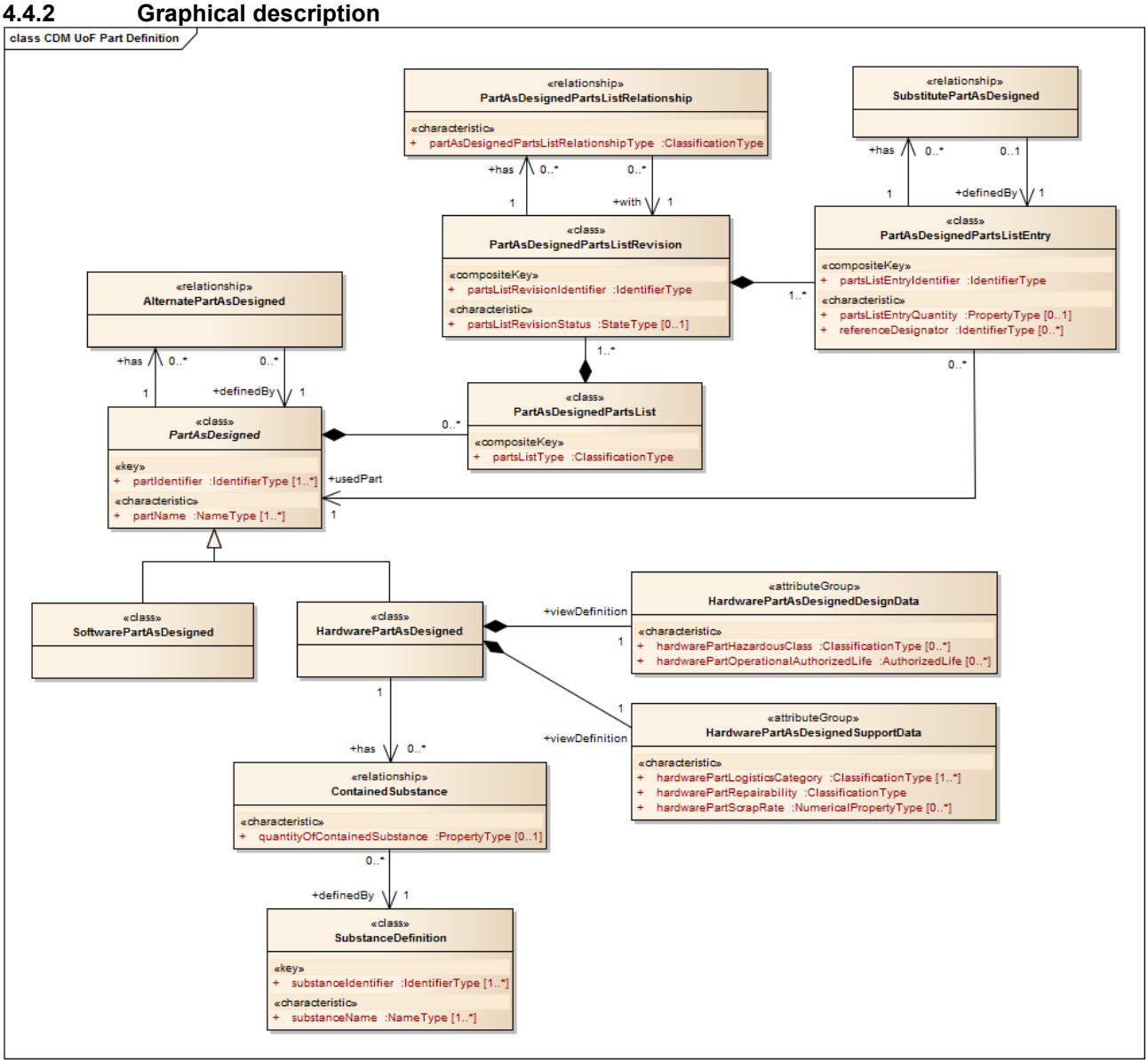

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Fig 9 CDM UoF Part Definition

4.4.3 Class definition

4.4.3.1 AlternatePartAsDesigned

AlternatePartAsDesigned is a <<relationship>> that defines an alternate PartAsDesigned which can replace the base PartAsDesigned in all its usages ie, it is context independent, and is fit, form and function equivalent.

4.4.3.1.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Accelerometer
- An association, zero, one or many, to object(s) of type AllowedProductConfigurationHardwarePartAsDesigned
- An association, zero, one or many, to object(s) of type DataSetAsDesigned
- An association, zero, one or many, to object(s) of type HardwarePartAsDesigned
- An association, zero, one or many, to object(s) of type PartAsDesigned

- An association, zero, one or many, to object(s) of type PressureSensor
- An association, zero, one or many, to object(s) of type SensorType
- An association, zero, one or many, to object(s) of type SoftwarePartAsDesigned
- An association, zero, one or many, to object(s) of type StrainGauge
- An association, zero, one or many, to object(s) of type SupportEquipment
- An association, zero, one or many, to object(s) of type Tachometer
- An association, zero, one or many, to object(s) of type TemperatureSensor

4.4.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)

4.4.3.2 ContainedSubstance

ContainedSubstance is a <<relationship>> that associates a HardwarePartAsDesigned with a contained SubstanceDefinition.

4.4.3.2.1 Attribute(s)

This class has the following attributes:

- quantityOfContainedSubstance, optional

4.4.3.2.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type SubstanceDefinition

4.4.3.3 HardwarePartAsDesigned

HardwarePartAsDesignedis a PartAsDesigned that is realized as physical items including non-countable material.

4.4.3.3.1 Attribute(s)

This class has the following attributes:

- partIdentifier (inherited from PartAsDesigned), one or many
- partName (inherited from PartAsDesigned), one or many

4.4.3.4 HardwarePartAsDesignedDesignData

HardwarePartAsDesignedDesignData is an <<attributeGroup>> that collects HardwarePartAsDesigned characteristics identified during design activities.

4.4.3.4.1 Attribute(s)

This class has the following attributes:

- hardwarePartHazardousClass, zero, one or many
- hardwarePartOperationalAuthorizedLife, zero, one or many

4.4.3.4.2 Associations

This class has the following associations:

- An aggregate association, viewDefinition, to related object(s) of type Accelerometer
- An aggregate association, viewDefinition, to related object(s) of type AllowedProductConfigurationHardwarePartAsDesigned
- An aggregate association, viewDefinition, to related object(s) of type HardwarePartAsDesigned
- An aggregate association, viewDefinition, to related object(s) of type PressureSensor
- An aggregate association, viewDefinition, to related object(s) of type SensorType
- An aggregate association, viewDefinition, to related object(s) of type StrainGauge
- An aggregate association, viewDefinition, to related object(s) of type SupportEquipment

- An aggregate association, viewDefinition, to related object(s) of type Tachometer
- An aggregate association, viewDefinition, to related object(s) of type TemperatureSensor

4.4.3.5 HardwarePartAsDesignedSupportData

HardwarePartAsDesignedSupportData is an <<attributeGroup>> that collects HardwarePartAsDesigned characteristics identified during supportability analysis activities.

4.4.3.5.1 Attribute(s)

This class has the following attributes:

- hardwarePartLogisticsCategory, one or many
- hardwarePartRepairability
- hardwarePartScrapRate, zero, one or many

4.4.3.5.2 Associations

This class has the following associations:

- An aggregate association, viewDefinition, to related object(s) of type Accelerometer
- An aggregate association, viewDefinition, to related object(s) of type AllowedProductConfigurationHardwarePartAsDesigned
- An aggregate association, viewDefinition, to related object(s) of type HardwarePartAsDesigned
- An aggregate association, viewDefinition, to related object(s) of type PressureSensor
- An aggregate association, viewDefinition, to related object(s) of type SensorType
- An aggregate association, viewDefinition, to related object(s) of type StrainGauge
- An aggregate association, viewDefinition, to related object(s) of type SupportEquipment
- An aggregate association, viewDefinition, to related object(s) of type Tachometer
- An aggregate association, viewDefinition, to related object(s) of type TemperatureSensor

4.4.3.6 PartAsDesigned

PartAsDesigned is a <<class>> that represents the definitional information for an artifact fullfilling a set of requirements, which can be produced or realized.

4.4.3.6.1 Attribute(s)

This class has the following attributes:

- partIdentifier, one or many
- partName, one or many

4.4.3.6.2 Associations

This class has the following associations:

- An association to object(s) of type AlternatePartAsDesigned

4.4.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
- MeasurementPointItem (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

4.4.3.6.4 Selects

This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (See S5000F UoF Applicability Statement, Para 4.11)
- Detector (See S5000F UoF Failure Detection and Location, Para 4.38)

- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- RealizedPart (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- SerializedAssertItem (See S5000F UoF Applicability Statement, Para 4.11)

4.4.3.7 PartAsDesignedPartsList

PartAsDesignedPartsList is a <<class>> that represents the definitional information for the collection of PartAsDesignedPartsListEntry included in the assembly of the parent PartAsDesigned.

Note

PartAsDesignedPartsList is typically referred to as a Bill of Material.

4.4.3.7.1 Attribute(s)

This class has the following attributes:

- partsListType

4.4.3.7.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type Accelerometer
- An aggregate association, zero, one or many, to related object(s) of type AllowedProductConfigurationHardwarePartAsDesigned
- An aggregate association, zero, one or many, to related object(s) of type DataSetAsDesigned
- An aggregate association, zero, one or many, to related object(s) of type HardwarePartAsDesigned
- An aggregate association, zero, one or many, to related object(s) of type PartAsDesigned
- An aggregate association, zero, one or many, to related object(s) of type PressureSensor
- An aggregate association, zero, one or many, to related object(s) of type SensorType
- An aggregate association, zero, one or many, to related object(s) of type SoftwarePartAsDesigned
- An aggregate association, zero, one or many, to related object(s) of type StrainGauge
- An aggregate association, zero, one or many, to related object(s) of type SupportEquipment
- An aggregate association, zero, one or many, to related object(s) of type Tachometer
- An aggregate association, zero, one or many, to related object(s) of type TemperatureSensor

4.4.3.8 PartAsDesignedPartsListEntry

PartAsDesignedPartsListEntry is a <<class>> that represents the inclusion of a PartAsDesigned in a PartAsDesignedPartsListRevision.

4.4.3.8.1 Attribute(s)

This class has the following attributes:

- partsListEntryIdentifier
- partsListEntryQuantity, optional
- referenceDesignator, zero, one or many

4.4.3.8.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type PartAsDesignedPartsListRevision
- An association to object(s) of type SubstitutePartAsDesigned
- An association, zero, one or many, to object(s) of type Accelerometer
- An association, zero, one or many, to object(s) of type AllowedProductConfigurationHardwarePartAsDesigned

- An association, zero, one or many, to object(s) of type DataSetAsDesigned
- An association, zero, one or many, to object(s) of type HardwarePartAsDesigned
- An association, zero, one or many, to object(s) of type PartAsDesigned
- An association, zero, one or many, to object(s) of type PressureSensor
- An association, zero, one or many, to object(s) of type SensorType
- An association, zero, one or many, to object(s) of type SoftwarePartAsDesigned
- An association, zero, one or many, to object(s) of type StrainGauge
- An association, zero, one or many, to object(s) of type SupportEquipment
- An association, zero, one or many, to object(s) of type Tachometer
- An association, zero, one or many, to object(s) of type TemperatureSensor

4.4.3.8.3 Implementations

This class implements the following <<extend>> interfaces:

- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- EffectiveOnProductConfigurationItem (See CDM UoF Product Design Configuration, Para 4.5)
- UsableOnItem (See CDM UoF Product Design Configuration, Para 4.5)

4.4.3.9 PartAsDesignedPartsListRelationship

PartAsDesignedPartsListRelationship is a <<relationship>> where one PartAsDesignedPartsList relates to another PartAsDesignedPartsList.

4.4.3.9.1 Attribute(s)

This class has the following attributes:

- partAsDesignedPartsListRelationshipType

4.4.3.9.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type PartAsDesignedPartsListRevision

4.4.3.10 PartAsDesignedPartsListRevision

PartAsDesignedPartsListRevision is a <<class>> representing an iteration applied to a PartAsDesignedPartsList.

4.4.3.10.1 Attribute(s)

This class has the following attributes:

- partsListRevisionIdentifier
- partsListRevisionStatus, optional

4.4.3.10.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type PartAsDesignedPartsList
- An association to object(s) of type PartAsDesignedPartsListRelationship

4.4.3.10.3 Implementations

This class implements the following <<extend>> interfaces:

- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- EffectiveOnProductConfigurationItem (See CDM UoF Product Design Configuration, Para 4.5)
- UsableOnItem (See CDM UoF Product Design Configuration, Para 4.5)

4.4.3.11 SoftwarePartAsDesigned

SoftwarePartAsDesigned is a PartAsDesigned that is produced as an executable software or as a data file.

Note

Non-executable software includes eg, maps.

4.4.3.11.1 Attribute(s)

This class has the following attributes:

- partIdentifier (inherited from PartAsDesigned), one or many
- partName (inherited from PartAsDesigned), one or many

4.4.3.11.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type AlternatePartAsDesigned

4.4.3.11.3 Implementations

This class implements the following <<extend>> interfaces:

- CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

4.4.3.11.4 Selects

This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReportingParty (See S5000F UoF Report, Para 4.73)
- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)

4.4.3.12 SubstanceDefinition

SubstanceDefinition is a <<class>> that identifies high concern physical matter.

4.4.3.12.1 Attribute(s)

This class has the following attributes:

- substanceIdentifier, one or many
- substanceName, one or many

4.4.3.12.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.4.3.12.3 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)

4.4.3.12.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)

4.4.3.13 SubstitutePartAsDesigned

SubstitutePartAsDesigned is a <<relationship>> that defines a substitute PartAsDesignedPartsListEntry which can replace the base PartAsDesignedPartsListEntry in the context of the parent PartAsDesignedPartsList.

4.4.3.13.1 Associations

This class has the following associations:

- An association, optional, to object(s) of type PartAsDesignedPartsListEntry

4.5 CDM UoF Product Design Configuration

4.5.1 Description

The Product Design Configuration UoF defines permitted combinations of breakdown elements, hardware and software, in the context of product variants and allowed product configurations.

4.5.2 Graphical description

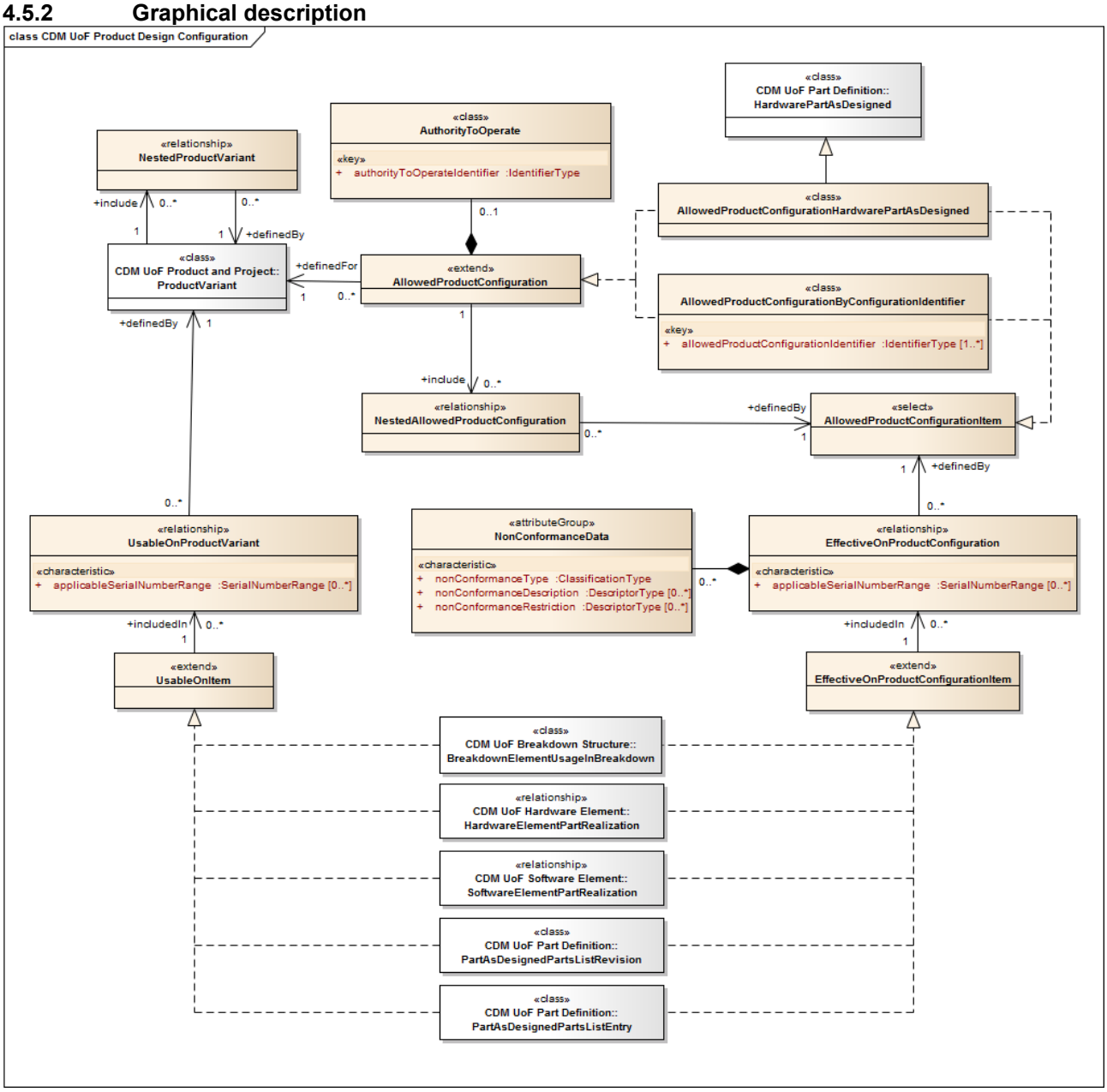

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Fig 10 CDM UoF Product Design Configuration

4.5.3 Class definition

4.5.3.1 AllowedProductConfiguration

AllowedProductConfiguration is an <<extend>> interface that provides its associated data model to those classes that must define permitted combinations of hardware and software parts which can or must be installed in specific locations (positions).

4.5.3.1.1 Associations

This class has the following associations:

- An association to object(s) of type AllowedProductConfigurationRole
- An association to object(s) of type NestedAllowedProductConfiguration
- An association, zero, one or many, to object(s) of type ProductVariant

4.5.3.2 AllowedProductConfigurationByConfigurationIdentifier

AllowedProductConfigurationByConfigurationIdentifier is a <<class>> that defines an AllowedProductConfiguration by means other than a part number.

4.5.3.2.1 Attribute(s)

This class has the following attributes:

- allowedProductConfigurationIdentifier, one or many

4.5.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.5.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- AllowedProductConfiguration

4.5.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductConfigurationItem
- ClassInstanceAssertItem (See S5000F UoF Applicability Statement, Para 4.11)

4.5.3.3 AllowedProductConfigurationHardwarePartAsDesigned

AllowedProductConfigurationHardwarePartAsDesigned is a HardwarePartAsDesigned that is managed as an AllowedProductConfiguration.

4.5.3.3.1 Attribute(s)

This class has the following attributes:

- partIdentifier (inherited from PartAsDesigned), one or many
- partName (inherited from PartAsDesigned), one or many

4.5.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type AlternatePartAsDesigned
- An association to object(s) of type ContainedSubstance

4.5.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- AllowedProductConfiguration
- CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

4.5.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductConfigurationItem
- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)

4.5.3.4 AllowedProductConfigurationItem

AllowedProductConfigurationItem is a <<select>> interface that identifies items which can be selected as an allowed Product configuration.

4.5.3.5 AuthorityToOperate

AuthorityToOperate is a <<class>> that represents a certification allowing a specific configuration of a Product to be put into operation.

Note

Type certificate for an aircraft signifies the airworthiness of its design.

Note

A design change cannot be put into operation without re-certification.

4.5.3.5.1 Attribute(s)

This class has the following attributes:

- authorityToOperateIdentifier

4.5.3.5.2 Associations

This class has the following associations:

- An aggregate association, optional, to related object(s) of type AllowedProductConfiguration

4.5.3.6 EffectiveOnProductConfiguration

EffectiveOnProductConfiguration is a <<relationship>> that identifies that a EffectiveOnProductConfigurationItem, included in the Breakdown for the overall Product, is effective in the associated AllowedProductConfiguration.

4.5.3.6.1 Attribute(s)

This class has the following attributes:

- applicableSerialNumberRange, zero, one or many

4.5.3.6.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of AllowedProductConfigurationItem

4.5.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)

4.5.3.7 EffectiveOnProductConfigurationItem
EffectiveOnProductConfigurationItem is an <<extend>> interface that provides its associated data model to those classes that can be included in one or many instances of AllowedProductConfiguration.

4.5.3.7.1 Associations
This class has the following associations:

– An association to object(s) of type EffectiveOnProductConfiguration

4.5.3.8 NestedAllowedProductConfiguration
NestedAllowedProductConfiguration is a <<relationship>> that defines that one AllowedProductConfiguration includes a subordinate AllowedProductConfiguration.

4.5.3.8.1 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of AllowedProductConfigurationItem

4.5.3.9 NestedProductVariant
NestedProductVariant is a <<relationship>> that defines that one ProductVariant includes a subordinate ProductVariant.

4.5.3.9.1 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) of type ProductVariant

4.5.3.10 NonConformanceData
NonConformanceData is an <<attributeGroup>> that collects information on how the EffectiveOnProductConfigurationItem does not comply with the requirements of its usage.

4.5.3.10.1 Attribute(s)
This class has the following attributes:

– nonConformanceDescription, zero, one or many
– nonConformanceRestriction, zero, one or many
– nonConformanceType

4.5.3.10.2 Associations
This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type EffectiveOnProductConfiguration

4.5.3.11 UsableOnItem
UsableOnItem is an <<extend>> interface that provides its associated data model to those classes that can have a limited effectivity with respect to its usage in one or many instances of ProductVariant.

4.5.3.11.1 Associations
This class has the following associations:

– An association to object(s) of type UsableOnProductVariant

4.5.3.12 UsableOnProductVariant
UsableOnProductVariant is a <<relationship>> that defines that a UsableOnItem, included in the Breakdown for the overall Product, is effective in the associated ProductVariant.

Note

UsableOnProductVariant is the equivalent of the Usable on Code in GEIA-0007B.

4.5.3.12.1 Attribute(s)

This class has the following attributes:

– applicableSerialNumberRange, zero, one or many

4.5.3.12.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type ProductVariant

4.5.3.12.3 Implementations

This class implements the following <<extend>> interfaces:

– ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)

4.6 CDM UoF Product Usage Context

4.6.1 Description

The Product Usage Context UoF defines the context in which the defined Product(s) and Product variant(s) are to be operated and maintained.

4.6.2 Graphical description

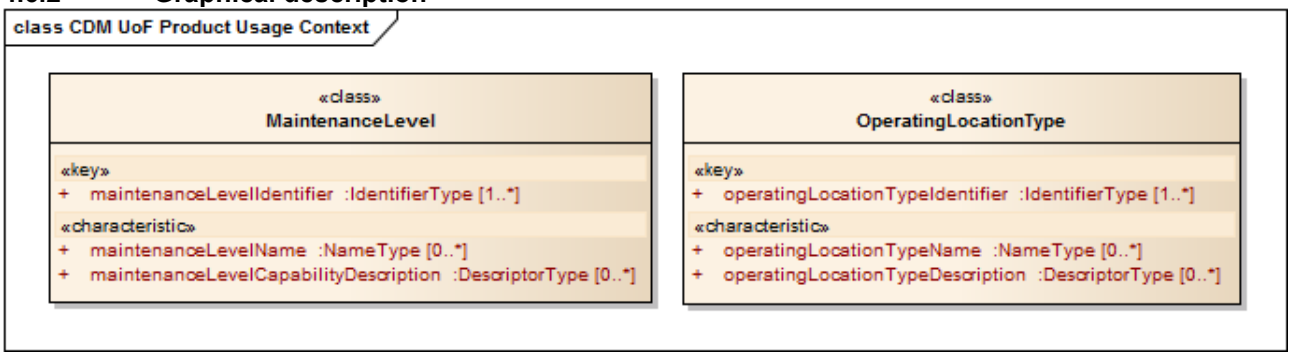

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Fig 11 CDM UoF Product Usage Context

4.6.3 Class definition

4.6.3.1 MaintenanceLevel

MaintenanceLevel is a <<class>> that represents the definition of a set of maintenance capabilities which will be made available to support a defined Product.

Note

MaintenanceLevel might be established either by a single organization or be distributed between a set of organizations.

4.6.3.1.1 Attribute(s)

This class has the following attributes:

– maintenanceLevelIdentifier, one or many
– maintenanceLevelCapabilityDescription, zero, one or many
– maintenanceLevelName, zero, one or many

4.6.3.1.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.6.3.1.3 *Selects*
This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (See S5000F UoF Applicability Statement, Para 4.11)

4.6.3.2 OperatingLocationType
OperatingLocationType is a <<class>> that represents the definition of the nature of the environment in which a product will be operated.

4.6.3.2.1 *Attribute(s)*
This class has the following attributes:

- operatingLocationTypeIdentifier, one or many
- operatingLocationTypeDescription, zero, one or many
- operatingLocationTypeName, zero, one or many

4.6.3.2.2 *Associations*
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.6.3.2.3 *Selects*
This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (See S5000F UoF Applicability Statement, Para 4.11)

4.7 CDM UoF Software Element

4.7.1 Description

The Software Element UoF provides the capability to specify that an element within a breakdown is software and can be associated with the software part(s) that fulfill the requirement.

4.7.2 Graphical description

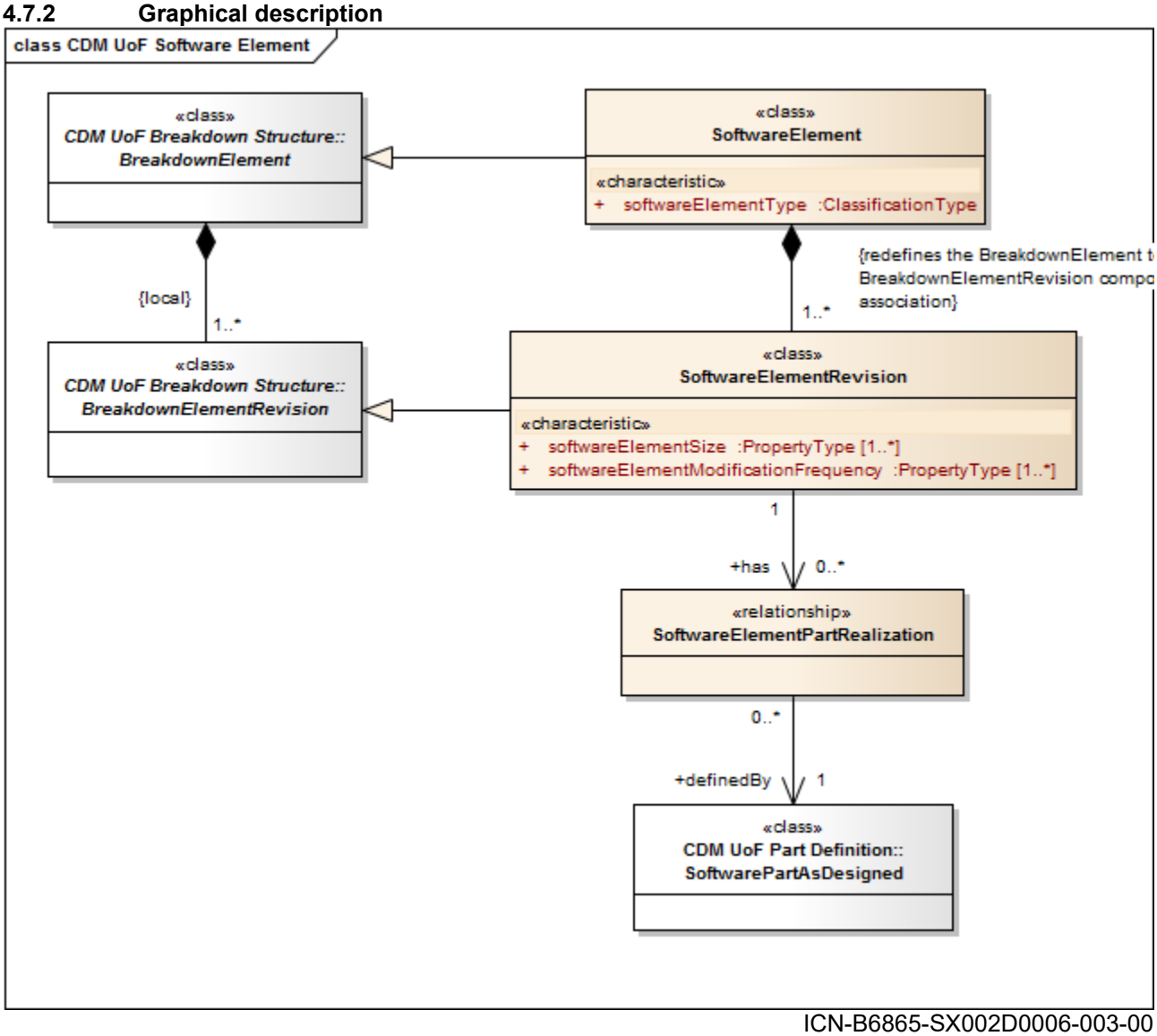

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Fig 12 CDM UoF Software Element

4.7.3 Class definition

4.7.3.1 SoftwareElement

SoftwareElement is a BreakdownElement that is realized as a SoftwarePartAsDesigned.

4.7.3.1.1 Attribute(s)

This class has the following attributes:

- breakdownElementIdentifier (inherited from BreakdownElement), one or many
- breakdownElementEssentiality (inherited from BreakdownElement), optional
- breakdownElementName (inherited from BreakdownElement), zero, one or many
- softwareElementType

4.7.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.7.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- BreakdownElementInZoneItem (inherited from BreakdownElement) (See CDM UoF Zone Element, Para 4.8)
- CostBreakdownContext (inherited from BreakdownElement) (See S5000F UoF Cost Breakdown, Para 4.25)
- InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
- MeasurementPointItem (inherited from BreakdownElement) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from BreakdownElement) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from BreakdownElement) (See S5000F UoF Work Breakdown, Para 4.97)

4.7.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- BreakdownElementRevisionRelationshipItem (inherited from BreakdownElement) (See S5000F UoF Breakdown Structure, Para 4.14)
- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from BreakdownElement) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencedItem (inherited from BreakdownElement) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
- InstallationLocationDefinitionItem (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)

4.7.3.2 SoftwareElementPartRealization

SoftwareElementPartRealization is a <<relationship>> where a SoftwareElementRevision relates to an instance of SoftwarePartAsDesigned which fulfills the SoftwareElement specification.

4.7.3.2.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type DataSetAsDesigned
- An association, zero, one or many, to object(s) of type SoftwarePartAsDesigned

4.7.3.2.2 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- EffectiveOnProductConfigurationItem (See CDM UoF Product Design Configuration, Para 4.5)
- UsableOnItem (See CDM UoF Product Design Configuration, Para 4.5)

4.7.3.2.3 Selects

This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (See S5000F UoF Applicability Statement, Para 4.11)
- SafetyItem (See S5000F UoF Safety, Para 4.78)

4.7.3.3 SoftwareElementRevision

SoftwareElementRevision is a BreakdownElementRevision representing an iteration applied to a SoftwareElement.

4.7.3.3.1 Attribute(s)

This class has the following attributes:

- breakdownElementRevisionIdentifier (inherited from BreakdownElementRevision)
- breakdownElementRevisionStatus (inherited from BreakdownElementRevision), optional
- maintenanceSignificantOrRelevant (inherited from BreakdownElementRevision)
- softwareElementModificationFrequency, one or many
- softwareElementSize, one or many

4.7.3.3.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type SoftwareElement
- An association to object(s) of type BreakdownElementRevisionRelationship
- An association to object(s) of type SoftwareElementPartRealization

4.7.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- BreakdownElementInZoneItem (inherited from BreakdownElementRevision) (See CDM UoF Zone Element, Para 4.8)
- ChangeControlledItem (inherited from BreakdownElementRevision) (See S5000F UoF Change Information, Para 4.21)
- DetectionMean (inherited from BreakdownElementRevision) (See S5000F UoF Failure Detection and Location, Para 4.38)
- MeasurementPointItem (inherited from BreakdownElementRevision) (See S5000F UoF Part As Realized, Para 4.65)

4.7.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- BreakdownElementRevisionRelationshipItem (inherited from BreakdownElementRevision) (See S5000F UoF Breakdown Structure, Para 4.14)
- Detector (inherited from BreakdownElementRevision) (See S5000F UoF Failure Detection and Location, Para 4.38)

4.8 CDM UoF Zone Element

4.8.1 Description

The Zone Element UoF defines the characteristics that are unique for a BreakdownElement and represents a three-dimensional space relate to a Product.

4.8.2 Graphical description

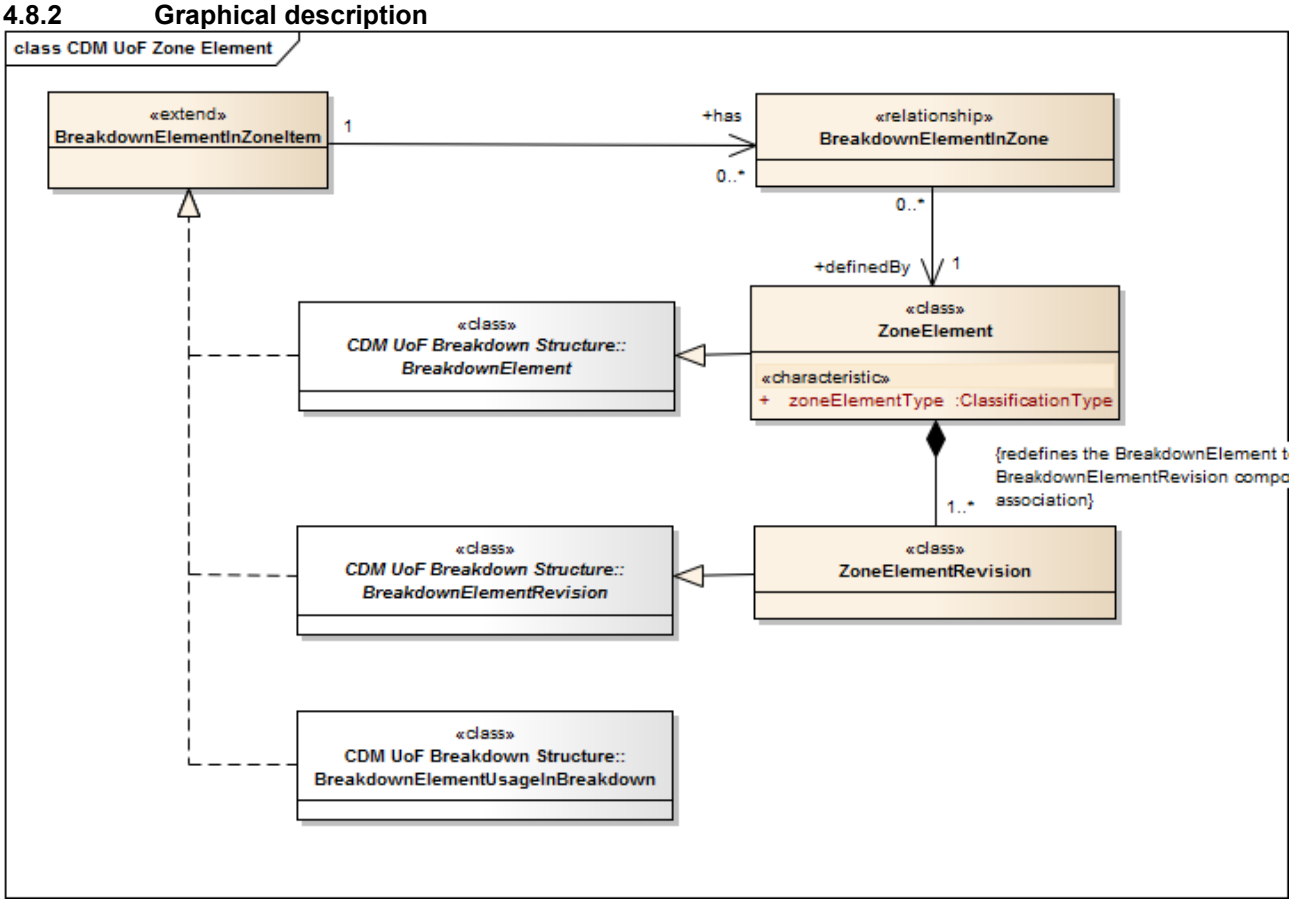

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Fig 13 CDM UoF Zone Element

4.8.3 Class definition

4.8.3.1 BreakdownElementInZone

BreakdownElementInZone is a <<relationship>> where a BreakdownElementInZoneItem relates to the ZoneElement where it is located.

4.8.3.1.1 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type ZoneElement

4.8.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

– ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)

4.8.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

– SafetyItem (See S5000F UoF Safety, Para 4.78)

4.8.3.2 BreakdownElementInZoneItem

BreakdownElementInZoneItem is an <<extend>> interface that provides its associated data model to those classes that implement it.

4.8.3.2.1 Associations

This class has the following associations:

- An association to object(s) of type BreakdownElementInZone

4.8.3.3 ZoneElement

ZoneElement is a BreakdownElement that represents a three-dimensional space related to a Product.

Note

A zone can also represent a work area such as a mechanical workshop onboard a ship.

4.8.3.3.1 Attribute(s)

This class has the following attributes:

- breakdownElementIdentifier (inherited from BreakdownElement), one or many
- breakdownElementEssentiality (inherited from BreakdownElement), optional
- breakdownElementName (inherited from BreakdownElement), zero, one or many
- zoneElementType

4.8.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.8.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- BreakdownElementInZoneItem (inherited from BreakdownElement)
- CostBreakdownContext (inherited from BreakdownElement) (See S5000F UoF Cost Breakdown, Para 4.25)
- MeasurementPointItem (inherited from BreakdownElement) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from BreakdownElement) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from BreakdownElement) (See S5000F UoF Work Breakdown, Para 4.97)

4.8.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- BreakdownElementRevisionRelationshipItem (inherited from BreakdownElement) (See S5000F UoF Breakdown Structure, Para 4.14)
- ClassInstanceAssertItem (inherited from BreakdownElement) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencedItem (inherited from BreakdownElement) (See S5000F UoF Digital File, Para 4.28)
- ReferencedPositionItem (See S5000F UoF Local Position, Para 4.45)

4.8.3.4 ZoneElementRevision

ZoneElementRevision is a BreakdownElementRevision representing an iteration applied to a ZoneElement.

4.8.3.4.1 Attribute(s)

This class has the following attributes:

- breakdownElementRevisionIdentifier (inherited from BreakdownElementRevision)
- breakdownElementRevisionStatus (inherited from BreakdownElementRevision), optional

– maintenanceSignificantOrRelevant (inherited from BreakdownElementRevision)

4.8.3.4.2 Associations

This class has the following associations:

– An aggregate association, one or many, to related object(s) of type ZoneElement
– An association to object(s) of type BreakdownElementRevisionRelationship
– An association to object(s) of type SerializedProductVariantZone

4.8.3.4.3 Implementations

This class implements the following <<extend>> interfaces:

– BreakdownElementInZoneItem (inherited from BreakdownElementRevision)
– ChangeControlledItem (inherited from BreakdownElementRevision) (See S5000F UoF Change Information, Para 4.21)
– DetectionMean (inherited from BreakdownElementRevision) (See S5000F UoF Failure Detection and Location, Para 4.38)
– DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
– MeasurementPointItem (inherited from BreakdownElementRevision) (See S5000F UoF Part As Realized, Para 4.65)

4.8.3.4.4 Selects

This class is a member of the following <<select>> interfaces:

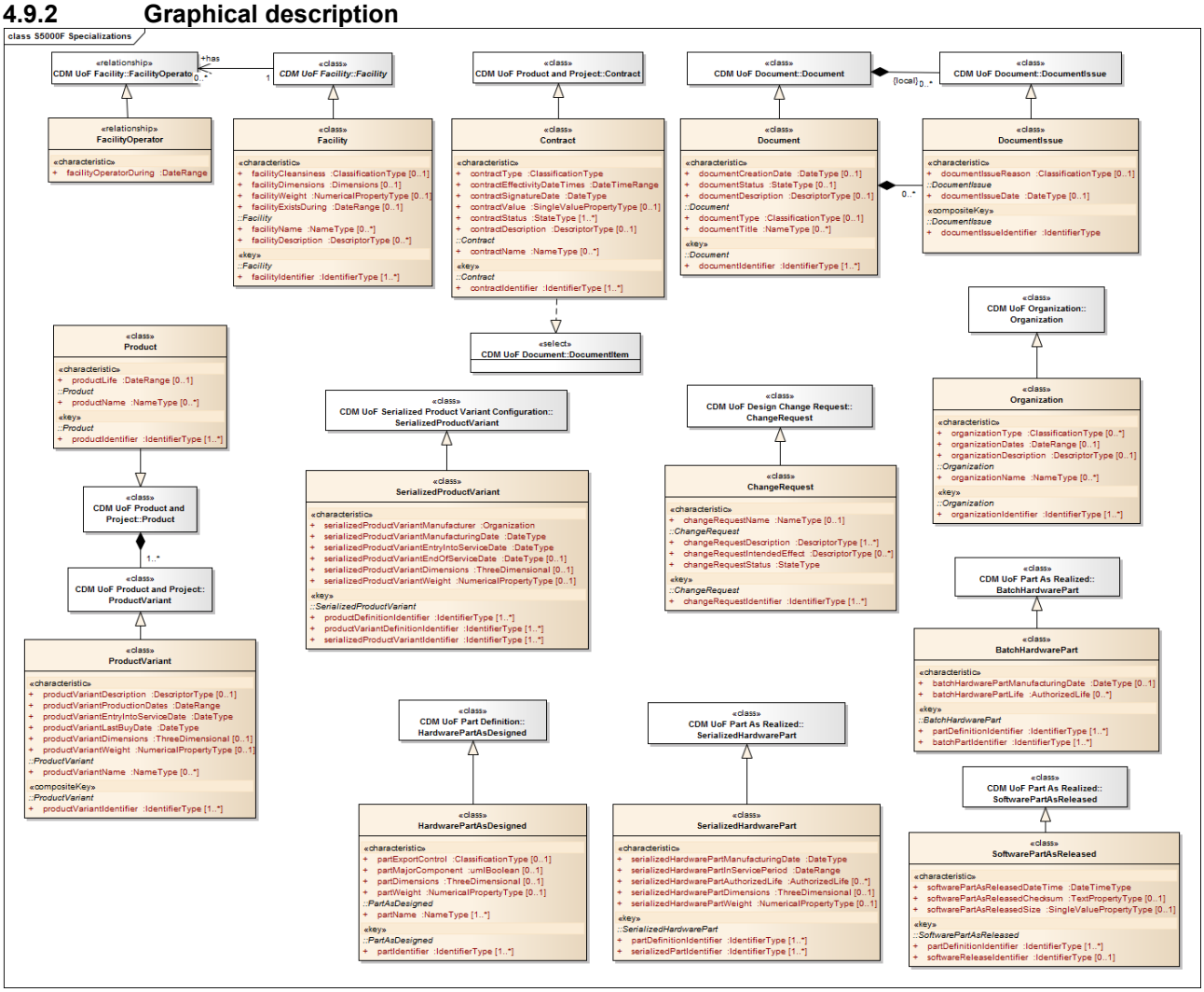
– BreakdownElementRevisionRelationshipItem (inherited from BreakdownElementRevision) (See S5000F UoF Breakdown Structure, Para 4.14)
– Detector (inherited from BreakdownElementRevision) (See S5000F UoF Failure Detection and Location, Para 4.38)
– ReferencedPositionItem (See S5000F UoF Local Position, Para 4.45)
– TransportPosition (See S5000F UoF Transporting Asset, Para 4.93)

4.9 S5000F Specializations

4.9.1 Description

S5000F specializations provides the specializations of classes from other ASD specifications (mainly SX002D) for the purpose of S5000F.

4.9.2 Graphical description



ICN-B6865-5000F15045-003-01

Fig 14 S5000F Specializations

4.9.3 Class definition

4.9.3.1 BatchHardwarePart

BatchHardwarePart is a <<class>> that represents actual physical parts which can be identified by their batch membership.

4.9.3.1.1 Attribute(s)

This class has the following attributes:

- batchPartIdentifier, one or many
- partDefinitionIdentifier, one or many
- batchHardwarePartLife, zero, one or many
- batchHardwarePartManufacturingDate, optional

4.9.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (inherited from BatchHardwarePart) (See S5000F UoF Digital File, Para 4.28)
- StoredPart (See S5000F UoF Warehouse and Spare Pool, Para 4.95)

4.9.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from BatchHardwarePart) (See S5000F UoF Digital File, Para 4.28)
- PoolItem (See S5000F UoF Warehouse and Spare Pool, Para 4.95)
- RealizedPart (inherited from BatchHardwarePart) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)

4.9.3.2 ChangeRequest

ChangeRequest is a <<class>> that represents a formal proposal for a modification to a configuration item upon a given baseline.

4.9.3.2.1 Attribute(s)

This class has the following attributes:

- changeRequestIdentifier, one or many
- changeRequestDescription, one or many
- changeRequestIntendedEffect, zero, one or many
- changeRequestStatus
- changeRequestName, optional

4.9.3.2.2 Associations

This class has the following associations:

- A composition association, respondsTo, zero, one or many, to child objects of type ChangeAuthorization
- An association to object(s) of type ChangeRequestCause
- An association to object(s) from classes that are members of ChangeRequestItem
- An association to object(s) from classes that are members of Party

4.9.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.9.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- SafetyItem (See S5000F UoF Safety, Para 4.78)

4.9.3.3 Contract

Contract is a <<class» that represents a binding agreement between two or more parties

4.9.3.3.1 Example(s)

- leasing contract
- procurement contract
- service contract
- subcontract

4.9.3.3.2 Attribute(s)

This class has the following attributes:

- contractIdentifier, one or many

- contractName, zero, one or many
- contractDescription, optional
- contractEffectivityDateTimes
- contractSignatureDate
- contractStatus, one or many
- contractType
- contractValue, optional

4.9.3.3.3 Associations

This class has the following associations:

- A composition association, poolUsageCoveredBy, zero, one or many, to child objects of type Pool
- An association to object(s) of type ContractItemDetails
- An association to object(s) of type ContractParty
- An association to object(s) of type ContractRelationship

4.9.3.3.4 Implementations

This class implements the following <<extend>> interfaces:

- BudgetingItem (See S5000F UoF Budget, Para 4.15)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (inherited from Contract) (See S5000F UoF Digital File, Para 4.28)
- OrganizationalBreakdownStructure (See S5000F UoF Organizational Breakdown Structure, Para 4.64)
- PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
- ReportableMetricItem (See S5000F UoF Reportable Metric, Para 4.75)
- SecurityClassificationItem (inherited from Contract) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

4.9.3.3.5 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ChangeRequestReasonItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from Contract) (See S5000F UoF Applicability Statement, Para 4.11)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (See CDM UoF Document, Para 4.2)
- MessageContextItem (inherited from Contract) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- SubjectOfPoliciesAndRegulations (See S5000F UoF Policies and Regulations, Para 4.68)

4.9.3.4 Document

Document is a <<class>> that represents a compiled set of information that serves a purpose.

Note

Document is an abstract class, ie, it must be instantiated by one of the classes implementing it.

4.9.3.4.1 Example(s)

- drawing
- manual
- report

4.9.3.4.2 Attribute(s)

This class has the following attributes:

- documentIdentifier, one or many
- documentTitle, zero, one or many
- documentType, optional
- documentCreationDate, optional
- documentDescription, optional
- documentStatus, optional

4.9.3.4.3 Associations

This class has the following associations:

- An association to object(s) of type DocumentRelationship

4.9.3.4.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.9.3.4.5 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)

4.9.3.5 DocumentIssue

DocumentIssue is a <<class>> that represents a specific release of a Document

4.9.3.5.1 Attribute(s)

This class has the following attributes:

- documentIssueIdentifier
- documentIssueDate, optional
- documentIssueReason, optional

4.9.3.5.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type Document
- An aggregate association, zero, one or many, to related object(s) of type ExportControlRegulation
- An aggregate association, zero, one or many, to related object(s) of type ExternalDocument
- An aggregate association, zero, one or many, to related object(s) of type FleetTaskCancellationNotice

- An aggregate association, zero, one or many, to related object(s) of type MaintenanceProgram
- An aggregate association, zero, one or many, to related object(s) of type PoliciesAndRegulations
- An aggregate association, zero, one or many, to related object(s) of type Report
- An aggregate association, zero, one or many, to related object(s) of type SafetyDocument
- An aggregate association, zero, one or many, to related object(s) of type SafetyIssue
- An aggregate association, zero, one or many, to related object(s) of type SafetyRequirementsDocument
- An aggregate association, zero, one or many, to related object(s) of type SafetyWarning
- An aggregate association, zero, one or many, to related object(s) of type SCORMContentPackage
- An aggregate association, zero, one or many, to related object(s) of type ServiceBulletin
- An aggregate association, zero, one or many, to related object(s) of type SpecialSafetyInstruction

4.9.3.5.3 Implementations

This class implements the following <<extend>> interfaces:

- ChangeControlledItem (inherited from DocumentIssue) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from DocumentIssue) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from DocumentIssue) (See S5000F UoF Export Control Requirement, Para 4.35)

4.9.3.5.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- DigitalFileReferencedItem (inherited from DocumentIssue) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from DocumentIssue) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)

4.9.3.6 Facility

Facility is a <<class>>that represents an infrastructure which exists, or is intended to be built or installed, and is established to serve a particular purpose.

4.9.3.6.1 Attribute(s)

This class has the following attributes:

- facilityIdentifier, one or many
- facilityDescription, zero, one or many
- facilityName, zero, one or many
- facilityCleansiness, optional
- facilityDimensions, optional
- facilityExistsDuring, optional
- facilityWeight, optional

4.9.3.6.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type FacilityLocation

- An association to object(s) of type FacilityOwner
- An association to object(s) of type FacilityRelationship. Each Facility can be related to from zero, one or many other Facilities (via the FacilityRelationship <<relationship>> class)
- An association, zero, one or many, to object(s) from classes that are members of LocationItem

4.9.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureCompliantItem (inherited from Facility) (See S5000F UoF Facility, Para 4.37)
- InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (See S5000F UoF Maintenance Program, Para 4.52)
- PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

4.9.3.6.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)
- EventItem (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
- MaintenanceItem (See S5000F UoF Maintenance Activity, Para 4.48)
- MessageContextItem (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)
- ReferencedPositionItem (See S5000F UoF Local Position, Para 4.45)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (See S5000F UoF Safety, Para 4.78)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)
- SubjectOfPoliciesAndRegulations (See S5000F UoF Policies and Regulations, Para 4.68)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (See S5000F UoF Warranty, Para 4.96)

4.9.3.7 FacilityOperator

FacilityOperator is a <<relationship>> that identifies the party responsible for running the Facility

4.9.3.7.1 Example(s)

- The FacilityOperator has leased the Facility from the FacilityOwner.

4.9.3.7.2 Attribute(s)

This class has the following attributes:

– facilityOperatorDuring

4.9.3.7.3 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of FacilityOperatorItem

4.9.3.7.4 Implementations

This class implements the following <<extend>> interfaces:

– ApplicabilityStatementItem (inherited from FacilityOperator) (See S5000F UoF Applicability Statement, Para 4.11)

4.9.3.7.5 Selects

This class is a member of the following <<select>> interfaces:

– SafetyItem (inherited from FacilityOperator) (See S5000F UoF Safety, Para 4.78)

4.9.3.8 HardwarePartAsDesigned

HardwarePartAsDesigned is a PartAsDesigned that is to be realized as physical items (hardware) including non-countable material.

4.9.3.8.1 Example(s)

– Examples of non-countable materials are: oil, sealant, paint.

4.9.3.8.2 Attribute(s)

This class has the following attributes:

– partIdentifier (inherited from PartAsDesigned), one or many
– partName (inherited from PartAsDesigned), one or many
– partDimensions, optional
– partExportControl, optional
– partMajorComponent, optional
– partWeight, optional

4.9.3.8.3 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
– An association to object(s) of type AlternatePartAsDesigned
– An association to object(s) of type ContainedSubstance

4.9.3.8.4 Implementations

This class implements the following <<extend>> interfaces:

– ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
– ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
– CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
– DetectionMean (See S5000F UoF Failure Detection and Location, Para 4.38)
– DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
– DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
– ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
– MaintenanceProgramItem (See S5000F UoF Maintenance Program, Para 4.52)

- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- TrackablePart (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

4.9.3.8.5 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductOperationalConfigurationItem (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
- MessageContextItem (See S5000F UoF Message, Para 4.55)
- ObsolescenceItem (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)
- SupplyItem (See S5000F UoF Supply Item, Para 4.89)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)

4.9.3.9 Organization

Organization is a <<class>> that represents an administrative structure with a particular purpose belonging to a legal entity.

4.9.3.9.1 Example(s)

- Government department
- International agency
- company

4.9.3.9.2 Attribute(s)

This class has the following attributes:

- organizationIdentifier, one or many
- organizationName, zero, one or many
- organizationDates, optional
- organizationDescription, optional
- organizationType, zero, one or many

4.9.3.9.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- BudgetingItem (See S5000F UoF Budget, Para 4.15)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
- OrganizationalBreakdownStructure (See S5000F UoF Organizational Breakdown Structure, Para 4.64)
- PartyItem (See S5000F UoF Party, Para 4.66)
- PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityAssignmentParty (See S5000F UoF Security Classification, Para 4.79)

4.9.3.9.4 Selects

This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (inherited from Organization) (See S5000F UoF Applicability Statement, Para 4.11)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- FacilityOperatorItem (inherited from Organization) (See S5000F UoF Facility, Para 4.37)
- LegalParty (inherited from Organization) (See S5000F UoF Project and Contract, Para 4.71)
- MessagePartyItem (inherited from Organization) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityAttribution (See S5000F UoF Availability, Para 4.13)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- Party (See S5000F UoF Party, Para 4.66)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ReportingParty (See S5000F UoF Report, Para 4.73)
- SafetyItem (See S5000F UoF Safety, Para 4.78)
- SubjectOfPoliciesAndRegulations (See S5000F UoF Policies and Regulations, Para 4.68)

4.9.3.10 Product

Product is <<class>> that represents a family of items which share the same underlying design purpose.

4.9.3.10.1 Example(s)

- Aegis Class Destroyer
- Airbus A340
- Ford Fusion
- iPhone 7
- Pegasus engine
- Stryker

4.9.3.10.2 Attribute(s)

This class has the following attributes:

- productIdentifier, one or many
- productName, zero, one or many
- productLife, optional

4.9.3.10.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.9.3.10.4 Implementations

This class implements the following <<extend>> interfaces:

- BreakdownItem (inherited from Product) (See S5000F UoF Breakdown Structure, Para 4.14)
- CapabilityItem (inherited from Product) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Product) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from Product) (See S5000F UoF Digital File, Para 4.28)
- PoliciesAndRegulationsCompliantItem (inherited from Product) (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityClassificationItem (inherited from Product) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from Product) (See S5000F UoF Work Breakdown, Para 4.97)

4.9.3.10.5 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Product) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from Product) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from Product) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Product) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Product) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureRequiringItem (inherited from Product) (See S5000F UoF Infrastructure Availability, Para 4.44)
- MessageContextItem (inherited from Product) (See S5000F UoF Message, Para 4.55)
- ObsolescenceItem (inherited from Product) (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- ReportContextItem (inherited from Product) (See S5000F UoF Report, Para 4.73)
- SerializedAssertItem (inherited from Product) (See S5000F UoF Applicability Statement, Para 4.11)
- SubjectOfPoliciesAndRegulations (inherited from Product) (See S5000F UoF Policies and Regulations, Para 4.68)

4.9.3.11 ProductVariant

A ProductVariant is a <<class>> that defines a member of a Product family which is configured for a specific purpose and is made available to the market.

Note

A product variant is often known as a model.

4.9.3.11.1 Example(s)

- Boeing 787-800 versus 787-900
- Ford Fusion S versus SE versus SEL

4.9.3.11.2 Attribute(s)

This class has the following attributes:

- productVariantIdentifier, one or many
- productVariantName, zero, one or many
- productVariantDescription, optional
- productVariantDimensions, optional
- productVariantEntryIntoServiceDate
- productVariantLastBuyDate
- productVariantProductionDates

– productVariantWeight, optional

4.9.3.11.3 Associations

This class has the following associations:

– An association to object(s) of type MaintenanceFacilitySlotAccomodation
– An association to object(s) of type NestedProductVariant
– An association to object(s) of type ProductVariantSupportedByPool. A ProductVariant can be associated with zero, one or many part Pools (via the ProductVariantSupportedbyPool <<relationhsip>>) that support it

4.9.3.11.4 Implementations

This class implements the following <<extend>> interfaces:

– ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
– BreakdownItem (inherited from ProductVariant) (See S5000F UoF Breakdown Structure, Para 4.14)
– CapabilityItem (See S5000F UoF Capability, Para 4.16)
– ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
– DigitalFileReferencingItem (inherited from ProductVariant) (See S5000F UoF Digital File, Para 4.28)
– InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
– ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
– MaintenanceProgramItem (See S5000F UoF Maintenance Program, Para 4.52)
– OperationalTimeItem (See S5000F UoF Operational Times, Para 4.62)
– PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
– ProductUsagePhaseItem (See S5000F UoF Product Usage Phase, Para 4.70)
– ReportableMetricItem (See S5000F UoF Reportable Metric, Para 4.75)
– SecurityClassificationItem (inherited from ProductVariant) (See S5000F UoF Security Classification, Para 4.79)
– TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)
– TransportingAsset (See S5000F UoF Transporting Asset, Para 4.93)
– WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

4.9.3.11.5 Selects

This class is a member of the following <<select>> interfaces:

– ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
– ClassInstanceAssertItem (inherited from ProductVariant) (See S5000F UoF Applicability Statement, Para 4.11)
– ContractItem (inherited from ProductVariant) (See S5000F UoF Project and Contract, Para 4.71)
– CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
– DigitalFileReferencedItem (inherited from ProductVariant) (See S5000F UoF Digital File, Para 4.28)
– ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
– InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
– InfrastructureRequiringItem (See S5000F UoF Infrastructure Availability, Para 4.44)
– MessageContextItem (inherited from ProductVariant) (See S5000F UoF Message, Para 4.55)
– ObsolescenceItem (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
– ReferencedPositionItem (See S5000F UoF Local Position, Para 4.45)
– ReportContextItem (See S5000F UoF Report, Para 4.73)
– ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
– SafetyItem (See S5000F UoF Safety, Para 4.78)

- SerializedAssertItem (inherited from ProductVariant) (See S5000F UoF Applicability Statement, Para 4.11)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)
- SubjectOfPoliciesAndRegulations (See S5000F UoF Policies and Regulations, Para 4.68)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)

4.9.3.12 SerializedHardwarePart

SerializedHardwarePart is <<class>> that represent an actual physical part which can be identified as an individual.

Note

A SerializedHardwarePart may evolve due to modifications. The actual build standard at a given moment is defined through the relationship SerializedPartDesignAssociation.

Note

A SerializedHardwarePart is usually referred to as "Equipment". This name has not been used in the data model so as to distinguish between the generic equipment and the individual ones.

4.9.3.12.1 Attribute(s)

This class has the following attributes:

- partDefinitionIdentifier, one or many
- serializedPartIdentifier, one or many
- serializedHardwarePartAuthorizedLife, zero, one or many
- serializedHardwarePartDimensions, optional
- serializedHardwarePartInServicePeriod
- serializedHardwarePartManufacturingDate
- serializedHardwarePartWeight, optional

4.9.3.12.2 Associations

This class has the following associations:

- An association to object(s) of type EquipmentOperation
- An association to object(s) of type EquipmentOwner
- An association to object(s) of type ModificationOf
- An association to object(s) of type SerializedPartDesignAssociation. A SerializedHardwarePart must be associated to one or many HarwarePartAsDesigned (via the SerializedPartDesignAssociation <<relationship>>)

4.9.3.12.3 Implementations

This class implements the following <<extend>> interfaces:

- AvailabilityItem (See S5000F UoF Availability, Para 4.13)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (inherited from SerializedHardwarePart) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
- ItemDamage (See S5000F UoF Damage, Para 4.26)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from SerializedHardwarePart) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- SerializedItem (See S5000F UoF Serialized Item, Para 4.80)
- StoredPart (See S5000F UoF Warehouse and Spare Pool, Para 4.95)

- TrackablePart (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

4.9.3.12.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from SerializedHardwarePart) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DamagedItem (See S5000F UoF Damage, Para 4.26)
- DigitalFileReferencedItem (inherited from SerializedHardwarePart) (See S5000F UoF Digital File, Para 4.28)
- EventItem (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
- MaintenanceItem (See S5000F UoF Maintenance Activity, Para 4.48)
- MessageContextItem (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- ObsolescenceItem (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- PoolItem (See S5000F UoF Warehouse and Spare Pool, Para 4.95)
- RealizedPart (inherited from SerializedHardwarePart) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReleasedDataSetItem (inherited from SerializedHardwarePart) (See S5000F UoF Data Sets, Para 4.27)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (See S5000F UoF Warranty, Para 4.96)

4.9.3.13 SerializedProductVariant

SerializedProductVariant is a <<class>> that represent an actual product variant which is identified as an individual.

Note

A SerializedProductVariant must be manufactured in accordance with its definition as defined by its productVariantIdentifier.

4.9.3.13.1 Attribute(s)

This class has the following attributes:

- productDefinitionIdentifier, one or many
- productVariantDefinitionIdentifier, one or many
- serializedProductVariantIdentifier, one or many
- serializedProductVariantDimensions, optional
- serializedProductVariantEndOfServiceDate, optional
- serializedProductVariantEntryIntoServiceDate
- serializedProductVariantManufacturer
- serializedProductVariantManufacturingDate
- serializedProductVariantWeight, optional

4.9.3.13.2 Associations

This class has the following associations:

- An association to object(s) of type MajorComponent
- An association to object(s) of type NestedSerializedProductVariant
- An association to object(s) of type PlannedPartInstallationLocation
- An association to object(s) of type SerializedProductOperationalPeriod
- An association to object(s) of type SerializedProductVariantConfigurationConformance
- An association to object(s) of type SerializedProductVariantEnvironment
- An association to object(s) of type SerializedProductVariantInFleet
- An association to object(s) of type SerializedProductVariantOperatingBase
- An association to object(s) of type SerializedProductVariantOperator
- An association, zero, one or many, to object(s) of type OperationalRole

4.9.3.13.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (See S5000F UoF Availability, Para 4.13)
- BreakdownItem (See S5000F UoF Breakdown Structure, Para 4.14)
- CapabilityItem (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (inherited from SerializedProductVariant) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
- ItemDamage (See S5000F UoF Damage, Para 4.26)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from SerializedProductVariant) (See S5000F UoF Part As Realized, Para 4.65)
- OperationalTimeItem (See S5000F UoF Operational Times, Para 4.62)
- PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
- ProductUsagePhaseItem (See S5000F UoF Product Usage Phase, Para 4.70)
- ReportableMetricItem (See S5000F UoF Reportable Metric, Para 4.75)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- SerializedItem (See S5000F UoF Serialized Item, Para 4.80)
- TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)
- TransportingAsset (See S5000F UoF Transporting Asset, Para 4.93)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

4.9.3.13.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from SerializedProductVariant) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DamagedItem (See S5000F UoF Damage, Para 4.26)
- DigitalFileReferencedItem (inherited from SerializedProductVariant) (See S5000F UoF Digital File, Para 4.28)
- EventItem (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
- InfrastructureRequiringItem (See S5000F UoF Infrastructure Availability, Para 4.44)
- MaintenanceItem (See S5000F UoF Maintenance Activity, Para 4.48)

- MessageContextItem (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- ObsolescenceItem (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- ReferencedPositionItem (See S5000F UoF Local Position, Para 4.45)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (See S5000F UoF Safety, Para 4.78)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)
- SubjectOfPoliciesAndRegulations (See S5000F UoF Policies and Regulations, Para 4.68)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (See S5000F UoF Warranty, Para 4.96)

4.9.3.14 SoftwarePartAsReleased

SoftwarePartAsReleased is <<class>> that represents actual build of a software which is delivered.

4.9.3.14.1 Attribute(s)

This class has the following attributes:

- partDefinitionIdentifier, one or many
- softwareReleaseIdentifier, optional
- softwarePartAsReleasedChecksum, optional
- softwarePartAsReleasedDateTime
- softwarePartAsReleasedSize, optional

4.9.3.14.2 Associations

This class has the following associations:

- An association to object(s) of type SoftwareOS
- An association to object(s) of type SoftwarePlatform
- An association, optional, to object(s) of type DataSetAsDesigned
- An association, optional, to object(s) of type SoftwarePartAsDesigned

4.9.3.14.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (See S5000F UoF Failure Detection and Location, Para 4.38)
- InfrastructureItem (See S5000F UoF Infrastructure, Para 4.43)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
- TrackablePart (See S5000F UoF Change Embodiment Planning, Para 4.18)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

4.9.3.14.4 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductOperationalConfigurationItem (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- EventItem (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)

- InfrastructureNode (See S5000F UoF Infrastructure, Para 4.43)
- MessageContextItem (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- ObsolescenceItem (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from SoftwarePartAsReleased) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReleasedDataSetItem (See S5000F UoF Data Sets, Para 4.27)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ReportingParty (See S5000F UoF Report, Para 4.73)
- SupplyItem (See S5000F UoF Supply Item, Para 4.89)
- WarrantyItem (See S5000F UoF Warranty, Para 4.96)

4.10 S5000F UoF Actual Fault Indication

4.10.1 Description

The Actual Fault Indication UoF allows to associate an actual Fault to a SerializedItem.

4.10.2 Graphical description

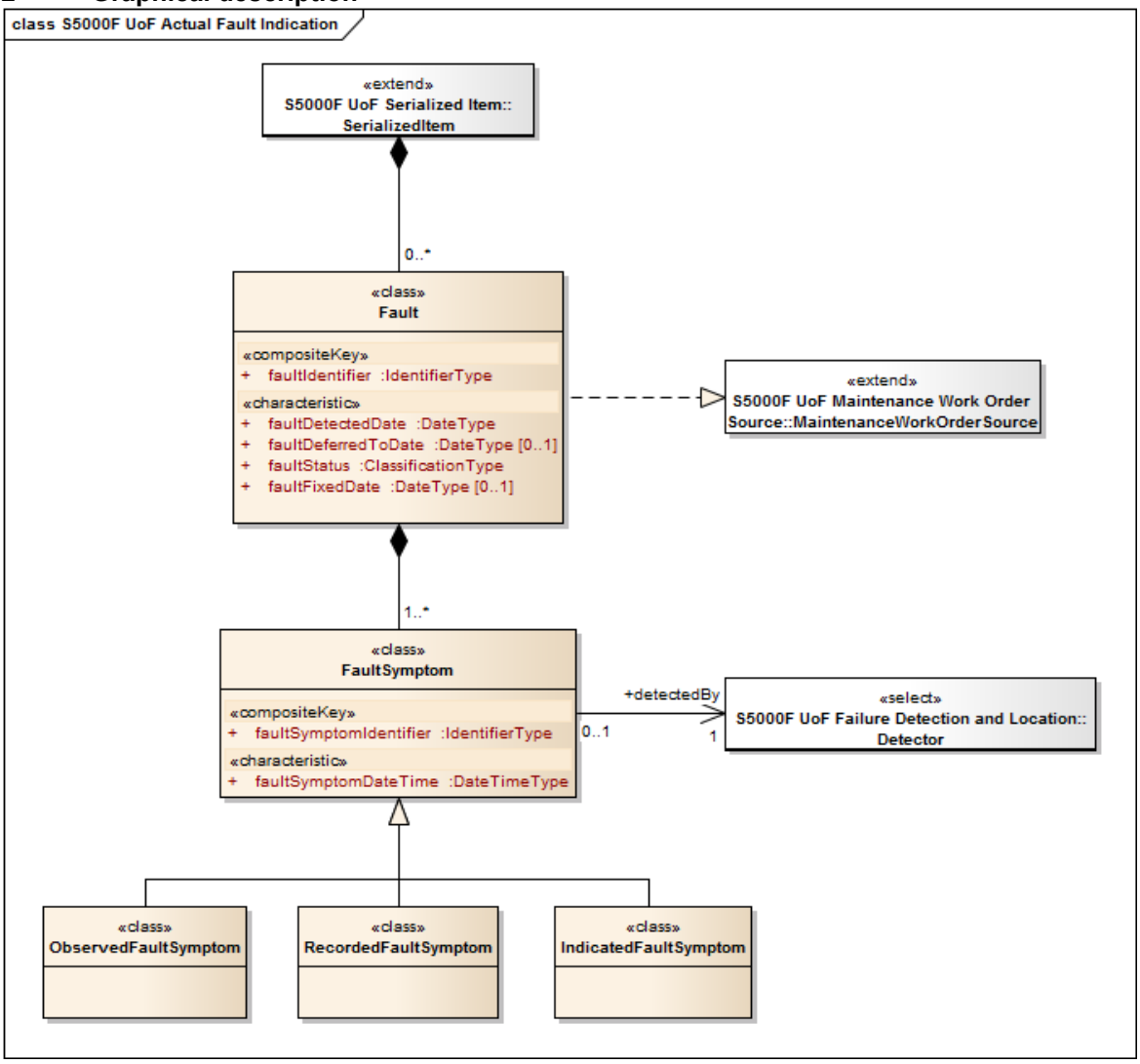


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Fig 15 S5000F UoF Actual Fault Indication

4.10.3 Class definition

4.10.3.1 Fault

Fault represents an unidentified anomalous behavior that occurred on a specific item at a specific date.

4.10.3.1.1 Attribute(s)

This class has the following attributes:

- faultIdentifier
- faultDeferredToDate, optional
- faultDetectedDate
- faultFixedDate, optional
- faultStatus

4.10.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type SerializedItem
- An association to object(s) of type FaultCause

4.10.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- MaintenanceWorkOrderSource (See S5000F UoF Maintenance Work Order Source, Para 4.53)

4.10.3.2 FaultSymptom

FaultSymptom is a <<class>> that represents an indication of the existence of a Fault.

4.10.3.2.1 Attribute(s)

This class has the following attributes:

- faultSymptomIdentifier
- faultSymptomDateTime

4.10.3.2.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type Fault
- An association, optional, to object(s) from classes that are members of Detector

4.10.3.3 IndicatedFaultSymptom

IndicatedFaultSymptom is a <<class>> that represents an indication of the existence of a Fault by some measuring or monitoring device.

4.10.3.3.1 Attribute(s)

This class has the following attributes:

- faultSymptomIdentifier (inherited from FaultSymptom)
- faultSymptomDateTime (inherited from FaultSymptom)

4.10.3.3.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type Fault
- An association, optional, to object(s) from classes that are members of Detector

4.10.3.4 ObservedFaultSymptom

ObservedFaultSymptom is a <<class>> that represents an indication of the existence of a Fault by means of physical observation.

4.10.3.4.1 Attribute(s)

This class has the following attributes:

- faultSymptomIdentifier (inherited from FaultSymptom)
- faultSymptomDateTime (inherited from FaultSymptom)

4.10.3.4.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type Fault
- An association, optional, to object(s) from classes that are members of Detector

4.10.3.5 RecordedFaultSymptom

RecordedFaultSymptom is a <<class>> that represents an indication of the existence of a Fault that has been recorded by a monitoring device.

4.10.3.5.1 Attribute(s)

This class has the following attributes:

- faultSymptomIdentifier (inherited from FaultSymptom)
- faultSymptomDateTime (inherited from FaultSymptom)

4.10.3.5.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type Fault
- An association, optional, to object(s) from classes that are members of Detector

4.11 S5000F UoF Applicability Statement

4.11.1 Description

The Applicability Statement UoF provides the capability to define the situation or situations under which related items are valid.

4.11.2 Graphical description

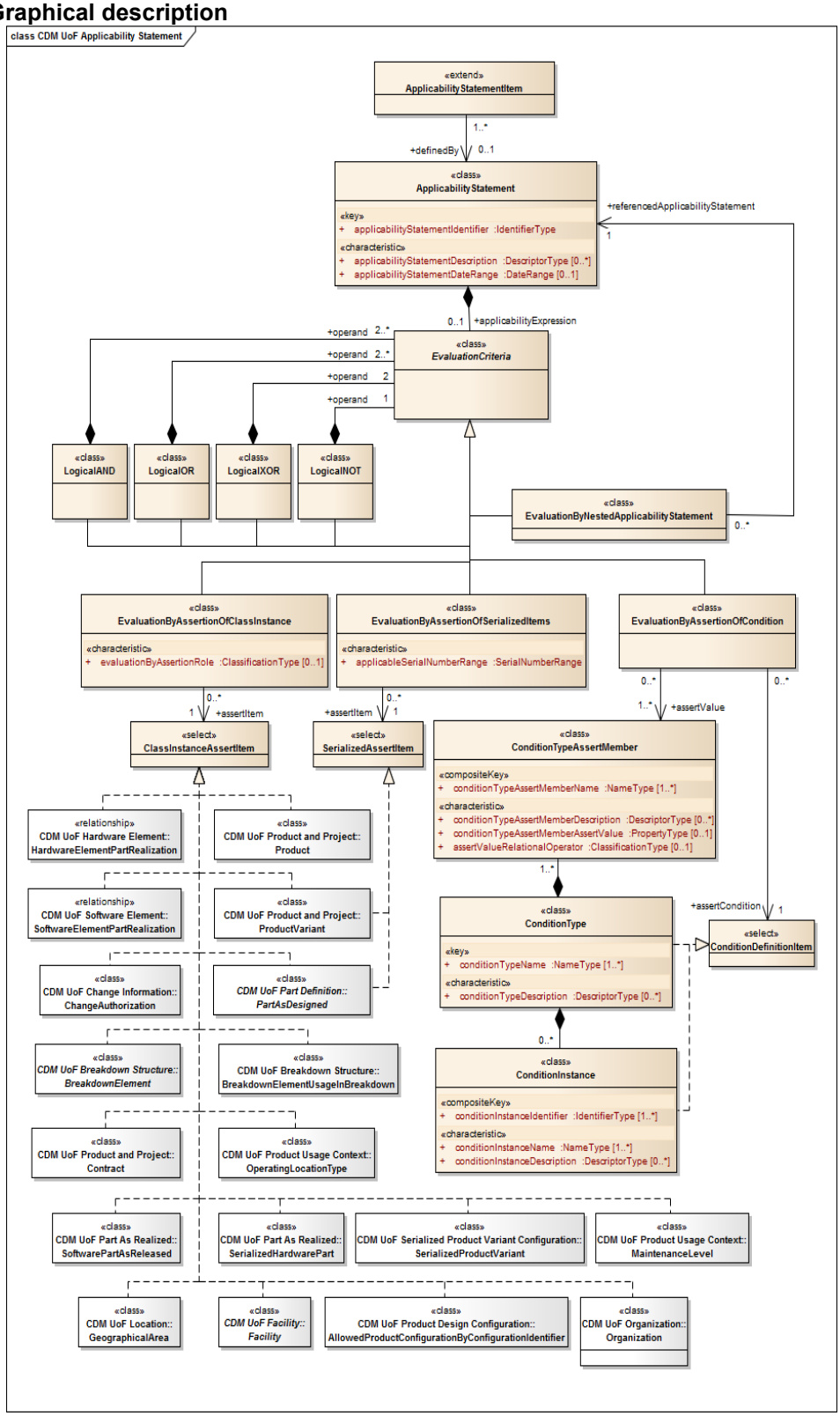

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Fig 16 CDM UoF Applicability Statement

4.11.3 Class definition

4.11.3.1 ApplicabilityStatement

ApplicabilityStatement is a <<class>> that defines the situation or situations under which related items are valid.

4.11.3.1.1 Attribute(s)

This class has the following attributes:

- applicabilityStatementIdentifier
- applicabilityStatementDateRange, optional
- applicabilityStatementDescription, zero, one or many

4.11.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.11.3.2 ApplicabilityStatementItem

ApplicabilityStatementItem is an <<extend>> interface that provides its associated data model to those classes which can have restricted validity as defined by an associated ApplicabilityStatement.

4.11.3.2.1 Associations

This class has the following associations:

- An association, one or many, to object(s) of type ApplicabilityStatement

4.11.3.3 ClassInstanceAssertItem

ClassInstanceAssertItem is a <<select>> interface that

identifies classes from which an instance can be used as the EvaluationByAssertionOfClassInstance assert item

4.11.3.4 ConditionDefinitionItem

ConditionDefinitionItem is a <<select>> interface that

identifies classes from which an instance can be used as the EvaluationByAssertionOfCondition assert condition.

4.11.3.5 ConditionInstance

ConditionInstance is a <<class>> that defines an individual concept or object having the characteristics of a generic ConditionType.

4.11.3.5.1 Example(s)

- Uniquely identified Service Bulletin

4.11.3.5.2 Attribute(s)

This class has the following attributes:

- conditionInstanceIdentifier, one or many
- conditionInstanceDescription, zero, one or many
- conditionInstanceName, one or many

4.11.3.5.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type ConditionType

4.11.3.5.4 Selects

This class is a member of the following <<select>> interfaces:

- ConditionDefinitionItem

4.11.3.6 ConditionType

ConditionType is a <<class>> that defines a concept or an object that needs to be included in applicability statements where the concept or object is not already represented in the data model.

4.11.3.6.1 Example(s)

- Environmental conditions

4.11.3.6.2 Attribute(s)

This class has the following attributes:

- conditionTypeName, one or many
- conditionTypeDescription, zero, one or many

4.11.3.6.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.11.3.6.4 Selects

This class is a member of the following <<select>> interfaces:

- ConditionDefinitionItem

4.11.3.7 ConditionTypeAssertMember

ConditionTypeAssertMember is <<class>> that defines a member for a given ConditionType which can be mapped to a Boolean expression and be evaluated to be either TRUE or FALSE.

4.11.3.7.1 Attribute(s)

This class has the following attributes:

- conditionTypeAssertMemberName, one or many
- assertValueRelationalOperator, optional
- conditionTypeAssertMemberAssertValue, optional
- conditionTypeAssertMemberDescription, zero, one or many

4.11.3.7.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type ConditionType

4.11.3.8 EvaluationByAssertionOfClassInstance

EvaluationByAssertionOfClassInstance is an EvaluationCriteria that identifies a class instance to be used as an assert item and be mapped to a Boolean expression which can be evaluated to be either TRUE or FALSE.

4.11.3.8.1 Attribute(s)

This class has the following attributes:

- evaluationByAssertionRole, optional

4.11.3.8.2 Associations

This class has the following associations:

- An aggregate association, applicabilityExpression, optional, to related object(s) of type ApplicabilityStatement
- An aggregate association, evaluationExpression, optional, to related object(s) of type ExpressionEvaluation
- An aggregate association, operand, to related object(s) of type LogicalNOT
- An aggregate association, operand, two, to related object(s) of type LogicalXOR
- An aggregate association, operand, two or many, to related object(s) of type LogicalAND
- An aggregate association, operand, two or many, to related object(s) of type LogicalOR
- An association, zero, one or many, to object(s) from classes that are members of ClassInstanceAssertItem

4.11.3.9 EvaluationByAssertionOfCondition

EvaluationByAssertionOfCondition is an EvaluationCriteria that identifies a combination of a defined condition and a defined value to be used as an assert item and be mapped to a Boolean expression which can be evaluated to be either TRUE or FALSE.

4.11.3.9.1 Associations

This class has the following associations:

- An aggregate association, applicabilityExpression, optional, to related object(s) of type ApplicabilityStatement
- An aggregate association, evaluationExpression, optional, to related object(s) of type ExpressionEvaluation
- An aggregate association, operand, to related object(s) of type LogicalNOT
- An aggregate association, operand, two, to related object(s) of type LogicalXOR
- An aggregate association, operand, two or many, to related object(s) of type LogicalAND
- An aggregate association, operand, two or many, to related object(s) of type LogicalOR
- An association, zero, one or many, to object(s) of type ConditionTypeAssertMember
- An association, zero, one or many, to object(s) from classes that are members of ConditionDefinitionItem

4.11.3.10 EvaluationByAssertionOfSerializedItems

EvaluationByAssertionOfSerializedItems is an EvaluationCriteria that identifies a class instance together with an associated serial number range to be used as an assert item and be mapped to a Boolean expression which can be evaluated to be either TRUE or

4.11.3.10.1 Attribute(s)

This class has the following attributes:

- applicableSerialNumberRange

4.11.3.10.2 Associations

This class has the following associations:

- An aggregate association, applicabilityExpression, optional, to related object(s) of type ApplicabilityStatement
- An aggregate association, evaluationExpression, optional, to related object(s) of type ExpressionEvaluation
- An aggregate association, operand, to related object(s) of type LogicalNOT
- An aggregate association, operand, two, to related object(s) of type LogicalXOR
- An aggregate association, operand, two or many, to related object(s) of type LogicalAND
- An aggregate association, operand, two or many, to related object(s) of type LogicalOR
- An association, zero, one or many, to object(s) from classes that are members of SerializedAssertItem

4.11.3.11 EvaluationByNestedApplicabilityStatement

EvaluationByNestedApplicabilityStatement is an EvaluationCriteria that enables an ApplicabilityStatement to be reused as part of this EvaluationCritieria.

Note

This class enables the definition of nested applicability statements.

4.11.3.11.1 Associations

This class has the following associations:

- An aggregate association, applicabilityExpression, optional, to related object(s) of type ApplicabilityStatement
- An aggregate association, evaluationExpression, optional, to related object(s) of type ExpressionEvaluation
- An aggregate association, operand, to related object(s) of type LogicalNOT
- An aggregate association, operand, two, to related object(s) of type LogicalXOR
- An aggregate association, operand, two or many, to related object(s) of type LogicalAND
- An aggregate association, operand, two or many, to related object(s) of type LogicalOR
- An association, zero, one or many, to object(s) of type ApplicabilityStatement

4.11.3.12 EvaluationCriteria

EvaluationCriteria is a <<classs>> that defines conditions that can be mapped to a Boolean expression which can be evaluated to be either TRUE or FALSE.

4.11.3.12.1 Associations

This class has the following associations:

- An aggregate association, applicabilityExpression, optional, to related object(s) of type ApplicabilityStatement
- An aggregate association, evaluationExpression, optional, to related object(s) of type ExpressionEvaluation
- An aggregate association, operand, to related object(s) of type LogicalNOT
- An aggregate association, operand, two, to related object(s) of type LogicalXOR
- An aggregate association, operand, two or many, to related object(s) of type LogicalAND
- An aggregate association, operand, two or many, to related object(s) of type LogicalOR

4.11.3.13 LogicalAND

LogicalAND is an EvaluationCriteria that defines a Boolean operation where the results of all its associated EvaluationCriteria must be TRUE for the result to be TRUE, otherwise the result is FALSE.

4.11.3.13.1 Associations

This class has the following associations:

- An aggregate association, applicabilityExpression, optional, to related object(s) of type ApplicabilityStatement
- An aggregate association, evaluationExpression, optional, to related object(s) of type ExpressionEvaluation
- An aggregate association, operand, to related object(s) of type LogicalNOT
- An aggregate association, operand, two, to related object(s) of type LogicalXOR
- An aggregate association, operand, two or many, to related object(s) of type LogicalAND
- An aggregate association, operand, two or many, to related object(s) of type LogicalOR

4.11.3.14 LogicalNOT

LogicalNOT is an EvaluationCriteria that defines a Boolean operation where the result from its associated EvaluationCritera must be FALSE for the result to be TRUE, otherwise the result is FALSE.

4.11.3.14.1 Associations

This class has the following associations:

- An aggregate association, applicabilityExpression, optional, to related object(s) of type ApplicabilityStatement
- An aggregate association, evaluationExpression, optional, to related object(s) of type ExpressionEvaluation
- An aggregate association, operand, to related object(s) of type LogicalNOT
- An aggregate association, operand, two, to related object(s) of type LogicalXOR
- An aggregate association, operand, two or many, to related object(s) of type LogicalAND
- An aggregate association, operand, two or many, to related object(s) of type LogicalOR

4.11.3.15 LogicalOR

LogicalOR is an EvaluationCriteria that defines a Boolean operation where the result from at least one of its associated EvaluationCriteria must be TRUE for the result to be TRUE, otherwise the result is FALSE.

4.11.3.15.1 Associations

This class has the following associations:

- An aggregate association, applicabilityExpression, optional, to related object(s) of type ApplicabilityStatement
- An aggregate association, evaluationExpression, optional, to related object(s) of type ExpressionEvaluation
- An aggregate association, operand, to related object(s) of type LogicalNOT
- An aggregate association, operand, two, to related object(s) of type LogicalXOR
- An aggregate association, operand, two or many, to related object(s) of type LogicalAND
- An aggregate association, operand, two or many, to related object(s) of type LogicalOR

4.11.3.16 LogicalXOR

LogicalXOR is an EvaluationCriteria that defines a Boolean operation where the result from one and only one of its associated EvaluationCriteria must be TRUE for the result to be TRUE, otherwise the result is FALSE.

4.11.3.16.1 Associations

This class has the following associations:

- An aggregate association, applicabilityExpression, optional, to related object(s) of type ApplicabilityStatement
- An aggregate association, evaluationExpression, optional, to related object(s) of type ExpressionEvaluation
- An aggregate association, operand, to related object(s) of type LogicalNOT
- An aggregate association, operand, two, to related object(s) of type LogicalXOR
- An aggregate association, operand, two or many, to related object(s) of type LogicalAND
- An aggregate association, operand, two or many, to related object(s) of type LogicalOR

4.11.3.17 SerializedAssertItem

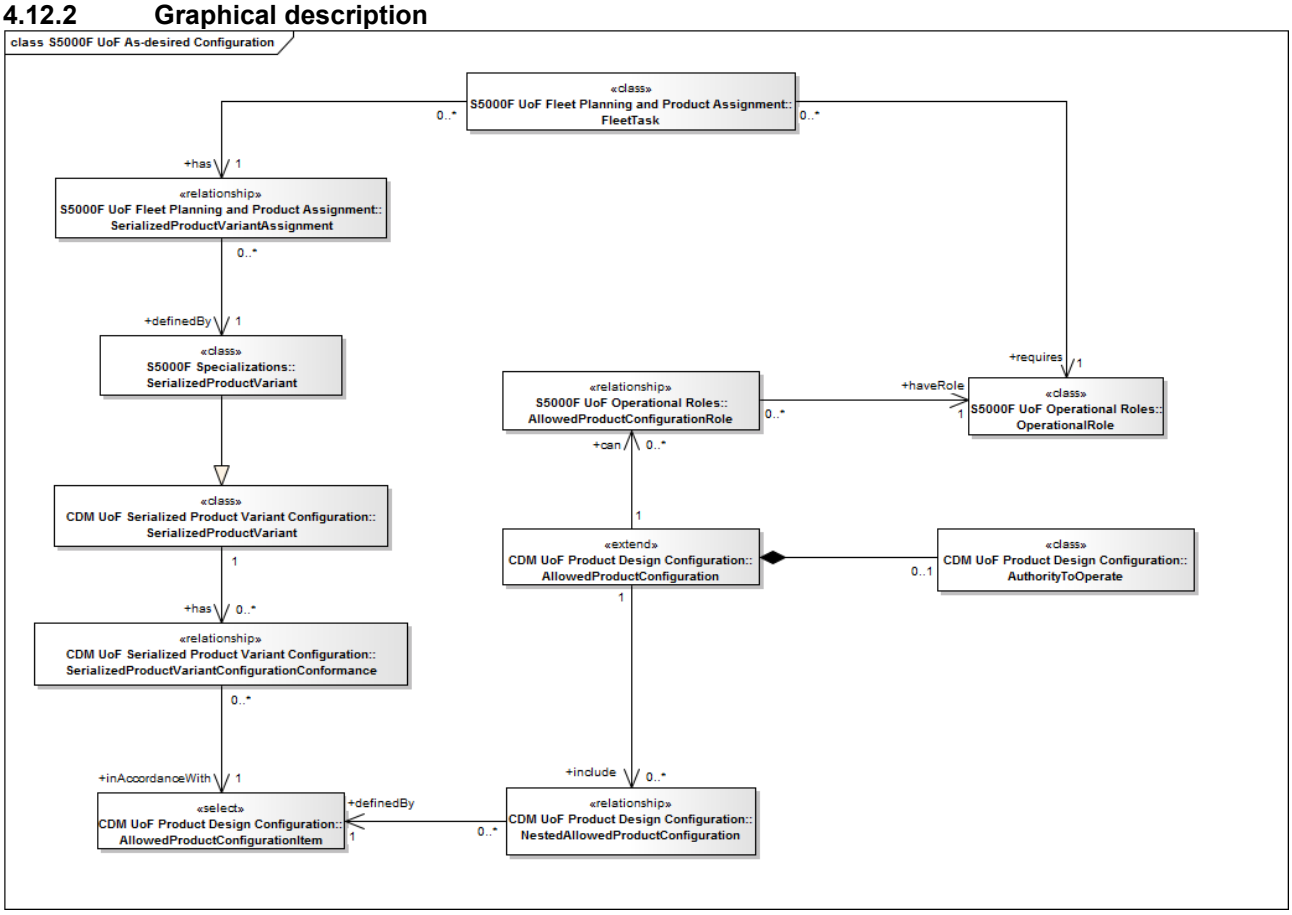
SerializedAssertItem is a <<select>> interface that identifies classes from which an instance can be used as the EvaluationByAssertionOfSerializedItems assert item

4.12 S5000F UoF As-desired Configuration

4.12.1 Description

The As-desired Configuration UoF establishes the relationship between the current operational role of a SerializedProductVariant and the operational role that is required to perform an assigned operational task.

4.12.2 Graphical description



ICN-B6865-5000F15003-002-01

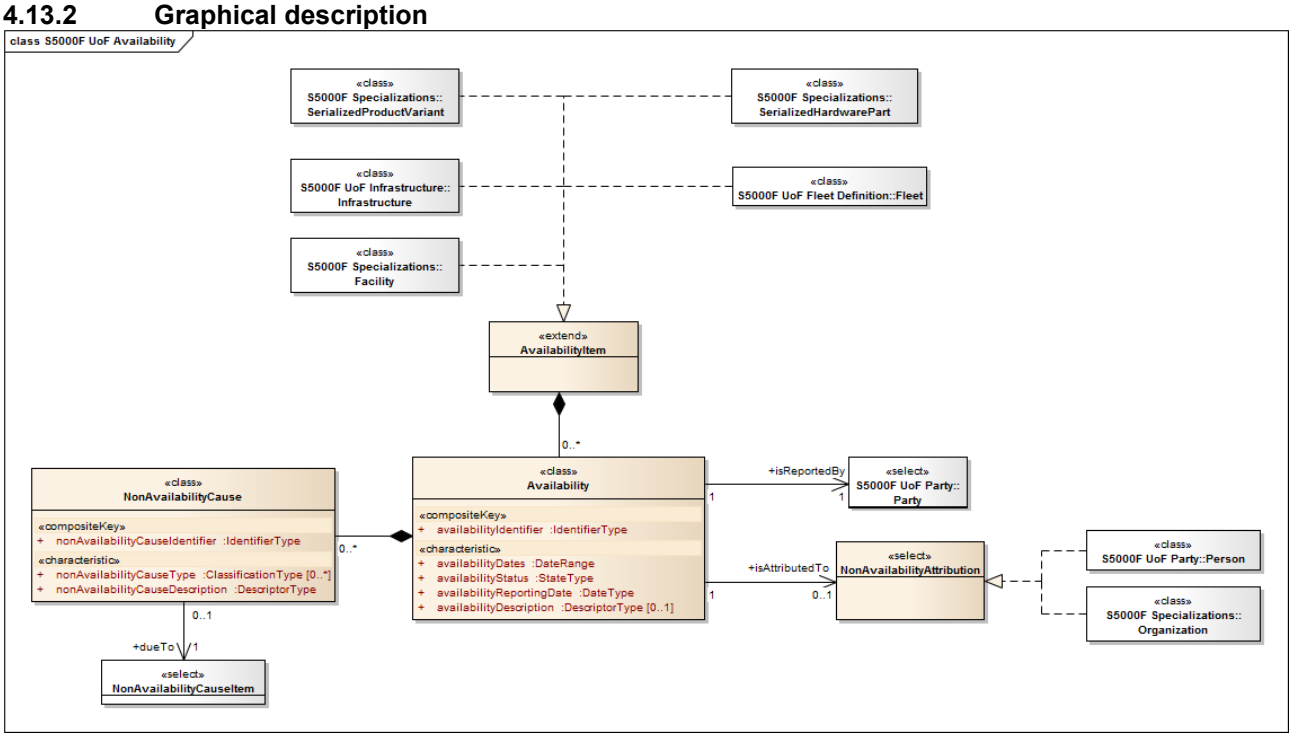
Fig 17 S5000F UoF As-desired Configuration

4.13 S5000F UoF Availability

4.13.1 Description

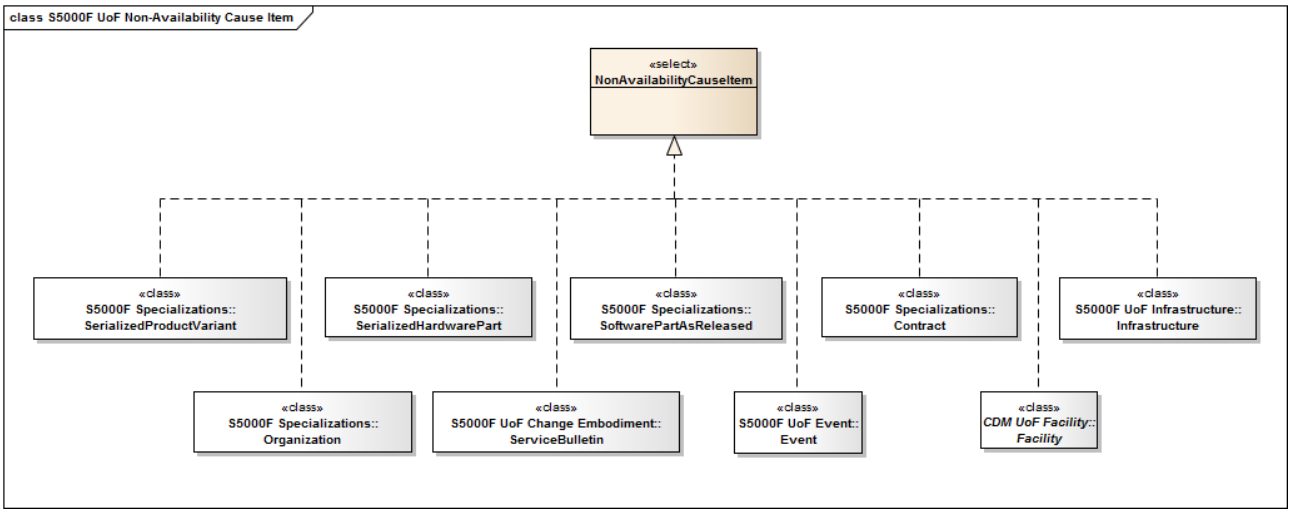
Availability UoF provides the necessary information to calculate the availability for individual items.

4.13.2 Graphical description



ICN-B6865-5000F15068-001-01

Fig 18 S5000F UoF Availability



ICN-B6865-5000F15069-001-01

Fig 19 S5000F UoF Non-Availability Cause Item

4.13.3 Class definition

4.13.3.1 Availability

Availability is an indication of the global availability status of an AvailabilityItem at a specific day.

4.13.3.1.1 Attribute(s)

This class has the following attributes:

- availabilityIdentifier
- availabilityDates
- availabilityDescription, optional
- availabilityReportingDate

– availabilityStatus

4.13.3.1.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type AvailabilityItem
– An association to object(s) from classes that are members of NonAvailabilityAttribution
– An association to object(s) from classes that are members of Party. A SerializedProductVariantAvailability must be associated to a Person or Organization instance that reports such availability (via the Party <<interface>>)

4.13.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

– ReportableItem (See S5000F UoF Report, Para 4.73)

4.13.3.2 AvailabilityItem

AvailabilityItem is an <<extend>> interface that allows to associate an Availability to an item.

4.13.3.3 NonAvailabilityAttribution

NonAvailabilityAttribution is a <<select>> interface that allows to associate a NonAvailability to the underlying responsible for the non-availability.

4.13.3.4 NonAvailabilityCause

NonAvailabilityCause is a <class>> that describes why a Availability was not achieved at a certain date.

4.13.3.4.1 Attribute(s)

This class has the following attributes:

– nonAvailabilityCauseIdentifier
– nonAvailabilityCauseDescription
– nonAvailabilityCauseType, zero, one or many

4.13.3.4.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type Availability
– An association, optional, to object(s) from classes that are members of NonAvailabilityCauseItem

4.13.3.5 NonAvailabilityCauseItem

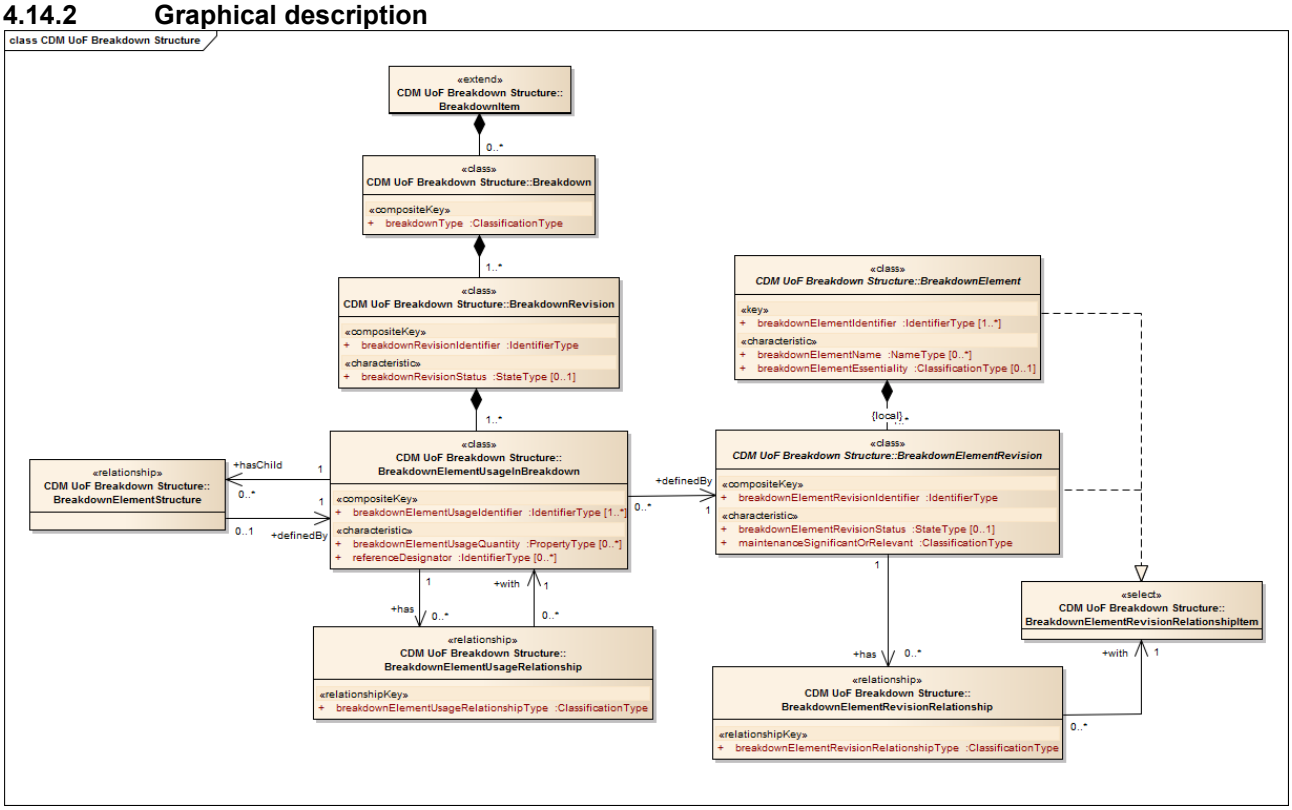
NonAvailabilityCauseItem is a <<select>> interface that allow to point out the root cause for a non-availability.

4.14 S5000F UoF Breakdown Structure

4.14.1 Description

The Breakdown Structure UoF provides the capability to define any number of hierarchical structures for a specific Product or ProductVariant.

4.14.2 Graphical description



ICN-B6865-SX002D0002-002-00

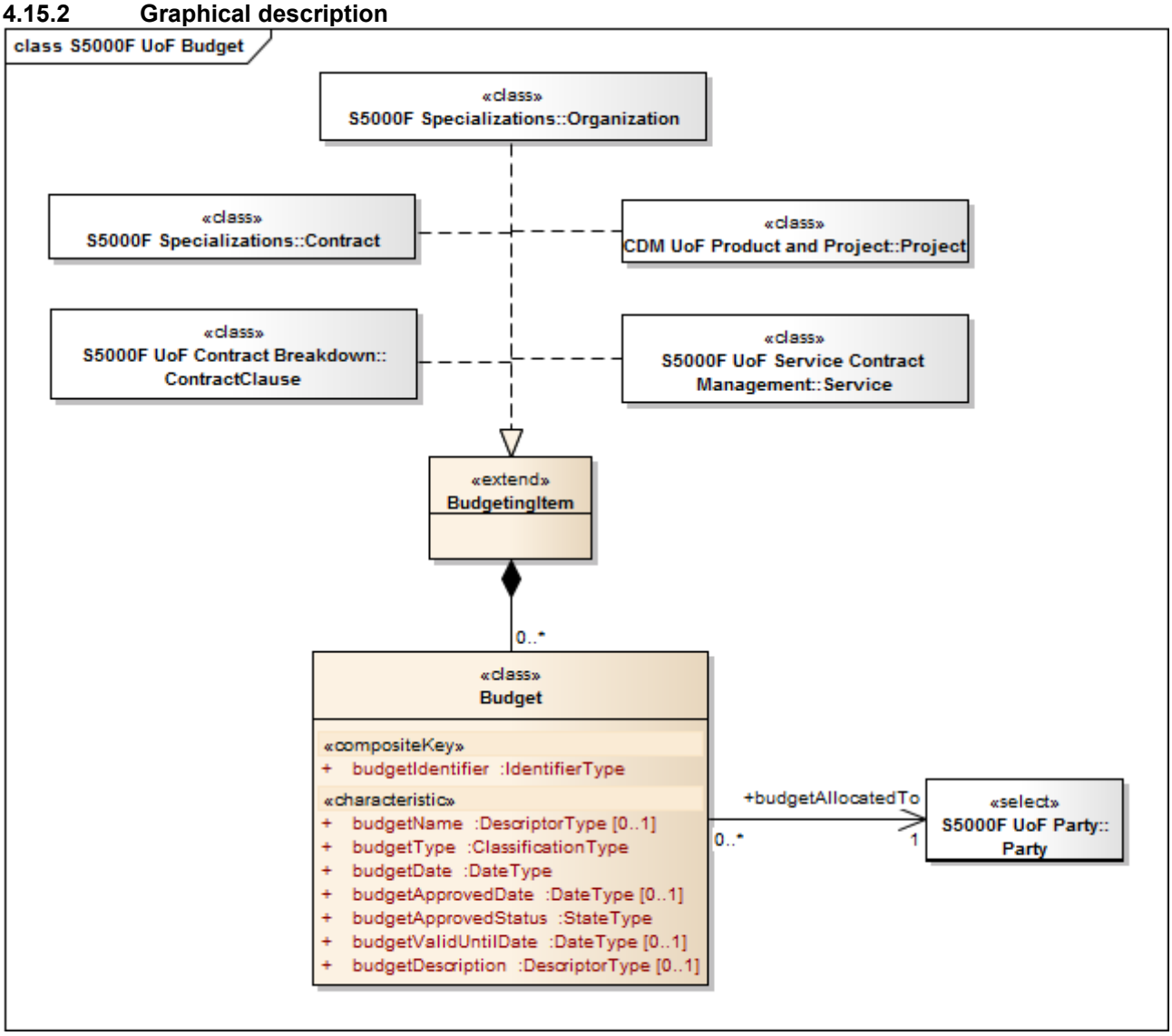
Fig 20 CDM UoF Breakdown Structure

4.15 S5000F UoF Budget

4.15.1 Description

The Budget UoF provides the necessary information to be able to assign a Budget to BudgetingItems that can have a Budget associated to them.

4.15.2 Graphical description



ICN-B6865-5000F15071-001-01

Fig 21 S5000F UoF Budget

4.15.3 Class definition

4.15.3.1 Budget

Budget is a class representing a cost proposal to perform a specific service or provide a certain item.

4.15.3.1.1 Attribute(s)

This class has the following attributes:

- budgetIdentifier
- budgetApprovedDate, optional
- budgetApprovedStatus
- budgetDate
- budgetDescription, optional
- budgetName, optional
- budgetType
- budgetValidUntilDate, optional

4.15.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type BudgetingItem
- An association, zero, one or many, to object(s) from classes that are members of Party

4.15.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)

4.15.3.2 BudgetingItem

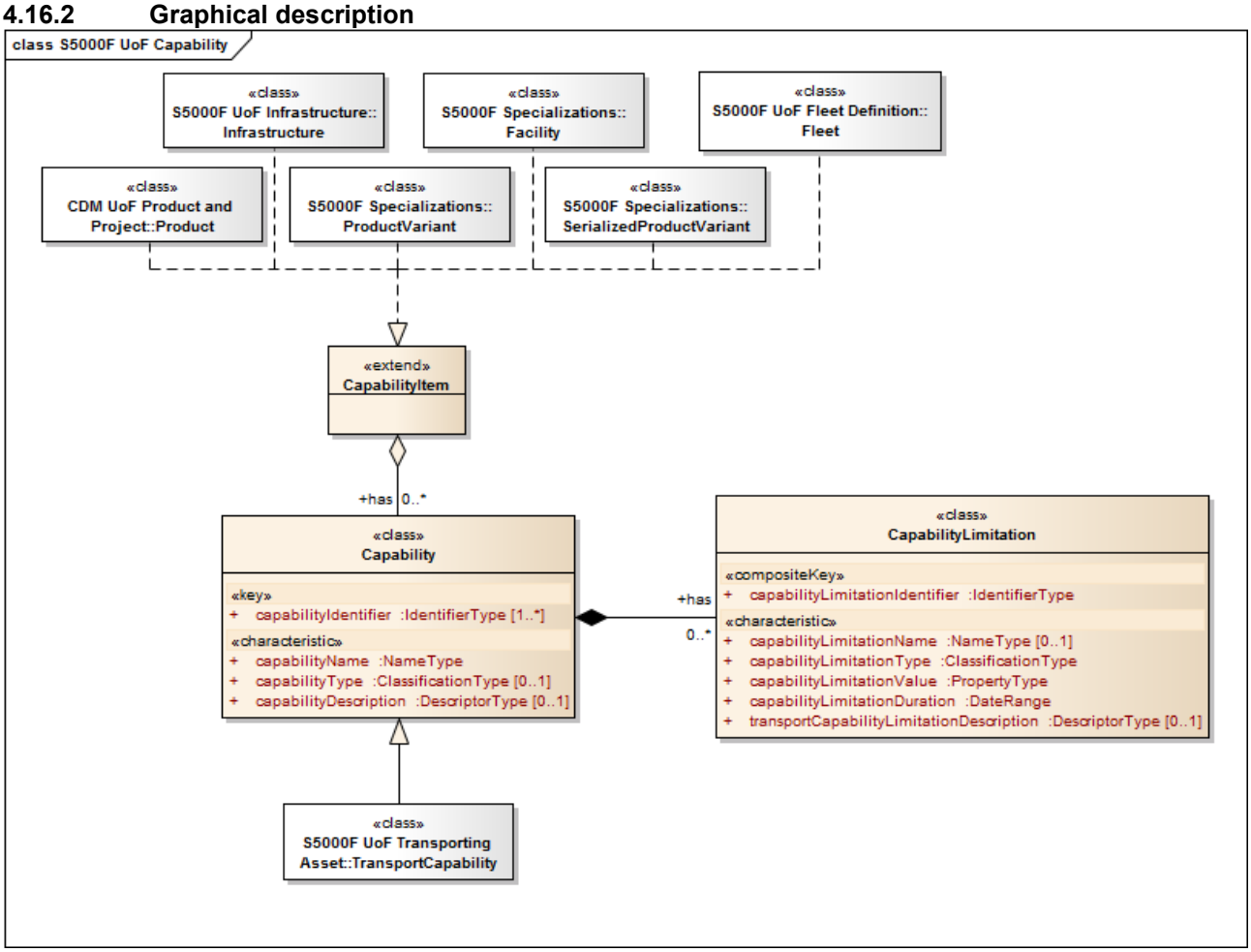
BudgetingItem is an <<extend>> interface that allows to associate Budgets to specific items.

4.16 S5000F UoF Capability

4.16.1 Description

Capability UoF provides the possibility to define a Capability that can be associated to existing items and identify potential limitations to that Capability.

4.16.2 Graphical description



ICN-B6865-5000F15072-001-01

Fig 22 S5000F UoF Capability

4.16.3 Class definition

4.16.3.1 Capability

Capability is a class that defines an ability or potential for an indicated use or deployment.

4.16.3.1.1 Attribute(s)

This class has the following attributes:

- capabilityIdentifier, one or many
- capabilityDescription, optional
- capabilityName
- capabilityType, optional

4.16.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, has, zero, one or many, to child objects of type CapabilityItem
- A composition association, has, zero, one or many, to child objects of type Service

4.16.3.2 CapabilityItem

CapabilityItem is an <<extend>> interface that allows to assign a Capabilities to an item.

4.16.3.3 CapabilityLimitation

CapabilityLimitation is a <<class>> that defines a limitation on the use of a specific Capability.

4.16.3.3.1 Example(s)

- environmental restriction
- legal restriction
- weight restriction

4.16.3.3.2 Attribute(s)

This class has the following attributes:

- capabilityLimitationIdentifier
- capabilityLimitationDuration
- capabilityLimitationName, optional
- capabilityLimitationType
- capabilityLimitationValue
- transportCapabilityLimitationDescription, optional

4.16.3.3.3 Associations

This class has the following associations:

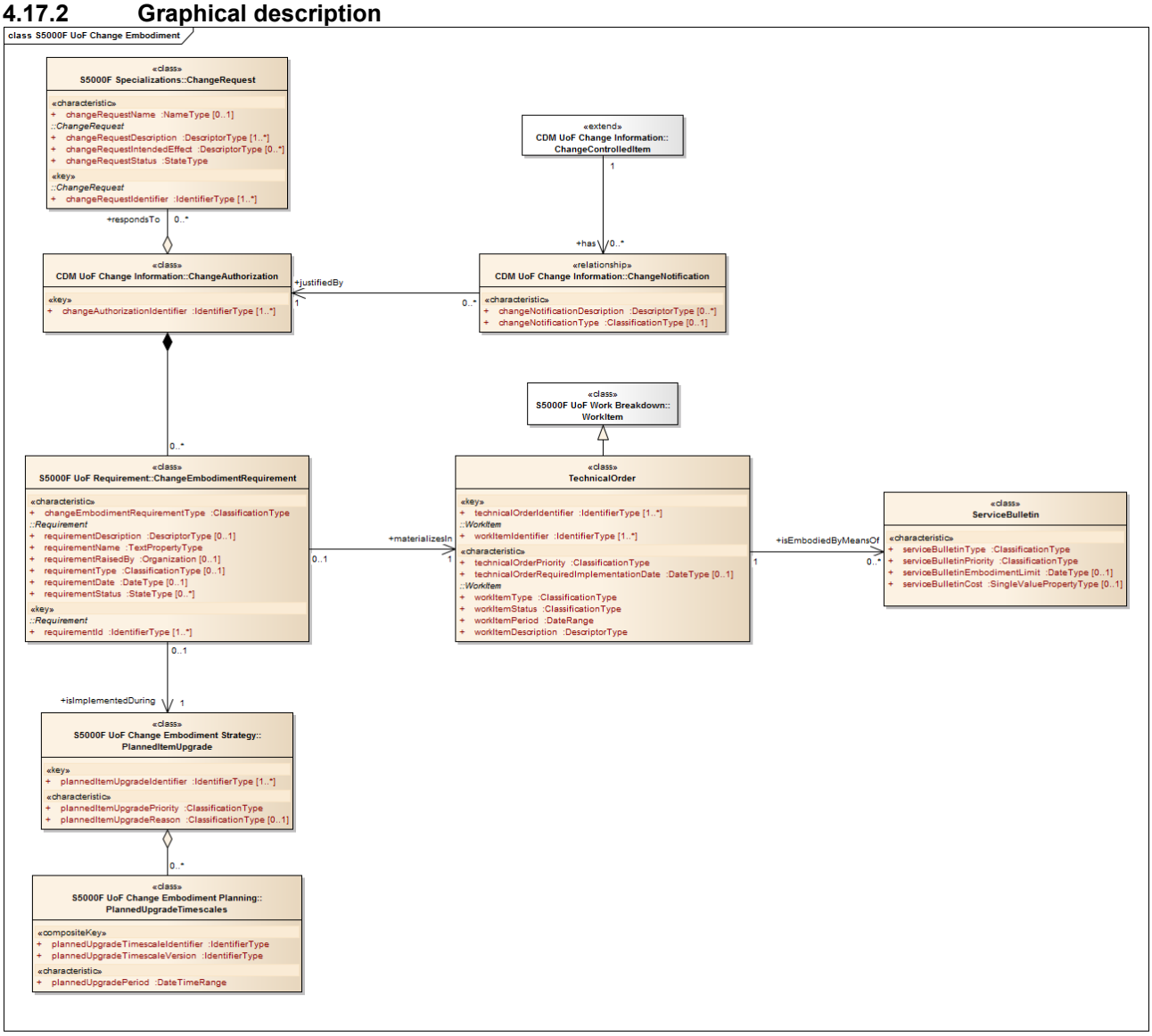
- An aggregate association, has, zero, one or many, to related object(s) of type Capability
- An aggregate association, has, zero, one or many, to related object(s) of type TransportCapability

4.17 S5000F UoF Change Embodiment

4.17.1 Description

The Change Embodiment UoF provides all the necessary information to plan and report the embodiment of a modification into a serialized item.

4.17.2 Graphical description



ICN-B6865-5000F15004-002-01

Fig 23 S5000F UoF Change Embodiment

4.17.3 Class definition

4.17.3.1 ServiceBulletin

ServiceBulletin is a class representing a set of documentation, material, spares and possibly other resources required to embody a change embodiment requirement into a ProductVariant or SerializedProductVariant.

4.17.3.1.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentCreationDate (inherited from Document), optional
- documentDescription (inherited from Document), optional
- documentStatus (inherited from Document), optional
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- serviceBulletinCost, optional

- serviceBulletinEmbodimentLimit, optional
- serviceBulletinPriority
- serviceBulletinType

4.17.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type DocumentRelationship

4.17.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.17.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- WarrantyItem (See S5000F UoF Warranty, Para 4.96)

4.17.3.2 TechnicalOrder

TechnicalOrder is a WorkItem raised by Maintenance Engineering to carry out a change or maintenance on a SerializedItem.

4.17.3.2.1 Attribute(s)

This class has the following attributes:

- workItemIdentifier (inherited from WorkItem), one or many
- technicalOrderIdentifier, one or many
- workItemDescription (inherited from WorkItem)
- workItemPeriod (inherited from WorkItem)
- workItemStatus (inherited from WorkItem)
- workItemType (inherited from WorkItem)
- technicalOrderPriority
- technicalOrderRequiredImplementationDate, optional

4.17.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

- A composition association, one or many, to child objects of type WorkBreakdownRevision
- An association to object(s) of type ServiceBulletin. A TechnicalOrder is associated to a ServiceBulletin
- An association to object(s) of type WorkItemRelationship
- An association, optional, to object(s) of type CostItem
- An association, zero, one or many, to object(s) from classes that are members of Party

4.17.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

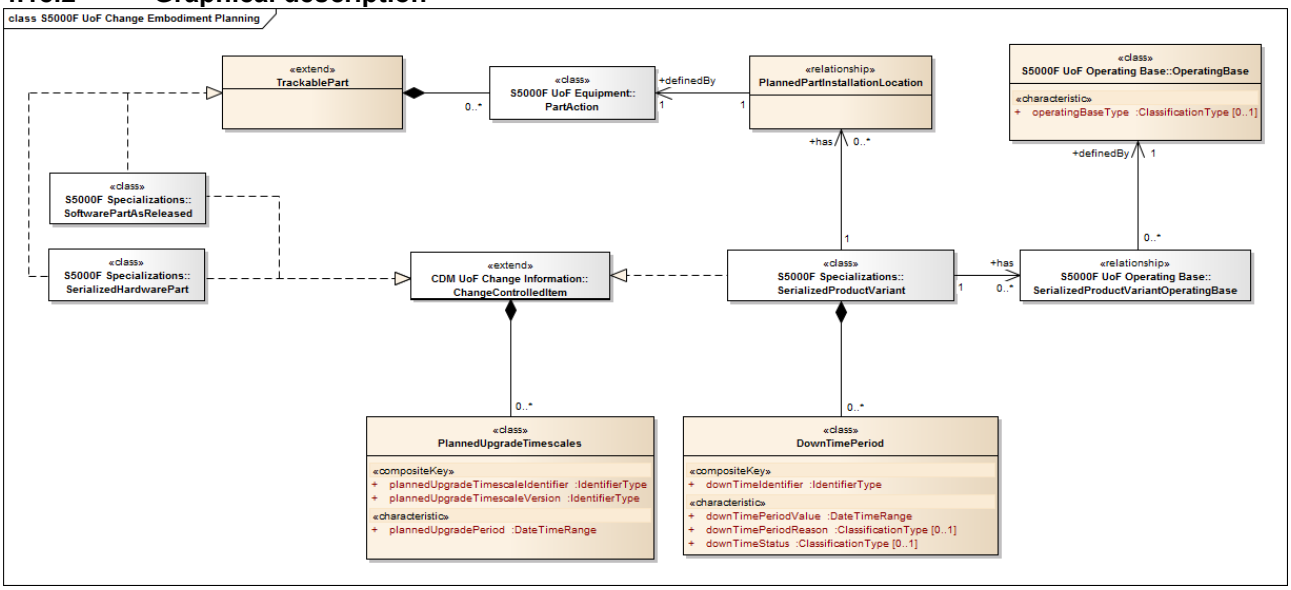
- MaintenanceWorkOrderSource (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from WorkItem) (See S5000F UoF Security Classification, Para 4.79)

4.18 S5000F UoF Change Embodiment Planning

4.18.1 Description

The Change Embodiment Planning UoF provides the capability to embody changes and resolution of obsolescence.

4.18.2 Graphical description



ICN-B6865-5000F15005-002-01

Fig 24 S5000F UoF Change Embodiment Planning

4.18.3 Class definition

4.18.3.1 DownTimePeriod

DownTimePeriod is a class representing a planned or actual downtime for a SerializedProductVariant.

4.18.3.1.1 Example(s)

- Non-working hours
- Overhaul period

4.18.3.1.2 Attribute(s)

This class has the following attributes:

- downTimeIdentifier
- downTimePeriodReason, optional
- downTimePeriodValue

– downTimeStatus, optional

4.18.3.1.3 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type SerializedProductVariant

4.18.3.2 PlannedPartInstallationLocation

PlannedPartInstallationLocation is a <<relationship>> that allows to indicate which Part was installed or uninstalled at which location on a specific SerializedProductVariant.

4.18.3.2.1 Associations

This class has the following associations:

– An association to object(s) of type PartAction

4.18.3.3 PlannedUpgradeTimescales

PlannedUpgradeTimescales is a class that defines the planned periods of times during which a PlannedUpgrade will be performed on specific items.

4.18.3.3.1 Attribute(s)

This class has the following attributes:

– plannedUpgradeTimescaleIdentifier
– plannedUpgradeTimescaleVersion
– plannedUpgradePeriod

4.18.3.3.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type ChangeControlledItem
– A composition association, zero, one or many, to child objects of type PlannedItemUpgrade

4.18.3.4 TrackablePart

TrackablePart is an <<extend>> interface for those items against which actions performed need to be recorded.

4.18.3.4.1 Example(s)

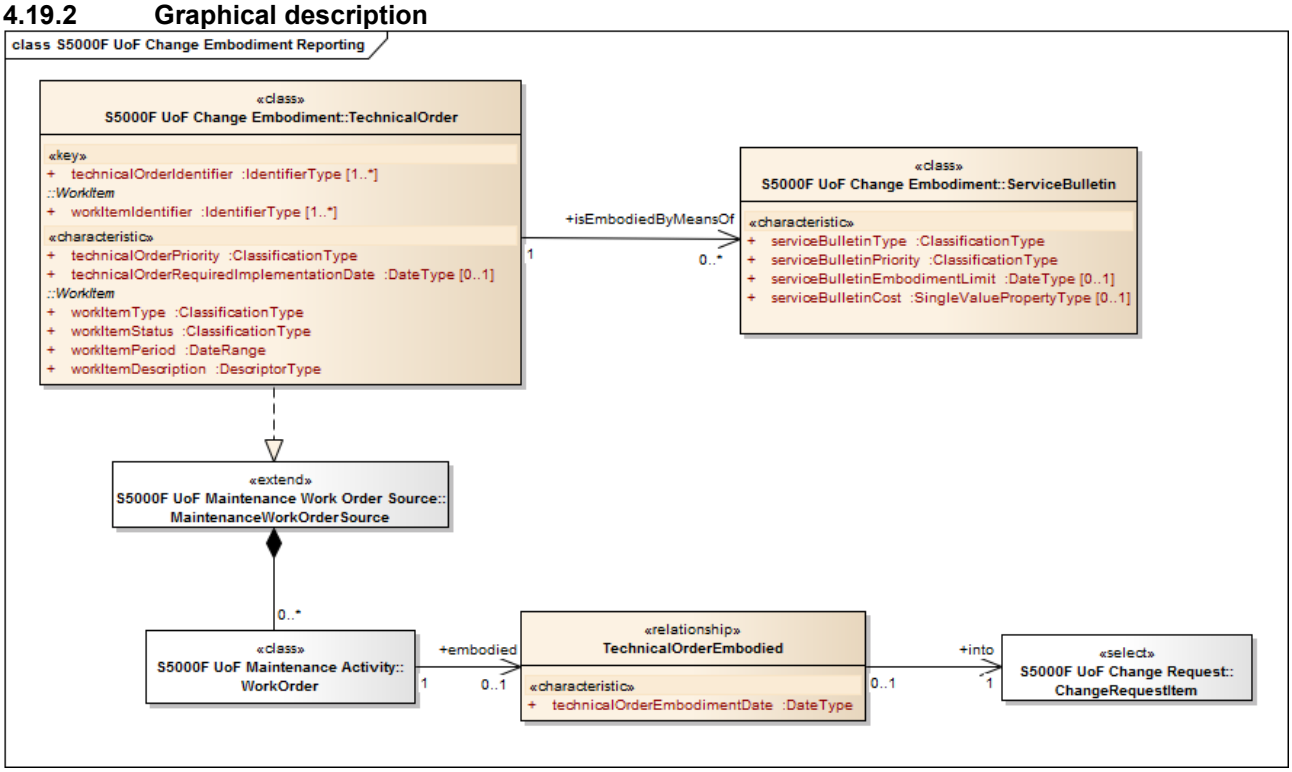
– A serialized item or a software part, but not things like a washer.

4.19 S5000F UoF Change Embodiment Reporting

4.19.1 Description

The Change Embodiment UoF provides all the necessary information to plan and report the embodiment of a modification into a serialized item.

4.19.2 Graphical description



ICN-B6865-5000F15073-001-01

Fig 25 S5000F UoF Change Embodiment Reporting

4.19.3 Class definition

4.19.3.1 TechnicalOrderEmbodied

TechnicalOrderEmbodied is a <<relationship>> that allows to report the WorkOrder that embodies a TechnicalOrder on the item on which it needs to be embodied.

4.19.3.1.1 Attribute(s)

This class has the following attributes:

– technicalOrderEmbodimentDate

4.19.3.1.2 Associations

This class has the following associations:

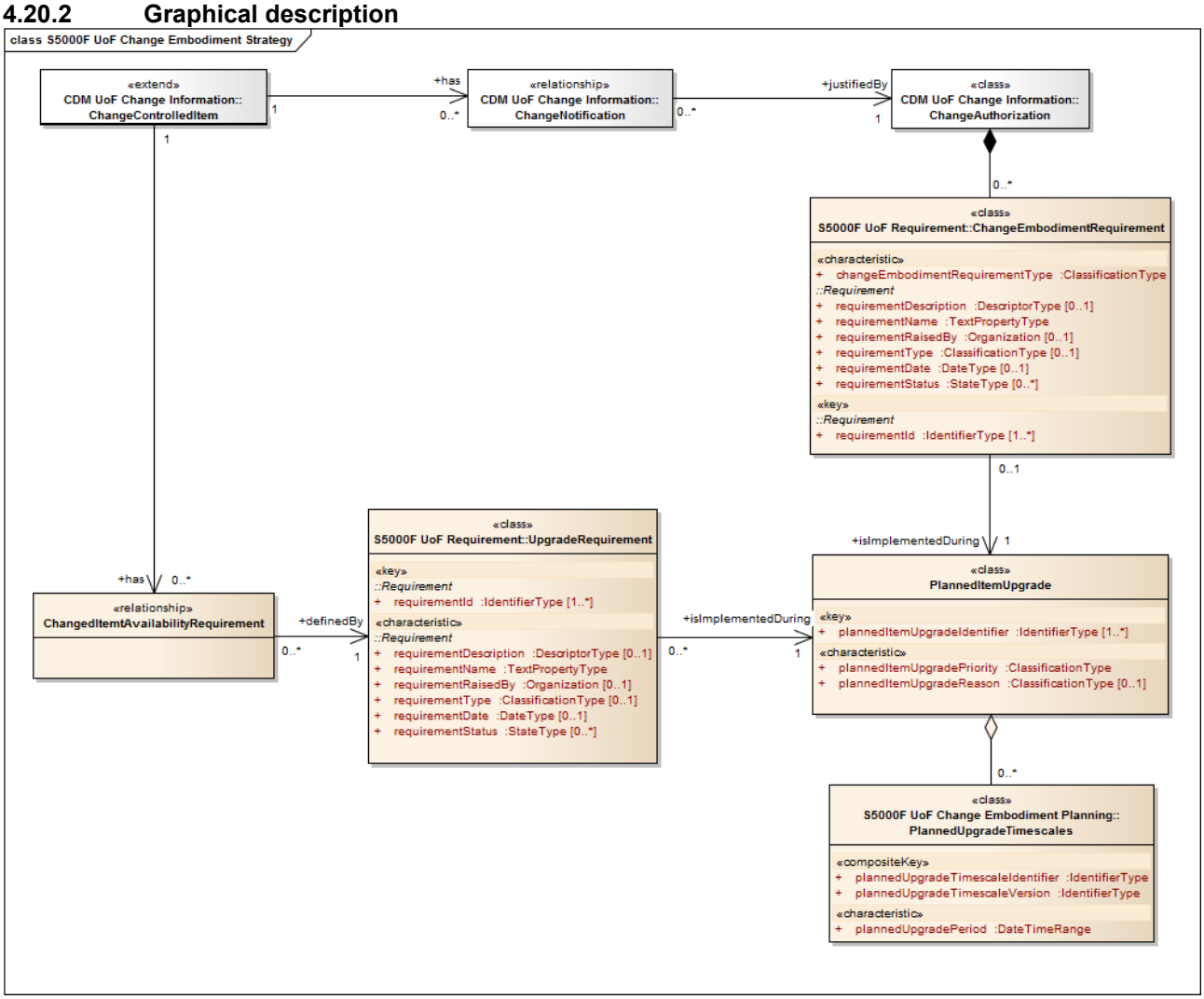
– An association, optional, to object(s) from classes that are members of ChangeRequestItem

4.20 S5000F UoF Change Embodiment Strategy

4.20.1 Description

The Change Embodiment Strategy Definition UoF provides all the necessary information to be able to define the strategy to embody a change on in-service items.

4.20.2 Graphical description



ICN-B6865-5000F15006-002-01

Fig 26 S5000F UoF Change Embodiment Strategy

4.20.3 Class definition

4.20.3.1 ChangedItemtAvailabilityRequirement

ChangedItemAvailabilityRequirement is a <<relationship>> that defines the required availability of the SerializedProductVariant or ProductVariant fleet into which the item to be upgraded has to be embodied during the Product upgrade.

4.20.3.1.1 Attribute(s)

This class has the following attributes:

- requirementId (inherited from Requirement), one or many
- requirementDate (inherited from Requirement), optional
- requirementDescription (inherited from Requirement), optional
- requirementName (inherited from Requirement)
- requirementRaisedBy (inherited from Requirement), optional
- requirementStatus (inherited from Requirement), zero, one or many
- requirementType (inherited from Requirement), optional

4.20.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type ServiceRequest
- An association to object(s) of type RequirementParty
- An association to object(s) of type RequirementRelationship
- An association, zero, one or many, to object(s) of type Document
- An association, zero, one or many, to object(s) of type UpgradeRequirement

4.20.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Requirement) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from Requirement) (See S5000F UoF Change Information, Para 4.21)
- MaintenanceWorkOrderSource (inherited from Requirement) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Requirement) (See S5000F UoF Security Classification, Para 4.79)

4.20.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- SafetyItem (inherited from Requirement) (See S5000F UoF Safety, Para 4.78)

4.20.3.2 PlannedItemUpgrade

PlannedUpgrade is a class that defines the planning for the upgrade for a ChangeEmbodimentRequirement for one or several items.

4.20.3.2.1 Attribute(s)

This class has the following attributes:

- plannedItemUpgradeIdentifier, one or many
- plannedItemUpgradePriority
- plannedItemUpgradeReason, optional

4.20.3.2.2 Associations

This class has the following associations:

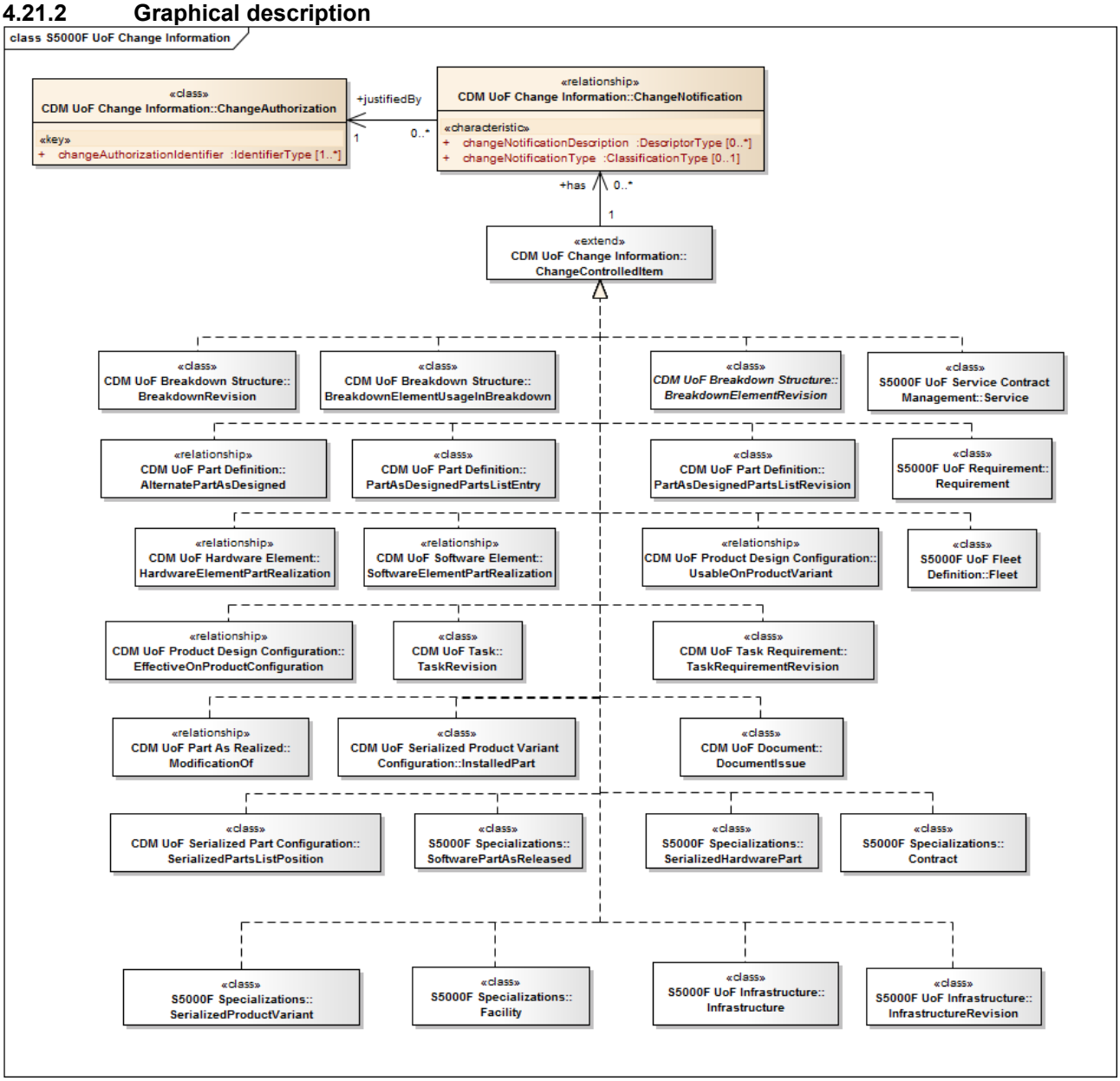
- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.21 S5000F UoF Change Information

4.21.1 Description

The Change Information UoF provides the capability to map ChangeControlledItems to a ChangeAuthorization.

4.21.2 Graphical description



ICN-B6865-5000F15074-001-01

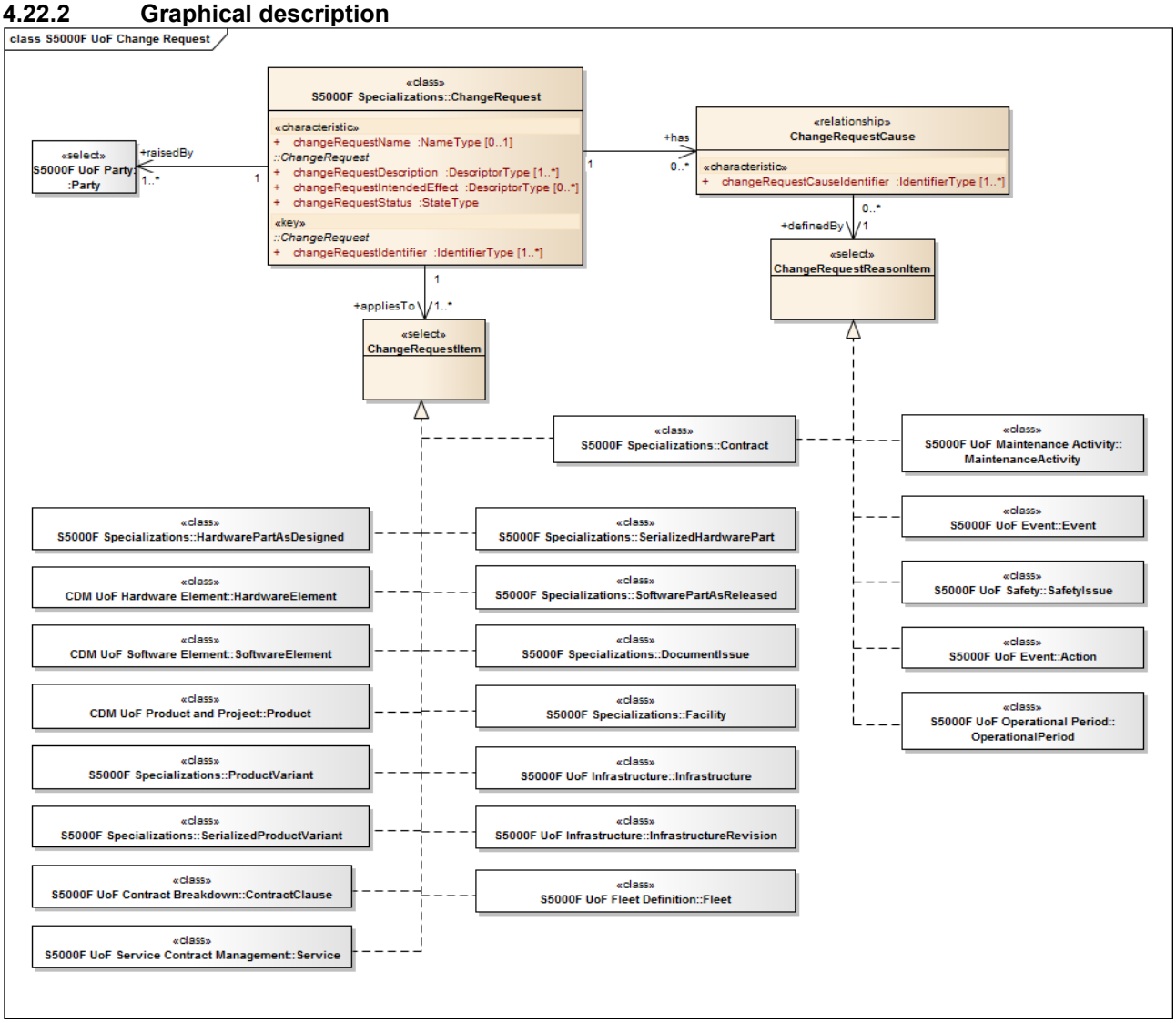
Fig 27 S5000F UoF Change Information

4.22 S5000F UoF Change Request

4.22.1 Description

The Change Request UoF provides the possibility to associate a ChangeRequest to items to be modified and document the reason for that ChangeRequest.

4.22.2 Graphical description



ICN-B6865-5000F15075-001-01

Fig 28 S5000F UoF Change Request

4.22.3 Class definition

4.22.3.1 ChangeRequestCause

ChangeRequestCause is a <<relationship>> that allows to associate the underlying cause(s) for a ChangeRequest.

4.22.3.1.1 Attribute(s)

This class has the following attributes:

– changeRequestCauseIdentifier, one or many

4.22.3.1.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of ChangeRequestReasonItem

4.22.3.2 ChangeRequestItem
ChangeRequestItem is a <<select>> interface that allows to associate the item to be changed to a ChangeRequest.

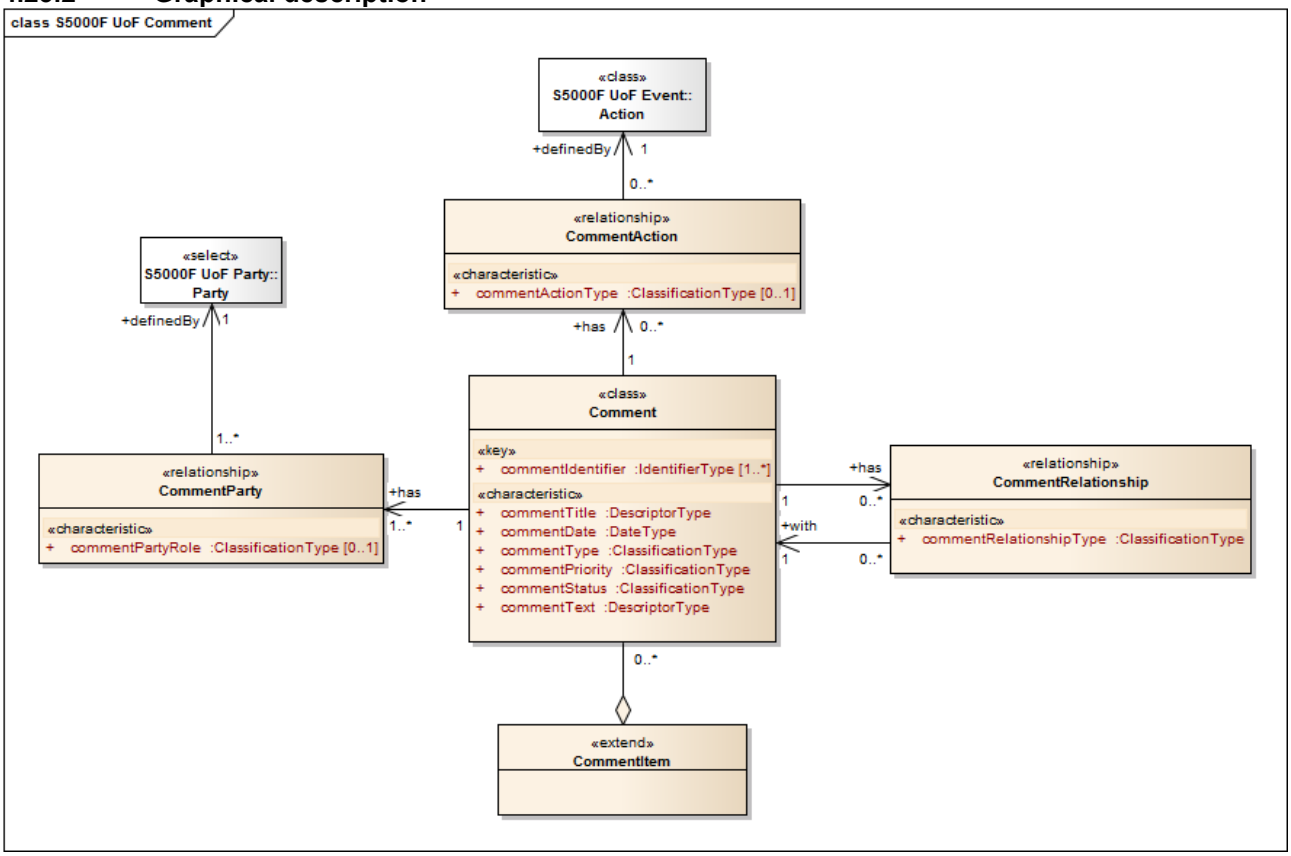
4.22.3.3 ChangeRequestReasonItem
ChangeRequestReasonItem is a <<select>> interface that allows to associate the underlying cause for a ChangeRequest.

4.23 S5000F UoF Comment

4.23.1 Description

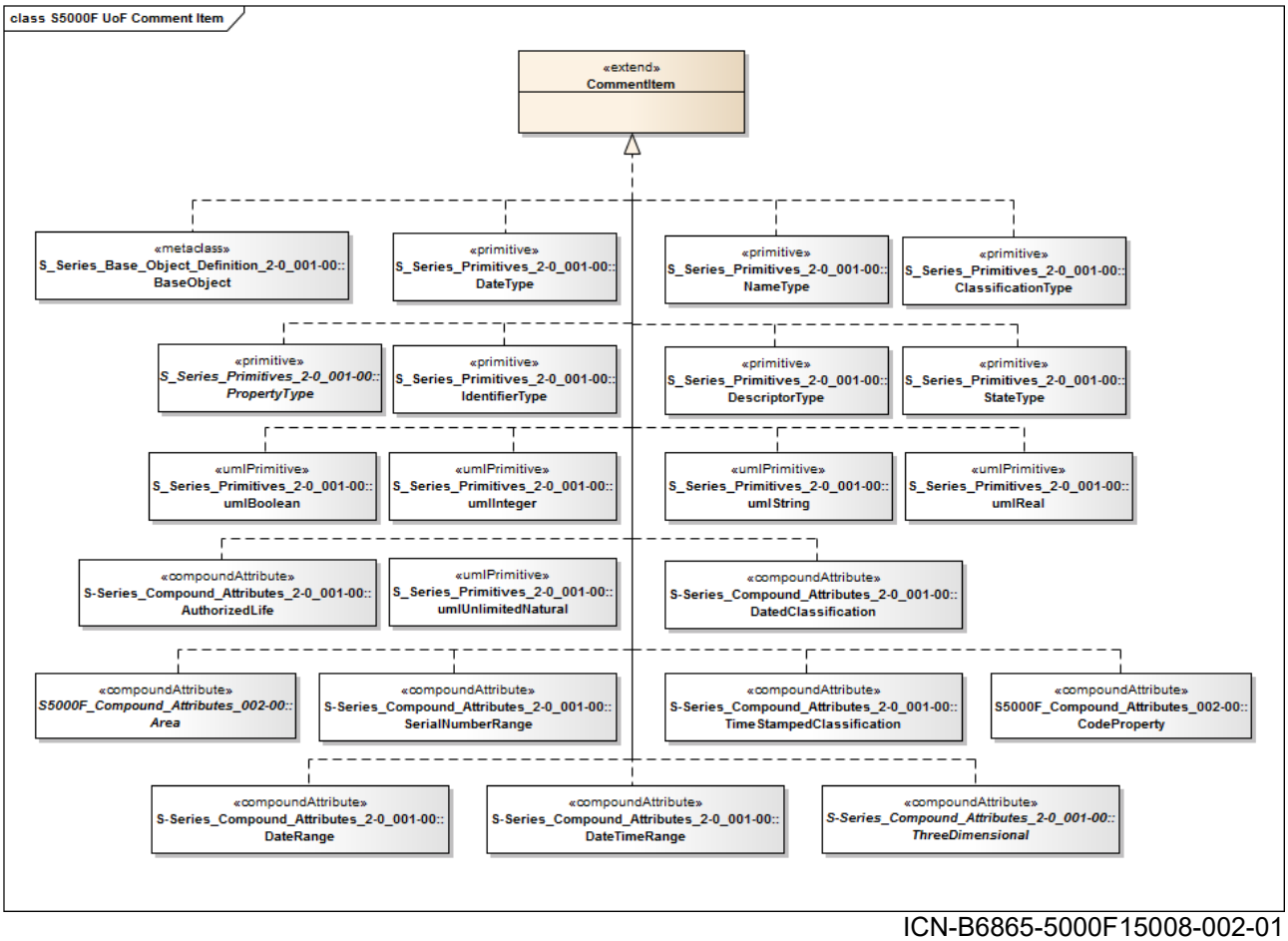
The Comment UoF defines the capability to provide comments on any feedback class.

4.23.2 Graphical description



ICN-B6865-5000F15007-002-01

Fig 29 S5000F UoF Comment



ICN-B6865-5000F15008-002-01

Fig 30 S5000F UoF Comment Item

4.23.3 Class definition

4.23.3.1 Comment

Comment is a textual statement about a related item that deals with an issue associated to that item that needs to be addressed.

4.23.3.1.1 Attribute(s)

This class has the following attributes:

- commentIdentifier, one or many
- commentDate
- commentPriority
- commentStatus
- commentText
- commentTitle
- commentType

4.23.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type CommentItem
- An association to object(s) of type CommentAction. A Comment can relate to zero, one or many Actions (via the CommentAction <<irelationship>>)
- An association to object(s) of type CommentParty

– An association to object(s) of type CommentRelationship. Each Comment can relate to zero, one or many Comments (via dhe CommentRelationship <<relationship>> class

4.23.3.1.3 Implementations
This class implements the following <<extend>> interfaces:

– SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.23.3.2 CommentAction
CommentAction is a <<relationship>> that allows to associate a Comment to one or several Actions performed in response to the Comment.

4.23.3.2.1 Attribute(s)
This class has the following attributes:

– commentActionType, optional

4.23.3.2.2 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) of type Action
– An association, zero, one or many, to object(s) of type RequiredSafetyAction

4.23.3.3 CommentItem
CommentItem is an <<extend>> interface allowing to establish an association between an item and the comments that are associated to it.

4.23.3.4 CommentParty
CommentParty is a <<relationship>> defining the association between a Comment and a Party.

4.23.3.4.1 Example(s)
– Comment raised by organization XYZ.

4.23.3.4.2 Attribute(s)
This class has the following attributes:

– commentPartyRole, optional

4.23.3.4.3 Associations
This class has the following associations:

– An association, one or many, to object(s) from classes that are members of Party

4.23.3.5 CommentRelationship
CommentRelationship is a <<relationship>> that defines the association between two different Comments.

4.23.3.5.1 Attribute(s)
This class has the following attributes:

– commentRelationshipType

4.23.3.5.2 Associations
This class has the following associations:

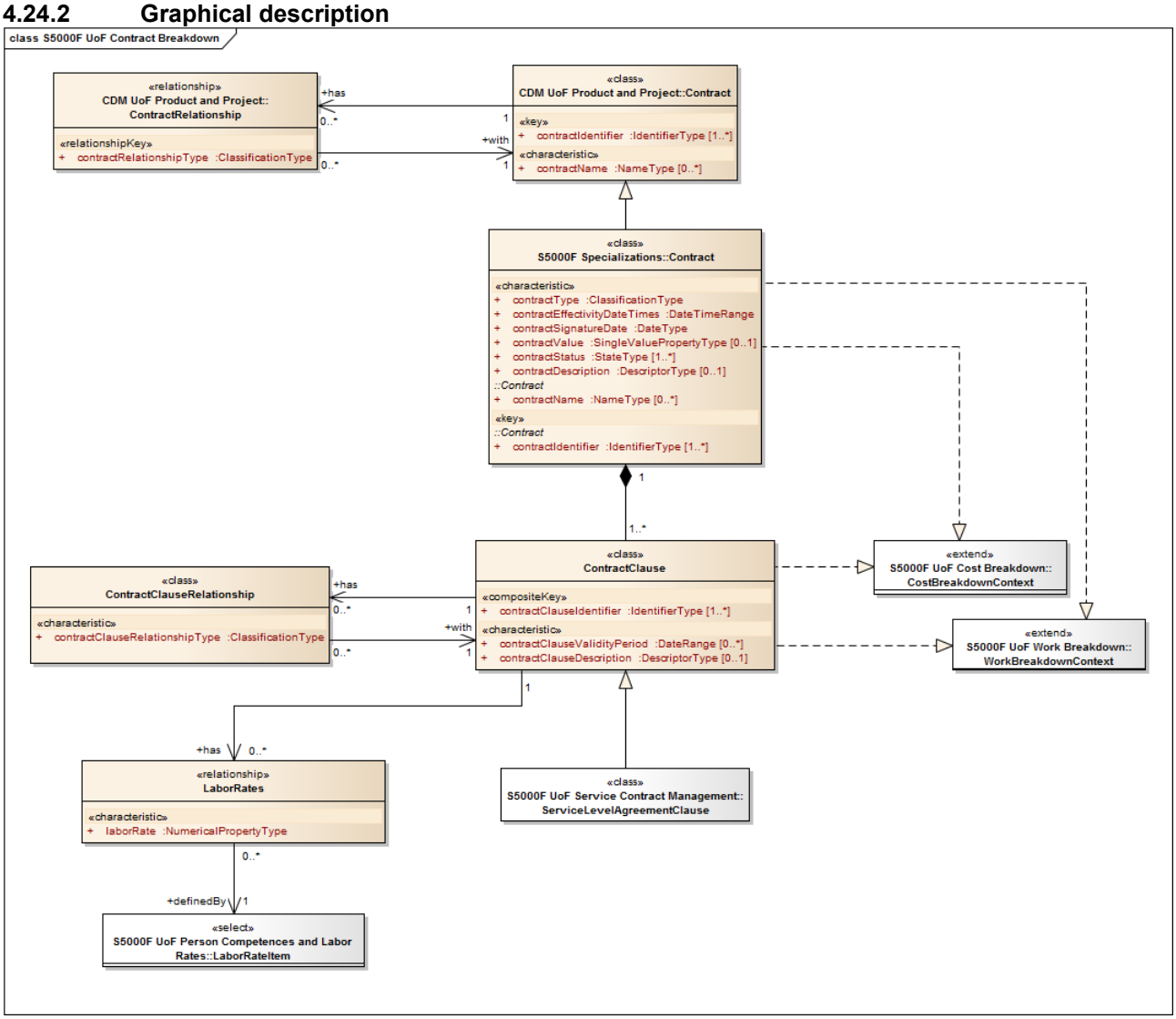
– An association, zero, one or many, to object(s) of type Comment

4.24 S5000F UoF Contract Breakdown

4.24.1 Description

The Contract Breakdown UoF provides the capability to define the breakdown for a Contract.

4.24.2 Graphical description



ICN-B6865-5000F15076-001-01

Fig 31 S5000F UoF Contract Breakdown

4.24.3 Class definition

4.24.3.1 ContractClause

ContractClause is a specific provision included in a Contract.

Note

A ContractClause allows for a finer granularity of a Contract. However, if this granularity is not available or desirable, a ContractClause can be defined which is the whole Contract.

Note

A ContractClause will address a specific aspect of the Contract between the Parties, detailing the agreement to ensure all Parties understand what is expected of the other.

4.24.3.1.1 Attribute(s)

This class has the following attributes:

- contractClauseIdentifier, one or many
- contractClauseDescription, optional
- contractClauseValidityPeriod, zero, one or many

4.24.3.1.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type Contract
- An association to object(s) of type ContractClauseRelationship
- An association to object(s) of type ItemWarranty
- An association to object(s) of type LaborRates

4.24.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- BudgetingItem (See S5000F UoF Budget, Para 4.15)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

4.24.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)

4.24.3.2 ContractClauseRelationship

ContractClauseRelationship is a <<relationship>> that allows to associate different ContractClauses.

4.24.3.2.1 Attribute(s)

This class has the following attributes:

- contractClauseRelationshipType

4.24.3.2.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type ContractClause
- An association, zero, one or many, to object(s) of type ServiceLevelAgreementClause

4.24.3.3 LaborRates

LaborRates is a <<relationship>> that allows to assign labor rates to different skills, skill levels and trades.

4.24.3.3.1 Attribute(s)

This class has the following attributes:

- laborRate

4.24.3.3.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of LaborRateItem

4.25 S5000F UoF Cost Breakdown

4.25.1 Description

The Cost Breakdown UoF provides the capability to define a cost breakdown structure (CBS).

4.25.2 Graphical description

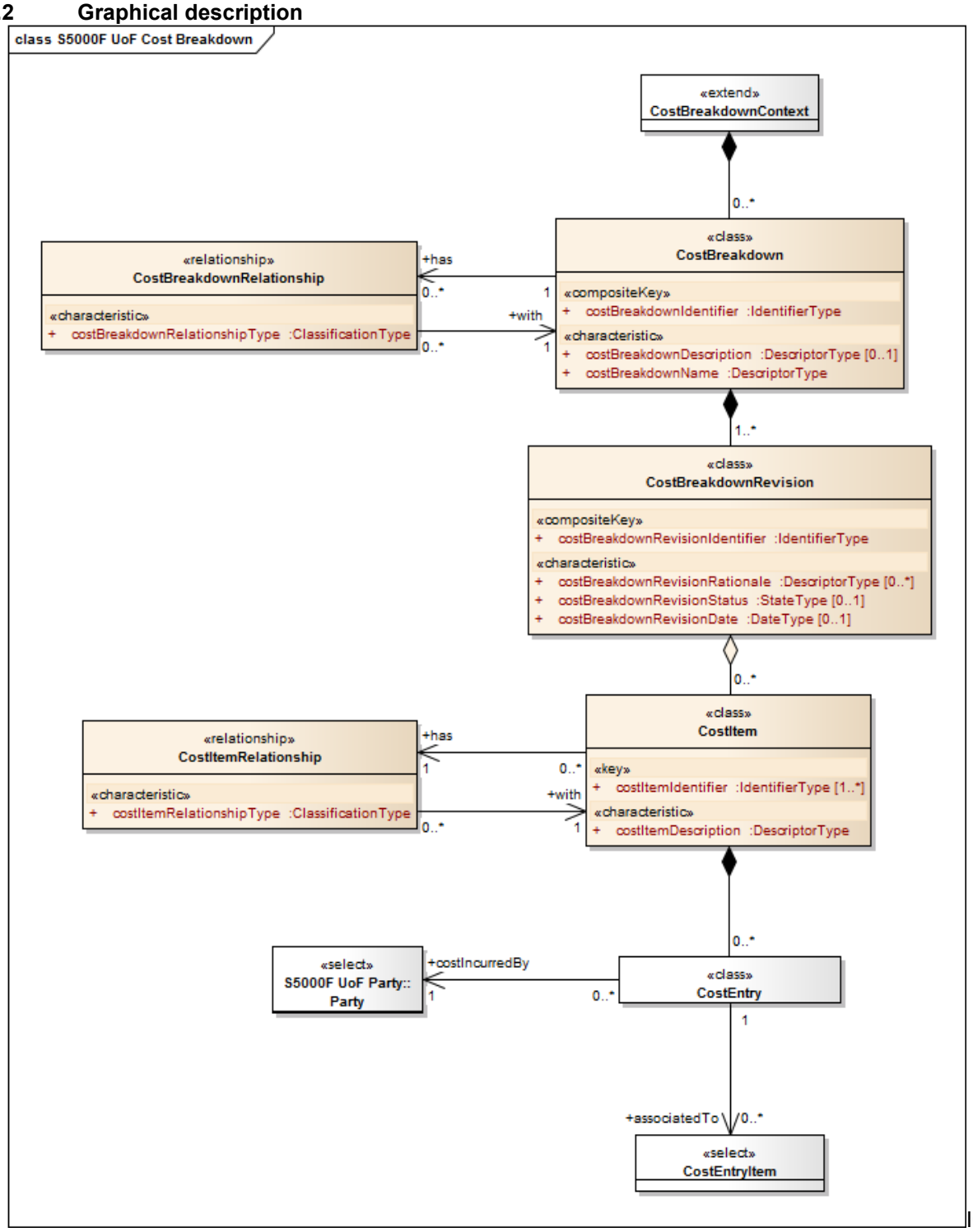


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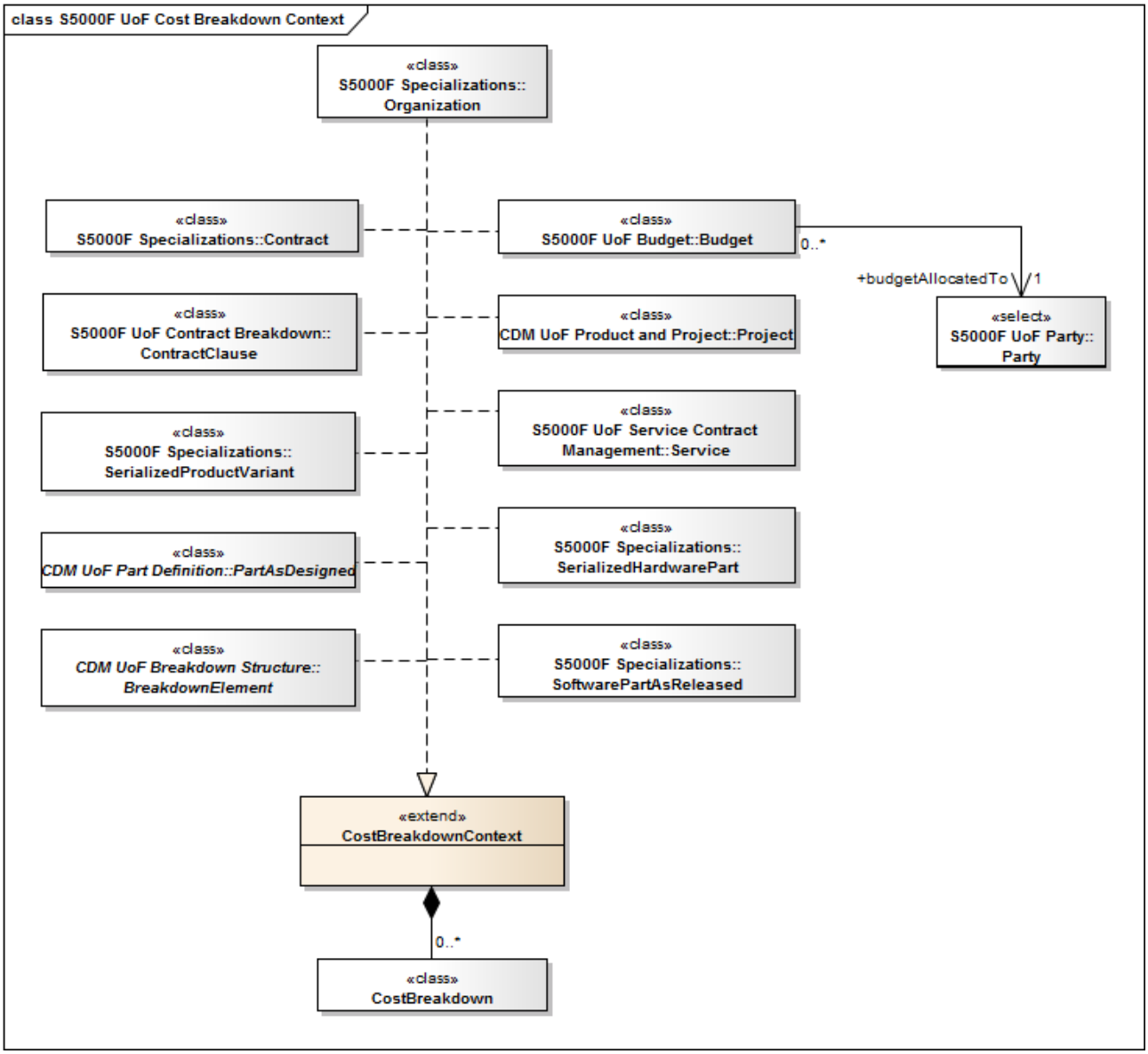
Fig 32 S5000F UoF Cost Breakdown



ICN-B6865-5000F15078-001-01

Fig 33 S5000F UoF Cost Breakdown Context

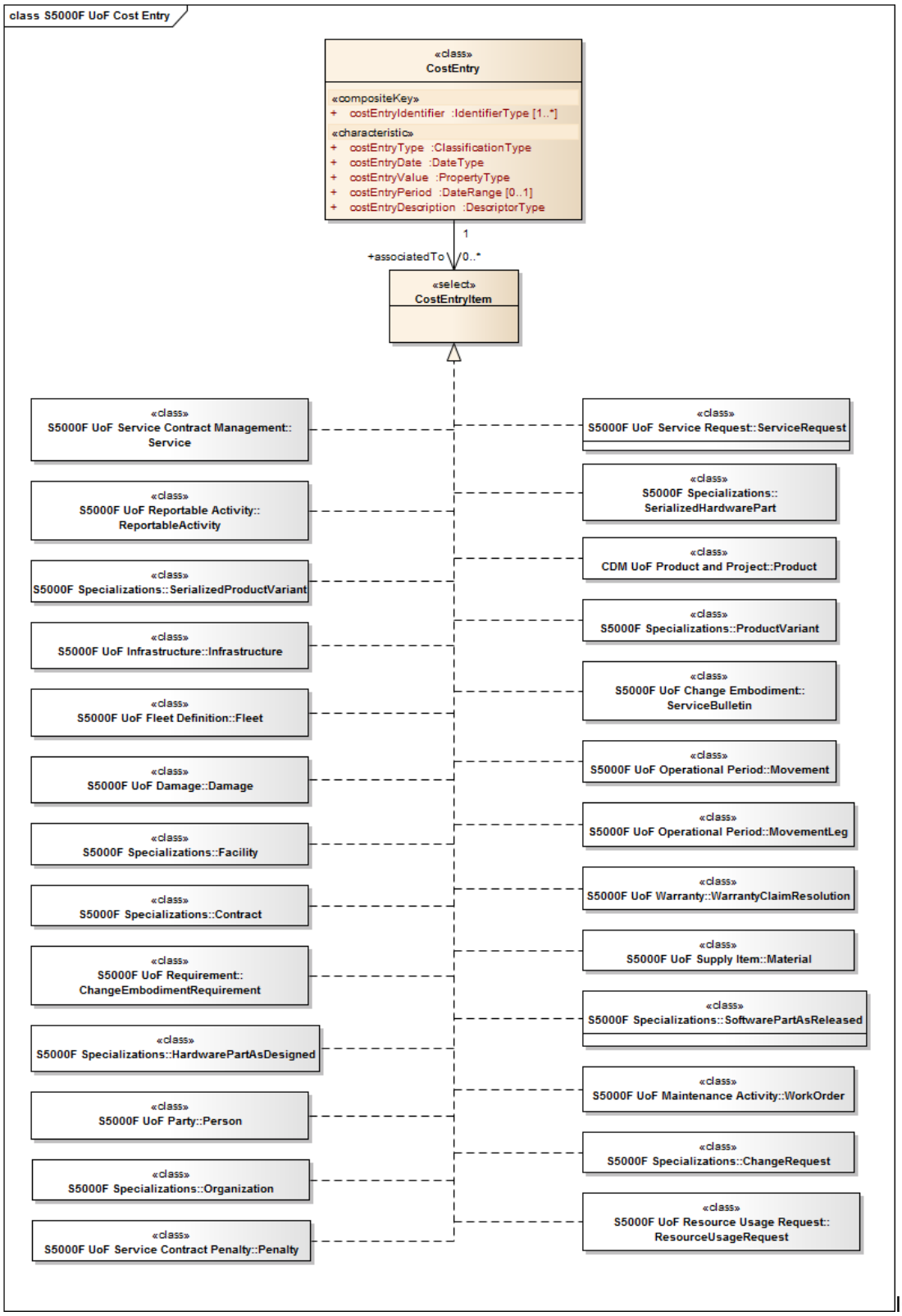


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Fig 34 S5000F UoF Cost Entry

4.25.3 Class definition

4.25.3.1 CostBreakdown

CostBreakdown is a class used to group all the different cost concepts associated to a particular purpose.

4.25.3.1.1 Attribute(s)

This class has the following attributes:

- costBreakdownIdentifier
- costBreakdownDescription, optional
- costBreakdownName

4.25.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type CostBreakdownContext
- An association to object(s) of type CostBreakdownRelationship

4.25.3.2 CostBreakdownContext

CostBreakdownContext is an <<extend>> interface that allows to assign a CostBreakdown to an item.

4.25.3.3 CostBreakdownRelationship

CostBreakdownRelationship is a <<relationship>> that allows to define associations between two different CostBreakdowns.

4.25.3.3.1 Attribute(s)

This class has the following attributes:

- costBreakdownRelationshipType

4.25.3.3.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type CostBreakdown

4.25.3.4 CostBreakdownRevision

CostBreakdownRevision is an iteration that is applied to a CostItem.

4.25.3.4.1 Attribute(s)

This class has the following attributes:

- costBreakdownRevisionIdentifier
- costBreakdownRevisionDate, optional
- costBreakdownRevisionRationale, zero, one or many
- costBreakdownRevisionStatus, optional

4.25.3.4.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type CostBreakdown

4.25.3.5 CostEntry

A CostEntry is an individual expense made at a specific date for a specific amount that needs to be recorded for accounting purposes.

4.25.3.5.1 Attribute(s)

This class has the following attributes:

- costEntryIdentifier, one or many
- costEntryDate
- costEntryDescription
- costEntryPeriod, optional
- costEntryType
- costEntryValue

4.25.3.5.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type CostItem
- An association to object(s) from classes that are members of CostEntryItem
- An association, zero, one or many, to object(s) from classes that are members of Party

4.25.3.5.3 Implementations

This class implements the following <<extend>> interfaces:

- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.25.3.5.4 Selects

This class is a member of the following <<select>> interfaces:

- ReportableItem (See S5000F UoF Report, Para 4.73)

4.25.3.6 CostEntryItem

A CostEntryItem is an <<select>> interface that associates a CostEntry to the item whose cost has to be incurred.

4.25.3.7 CostItem

A CostItem is a generic concept to group individual expenses for accounting or program management purposes.

Note

A same CostItem can be associated to several CostBreakdownRevisions.

4.25.3.7.1 Attribute(s)

This class has the following attributes:

- costItemIdentifier, one or many
- costItemDescription

4.25.3.7.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type CostBreakdownRevision
- An association to object(s) of type ResourceUsageRequest
- An association, zero, one or many, to object(s) of type CostItemRelationship

4.25.3.7.3 Implementations

This class implements the following <<extend>> interfaces:

- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.25.3.8 CostItemRelationship

CostItemRelationship is a <<relationship>> that establishes the association between two different CostItems.

4.25.3.8.1 Attribute(s)

This class has the following attributes:

– costItemRelationshipType

4.25.3.8.2 Associations

This class has the following associations:

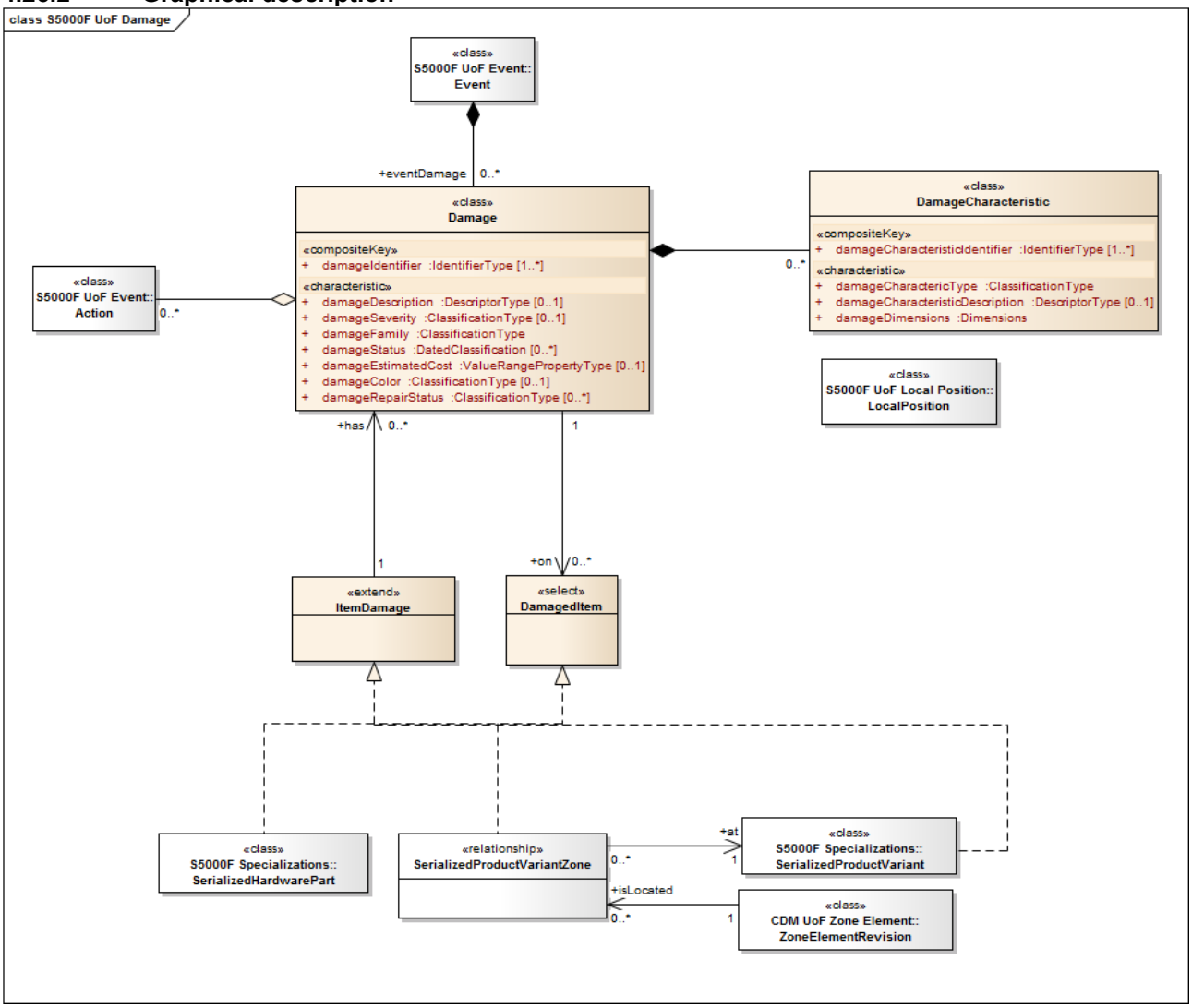
– An association, zero, one or many, to object(s) of type CostItem

4.26 S5000F UoF Damage

4.26.1 Description

The Damage UoF allows to document a Damage and associated damage characteristics.

4.26.2 Graphical description



ICN-B6865-5000F15079-001-01

Fig 35 S5000F UoF Damage

4.26.3 Class definition

4.26.3.1 Damage

Damage is a harm to an item resulting in loss of value or the impairment of usefulness.

4.26.3.1.1 Attribute(s)

This class has the following attributes:

- damageIdentifier, one or many
- damageColor, optional
- damageDescription, optional
- damageEstimatedCost, optional
- damageFamily
- damageRepairStatus, zero, one or many
- damageSeverity, optional
- damageStatus, zero, one or many

4.26.3.1.2 Associations

This class has the following associations:

- An aggregate association, eventDamage, zero, one or many, to related object(s) of type Event
- An aggregate association, eventDamage, zero, one or many, to related object(s) of type MaintenanceEvent
- An aggregate association, eventDamage, zero, one or many, to related object(s) of type OperationalEvent
- An aggregate association, eventDamage, zero, one or many, to related object(s) of type WarrantyEvent
- An association to object(s) from classes that are members of DamagedItem

4.26.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- PositionReferencingItem (See S5000F UoF Local Position, Para 4.45)

4.26.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)

4.26.3.2 DamageAreaDimensions

DamageAreaDimensions is a <<select>> interface that allows to define the areal dimensions of a DamageCharacteristic.

4.26.3.3 DamageCharacteristic

DamageCharacteristic is a <<class>> that allows to document the characteristics of a Damage.

4.26.3.3.1 Attribute(s)

This class has the following attributes:

- damageCharacteristicIdentifier, one or many
- damageCharactericType
- damageCharacteristicDescription, optional
- damageDimensions

4.26.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type Damage

4.26.3.4 DamagedItem

DamagedItem is a <<select>> interface that allows to associate a Damage to the item where the Damage has occurred.

4.26.3.5 ItemDamage

ItemDamage is an <<extend>> interface that allows to document the Damage that an item has suffered.

4.26.3.5.1 Associations

This class has the following associations:

– An association to object(s) of type Damage

4.26.3.6 SerializedProductVariantZone

SerializedProductVariantZone is a <<relationship>> that allows to associate a Damage to a serialied ProductVariantZone.

4.26.3.6.1 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type SerializedProductVariant

4.26.3.6.2 Implementations

This class implements the following <<extend>> interfaces:

– ItemDamage

4.26.3.6.3 Selects

This class is a member of the following <<select>> interfaces:

– DamagedItem

4.27 S5000F UoF Data Sets

4.27.1 Description

The Data Sets UoF provides the capability to manage data sets and associate them to the items that geerate/consume them.

4.27.2 Graphical description

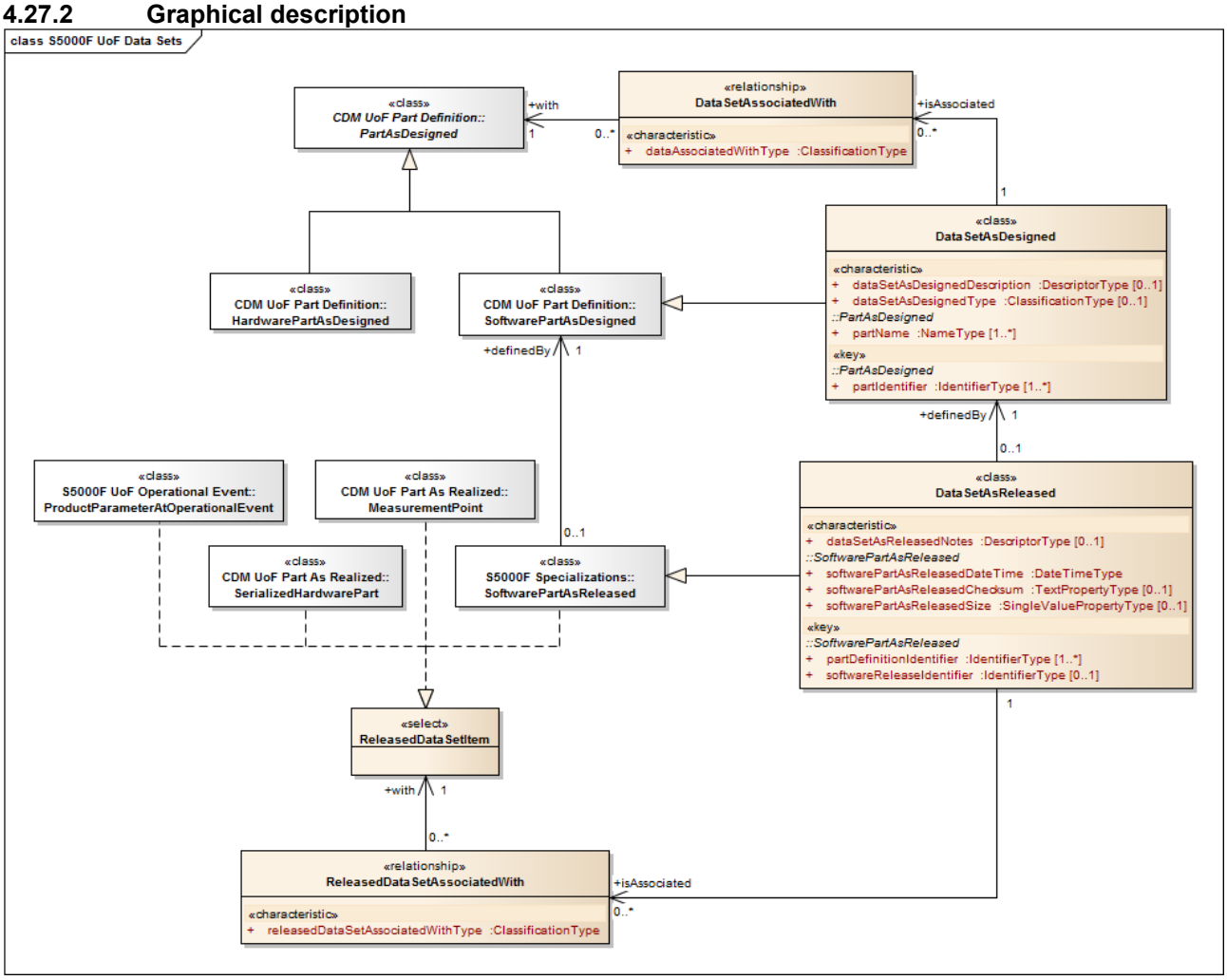


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Fig 36 S5000F UoF Data Sets

4.27.3 Class definition

4.27.3.1 DataSetAsDesigned

DataSetAsDesigned is a class representing a data structure.

4.27.3.1.1 Attribute(s)

This class has the following attributes:

- partIdentifier (inherited from PartAsDesigned), one or many
- partName (inherited from PartAsDesigned), one or many
- dataSetAsDesignedDescription, optional
- dataSetAsDesignedType, optional

4.27.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type AlternatePartAsDesigned
- An association to object(s) of type DataSetAssociatedWith

4.27.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ItemUnderExportControl (inherited from SoftwarePartAsDesigned) (See S5000F UoF Export Control Requirement, Para 4.35)
- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

4.27.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from SoftwarePartAsDesigned) (See S5000F UoF Project and Contract, Para 4.71)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ExportControlledItem (inherited from SoftwarePartAsDesigned) (See S5000F UoF Export Control License, Para 4.34)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReportingParty (inherited from SoftwarePartAsDesigned) (See S5000F UoF Report, Para 4.73)
- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)

4.27.3.2 DataSetAsReleased

DataSetAsReleased is a class representing a set of actual data that are structured as a DataSetAsDesigned.

4.27.3.2.1 Attribute(s)

This class has the following attributes:

- partDefinitionIdentifier (inherited from SoftwarePartAsReleased), one or many
- softwareReleaseIdentifier (inherited from SoftwarePartAsReleased), optional
- softwarePartAsReleasedChecksum (inherited from SoftwarePartAsReleased), optional
- softwarePartAsReleasedDateTime (inherited from SoftwarePartAsReleased)
- softwarePartAsReleasedSize (inherited from SoftwarePartAsReleased), optional
- dataSetAsReleasedNotes, optional

4.27.3.2.2 Associations

This class has the following associations:

- An association to object(s) of type ReleasedDataSetAssociatedWith
- An association to object(s) of type SoftwareOS

- An association to object(s) of type SoftwarePlatform
- An association, optional, to object(s) of type DataSetAsDesigned
- An association, optional, to object(s) of type SoftwarePartAsDesigned

4.27.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (inherited from SoftwarePartAsReleased) (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (inherited from SoftwarePartAsReleased) (See S5000F UoF Failure Detection and Location, Para 4.38)
- InfrastructureItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Infrastructure, Para 4.43)
- ItemUnderExportControl (inherited from SoftwarePartAsReleased) (See S5000F UoF Export Control Requirement, Para 4.35)
- TrackablePart (inherited from SoftwarePartAsReleased) (See S5000F UoF Change Embodiment Planning, Para 4.18)
- WorkBreakdownContext (inherited from SoftwarePartAsReleased) (See S5000F UoF Work Breakdown, Para 4.97)

4.27.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductOperationalConfigurationItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Cost Breakdown, Para 4.25)
- EventItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (inherited from SoftwarePartAsReleased) (See S5000F UoF Infrastructure, Para 4.43)
- MessageContextItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Availability, Para 4.13)
- ObsolescenceItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from SoftwarePartAsReleased) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReleasedDataSetItem (inherited from SoftwarePartAsReleased)
- ReportContextItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Report, Para 4.73)
- ReportingParty (inherited from SoftwarePartAsReleased) (See S5000F UoF Report, Para 4.73)

- SupplyItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Supply Item, Para 4.89)
- WarrantyItem (inherited from SoftwarePartAsReleased) (See S5000F UoF Warranty, Para 4.96)

4.27.3.3 DataSetAssociatedWith

DataSetAssociatedWith is a <<relationship>> that allows to associate a DataSetAsDesigned to a PartAsDesigned

4.27.3.3.1 Attribute(s)

This class has the following attributes:

- dataAssociatedWithType

4.27.3.3.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Accelerometer
- An association, zero, one or many, to object(s) of type AllowedProductConfigurationHardwarePartAsDesigned
- An association, zero, one or many, to object(s) of type DataSetAsDesigned
- An association, zero, one or many, to object(s) of type HardwarePartAsDesigned
- An association, zero, one or many, to object(s) of type PartAsDesigned
- An association, zero, one or many, to object(s) of type PressureSensor
- An association, zero, one or many, to object(s) of type SensorType
- An association, zero, one or many, to object(s) of type SoftwarePartAsDesigned
- An association, zero, one or many, to object(s) of type StrainGauge
- An association, zero, one or many, to object(s) of type SupportEquipment
- An association, zero, one or many, to object(s) of type Tachometer
- An association, zero, one or many, to object(s) of type TemperatureSensor

4.27.3.4 ReleasedDataSetAssociatedWith

ReleasedDataSetAssociatedWith is a <<relationship>> that allows to associate DataSetAsReleased with an item.

4.27.3.4.1 Attribute(s)

This class has the following attributes:

- releasedDataSetAssociatedWithType

4.27.3.4.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of ReleasedDataSetItem

4.27.3.5 ReleasedDataSetItem

ReleasedDataSetItem is a <<select>> interface that allows to associate items to a DataSetAsReleased.

4.28 S5000F UoF Digital File

4.28.1 Description

The Digital File UoF provides the capability to both reference a digital file from the exchanged data as well as to exchange the digital file itself.

4.28.2 Graphical description

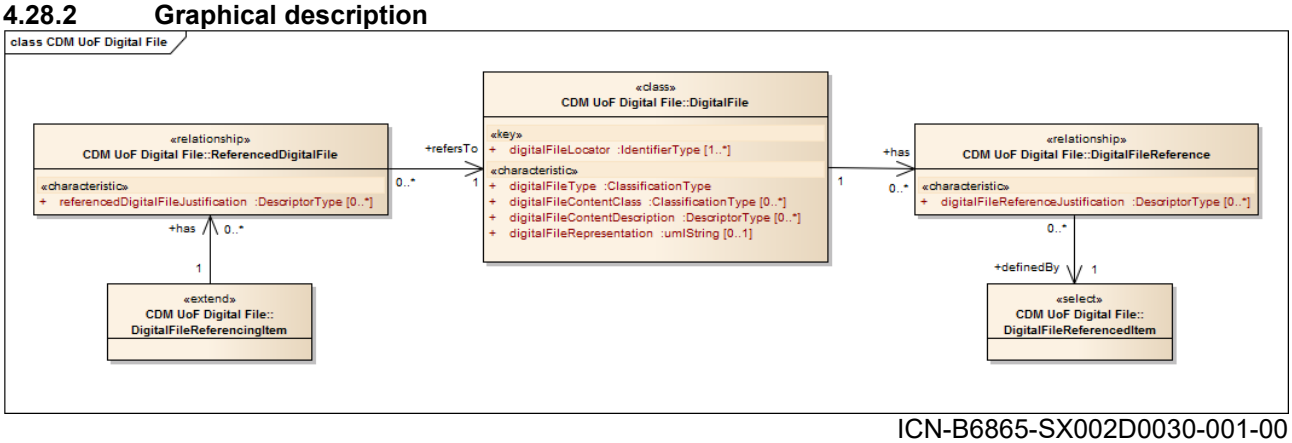

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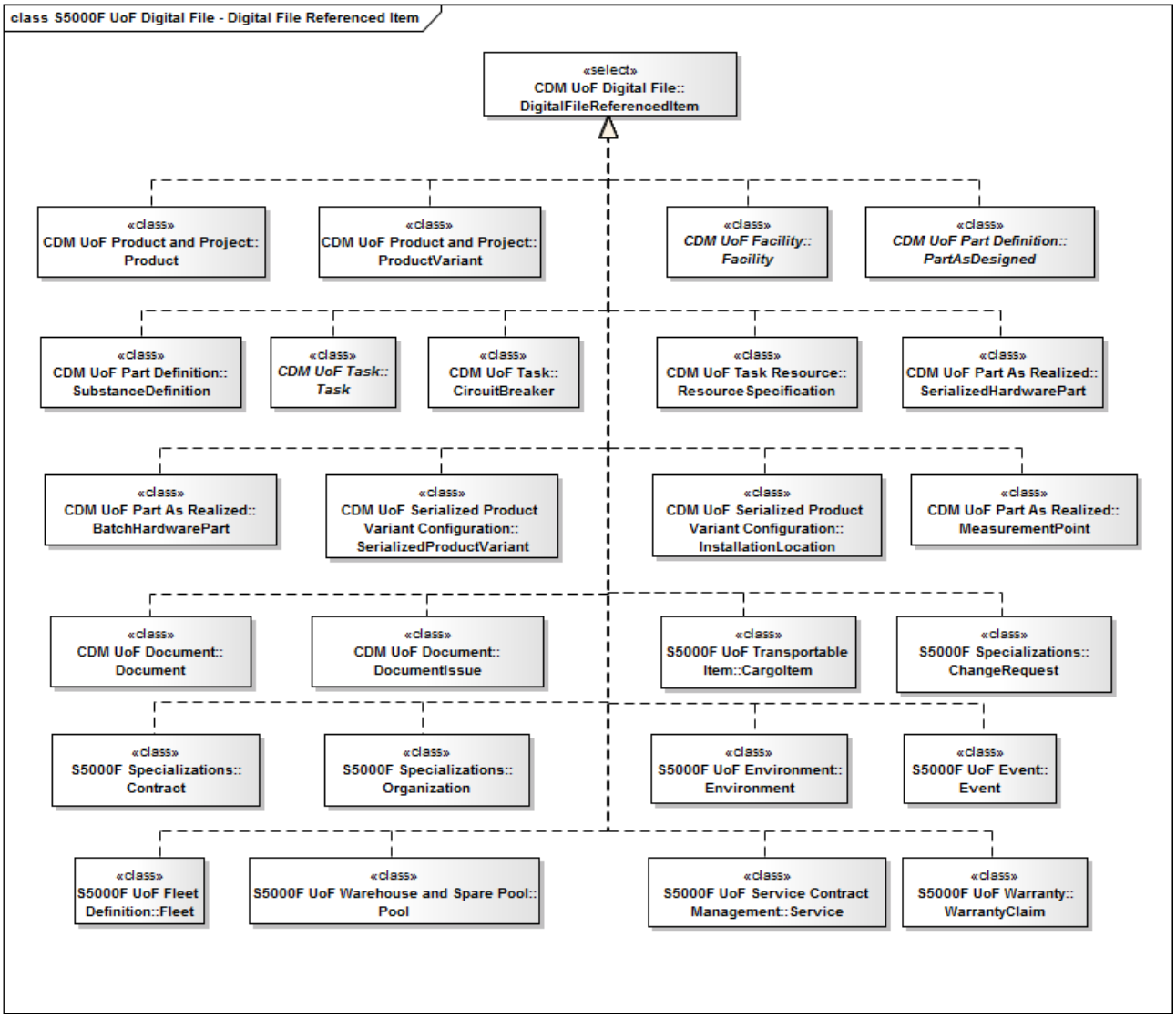
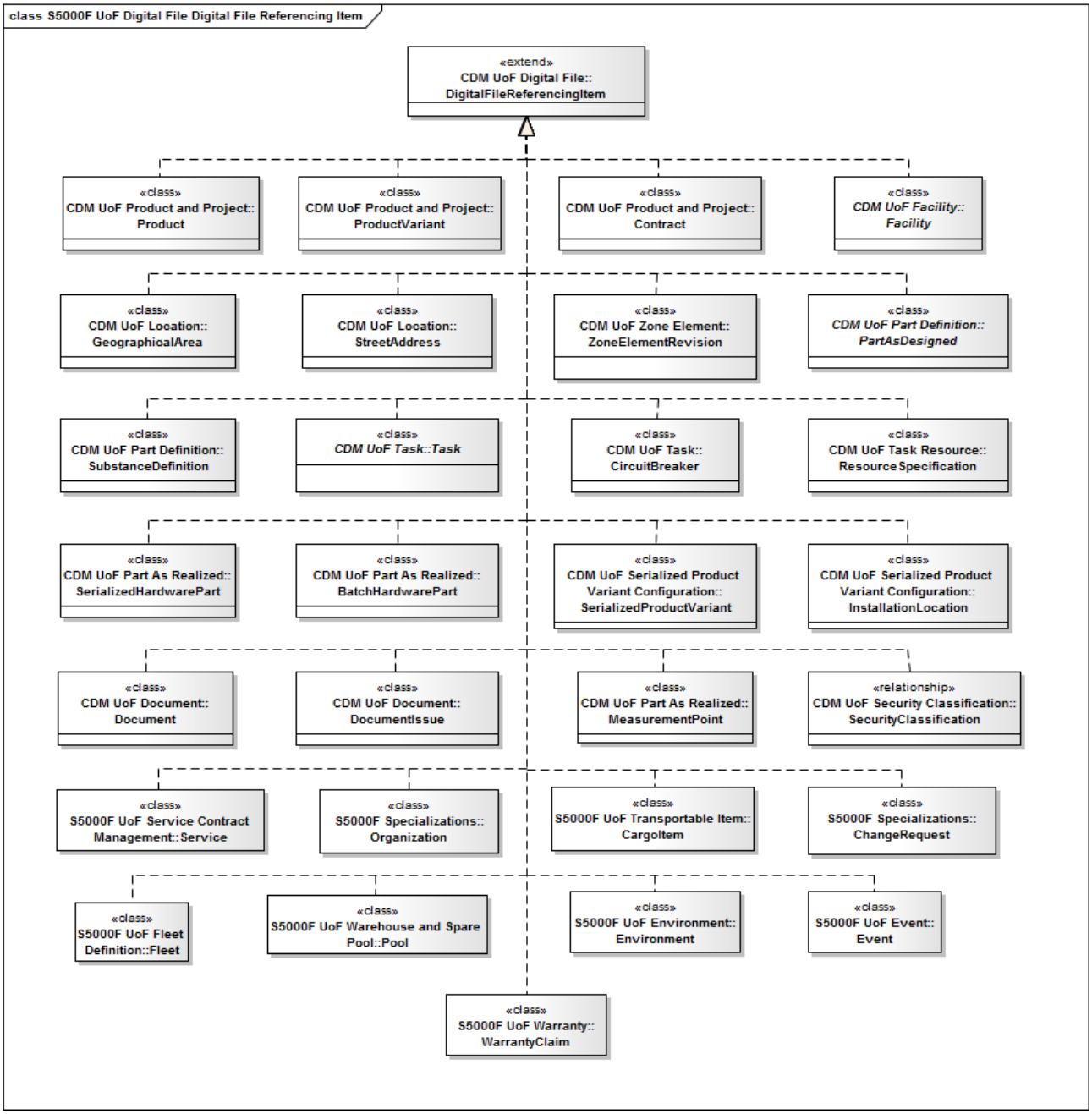
Fig 37 CDM UoF Digital File



ICN-B6865-5000F15082-001-01

Fig 38 S5000F UoF Digital File - Digital File Referenced Item



ICN-B6865-5000F15081-001-01

Fig 39 S5000F UoF Digital File Digital File Referencing Item

4.29 S5000F UoF Document

4.29.1 Description

The S5000F Document UoF extends the CDM Document UoF to define the types of documents and the relationships that such documents typically establish.

4.29.2 Graphical description

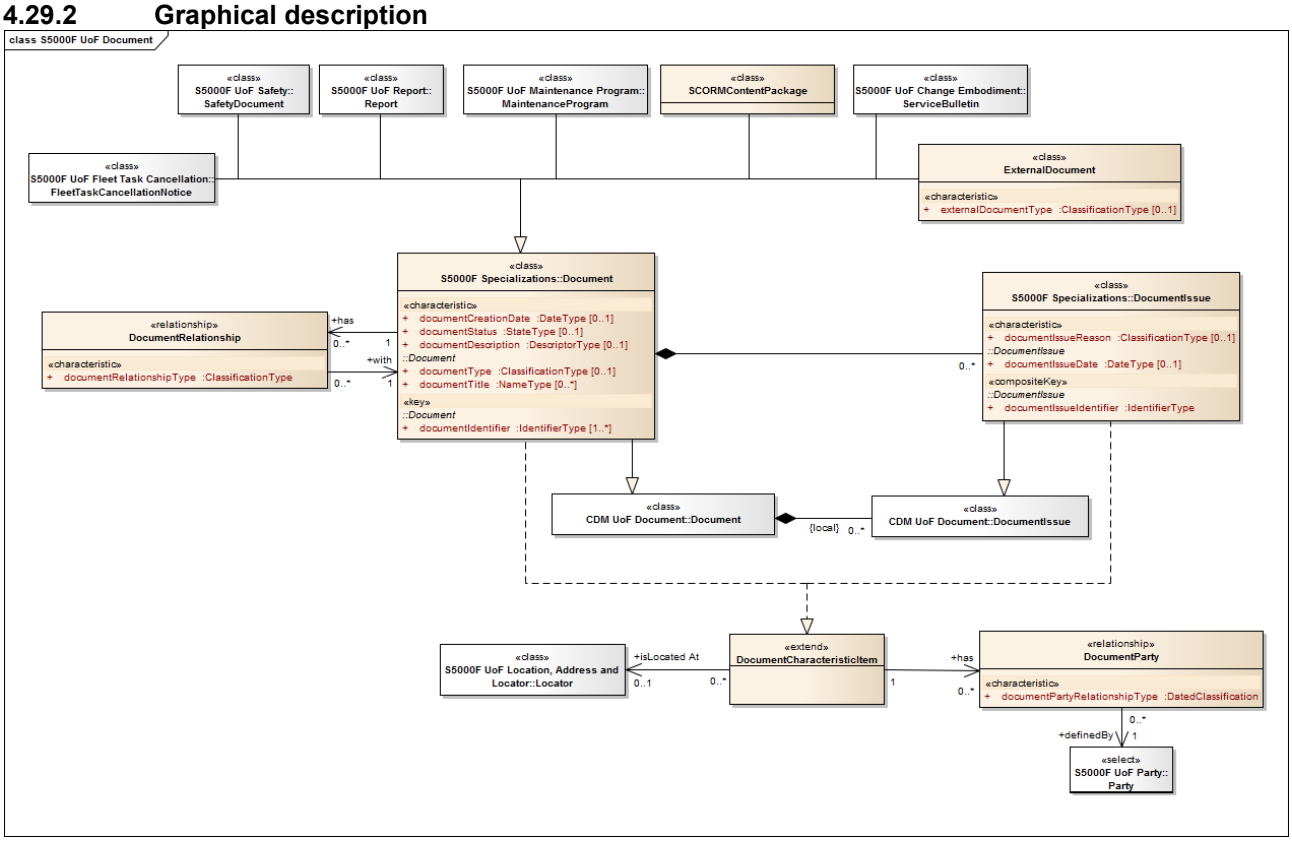


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Fig 40 S5000F UoF Document

4.29.3 Class definition

4.29.3.1 DocumentCharacteristicItem

DocumentCharacteristicItem is an <<extend>> interface that provides the capability to associate additional relationships to Documents and DocumentIssues..

4.29.3.1.1 Associations

This class has the following associations:

- An association to object(s) of type DocumentParty
- An association, zero, one or many, to object(s) of type Locator

4.29.3.2 DocumentParty

DocumentParty is a <<relationship>> class that defines the association of a document with a specific Party.

4.29.3.2.1 Example(s)

- approved by
- prepared by
- reported to

4.29.3.2.2 Attribute(s)

This class has the following attributes:

- documentPartyRelationshipType

4.29.3.2.3 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of Party

4.29.3.3 DocumentRelationship
DocumentRelationship is a <<relationship>> that identifies how two different documents are associated with each other.

4.29.3.3.1 Attribute(s)
This class has the following attributes:

– documentRelationshipType

4.29.3.3.2 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) of type Document
– An association, zero, one or many, to object(s) of type ExportControlRegulation
– An association, zero, one or many, to object(s) of type ExternalDocument
– An association, zero, one or many, to object(s) of type FleetTaskCancellationNotice
– An association, zero, one or many, to object(s) of type MaintenanceProgram
– An association, zero, one or many, to object(s) of type PoliciesAndRegulations
– An association, zero, one or many, to object(s) of type Report
– An association, zero, one or many, to object(s) of type SafetyDocument
– An association, zero, one or many, to object(s) of type SafetyIssue
– An association, zero, one or many, to object(s) of type SafetyRequirementsDocument
– An association, zero, one or many, to object(s) of type SafetyWarning
– An association, zero, one or many, to object(s) of type SCORMContentPackage
– An association, zero, one or many, to object(s) of type ServiceBulletin
– An association, zero, one or many, to object(s) of type SpecialSafetyInstruction

4.29.3.4 ExternalDocument
ExternalDocument is a specialization of class Document, and represents all documents that do not have a specialied class.

4.29.3.4.1 Attribute(s)
This class has the following attributes:

– documentIdentifier (inherited from Document), one or many
– documentCreationDate (inherited from Document), optional
– documentDescription (inherited from Document), optional
– documentStatus (inherited from Document), optional
– documentTitle (inherited from Document), zero, one or many
– documentType (inherited from Document), optional
– externalDocumentType, optional

4.29.3.4.2 Associations
This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
– An association to object(s) of type DocumentRelationship

4.29.3.4.3 Implementations
This class implements the following <<extend>> interfaces:

– ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
– DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)

- DocumentCharacteristicItem (inherited from Document)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.29.3.4.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)

4.29.3.5 SCORMContentPackage

SCORMContentPackage is a specialization of class Document and represents a SCORM content package.

4.29.3.5.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentCreationDate (inherited from Document), optional
- documentDescription (inherited from Document), optional
- documentStatus (inherited from Document), optional
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional

4.29.3.5.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type DocumentRelationship

4.29.3.5.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.29.3.5.4 Selects

This class is a member of the following <<select>> interfaces:

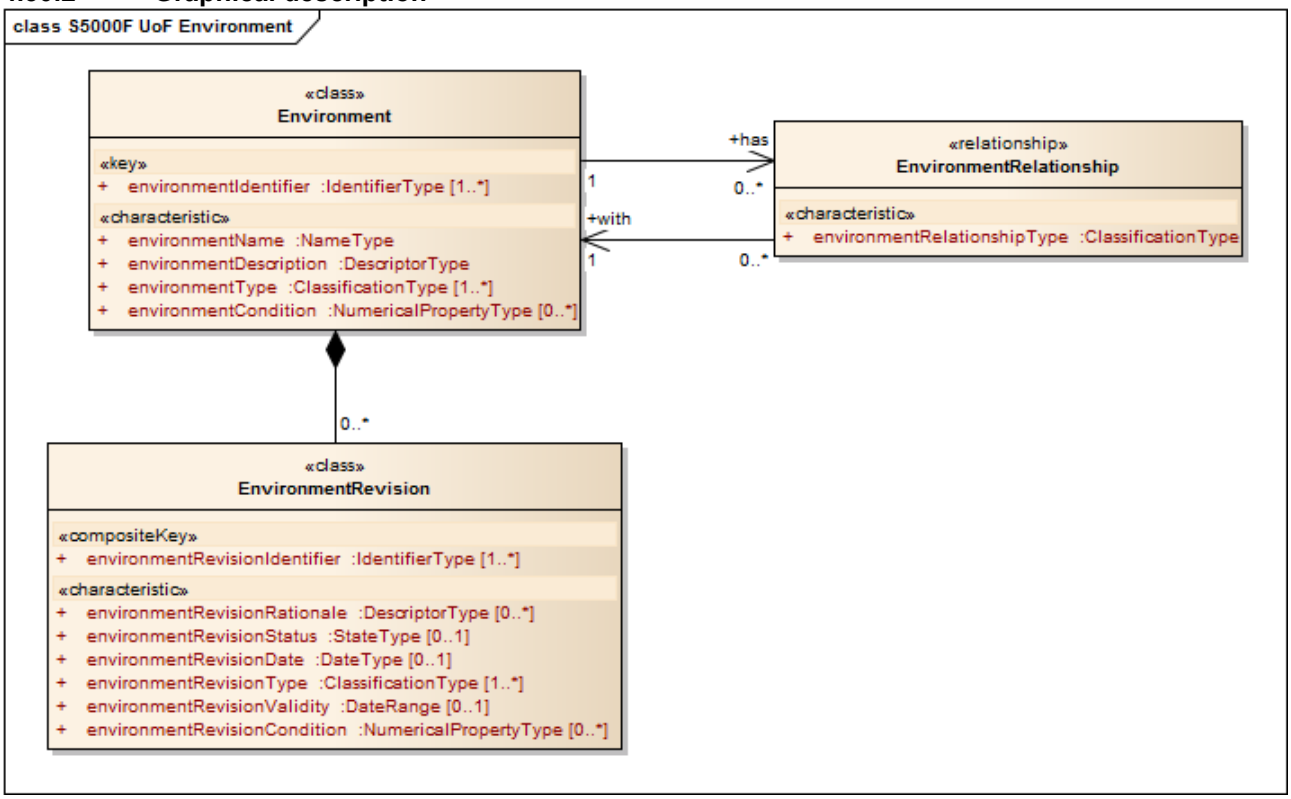
- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)

4.30 S5000F UoF Environment

4.30.1 Description

The Environment UoF allows to document the characteristics of an Environment and its relationship with other Environments.

4.30.2 Graphical description



ICN-B6865-5000F15083-001-01

Fig 41 S5000F UoF Environment

4.30.3 Class definition

4.30.3.1 Environment

Environment is a class that represents the environment in which the Product operation or maintenance takes place.

4.30.3.1.1 Attribute(s)

This class has the following attributes:

- environmentIdentifier, one or many
- environmentCondition, zero, one or many
- environmentDescription
- environmentName
- environmentType, one or many

4.30.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type Facility
- A composition association, zero, one or many, to child objects of type MaintenanceFacility
- A composition association, zero, one or many, to child objects of type OperatingBase

- A composition association, zero, one or many, to child objects of type OtherFacility
- A composition association, zero, one or many, to child objects of type ParkingFacility
- A composition association, zero, one or many, to child objects of type Warehouse
- An association to object(s) of type EnvironmentRelationship

4.30.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.30.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- ReportContextItem (See S5000F UoF Report, Para 4.73)

4.30.3.2 EnvironmentRelationship

EnvironmentRelationship is a <<relationship>> that allows associations between two different Environments to be defined.

4.30.3.2.1 Attribute(s)

This class has the following attributes:

- environmentRelationshipType

4.30.3.2.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Environment

4.30.3.3 EnvironmentRevision

EnvironmentRevision is a <<class>> representing an iteration applied to an Environment.

4.30.3.3.1 Attribute(s)

This class has the following attributes:

- environmentRevisionIdentifier, one or many
- environmentRevisionCondition, zero, one or many
- environmentRevisionDate, optional
- environmentRevisionRationale, zero, one or many
- environmentRevisionStatus, optional
- environmentRevisionType, one or many
- environmentRevisionValidity, optional

4.30.3.3.2 Associations

This class has the following associations:

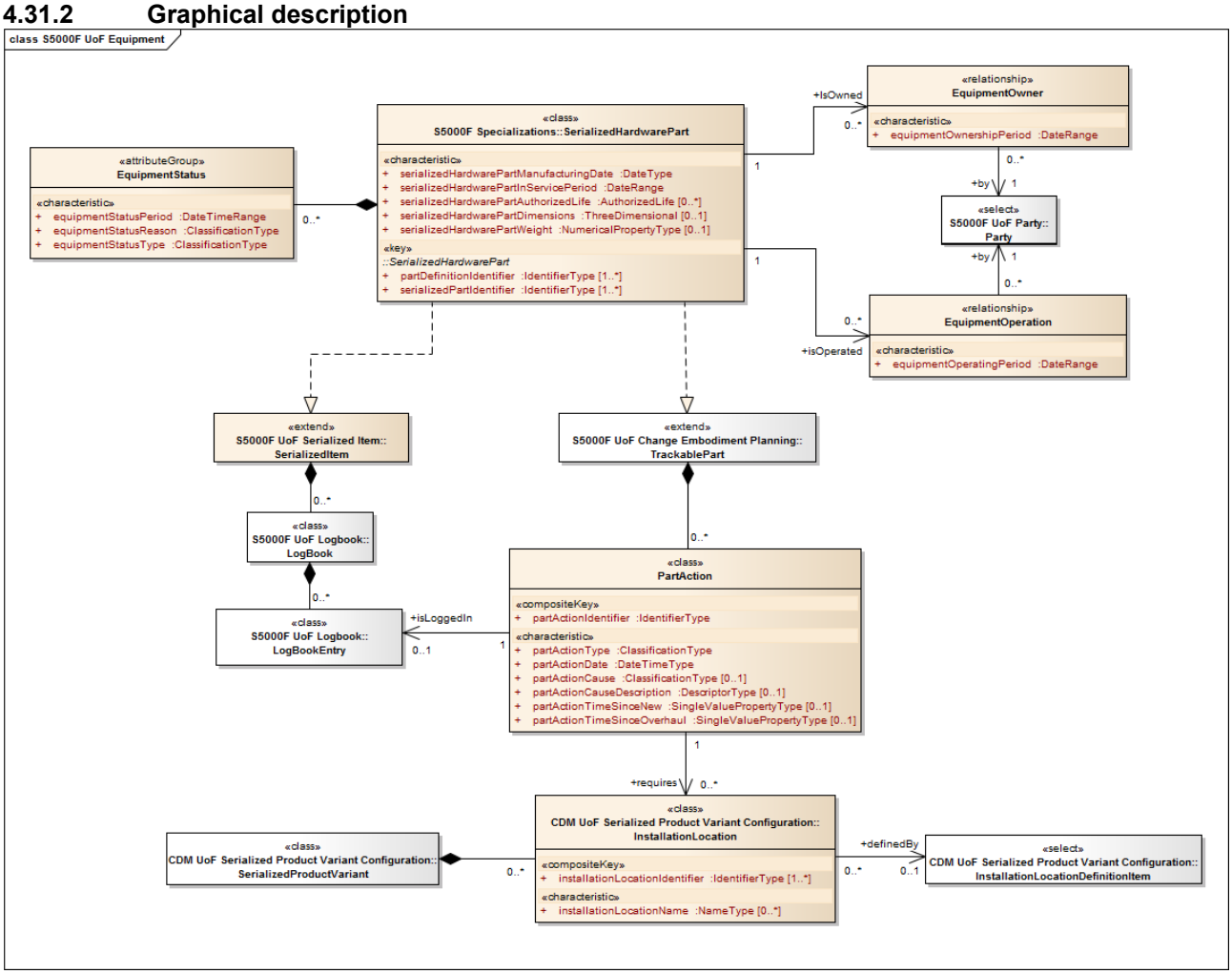
- An aggregate association, zero, one or many, to related object(s) of type Environment

4.31 S5000F UoF Equipment

4.31.1 Description

The Equipment UoF defines all the information associated to a HardwarePartAsSerialized (also known as Equipment).

4.31.2 Graphical description



ICN-B6865-5000F15013-002-01

Fig 42 S5000F UoF Equipment

4.31.3 Class definition

4.31.3.1 EquipmentOperation

EquipmentOperation is a <<relationship>> that defines which Party has operated a SerializedHardwarePart during a specific time period.

4.31.3.1.1 Attribute(s)

This class has the following attributes:

– equipmentOperatingPeriod

4.31.3.1.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of Party

4.31.3.2 EquipmentOwner

EquipmentOwner is a <<relationship>> defining who and to what extent is the equipment owner during a specific period of time.

4.31.3.2.1 Attribute(s)

This class has the following attributes:

– equipmentOwnershipPeriod

4.31.3.2.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of Party

4.31.3.3 EquipmentStatus

EquipmentStatus is an <<attributeGroup>> that represents the status of a SerializedHardwarePart during a specific period of time and the reason for such status.

4.31.3.3.1 Attribute(s)

This class has the following attributes:

– equipmentStatusPeriod
– equipmentStatusReason
– equipmentStatusType

4.31.3.3.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type SerializedHardwarePart
– An aggregate association, zero, one or many, to related object(s) of type SerializedSupportEquipment

4.31.3.4 PartAction

PartAction is an action performed on a part as a result of a MaintenanceActivity.

4.31.3.4.1 Example(s)

– cleanse
– erase (software or data)
– install
– load (software or data)
– remove

4.31.3.4.2 Attribute(s)

This class has the following attributes:

– partActionIdentifier
– partActionCause, optional
– partActionCauseDescription, optional
– partActionDate
– partActionTimeSinceNew, optional
– partActionTimeSinceOverhaul, optional
– partActionType

4.31.3.4.3 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type TrackablePart
– An association to object(s) of type InstallationLocation
– An association to object(s) of type LogBookEntry

4.31.3.4.4 Selects

This class is a member of the following <<select>> interfaces:

– RequiredSafetyActionImplementation (See S5000F UoF Safety, Para 4.78)

4.31.3.5 PartInstallationLocation

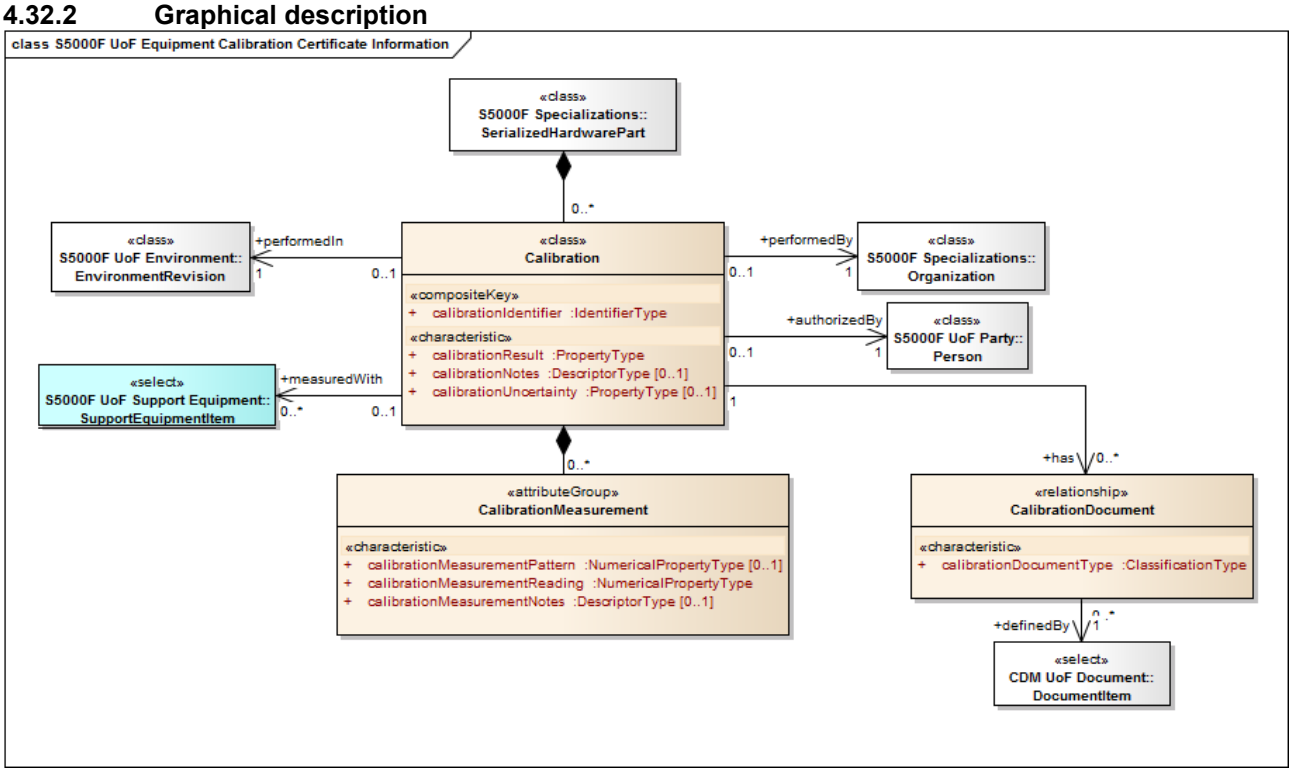
PartInstallationLocation is the <<relationship>> that indicates where a specific HardwarePart is installed for a specific SerializedProductVariant.

4.32 S5000F UoF Equipment Calibration Certificate Information

4.32.1 Description

The Equipment Calibration Certificate Information UoF provides the capability to submit the information associated to the calibration of a SerializedHardwarePart.

4.32.2 Graphical description



ICN-B6865-5000F15084-001-01

Fig 43 S5000F UoF Equipment Calibration Certificate Information

4.32.3 Class definition

4.32.3.1 Calibration

Calibration is an <<attributeGroup> that provides historical data about calibration.

4.32.3.1.1 Attribute(s)

This class has the following attributes:

- calibrationIdentifier
- calibrationNotes, optional
- calibrationResult
- calibrationUncertainty, optional

4.32.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type SerializedHardwarePart
- An aggregate association, zero, one or many, to related object(s) of type SerializedSupportEquipment
- An association to object(s) of type CalibrationDocument

- An association, optional, to object(s) of type EnvironmentRevision
- An association, optional, to object(s) of type MaintenanceOrganization
- An association, optional, to object(s) of type MaintenancePerson
- An association, optional, to object(s) of type OperatorOrganization
- An association, optional, to object(s) of type OperatorPerson
- An association, optional, to object(s) of type Organization
- An association, optional, to object(s) of type Person
- An association, optional, to object(s) from classes that are members of SupportEquipmentItem

4.32.3.2 CalibrationDocument

CalibrationDocument is a <<relationship>> that associates a Calibration to a Document.

4.32.3.2.1 Attribute(s)

This class has the following attributes:

- calibrationDocumentType

4.32.3.2.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of DocumentItem

4.32.3.3 CalibrationMeasurement

CalibrationMeasurement is a <<attributeGroup>> that provides the individual measurements performed to carry out an individual Calibration.

4.32.3.3.1 Attribute(s)

This class has the following attributes:

- calibrationMeasurementNotes, optional
- calibrationMeasurementPattern, optional
- calibrationMeasurementReading

4.32.3.3.2 Associations

This class has the following associations:

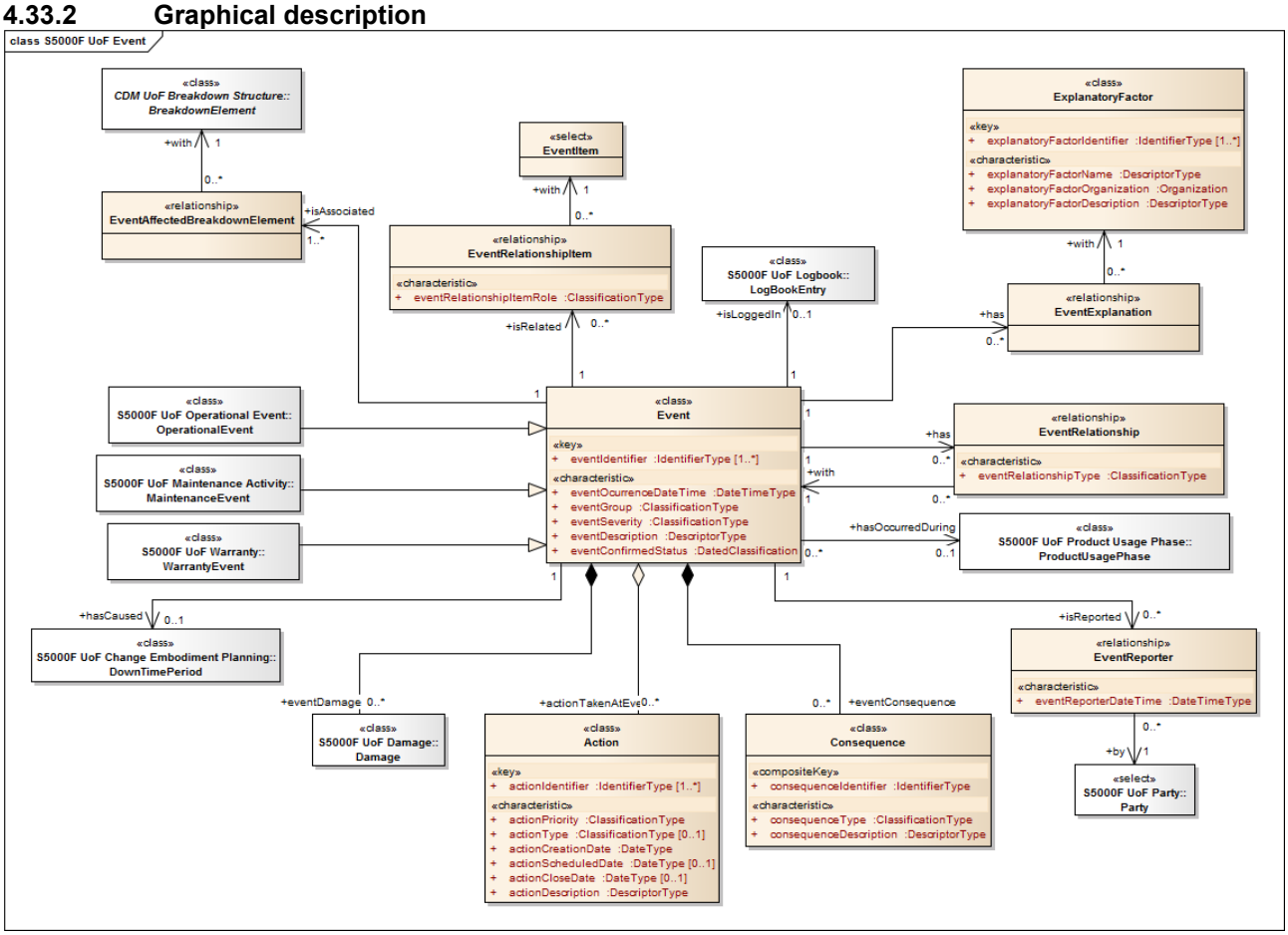
- An aggregate association, zero, one or many, to related object(s) of type Calibration

4.33 S5000F UoF Event

4.33.1 Description

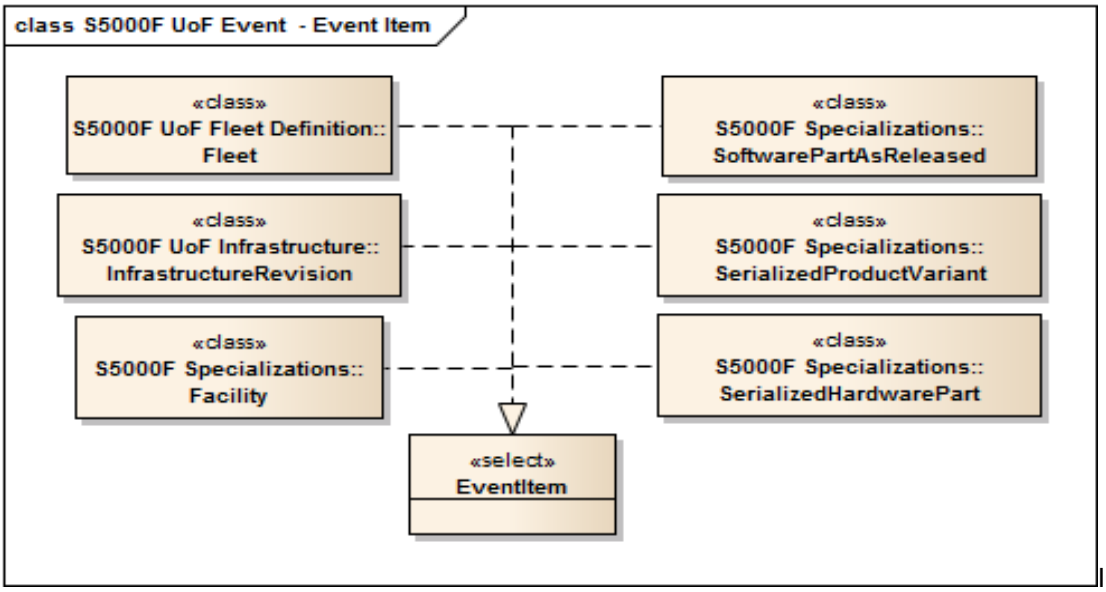
The Event UoF defines all the types of Events and the relationships with each other.

4.33.2 Graphical description



ICN-B6865-5000F15014-002-01

Fig 44 S5000F UoF Event



ICN-B6865-5000F15113-001-01

Fig 45 S5000F UoF Event - Event Item

4.33.3 Class definition

4.33.3.1 Action

Action is a fact or process of doing something, typically to achieve an aim.

4.33.3.1.1 Attribute(s)

This class has the following attributes:

- actionIdentifier, one or many
- actionCloseDate, optional
- actionCreationDate
- actionDescription
- actionPriority
- actionScheduledDate, optional
- actionType, optional

4.33.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type Damage
- A composition association, zero, one or many, to child objects of type WarrantyClaim
- A composition association, actionTakenAtEvent, zero, one or many, to child objects of type Event
- A composition association, actionTakenAtEvent, zero, one or many, to child objects of type MaintenanceEvent
- A composition association, actionTakenAtEvent, zero, one or many, to child objects of type OperationalEvent
- A composition association, actionTakenAtEvent, zero, one or many, to child objects of type WarrantyEvent

4.33.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestReasonItem (See S5000F UoF Change Request, Para 4.22)
- RequiredSafetyActionImplementation (See S5000F UoF Safety, Para 4.78)

4.33.3.2 Consequence

Consequence is a class providing information about the consequences of an Event.

4.33.3.2.1 Attribute(s)

This class has the following attributes:

- consequenceIdentifier
- consequenceDescription
- consequenceType

4.33.3.2.2 Associations

This class has the following associations:

- An aggregate association, eventConsequence, zero, one or many, to related object(s) of type Event
- An aggregate association, eventConsequence, zero, one or many, to related object(s) of type MaintenanceEvent
- An aggregate association, eventConsequence, zero, one or many, to related object(s) of type OperationalEvent
- An aggregate association, eventConsequence, zero, one or many, to related object(s) of type WarrantyEvent

4.33.3.3 Event

Event is an important happening or occurrence at a specific point in time that requires to be documented or recorded.

4.33.3.3.1 Attribute(s)

This class has the following attributes:

- eventIdentifier, one or many
- eventConfirmedStatus
- eventDescription
- eventGroup
- eventOcurrenceDateTime
- eventSeverity

4.33.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type DownTimePeriod
- An association to object(s) of type EventAffectedBreakdownElement
- An association to object(s) of type EventExplanation. An Event can be associated to zero, one or many ExplanatoryFactors
- An association to object(s) of type EventRelationship
- An association to object(s) of type EventRelationshipItem
- An association to object(s) of type EventReporter
- An association to object(s) of type LogBookEntry. An Event instance can be optionally logged in a LogBookEntry instance
- An association, zero, one or many, to object(s) of type ProductUsagePhase

4.33.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
- MaintenanceWorkOrderSource (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.33.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestReasonItem (See S5000F UoF Change Request, Para 4.22)
- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- ReportContextItem (See S5000F UoF Report, Para 4.73)

4.33.3.4 EventAffectedBreakdownElement

EventAffectedBreakdownElement is a <<relationship>> that allows to associate an Event to the BreakdownElements affected by it.

4.33.3.4.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type AggregatedElement
- An association, zero, one or many, to object(s) of type BreakdownElement
- An association, zero, one or many, to object(s) of type HardwareElement
- An association, zero, one or many, to object(s) of type SoftwareElement
- An association, zero, one or many, to object(s) of type ZoneElement

4.33.3.5 EventExplanation
EventExplanation is a <<relationship>> that allows to associate an Event to the ExplanatoryFactors that explain it.

4.33.3.5.1 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) of type ExplanatoryFactor

4.33.3.6 EventItem
EventItem is a <<select>> interface that allows to associate Events to items

4.33.3.7 EventRelationship
EventRelationship is a <<relationship>> describing the association between two different events.

4.33.3.7.1 Attribute(s)
This class has the following attributes:

- eventRelationshipType

4.33.3.7.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) of type Event
- An association, zero, one or many, to object(s) of type MaintenanceEvent
- An association, zero, one or many, to object(s) of type OperationalEvent
- An association, zero, one or many, to object(s) of type WarrantyEvent

4.33.3.8 EventRelationshipItem
EventRelationshipItem is a <<relationship>> that allows to associate an Event to an item.

4.33.3.8.1 Attribute(s)
This class has the following attributes:

- eventRelationshipItemRole

4.33.3.8.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of EventItem

4.33.3.9 EventReporter
EventReporter is a <<relationship>> that permits to associate an event to the Party that has reported that Event.

4.33.3.9.1 Attribute(s)
This class has the following attributes:

- eventReporterDateTime

4.33.3.9.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of Party

4.33.3.10 ExplanatoryFactor
ExplanatoryFactor is a class that provides information about the factor that caused an Event.

4.33.3.10.1 Example(s)

- explosion
- human error
- strong lateral wind

4.33.3.10.2 Attribute(s)

This class has the following attributes:

- explanatoryFactorIdentifier, one or many
- explanatoryFactorDescription
- explanatoryFactorName
- explanatoryFactorOrganization

4.33.3.10.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.34 S5000F UoF Export Control License

4.34.1 Description

The Export Control UoF provides the capability to assign export control classifications to objects that need special handling for protection against unauthorized access or distribution in accordance with export control laws.

4.34.2 Graphical description

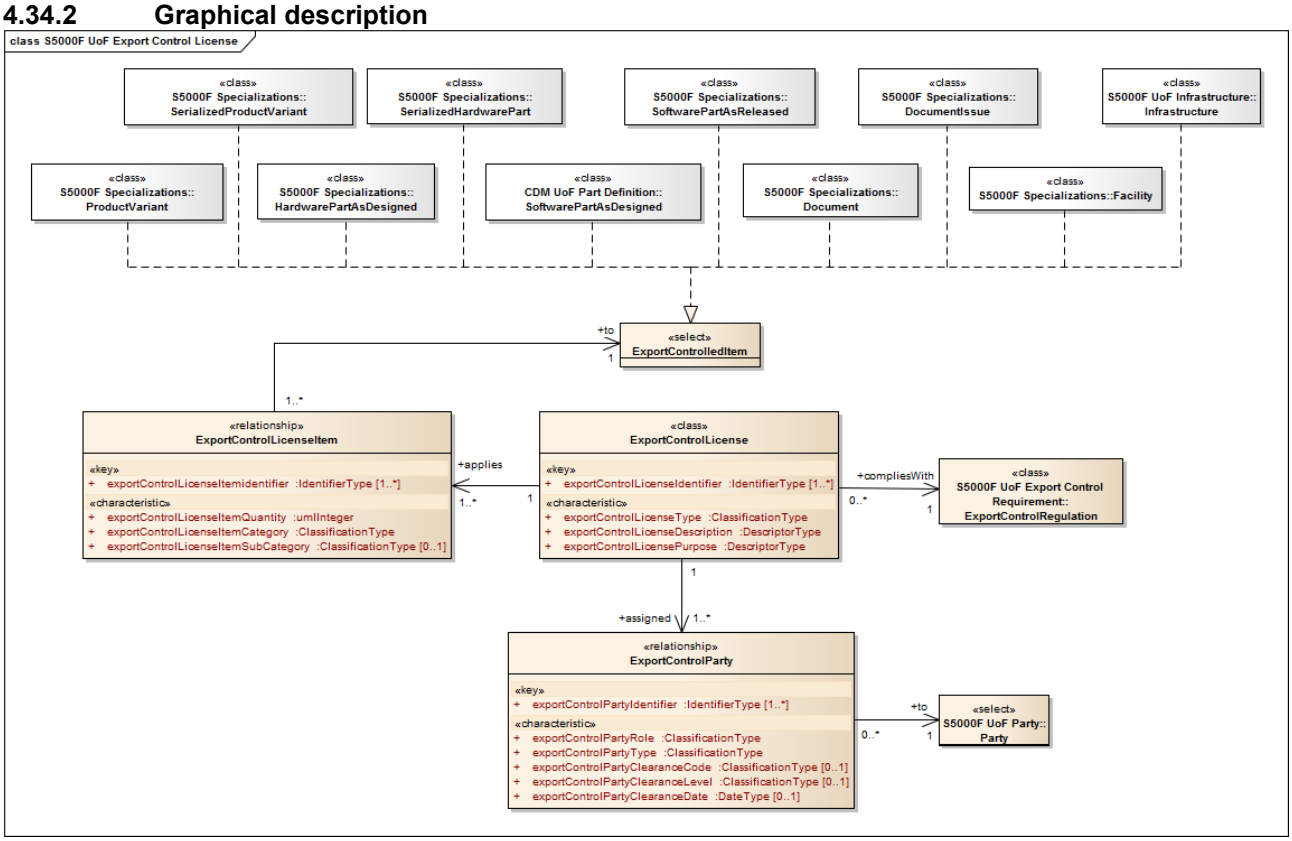


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Fig 46 S5000F UoF Export Control License

4.34.3 Class definition

4.34.3.1 ExportControlledItem

ExportControlledItem is a <<select>> interface that defines the items that can be subject to export control.

4.34.3.2 ExportControlLicense

ExportControlLicense is a <<class>> representing an authorization to one or more parties to export item(s) under the terms of an ExportControlRegulation.

4.34.3.2.1 Attribute(s)

This class has the following attributes:

- exportControlLicenseIdentifier, one or many
- exportControlLicenseDescription
- exportControlLicensePurpose
- exportControlLicenseType

4.34.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type ExportControlLicenseItem
- An association to object(s) of type ExportControlParty
- An association, zero, one or many, to object(s) of type ExportControlRegulation

4.34.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.34.3.3 ExportControlLicenseItem

ExportControlLicenseItem is a <<relationship>> that associates an ExportControlLicense to the export-controlled items to which this license applies.

4.34.3.3.1 Attribute(s)

This class has the following attributes:

- exportControlLicenseItemidentifier, one or many
- exportControlLicenseItemCategory
- exportControlLicenseItemQuantity
- exportControlLicenseItemSubCategory, optional

4.34.3.3.2 Associations

This class has the following associations:

- An association, one or many, to object(s) from classes that are members of ExportControlledItem

4.34.3.4 ExportControlParty

ExportControlParty is a <<relationship>> that associates an ExportControlLicense to the parties to which it applies or that control it.

4.34.3.4.1 Attribute(s)

This class has the following attributes:

- exportControlPartyIdentifier, one or many
- exportControlPartyClearanceCode, optional
- exportControlPartyClearanceDate, optional

– exportControlPartyClearanceLevel, optional
– exportControlPartyRole
– exportControlPartyType

4.34.3.4.2 Associations

This class has the following associations:

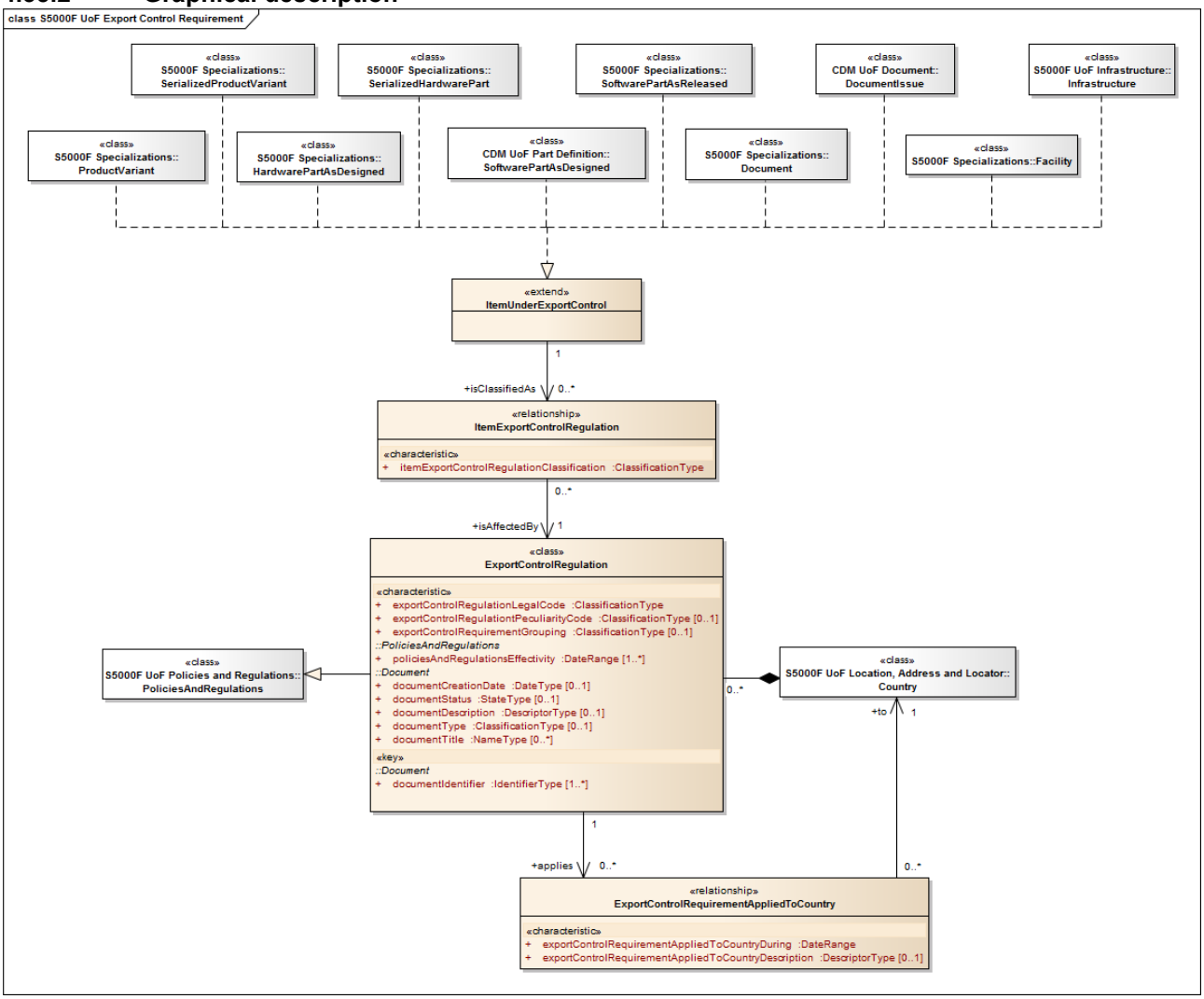
– An association, zero, one or many, to object(s) from classes that are members of Party

4.35 S5000F UoF Export Control Requirement

4.35.1 Description

The Export Control UoF provides the capability to assign export control classifications to objects that need special handling for protection against unauthorized access or distribution in accordance with export control laws.

4.35.2 Graphical description



ICN-B6865-5000F15086-001-01

Fig 47 S5000F UoF Export Control Requirement

4.35.3 Class definition

4.35.3.1 ExportControlRegulation

ExportControlRegulation is a legal document that defines export control restrictions to one or several items or item categories.

4.35.3.1.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentCreationDate (inherited from Document), optional
- documentDescription (inherited from Document), optional
- documentStatus (inherited from Document), optional
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- policiesAndRegulationsEffectivity (inherited from PoliciesAndRegulations), one or many
- exportControlRegulationLegalCode
- exportControlRegulationtPeculiarityCode, optional
- exportControlRequirementGrouping, optional

4.35.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type Country
- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type DocumentRelationship
- An association to object(s) of type ExportControlRequirementAppliedToCountry

4.35.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from Document)
- PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.35.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)

4.35.3.2 ExportControlRequirementAppliedToCountry

exportControlRequirementAppliedToCountry is a <<relationship>> that defines to which countries an ExportControlRegulation is applied.

4.35.3.2.1 Attribute(s)

This class has the following attributes:

- exportControlRequirementAppliedToCountryDescription, optional
- exportControlRequirementAppliedToCountryDuring

4.35.3.2.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Country

4.35.3.3 ItemExportControlRegulation

ItemExportControlRegulation is a <<relationship>> that allows to associate an ItemUnderExportControl with the ExportControlRegulation that governs its export,

4.35.3.3.1 Attribute(s)

This class has the following attributes:

- itemExportControlRegulationClassification

4.35.3.3.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type ExportControlRegulation

4.35.3.4 ItemUnderExportControl

ItemUnderExportControl is an <<extend>> interface that allows to define items under export control rules.

4.35.3.4.1 Associations

This class has the following associations:

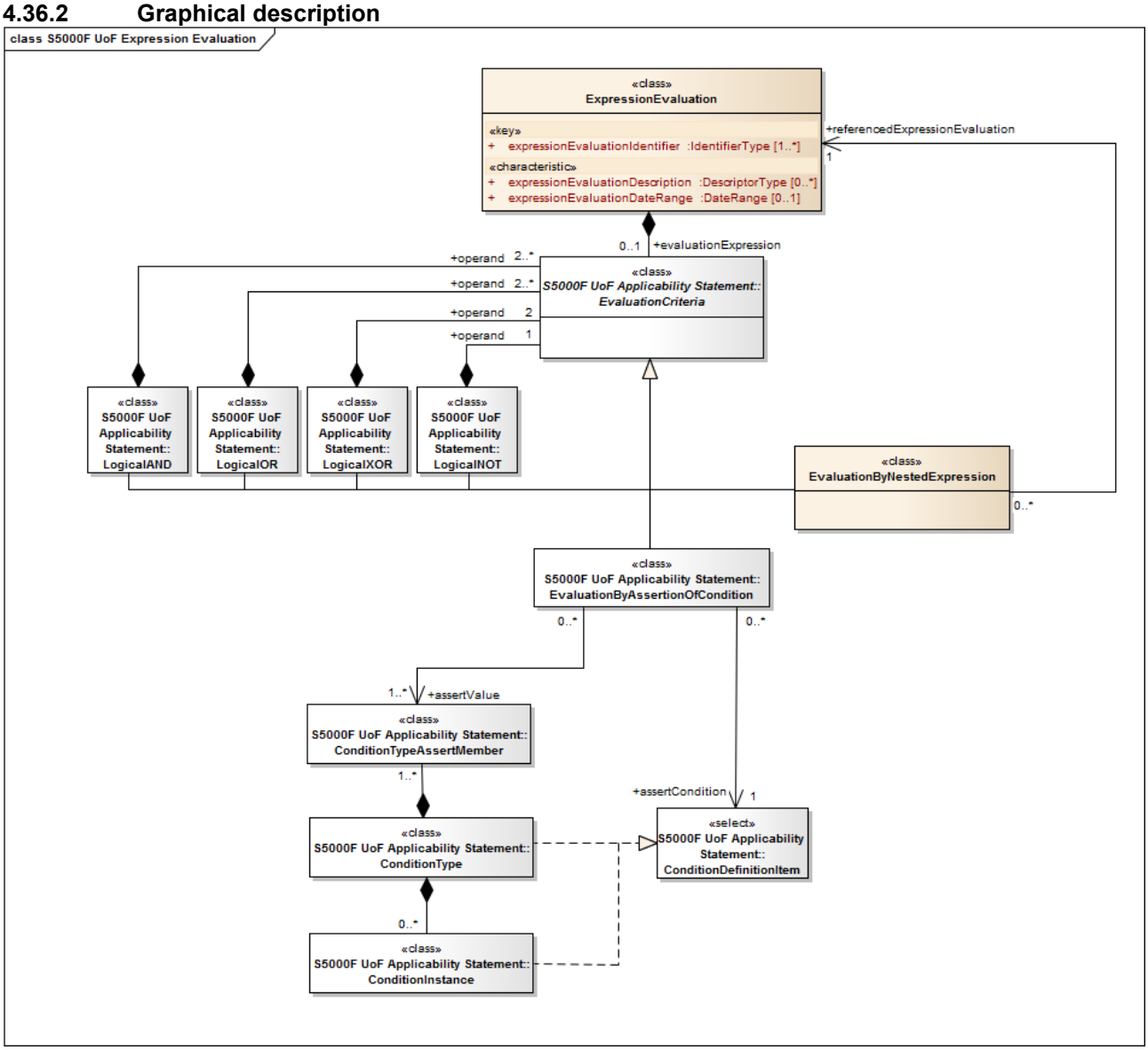
- An association to object(s) of type ItemExportControlRegulation

4.36 S5000F UoF Expression Evaluation

4.36.1 Description

Expression Evaluation UoF provides the capability to define complex expressions or conditions.

4.36.2 Graphical description



ICN-B6865-5000F15055-001-01

Fig 48 S5000F UoF Expression Evaluation

4.36.3 Class definition

4.36.3.1 EvaluationByNestedExpression

EvaluationByNestedExpression is an EvaluationCriteria that defines a Boolean expression between additional EvaluationCriteria that can be evaluated to either TRUE or FALSE.

4.36.3.1.1 Associations

This class has the following associations:

- An aggregate association, applicabilityExpression, optional, to related object(s) of type ApplicabilityStatement
- An aggregate association, evaluationExpression, optional, to related object(s) of type ExpressionEvaluation
- An aggregate association, operand, to related object(s) of type LogicalNOT
- An aggregate association, operand, two, to related object(s) of type LogicalXOR
- An aggregate association, operand, two or many, to related object(s) of type LogicalAND

– An aggregate association, operand, two or many, to related object(s) of type LogicalOR
– An association, zero, one or many, to object(s) of type ExpressionEvaluation

4.36.3.2 ExpressionEvaluation

ExpressiontEvaluation is a Boolean expression that can be evaluated to be either TRUE or FALSE.

4.36.3.2.1 Attribute(s)

This class has the following attributes:

– expressionEvaluationIdentifier, one or many
– expressionEvaluationDateRange, optional
– expressionEvaluationDescription, zero, one or many

4.36.3.2.2 Associations

This class has the following associations:

– A composition association, serviceLevelAgreementExpression, optional, to child objects of type ServiceLevelAgreementClause

4.37 S5000F UoF Facility

4.37.1 Description

The Facility UoF defines the basic information related to a Facility.

4.37.2 Graphical description

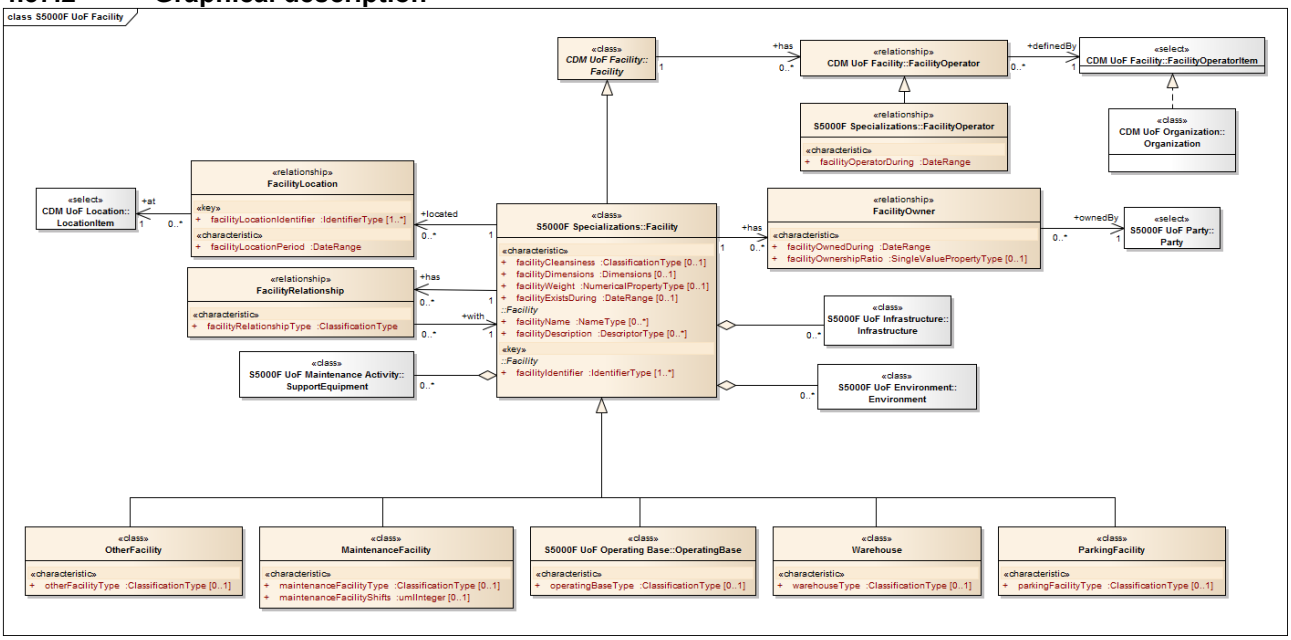


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Fig 49 S5000F UoF Facility

4.37.3 Class definition

4.37.3.1 FacilityLocation

FacilityLocation is a <<relationship>> that defines at which Location a Facility is located.

4.37.3.1.1 Attribute(s)

This class has the following attributes:

– facilityLocationIdentifier, one or many
– facilityLocationPeriod

4.37.3.1.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of LocationItem

4.37.3.2 FacilityOwner
FacilityOwner is a <<relationship>> that defines the total or partial ownership of a facility by a specific party during a specific period of time.

4.37.3.2.1 Attribute(s)
This class has the following attributes:

- facilityOwnedDuring
- facilityOwnershipRatio, optional

4.37.3.2.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of Party

4.37.3.3 FacilityRelationship
FacilityRelationship is a <<relationship>> that defines how two Facilities are related with each other.

4.37.3.3.1 Attribute(s)
This class has the following attributes:

- facilityRelationshipType

4.37.3.3.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) of type Facility
- An association, zero, one or many, to object(s) of type MaintenanceFacility
- An association, zero, one or many, to object(s) of type OperatingBase
- An association, zero, one or many, to object(s) of type OtherFacility
- An association, zero, one or many, to object(s) of type ParkingFacility
- An association, zero, one or many, to object(s) of type Warehouse

4.37.3.4 MaintenanceFacility
MaintenanceFacility is a Facility that is mainly established for providing product support.

4.37.3.4.1 Attribute(s)
This class has the following attributes:

- facilityIdentifier (inherited from Facility), one or many
- facilityCleansiness (inherited from Facility), optional
- facilityDescription (inherited from Facility), zero, one or many
- facilityDimensions (inherited from Facility), optional
- facilityExistsDuring (inherited from Facility), optional
- facilityName (inherited from Facility), zero, one or many
- facilityWeight (inherited from Facility), optional
- maintenanceFacilityShifts, optional
- maintenanceFacilityType, optional

4.37.3.4.2 Associations
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, has, zero, one or many, to child objects of type MaintenanceOrganization
- An association to object(s) of type FacilityLocation
- An association to object(s) of type FacilityOwner
- An association to object(s) of type FacilityRelationship. Each Facility can be related to from zero, one or many other Facilities (via the FacilityRelationship <<relationship>> class)
- An association to object(s) of type MaintenanceFacilityLevel
- An association, zero, one or many, to object(s) from classes that are members of LocationItem

4.37.3.4.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (inherited from Facility) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Facility) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureCompliantItem (inherited from Facility) (See S5000F UoF Facility, Para 4.37)
- InfrastructureItem (inherited from Facility) (See S5000F UoF Infrastructure, Para 4.43)
- ItemUnderExportControl (inherited from Facility) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from Facility) (See S5000F UoF Maintenance Program, Para 4.52)
- PoliciesAndRegulationsCompliantItem (inherited from Facility) (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityClassificationItem (inherited from Facility) (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures (inherited from Facility) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from Facility) (See S5000F UoF Work Breakdown, Para 4.97)

4.37.3.4.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Facility) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from Facility) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Facility) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)
- EventItem (inherited from Facility) (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (inherited from Facility) (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (inherited from Facility) (See S5000F UoF Infrastructure, Para 4.43)
- MaintenanceItem (inherited from Facility) (See S5000F UoF Maintenance Activity, Para 4.48)
- MessageContextItem (inherited from Facility) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)

- ReferencedPositionItem (inherited from Facility) (See S5000F UoF Local Position, Para 4.45)
- ReportContextItem (inherited from Facility) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Facility) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Facility) (See S5000F UoF Safety, Para 4.78)
- ServiceItem (inherited from Facility) (See S5000F UoF Service Request, Para 4.86)
- SubjectOfPoliciesAndRegulations (inherited from Facility) (See S5000F UoF Policies and Regulations, Para 4.68)
- TransportableItem (inherited from Facility) (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (inherited from Facility) (See S5000F UoF Warranty, Para 4.96)

4.37.3.5 OtherFacility

OtherFacility is a Facility that has no specific classification.

4.37.3.5.1 Attribute(s)

This class has the following attributes:

- facilityIdentifier (inherited from Facility), one or many
- facilityCleansiness (inherited from Facility), optional
- facilityDescription (inherited from Facility), zero, one or many
- facilityDimensions (inherited from Facility), optional
- facilityExistsDuring (inherited from Facility), optional
- facilityName (inherited from Facility), zero, one or many
- facilityWeight (inherited from Facility), optional
- otherFacilityType, optional

4.37.3.5.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type FacilityLocation
- An association to object(s) of type FacilityOwner
- An association to object(s) of type FacilityRelationship. Each Facility can be related to from zero, one or many other Facilities (via the FacilityRelationship <<relationship>> class)
- An association, zero, one or many, to object(s) from classes that are members of LocationItem

4.37.3.5.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (inherited from Facility) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Facility) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureCompliantItem (inherited from Facility) (See S5000F UoF Facility, Para 4.37)
- InfrastructureItem (inherited from Facility) (See S5000F UoF Infrastructure, Para 4.43)
- ItemUnderExportControl (inherited from Facility) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from Facility) (See S5000F UoF Maintenance Program, Para 4.52)

- PoliciesAndRegulationsCompliantItem (inherited from Facility) (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityClassificationItem (inherited from Facility) (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures (inherited from Facility) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from Facility) (See S5000F UoF Work Breakdown, Para 4.97)

4.37.3.5.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Facility) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from Facility) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Facility) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)
- EventItem (inherited from Facility) (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (inherited from Facility) (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (inherited from Facility) (See S5000F UoF Infrastructure, Para 4.43)
- MaintenanceItem (inherited from Facility) (See S5000F UoF Maintenance Activity, Para 4.48)
- MessageContextItem (inherited from Facility) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)
- ReferencedPositionItem (inherited from Facility) (See S5000F UoF Local Position, Para 4.45)
- ReportContextItem (inherited from Facility) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Facility) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Facility) (See S5000F UoF Safety, Para 4.78)
- ServiceItem (inherited from Facility) (See S5000F UoF Service Request, Para 4.86)
- SubjectOfPoliciesAndRegulations (inherited from Facility) (See S5000F UoF Policies and Regulations, Para 4.68)
- TransportableItem (inherited from Facility) (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (inherited from Facility) (See S5000F UoF Warranty, Para 4.96)

4.37.3.6 ParkingFacility

ParkingFacility is a Facility used to park SerializedProductVariants that are mobile and can move beweeen different Locations.

4.37.3.6.1 Attribute(s)

This class has the following attributes:

- facilityIdentifier (inherited from Facility), one or many
- facilityCleansiness (inherited from Facility), optional
- facilityDescription (inherited from Facility), zero, one or many
- facilityDimensions (inherited from Facility), optional
- facilityExistsDuring (inherited from Facility), optional
- facilityName (inherited from Facility), zero, one or many
- facilityWeight (inherited from Facility), optional
- parkingFacilityType, optional

4.37.3.6.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type FacilityLocation
- An association to object(s) of type FacilityOwner
- An association to object(s) of type FacilityRelationship. Each Facility can be related to from zero, one or many other Facilities (via the FacilityRelationship <<relationship>> class)
- An association, zero, one or many, to object(s) from classes that are members of LocationItem

4.37.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (inherited from Facility) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Facility) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureCompliantItem (inherited from Facility) (See S5000F UoF Facility, Para 4.37)
- InfrastructureItem (inherited from Facility) (See S5000F UoF Infrastructure, Para 4.43)
- ItemUnderExportControl (inherited from Facility) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from Facility) (See S5000F UoF Maintenance Program, Para 4.52)
- PoliciesAndRegulationsCompliantItem (inherited from Facility) (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityClassificationItem (inherited from Facility) (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures (inherited from Facility) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from Facility) (See S5000F UoF Work Breakdown, Para 4.97)

4.37.3.6.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Facility) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from Facility) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Facility) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)
- EventItem (inherited from Facility) (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (inherited from Facility) (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (inherited from Facility) (See S5000F UoF Infrastructure, Para 4.43)
- MaintenanceItem (inherited from Facility) (See S5000F UoF Maintenance Activity, Para 4.48)
- MessageContextItem (inherited from Facility) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)

- ReferencedPositionItem (inherited from Facility) (See S5000F UoF Local Position, Para 4.45)
- ReportContextItem (inherited from Facility) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Facility) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Facility) (See S5000F UoF Safety, Para 4.78)
- ServiceItem (inherited from Facility) (See S5000F UoF Service Request, Para 4.86)
- SubjectOfPoliciesAndRegulations (inherited from Facility) (See S5000F UoF Policies and Regulations, Para 4.68)
- TransportableItem (inherited from Facility) (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (inherited from Facility) (See S5000F UoF Warranty, Para 4.96)

4.37.3.7 Warehouse

Warehouse is a Facility used to store parts.

4.37.3.7.1 Attribute(s)

This class has the following attributes:

- facilityIdentifier (inherited from Facility), one or many
- facilityCleansiness (inherited from Facility), optional
- facilityDescription (inherited from Facility), zero, one or many
- facilityDimensions (inherited from Facility), optional
- facilityExistsDuring (inherited from Facility), optional
- facilityName (inherited from Facility), zero, one or many
- facilityWeight (inherited from Facility), optional
- warehouseType, optional

4.37.3.7.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type FacilityLocation
- An association to object(s) of type FacilityOwner
- An association to object(s) of type FacilityRelationship. Each Facility can be related to from zero, one or many other Facilities (via the FacilityRelationship <<relationship>> class)
- An association, zero, one or many, to object(s) from classes that are members of LocationItem

4.37.3.7.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (inherited from Facility) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Facility) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureCompliantItem (inherited from Facility) (See S5000F UoF Facility, Para 4.37)
- InfrastructureItem (inherited from Facility) (See S5000F UoF Infrastructure, Para 4.43)
- ItemUnderExportControl (inherited from Facility) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from Facility) (See S5000F UoF Maintenance Program, Para 4.52)

- PoliciesAndRegulationsCompliantItem (inherited from Facility) (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityClassificationItem (inherited from Facility) (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures (inherited from Facility) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from Facility) (See S5000F UoF Work Breakdown, Para 4.97)

4.37.3.7.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Facility) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from Facility) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Facility) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)
- EventItem (inherited from Facility) (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (inherited from Facility) (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (inherited from Facility) (See S5000F UoF Infrastructure, Para 4.43)
- MaintenanceItem (inherited from Facility) (See S5000F UoF Maintenance Activity, Para 4.48)
- MessageContextItem (inherited from Facility) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)
- ReferencedPositionItem (inherited from Facility) (See S5000F UoF Local Position, Para 4.45)
- ReportContextItem (inherited from Facility) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Facility) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Facility) (See S5000F UoF Safety, Para 4.78)
- ServiceItem (inherited from Facility) (See S5000F UoF Service Request, Para 4.86)
- SubjectOfPoliciesAndRegulations (inherited from Facility) (See S5000F UoF Policies and Regulations, Para 4.68)
- TransportableItem (inherited from Facility) (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (inherited from Facility) (See S5000F UoF Warranty, Para 4.96)

4.38 S5000F UoF Failure Detection and Location

4.38.1 Description

The Failure Detection and Location UoF provides the capability to specify the failures that can be detected by equipment (including test equipment) or software.

4.38.2 Graphical description

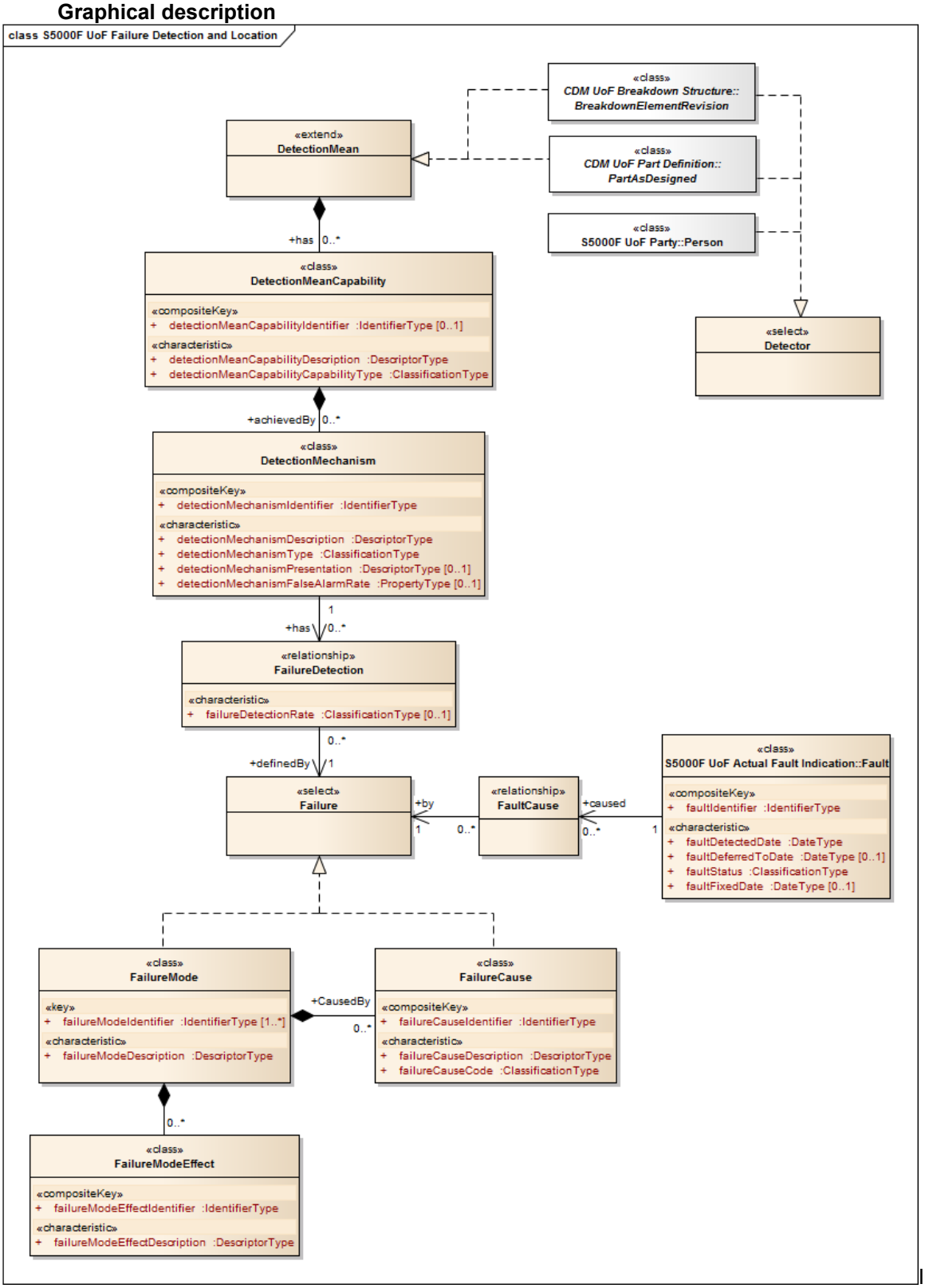

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Fig 50 S5000F UoF Failure Detection and Location

4.38.3 Class definition

4.38.3.1 DetectionMean

DetectionMean is an <<extend>> interface that allows to associate DetectionMeanCapabilities to the elements that allowed for detection of a failure.

4.38.3.2 DetectionMeanCapability

DetectionMeanCapability is a class that identifies the capability to detect a failure.

4.38.3.2.1 Attribute(s)

This class has the following attributes:

- detectionMeanCapabilityIdentifier, optional
- detectionMeanCapabilityCapabilityType
- detectionMeanCapabilityDescription

4.38.3.2.2 Associations

This class has the following associations:

- An aggregate association, has, zero, one or many, to related object(s) of type DetectionMean

4.38.3.3 DetectionMechanism

DetectionMechanism is a class that allows to define the mechanism by means of which a failure is detected.

4.38.3.3.1 Attribute(s)

This class has the following attributes:

- detectionMechanismIdentifier
- detectionMechanismDescription
- detectionMechanismFalseAlarmRate, optional
- detectionMechanismPresentation, optional
- detectionMechanismType

4.38.3.3.2 Associations

This class has the following associations:

- An aggregate association, achievedBy, zero, one or many, to related object(s) of type DetectionMeanCapability
- An association to object(s) of type FailureDetection

4.38.3.4 Detector

Detector is a <<select>> interface representing the elements that can detect or have detected an anomalous behaviour (fault) in a SerializedHardwarePart.

4.38.3.5 Failure

Failure is a <<select>> interface that allows to identify the reason for an EquipmentFault.

4.38.3.5.1 Associations

This class has the following associations:

- A composition association, has, zero, one or many, to child objects of type ShopFindings

4.38.3.6 FailureCause

The FailureCause class represents an unacceptable reduction of functionality of an item where the item cannot continue its intended use.

Note

A failure occurs during proper usage of an item.

4.38.3.6.1 Attribute(s)
This class has the following attributes:

- failureCauseIdentifier
- failureCauseCode
- failureCauseDescription

4.38.3.6.2 Associations
This class has the following associations:

- An aggregate association, CausedBy, zero, one or many, to related object(s) of type FailureMode

4.38.3.6.3 Selects
This class is a member of the following <<select>> interfaces:

- Failure

4.38.3.7 FailureDetection
FailureDetection is a <<relationship>> that allows to define which DetectionMechanism is capable of detecting a specific Failure.

4.38.3.7.1 Attribute(s)
This class has the following attributes:

- failureDetectionRate, optional

4.38.3.7.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of Failure

4.38.3.8 FailureMode
FailureMode represents an identifiable condition in which one element of a redundant system has failed (no longer available) and impacts on the required function output of the system.

4.38.3.8.1 Attribute(s)
This class has the following attributes:

- failureModeIdentifier, one or many
- failureModeDescription

4.38.3.8.2 Associations
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.38.3.8.3 Selects
This class is a member of the following <<select>> interfaces:

- Failure

4.38.3.9 FailureModeEffect
The FailureModeEffect class defines the consequences of an identified failure mode and its effect on the local/next higher/end item operation, function or status.

Note
An instance of class FailureModeEffect has no meaning by itself, but only in context of an identified FailureMode.

4.38.3.9.1 Attribute(s)

This class has the following attributes:

- failureModeEffectIdentifier
- failureModeEffectDescription

4.38.3.9.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type FailureMode

4.38.3.10 FaultCause

FaultCause is a <<relationship>> that allows to associate a Fault to its underlying cause.

4.38.3.10.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of Failure

4.39 S5000F UoF Fleet Definition

4.39.1 Description

The Fleet Definition UoF defines the basic information of a set of SerializedProductVariants that operate together.

4.39.2 Graphical description

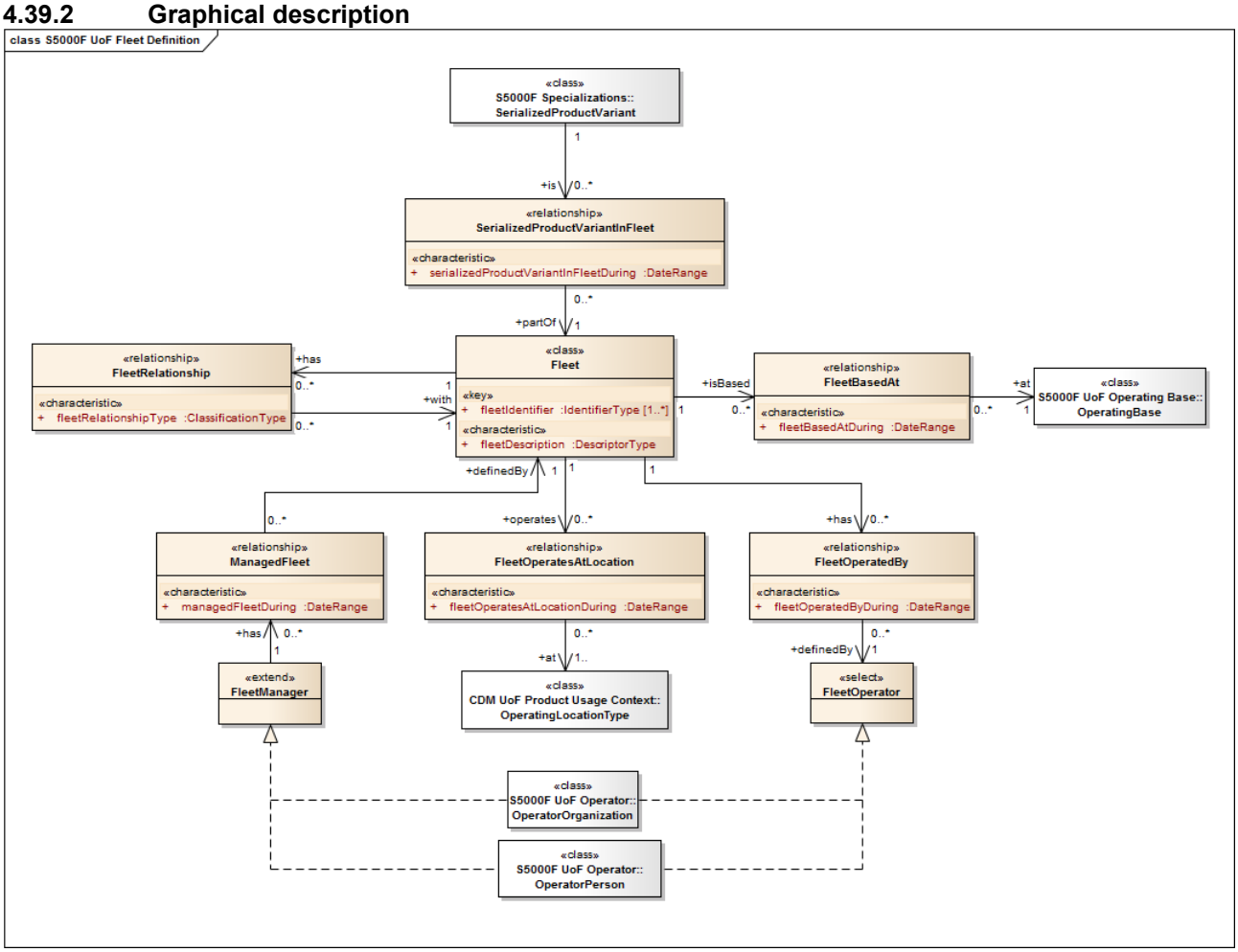

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Fig 51 S5000F UoF Fleet Definition

4.39.3 Class definition

4.39.3.1 Fleet

The Fleet class represents a group of SerializedProductVariants, representing vehicles that move together, are engaged in the same activity, belong to a same owner or are operated by a same organization.

Note

SerializedProductVariants in a Fleet do not need to belong necessarily to a same ProductVariant.

Note

Though Fleet is typically used for vehicles, the concept can be extended, for example to group all robots in a same manufacturing line.

4.39.3.1.1 Example(s)

- all aircraft of one airline (independent of type)
- bicycles or cars of one hire company
- municipal buses of one town
- the individual machines of a specific part number that operate in a specific region? the individual machines of a specific part number that operate in a specific region
- warships of several countries performing joint exercises

4.39.3.1.2 Attribute(s)
This class has the following attributes:

- fleetIdentifier, one or many
- fleetDescription

4.39.3.1.3 Associations
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type FleetBasedAt
- An association to object(s) of type FleetOperatedBy
- An association to object(s) of type FleetOperatesAtLocation
- An association to object(s) of type FleetRelationship
- An association to object(s) of type FleetTaskList. A Fleet can have zero, one or many FleetTasks associated to it (via the FleetTaskList <<relationship>>)

4.39.3.1.4 Implementations
This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)
- TransportingAsset (See S5000F UoF Transporting Asset, Para 4.93)

4.39.3.1.5 Selects
This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- EventItem (See S5000F UoF Event, Para 4.33)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (See S5000F UoF Safety, Para 4.78)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)

4.39.3.2 FleetBasedAt
FleetBasedAt is a <<relationship>> that indicates the location at which as Fleet is based at a specific point in time.

4.39.3.2.1 Attribute(s)
This class has the following attributes:

- fleetBasedAtDuring

4.39.3.2.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) of type OperatingBase

4.39.3.3 FleetManager
FleetManager is an <<extend>> interface that allows to assign capabilities to the OperatorOrganization or OperatorPerson that manages a Fleet.

4.39.3.3.1 Associations
This class has the following associations:

– An association to object(s) of type ManagedFleet

4.39.3.4 FleetOperatedBy
FleetOperator is <<relationship>> that allows to assign an Operator to a Fleet during a specific period of time.

4.39.3.4.1 Attribute(s)
This class has the following attributes:

– fleetOperatedByDuring

4.39.3.4.2 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of FleetOperator

4.39.3.5 FleetOperatesAtLocation
FleetOperatesAtLocation is a <<relationship>> that indicates the location at which as Fleet operates at a specific point in time.

4.39.3.5.1 Attribute(s)
This class has the following attributes:

– fleetOperatesAtLocationDuring

4.39.3.5.2 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) of type OperatingLocationType

4.39.3.6 FleetOperator
FleetOperator is a <<select>> interface that allows to identify the operator of a Fleet.

4.39.3.7 FleetRelationship
FleetRelationship is a <<relationship>> that indicates how two Fleets are related with each other.

4.39.3.7.1 Attribute(s)
This class has the following attributes:

– fleetRelationshipType

4.39.3.7.2 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) of type Fleet

4.39.3.8 ManagedFleet
ManagedFleet is a <<relationship>> that allows to associate a FleetManager to the Fleet that it manages during a specific period of time.

4.39.3.8.1 Attribute(s)
This class has the following attributes:

– managedFleetDuring

4.39.3.8.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type Fleet

4.39.3.9 SerializedProductVariantInFleet

SerializedProductVariantInFleet is a <<relationship>> that defines the association between a SerializedProductVariant and the Fleet to which it belongs.

4.39.3.9.1 Attribute(s)

This class has the following attributes:

– serializedProductVariantInFleetDuring

4.39.3.9.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type Fleet

4.40 S5000F UoF Fleet Monitoring

4.40.1 Description

The Fleet Monitoring UoF provides the capability to monitor the operational periods of a Fleet.

4.40.2 Graphical description

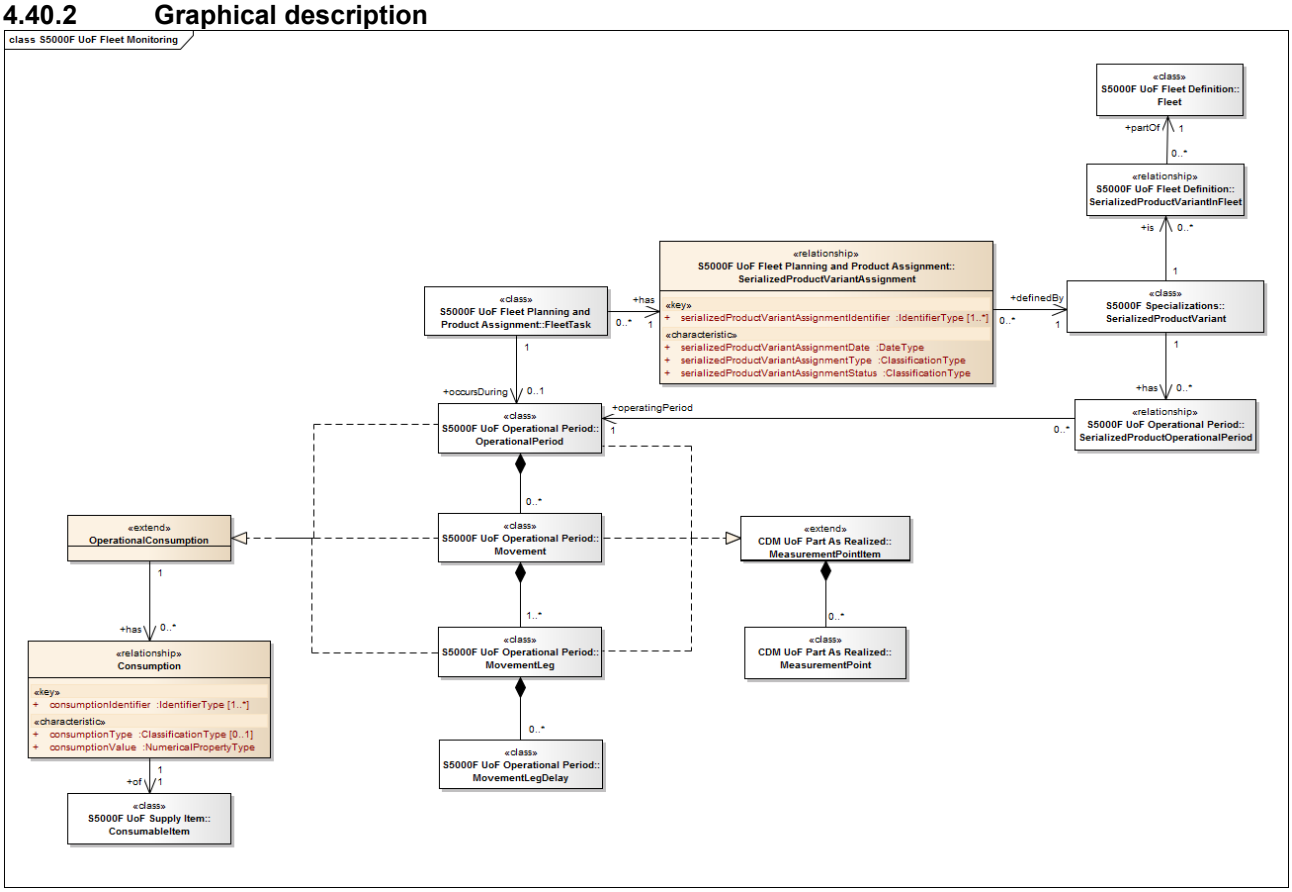

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Fig 52 S5000F UoF Fleet Monitoring

4.40.3 Class definition

4.40.3.1 Consumption

Consumption is a <<relationship>> that defines the Product(s) that have been consumed by a SerializedProductVariant as part of an operational period, movement or movement leg.

4.40.3.1.1 Example(s)

- fuel consumption
- oil consumption

4.40.3.1.2 Attribute(s)

This class has the following attributes:

- consumptionIdentifier, one or many
- consumptionType, optional
- consumptionValue

4.40.3.1.3 Associations

This class has the following associations:

- An association to object(s) of type ConsumableItem

4.40.3.2 OperationalConsumption

OperationalConsumption is an <<extend>> interface that allows to associate a Product consumption to an operational period, movement or movement leg.

4.40.3.2.1 Associations

This class has the following associations:

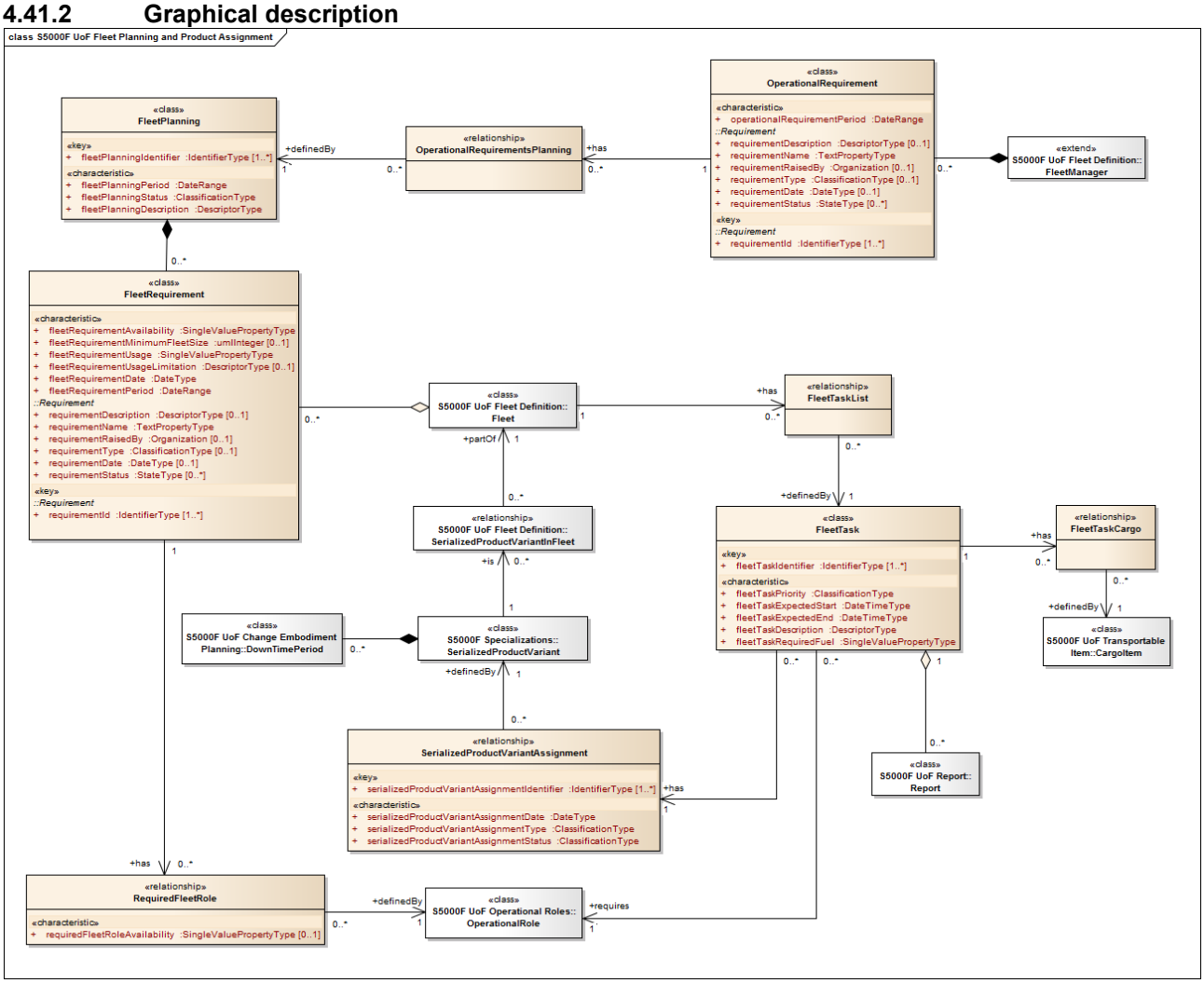
- An association to object(s) of type Consumption

4.41 S5000F UoF Fleet Planning and Product Assignment

4.41.1 Description

The Fleet Planning and Product Assignment UoF provides the capability to plan the tasks to be carried out by a fleet of Products and assign the most adequate Product to carry out each task.

4.41.2 Graphical description



ICN-B6865-5000F15018-002-01

Fig 53 S5000F UoF Fleet Planning and Product Assignment

4.41.3 Class definition

4.41.3.1 FleetPlanning

FleetPlanning is a class representing the planned usage of a fleet during a specified period of time.

4.41.3.1.1 Attribute(s)

This class has the following attributes:

- fleetPlanningIdentifier, one or many
- fleetPlanningDescription
- fleetPlanningPeriod
- fleetPlanningStatus

4.41.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.41.3.2 FleetRequirement

FleetRequirement is a Requirement (need) that a fleet must comply with.

4.41.3.2.1 Example(s)

- Two A/C in MedEvac role need to be available Monday thru Thursday.

4.41.3.2.2 Attribute(s)

This class has the following attributes:

- requirementId (inherited from Requirement), one or many
- requirementDate (inherited from Requirement), optional
- requirementDescription (inherited from Requirement), optional
- requirementName (inherited from Requirement)
- requirementRaisedBy (inherited from Requirement), optional
- requirementStatus (inherited from Requirement), zero, one or many
- requirementType (inherited from Requirement), optional
- fleetRequirementAvailability
- fleetRequirementDate
- fleetRequirementMinimumFleetSize, optional
- fleetRequirementPeriod
- fleetRequirementUsage
- fleetRequirementUsageLimitation, optional

4.41.3.2.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type FleetPlanning
- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type Fleet
- A composition association, zero, one or many, to child objects of type ServiceRequest
- An association to object(s) of type RequiredFleetRole. A FleetRequirement can be associated to zero, one or many required OperationalRoles (via the RequiredFleetRole <<relationship>>)
- An association to object(s) of type RequirementParty
- An association to object(s) of type RequirementRelationship
- An association, zero, one or many, to object(s) of type Document

4.41.3.2.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Requirement) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from Requirement) (See S5000F UoF Change Information, Para 4.21)
- MaintenanceWorkOrderSource (inherited from Requirement) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Requirement) (See S5000F UoF Security Classification, Para 4.79)

4.41.3.2.5 Selects

This class is a member of the following <<select>> interfaces:

- SafetyItem (inherited from Requirement) (See S5000F UoF Safety, Para 4.78)

4.41.3.3 FleetTask

The FleetTask class represents a planned activity to be carried out by a SerializedProductVariant as part of the activities that the fleet has to perform.

4.41.3.3.1 Attribute(s)

This class has the following attributes:

- fleetTaskIdentifier, one or many
- fleetTaskDescription
- fleetTaskExpectedEnd
- fleetTaskExpectedStart
- fleetTaskPriority
- fleetTaskRequiredFuel

4.41.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type FleetTaskCargo. A FleetTask can be associated to zero, one or many CargoItems (via the FleetTaskCargo <<relationship>>)
- An association to object(s) of type OperationalPeriod
- An association, zero, one or many, to object(s) of type OperationalRole
- An association, zero, one or many, to object(s) of type SerializedProductVariantAssignment. Each SerializedProductVariant can be assigned to zero, one or many FleetTasks (via the SerializedProductVariantAssignment <<relationship>>)

4.41.3.4 FleetTaskCargo

FleetTaskCargo is a <<relationship>> that allows to associate a CargoItem to a FleetTask.

4.41.3.4.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type CargoItem

4.41.3.5 FleetTaskList

FleetTaskList is a <<relationship>> that defines which FleetTasks are performed by which Fleets for a specific FleetPlanning.

4.41.3.5.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type FleetTask

4.41.3.6 OperationalRequirement

OperationalRequirement is a Requirement to perform a specific operation with a Product.

4.41.3.6.1 Attribute(s)

This class has the following attributes:

- requirementId (inherited from Requirement), one or many
- requirementDate (inherited from Requirement), optional
- requirementDescription (inherited from Requirement), optional
- requirementName (inherited from Requirement)
- requirementRaisedBy (inherited from Requirement), optional
- requirementStatus (inherited from Requirement), zero, one or many
- requirementType (inherited from Requirement), optional
- operationalRequirementPeriod

4.41.3.6.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type FleetManager

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type ServiceRequest
- An association to object(s) of type OperationalRequirementsPlanning
- An association to object(s) of type RequirementParty
- An association to object(s) of type RequirementRelationship
- An association, zero, one or many, to object(s) of type Document

4.41.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Requirement) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from Requirement) (See S5000F UoF Change Information, Para 4.21)
- MaintenanceWorkOrderSource (inherited from Requirement) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Requirement) (See S5000F UoF Security Classification, Para 4.79)

4.41.3.6.4 Selects

This class is a member of the following <<select>> interfaces:

- SafetyItem (inherited from Requirement) (See S5000F UoF Safety, Para 4.78)

4.41.3.7 OperationalRequirementsPlanning

OperationalRequirementsPlanning is a <<relationship>> that relates an OperationalRquirement to the FleetPlanning during one or several OperationalPeriods.

4.41.3.7.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type FleetPlanning

4.41.3.8 RequiredFleetRole

RequiredFleetRole is a <<relationship>> that allows to define the OperationalRoles that a FleetRequirement must meet.

4.41.3.8.1 Attribute(s)

This class has the following attributes:

- requiredFleetRoleAvailability, optional

4.41.3.8.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type OperationalRole

4.41.3.9 SerializedProductVariantAssignment

SerializedProductVariantAssignment is a <<relationship>> between a FleetTask and the vehicle that has been assigned to perform that FleetTask.

Note

The SerializedProductVariant is in this case always a vehicle.

4.41.3.9.1 Attribute(s)

This class has the following attributes:

- serializedProductVariantAssignmentIdentifier, one or many
- serializedProductVariantAssignmentDate

– serializedProductVariantAssignmentStatus
– serializedProductVariantAssignmentType

4.41.3.9.2 Associations

This class has the following associations:

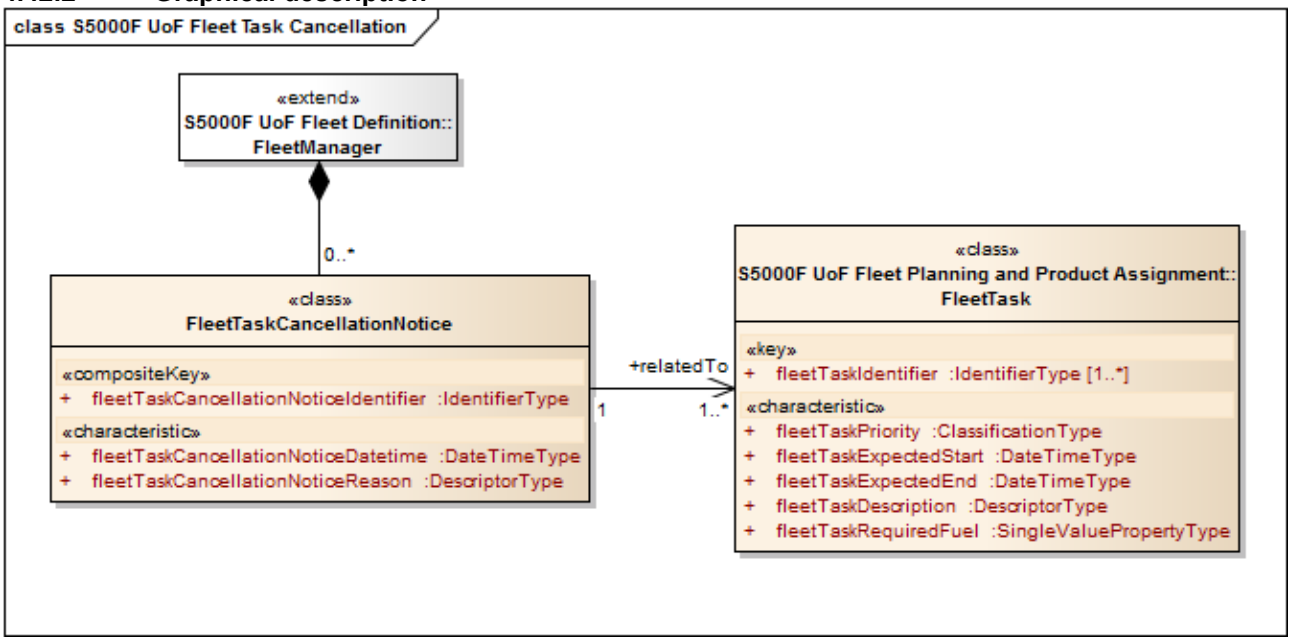
– An association, zero, one or many, to object(s) of type SerializedProductVariant. The SerializedProductVariant to which a FleetTask hasb eeb assigned (through the SerializedProductVariantAssignment <<relationship>>)

4.42 S5000F UoF Fleet Task Cancellation

4.42.1 Description

The Fleet Task Cancellation UoF provides the capability to cancel a FleetTask.

4.42.2 Graphical description



ICN-B6865-5000F15061-002-01

Fig 54 S5000F UoF Fleet Task Cancellation

4.42.3 Class definition

4.42.3.1 FleetTaskCancellationNotice

FleetTaskCancellationNotice is a Document published by an Operator to cancel a FleetTask.

4.42.3.1.1 Attribute(s)

This class has the following attributes:

– documentIdentifier (inherited from Document), one or many
– fleetTaskCancellationNoticeIdentifier
– documentCreationDate (inherited from Document), optional
– documentDescription (inherited from Document), optional
– documentStatus (inherited from Document), optional
– documentTitle (inherited from Document), zero, one or many
– documentType (inherited from Document), optional
– fleetTaskCancellationNoticeDatetime
– fleetTaskCancellationNoticeReason

4.42.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type FleetManager
- An association to object(s) of type DocumentRelationship
- An association to object(s) of type FleetTask

4.42.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.42.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

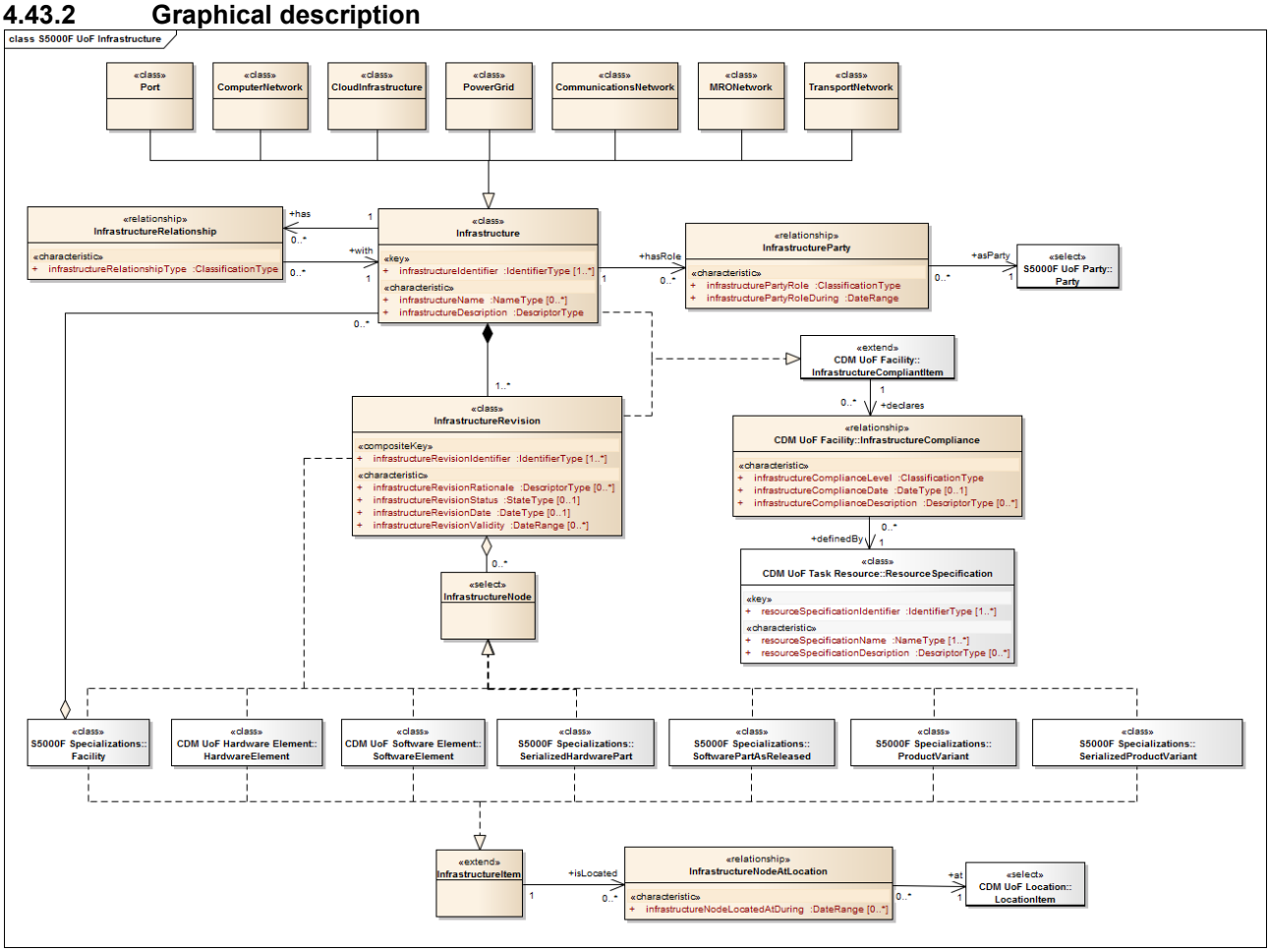
- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)

4.43 S5000F UoF Infrastructure

4.43.1 Description

The Infrastructure UoF defines the basic information related to an infrastructure.

4.43.2 Graphical description



ICN-B6865-5000F15088-001-01

Fig 55 S5000F UoF Infrastructure

4.43.3 Class definition

4.43.3.1 CloudInfrastructure

CloudInfrastructure is an Infrastructure that represents a network of remote servers hosted on the Internet and used to store, manage, and process data in place of local servers or personal computers.

4.43.3.1.1 Attribute(s)

This class has the following attributes:

- infrastructureIdentifier (inherited from Infrastructure), one or many
- infrastructureDescription (inherited from Infrastructure)
- infrastructureName (inherited from Infrastructure), zero, one or many

4.43.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type Facility
- An association to object(s) of type InfrastructureParty
- An association to object(s) of type InfrastructureRelationship

4.43.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Infrastructure) (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (inherited from Infrastructure) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Infrastructure) (See S5000F UoF Change Information, Para 4.21)
- InfrastructureCompliantItem (inherited from Infrastructure) (See S5000F UoF Facility, Para 4.37)
- ItemUnderExportControl (inherited from Infrastructure) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from Infrastructure) (See S5000F UoF Maintenance Program, Para 4.52)
- SecurityClassificationItem (inherited from Infrastructure) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from Infrastructure) (See S5000F UoF Work Breakdown, Para 4.97)

4.43.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Infrastructure) (See S5000F UoF Change Request, Para 4.22)
- ContractItem (inherited from Infrastructure) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Infrastructure) (See S5000F UoF Cost Breakdown, Para 4.25)
- ExportControlledItem (inherited from Infrastructure) (See S5000F UoF Export Control License, Para 4.34)
- MaintenanceItem (inherited from Infrastructure) (See S5000F UoF Maintenance Activity, Para 4.48)
- NonAvailabilityCauseItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
- ReportContextItem (inherited from Infrastructure) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Infrastructure) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Infrastructure) (See S5000F UoF Safety, Para 4.78)
- ServiceItem (inherited from Infrastructure) (See S5000F UoF Service Request, Para 4.86)
- WarrantyItem (inherited from Infrastructure) (See S5000F UoF Warranty, Para 4.96)

4.43.3.2 CommunicationsNetwork

CommunicationsNetwork is an Infrastructure that represents a number of machines, computers and communication lines that allow the communication between different parties or machines.

4.43.3.2.1 Attribute(s)

This class has the following attributes:

- infrastructureIdentifier (inherited from Infrastructure), one or many
- infrastructureDescription (inherited from Infrastructure)
- infrastructureName (inherited from Infrastructure), zero, one or many

4.43.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type Facility
- An association to object(s) of type InfrastructureParty
- An association to object(s) of type InfrastructureRelationship

4.43.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Infrastructure) (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (inherited from Infrastructure) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Infrastructure) (See S5000F UoF Change Information, Para 4.21)
- InfrastructureCompliantItem (inherited from Infrastructure) (See S5000F UoF Facility, Para 4.37)
- ItemUnderExportControl (inherited from Infrastructure) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from Infrastructure) (See S5000F UoF Maintenance Program, Para 4.52)
- SecurityClassificationItem (inherited from Infrastructure) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from Infrastructure) (See S5000F UoF Work Breakdown, Para 4.97)

4.43.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Infrastructure) (See S5000F UoF Change Request, Para 4.22)
- ContractItem (inherited from Infrastructure) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Infrastructure) (See S5000F UoF Cost Breakdown, Para 4.25)
- ExportControlledItem (inherited from Infrastructure) (See S5000F UoF Export Control License, Para 4.34)
- MaintenanceItem (inherited from Infrastructure) (See S5000F UoF Maintenance Activity, Para 4.48)
- NonAvailabilityCauseItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
- ReportContextItem (inherited from Infrastructure) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Infrastructure) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Infrastructure) (See S5000F UoF Safety, Para 4.78)
- ServiceItem (inherited from Infrastructure) (See S5000F UoF Service Request, Para 4.86)
- WarrantyItem (inherited from Infrastructure) (See S5000F UoF Warranty, Para 4.96)

4.43.3.3 ComputerNetwork

ComputerNetwork is an Infrastructure that represents a number of interconnected computers, irrespectively of their location.

4.43.3.3.1 Attribute(s)

This class has the following attributes:

- infrastructureIdentifier (inherited from Infrastructure), one or many
- infrastructureDescription (inherited from Infrastructure)

– infrastructureName (inherited from Infrastructure), zero, one or many

4.43.3.3.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
– A composition association, zero, one or many, to child objects of type Facility
– An association to object(s) of type InfrastructureParty
– An association to object(s) of type InfrastructureRelationship

4.43.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

– ApplicabilityStatementItem (inherited from Infrastructure) (See S5000F UoF Applicability Statement, Para 4.11)
– AvailabilityItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
– CapabilityItem (inherited from Infrastructure) (See S5000F UoF Capability, Para 4.16)
– ChangeControlledItem (inherited from Infrastructure) (See S5000F UoF Change Information, Para 4.21)
– InfrastructureCompliantItem (inherited from Infrastructure) (See S5000F UoF Facility, Para 4.37)
– ItemUnderExportControl (inherited from Infrastructure) (See S5000F UoF Export Control Requirement, Para 4.35)
– MaintenanceProgramItem (inherited from Infrastructure) (See S5000F UoF Maintenance Program, Para 4.52)
– SecurityClassificationItem (inherited from Infrastructure) (See S5000F UoF Security Classification, Para 4.79)
– WorkBreakdownContext (inherited from Infrastructure) (See S5000F UoF Work Breakdown, Para 4.97)

4.43.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

– ChangeRequestItem (inherited from Infrastructure) (See S5000F UoF Change Request, Para 4.22)
– ContractItem (inherited from Infrastructure) (See S5000F UoF Project and Contract, Para 4.71)
– CostEntryItem (inherited from Infrastructure) (See S5000F UoF Cost Breakdown, Para 4.25)
– ExportControlledItem (inherited from Infrastructure) (See S5000F UoF Export Control License, Para 4.34)
– MaintenanceItem (inherited from Infrastructure) (See S5000F UoF Maintenance Activity, Para 4.48)
– NonAvailabilityCauseItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
– ReportContextItem (inherited from Infrastructure) (See S5000F UoF Report, Para 4.73)
– ResourceItem (inherited from Infrastructure) (See S5000F UoF Resource Usage Request, Para 4.77)
– SafetyItem (inherited from Infrastructure) (See S5000F UoF Safety, Para 4.78)
– ServiceItem (inherited from Infrastructure) (See S5000F UoF Service Request, Para 4.86)
– WarrantyItem (inherited from Infrastructure) (See S5000F UoF Warranty, Para 4.96)

4.43.3.4 Infrastructure

Infrastructure is a <<class>> that represents the basic physical and organizational structures and facilities needed for the operation of an organization or Product or required for the provision of a service.

Note

An infrastructure can be located across many different locations or can even be mobile.

4.43.3.4.1 Example(s)

- airport
- bus service
- railroad
- roads
- set of buildings

4.43.3.4.2 Attribute(s)

This class has the following attributes:

- infrastructureIdentifier, one or many
- infrastructureDescription
- infrastructureName, zero, one or many

4.43.3.4.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type Facility
- A composition association, zero, one or many, to child objects of type MaintenanceFacility
- A composition association, zero, one or many, to child objects of type OperatingBase
- A composition association, zero, one or many, to child objects of type OtherFacility
- A composition association, zero, one or many, to child objects of type ParkingFacility
- A composition association, zero, one or many, to child objects of type Warehouse
- An association to object(s) of type InfrastructureParty
- An association to object(s) of type InfrastructureRelationship

4.43.3.4.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- InfrastructureCompliantItem (See S5000F UoF Facility, Para 4.37)
- ItemUnderExportControl (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (See S5000F UoF Maintenance Program, Para 4.52)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

4.43.3.4.5 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- ExportControlledItem (See S5000F UoF Export Control License, Para 4.34)
- MaintenanceItem (See S5000F UoF Maintenance Activity, Para 4.48)
- NonAvailabilityCauseItem (See S5000F UoF Availability, Para 4.13)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (See S5000F UoF Safety, Para 4.78)
- ServiceItem (See S5000F UoF Service Request, Para 4.86)

– WarrantyItem (See S5000F UoF Warranty, Para 4.96)

4.43.3.5 InfrastructureItem
InfrastructureItem is an <<extend>> interface that allows to associate additional capabilities to items that can belong to an Infrastructure.

4.43.3.5.1 Associations
This class has the following associations:

– An association to object(s) of type InfrastructureNodeAtLocation

4.43.3.6 InfrastructureNode
InfrastructureNode is a <<class>> representing one item that forms part of an Infrastructure.

4.43.3.6.1 Associations
This class has the following associations:

– A composition association, zero, one or many, to child objects of type InfrastructureRevision

4.43.3.7 InfrastructureNodeAtLocation
InfrastructureNodeAtLocation is a <<relationship>> that defines the Location at which an InfrastructureNode is located.

4.43.3.7.1 Attribute(s)
This class has the following attributes:

– infrastructureNodeLocatedAtDuring, zero, one or many

4.43.3.7.2 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of LocationItem

4.43.3.8 InfrastructureParty
InfrastructureParty is a <<relationship>> that associates a Party to an Infrastructure.

4.43.3.8.1 Attribute(s)
This class has the following attributes:

– infrastructurePartyRole
– infrastructurePartyRoleDuring

4.43.3.8.2 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of Party

4.43.3.9 InfrastructureRelationship
InfrastructureRelationship is a <<relationship>> that defines how two Infrastructures are related with each other.

4.43.3.9.1 Attribute(s)
This class has the following attributes:

– infrastructureRelationshipType

4.43.3.9.2 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) of type CloudInfrastructure

- An association, zero, one or many, to object(s) of type CommunicationsNetwork
- An association, zero, one or many, to object(s) of type ComputerNetwork
- An association, zero, one or many, to object(s) of type Infrastructure
- An association, zero, one or many, to object(s) of type MRONetwork
- An association, zero, one or many, to object(s) of type Port
- An association, zero, one or many, to object(s) of type PowerGrid
- An association, zero, one or many, to object(s) of type TransportNetwork

4.43.3.10 InfrastructureRevision

InfrastructureRevision is a <<class>> representing an iteration applied to a InfrastructureRevision.

4.43.3.10.1 Attribute(s)

This class has the following attributes:

- infrastructureRevisionIdentifier, one or many
- infrastructureRevisionDate, optional
- infrastructureRevisionRationale, zero, one or many
- infrastructureRevisionStatus, optional
- infrastructureRevisionValidity, zero, one or many

4.43.3.10.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type CloudInfrastructure
- An aggregate association, one or many, to related object(s) of type CommunicationsNetwork
- An aggregate association, one or many, to related object(s) of type ComputerNetwork
- An aggregate association, one or many, to related object(s) of type Infrastructure
- An aggregate association, one or many, to related object(s) of type MRONetwork
- An aggregate association, one or many, to related object(s) of type Port
- An aggregate association, one or many, to related object(s) of type PowerGrid
- An aggregate association, one or many, to related object(s) of type TransportNetwork

4.43.3.10.3 Implementations

This class implements the following <<extend>> interfaces:

- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- InfrastructureCompliantItem (See S5000F UoF Facility, Para 4.37)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

4.43.3.10.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- EventItem (See S5000F UoF Event, Para 4.33)
- InfrastructureNode

4.43.3.11 MRONetwork

MRONetwork is an Infrastructure consisting or Maintenance, Repair and Overhaul (MRO) facilities.

Note

The different facilities do not need to be in a same location, but may be spread world-wide.

4.43.3.11.1 Example(s)

- aircraft overhaul center

- equipment repair shop
- shipyard

4.43.3.11.2 Attribute(s)

This class has the following attributes:

- infrastructureIdentifier (inherited from Infrastructure), one or many
- infrastructureDescription (inherited from Infrastructure)
- infrastructureName (inherited from Infrastructure), zero, one or many

4.43.3.11.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type Facility
- An association to object(s) of type InfrastructureParty
- An association to object(s) of type InfrastructureRelationship

4.43.3.11.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Infrastructure) (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (inherited from Infrastructure) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Infrastructure) (See S5000F UoF Change Information, Para 4.21)
- InfrastructureCompliantItem (inherited from Infrastructure) (See S5000F UoF Facility, Para 4.37)
- ItemUnderExportControl (inherited from Infrastructure) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from Infrastructure) (See S5000F UoF Maintenance Program, Para 4.52)
- SecurityClassificationItem (inherited from Infrastructure) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from Infrastructure) (See S5000F UoF Work Breakdown, Para 4.97)

4.43.3.11.5 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Infrastructure) (See S5000F UoF Change Request, Para 4.22)
- ContractItem (inherited from Infrastructure) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Infrastructure) (See S5000F UoF Cost Breakdown, Para 4.25)
- ExportControlledItem (inherited from Infrastructure) (See S5000F UoF Export Control License, Para 4.34)
- MaintenanceItem (inherited from Infrastructure) (See S5000F UoF Maintenance Activity, Para 4.48)
- NonAvailabilityCauseItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
- ReportContextItem (inherited from Infrastructure) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Infrastructure) (See S5000F UoF Resource Usage Request, Para 4.77)

- SafetyItem (inherited from Infrastructure) (See S5000F UoF Safety, Para 4.78)
- ServiceItem (inherited from Infrastructure) (See S5000F UoF Service Request, Para 4.86)
- WarrantyItem (inherited from Infrastructure) (See S5000F UoF Warranty, Para 4.96)

4.43.3.12 Port

Port is an infrastructure used for the docking of ships.

4.43.3.12.1 Attribute(s)

This class has the following attributes:

- infrastructureIdentifier (inherited from Infrastructure), one or many
- infrastructureDescription (inherited from Infrastructure)
- infrastructureName (inherited from Infrastructure), zero, one or many

4.43.3.12.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type Facility
- An association to object(s) of type InfrastructureParty
- An association to object(s) of type InfrastructureRelationship

4.43.3.12.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Infrastructure) (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (inherited from Infrastructure) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Infrastructure) (See S5000F UoF Change Information, Para 4.21)
- InfrastructureCompliantItem (inherited from Infrastructure) (See S5000F UoF Facility, Para 4.37)
- ItemUnderExportControl (inherited from Infrastructure) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from Infrastructure) (See S5000F UoF Maintenance Program, Para 4.52)
- SecurityClassificationItem (inherited from Infrastructure) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from Infrastructure) (See S5000F UoF Work Breakdown, Para 4.97)

4.43.3.12.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Infrastructure) (See S5000F UoF Change Request, Para 4.22)
- ContractItem (inherited from Infrastructure) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Infrastructure) (See S5000F UoF Cost Breakdown, Para 4.25)
- ExportControlledItem (inherited from Infrastructure) (See S5000F UoF Export Control License, Para 4.34)
- MaintenanceItem (inherited from Infrastructure) (See S5000F UoF Maintenance Activity, Para 4.48)
- NonAvailabilityCauseItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)

- ReportContextItem (inherited from Infrastructure) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Infrastructure) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Infrastructure) (See S5000F UoF Safety, Para 4.78)
- ServiceItem (inherited from Infrastructure) (See S5000F UoF Service Request, Para 4.86)
- WarrantyItem (inherited from Infrastructure) (See S5000F UoF Warranty, Para 4.96)

4.43.3.13 PowerGrid

PowerGrid is an Infrastructure used to generate, transport and distribute power.

4.43.3.13.1 Attribute(s)

This class has the following attributes:

- infrastructureIdentifier (inherited from Infrastructure), one or many
- infrastructureDescription (inherited from Infrastructure)
- infrastructureName (inherited from Infrastructure), zero, one or many

4.43.3.13.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type Facility
- An association to object(s) of type InfrastructureParty
- An association to object(s) of type InfrastructureRelationship

4.43.3.13.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Infrastructure) (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (inherited from Infrastructure) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Infrastructure) (See S5000F UoF Change Information, Para 4.21)
- InfrastructureCompliantItem (inherited from Infrastructure) (See S5000F UoF Facility, Para 4.37)
- ItemUnderExportControl (inherited from Infrastructure) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from Infrastructure) (See S5000F UoF Maintenance Program, Para 4.52)
- SecurityClassificationItem (inherited from Infrastructure) (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (inherited from Infrastructure) (See S5000F UoF Work Breakdown, Para 4.97)

4.43.3.13.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Infrastructure) (See S5000F UoF Change Request, Para 4.22)
- ContractItem (inherited from Infrastructure) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Infrastructure) (See S5000F UoF Cost Breakdown, Para 4.25)
- ExportControlledItem (inherited from Infrastructure) (See S5000F UoF Export Control License, Para 4.34)

- MaintenanceItem (inherited from Infrastructure) (See S5000F UoF Maintenance Activity, Para 4.48)
- NonAvailabilityCauseItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
- ReportContextItem (inherited from Infrastructure) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Infrastructure) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Infrastructure) (See S5000F UoF Safety, Para 4.78)
- ServiceItem (inherited from Infrastructure) (See S5000F UoF Service Request, Para 4.86)
- WarrantyItem (inherited from Infrastructure) (See S5000F UoF Warranty, Para 4.96)

4.43.3.14 TransportNetwork

TransportNetwork is an Infrastructure used to transport items.

4.43.3.14.1 Example(s)

- Airline
- Railroad

4.43.3.14.2 Attribute(s)

This class has the following attributes:

- infrastructureIdentifier (inherited from Infrastructure), one or many
- infrastructureDescription (inherited from Infrastructure)
- infrastructureName (inherited from Infrastructure), zero, one or many

4.43.3.14.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type Facility
- An association to object(s) of type InfrastructureParty
- An association to object(s) of type InfrastructureRelationship

4.43.3.14.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Infrastructure) (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (inherited from Infrastructure) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Infrastructure) (See S5000F UoF Change Information, Para 4.21)
- InfrastructureCompliantItem (inherited from Infrastructure) (See S5000F UoF Facility, Para 4.37)
- ItemUnderExportControl (inherited from Infrastructure) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from Infrastructure) (See S5000F UoF Maintenance Program, Para 4.52)
- SecurityClassificationItem (inherited from Infrastructure) (See S5000F UoF Security Classification, Para 4.79)
- TransportingAsset (See S5000F UoF Transporting Asset, Para 4.93)
- WorkBreakdownContext (inherited from Infrastructure) (See S5000F UoF Work Breakdown, Para 4.97)

4.43.3.14.5 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Infrastructure) (See S5000F UoF Change Request, Para 4.22)
- ContractItem (inherited from Infrastructure) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Infrastructure) (See S5000F UoF Cost Breakdown, Para 4.25)
- ExportControlledItem (inherited from Infrastructure) (See S5000F UoF Export Control License, Para 4.34)
- MaintenanceItem (inherited from Infrastructure) (See S5000F UoF Maintenance Activity, Para 4.48)
- NonAvailabilityCauseItem (inherited from Infrastructure) (See S5000F UoF Availability, Para 4.13)
- ReportContextItem (inherited from Infrastructure) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Infrastructure) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Infrastructure) (See S5000F UoF Safety, Para 4.78)
- ServiceItem (inherited from Infrastructure) (See S5000F UoF Service Request, Para 4.86)
- WarrantyItem (inherited from Infrastructure) (See S5000F UoF Warranty, Para 4.96)

4.44 S5000F UoF Infrastructure Availability

4.44.1 Description

The Infrastructure Availability UoF allows to document what Products or Services can use a specific Infrastructure.

4.44.2 Graphical description

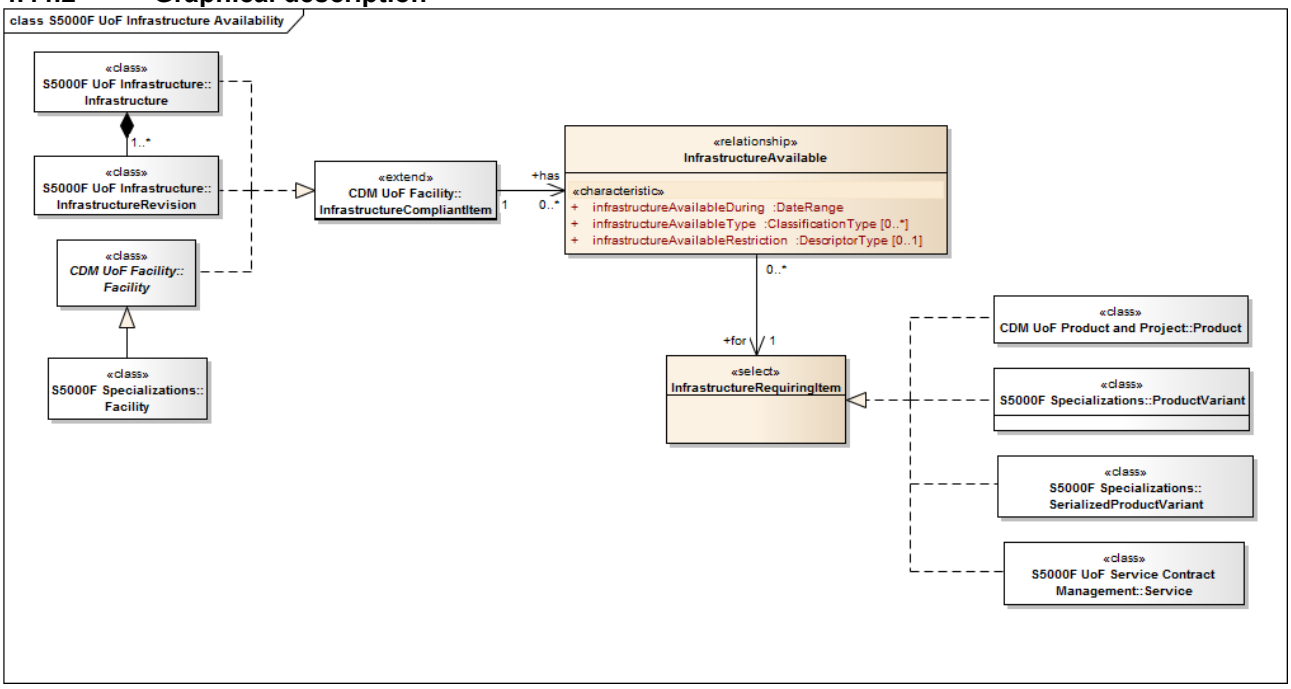


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Fig 56 S5000F UoF Infrastructure Availability

4.44.3 Class definition

4.44.3.1 InfrastructureAvailable

InfrastructureAvailableFor is a <<relationship>> that provides the capability of associating an Infrastructure to items that can use it.

4.44.3.1.1 Attribute(s)

This class has the following attributes:

- infrastructureAvailableDuring
- infrastructureAvailableRestriction, optional
- infrastructureAvailableType, zero, one or many

4.44.3.1.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of InfrastructureRequiringItem

4.44.3.2 InfrastructureRequiringItem

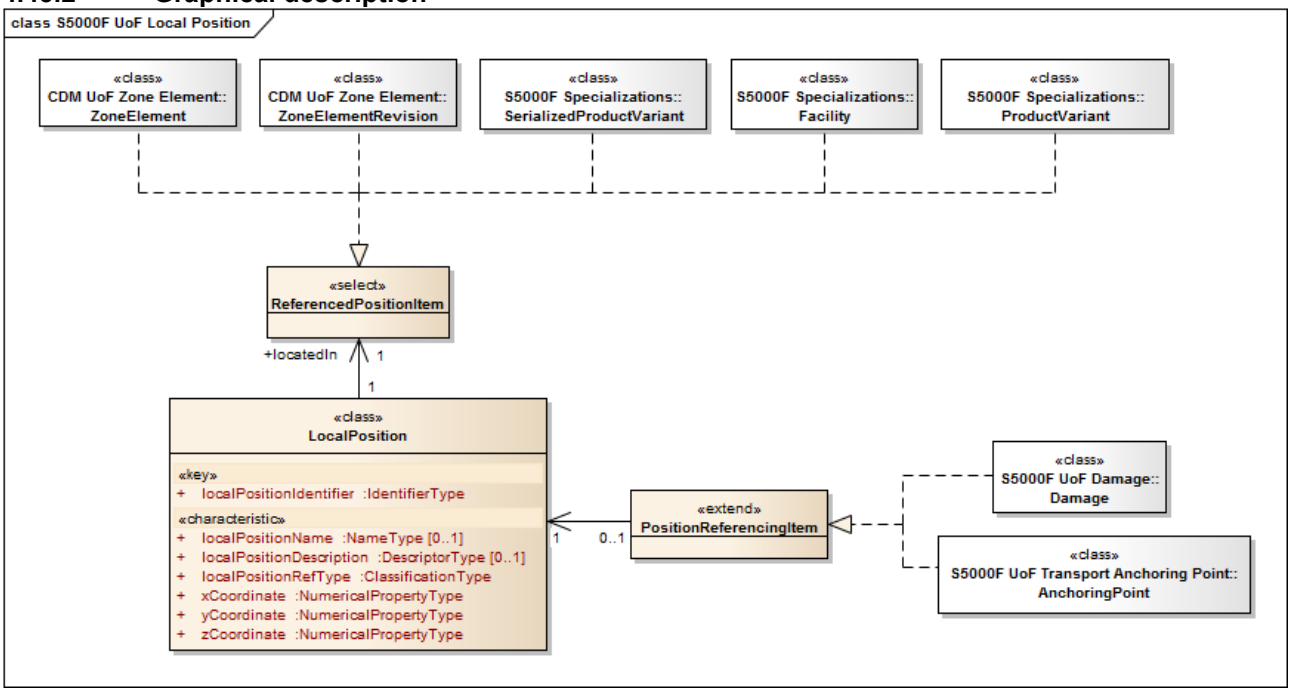
InfrastructureRequiringItem ia a <<select>> interface that defines items requiring an Infrastructure.

4.45 S5000F UoF Local Position

4.45.1 Description

Local Position UoF provides the capability to define the coordinates of a specific spot at a referenced item.

4.45.2 Graphical description



ICN-B6865-5000F15114-001-01

Fig 57 S5000F UoF Local Position

4.45.3 Class definition

4.45.3.1 LocalPosition

LocalPosition is a <<class>> representing the local coordinates that uniquely identify a position within a ZoneElementRevision.

4.45.3.1.1 Attribute(s)

This class has the following attributes:

- localPositionIdentifier
- localPositionDescription, optional

- localPositionName, optional
- localPositionRefType
- xCoordinate
- yCoordinate
- zCoordinate, optional

4.45.3.1.2 Associations

This class has the following associations:

- An association to object(s) from classes that are members of ReferencedPositionItem

4.45.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

- TransportPosition (See S5000F UoF Transporting Asset, Para 4.93)

4.45.3.2 PositionReferencingItem

PositionReferencingItem is an <<extend>> interface that allows to document the LocalPositions of an item.

4.45.3.2.1 Associations

This class has the following associations:

- An association, optional, to object(s) of type LocalPosition

4.45.3.3 ReferencedPositionItem

ReferencedPositionItem is a <<select>> interface that represents the item where a LocalPosition is located.

4.46 S5000F UoF Location, Address and Locator

4.46.1 Description

The Location, Address and Locator UoF provides the capability to specify the physical and functional location of an item.

4.46.2 Graphical description

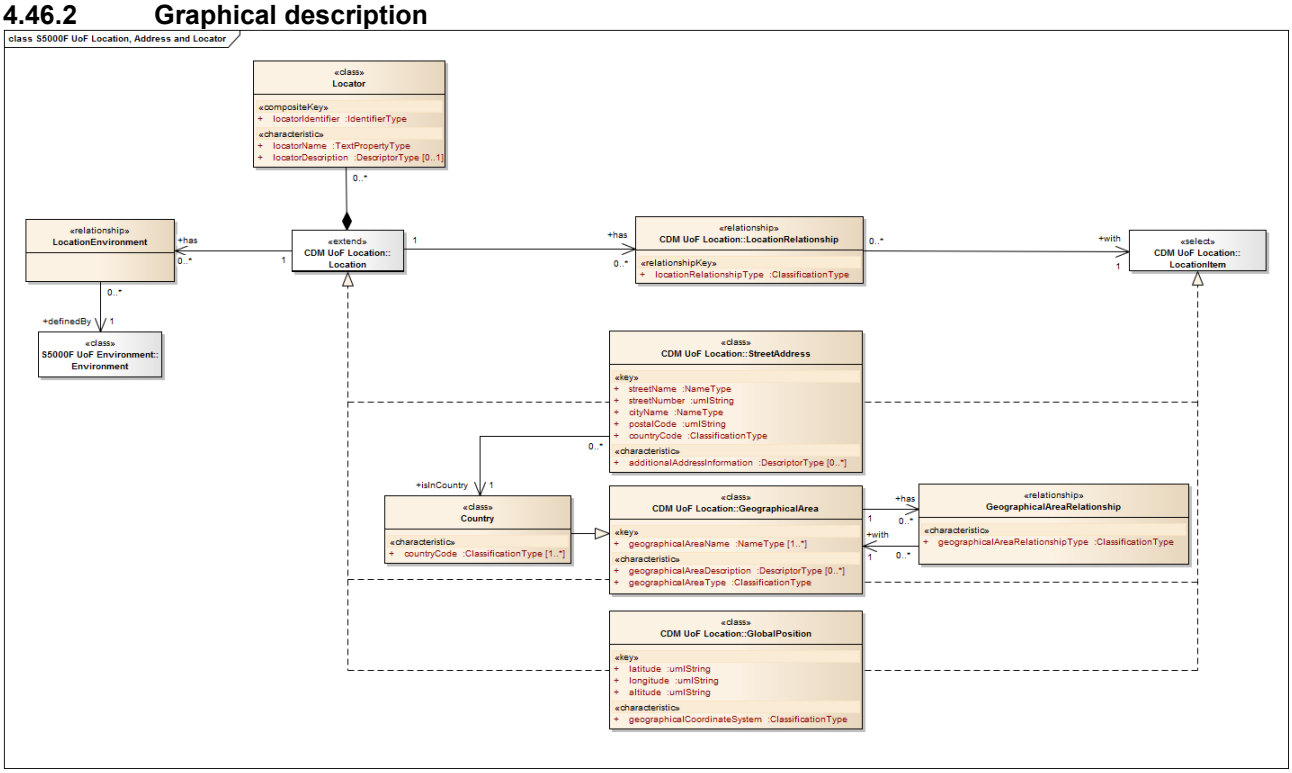


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Fig 58 S5000F UoF Location, Address and Locator

4.46.3 Class definition

4.46.3.1 Country

Country is a GeographicalArea occupied by a nation with its own government.

4.46.3.1.1 Example(s)

- France
- Germany
- USA

4.46.3.1.2 Attribute(s)

This class has the following attributes:

- geographicalAreaName (inherited from GeographicalArea), one or many
- geographicalAreaDescription (inherited from GeographicalArea), zero, one or many
- geographicalAreaType (inherited from GeographicalArea)
- countryCode, one or many

4.46.3.1.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type GeographicalAreaRelationship. Each GeographicalArea can be related to from zero, one or many other GeographicalAreas(via the GeographicalAreaRelationship <<relationship>> class)

4.46.3.1.4 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (inherited from GeographicalArea) (See S5000F UoF Digital File, Para 4.28)
- Location (inherited from GeographicalArea) (See S5000F UoF Location, Address and Locator, Para 4.46)

4.46.3.1.5 Selects

This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (inherited from GeographicalArea) (See S5000F UoF Applicability Statement, Para 4.11)
- LocationItem (inherited from GeographicalArea) (See S5000F UoF Location, Address and Locator, Para 4.46)

4.46.3.2 GeographicalAreaRelationship

GeographicalAreaRelationship is a <<relationship>> that determines how a GeographicalArea is related to another one.

4.46.3.2.1 Example(s)

- belongs to
- is adyacent to
- is south of

4.46.3.2.2 Attribute(s)

This class has the following attributes:

- geographicalAreaRelationshipType

4.46.3.2.3 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Country
- An association, zero, one or many, to object(s) of type GeographicalArea

4.46.3.3 LocationEnvironment

LocationEnvironment is a <<relationship>> that allows to associate a Location to the Environment(s) at that Location.

4.46.3.3.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Environment

4.46.3.4 Locator

Locator is a functional area that indicates where an item is physically placed at a specific location.

Note

Contrary to Location, a Locator cannot be placed on a map and can be reassigned from one location to a different one.

4.46.3.4.1 Example(s)

- Drawer or shelf in a warehouse.
- Location identifier for company department.
- P.O. Box

4.46.3.4.2 Attribute(s)

This class has the following attributes:

- locatorIdentifier
- locatorDescription, optional

– locatorName

4.46.3.4.3 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type Location

4.47 S5000F UoF Logbook

4.47.1 Description

The Logbook Entry UoF provides the registered information about a serialized item.

4.47.2 Graphical description

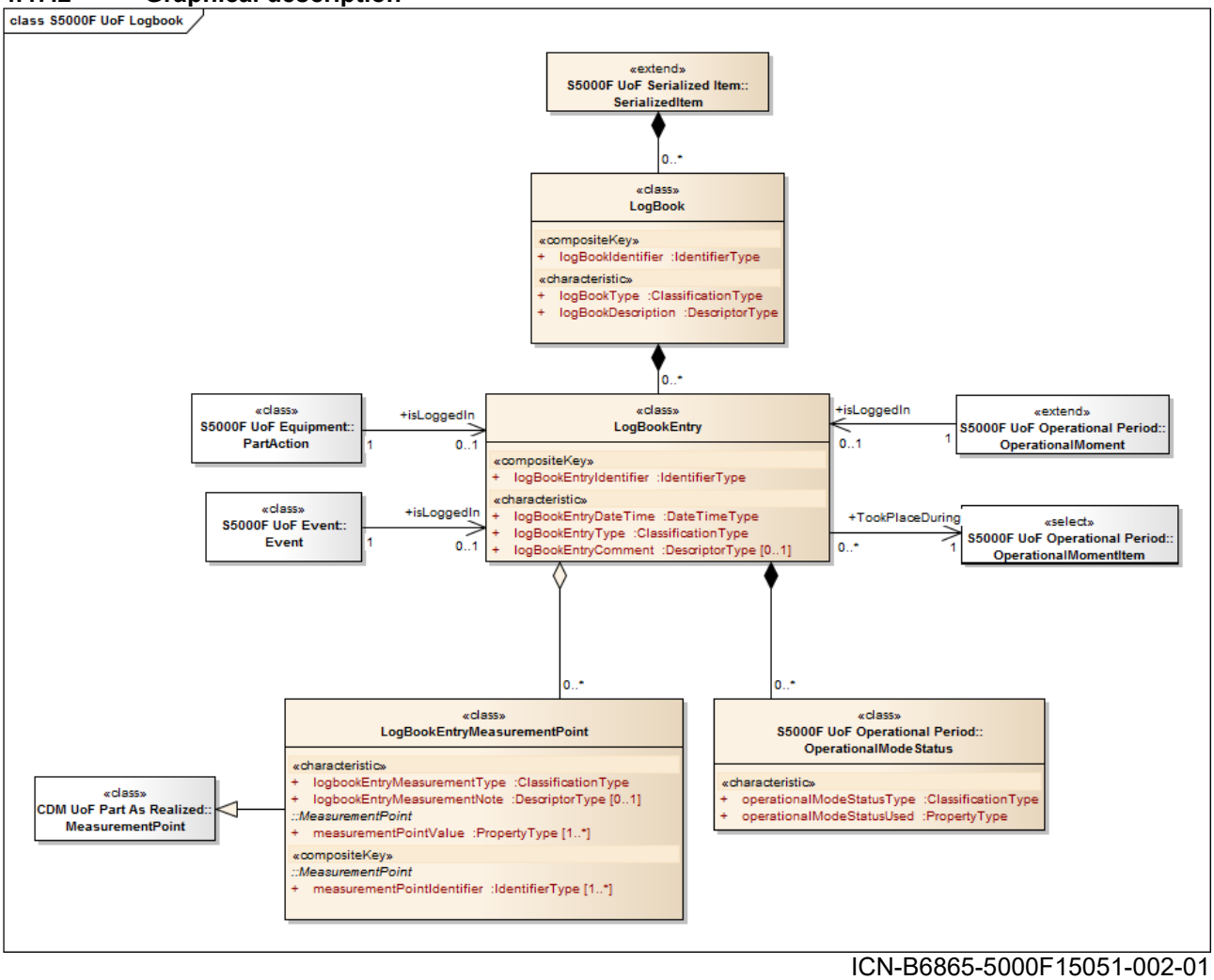

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Fig 59 S5000F UoF Logbook

4.47.3 Class definition

4.47.3.1 LogBook

LogBook is a class that represents a set of records called LogBookEntries that compile critical activities or events that need to be registered for a defined purpose.

4.47.3.1.1 Attribute(s)

This class has the following attributes:

– logBookIdentifier
– logBookDescription

– logBookType

4.47.3.1.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type SerializedItem

4.47.3.2 LogBookEntry

LogBookEntry is an individual entry into a logbook, defining one critical activity or event to be included in the LogBook.

Note

Multiple MeasurementPoints can be associated to a single logbook entry.

Note

A LogBookEntry can be used for operation, maintenance, overhaul, etc.

4.47.3.2.1 Example(s)

– cycles
– flight hours
– landings
– maintenance actions
– operating hours
– overhaul

4.47.3.2.2 Attribute(s)

This class has the following attributes:

– logBookEntryIdentifier
– logBookEntryComment, optional
– logBookEntryDateTime
– logBookEntryType

4.47.3.2.3 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type LogBook
– An association, zero, one or many, to object(s) from classes that are members of OperationalMomentItem

4.47.3.3 LogBookEntryMeasurementPoint

LogBookEntryCounter is the value of a specific Product counter when the logbook entry was performed.

4.47.3.3.1 Attribute(s)

This class has the following attributes:

– measurementPointIdentifier (inherited from MeasurementPoint), one or many
– measurementPointValue (inherited from MeasurementPoint), one or many
– logbookEntryMeasurementNote, optional
– logbookEntryMeasurementType

4.47.3.3.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type MeasurementPointItem
– A composition association, zero, one or many, to child objects of type LogBookEntry

4.47.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (inherited from MeasurementPoint) (See S5000F UoF Digital File, Para 4.28)

4.47.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

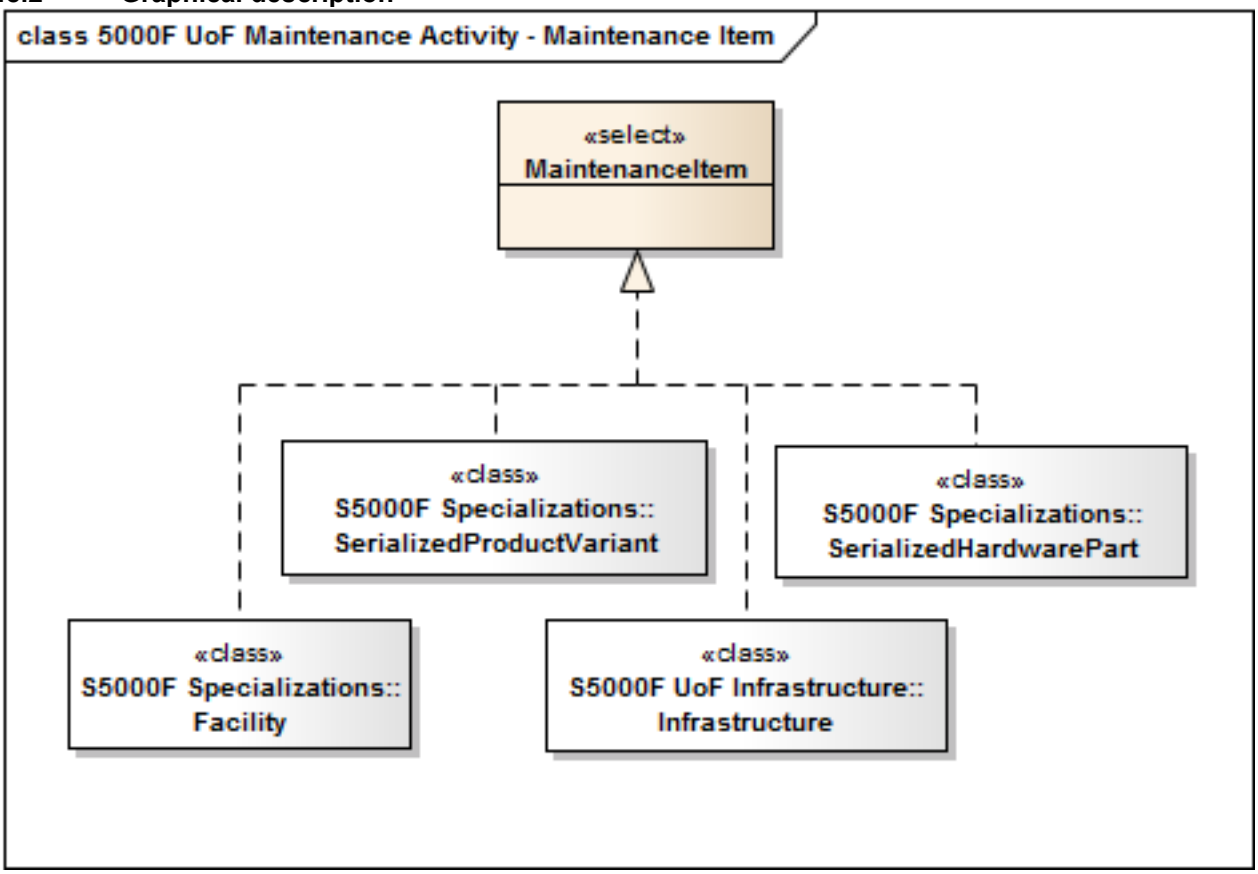
- DigitalFileReferencedItem (inherited from MeasurementPoint) (See S5000F UoF Digital File, Para 4.28)
- ReleasedDataSetItem (inherited from MeasurementPoint) (See S5000F UoF Data Sets, Para 4.27)

4.48 S5000F UoF Maintenance Activity

4.48.1 Description

The Maintenance Activity UoF provides all the necessary information associated to the execution of a maintenance activity.

4.48.2 Graphical description



ICN-B6865-SXXXXX-XXX-01

Fig 60 S5000F UoF Maintenance Activity - Maintenance Item

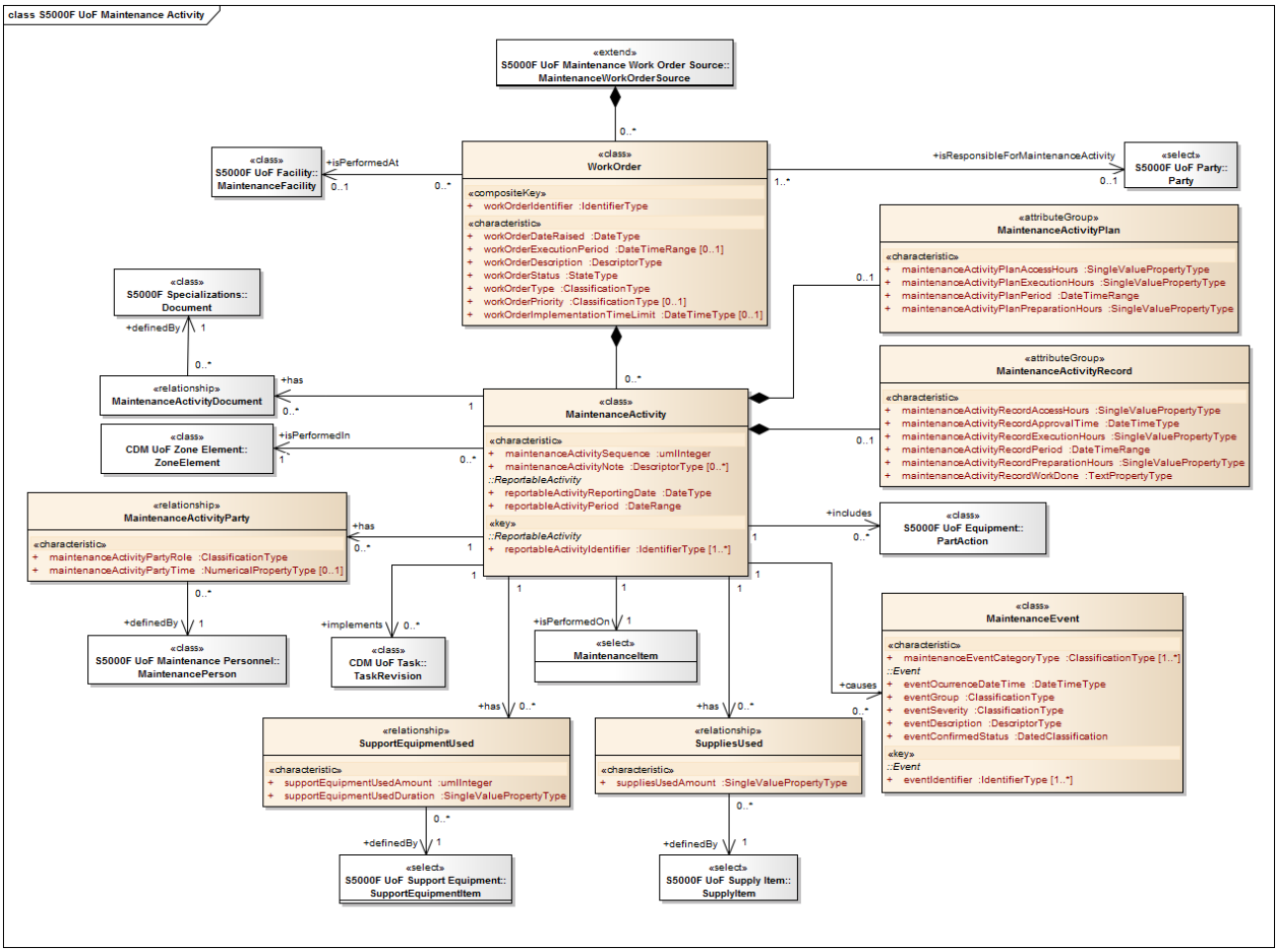


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Fig 61 S5000F UoF Maintenance Activity

4.48.3 Class definition

4.48.3.1 MaintenanceActivity

MaintenanceActivity is a ReportableActivity that is associated to a maintenance task.

4.48.3.1.1 Attribute(s)

This class has the following attributes:

- reportableActivityIdentifier (inherited from ReportableActivity), one or many
- reportableActivityPeriod (inherited from ReportableActivity)
- reportableActivityReportingDate (inherited from ReportableActivity)
- maintenanceActivityNote, zero, one or many
- maintenanceActivitySequence

4.48.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An aggregate association, zero, one or many, to related object(s) of type WorkOrder
- A composition association, zero, one or many, to child objects of type WorkItem
- An association to object(s) of type MaintenanceActivityDocument
- An association to object(s) of type MaintenanceActivityParty
- An association to object(s) of type MaintenanceEvent

- An association to object(s) of type PartAction
- An association to object(s) of type SuppliesUsed. A MaintenanceActivity can use zero, one or many items implementing the SupplyItem <<interface>> via the SuppliesUsed <<relationship>>
- An association to object(s) of type SupportEquipmentUsed. A MaintenanceActivity can be associated to zero, one or many SupportEquipments that it has used
- An association to object(s) of type TaskRevision
- An association, zero, one or many, to object(s) of type ZoneElement
- An association to object(s) from classes that are members of MaintenanceItem. A MaintenanceActivity is always performed on an instance of a class implementing the SerializedItem <<interface>>
- An association, zero, one or many, to object(s) from classes that are members of Party

4.48.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestReasonItem (See S5000F UoF Change Request, Para 4.22)
- CostEntryItem (inherited from ReportableActivity) (See S5000F UoF Cost Breakdown, Para 4.25)
- ReportableItem (inherited from ReportableActivity) (See S5000F UoF Report, Para 4.73)

4.48.3.2 MaintenanceActivityDocument

MaintenanceActivityDocument is a <<relationship>> that allows to associate documents (relating) to a MaintenanceActivity requiring them (related).

4.48.3.2.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Document
- An association, zero, one or many, to object(s) of type ExportControlRegulation
- An association, zero, one or many, to object(s) of type ExternalDocument
- An association, zero, one or many, to object(s) of type FleetTaskCancellationNotice
- An association, zero, one or many, to object(s) of type MaintenanceProgram
- An association, zero, one or many, to object(s) of type PoliciesAndRegulations
- An association, zero, one or many, to object(s) of type Report
- An association, zero, one or many, to object(s) of type SafetyDocument
- An association, zero, one or many, to object(s) of type SafetyIssue
- An association, zero, one or many, to object(s) of type SafetyRequirementsDocument
- An association, zero, one or many, to object(s) of type SafetyWarning
- An association, zero, one or many, to object(s) of type SCORMContentPackage
- An association, zero, one or many, to object(s) of type ServiceBulletin
- An association, zero, one or many, to object(s) of type SpecialSafetyInstruction

4.48.3.3 MaintenanceActivityParty

MaintenanceActivityParty is a <<relationship>> that allows to associate a MaintenanceActivity to the person who is going to carry out the MaintenanceActivity.

4.48.3.3.1 Attribute(s)

This class has the following attributes:

- maintenanceActivityPartyRole
- maintenanceActivityPartyTime, optional

4.48.3.3.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type MaintenancePerson

4.48.3.4 MaintenanceActivityPlan

MaintenanceActivityPlan is an <<attributeGroup>> that details the information associated to the planning of a MaintenanceActivity.

4.48.3.4.1 Attribute(s)

This class has the following attributes:

- maintenanceActivityPlanAccessHours
- maintenanceActivityPlanExecutionHours
- maintenanceActivityPlanPeriod
- maintenanceActivityPlanPreparationHours

4.48.3.4.2 Associations

This class has the following associations:

- An aggregate association, optional, to related object(s) of type MaintenanceActivity

4.48.3.5 MaintenanceActivityRecord

MaintenanceActivityRecord is an <<attributeGroup>> that details the information associated to the execution of a MaintenanceActivity.

4.48.3.5.1 Attribute(s)

This class has the following attributes:

- maintenanceActivityRecordAccessHours
- maintenanceActivityRecordApprovalTime
- maintenanceActivityRecordExecutionHours
- maintenanceActivityRecordPeriod
- maintenanceActivityRecordPreparationHours
- maintenanceActivityRecordWorkDone

4.48.3.5.2 Associations

This class has the following associations:

- An aggregate association, optional, to related object(s) of type MaintenanceActivity

4.48.3.6 MaintenanceEvent

MaintenanceEvent is an event that consists in the realization of one or several maintenance activities or occurs as the result of a maintenance activity.

4.48.3.6.1 Attribute(s)

This class has the following attributes:

- eventIdentifier (inherited from Event), one or many
- eventConfirmedStatus (inherited from Event)
- eventDescription (inherited from Event)
- eventGroup (inherited from Event)
- eventOcurrenceDateTime (inherited from Event)
- eventSeverity (inherited from Event)
- maintenanceEventCategoryType, one or many

4.48.3.6.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type LogBookEntry
- An association to object(s) of type DownTimePeriod
- An association to object(s) of type EventAffectedBreakdownElement

- An association to object(s) of type EventExplanation. An Event can be associated to zero, one or many ExplanatoryFactors
- An association to object(s) of type EventRelationship
- An association to object(s) of type EventRelationshipItem
- An association to object(s) of type EventReporter
- An association to object(s) of type LogBookEntry. An Event instance can be optionally logged in a LogBookEntry instance
- An association, zero, one or many, to object(s) of type ProductUsagePhase

4.48.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (inherited from Event) (See S5000F UoF Digital File, Para 4.28)
- MaintenanceWorkOrderSource (inherited from Event) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Event) (See S5000F UoF Security Classification, Para 4.79)

4.48.3.6.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestReasonItem (inherited from Event) (See S5000F UoF Change Request, Para 4.22)
- DigitalFileReferencedItem (inherited from Event) (See S5000F UoF Digital File, Para 4.28)
- NonAvailabilityCauseItem (inherited from Event) (See S5000F UoF Availability, Para 4.13)
- ReportContextItem (inherited from Event) (See S5000F UoF Report, Para 4.73)

4.48.3.7 MaintenanceItem

MaintenanceItem is a <<select interface>> that allows to select an item of a specific type that can be maintained.

4.48.3.8 SuppliesUsed

SuppliesUsed is a <<relationship>> that describes the amount of supplies used for a MaintenanceActivity.

4.48.3.8.1 Attribute(s)

This class has the following attributes:

- suppliesUsedAmount

4.48.3.8.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of SupplyItem

4.48.3.9 SupportEquipment

SupportEquipment is a HardwareElement used exclusively for support purposes.

4.48.3.9.1 Example(s)

- Automatic Test Equipment (ATE)
- borescope
- hoisting device
- oscilloscope
- tester
- tow bar

4.48.3.9.2 Attribute(s)

This class has the following attributes:

- partIdentifier (inherited from PartAsDesigned), one or many
- partDimensions (inherited from HardwarePartAsDesigned), optional
- partExportControl (inherited from HardwarePartAsDesigned), optional
- partMajorComponent (inherited from HardwarePartAsDesigned), optional
- partName (inherited from PartAsDesigned), one or many
- partWeight (inherited from HardwarePartAsDesigned), optional
- supportEquipmentCalibrationRequired, optional
- supportEquipmentPower, zero, one or many
- supportEquipmentType

4.48.3.9.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type Facility
- A composition association, zero, one or many, to child objects of type MaintenanceFacility
- A composition association, zero, one or many, to child objects of type OperatingBase
- A composition association, zero, one or many, to child objects of type OtherFacility
- A composition association, zero, one or many, to child objects of type ParkingFacility
- A composition association, zero, one or many, to child objects of type Warehouse
- An association to object(s) of type AlternatePartAsDesigned
- An association to object(s) of type ContainedSubstance

4.48.3.9.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from AlternatePartAsDesigned) (See S5000F UoF Change Information, Para 4.21)
- ChangeControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (inherited from HardwarePartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ItemUnderExportControl (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- TrackablePart (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)

- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

4.48.3.9.5 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductOperationalConfigurationItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ExportControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control License, Para 4.34)
- MessageContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Message, Para 4.55)
- ObsolescenceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReportContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Resource Usage Request, Para 4.77)
- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ServiceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Service Request, Para 4.86)
- SupplyItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Supply Item, Para 4.89)
- SupportEquipmentItem (See S5000F UoF Support Equipment, Para 4.90)
- TransportableItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)

4.48.3.10 SupportEquipmentUsed

SupportEquipmentUsed is a <<relationship>> that defines the equipment that has been used to perform a specific MaintenanceActivity.

4.48.3.10.1 Attribute(s)

This class has the following attributes:

- supportEquipmentUsedAmount
- supportEquipmentUsedDuration

4.48.3.10.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of SupportEquipmentItem

4.48.3.11 WorkOrder

WorkOrder is an instruction to perform maintenance work on a SerializedItem.

4.48.3.11.1 Attribute(s)

This class has the following attributes:

- workOrderIdentifier
- workOrderDateRaised
- workOrderDescription
- workOrderExecutionPeriod, optional
- workOrderImplementationTimeLimit, optional
- workOrderPriority, optional
- workOrderStatus
- workOrderType

4.48.3.11.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type MaintenanceWorkOrderSource
- An association to object(s) of type TechnicalOrderEmbodied
- An association, zero, one or many, to object(s) of type MaintenanceFacility
- An association, one or many, to object(s) from classes that are members of Party. A WorkOrder has an optional association with a Person or Organization implementing the Party <<interface>> that is responsible for the MaintenanceActivities associated to that WorkOrder

4.48.3.11.3 Implementations

This class implements the following <<extend>> interfaces:

- MaintenanceWorkOrderSource (See S5000F UoF Maintenance Work Order Source, Para 4.53)

4.48.3.11.4 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- ReportableItem (See S5000F UoF Report, Para 4.73)

4.49 S5000F UoF Maintenance Facility Planning

4.49.1 Description

The Maintenance Facility Planning UoF provides the necessary information about the Products that can be maintained at one specific facility, as well as the available maintenance slots.

4.49.2 Graphical description

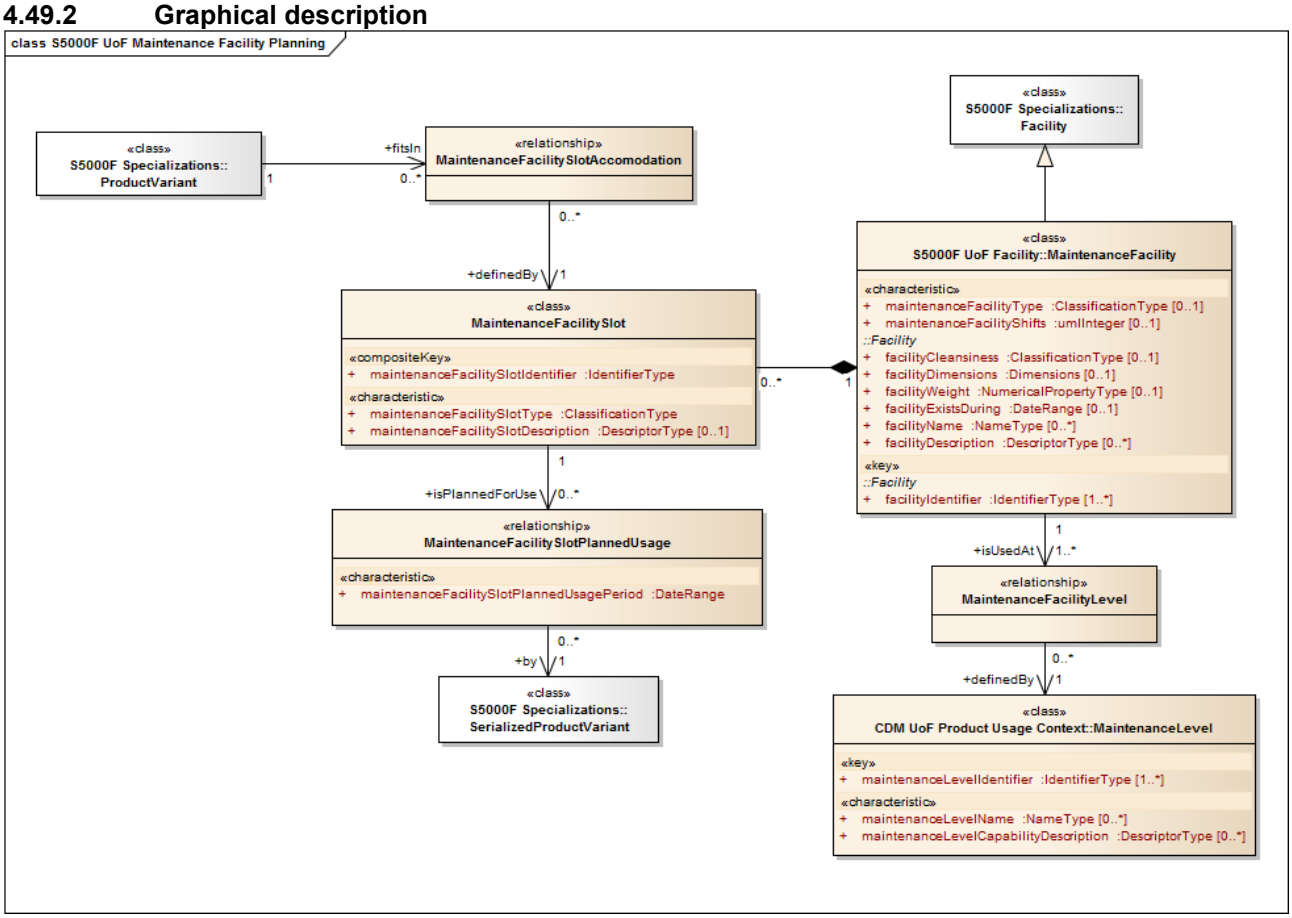

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Fig 62 S5000F UoF Maintenance Facility Planning

4.49.3 Class definition

4.49.3.1 MaintenanceFacilityLevel

MaintenanceFacilityLevel is a <<relationship> that defines the MaintenanceLevels of a Facility.

4.49.3.1.1 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type MaintenanceLevel

4.49.3.2 MaintenanceFacilitySlot

MaintenanceFacilitySlot is a fixed position within a MaintenanceFacility in which exactly one SerializedProductVariant can be accommodated.

4.49.3.2.1 Attribute(s)

This class has the following attributes:

– maintenanceFacilitySlotIdentifier
– maintenanceFacilitySlotDescription, optional
– maintenanceFacilitySlotType

4.49.3.2.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type MaintenanceFacility

– An association to object(s) of type MaintenanceFacilitySlotPlannedUsage

4.49.3.3 MaintenanceFacilitySlotAccomodation
MaintenanceFacilitySlotAccomodation is a <<relationship>> that defines which ProductVariants can be accommodated in a specific MaintenanceFacilitySlot.

4.49.3.3.1 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) of type MaintenanceFacilitySlot

4.49.3.4 MaintenanceFacilitySlotPlannedUsage
MaintenanceFacilitySlotPlannedUsage is a <<relationship>> that indicates the planned allocation of a MaintenanceFacilitySlot to a specific SerializedProductVariant.

4.49.3.4.1 Attribute(s)
This class has the following attributes:

– maintenanceFacilitySlotPlannedUsagePeriod

4.49.3.4.2 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) of type SerializedProductVariant

4.50 S5000F UoF Maintenance Organization

4.50.1 Description

The Maintenance Organization UoF provides the necessary information about the accreditations of a maintenance organization as well as the type of ProductVariants that it can maintain.

4.50.2 Graphical description

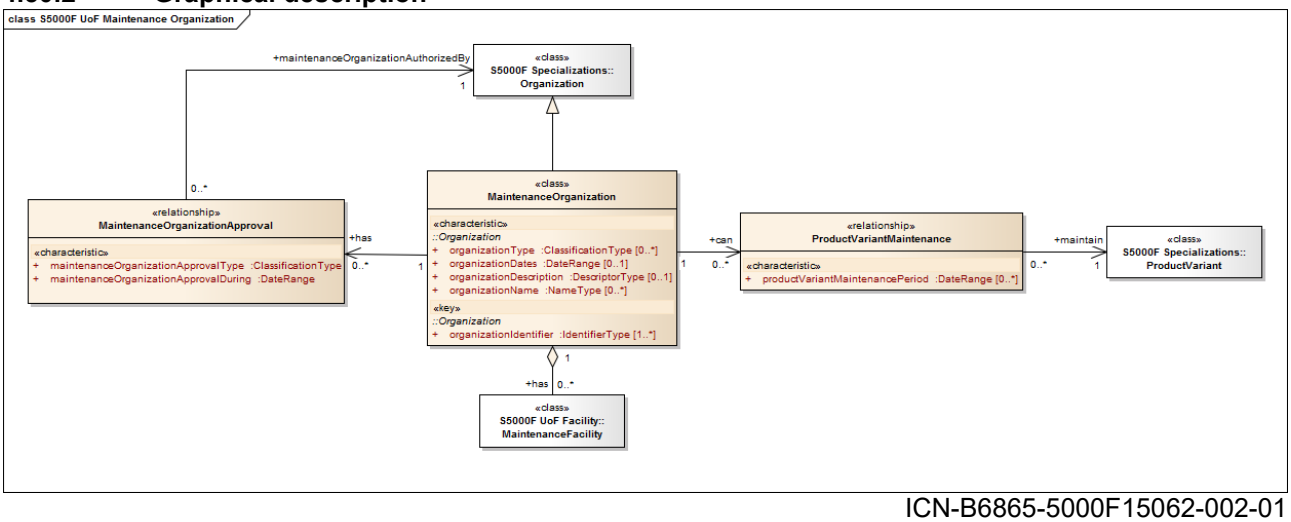

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Fig 63 S5000F UoF Maintenance Organization

4.50.3 Class definition

4.50.3.1 MaintenanceOrganization
MaintenanceOrganization is an organization approved to perform maintenance tasks on a specific set of Products or ProductVariants.

4.50.3.1.1 Attribute(s)
This class has the following attributes:

- organizationIdentifier (inherited from Organization), one or many
- organizationDates (inherited from Organization), optional
- organizationDescription (inherited from Organization), optional
- organizationName (inherited from Organization), zero, one or many
- organizationType (inherited from Organization), zero, one or many

4.50.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type MaintenanceOrganizationApproval
- An association to object(s) of type ProductVariantMaintenance

4.50.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Organization) (See S5000F UoF Applicability Statement, Para 4.11)
- BudgetingItem (inherited from Organization) (See S5000F UoF Budget, Para 4.15)
- CostBreakdownContext (inherited from Organization) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (inherited from Organization) (See S5000F UoF Digital File, Para 4.28)
- OrganizationalBreakdownStructure (inherited from Organization) (See S5000F UoF Organizational Breakdown Structure, Para 4.64)
- PartyItem (inherited from Organization) (See S5000F UoF Party, Para 4.66)
- PoliciesAndRegulationsCompliantItem (inherited from Organization) (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityAssignmentParty (inherited from Organization) (See S5000F UoF Security Classification, Para 4.79)

4.50.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (inherited from Organization) (See S5000F UoF Applicability Statement, Para 4.11)
- CostEntryItem (inherited from Organization) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Organization) (See S5000F UoF Digital File, Para 4.28)
- FacilityOperatorItem (inherited from Organization) (See S5000F UoF Facility, Para 4.37)
- LegalParty (inherited from Organization) (See S5000F UoF Project and Contract, Para 4.71)
- MessagePartyItem (inherited from Organization) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityAttribution (inherited from Organization) (See S5000F UoF Availability, Para 4.13)
- NonAvailabilityCauseItem (inherited from Organization) (See S5000F UoF Availability, Para 4.13)
- Party (inherited from Organization) (See S5000F UoF Party, Para 4.66)
- ReportContextItem (inherited from Organization) (See S5000F UoF Report, Para 4.73)
- ReportingParty (inherited from Organization) (See S5000F UoF Report, Para 4.73)
- SafetyItem (inherited from Organization) (See S5000F UoF Safety, Para 4.78)
- SubjectOfPoliciesAndRegulations (inherited from Organization) (See S5000F UoF Policies and Regulations, Para 4.68)

4.50.3.2 MaintenanceOrganizationApproval

MaintenanceOrganizationApproval is a <<relationship>> that identifies the authorization of an Organization to operate as a Maintenanceorganization for a specific period of time.

4.50.3.2.1 Attribute(s)

This class has the following attributes:

- maintenanceOrganizationApprovalDuring
- maintenanceOrganizationApprovalType

4.50.3.2.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type MaintenanceOrganization
- An association, zero, one or many, to object(s) of type OperatorOrganization
- An association, zero, one or many, to object(s) of type Organization

4.50.3.3 ProductVariantMaintenance

ProductVariantMaintenance is a <<relationship>> allowing to associate a MaintenanceOrganisation (relating) to the ProductVariants it can maintain (related).

4.50.3.3.1 Attribute(s)

This class has the following attributes:

- productVariantMaintenancePeriod, zero, one or many

4.50.3.3.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type ProductVariant

4.51 S5000F UoF Maintenance Personnel

4.51.1 Description

Maintenance Personnel UoF provides the necessary information associated to maintenance staff.

4.51.2 Graphical description

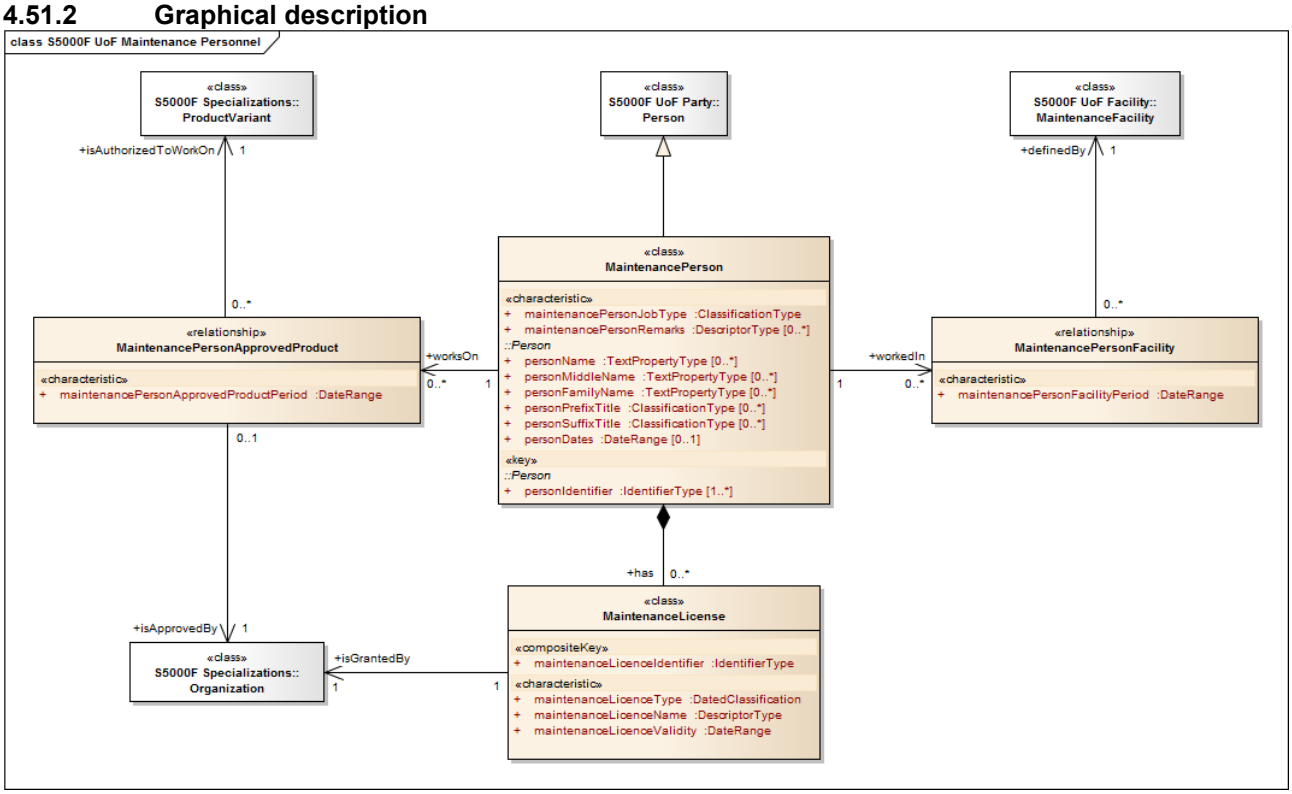

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Fig 64 S5000F UoF Maintenance Personnel

4.51.3 Class definition

4.51.3.1 MaintenanceLicense

MaintenanceLicense is a class representing the authorization of an authority to a MaintenancePerson to perform specific maintenance tasks.

4.51.3.1.1 Example(s)

– B1 aircraft maintenance license.

4.51.3.1.2 Attribute(s)

This class has the following attributes:

– maintenanceLicenceIdentifier
– maintenanceLicenceName
– maintenanceLicenceType
– maintenanceLicenceValidity

4.51.3.1.3 Associations

This class has the following associations:

– An aggregate association, has, zero, one or many, to related object(s) of type MaintenancePerson
– An association to object(s) of type MaintenanceOrganization
– An association to object(s) of type OperatorOrganization
– An association to object(s) of type Organization

4.51.3.2 MaintenancePerson

MaintenancePerson is a person with the skills to be able to perform maintenance activities.

4.51.3.2.1 Attribute(s)

This class has the following attributes:

- personIdentifier (inherited from Person), one or many
- personDates (inherited from Person), optional
- personFamilyName (inherited from Person), zero, one or many
- personMiddleName (inherited from Person), zero, one or many
- personName (inherited from Person), zero, one or many
- personPrefixTitle (inherited from Person), zero, one or many
- personSuffixTitle (inherited from Person), zero, one or many
- maintenancePersonJobType
- maintenancePersonRemarks, zero, one or many

4.51.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type MaintenancePersonApprovedProduct
- An association to object(s) of type MaintenancePersonFacility
- An association to object(s) of type PersonGroup

4.51.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- PartyItem (inherited from Person) (See S5000F UoF Party, Para 4.66)
- PersonCompetenceItem (inherited from Person) (See S5000F UoF Person Competences and Labor Rates, Para 4.67)
- SecurityAssignmentParty (inherited from Person) (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures (inherited from Person) (See S5000F UoF Transportable Item, Para 4.92)

4.51.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (inherited from Person) (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (inherited from Person) (See S5000F UoF Failure Detection and Location, Para 4.38)
- LegalParty (inherited from Person) (See S5000F UoF Project and Contract, Para 4.71)
- MessagePartyItem (inherited from Person) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityAttribution (inherited from Person) (See S5000F UoF Availability, Para 4.13)
- Party (inherited from Person) (See S5000F UoF Party, Para 4.66)
- ReportingParty (inherited from Person) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Person) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Person) (See S5000F UoF Safety, Para 4.78)
- TransportableItem (inherited from Person) (See S5000F UoF Transportable Item, Para 4.92)

4.51.3.3 MaintenancePersonApprovedProduct

MaintenancePersonApprovedProduct is a <<relationship>> that defines which MaintenancePersons have been approved to carry out maintenance on specific ProductVariants, possibly with a specific approval by an organization.

4.51.3.3.1 Attribute(s)

This class has the following attributes:

– maintenancePersonApprovedProductPeriod

4.51.3.3.2 Associations

This class has the following associations:

– An association, optional, to object(s) of type MaintenanceOrganization
– An association, optional, to object(s) of type OperatorOrganization
– An association, optional, to object(s) of type Organization
– An association, zero, one or many, to object(s) of type ProductVariant

4.51.3.4 MaintenancePersonFacility

MaintenancePersonFacility is a <<relationship>> that documents the MaintenanceFacility where a MaintenancePerson is working during a specific period of time.

4.51.3.4.1 Attribute(s)

This class has the following attributes:

– maintenancePersonFacilityPeriod

4.51.3.4.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type MaintenanceFacility

4.52 S5000F UoF Maintenance Program

4.52.1 Description

The Maintenance Program UoF provides the capability to define a maintenance program for an item, either by the OEM or a tailored one by a maintenance organization.

4.52.2 Graphical description

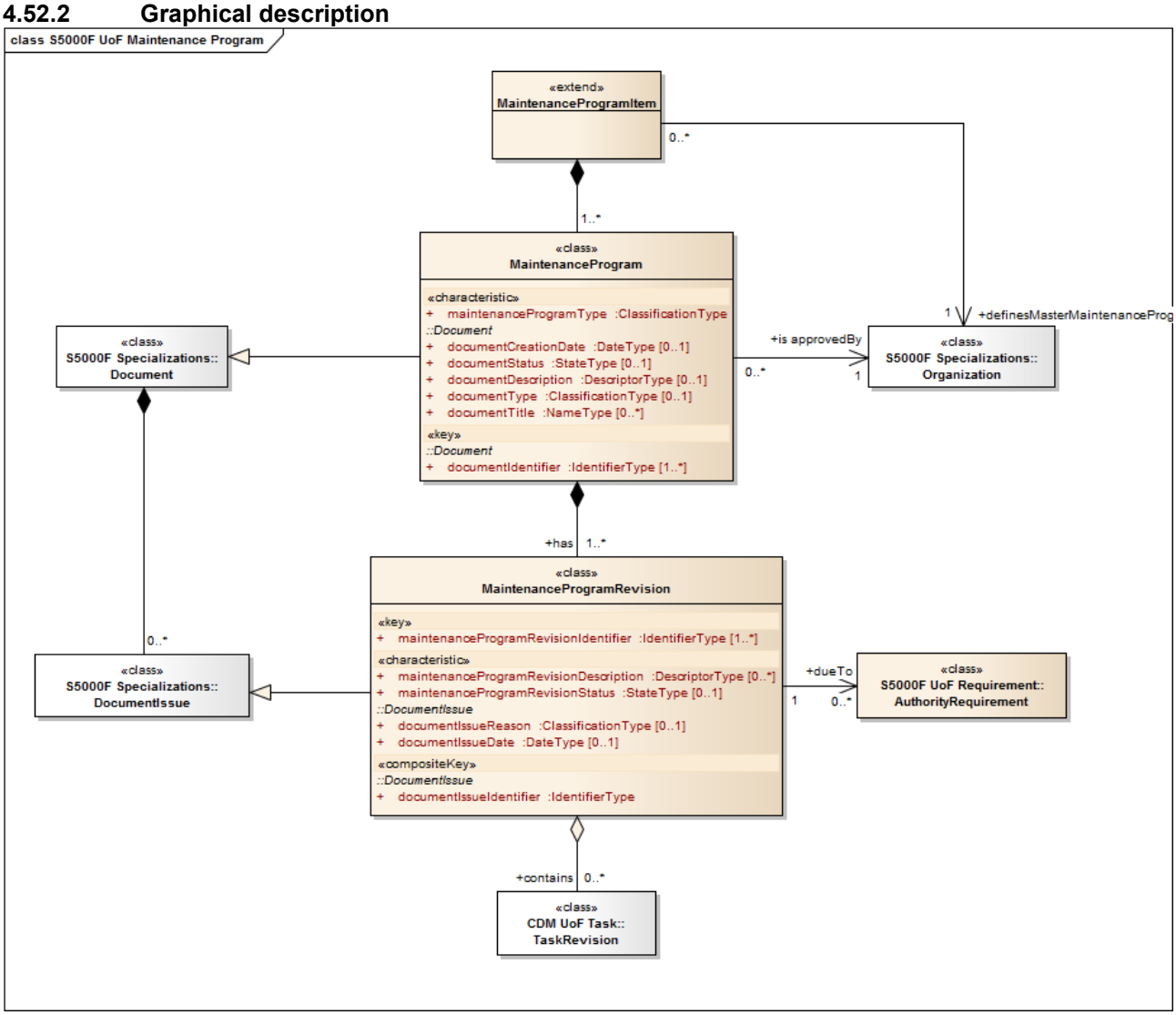

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Fig 65 S5000F UoF Maintenance Program

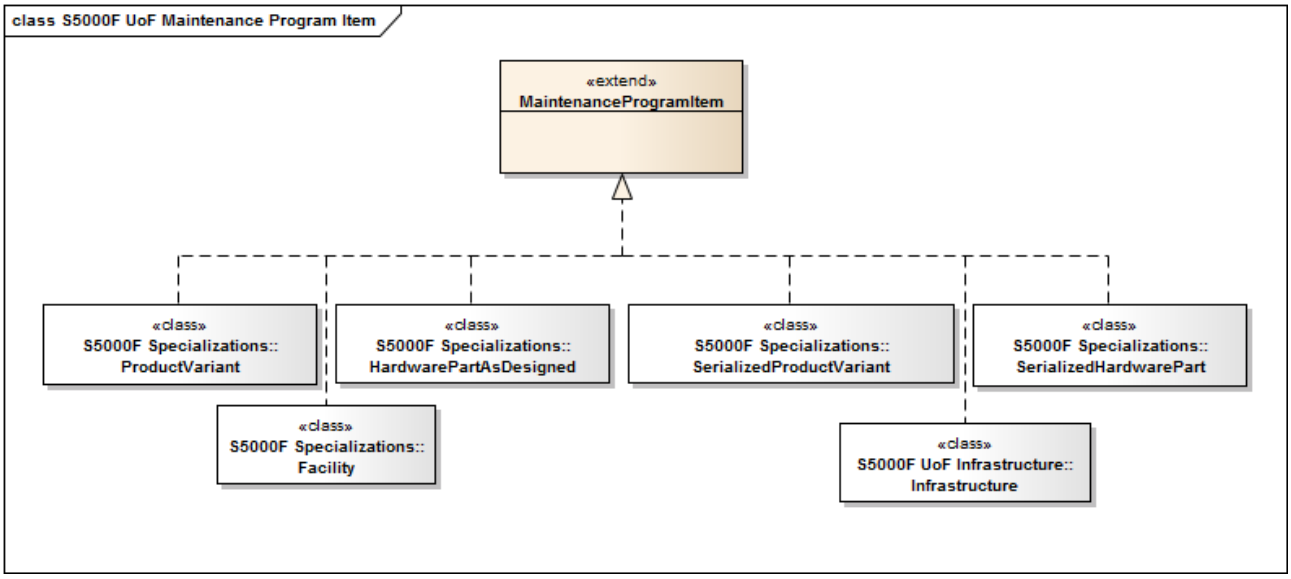

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Fig 66 S5000F UoF Maintenance Program Item

4.52.3 Class definition

4.52.3.1 MaintenanceProgram

MaintenanceProgram is a class that represents a set of TaskRequirements that must be applied to a ProductVariant so as to maintain the ProductVariant in an operational state.

4.52.3.1.1 Example(s)

- OEM maintenance program
- Operator maintenance program

4.52.3.1.2 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentCreationDate (inherited from Document), optional
- documentDescription (inherited from Document), optional
- documentStatus (inherited from Document), optional
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- maintenanceProgramType

4.52.3.1.3 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type MaintenanceProgramItem
- An association to object(s) of type DocumentRelationship
- An association, zero, one or many, to object(s) of type MaintenanceOrganization. Each MaintenanceProgram can be associated to the Organization that has approved it
- An association, zero, one or many, to object(s) of type OperatorOrganization. Each MaintenanceProgram can be associated to the Organization that has approved it
- An association, zero, one or many, to object(s) of type Organization. Each MaintenanceProgram can be associated to the Organization that has approved it

4.52.3.1.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceWorkOrderSource (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.52.3.1.5 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)
- SafetyItem (See S5000F UoF Safety, Para 4.78)

4.52.3.2 MaintenanceProgramItem

MaintenanceProgramItem is an <<extend>> interface that allows to associate a MaintenanceProgram to an item.

4.52.3.2.1 Example(s)

- equipment
- facility
- individual aircraft
- power grid
- ship

4.52.3.2.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type MaintenanceOrganization
- An association, zero, one or many, to object(s) of type OperatorOrganization
- An association, zero, one or many, to object(s) of type Organization

4.52.3.3 MaintenanceProgramRevision

MaintenanceProgramRevision is an iteration of a MaintenanceProgram.

4.52.3.3.1 Attribute(s)

This class has the following attributes:

- maintenanceProgramRevisionIdentifier, one or many
- documentIssueIdentifier (inherited from DocumentIssue)
- documentIssueDate (inherited from DocumentIssue), optional
- documentIssueReason (inherited from DocumentIssue), optional
- maintenanceProgramRevisionDescription, zero, one or many
- maintenanceProgramRevisionStatus, optional

4.52.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type Document

- An aggregate association, has, one or many, to related object(s) of type MaintenanceProgram
- An association to object(s) of type AuthorityRequirement

4.52.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- ChangeControlledItem (inherited from DocumentIssue) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from DocumentIssue) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from DocumentIssue) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from DocumentIssue) (See S5000F UoF Export Control Requirement, Para 4.35)

4.52.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

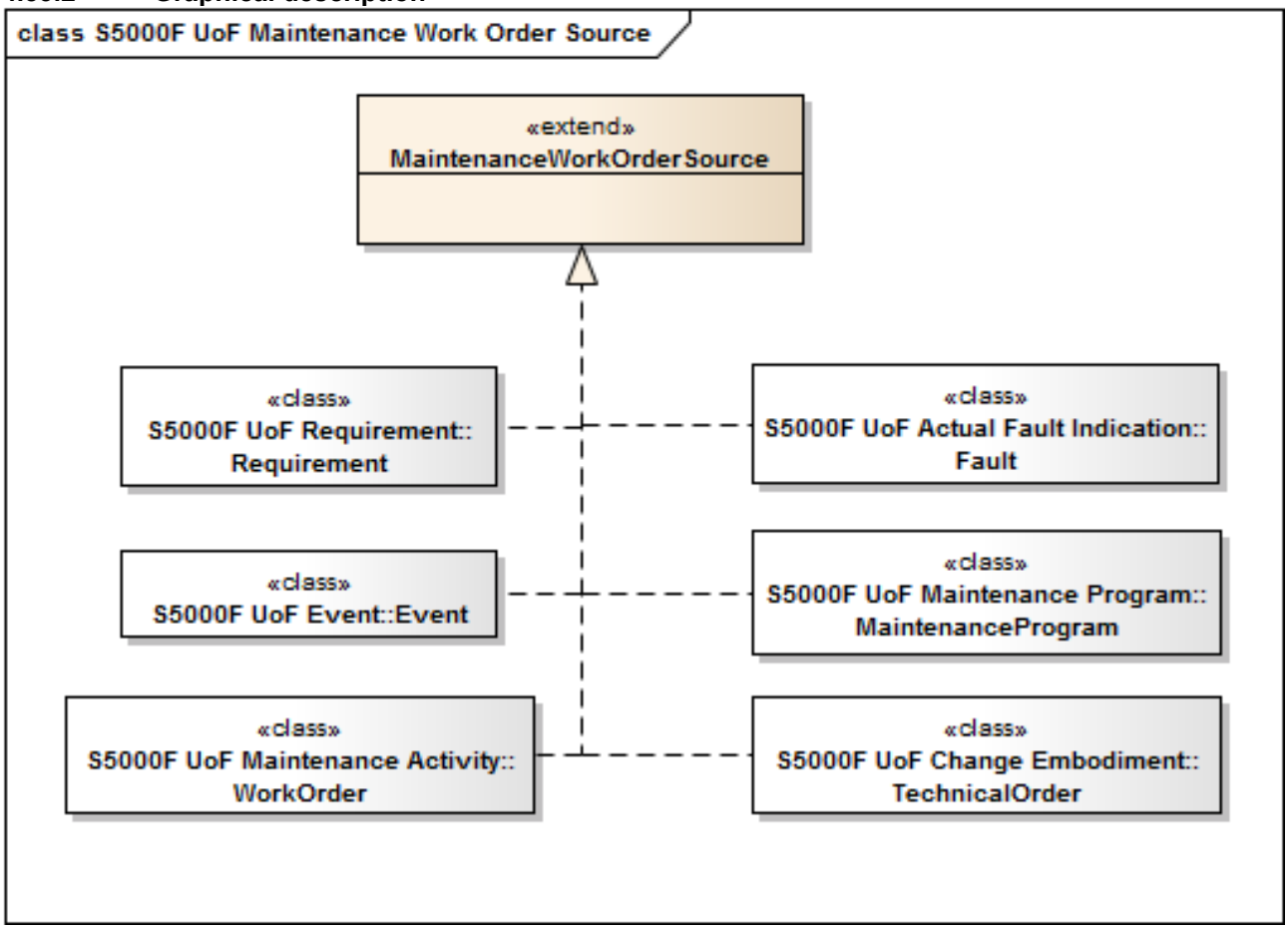
- ChangeRequestItem (inherited from DocumentIssue) (See S5000F UoF Change Request, Para 4.22)
- DigitalFileReferencedItem (inherited from DocumentIssue) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from DocumentIssue) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from DocumentIssue) (See S5000F UoF Export Control License, Para 4.34)

4.53 S5000F UoF Maintenance Work Order Source

4.53.1 Description

The Maintenance Work Order Source UoF provides the necessary information to define the source of a WorkOrder.

4.53.2 Graphical description



ICN-B6865-5000F15025-002-01

Fig 67 S5000F UoF Maintenance Work Order Source

4.53.3 Class definition

4.53.3.1 MaintenanceWorkOrderSource

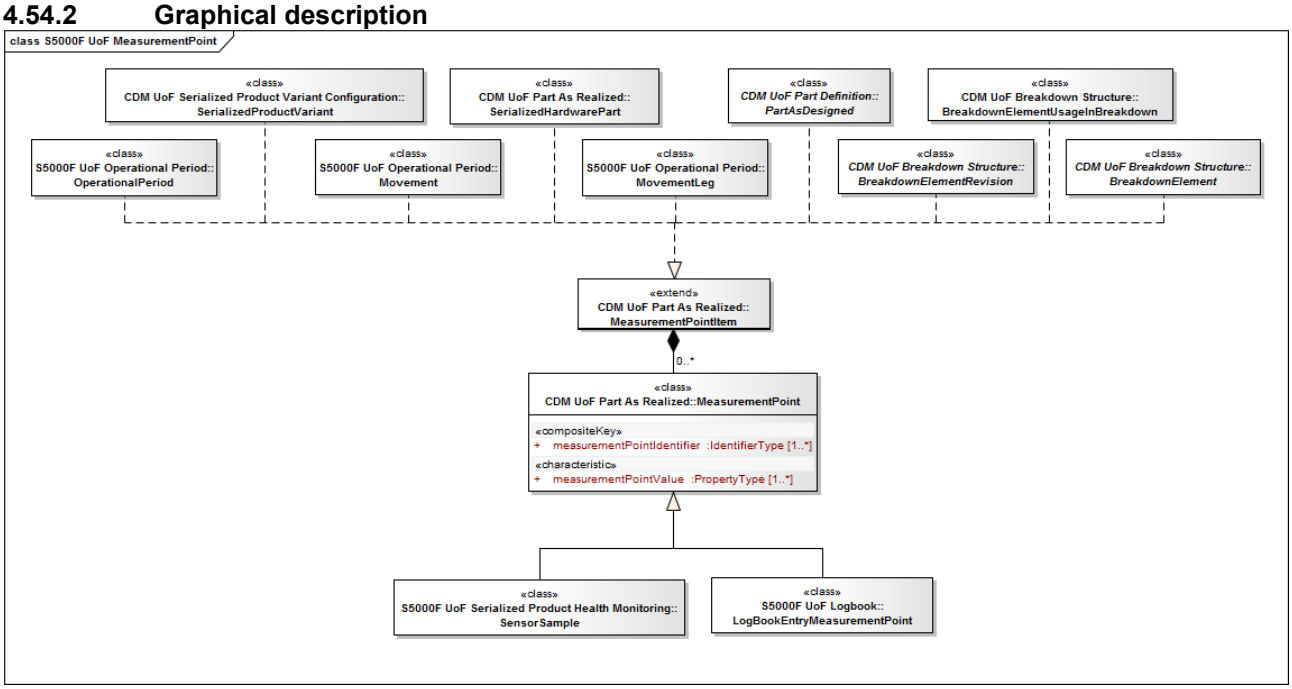
MaintenanceWorkOrderSource is an <<extend>> interface that allows to define the sources for WorkOrders.

4.54 S5000F UoF MeasurementPoint

4.54.1 Description

UoF MeasurementPoint provides the capability to assign MeasurementPoints to classes requiring some type of measurement.

4.54.2 Graphical description



ICN-B6865-5000F15092-001-01

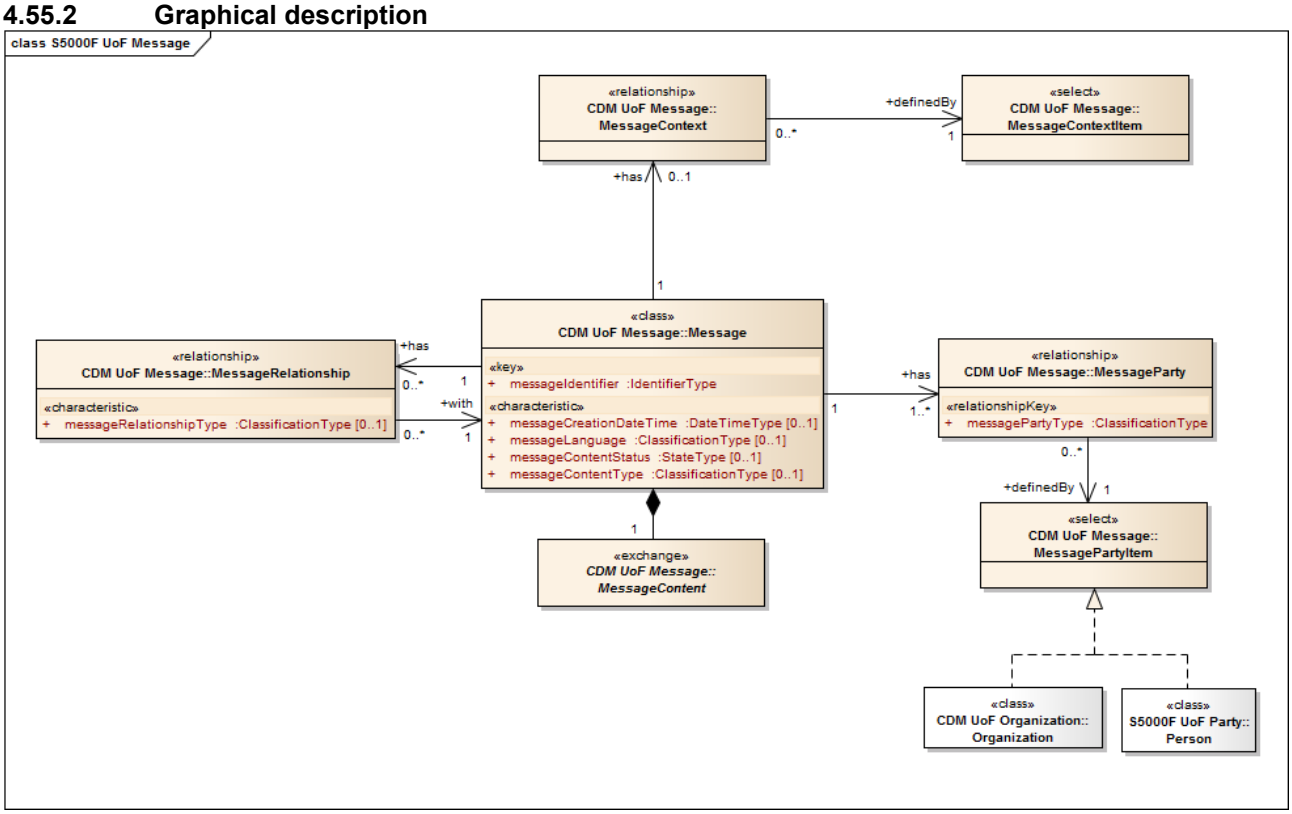
Fig 68 S5000F UoF MeasurementPoint

4.55 S5000F UoF Message

4.55.1 Description

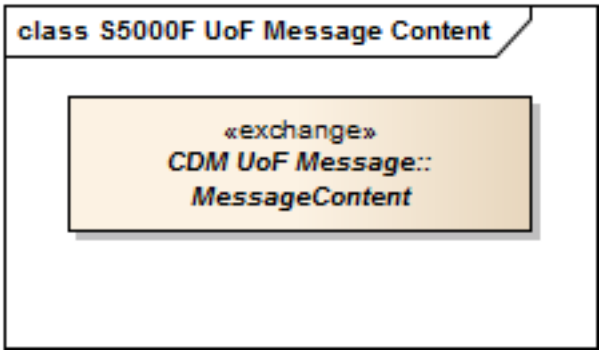
The Message UoF provides the capability of defining a wrapper for all S-Series Specifications data exchanges.

4.55.2 Graphical description



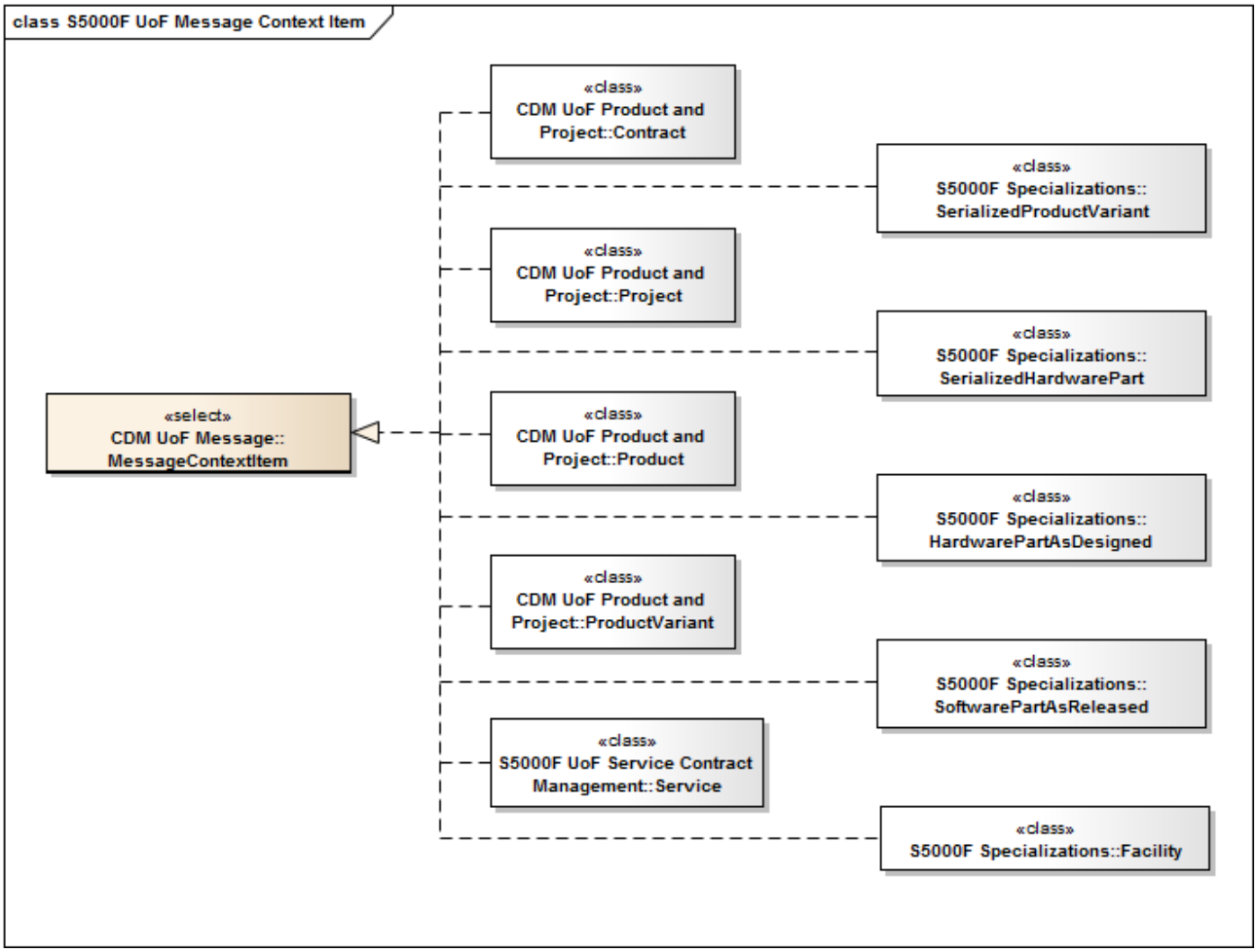
ICN-B6865-5000F15057-002-01

Fig 69 S5000F UoF Message



ICN-B6865-5000F15093-001-01

Fig 70 S5000F UoF Message Content



ICN-B6865-5000F15094-001-01

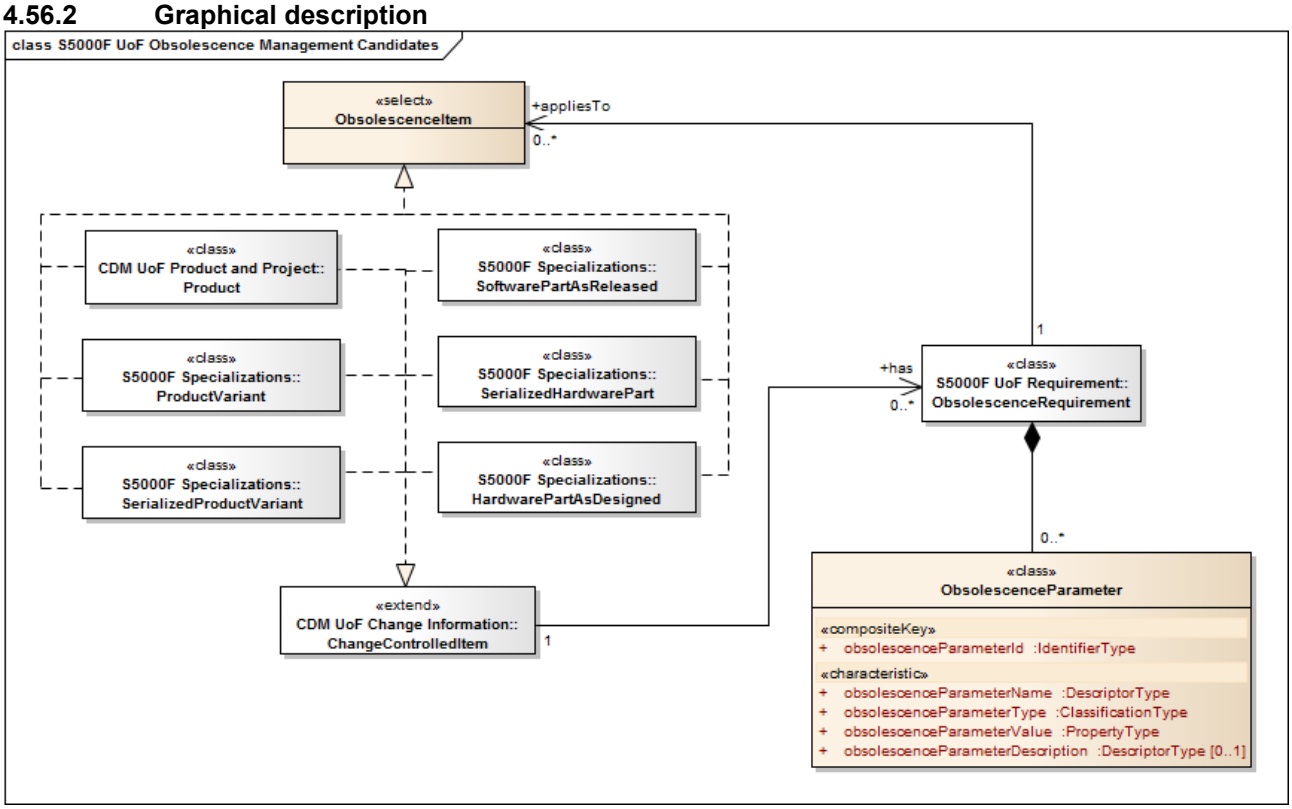
Fig 71 S5000F UoF Message Context Item

4.56 S5000F UoF Obsolescence Management Candidates

4.56.1 Description

The Obsolescence Management Candidates UoF provides the capability to identify obsolete items that comply with certain ObsolescenceRequirements.

4.56.2 Graphical description



ICN-B6865-5000F15026-002-01

Fig 72 S5000F UoF Obsolescence Management Candidates

4.56.3 Class definition

4.56.3.1 ObsolescenceItem

ObsolescenceItem is a <<select>> interface that allows to define an item to which an ObsolescenceRequirement can apply.

4.56.3.2 ObsolescenceParameter

ObsolescenceParameter is a class representing a criterion that allows to evaluate whether an ObsolescenceRequirement has been met.

4.56.3.2.1 Example(s)

- No longer manufactured
- Older than ten years

4.56.3.2.2 Attribute(s)

This class has the following attributes:

- obsolescenceParameterId
- obsolescenceParameterDescription, optional
- obsolescenceParameterName
- obsolescenceParameterType
- obsolescenceParameterValue

4.56.3.2.3 Associations

This class has the following associations:

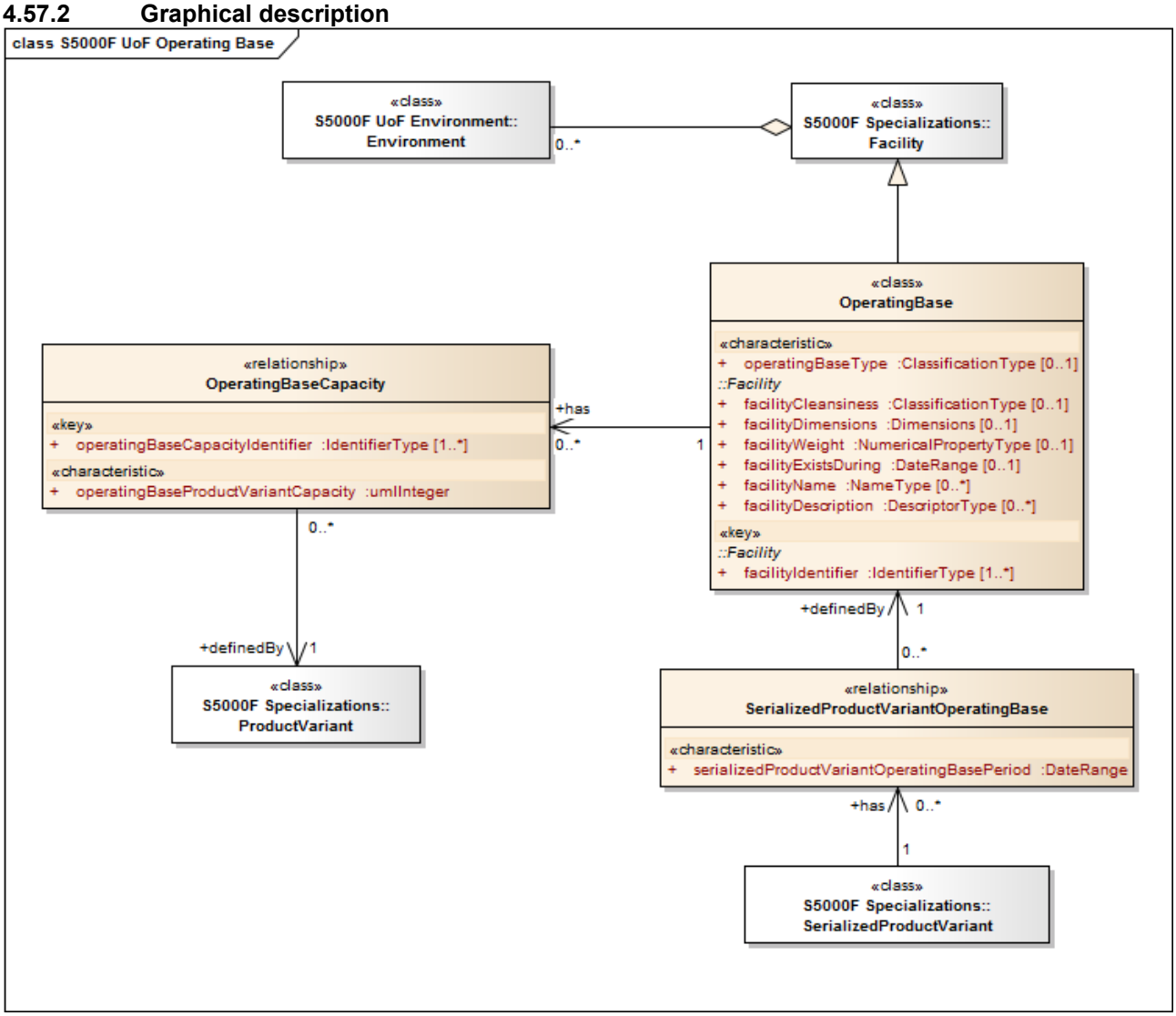
- An aggregate association, zero, one or many, to related object(s) of type ObsolescenceRequirement

4.57 S5000F UoF Operating Base

4.57.1 Description

The Operating Base UoF provides the necessary information associated to an OperatingBase.

4.57.2 Graphical description



ICN-B6865-5000F15027-002-01

Fig 73 S5000F UoF Operating Base

4.57.3 Class definition

4.57.3.1 OperatingBase

OperatingBase is a Facility that is mainly established for providing support for operations.

4.57.3.1.1 Example(s)

- airfield
- garage
- harbor

4.57.3.1.2 Attribute(s)

This class has the following attributes:

- facilityIdentifier (inherited from Facility), one or many
- facilityCleansiness (inherited from Facility), optional

- facilityDescription (inherited from Facility), zero, one or many
- facilityDimensions (inherited from Facility), optional
- facilityExistsDuring (inherited from Facility), optional
- facilityName (inherited from Facility), zero, one or many
- facilityWeight (inherited from Facility), optional
- operatingBaseType, optional

4.57.3.1.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type FacilityLocation
- An association to object(s) of type FacilityOwner
- An association to object(s) of type FacilityRelationship. Each Facility can be related to from zero, one or many other Facilities (via the FacilityRelationship <<relationship>> class)
- An association to object(s) of type OperatingBaseCapacity. An OperatingBase can be associated with zero, one or many ProductVariants (via the OperatingBaseCapacity <<relationship>> that can operate there
- An association, zero, one or many, to object(s) from classes that are members of LocationItem

4.57.3.1.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- AvailabilityItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)
- CapabilityItem (inherited from Facility) (See S5000F UoF Capability, Para 4.16)
- ChangeControlledItem (inherited from Facility) (See S5000F UoF Change Information, Para 4.21)
- DigitalFileReferencingItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureCompliantItem (inherited from Facility) (See S5000F UoF Facility, Para 4.37)
- InfrastructureItem (inherited from Facility) (See S5000F UoF Infrastructure, Para 4.43)
- ItemUnderExportControl (inherited from Facility) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from Facility) (See S5000F UoF Maintenance Program, Para 4.52)
- PoliciesAndRegulationsCompliantItem (inherited from Facility) (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityClassificationItem (inherited from Facility) (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures (inherited from Facility) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from Facility) (See S5000F UoF Work Breakdown, Para 4.97)

4.57.3.1.5 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from Facility) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from Facility) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from Facility) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from Facility) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Facility) (See S5000F UoF Digital File, Para 4.28)

- EventItem (inherited from Facility) (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (inherited from Facility) (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (inherited from Facility) (See S5000F UoF Infrastructure, Para 4.43)
- MaintenanceItem (inherited from Facility) (See S5000F UoF Maintenance Activity, Para 4.48)
- MessageContextItem (inherited from Facility) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (inherited from Facility) (See S5000F UoF Availability, Para 4.13)
- ReferencedPositionItem (inherited from Facility) (See S5000F UoF Local Position, Para 4.45)
- ReportContextItem (inherited from Facility) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Facility) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Facility) (See S5000F UoF Safety, Para 4.78)
- ServiceItem (inherited from Facility) (See S5000F UoF Service Request, Para 4.86)
- SubjectOfPoliciesAndRegulations (inherited from Facility) (See S5000F UoF Policies and Regulations, Para 4.68)
- TransportableItem (inherited from Facility) (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (inherited from Facility) (See S5000F UoF Warranty, Para 4.96)

4.57.3.2 OperatingBaseCapacity

OperatingBaseCapacity is a <<relationship>> that identifies the capacity of an OperatingBase to allow the operation of a specific ProductVariant.

4.57.3.2.1 Example(s)

- 2 buses
- 8 cars

4.57.3.2.2 Attribute(s)

This class has the following attributes:

- operatingBaseCapacityIdentifier, one or many
- operatingBaseProductVariantCapacity

4.57.3.2.3 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type ProductVariant

4.57.3.3 SerializedProductVariantOperatingBase

SerializedProductVariantOperatingBase is a <<relationship>> that establishes in which OperatingBase a SerializedProductVariant has been operating during a specific period of time.

4.57.3.3.1 Attribute(s)

This class has the following attributes:

- serializedProductVariantOperatingBasePeriod

4.57.3.3.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type OperatingBase

4.58 S5000F UoF Operational Environment

4.58.1 Description

Operational Environment UoF provides all necessary information associated to the environment in which a specific SerialiedProductVariant operates.

4.58.2 Graphical description

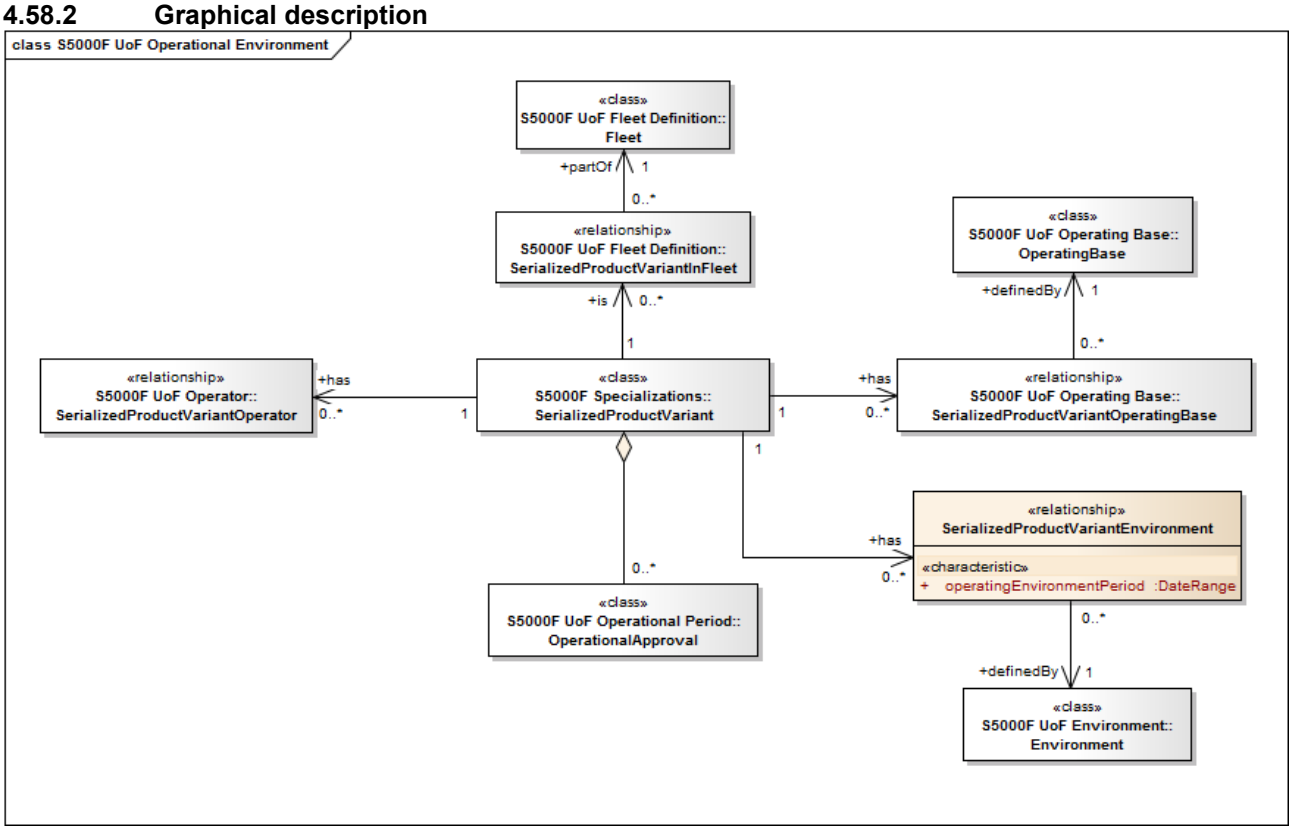


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Fig 74 S5000F UoF Operational Environment

4.58.3 Class definition

4.58.3.1 SerializedProductVariantEnvironment

SerializedProductVariantEnvironment is a <<relationship>> that determines in which Environment a SerializedProductVariant has operated during a specific period of time.

4.58.3.1.1 Attribute(s)

This class has the following attributes:

– operatingEnvironmentPeriod

4.58.3.1.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type Environment

4.58.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

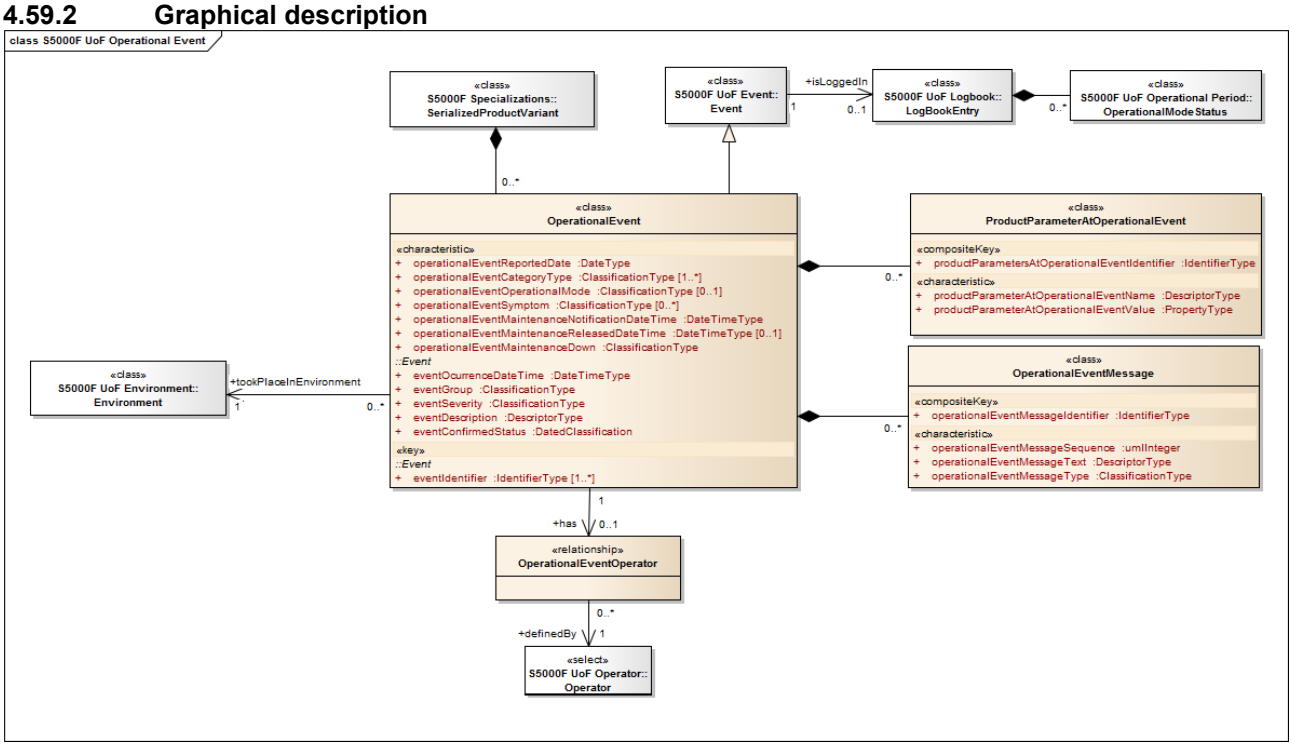
– OperationalTimeItem (See S5000F UoF Operational Times, Para 4.62)

4.59 S5000F UoF Operational Event

4.59.1 Description

Operational Event UoF allows to define all the information associated to an OperationalEvent.

4.59.2 Graphical description



ICN-B6865-5000F15029-002-01

Fig 75 S5000F UoF Operational Event

4.59.3 Class definition

4.59.3.1 OperationalEvent

OperationalEvent is a class representing an Event during the SerializedProductVariant operation that can have an impact on the operation itself, on maintenance, or on safety.

4.59.3.1.1 Attribute(s)

This class has the following attributes:

- eventIdentifier (inherited from Event), one or many
- eventConfirmedStatus (inherited from Event)
- eventDescription (inherited from Event)
- eventGroup (inherited from Event)
- eventOcurrenceDateTime (inherited from Event)
- eventSeverity (inherited from Event)
- operationalEventCategoryType, one or many
- operationalEventMaintenanceDown
- operationalEventMaintenanceNotificationDateTime
- operationalEventMaintenanceReleasedDateTime, optional
- operationalEventOperationalMode, optional
- operationalEventReportedDate
- operationalEventSymptom, zero, one or many

4.59.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An aggregate association, zero, one or many, to related object(s) of type SerializedProductVariant
- An association to object(s) of type DownTimePeriod

- An association to object(s) of type EventAffectedBreakdownElement
- An association to object(s) of type EventExplanation. An Event can be associated to zero, one or many ExplanatoryFactors
- An association to object(s) of type EventRelationship
- An association to object(s) of type EventRelationshipItem
- An association to object(s) of type EventReporter
- An association to object(s) of type LogBookEntry. An Event instance can be optionally logged in a LogBookEntry instance
- An association to object(s) of type OperationalEventOperator. An OperationalEvent can be optionally related to a class instance implementing the Operator <<interface>>
- An association, zero, one or many, to object(s) of type Environment. An Environment can be associated to zero, one or many OperationalEvents
- An association, zero, one or many, to object(s) of type ProductUsagePhase

4.59.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (inherited from Event) (See S5000F UoF Digital File, Para 4.28)
- MaintenanceWorkOrderSource (inherited from Event) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Event) (See S5000F UoF Security Classification, Para 4.79)

4.59.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestReasonItem (inherited from Event) (See S5000F UoF Change Request, Para 4.22)
- DigitalFileReferencedItem (inherited from Event) (See S5000F UoF Digital File, Para 4.28)
- NonAvailabilityCauseItem (inherited from Event) (See S5000F UoF Availability, Para 4.13)
- ReportableItem (See S5000F UoF Report, Para 4.73)
- ReportContextItem (inherited from Event) (See S5000F UoF Report, Para 4.73)

4.59.3.2 OperationalEventMessage

OperationalEventMessage is a message, failure code or acoustic or visual warning that occurred during an OperationEvent.

4.59.3.2.1 Attribute(s)

This class has the following attributes:

- operationalEventMessageIdentifier
- operationalEventMessageSequence
- operationalEventMessageText
- operationalEventMessageType

4.59.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type OperationalEvent

4.59.3.3 OperationalEventOperator

OperationalEventOperator is a <<relationship>> that allows to associate an OperationalEvent to the Party that was operating the ProductVariant at that moment in time.

4.59.3.3.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of Operator

4.59.3.4 ProductParameterAtOperationalEvent

ProductParameterAtOperationalEvent provides the value of a Product parameter when an operational event occurred.

4.59.3.4.1 Attribute(s)

This class has the following attributes:

- productParametersAtOperationalEventIdentifier
- productParameterAtOperationalEventName
- productParameterAtOperationalEventValue

4.59.3.4.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type OperationalEvent

4.59.3.4.3 Selects

This class is a member of the following <<select>> interfaces:

- ReleasedDataSetItem (See S5000F UoF Data Sets, Para 4.27)

4.60 S5000F UoF Operational Period

4.60.1 Description

Serialized Product Operational Period UoF provides the information associated to one specific operational period of the product as part of its operation.

4.60.2 Graphical description

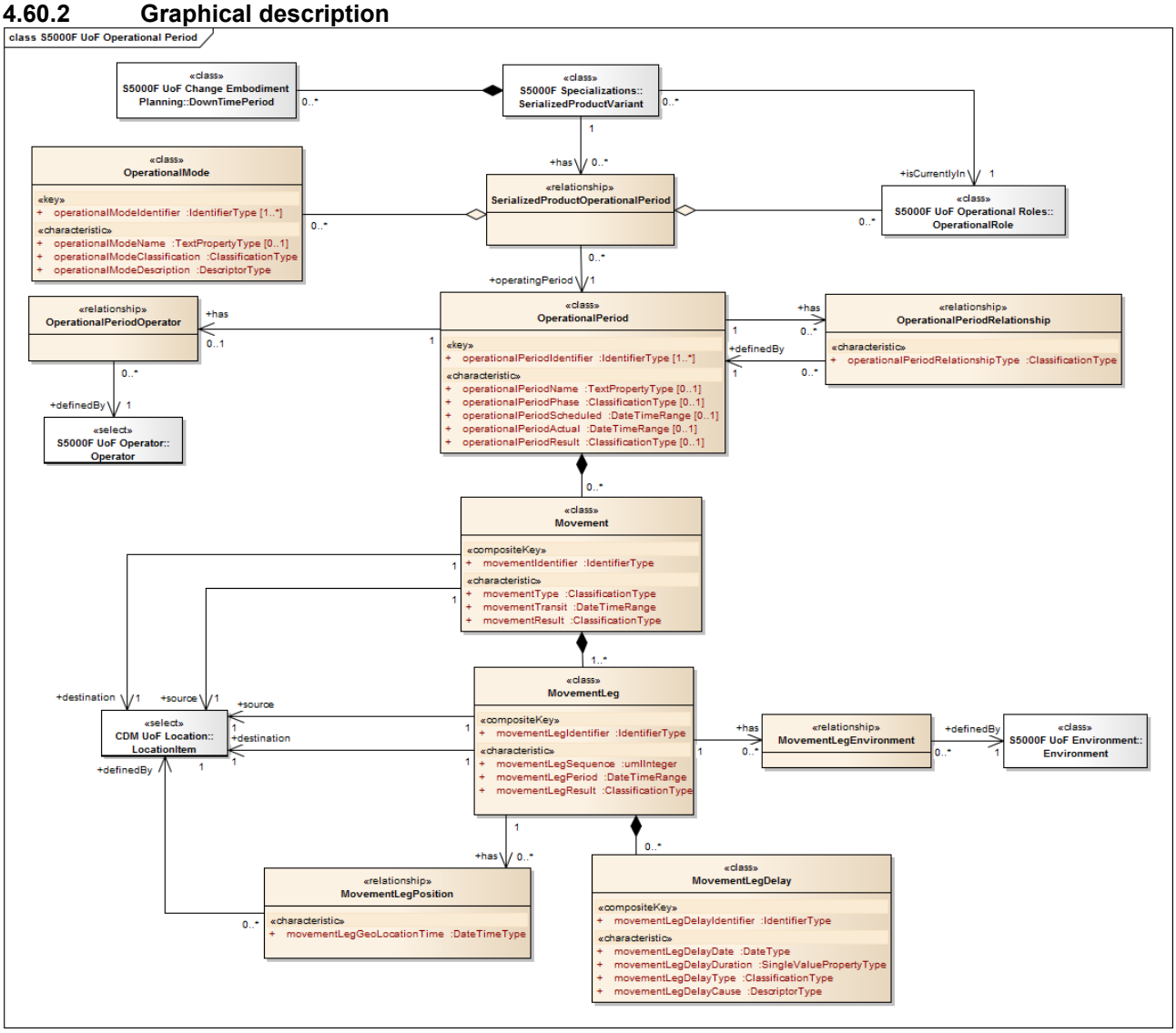


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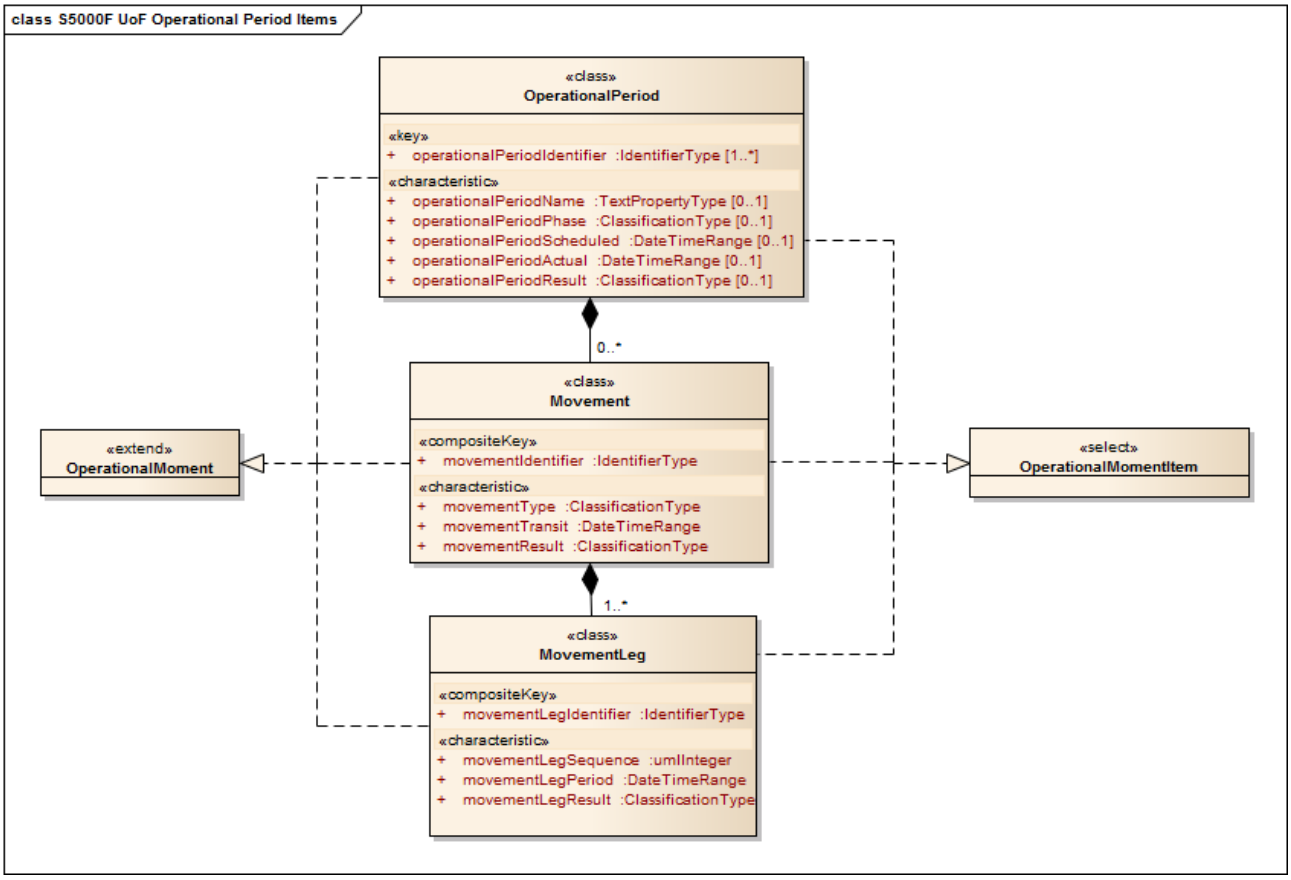
Fig 76 S5000F UoF Operational Period



ICN-B6865-5000F15117-001-01

Fig 77 S5000F UoF Operational Period Items

4.60.3 Class definition

4.60.3.1 Movement

Movement represents the act of autonomously changing the physical location or position of a SerializedProductVariant.

Note

The Movement of a SerializedProductVariant must be autonomous but not necessarily self-propelled. The flight of a glider and the orbiting of a satellite are considered movements.

Note

The transport of a SerializedProductVariant by another item cannot be considered a movement, as the Movement is performed by the TransportingAsset that transports it.

4.60.3.1.1 Example(s)

- Aircraft flying from Madrid to Rome.
- Orbiting of a satellite
- Robot moving to a different position.
- Ship sailing from London to New York.
- Train driving from Paris to Munich.

4.60.3.1.2 Attribute(s)

This class has the following attributes:

- movementIdentifier
- movementResult
- movementTransit

– movementType

4.60.3.1.3 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type OperationalPeriod
– An association to object(s) from classes that are members of LocationItem

4.60.3.1.4 Implementations

This class implements the following <<extend>> interfaces:

– MeasurementPointItem (See S5000F UoF Part As Realized, Para 4.65)
– OperationalConsumption (See S5000F UoF Fleet Monitoring, Para 4.40)
– OperationalMoment
– SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.60.3.1.5 Selects

This class is a member of the following <<select>> interfaces:

– CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
– OperationalMomentItem

4.60.3.2 MovementLeg

MovementLeg is a class representing one of the individual displacements performed during a Movement, which will be at least one MovementLeg.

Note

A characteristic of a MovementLeg is that there is a physical Interruption of the Movement at the end of the MovementLeg, which can be followed by further MovementLeg(s) to complete the Movement.

Note

A Movement that is uninterrupted would only have one single MovementLeg.

4.60.3.2.1 Example(s)

– A flight from Madrid to Singapore, stopping at Dubai, has two movement legs: Madrid-Dubai and Dubai-Singapore.

4.60.3.2.2 Attribute(s)

This class has the following attributes:

– movementLegIdentifier
– movementLegPeriod
– movementLegResult
– movementLegSequence

4.60.3.2.3 Associations

This class has the following associations:

– An aggregate association, one or many, to related object(s) of type Movement
– An association to object(s) of type MovementLegEnvironment
– An association to object(s) of type MovementLegPosition
– An association to object(s) from classes that are members of LocationItem

4.60.3.2.4 Implementations

This class implements the following <<extend>> interfaces:

– MeasurementPointItem (See S5000F UoF Part As Realized, Para 4.65)
– OperationalConsumption (See S5000F UoF Fleet Monitoring, Para 4.40)
– OperationalMoment

– SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.60.3.2.5 Selects

This class is a member of the following <<select>> interfaces:

– CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
– OperationalMomentItem

4.60.3.3 MovementLegDelay

MovementLegDelay is a class representing a delay that occurred during a travelLeg.

4.60.3.3.1 Attribute(s)

This class has the following attributes:

– movementLegDelayIdentifier
– movementLegDelayCause
– movementLegDelayDate
– movementLegDelayDuration
– movementLegDelayType

4.60.3.3.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type MovementLeg

4.60.3.4 MovementLegEnvironment

MovementLegEnvironment is a <<relationship>> that allows to associate a MovementLeg to the Environment(s) where this took place.

4.60.3.4.1 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type Environment

4.60.3.5 MovementLegPosition

MovementLegPosition is a <<relationship>> that defines at which point in space a Product was at a certain moment during a MovementLeg.

4.60.3.5.1 Attribute(s)

This class has the following attributes:

– movementLegGeoLocationTime

4.60.3.5.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of LocationItem

4.60.3.6 OperationalApproval

OperationalApproval is a class that represents the authorization to a SerializedProductVariant for a specific mode of operation.

4.60.3.6.1 Example(s)

– Area Navigation (RNAV)
– Autonomous approach
– Cargo
– Extended Operations (ETOPS)
– Passenger transport

4.60.3.6.2 Attribute(s)
This class has the following attributes:

- operationalApprovalIdentifier, one or many
- operationalApprovalType

4.60.3.6.3 Associations
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type SerializedProductVariant

4.60.3.7 OperationalMode
OperationalMode represents the actual usage mode of a SerializedProductVariant during a specific OperationalPeriod.

Note
Can be used to provide European Coordination Centre for Accident and Incident Reporting Systems (ECCAIRS) information.

Note
A same OperationalRole can have different OperationalModes associated to it (scheduled, unscheduled, passenger or cargo transport, dual/solo training, etc.)

4.60.3.7.1 Example(s)
- non-scheduled international passenger transport
- scheduled cargo transport

4.60.3.7.2 Attribute(s)
This class has the following attributes:

- operationalModeIdentifier, one or many
- operationalModeClassification
- operationalModeDescription
- operationalModeName, optional

4.60.3.7.3 Associations
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type SerializedProductOperationalPeriod

4.60.3.8 OperationalModeStatus
Mode of operation associated to a LogBookEntry.

4.60.3.8.1 Example(s)
- ETOPS (for aviation)
- full power

4.60.3.8.2 Attribute(s)
This class has the following attributes:

- operationalModeStatusType
- operationalModeStatusUsed

4.60.3.8.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type LogBookEntry

4.60.3.9 OperationalMoment

OperationalMoment is an <<extend>> interface that allows to associate an operational moment to other items.

4.60.3.9.1 Associations

This class has the following associations:

- An association to object(s) of type LogBookEntry. A Movement instance can be optionally logged in a aingle LogBookEntry instance

4.60.3.10 OperationalMomentItem

OperationalMomentItem is a <<select>> interface that allows linking to a specific operational moment, such as an operating period, movement or travel leg.

4.60.3.11 OperationalPeriod

OperationalPeriod is a class that defines the characteristics of a time frame during which a SerializedProductVariant was operated.

4.60.3.11.1 Attribute(s)

This class has the following attributes:

- operationalPeriodIdentifier, one or many
- operationalPeriodActual, optional
- operationalPeriodName, optional
- operationalPeriodPhase, optional
- operationalPeriodResult, optional
- operationalPeriodScheduled, optional

4.60.3.11.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type OperationalPeriodOperator
- An association to object(s) of type OperationalPeriodRelationship. Each OperationalPeriod can relate to zero, one or many other OperationalPeriods (via the OperationalPeriodRelationship <<relationship>> class)

4.60.3.11.3 Implementations

This class implements the following <<extend>> interfaces:

- MeasurementPointItem (See S5000F UoF Part As Realized, Para 4.65)
- OperationalConsumption (See S5000F UoF Fleet Monitoring, Para 4.40)
- OperationalMoment

4.60.3.11.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestReasonItem (See S5000F UoF Change Request, Para 4.22)
- OperationalMomentItem

4.60.3.12 OperationalPeriodOperator

OperationalPeriodOperator is a <<relationship>> that defines which Party has carried out the operation during an OperationalPeriod.

4.60.3.12.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of Operator

4.60.3.13 OperationalPeriodRelationship

OperationalPeriodRelationship is a <<relationship>> that defines the association between two different OperationalPeriods.

4.60.3.13.1 Example(s)

- after
- before
- simultaneous to

4.60.3.13.2 Attribute(s)

This class has the following attributes:

- operationalPeriodRelationshipType

4.60.3.13.3 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type OperationalPeriod

4.60.3.14 SerializedProductOperationalPeriod

SerializedProductOperationalPeriod is a <<relationship>> that describes the specific operational role of a SerializedProductVariant during a particular operational period.

4.60.3.14.1 Associations

This class has the following associations:

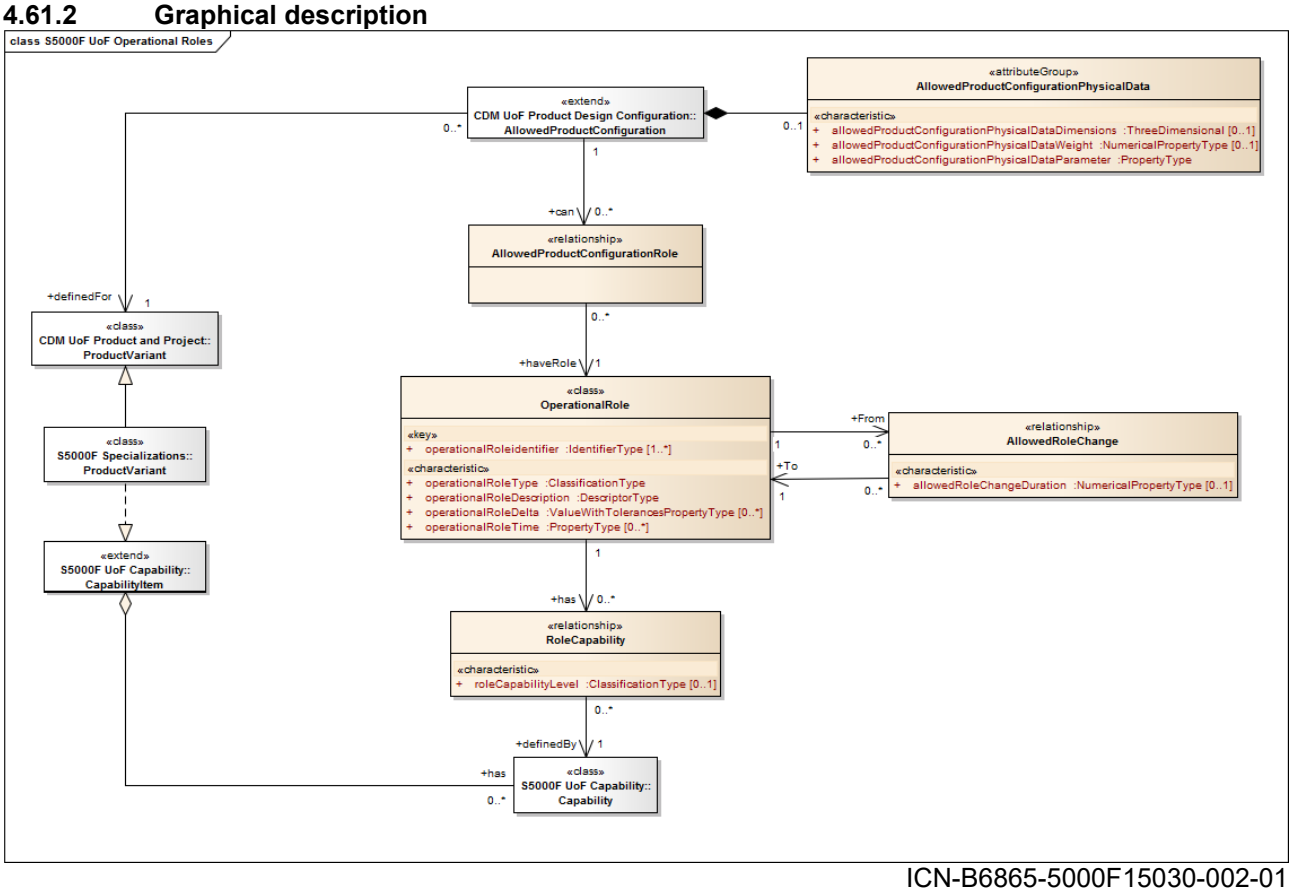
- An association, zero, one or many, to object(s) of type OperationalPeriod

4.61 S5000F UoF Operational Roles

4.61.1 Description

Operational Roles UoF defines the Product capabilities associated to each OperationalRole and the allowed role changes associated to each OperationalRole.

4.61.2 Graphical description



ICN-B6865-5000F15030-002-01

Fig 78 S5000F UoF Operational Roles

4.61.3 Class definition

4.61.3.1 AllowedProductConfigurationPhysicalData

AllowedProductConfigurationPhysicalData is an <<attributeGroup>> that provides physical characteristics associated to an AllowedProductConfiguration.

4.61.3.1.1 Attribute(s)

This class has the following attributes:

- allowedProductConfigurationPhysicalDataDimensions, optional
- allowedProductConfigurationPhysicalDataParameter
- allowedProductConfigurationPhysicalDataWeight, optional

4.61.3.1.2 Associations

This class has the following associations:

- An aggregate association, optional, to related object(s) of type AllowedProductConfiguration

4.61.3.2 AllowedProductConfigurationRole

AllowedProductConfigurationRole is a <<relationship>> that defines what OperationalRoles can be performed by a specific AllowedProductConfiguration.

4.61.3.2.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type OperationalRole
- An association, zero, one or many, to object(s) from classes that are members of AllowedProductOperationalConfigurationItem

4.61.3.3 AllowedRoleChange

AllowedRoleChange is a <<relationship>> that defines the role changes that are possible to allow a Product in one specific role to be configured for a different role.

4.61.3.3.1 Attribute(s)

This class has the following attributes:

- allowedRoleChangeDuration, optional

4.61.3.3.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type OperationalRole

4.61.3.4 OperationalRole

OperationalRole defines the capabilities that a product must be able to provide so as to perform a specific task or mission as part of its operation.

4.61.3.4.1 Attribute(s)

This class has the following attributes:

- operationalRoleidentifier, one or many
- operationalRoleDelta, zero, one or many
- operationalRoleDescription
- operationalRoleTime, zero, one or many
- operationalRoleType

4.61.3.4.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type SerializedProductOperationalPeriod
- An association to object(s) of type AllowedRoleChange. Each OperationalRole can relate to zero, one or many other OperationalRoles to which it can be changed
- An association to object(s) of type RoleCapability

4.61.3.5 RoleCapability

RoleCapability is a <<relationship>> that defines which product capabilities are provided by a specific OperationalRole.

4.61.3.5.1 Attribute(s)

This class has the following attributes:

- roleCapabilityLevel, optional

4.61.3.5.2 Associations

This class has the following associations:

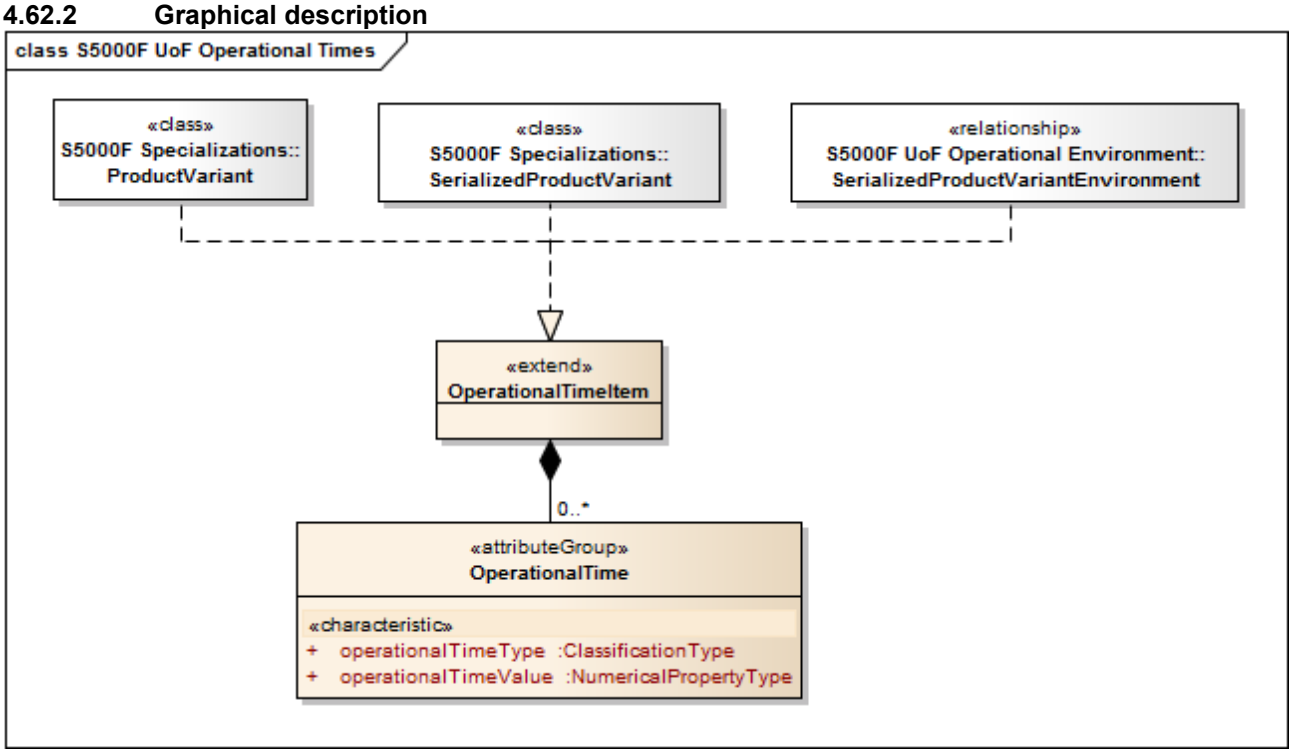
- An association, zero, one or many, to object(s) of type Capability
- An association, zero, one or many, to object(s) of type TransportCapability

4.62 S5000F UoF Operational Times

4.62.1 Description

Operational Times UoF provies the capability to define times associated to an operation.

4.62.2 Graphical description



ICN-B6865-5000F15095-001-01

Fig 79 S5000F UoF Operational Times

4.62.3 Class definition

4.62.3.1 OperationalTime

OperationalTime is an <<attributeGroup>> that can be associated to an OperationalTimeItem.

4.62.3.1.1 Attribute(s)

This class has the following attributes:

- operationalTimeType
- operationalTimeValue

4.62.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type OperationalTimeItem

4.62.3.2 OperationalTimeItem

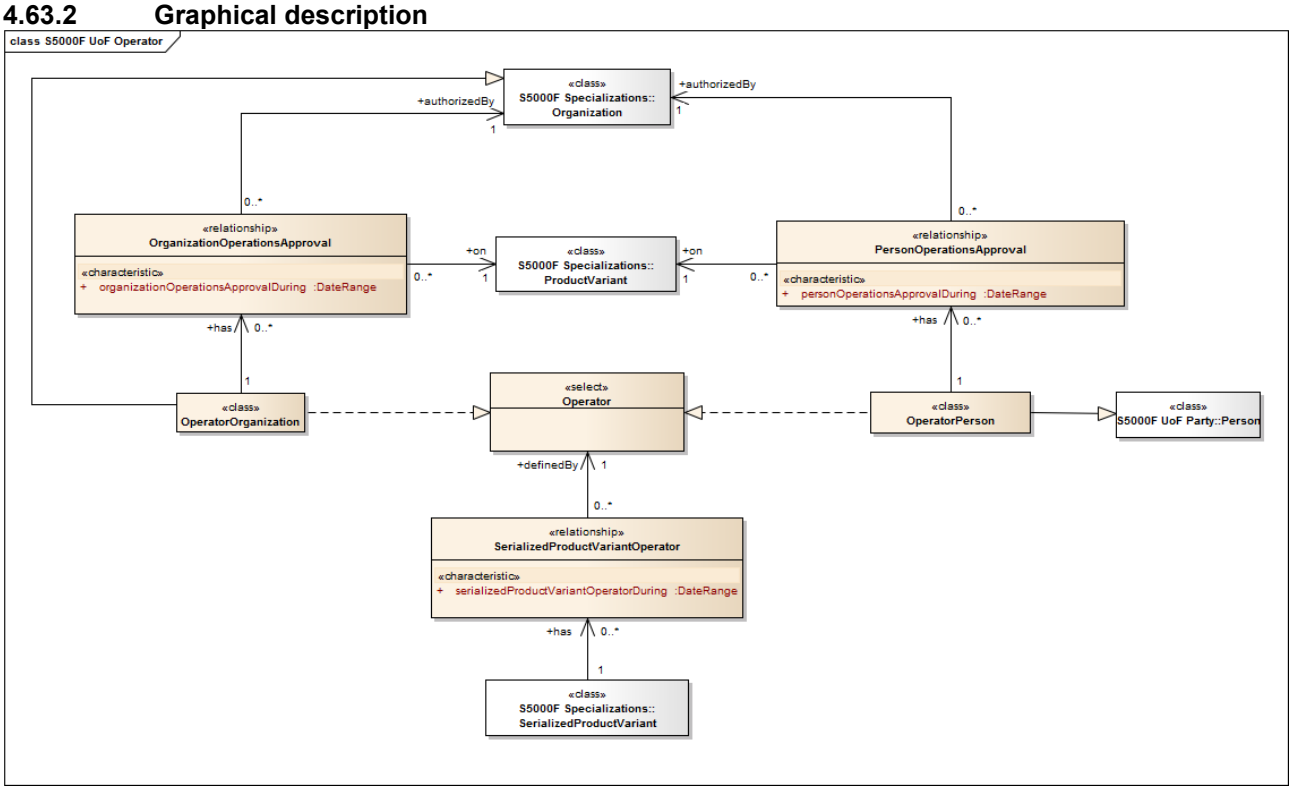
OperationalTimeItem is an <<extend>> interface that can have operational time information associated to it.

4.63 S5000F UoF Operator

4.63.1 Description

Operator UoF provides the capability to specify which organizations operate a SerializedProductVariant and which Parties are authorized to operate a ProductVariant.

4.63.2 Graphical description



ICN-B6865-5000F15031-002-01

Fig 80 S5000F UoF Operator

4.63.3 Class definition

4.63.3.1 Operator

Operator is a <<select interface>> that represents the entities that operate one or several SerializedProductVariants.

4.63.3.2 OperatorOrganization

OperatorOrganization is an Organization that operates one or several SerializedProductVariants.

4.63.3.2.1 Attribute(s)

This class has the following attributes:

- organizationIdentifier (inherited from Organization), one or many
- organizationDates (inherited from Organization), optional
- organizationDescription (inherited from Organization), optional
- organizationName (inherited from Organization), zero, one or many
- organizationType (inherited from Organization), zero, one or many

4.63.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type OrganizationOperationsApproval

4.63.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Organization) (See S5000F UoF Applicability Statement, Para 4.11)
- BudgetingItem (inherited from Organization) (See S5000F UoF Budget, Para 4.15)
- CostBreakdownContext (inherited from Organization) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (inherited from Organization) (See S5000F UoF Digital File, Para 4.28)
- FleetManager (See S5000F UoF Fleet Definition, Para 4.39)
- OrganizationalBreakdownStructure (inherited from Organization) (See S5000F UoF Organizational Breakdown Structure, Para 4.64)
- PartyItem (inherited from Organization) (See S5000F UoF Party, Para 4.66)
- PoliciesAndRegulationsCompliantItem (inherited from Organization) (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityAssignmentParty (inherited from Organization) (See S5000F UoF Security Classification, Para 4.79)

4.63.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- ClassInstanceAssertItem (inherited from Organization) (See S5000F UoF Applicability Statement, Para 4.11)
- CostEntryItem (inherited from Organization) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (inherited from Organization) (See S5000F UoF Digital File, Para 4.28)
- FacilityOperatorItem (inherited from Organization) (See S5000F UoF Facility, Para 4.37)
- FleetOperator (See S5000F UoF Fleet Definition, Para 4.39)
- LegalParty (inherited from Organization) (See S5000F UoF Project and Contract, Para 4.71)
- MessagePartyItem (inherited from Organization) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityAttribution (inherited from Organization) (See S5000F UoF Availability, Para 4.13)
- NonAvailabilityCauseItem (inherited from Organization) (See S5000F UoF Availability, Para 4.13)
- Operator
- Party (inherited from Organization) (See S5000F UoF Party, Para 4.66)
- ReportContextItem (inherited from Organization) (See S5000F UoF Report, Para 4.73)
- ReportingParty (inherited from Organization) (See S5000F UoF Report, Para 4.73)
- SafetyItem (inherited from Organization) (See S5000F UoF Safety, Para 4.78)
- SubjectOfPoliciesAndRegulations (inherited from Organization) (See S5000F UoF Policies and Regulations, Para 4.68)

4.63.3.3 OperatorPerson

OperatorPerson is a Person that operates one or several ProductVariants.

4.63.3.3.1 Example(s)

- drone pilot
- truck driver

4.63.3.3.2 Attribute(s)

This class has the following attributes:

- personIdentifier (inherited from Person), one or many
- personDates (inherited from Person), optional
- personFamilyName (inherited from Person), zero, one or many
- personMiddleName (inherited from Person), zero, one or many
- personName (inherited from Person), zero, one or many

- personPrefixTitle (inherited from Person), zero, one or many
- personSuffixTitle (inherited from Person), zero, one or many

4.63.3.3.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type PersonGroup
- An association to object(s) of type PersonOperationsApproval

4.63.3.3.4 Implementations

This class implements the following <<extend>> interfaces:

- FleetManager (See S5000F UoF Fleet Definition, Para 4.39)
- PartyItem (inherited from Person) (See S5000F UoF Party, Para 4.66)
- PersonCompetenceItem (inherited from Person) (See S5000F UoF Person Competences and Labor Rates, Para 4.67)
- SecurityAssignmentParty (inherited from Person) (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures (inherited from Person) (See S5000F UoF Transportable Item, Para 4.92)

4.63.3.3.5 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (inherited from Person) (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (inherited from Person) (See S5000F UoF Failure Detection and Location, Para 4.38)
- FleetOperator (See S5000F UoF Fleet Definition, Para 4.39)
- LegalParty (inherited from Person) (See S5000F UoF Project and Contract, Para 4.71)
- MessagePartyItem (inherited from Person) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityAttribution (inherited from Person) (See S5000F UoF Availability, Para 4.13)
- Operator
- Party (inherited from Person) (See S5000F UoF Party, Para 4.66)
- ReportingParty (inherited from Person) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from Person) (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (inherited from Person) (See S5000F UoF Safety, Para 4.78)
- TransportableItem (inherited from Person) (See S5000F UoF Transportable Item, Para 4.92)

4.63.3.4 OrganizationOperationsApproval

OrganizationOperationsApproval is a <<relationship>> that identifies the authorization of an OperatorOrganization to operate a specific ProductVariant by a specific Organization for a specific period of time.

4.63.3.4.1 Example(s)

- Municipal authorization to operate a bus line.

4.63.3.4.2 Attribute(s)

This class has the following attributes:

- organizationOperationsApprovalDuring

4.63.3.4.3 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type MaintenanceOrganization
- An association, zero, one or many, to object(s) of type OperatorOrganization
- An association, zero, one or many, to object(s) of type Organization
- An association, zero, one or many, to object(s) of type ProductVariant

4.63.3.5 PersonOperationsApproval

PersonOperationsApproval is a <<relationship>> that documents the authorization by an Organization to an OperatorPerson to operate a ProductVariant during a specific period of time.

4.63.3.5.1 Example(s)

- driver's licence
- mariner license
- pilot type certificate

4.63.3.5.2 Attribute(s)

This class has the following attributes:

- personOperationsApprovalDuring

4.63.3.5.3 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type MaintenanceOrganization
- An association, zero, one or many, to object(s) of type OperatorOrganization
- An association, zero, one or many, to object(s) of type Organization
- An association, zero, one or many, to object(s) of type ProductVariant

4.63.3.6 SerializedProductVariantOperator

SerializedProductVariantOperator is a <<relationship>> defining the operation of a SerializedProductVariant during a specific period of time.

4.63.3.6.1 Attribute(s)

This class has the following attributes:

- serializedProductVariantOperatorDuring

4.63.3.6.2 Associations

This class has the following associations:

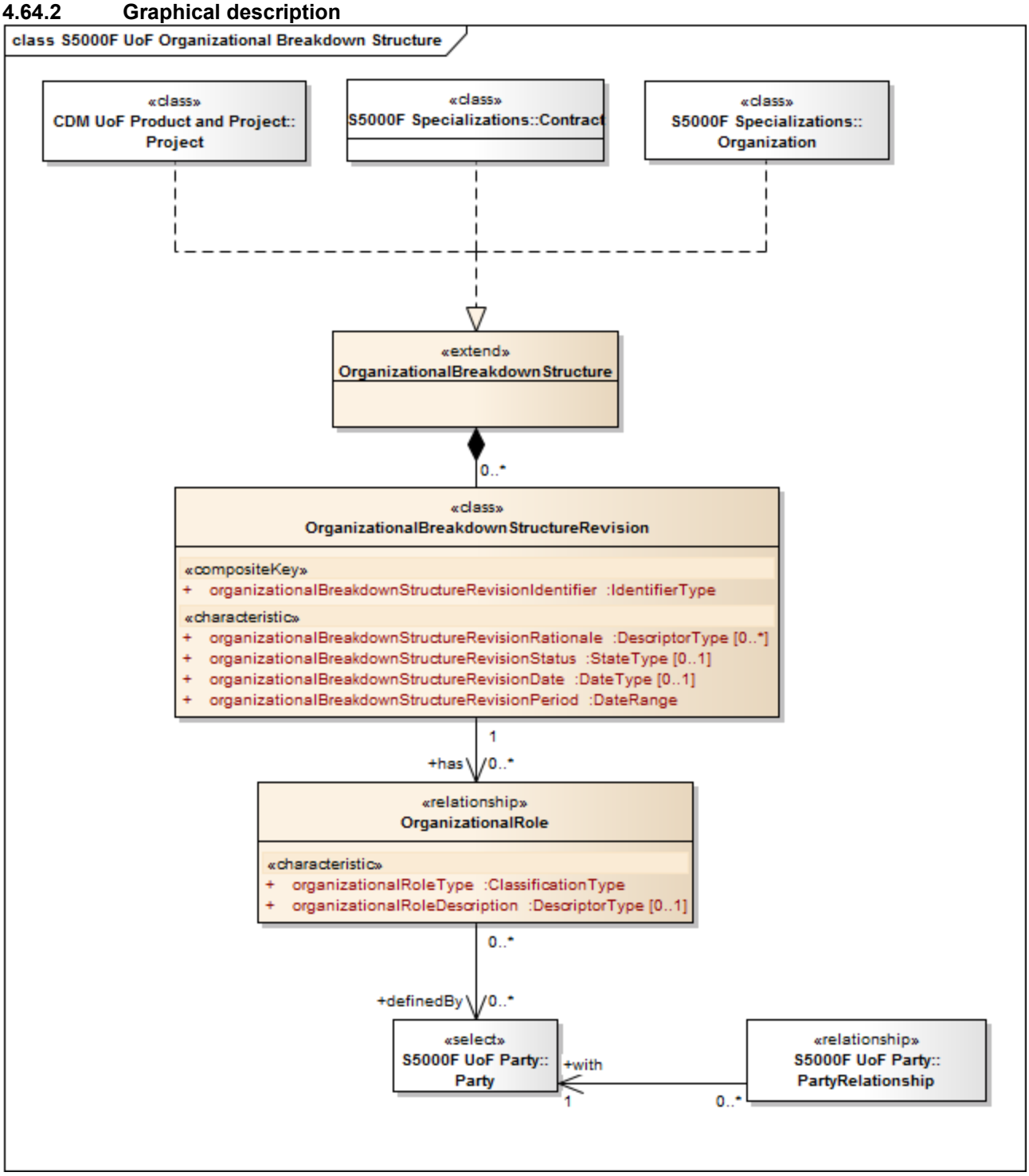
- An association, zero, one or many, to object(s) from classes that are members of Operator

4.64 S5000F UoF Organizational Breakdown Structure

4.64.1 Description

The Organizational Breakdown Structure UoF defines the organization that is established specifically for a project or contract.

4.64.2 Graphical description



ICN-B6865-5000F15032-002-01

Fig 81 S5000F UoF Organizational Breakdown Structure

4.64.3 Class definition

4.64.3.1 OrganizationalBreakdownStructure

OrganizationalBreakdownStructure is an <<extend>> interface that allows to relate an organizational structure to a Project or Contract.

4.64.3.2 OrganizationalBreakdownStructureRevision

OrganizationalBreakdownStructureRevision is an class that represents a specific revision of an organizational breakdown structure.

4.64.3.2.1 Attribute(s)

This class has the following attributes:

- organizationalBreakdownStructureRevisionIdentifier
- organizationalBreakdownStructureRevisionDate, optional
- organizationalBreakdownStructureRevisionPeriod
- organizationalBreakdownStructureRevisionRationale, zero, one or many
- organizationalBreakdownStructureRevisionStatus, optional

4.64.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type OrganizationalBreakdownStructure
- An association to object(s) of type OrganizationalRole

4.64.3.3 OrganizationalRole

OrganizationalRole is a <<relationship>> that defines the role that a Party performs within a project or contract-specific organizational structure.

4.64.3.3.1 Attribute(s)

This class has the following attributes:

- organizationalRoleDescription, optional
- organizationalRoleType

4.64.3.3.2 Associations

This class has the following associations:

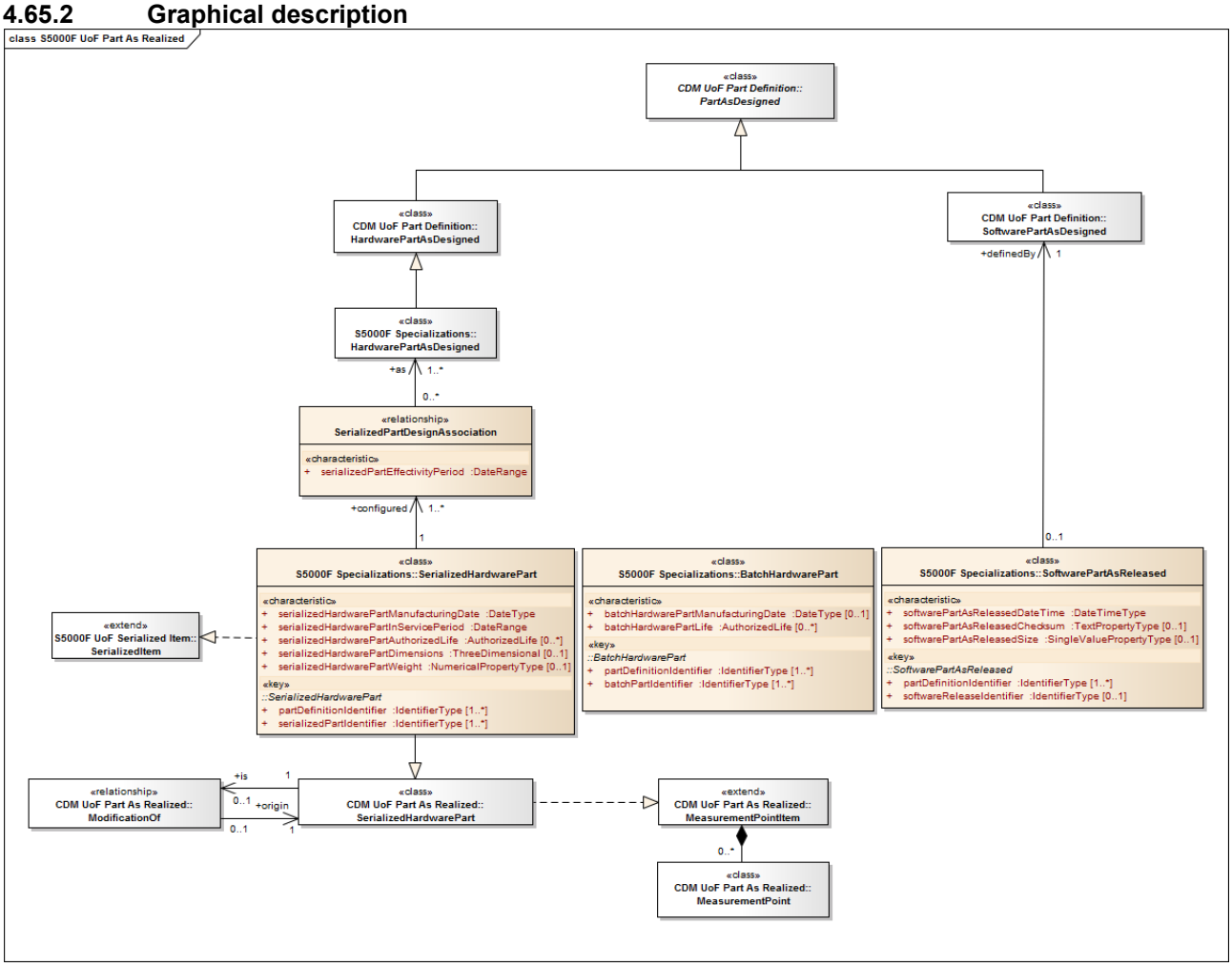
- An association, zero, one or many, to object(s) from classes that are members of Party

4.65 S5000F UoF Part As Realized

4.65.1 Description

The Part As Realized UoF provides the capability to associate actual (physical parts, both serialized and not serialized, to the Design items that they implement.

4.65.2 Graphical description



ICN-B6865-5000F15063-002-01

Fig 82 S5000F UoF Part As Realized

4.65.3 Class definition

4.65.3.1 SerializedPartDesignAssociation

SerializedPartDesignAssociation is a <<relationship>> that associates a SerializedHardwarePart to the HardwarePartAsDesigned that defines its functionality during a specific period of time.

Note

Several relationships can exist for different periods if the SerializedHardwarePart has been modificed to adhere to a new specification.

Note

The periods of the different relationships cannot overlap - a SerializedHardwarePart can only belong to a single specification at a specific moment in time.

Note

The relationship has an effectivityPeriod so as to indicate the period during which the SerializedHardwarePart adhered to this specification.

4.65.3.1.1 Example(s)

- Part A belongs to build standard BS1 from 2013-01-01 to 2016-08-31
- Part A belongs to build standard BS2 from 2016-08-31 onwards

4.65.3.1.2 Attribute(s)

This class has the following attributes:

– serializedPartEffectivityPeriod

4.65.3.1.3 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type Accelerometer
– An association, zero, one or many, to object(s) of type HardwarePartAsDesigned
– An association, zero, one or many, to object(s) of type PressureSensor
– An association, zero, one or many, to object(s) of type SensorType
– An association, zero, one or many, to object(s) of type StrainGauge
– An association, zero, one or many, to object(s) of type SupportEquipment
– An association, zero, one or many, to object(s) of type Tachometer
– An association, zero, one or many, to object(s) of type TemperatureSensor

4.66 S5000F UoF Party

4.66.1 Description

Party UoF describes the generic interface used for the establishment of relations with different parties (organizations or people).

4.66.2 Graphical description

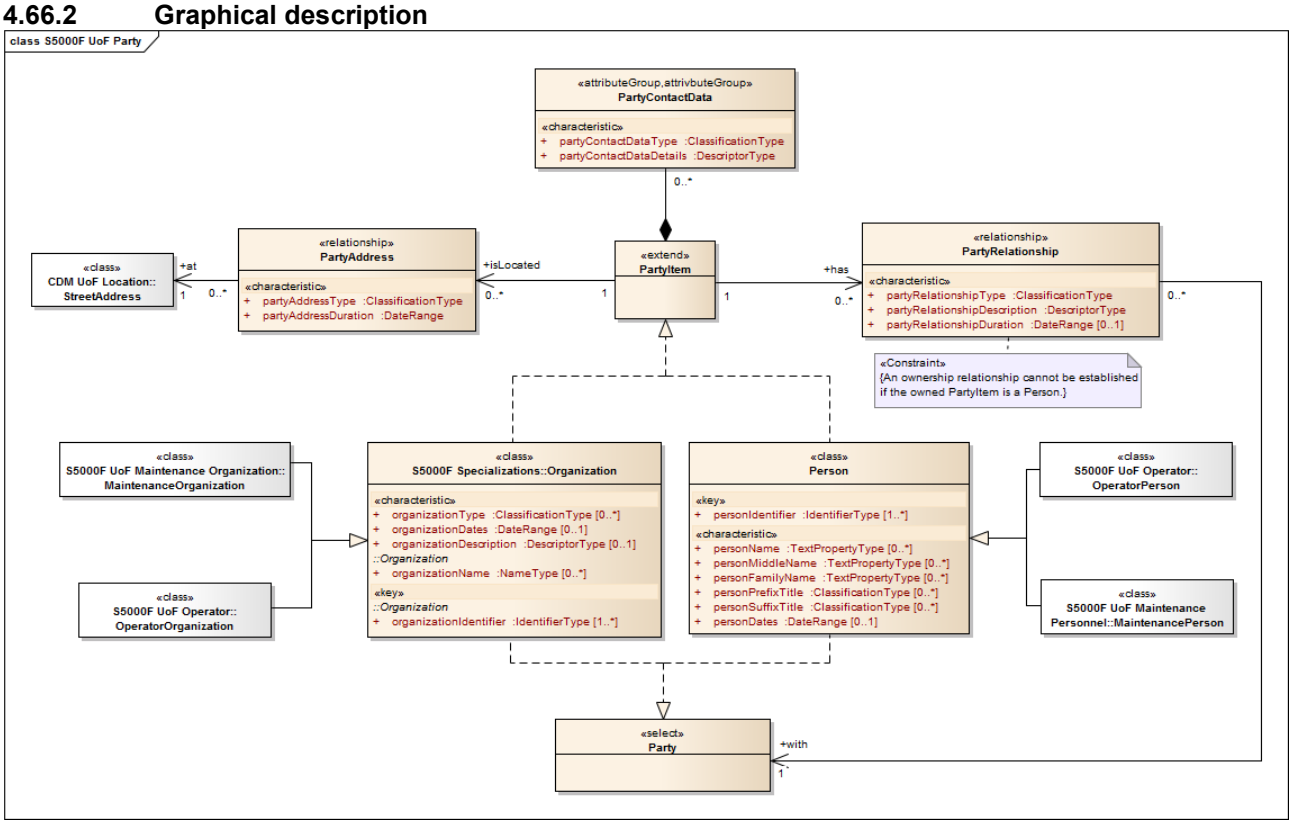


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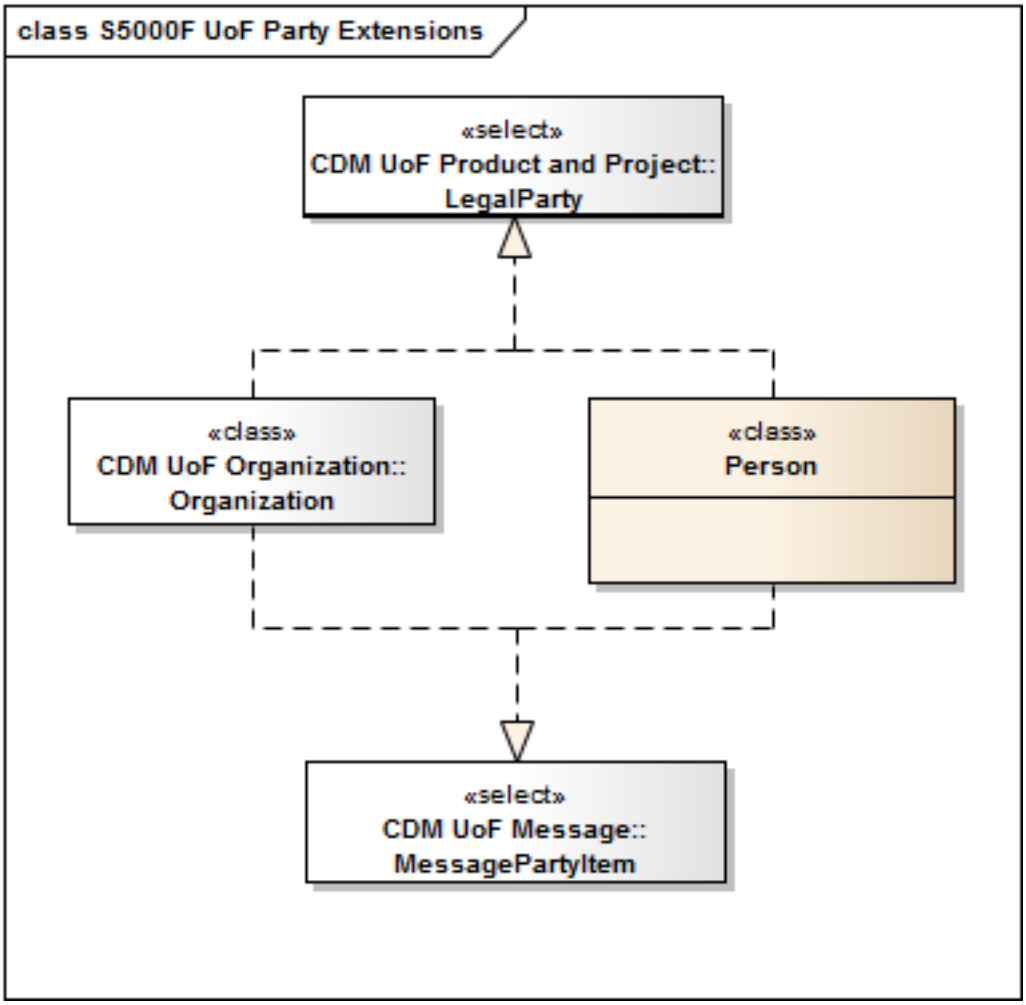
Fig 83 S5000F UoF Party



ICN-B6865-5000F15096-001-01

Fig 84 S5000F UoF Party Extensions

4.66.3 Class definition

4.66.3.1 Party

Party is an <<interface>> representing an entity that is capable of signing a contract or carrying out actions by itself without being instructed to do so.

4.66.3.1.1 Example(s)

- organization
- person

4.66.3.2 PartyAddress

PartyAddress is a <<relationship>> that defines the association between a Party and an Address.

4.66.3.2.1 Attribute(s)

This class has the following attributes:

- partyAddressDuration
- partyAddressType

4.66.3.2.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type StreetAddress

4.66.3.3 PartyContactData
PartyContactData is an <<attributeGroup>> that provides the contact details for a Party.

4.66.3.3.1 Attribute(s)
This class has the following attributes:

– partyContactDataDetails
– partyContactDataType

4.66.3.3.2 Associations
This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type PartyItem

4.66.3.4 PartyItem
PartyItem is an <<extend>> interface that allows to provide additional capabilities to Organizations and Persons.

4.66.3.4.1 Associations
This class has the following associations:

– An association to object(s) of type PartyAddress. A PartyItem can be associated zero, one or many times to an Address (via the PartyAddress <<relationship>>)
– An association to object(s) of type PartyRelationship

4.66.3.5 PartyRelationship
A PartyRelationship is a <<relationship>> existing between two Parties (organizations or people).

4.66.3.5.1 Attribute(s)
This class has the following attributes:

– partyRelationshipDescription
– partyRelationshipDuration, optional
– partyRelationshipType

4.66.3.5.2 Associations
This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of Party

4.66.3.6 Person
Person is a living human being.

4.66.3.6.1 Attribute(s)
This class has the following attributes:

– personIdentifier, one or many
– personDates, optional
– personFamilyName, zero, one or many
– personMiddleName, zero, one or many
– personName, zero, one or many
– personPrefixTitle, zero, one or many
– personSuffixTitle, zero, one or many

4.66.3.6.2 Associations
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type PersonGroup

4.66.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- PartyItem
- PersonCompetenceItem (See S5000F UoF Person Competences and Labor Rates, Para 4.67)
- SecurityAssignmentParty (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)

4.66.3.6.4 Selects

This class is a member of the following <<select>> interfaces:

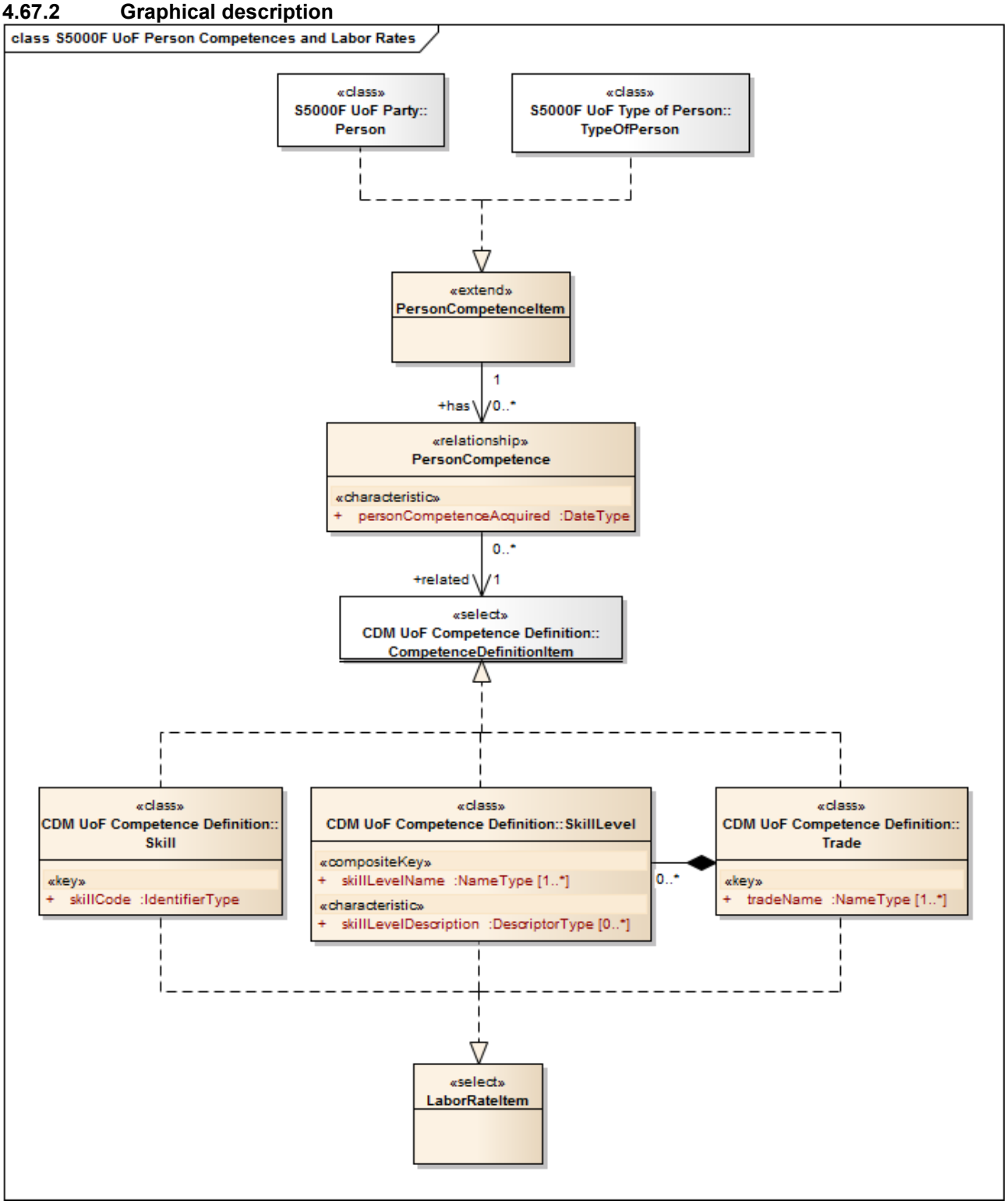
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (See S5000F UoF Failure Detection and Location, Para 4.38)
- LegalParty (See S5000F UoF Project and Contract, Para 4.71)
- MessagePartyItem (See S5000F UoF Message, Para 4.55)
- NonAvailabilityAttribution (See S5000F UoF Availability, Para 4.13)
- Party
- ReportingParty (See S5000F UoF Report, Para 4.73)
- ResourceItem (See S5000F UoF Resource Usage Request, Para 4.77)
- SafetyItem (See S5000F UoF Safety, Para 4.78)
- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)

4.67 S5000F UoF Person Competences and Labor Rates

4.67.1 Description

Person Competences and Labor Rates UoF provides information about the competences and labor rates that can be associated to a person.

4.67.2 Graphical description



ICN-B6865-5000F15097-001-01

Fig 85 S5000F UoF Person Competences and Labor Rates

4.67.3 Class definition

4.67.3.1 LaborRateItem

LaborRateItem is a <<select>> interface that allows to associate a LaborRate to a skilled labor.

4.67.3.2 PersonCompetence
The PersonCompetence is a <<relationship>> that defines the competences that a Person has acquired.

4.67.3.2.1 Attribute(s)
This class has the following attributes:

- personCompetenceAcquired

4.67.3.2.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of CompetenceDefinitionItem

4.67.3.3 PersonCompetenceItem
PersonCompetenceItem is an <<extend>> interface that allows to associate a PersonCompetence to a GenericPerson. or an individual.

4.67.3.3.1 Associations
This class has the following associations:

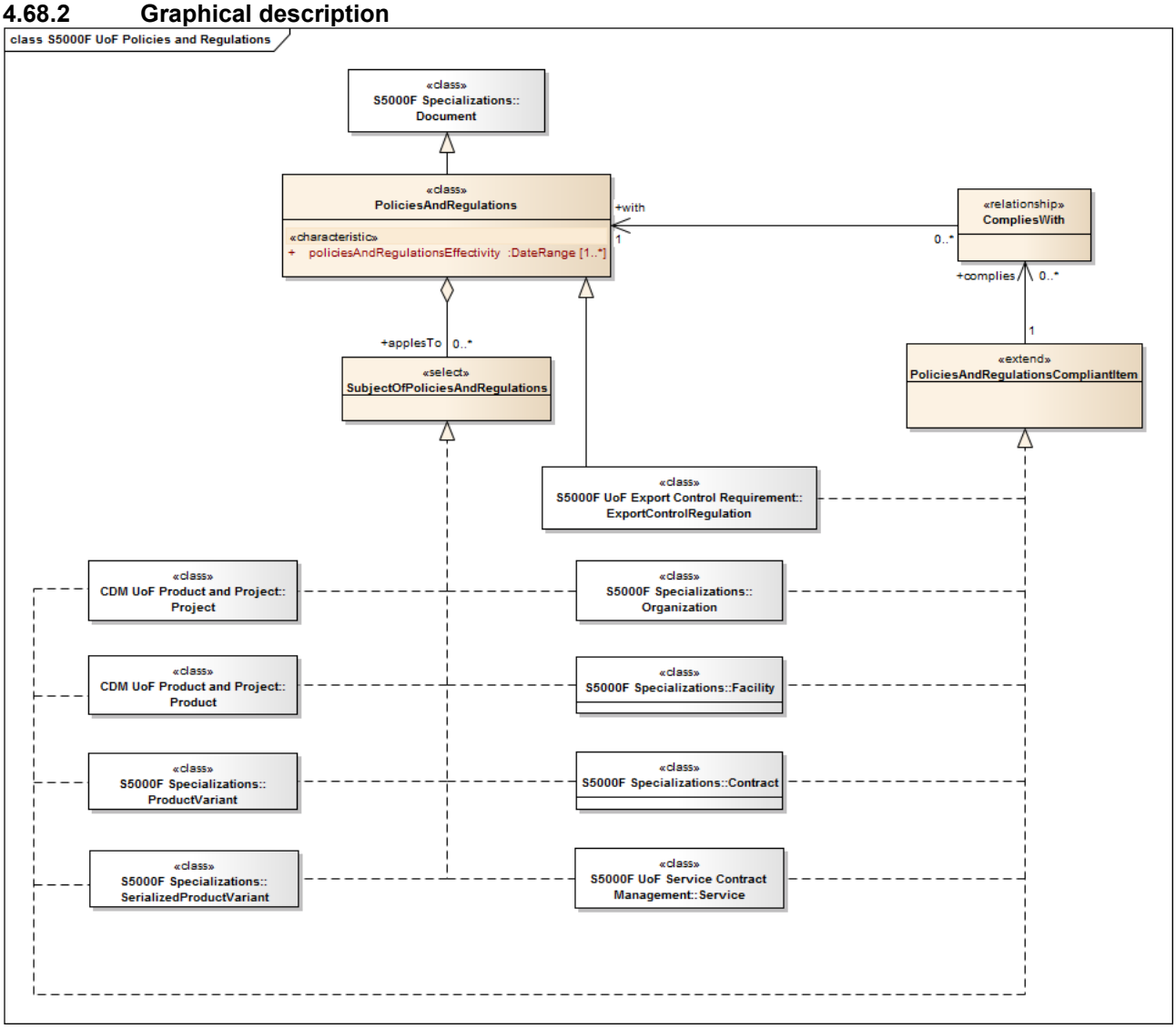
- An association to object(s) of type PersonCompetence. A person can have zero, one or many competences associated to it (via the PersonCompetence <<relationship>>)

4.68 S5000F UoF Policies and Regulations

4.68.1 Description

Policies and Regulations UoF provides the capability to associate policies and regulations to specific items.

4.68.2 Graphical description



ICN-B6865-5000F15064-002-01

Fig 86 S5000F UoF Policies and Regulations

4.68.3 Class definition

4.68.3.1 CompliesWith

CompliesWith is a <<relationship>> that allows to associate an item with the PoliciesAndRegulations with which it complies.

4.68.3.1.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type ExportControlRegulation
- An association, zero, one or many, to object(s) of type PoliciesAndRegulations

4.68.3.2 PoliciesAndRegulations

PoliciesAndRegulations is a Document that defines mandatory practices for a Project, Product, Contract, Service or major item requiring specific guidelines.

4.68.3.2.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentCreationDate (inherited from Document), optional
- documentDescription (inherited from Document), optional
- documentStatus (inherited from Document), optional
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- policiesAndRegulationsEffectivity, one or many

4.68.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type DocumentRelationship

4.68.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.68.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)

4.68.3.3 PoliciesAndRegulationsCompliantItem

PoliciesAndRegulationsCompliantItem is an <<extend>> interface that allows to associate an item to the PoliciesAndRegulations with which it complies

4.68.3.3.1 Associations

This class has the following associations:

- An association to object(s) of type CompliesWith

4.68.3.4 SubjectOfPoliciesAndRegulations

SubjectofPoliciesAndRegulations is a <<select>> interface that allows to associate policies and regulations to the items to which they apply.

4.68.3.4.1 Associations

This class has the following associations:

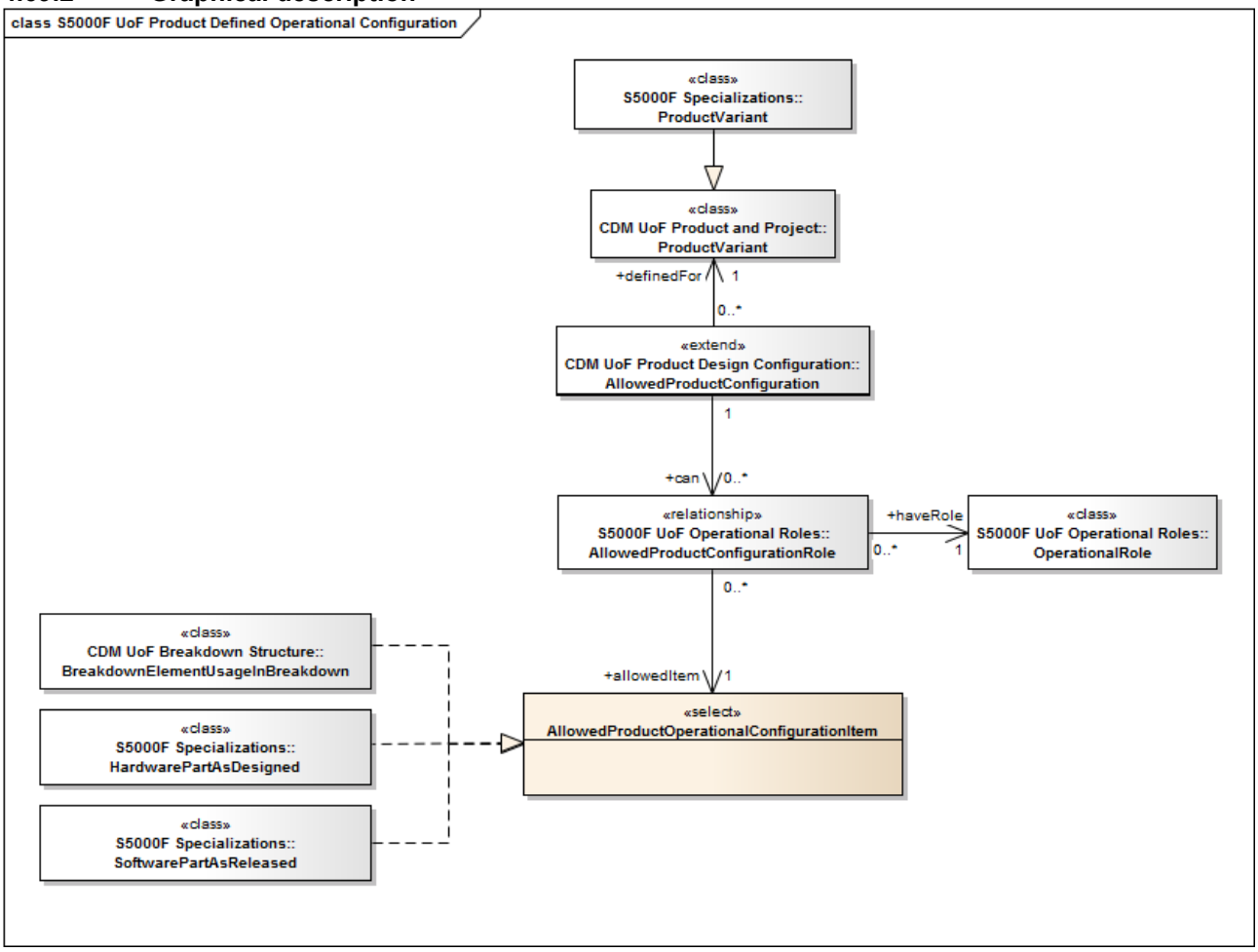
- A composition association, applesTo, zero, one or many, to child objects of type ExportControlRegulation
- A composition association, applesTo, zero, one or many, to child objects of type PoliciesAndRegulations

4.69 S5000F UoF Product Defined Operational Configuration

4.69.1 Description

The Product Defined Operational Configuration UoF supports the definition of Role related restrictions within an overall allowed Product configuration (type certificate).

4.69.2 Graphical description



ICN-B6865-5000F15036-002-00

Fig 87 S5000F UoF Product Defined Operational Configuration

4.69.3 Class definition

4.69.3.1 AllowedProductOperationalConfigurationItem

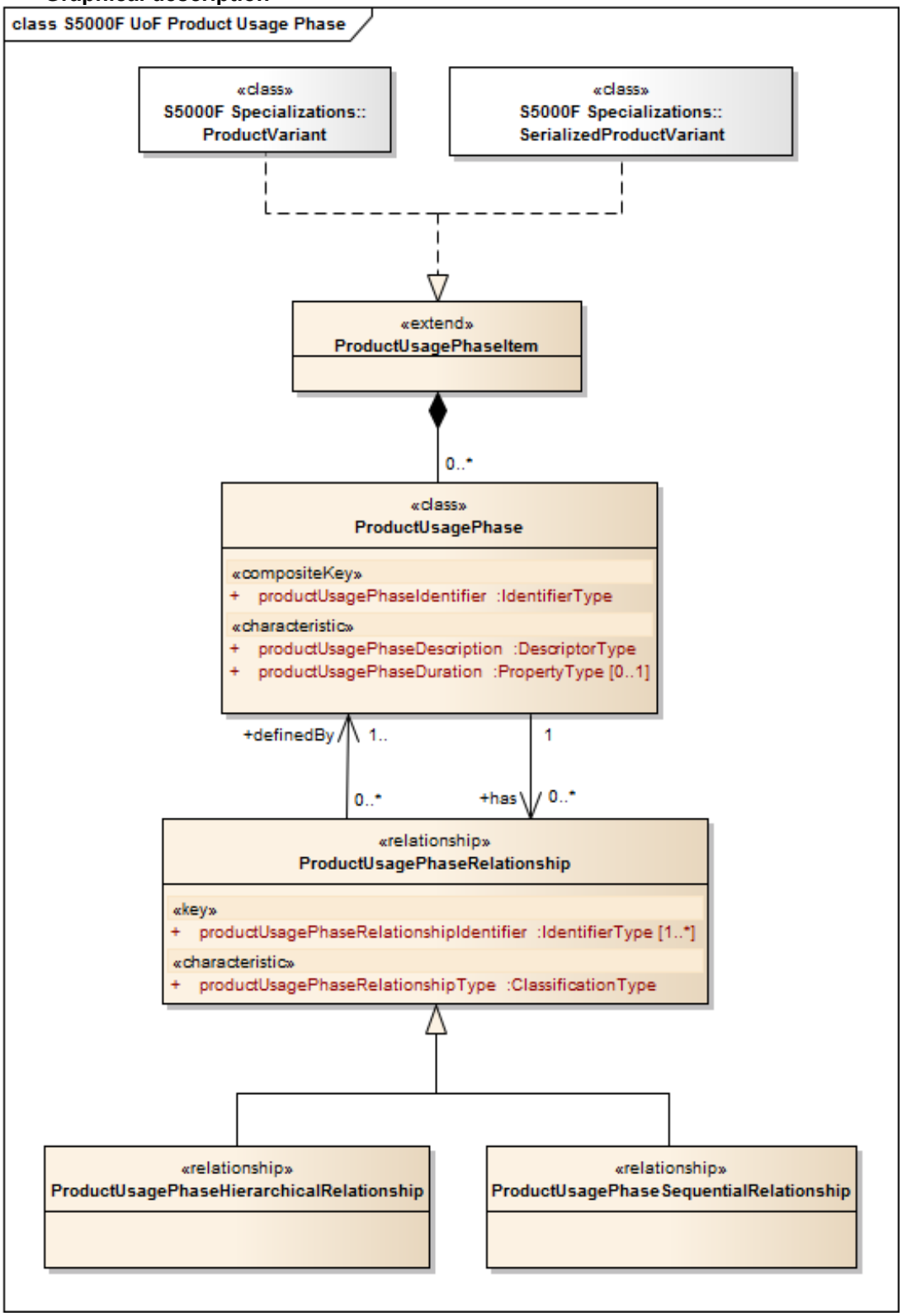
AllowedProductOperationalConfigurationItem is an <<interface>> that allows to define the items that can be included in the AllowedProductOperationalConfiguration.

4.70 S5000F UoF Product Usage Phase

4.70.1 Description

Product Usage Phase UoF provides the capability to define segments of the Product usage that have different usage characteristics.

4.70.2 Graphical description



ICN-B6865-5000F15037-002-01

Fig 88 S5000F UoF Product Usage Phase

4.70.3 Class definition

4.70.3.1 ProductUsagePhase

ProductUsagePhase is a distinct period of time during which a Product, ProductVariant or SerializedProductVariant will be used in a specific way, which is different from any other ProductUsagePhase.

4.70.3.1.1 Example(s)

- cruise
- immersion
- take-off

4.70.3.1.2 Attribute(s)

This class has the following attributes:

- productUsagePhaseIdentifier
- productUsagePhaseDescription
- productUsagePhaseDuration, optional

4.70.3.1.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type ProductUsagePhaseItem
- An association to object(s) of type ProductUsagePhaseHierarchicalRelationship
- An association to object(s) of type ProductUsagePhaseRelationship
- An association to object(s) of type ProductUsagePhaseSequentialRelationship

4.70.3.2 ProductUsagePhaseHierarchicalRelationship

ProductUsagePhaseHierarchicalRelationship is a <<relationship>> that allows to define a hierarchical association between two ProductUsagePhases.

4.70.3.2.1 Attribute(s)

This class has the following attributes:

- productUsagePhaseRelationshipIdentifier (inherited from ProductUsagePhaseRelationship), one or many
- productUsagePhaseRelationshipType (inherited from ProductUsagePhaseRelationship)

4.70.3.2.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type ProductUsagePhase

4.70.3.3 ProductUsagePhaseItem

ProductUsagePhaseItem is anwxtend>> interface which associates a ProductUsagePhase to the item(s) that have that type of usage.

4.70.3.4 ProductUsagePhaseRelationship

ProductUsagePhaseRelationship is a <<relationship>> that defines how two ProductUsagePhases are associated with each other.

4.70.3.4.1 Attribute(s)

This class has the following attributes:

- productUsagePhaseRelationshipIdentifier, one or many
- productUsagePhaseRelationshipType

4.70.3.4.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type ProductUsagePhase

4.70.3.5 ProductUsagePhaseSequentialRelationship
ProductUsagePhaseSequentialRelationship is a <<relationship>> that allows to define a sequential association between two ProductUsagePhases.

4.70.3.5.1 Attribute(s)
This class has the following attributes:

– productUsagePhaseRelationshipIdentifier (inherited from ProductUsagePhaseRelationship), one or many
– productUsagePhaseRelationshipType (inherited from ProductUsagePhaseRelationship)

4.70.3.5.2 Associations
This class has the following associations:

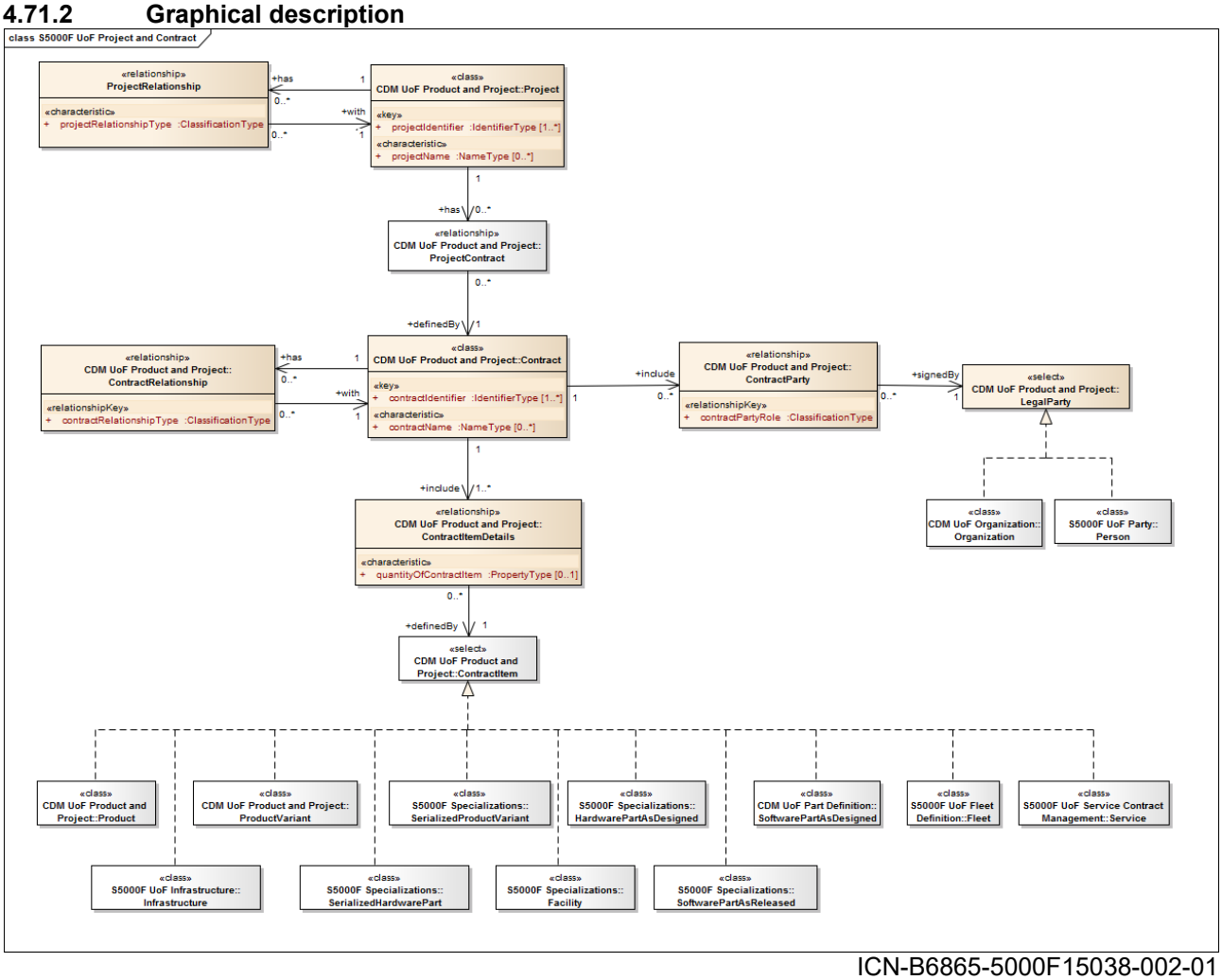
– An association, zero, one or many, to object(s) of type ProductUsagePhase

4.71 S5000F UoF Project and Contract

4.71.1 Description

The Project and Contract UoF defines the main relationships between one or several projects and one or several contracts, including what the purpose of the contract is in relationship with the project.

4.71.2 Graphical description



ICN-B6865-5000F15038-002-01

Fig 89 S5000F UoF Project and Contract

4.71.3 Class definition

4.71.3.1 ProjectRelationship

ProjectRelationShip is a <<relationship>> that defines an association between two different Projects.

4.71.3.1.1 Attribute(s)

This class has the following attributes:

– projectRelationshipType

4.71.3.1.2 Associations

This class has the following associations:

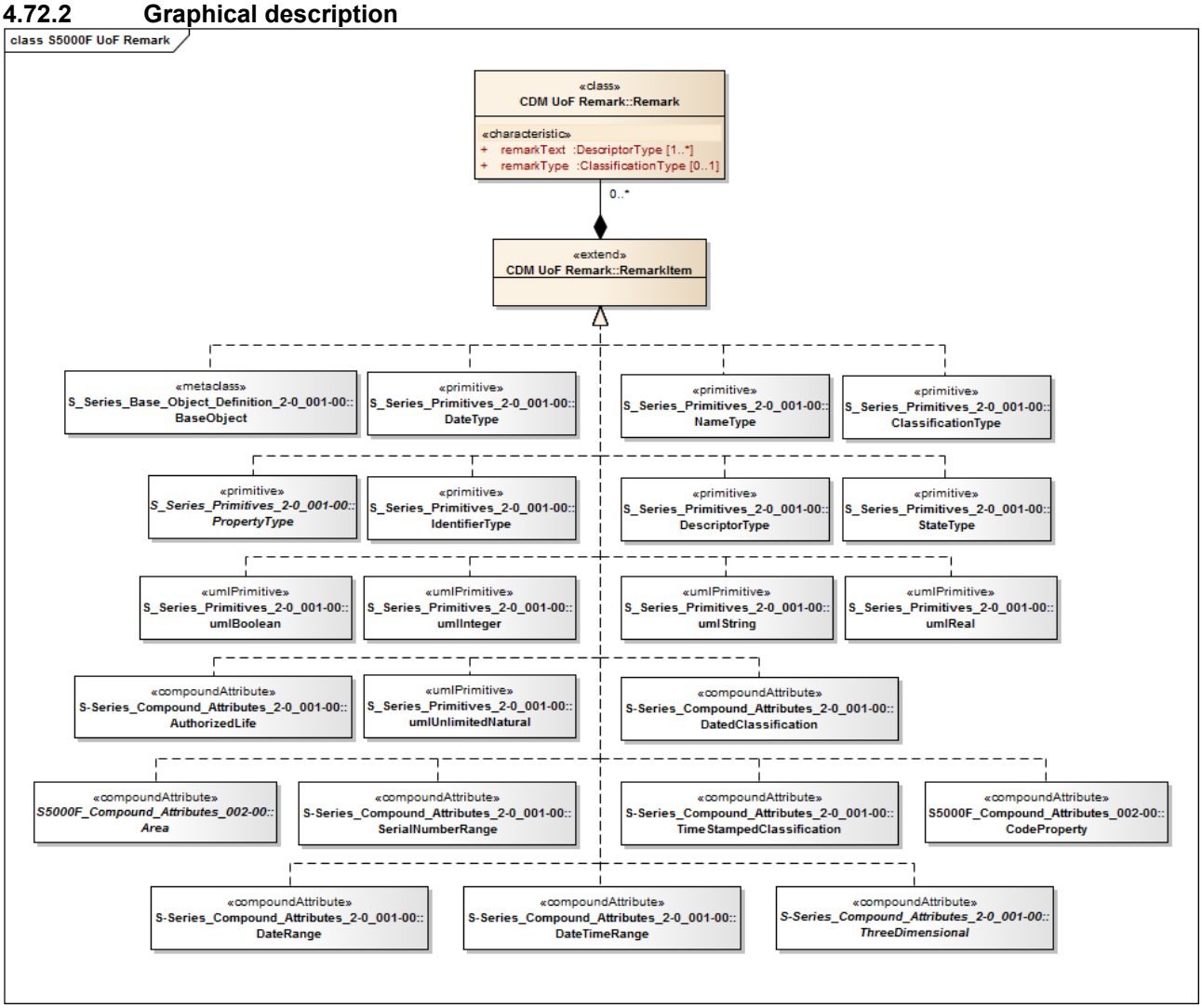
– An association, zero, one or many, to object(s) of type Project

4.72 S5000F UoF Remark

4.72.1 Description

The Remark UoF provides the capability to attack a comment, observation, or any text to an object of interest.

4.72.2 Graphical description



ICN-B6865-5000F15098-001-01

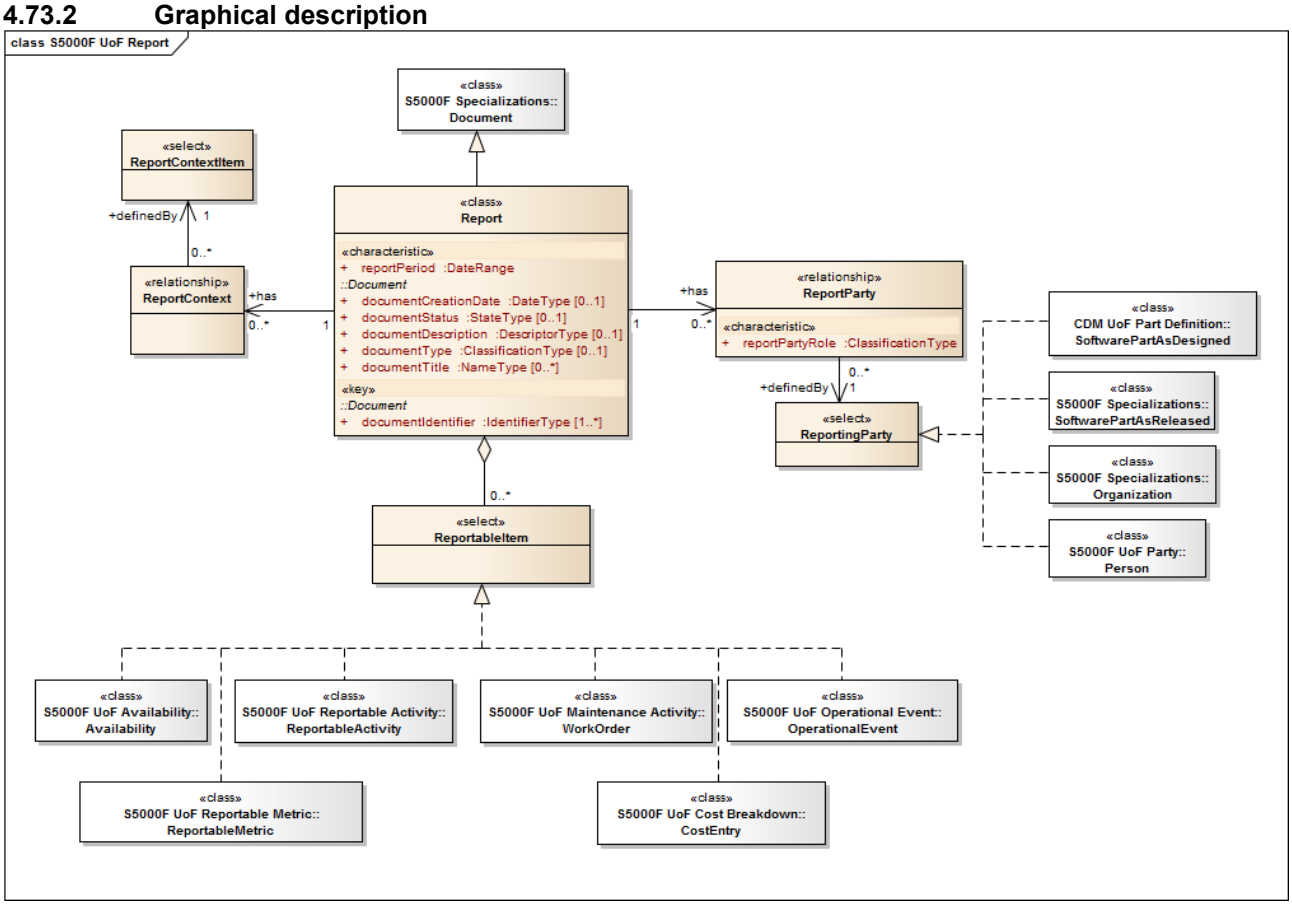
Fig 90 S5000F UoF Remark

4.73 S5000F UoF Report

4.73.1 Description

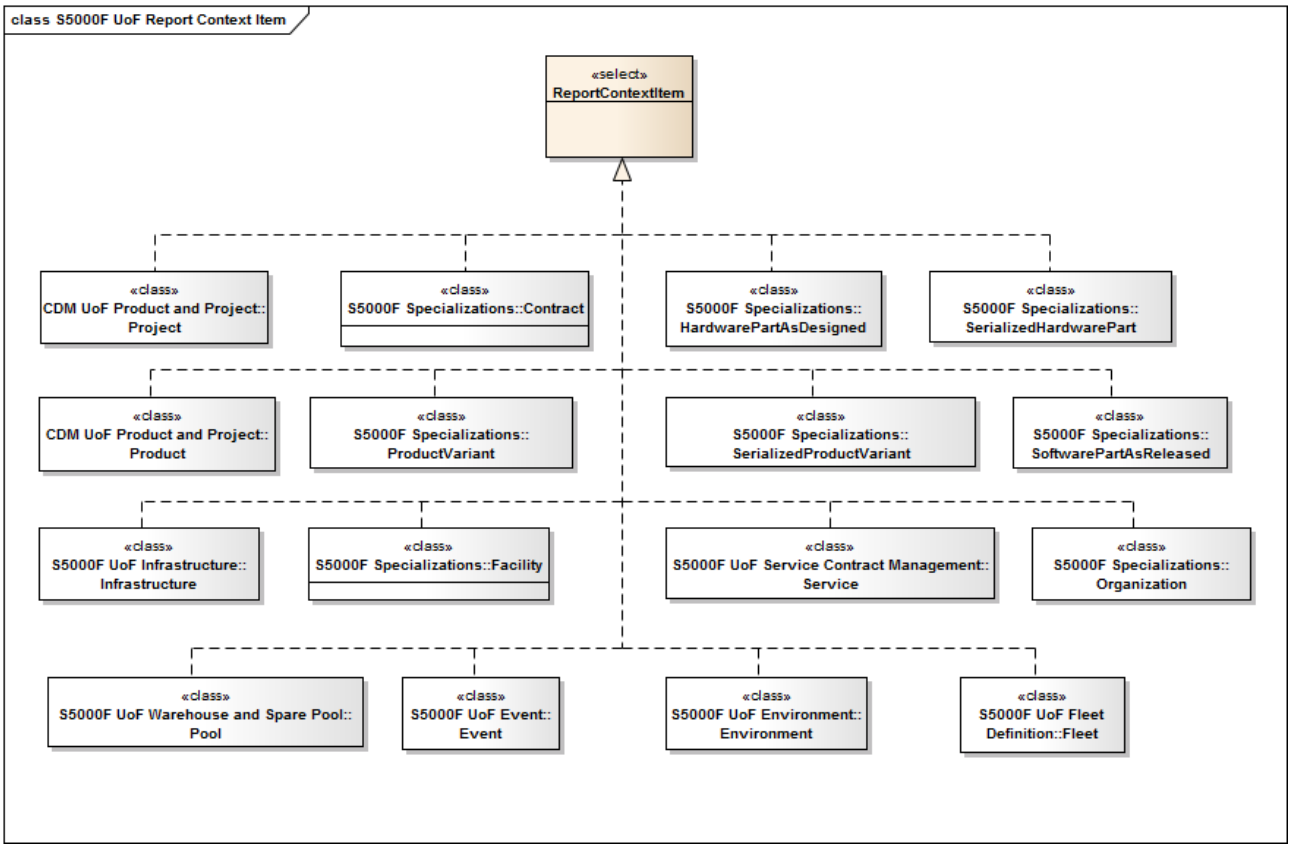
The Report UoF permits to deliver formal information between parties, usually as part of a contractual requirement.

4.73.2 Graphical description



ICN-B6865-5000F15099-001-01

Fig 91 S5000F UoF Report



ICN-B6865-5000F15041-002-01

Fig 92 S5000F UoF Report Context Item

4.73.3 Class definition

4.73.3.1 Report

Report is a Document that provides information about the execution of certain activities or significant events that have taken place.

Note

The relationship of Report with the subject of the Report (eg, a Contract) is performed through the DocumentAssignmentItem <<interface>> that is inherited from the Document class.

4.73.3.1.1 Example(s)

- cost report
- progress report
- technical report

4.73.3.1.2 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentCreationDate (inherited from Document), optional
- documentDescription (inherited from Document), optional
- documentStatus (inherited from Document), optional
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- reportPeriod

4.73.3.1.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type FleetTask
- An association to object(s) of type DocumentRelationship
- An association to object(s) of type ReportContext
- An association to object(s) of type ReportParty

4.73.3.1.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.73.3.1.5 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)

4.73.3.2 ReportableItem

ReportableItem is a <<select interface>> representing everything that is worth reporting.

4.73.3.2.1 Example(s)

- incurred cost
- maintenance activity
- operational event

4.73.3.2.2 Associations

This class has the following associations:

- A composition association, zero, one or many, to child objects of type Report

4.73.3.3 ReportContext

ReportContext is a <<relationship>> that allows a Report to be associated to its context.

4.73.3.3.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of ReportContextItem

4.73.3.4 ReportContextItem

ReportContextItem is a <<select>> interface that allows to indicate on which items a Report provides information.

4.73.3.5 ReportingParty
ReportingParty is a <<select>> interface that allows to define the author of a Report.

4.73.3.6 ReportParty
ReportParty is a <<relationship>> that allows a ReportingParty to be associated to a Report.

4.73.3.6.1 Attribute(s)
This class has the following attributes:

– reportPartyRole

4.73.3.6.2 Associations
This class has the following associations:

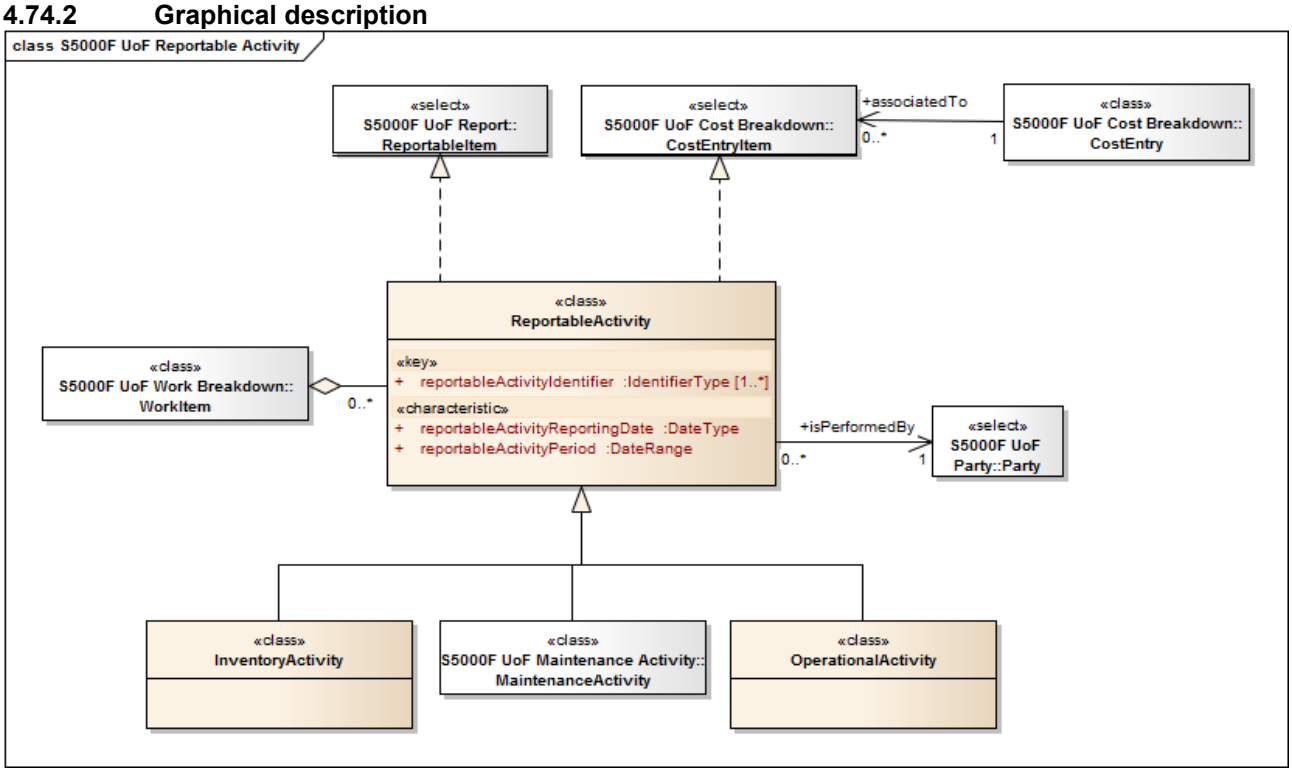
– An association, zero, one or many, to object(s) from classes that are members of ReportingParty

4.74 S5000F UoF Reportable Activity

4.74.1 Description

The Reportable Activity UoF provides the main relationships of a ReportableActvity and derived classes.

4.74.2 Graphical description



ICN-B6865-5000F15040-002-01

Fig 93 S5000F UoF Reportable Activity

4.74.3 Class definition

4.74.3.1 InventoryActivity
InventoryActivity is an Activity associated to the management of spares or warehouses-

4.74.3.1.1 Attribute(s)
This class has the following attributes:

– reportableActivityIdentifier (inherited from ReportableActivity), one or many

- reportableActivityPeriod (inherited from ReportableActivity)
- reportableActivityReportingDate (inherited from ReportableActivity)

4.74.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type WorkItem
- An association, zero, one or many, to object(s) from classes that are members of Party

4.74.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (inherited from ReportableActivity) (See S5000F UoF Cost Breakdown, Para 4.25)
- ReportableItem (inherited from ReportableActivity) (See S5000F UoF Report, Para 4.73)

4.74.3.2 OperationalActivity

OperationalActivity is an Activity associated to the operation of a SerializedProduct.

4.74.3.2.1 Attribute(s)

This class has the following attributes:

- reportableActivityIdentifier (inherited from ReportableActivity), one or many
- reportableActivityPeriod (inherited from ReportableActivity)
- reportableActivityReportingDate (inherited from ReportableActivity)

4.74.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type WorkItem
- An association, zero, one or many, to object(s) from classes that are members of Party

4.74.3.2.3 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (inherited from ReportableActivity) (See S5000F UoF Cost Breakdown, Para 4.25)
- ReportableItem (inherited from ReportableActivity) (See S5000F UoF Report, Para 4.73)

4.74.3.3 ReportableActivity

ReportableActivity is an activity that is part of work item that is deemed to be of sufficient importance as to be reported.

4.74.3.3.1 Example(s)

- maintenance action

4.74.3.3.2 Attribute(s)

This class has the following attributes:

- reportableActivityIdentifier, one or many
- reportableActivityPeriod
- reportableActivityReportingDate

4.74.3.3.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type TechnicalOrder
- A composition association, zero, one or many, to child objects of type WorkItem
- An association, zero, one or many, to object(s) from classes that are members of Party

4.74.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

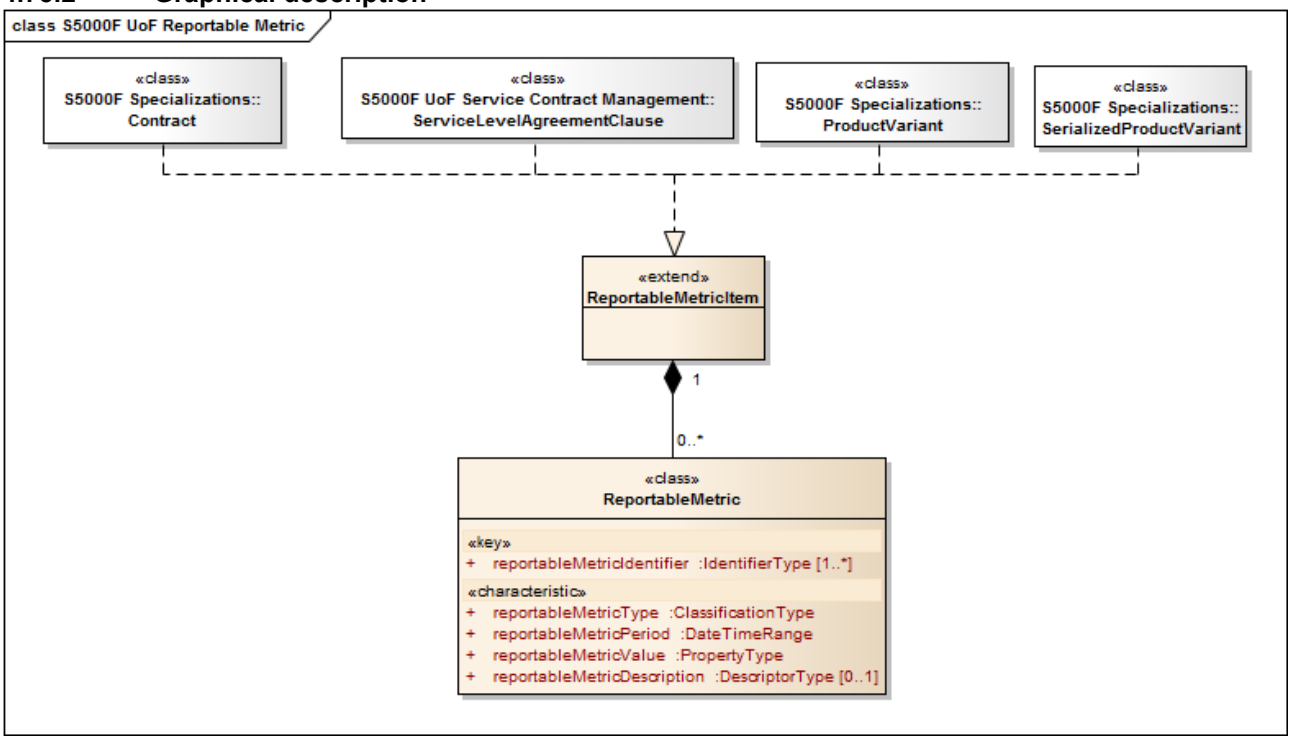
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- ReportableItem (See S5000F UoF Report, Para 4.73)

4.75 S5000F UoF Reportable Metric

4.75.1 Description

The Reportable Metric UoF allows to define the measurement performed on an item.

4.75.2 Graphical description



ICN-B6865-5000F15100-001-01

Fig 94 S5000F UoF Reportable Metric

4.75.3 Class definition

4.75.3.1 ReportableMetric

ReportableMetric is a measure of a specific characteristic that can evolve over time and is reported periodically for program or contract management purposes.

4.75.3.1.1 Attribute(s)

This class has the following attributes:

- reportableMetricIdentifier, one or many
- reportableMetricDescription, optional
- reportableMetricPeriod
- reportableMetricType
- reportableMetricValue

4.75.3.1.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type ReportableMetricItem

4.75.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

– SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.75.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

– ReportableItem (See S5000F UoF Report, Para 4.73)

4.75.3.2 ReportableMetricItem

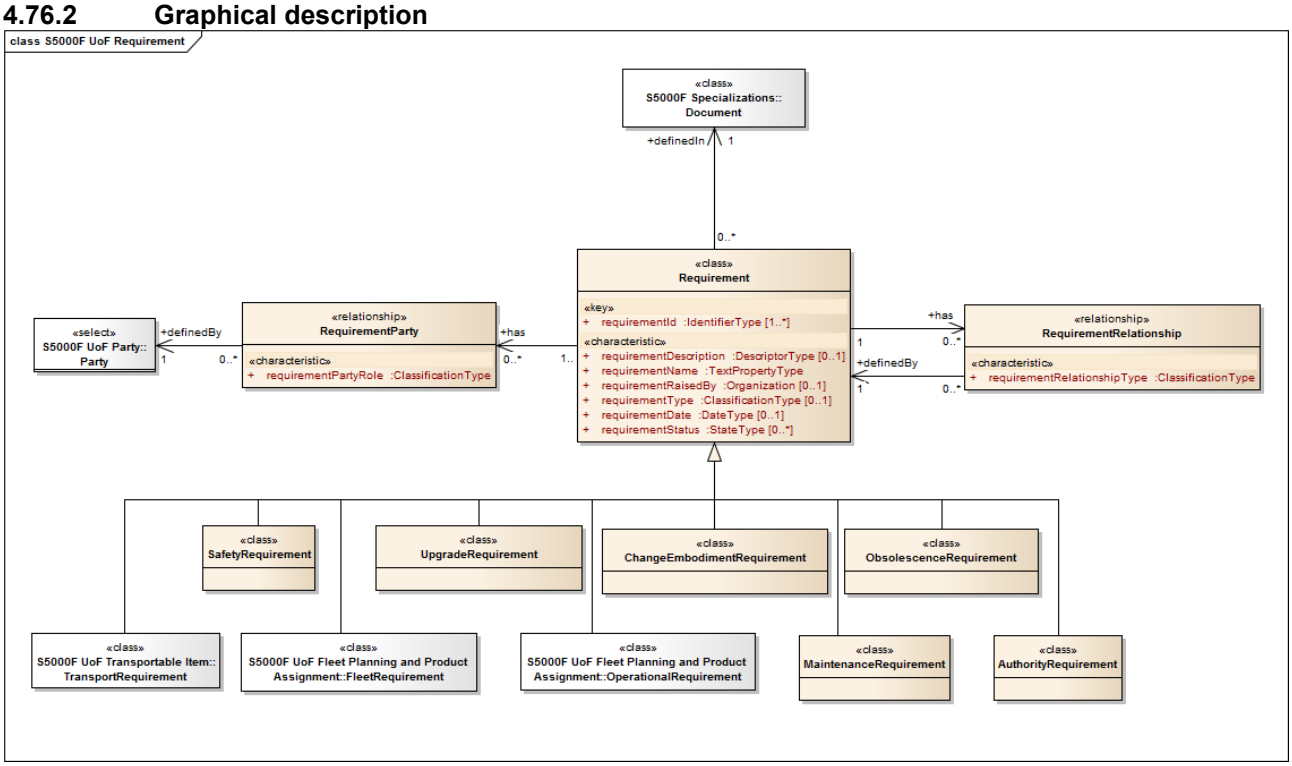
ReportableMetricItem is an <<extend>> interface that allows to assign ReportableMetrics to different items.

4.76 S5000F UoF Requirement

4.76.1 Description

Requirement UoF provides the capability to specify statements of needs that require implementation.

4.76.2 Graphical description



ICN-B6865-5000F15042-002-01

Fig 95 S5000F UoF Requirement

4.76.3 Class definition

4.76.3.1 AuthorityRequirement

AuthorityRequirement is a Requirement that has been issued by a technical or legal authority.

4.76.3.1.1 Attribute(s)

This class has the following attributes:

- requirementId (inherited from Requirement), one or many
- requirementDate (inherited from Requirement), optional
- requirementDescription (inherited from Requirement), optional
- requirementName (inherited from Requirement)
- requirementRaisedBy (inherited from Requirement), optional
- requirementStatus (inherited from Requirement), zero, one or many
- requirementType (inherited from Requirement), optional

4.76.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type ServiceRequest
- An association to object(s) of type RequirementParty
- An association to object(s) of type RequirementRelationship
- An association, zero, one or many, to object(s) of type Document

4.76.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Requirement) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from Requirement) (See S5000F UoF Change Information, Para 4.21)
- MaintenanceWorkOrderSource (inherited from Requirement) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Requirement) (See S5000F UoF Security Classification, Para 4.79)

4.76.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- SafetyItem (inherited from Requirement) (See S5000F UoF Safety, Para 4.78)

4.76.3.2 ChangeEmbodimentRequirement

ChangeEmbodimentRequirement is a Requirement to embody an authorized modification into one or several items.

4.76.3.2.1 Example(s)

- Embody change within 6 months after change approval.

4.76.3.2.2 Attribute(s)

This class has the following attributes:

- requirementId (inherited from Requirement), one or many
- requirementDate (inherited from Requirement), optional
- requirementDescription (inherited from Requirement), optional
- requirementName (inherited from Requirement)
- requirementRaisedBy (inherited from Requirement), optional
- requirementStatus (inherited from Requirement), zero, one or many
- requirementType (inherited from Requirement), optional
- changeEmbodimentRequirementType

4.76.3.2.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type ChangeAuthorization
- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type ServiceRequest
- An association to object(s) of type RequirementParty
- An association to object(s) of type RequirementRelationship
- An association, optional, to object(s) of type PlannedItemUpgrade. A ChangeEmbodimentRequirement can be optionally associated to a PlannedItemUpgrade
- An association, optional, to object(s) of type TechnicalOrder. ChangeEmbodimentRequirement can be optionally associated to a TechnicalOrder
- An association, zero, one or many, to object(s) of type Document

4.76.3.2.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Requirement) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from Requirement) (See S5000F UoF Change Information, Para 4.21)
- MaintenanceWorkOrderSource (inherited from Requirement) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Requirement) (See S5000F UoF Security Classification, Para 4.79)

4.76.3.2.5 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- SafetyItem (inherited from Requirement) (See S5000F UoF Safety, Para 4.78)

4.76.3.3 MaintenanceRequirement

MaintenanceRequirement is a Requirement to carry out one or several maintenance actions.

4.76.3.3.1 Attribute(s)

This class has the following attributes:

- requirementId (inherited from Requirement), one or many
- requirementDate (inherited from Requirement), optional
- requirementDescription (inherited from Requirement), optional
- requirementName (inherited from Requirement)
- requirementRaisedBy (inherited from Requirement), optional
- requirementStatus (inherited from Requirement), zero, one or many
- requirementType (inherited from Requirement), optional

4.76.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type ServiceRequest
- An association to object(s) of type RequirementParty
- An association to object(s) of type RequirementRelationship
- An association, zero, one or many, to object(s) of type Document

4.76.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Requirement) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from Requirement) (See S5000F UoF Change Information, Para 4.21)
- MaintenanceWorkOrderSource (inherited from Requirement) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Requirement) (See S5000F UoF Security Classification, Para 4.79)

4.76.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- SafetyItem (inherited from Requirement) (See S5000F UoF Safety, Para 4.78)

4.76.3.4 ObsolescenceRequirement

ObsolescenceRequirement is a Requirement that indicates when an item becomes obsolete.

4.76.3.4.1 Example(s)

- Seek replacement every five years or when supplier informs that item is discontinued.

4.76.3.4.2 Attribute(s)

This class has the following attributes:

- requirementId (inherited from Requirement), one or many
- requirementDate (inherited from Requirement), optional
- requirementDescription (inherited from Requirement), optional
- requirementName (inherited from Requirement)
- requirementRaisedBy (inherited from Requirement), optional
- requirementStatus (inherited from Requirement), zero, one or many
- requirementType (inherited from Requirement), optional

4.76.3.4.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type ServiceRequest
- An association to object(s) of type RequirementParty
- An association to object(s) of type RequirementRelationship
- An association, zero, one or many, to object(s) of type Document
- An association to object(s) from classes that are members of ObsolescenceItem

4.76.3.4.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Requirement) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from Requirement) (See S5000F UoF Change Information, Para 4.21)
- MaintenanceWorkOrderSource (inherited from Requirement) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Requirement) (See S5000F UoF Security Classification, Para 4.79)

4.76.3.4.5 Selects

This class is a member of the following <<select>> interfaces:

– SafetyItem (inherited from Requirement) (See S5000F UoF Safety, Para 4.78)

4.76.3.5 Requirement
Requirement is a documented need that has to be implemented.

4.76.3.5.1 Attribute(s)
This class has the following attributes:

– requirementId, one or many
– requirementDate, optional
– requirementDescription, optional
– requirementName
– requirementRaisedBy, optional
– requirementStatus, zero, one or many
– requirementType, optional

4.76.3.5.2 Associations
This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
– A composition association, zero, one or many, to child objects of type ServiceRequest
– An association to object(s) of type RequirementParty
– An association to object(s) of type RequirementRelationship
– An association, zero, one or many, to object(s) of type Document
– An association, zero, one or many, to object(s) of type ExportControlRegulation
– An association, zero, one or many, to object(s) of type ExternalDocument
– An association, zero, one or many, to object(s) of type FleetTaskCancellationNotice
– An association, zero, one or many, to object(s) of type MaintenanceProgram
– An association, zero, one or many, to object(s) of type PoliciesAndRegulations
– An association, zero, one or many, to object(s) of type Report
– An association, zero, one or many, to object(s) of type SafetyDocument
– An association, zero, one or many, to object(s) of type SafetyIssue
– An association, zero, one or many, to object(s) of type SafetyRequirementsDocument
– An association, zero, one or many, to object(s) of type SafetyWarning
– An association, zero, one or many, to object(s) of type SCORMContentPackage
– An association, zero, one or many, to object(s) of type ServiceBulletin
– An association, zero, one or many, to object(s) of type SpecialSafetyInstruction

4.76.3.5.3 Implementations
This class implements the following <<extend>> interfaces:

– ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
– ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
– MaintenanceWorkOrderSource (See S5000F UoF Maintenance Work Order Source, Para 4.53)
– SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.76.3.5.4 Selects
This class is a member of the following <<select>> interfaces:

– SafetyItem (See S5000F UoF Safety, Para 4.78)

4.76.3.6 RequirementParty
RequirementParty is a <<relationship>> that associates a Requirement with a Party.

4.76.3.6.1 Attribute(s)
This class has the following attributes:

- requirementPartyRole

4.76.3.6.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of Party

4.76.3.7 RequirementRelationship
RequirementRelationship is a <<relationship>> that defines the association between two Requirements.

4.76.3.7.1 Attribute(s)
This class has the following attributes:

- requirementRelationshipType

4.76.3.7.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) of type AuthorityRequirement
- An association, zero, one or many, to object(s) of type ChangedItemtAvailabilityRequirement
- An association, zero, one or many, to object(s) of type ChangeEmbodimentRequirement
- An association, zero, one or many, to object(s) of type FleetRequirement
- An association, zero, one or many, to object(s) of type MaintenanceRequirement
- An association, zero, one or many, to object(s) of type ObsolescenceRequirement
- An association, zero, one or many, to object(s) of type OperationalRequirement
- An association, zero, one or many, to object(s) of type Requirement
- An association, zero, one or many, to object(s) of type SafetyRequirement
- An association, zero, one or many, to object(s) of type TransportRequirement
- An association, zero, one or many, to object(s) of type UpgradeRequirement

4.76.3.8 SafetyRequirement
SafetyRequirement is a Requirement that has to be applied for safety purposes.

4.76.3.8.1 Attribute(s)
This class has the following attributes:

- requirementId (inherited from Requirement), one or many
- requirementDate (inherited from Requirement), optional
- requirementDescription (inherited from Requirement), optional
- requirementName (inherited from Requirement)
- requirementRaisedBy (inherited from Requirement), optional
- requirementStatus (inherited from Requirement), zero, one or many
- requirementType (inherited from Requirement), optional

4.76.3.8.2 Associations
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type SafetyRequirementsDocument
- A composition association, zero, one or many, to child objects of type ServiceRequest
- An association to object(s) of type RequirementParty

- An association to object(s) of type RequirementRelationship
- An association, zero, one or many, to object(s) of type Document

4.76.3.8.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Requirement) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from Requirement) (See S5000F UoF Change Information, Para 4.21)
- MaintenanceWorkOrderSource (inherited from Requirement) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Requirement) (See S5000F UoF Security Classification, Para 4.79)

4.76.3.8.4 Selects

This class is a member of the following <<select>> interfaces:

- SafetyItem (inherited from Requirement) (See S5000F UoF Safety, Para 4.78)

4.76.3.9 UpgradeRequirement

UpgradeRequirement is a Requirement that must be applied during the embodiment of a change (upgrade).

4.76.3.9.1 Example(s)

- The individual ProductVariant downtime for the upgrade must not exceed 3 hours.
- The modification can be only embodied when the vehicle is defueled.
- Upgrade to be performed during maintenance period extending for more than 3 days, so as not to impact fleet operations.

4.76.3.9.2 Attribute(s)

This class has the following attributes:

- requirementId (inherited from Requirement), one or many
- requirementDate (inherited from Requirement), optional
- requirementDescription (inherited from Requirement), optional
- requirementName (inherited from Requirement)
- requirementRaisedBy (inherited from Requirement), optional
- requirementStatus (inherited from Requirement), zero, one or many
- requirementType (inherited from Requirement), optional

4.76.3.9.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type ServiceRequest
- An association to object(s) of type RequirementParty
- An association to object(s) of type RequirementRelationship
- An association, zero, one or many, to object(s) of type Document
- An association, zero, one or many, to object(s) of type PlannedItemUpgrade

4.76.3.9.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Requirement) (See S5000F UoF Applicability Statement, Para 4.11)

- ChangeControlledItem (inherited from Requirement) (See S5000F UoF Change Information, Para 4.21)
- MaintenanceWorkOrderSource (inherited from Requirement) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Requirement) (See S5000F UoF Security Classification, Para 4.79)

4.76.3.9.5 Selects

This class is a member of the following <<select>> interfaces:

- SafetyItem (inherited from Requirement) (See S5000F UoF Safety, Para 4.78)

4.77 S5000F UoF Resource Usage Request

4.77.1 Description

The Resource Usage Request UoF provides the capability for one party to ask for the utilization of resources from a different Party.

4.77.2 Graphical description

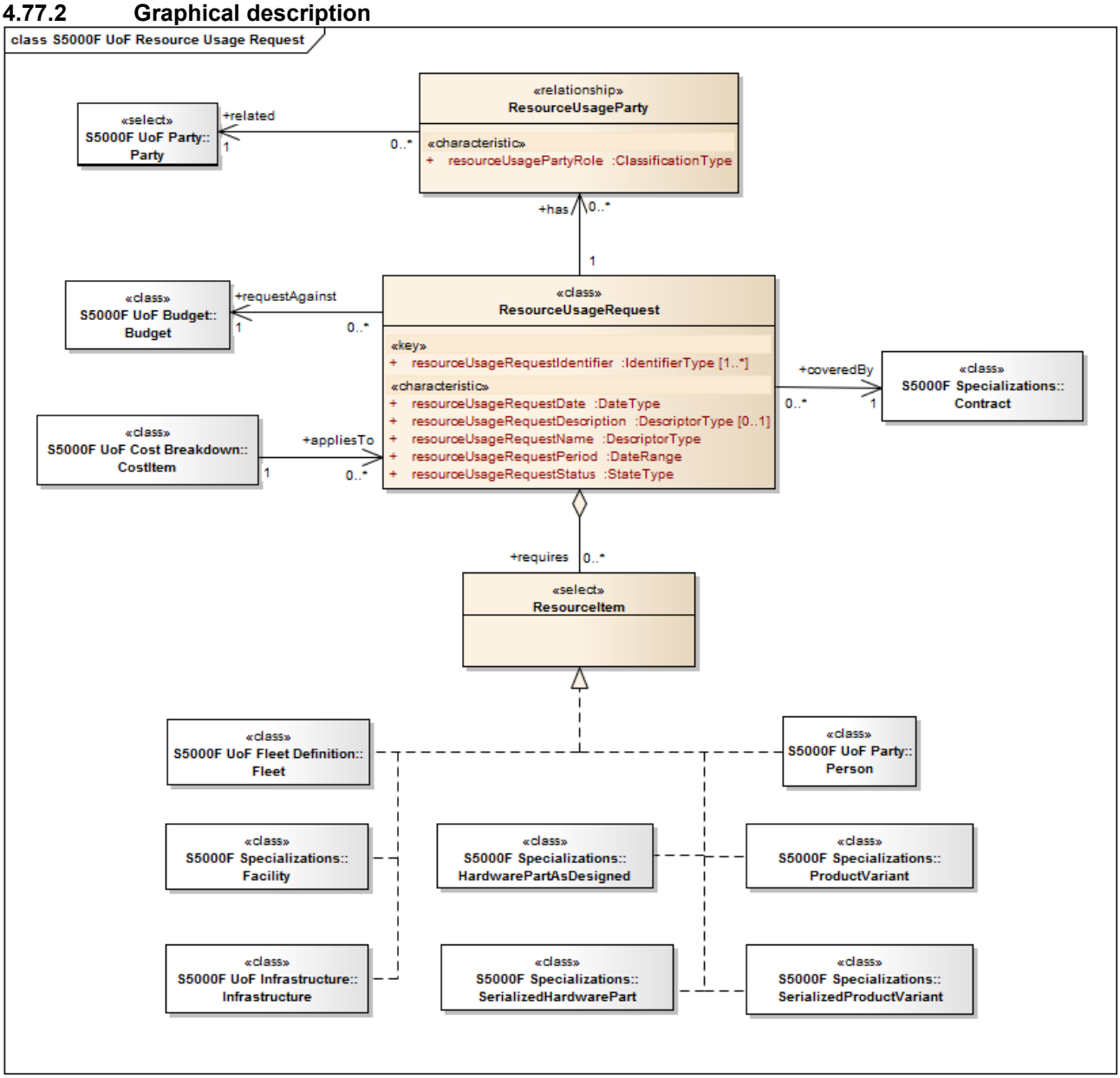


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Fig 96 S5000F UoF Resource Usage Request

4.77.3 Class definition

4.77.3.1 ResourceItem

ResourceItem is a <<select>> interface representing items whose usage can be requested for a specific period of time and during which they cannot be used by somebody else.

4.77.3.1.1 Associations

This class has the following associations:

– A composition association, requires, zero, one or many, to child objects of type ResourceUsageRequest

4.77.3.2 ResourceUsageParty

ResourceUsageParty is a <<relationship>> that defines which party request which one to use a resource.

4.77.3.2.1 Attribute(s)
This class has the following attributes:

- resourceUsagePartyRole

4.77.3.2.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of Party

4.77.3.3 ResourceUsageRequest
ResourceUsageRequest is a class representing a demand from a party to use a resource belonging to a different party.

4.77.3.3.1 Example(s)
- request for a simulator slot
- request for usage of a ship dock

4.77.3.3.2 Attribute(s)
This class has the following attributes:

- resourceUsageRequestIdentifier, one or many
- resourceUsageRequestDate
- resourceUsageRequestDescription, optional
- resourceUsageRequestName
- resourceUsageRequestPeriod
- resourceUsageRequestStatus

4.77.3.3.3 Associations
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type ResourceUsageParty. A ResourceUsageRequest must be associated to exactly two Paties (via the ResourceUsageParty <<relationship>)
- An association, zero, one or many, to object(s) of type Budget
- An association, zero, one or many, to object(s) of type Contract

4.77.3.3.4 Selects
This class is a member of the following <<select>> interfaces:

- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)

4.78 S5000F UoF Safety

4.78.1 Description

Safety UoF identifies how safety issues and safety documents are related.

4.78.2 Graphical description

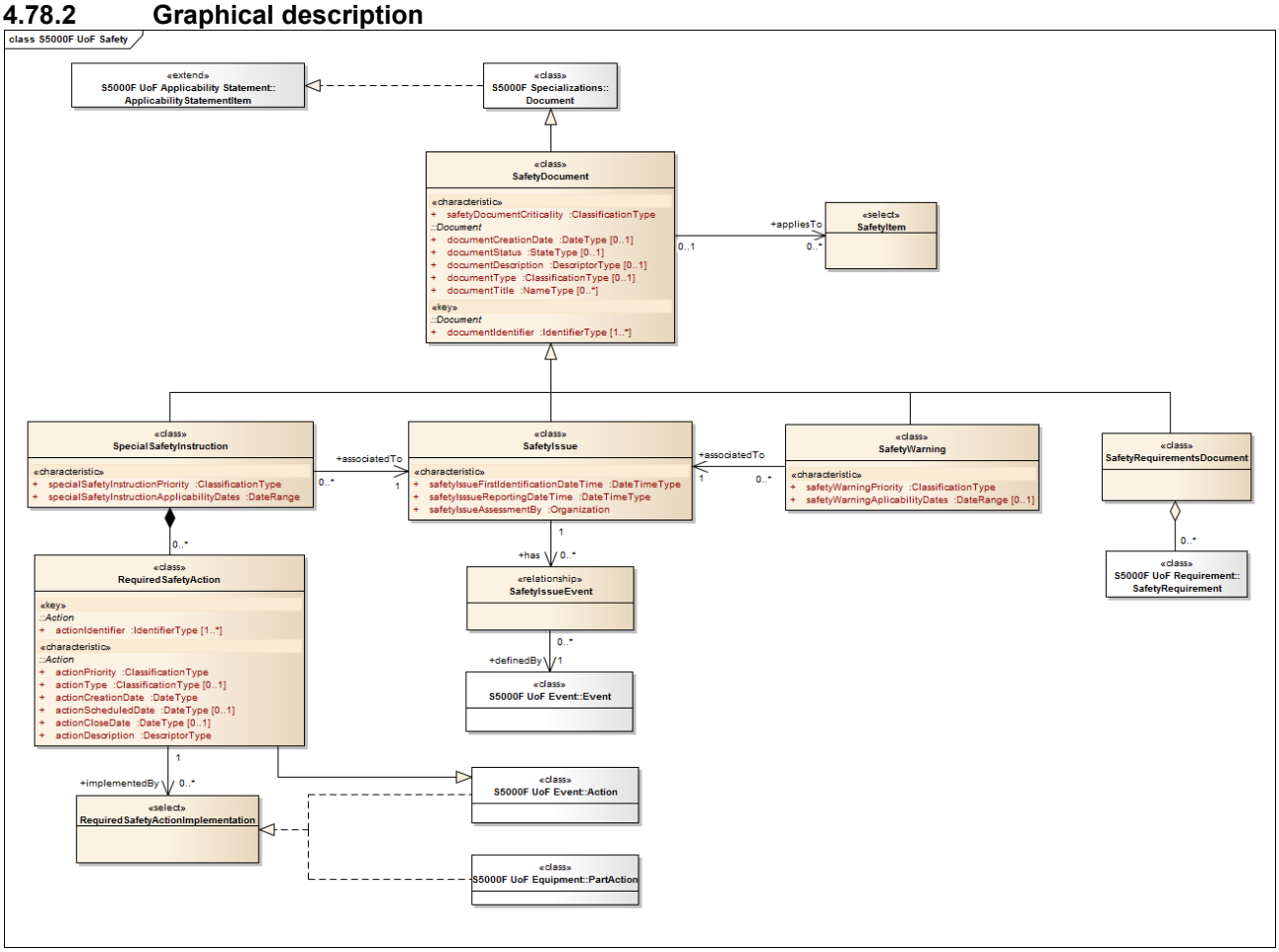

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Fig 97 S5000F UoF Safety

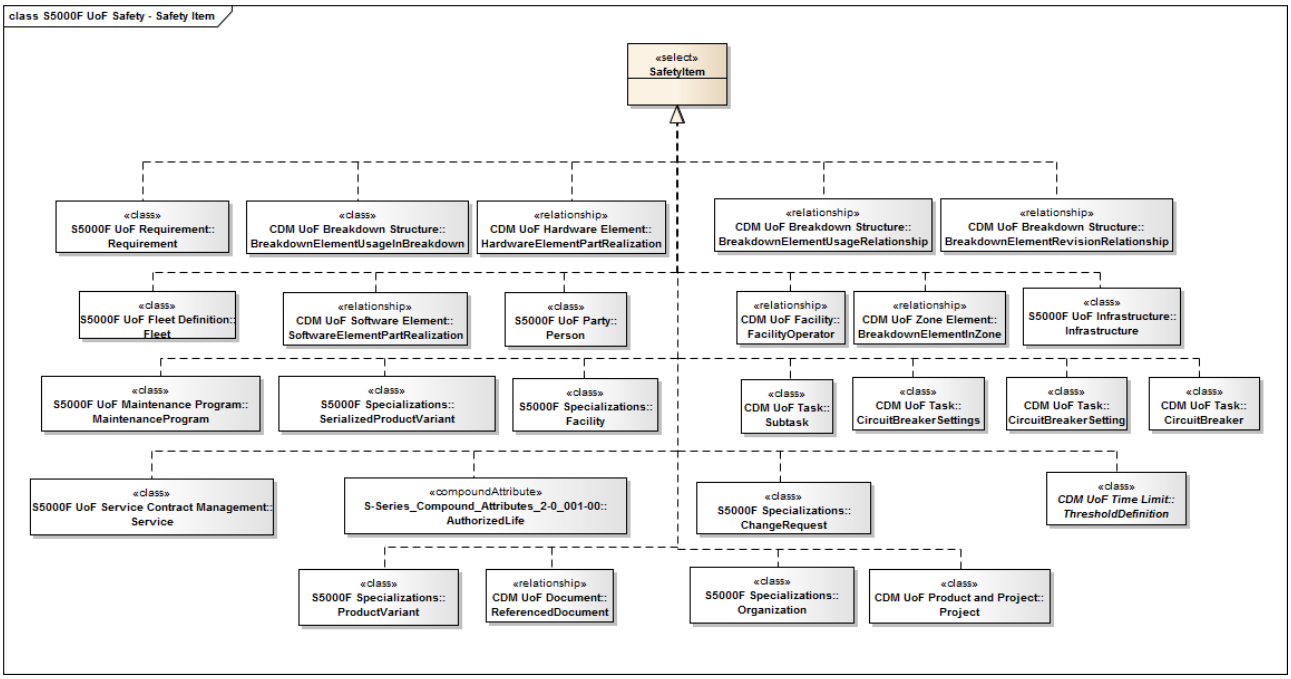

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Fig 98 S5000F UoF Safety - Safety Item

4.78.3 Class definition

4.78.3.1 RequiredSafetyAction

RequiredSafetyAction is a <<class>> representing the action to be taken as part of a SpecialSafetyInstruction so as to ensure the Product safety.

4.78.3.1.1 Attribute(s)

This class has the following attributes:

- actionIdentifier (inherited from Action), one or many
- actionCloseDate (inherited from Action), optional
- actionCreationDate (inherited from Action)
- actionDescription (inherited from Action)
- actionPriority (inherited from Action)
- actionScheduledDate (inherited from Action), optional
- actionType (inherited from Action), optional

4.78.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An aggregate association, zero, one or many, to related object(s) of type SpecialSafetyInstruction
- A composition association, zero, one or many, to child objects of type Damage
- A composition association, zero, one or many, to child objects of type WarrantyClaim
- A composition association, actionTakenAtEvent, zero, one or many, to child objects of type Event
- An association to object(s) from classes that are members of RequiredSafetyActionImplementation

4.78.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestReasonItem (inherited from Action) (See S5000F UoF Change Request, Para 4.22)
- RequiredSafetyActionImplementation (inherited from Action)

4.78.3.2 RequiredSafetyActionImplementation

RequiredSafetyActionImplementation is a <<select>> interface that allows to provide traceability between taken a RequiredSafetyAction and the actions effectively implementing it.

4.78.3.3 SafetyDocument

SafetyDocument is a Document associated to the safety of an item.

4.78.3.3.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentCreationDate (inherited from Document), optional
- documentDescription (inherited from Document), optional
- documentStatus (inherited from Document), optional
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- safetyDocumentCriticality

4.78.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type DocumentRelationship
- An association, optional, to object(s) from classes that are members of SafetyItem

4.78.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.78.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)

4.78.3.4 SafetyIssue

SafetyIssue is a SafetyDocument reporting a safety issue associated to the safety of a Product, Service or Part (hardware or software) item.

Note

SafetyIssues are usually generated by a productvariant operator, typically as the result of an (operational) Event.

Note

The organization reporting the SafetyIssue, the relationship with other SafetyIssues, applicability, etc, are inherited from the Document class.

4.78.3.4.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentCreationDate (inherited from Document), optional
- documentDescription (inherited from Document), optional
- documentStatus (inherited from Document), optional
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- safetyDocumentCriticality (inherited from SafetyDocument)
- safetyIsssueReportingDateTime
- safetyIssueAssessmentBy
- safetyIssueFirstIdentificationDateTime

4.78.3.4.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type DocumentRelationship
- An association to object(s) of type SafetyIssueEvent
- An association, optional, to object(s) from classes that are members of SafetyItem

4.78.3.4.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.78.3.4.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestReasonItem (See S5000F UoF Change Request, Para 4.22)
- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)

4.78.3.5 SafetyIssueEvent

SafetyIssueEvent is a <<relationship>> that allows to associate a SafetyIssue to associated Events.

4.78.3.5.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Event
- An association, zero, one or many, to object(s) of type MaintenanceEvent
- An association, zero, one or many, to object(s) of type OperationalEvent
- An association, zero, one or many, to object(s) of type WarrantyEvent

4.78.3.6 SafetyItem

SafetyItem is a <<select>> interface that allows to identify an item to which as SafetyDocument applies.

4.78.3.7 SafetyRequirementsDocument

SafetyRequirementsDocument is a SafetyDocument that defines the necessary SafetyRequirements for a specific purpose.

4.78.3.7.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentCreationDate (inherited from Document), optional
- documentDescription (inherited from Document), optional
- documentStatus (inherited from Document), optional
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- safetyDocumentCriticality (inherited from SafetyDocument)

4.78.3.7.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type DocumentRelationship
- An association, optional, to object(s) from classes that are members of SafetyItem

4.78.3.7.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.78.3.7.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)

4.78.3.8 SafetyWarning

SafetyWarning is a SafetyDocument that provides information about potential safety issues associated to a Product, service or hardware or software items.

Note

The organization generating theSafetyWarning, relationship with other SafetyIssues or SafetyWarnings, applicability, etc, are inherited from the Document class.

Note

SafetyWarnings are usually generated by the Product manufacturer or by legal authorities.

4.78.3.8.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentCreationDate (inherited from Document), optional
- documentDescription (inherited from Document), optional
- documentStatus (inherited from Document), optional
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- safetyDocumentCriticality (inherited from SafetyDocument)
- safetyWarningAplicabilityDates, optional
- safetyWarningPriority

4.78.3.8.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type DocumentRelationship
- An association, zero, one or many, to object(s) of type SafetyIssue
- An association, optional, to object(s) from classes that are members of SafetyItem

4.78.3.8.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.78.3.8.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)

4.78.3.9 SpecialSafetyInstruction

SpecialSafetyInstruction is a SafetyDocument providing specific mandatory instructions to be followed in addition to those existing in the standard documentation so as that special safety issues can be addressed.

Note

SpecialSafetyInstructions are usually generated by the Product manufacturer or by legal authorities.

Note

The organization generating the SpecialSafetyInstruction and relationships with SafetyIssues, SafetyWarnings or other SpecialSafetyInstruction, applicability, etc., are inherited from the Document class.

4.78.3.9.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from Document), one or many
- documentCreationDate (inherited from Document), optional
- documentDescription (inherited from Document), optional
- documentStatus (inherited from Document), optional
- documentTitle (inherited from Document), zero, one or many
- documentType (inherited from Document), optional
- safetyDocumentCriticality (inherited from SafetyDocument)
- specialSafetyInstructionApplicabilityDates
- specialSafetyInstructionPriority

4.78.3.9.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type DocumentRelationship
- An association, zero, one or many, to object(s) of type SafetyIssue
- An association, optional, to object(s) from classes that are members of SafetyItem

4.78.3.9.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Document) (See S5000F UoF Applicability Statement, Para 4.11)
- DigitalFileReferencingItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentCharacteristicItem (inherited from Document) (See S5000F UoF Document, Para 4.29)
- ItemUnderExportControl (inherited from Document) (See S5000F UoF Export Control Requirement, Para 4.35)
- SecurityClassificationItem (inherited from Document) (See S5000F UoF Security Classification, Para 4.79)

4.78.3.9.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from Document) (See S5000F UoF Digital File, Para 4.28)
- DocumentItem (inherited from Document) (See CDM UoF Document, Para 4.2)
- ExportControlledItem (inherited from Document) (See S5000F UoF Export Control License, Para 4.34)

4.79 S5000F UoF Security Classification

4.79.1 Description

Security Classification UoF provides the capability to assign security classifications to objects that need special handling for protection against unauthorized access or distribution.

4.79.2 Graphical description

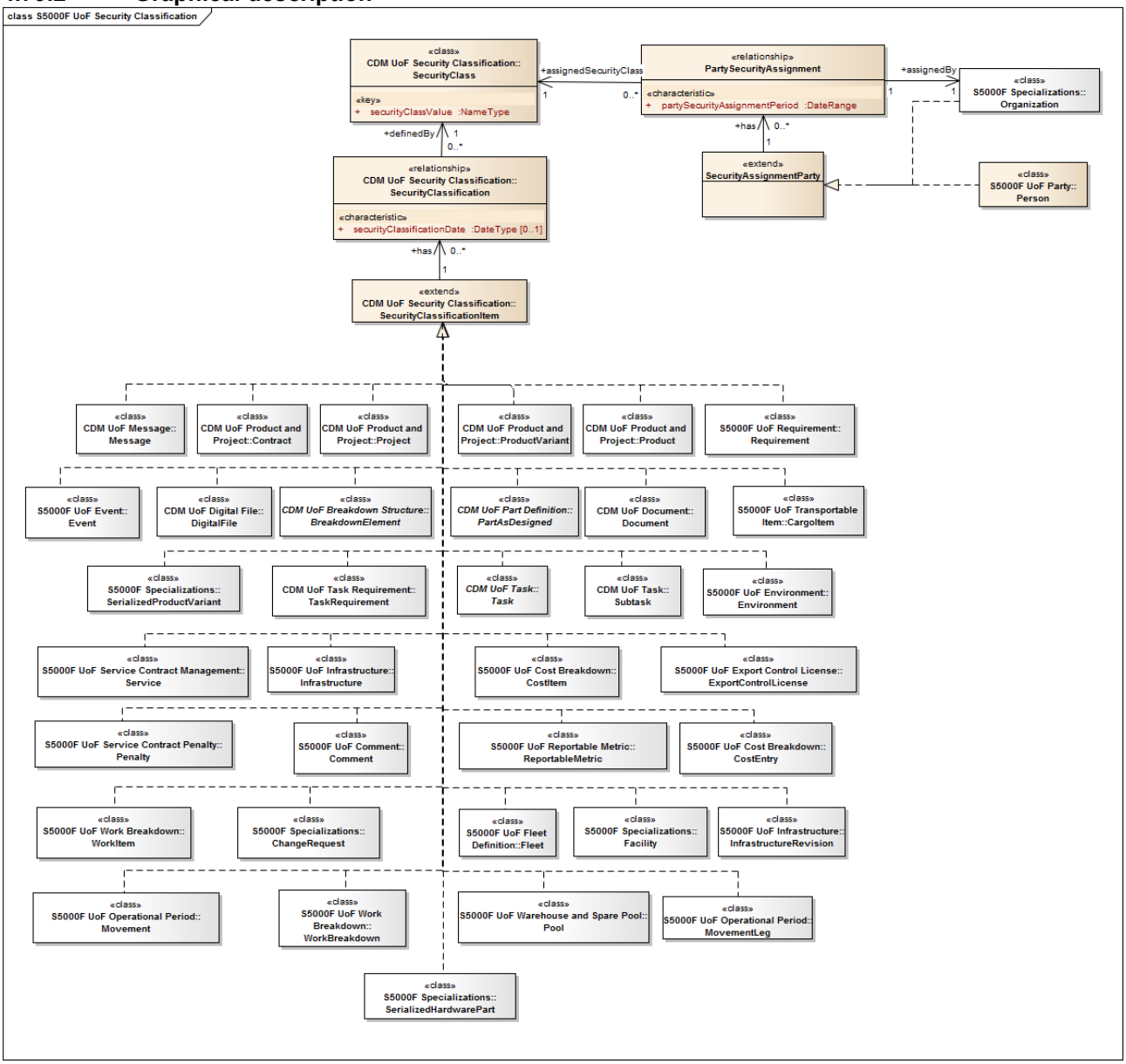

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Fig 99 S5000F UoF Security Classification

4.79.3 Class definition

4.79.3.1 PartySecurityAssignment

PartySecurityAssignment is a <<relationship>> that establishes the security clearance of a Party during a certain period of time.

4.79.3.1.1 Attribute(s)

This class has the following attributes:

– partySecurityAssignmentPeriod

4.79.3.1.2 Associations

This class has the following associations:

– An association to object(s) of type MaintenanceOrganization. A SecurityClassification is assigned to a Peron or Organization instance implementing the Party <<interface>> by an assiging Organization (through the PartySecurityAssignment <<relationship>>)
– An association to object(s) of type OperatorOrganization. A SecurityClassification is assigned to a Peron or Organization instance implementing the Party <<interface>> by an assiging Organization (through the PartySecurityAssignment <<relationship>>)
– An association to object(s) of type Organization. A SecurityClassification is assigned to a Peron or Organization instance implementing the Party <<interface>> by an assiging Organization (through the PartySecurityAssignment <<relationship>>)
– An association, zero, one or many, to object(s) of type SecurityClass

4.79.3.2 SecurityAssignmentParty

SecurityAssignmentParty is an <<extend>> interface that allows to assign Security clearances to specific Parties.

4.79.3.2.1 Associations

This class has the following associations:

– An association to object(s) of type PartySecurityAssignment

4.80 S5000F UoF Serialized Item

4.80.1 Description

The Serialized Item UoF represents an interface of elements that can be serialized and can therefore have an individual tracking.

4.80.2 Graphical description

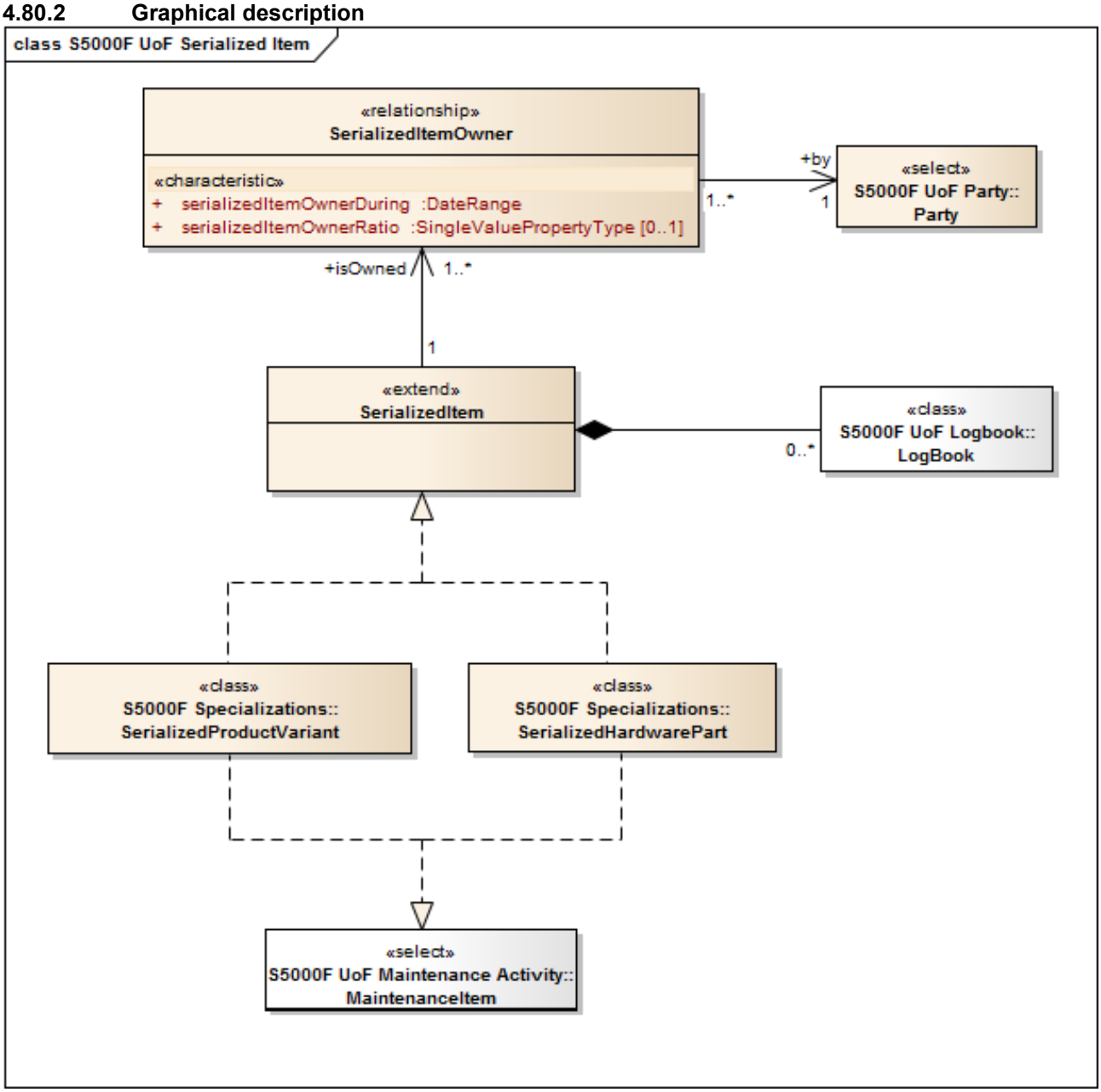

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Fig 100 S5000F UoF Serialized Item

4.80.3 Class definition

4.80.3.1 SerializedItem

SerializedItem is an <<extend>> interface class representing all serialized items.

4.80.3.1.1 Example(s)

- hardware part as serialized
- Serialized Product variant

4.80.3.1.2 Associations

This class has the following associations:

- An association to object(s) of type SerializedItemOwner

4.80.3.2 SerializedItemOwner

SerializedItemOwner is a <<relationship>> describing the party holding the partial or total ownership of an item implementing the SerializedItem <<interface>>.

4.80.3.2.1 Attribute(s)

This class has the following attributes:

- serializedItemOwnerDuring
- serializedItemOwnerRatio, optional

4.80.3.2.2 Associations

This class has the following associations:

- An association, one or many, to object(s) from classes that are members of Party

4.81 S5000F UoF Serialized Product Health Monitoring

4.81.1 Description

Serialized Product Variant Health Monitoring UoF provides the capability to transfer health monitoring data from a SerializedProductVariant

4.81.2 Graphical description

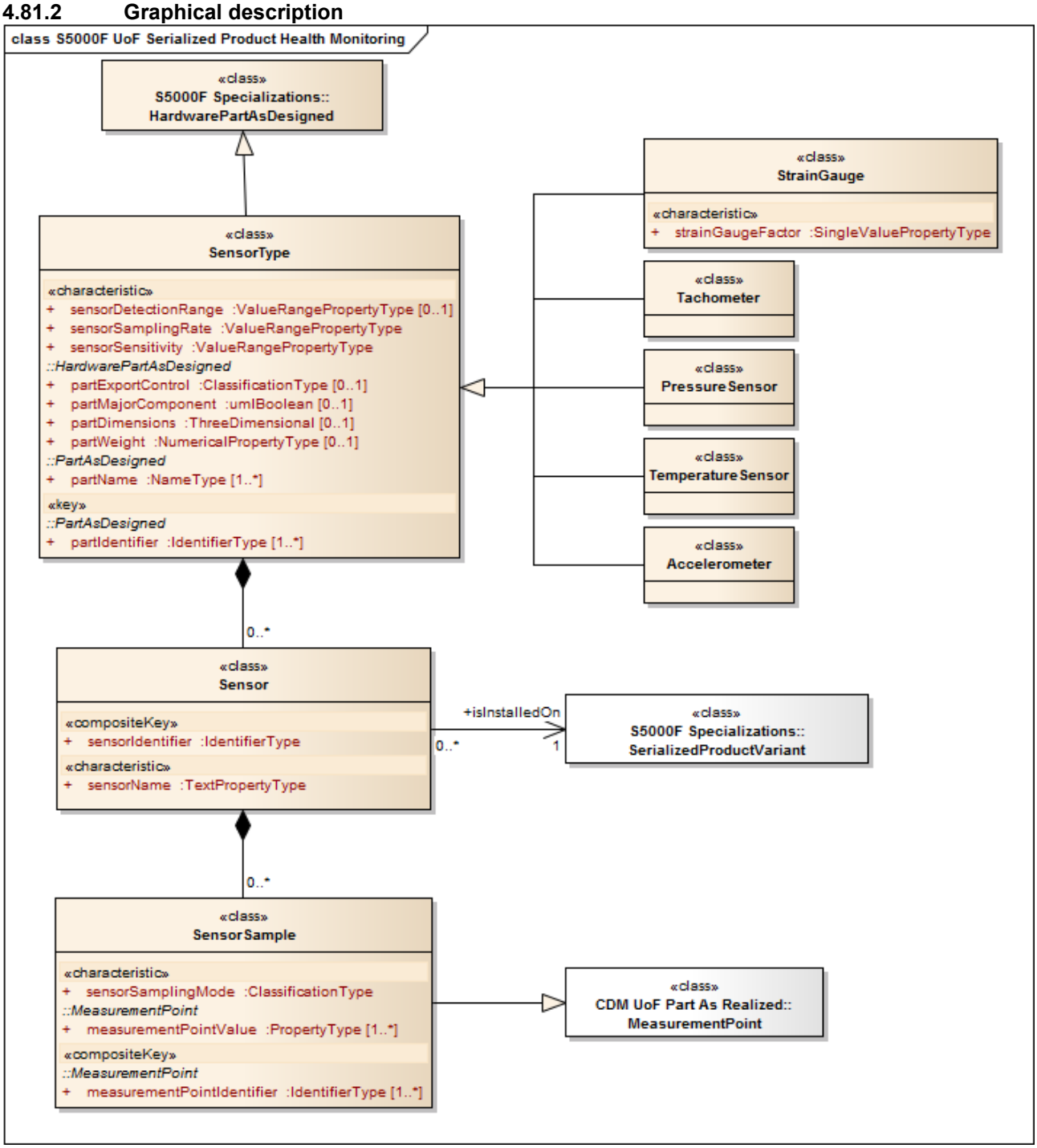

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Fig 101 S5000F UoF Serialized Product Health Monitoring

4.81.3 Class definition

4.81.3.1 Accelerometer

Accelerometer is a SensorType that measures acceleration.

4.81.3.1.1 Attribute(s)

This class has the following attributes:

– partIdentifier (inherited from PartAsDesigned), one or many

- partDimensions (inherited from HardwarePartAsDesigned), optional
- partExportControl (inherited from HardwarePartAsDesigned), optional
- partMajorComponent (inherited from HardwarePartAsDesigned), optional
- partName (inherited from PartAsDesigned), one or many
- partWeight (inherited from HardwarePartAsDesigned), optional
- sensorDetectionRange (inherited from SensorType), optional
- sensorSamplingRate (inherited from SensorType)
- sensorSensitivity (inherited from SensorType)

4.81.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type AlternatePartAsDesigned
- An association to object(s) of type ContainedSubstance

4.81.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (inherited from HardwarePartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ItemUnderExportControl (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- TrackablePart (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

4.81.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductOperationalConfigurationItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)

- ContractItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ExportControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control License, Para 4.34)
- MessageContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Message, Para 4.55)
- ObsolescenceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReportContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Resource Usage Request, Para 4.77)
- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ServiceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Service Request, Para 4.86)
- SupplyItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Supply Item, Para 4.89)
- TransportableItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)

4.81.3.2 PressureSensor

PressureSensor is a SensorType that measures pressure.

4.81.3.2.1 Attribute(s)

This class has the following attributes:

- partIdentifier (inherited from PartAsDesigned), one or many
- partDimensions (inherited from HardwarePartAsDesigned), optional
- partExportControl (inherited from HardwarePartAsDesigned), optional
- partMajorComponent (inherited from HardwarePartAsDesigned), optional
- partName (inherited from PartAsDesigned), one or many
- partWeight (inherited from HardwarePartAsDesigned), optional
- sensorDetectionRange (inherited from SensorType), optional
- sensorSamplingRate (inherited from SensorType)
- sensorSensitivity (inherited from SensorType)

4.81.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type AlternatePartAsDesigned
- An association to object(s) of type ContainedSubstance

4.81.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (inherited from HardwarePartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ItemUnderExportControl (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- TrackablePart (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

4.81.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductOperationalConfigurationItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ExportControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control License, Para 4.34)
- MessageContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Message, Para 4.55)
- ObsolescenceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReportContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Resource Usage Request, Para 4.77)

- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ServiceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Service Request, Para 4.86)
- SupplyItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Supply Item, Para 4.89)
- TransportableItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)

4.81.3.3 Sensor

Sensor is an individual SensorType that has a unique identity and can be used to measure values of a specific type.

Note

The unique identification of a Sensor can be a part number+serial number (if it is serialized) or a location identifier together with the identifier of the SerializedProduct where it is mounted.

4.81.3.3.1 Attribute(s)

This class has the following attributes:

- sensorIdentifier
- sensorName

4.81.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type Accelerometer
- An aggregate association, zero, one or many, to related object(s) of type PressureSensor
- An aggregate association, zero, one or many, to related object(s) of type SensorType
- An aggregate association, zero, one or many, to related object(s) of type StrainGauge
- An aggregate association, zero, one or many, to related object(s) of type Tachometer
- An aggregate association, zero, one or many, to related object(s) of type TemperatureSensor
- An association, zero, one or many, to object(s) of type SerializedProductVariant

4.81.3.4 SensorSample

SensorSample is a particular reading of an individual sensor at a specific point in time.

4.81.3.4.1 Attribute(s)

This class has the following attributes:

- measurementPointIdentifier (inherited from MeasurementPoint), one or many
- measurementPointValue (inherited from MeasurementPoint), one or many
- sensorSamplingMode

4.81.3.4.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type MeasurementPointItem
- An aggregate association, zero, one or many, to related object(s) of type Sensor

4.81.3.4.3 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (inherited from MeasurementPoint) (See S5000F UoF Digital File, Para 4.28)

4.81.3.4.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (inherited from MeasurementPoint) (See S5000F UoF Digital File, Para 4.28)
- ReleasedDataSetItem (inherited from MeasurementPoint) (See S5000F UoF Data Sets, Para 4.27)

4.81.3.5 SensorType

SensorType is HardwarePartAsDesigned that measures physical events and provides the information to external devices.

4.81.3.5.1 Example(s)

- Accelerometer
- Pressure gauge
- Strain gauge
- Tachometer
- Temperature sensor

4.81.3.5.2 Attribute(s)

This class has the following attributes:

- partIdentifier (inherited from PartAsDesigned), one or many
- partDimensions (inherited from HardwarePartAsDesigned), optional
- partExportControl (inherited from HardwarePartAsDesigned), optional
- partMajorComponent (inherited from HardwarePartAsDesigned), optional
- partName (inherited from PartAsDesigned), one or many
- partWeight (inherited from HardwarePartAsDesigned), optional
- sensorDetectionRange, optional
- sensorSamplingRate
- sensorSensitivity

4.81.3.5.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type AlternatePartAsDesigned
- An association to object(s) of type ContainedSubstance

4.81.3.5.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from AlternatePartAsDesigned) (See S5000F UoF Change Information, Para 4.21)
- ChangeControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (inherited from HardwarePartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)

- ItemUnderExportControl (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- TrackablePart (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

4.81.3.5.5 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductOperationalConfigurationItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ExportControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control License, Para 4.34)
- MessageContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Message, Para 4.55)
- ObsolescenceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReportContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Resource Usage Request, Para 4.77)
- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ServiceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Service Request, Para 4.86)
- SupplyItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Supply Item, Para 4.89)
- TransportableItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)

4.81.3.6 StrainGauge

StrainGauge is a SensorType whose resistance varies with applied force; it converts force, pressure, tension, weight, etc, into a change in electrical resistance which can then be measured.

4.81.3.6.1 Attribute(s)

This class has the following attributes:

- partIdentifier (inherited from PartAsDesigned), one or many
- partDimensions (inherited from HardwarePartAsDesigned), optional
- partExportControl (inherited from HardwarePartAsDesigned), optional
- partMajorComponent (inherited from HardwarePartAsDesigned), optional
- partName (inherited from PartAsDesigned), one or many
- partWeight (inherited from HardwarePartAsDesigned), optional
- sensorDetectionRange (inherited from SensorType), optional
- sensorSamplingRate (inherited from SensorType)
- sensorSensitivity (inherited from SensorType)
- strainGaugeFactor

4.81.3.6.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type AlternatePartAsDesigned
- An association to object(s) of type ContainedSubstance

4.81.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (inherited from HardwarePartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ItemUnderExportControl (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- TrackablePart (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

4.81.3.6.4 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductOperationalConfigurationItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ExportControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control License, Para 4.34)
- MessageContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Message, Para 4.55)
- ObsolescenceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReportContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Resource Usage Request, Para 4.77)
- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ServiceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Service Request, Para 4.86)
- SupplyItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Supply Item, Para 4.89)
- TransportableItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)

4.81.3.7 Tachometer

Tachometer is a SensorType that measures revolutions of a rotating item.

4.81.3.7.1 Attribute(s)

This class has the following attributes:

- partIdentifier (inherited from PartAsDesigned), one or many
- partDimensions (inherited from HardwarePartAsDesigned), optional
- partExportControl (inherited from HardwarePartAsDesigned), optional
- partMajorComponent (inherited from HardwarePartAsDesigned), optional
- partName (inherited from PartAsDesigned), one or many
- partWeight (inherited from HardwarePartAsDesigned), optional
- sensorDetectionRange (inherited from SensorType), optional
- sensorSamplingRate (inherited from SensorType)
- sensorSensitivity (inherited from SensorType)

4.81.3.7.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type AlternatePartAsDesigned
- An association to object(s) of type ContainedSubstance

4.81.3.7.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (inherited from HardwarePartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ItemUnderExportControl (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- TrackablePart (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

4.81.3.7.4 Selects

This class is a member of the following <<select>> interfaces:

- AllowedProductOperationalConfigurationItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ExportControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control License, Para 4.34)
- MessageContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Message, Para 4.55)

- ObsolescenceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReportContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Resource Usage Request, Para 4.77)
- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ServiceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Service Request, Para 4.86)
- SupplyItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Supply Item, Para 4.89)
- TransportableItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)

4.81.3.8 TemperatureSensor

TemperatureSensor is a SensorType that measures temperature.

4.81.3.8.1 Attribute(s)

This class has the following attributes:

- partIdentifier (inherited from PartAsDesigned), one or many
- partDimensions (inherited from HardwarePartAsDesigned), optional
- partExportControl (inherited from HardwarePartAsDesigned), optional
- partMajorComponent (inherited from HardwarePartAsDesigned), optional
- partName (inherited from PartAsDesigned), one or many
- partWeight (inherited from HardwarePartAsDesigned), optional
- sensorDetectionRange (inherited from SensorType), optional
- sensorSamplingRate (inherited from SensorType)
- sensorSensitivity (inherited from SensorType)

4.81.3.8.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type AlternatePartAsDesigned
- An association to object(s) of type ContainedSubstance

4.81.3.8.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- DetectionMean (inherited from HardwarePartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DetectionMean (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencingItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)

- ItemUnderExportControl (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from PartAsDesigned) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from PartAsDesigned) (See S5000F UoF Security Classification, Para 4.79)
- TrackablePart (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from PartAsDesigned) (See S5000F UoF Work Breakdown, Para 4.97)

4.81.3.8.4 Selects

This class is a member of the following <<select>> interfaces:

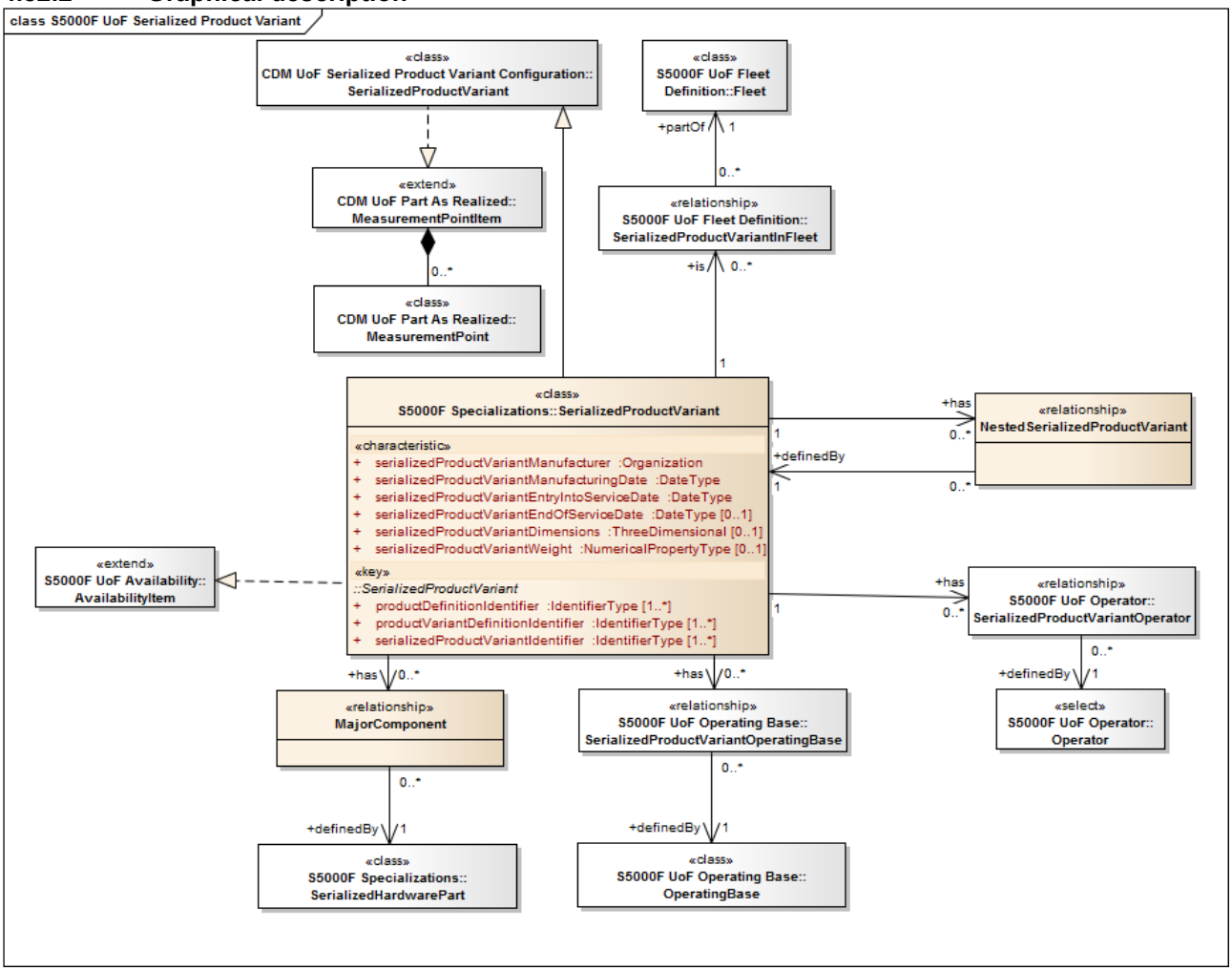
- AllowedProductOperationalConfigurationItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Product Defined Operational Configuration, Para 4.69)
- ChangeRequestItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Cost Breakdown, Para 4.25)
- Detector (inherited from PartAsDesigned) (See S5000F UoF Failure Detection and Location, Para 4.38)
- DigitalFileReferencedItem (inherited from PartAsDesigned) (See S5000F UoF Digital File, Para 4.28)
- ExportControlledItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Export Control License, Para 4.34)
- MessageContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Message, Para 4.55)
- ObsolescenceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Obsolescence Management Candidates, Para 4.56)
- RealizedPart (inherited from PartAsDesigned) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReportContextItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Resource Usage Request, Para 4.77)
- SerializedAssertItem (inherited from PartAsDesigned) (See S5000F UoF Applicability Statement, Para 4.11)
- ServiceItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Service Request, Para 4.86)
- SupplyItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Supply Item, Para 4.89)
- TransportableItem (inherited from HardwarePartAsDesigned) (See S5000F UoF Transportable Item, Para 4.92)

4.82 S5000F UoF Serialized Product Variant

4.82.1 Description

Serialized Product Variant UoF defines the relationship of a serialized ProductVariant with its Product base and key parties associated to it.

4.82.2 Graphical description



ICN-B6865-5000F15053-003-01

Fig 102 S5000F UoF Serialized Product Variant

4.82.3 Class definition

4.82.3.1 MajorComponent

MajorComponent is a <<relationship>> declaring that a SerializedHardwarePart is of special importance within a SerializedProductVariant and therefore needs special tracking.

Note

A MajorComponent is typically an item that, though embedded in a Product, can be considered a Product of its own and can be tracked or managed separately.

4.82.3.1.1 Example(s)

- engine
- landing gear

4.82.3.1.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) of type SerializedHardwarePart
– An association, zero, one or many, to object(s) of type SerializedSupportEquipment

4.82.3.2 NestedSerializedProductVariant
NestedSerializedProductVariant is a <<relationship>> that that defines that one SerializedProductVariant includes a subordinate SerializedProductVariant.

4.82.3.2.1 Associations
This class has the following associations:

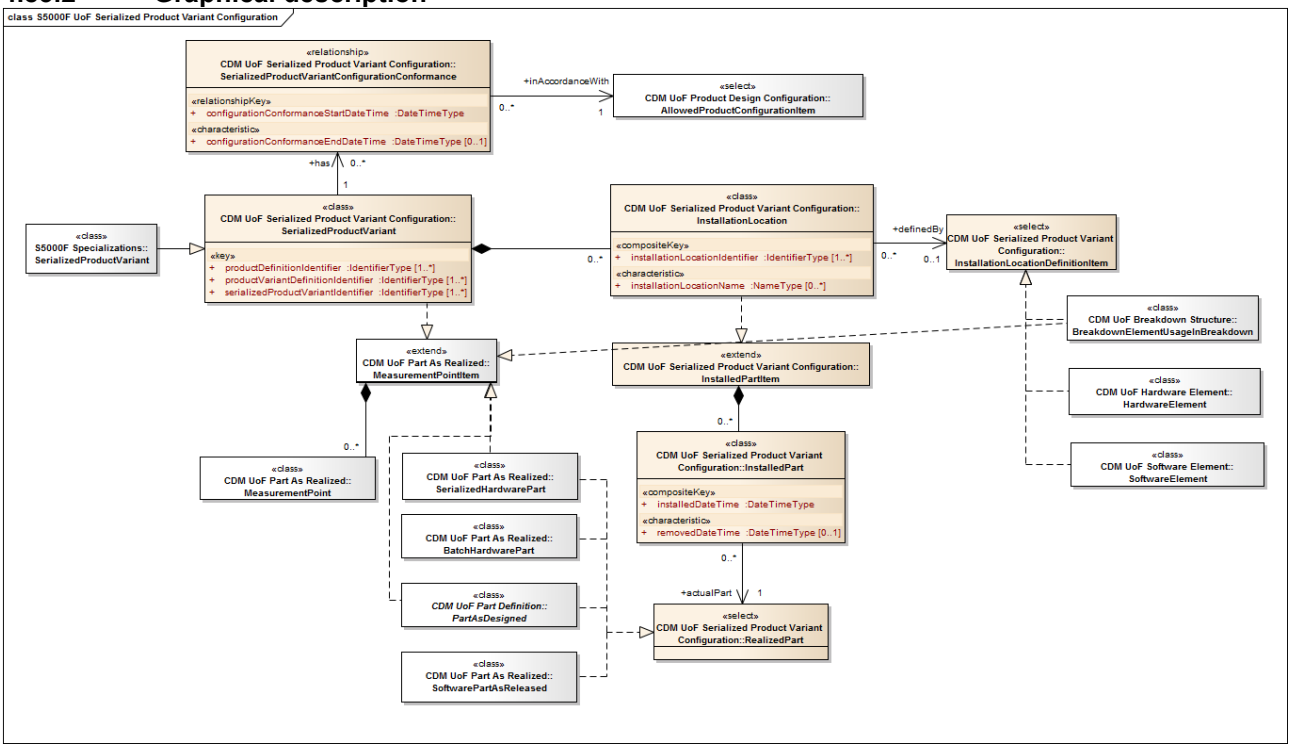
– An association, zero, one or many, to object(s) of type SerializedProductVariant

4.83 S5000F UoF Serialized Product Variant Configuration

4.83.1 Description

The Serialized Product Variant Configuration UoF provides the capability to identify combinations of actual installation locations for a given SerializedProductVariant and actual parts that are or have been installed at the respective installation locatio

4.83.2 Graphical description



ICN-B6865-5000F15102-001-01

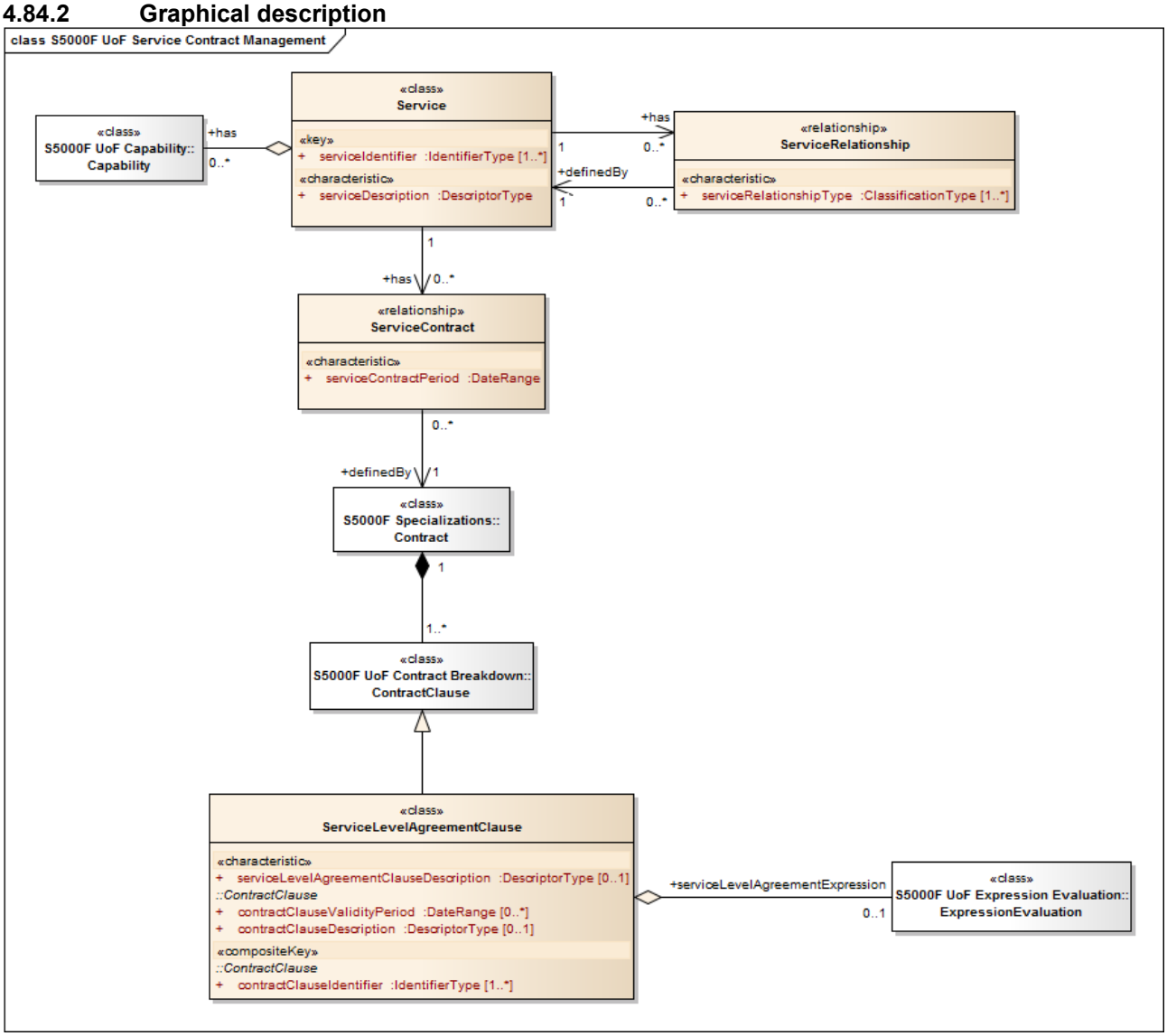
Fig 103 S5000F UoF Serialized Product Variant Configuration

4.84 S5000F UoF Service Contract Management

4.84.1 Description

The Service Contract Management UoF permits to map the service reporting to the service level agreement (SLA) clauses so as to ensure compliance with the contractual SLAs.

4.84.2 Graphical description



ICN-B6865-5000F15054-003-01

Fig 104 S5000F UoF Service Contract Management

4.84.3 Class definition

4.84.3.1 Service

A Service is a contract where technical or intellectual work is performed but no delivery of goods takes place.

4.84.3.1.1 Attribute(s)

This class has the following attributes:

- serviceIdentifier, one or many
- serviceDescription

4.84.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

- An association to object(s) of type ServiceContract. A Service can be associates with zero, one or many Contracts (through the ServiceContract <<relationship>>)
- An association to object(s) of type ServiceRelationship

4.84.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (See S5000F UoF Applicability Statement, Para 4.11)
- BudgetingItem (See S5000F UoF Budget, Para 4.15)
- ChangeControlledItem (See S5000F UoF Change Information, Para 4.21)
- CostBreakdownContext (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
- PoliciesAndRegulationsCompliantItem (See S5000F UoF Policies and Regulations, Para 4.68)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- WorkBreakdownContext (See S5000F UoF Work Breakdown, Para 4.97)

4.84.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (See S5000F UoF Change Request, Para 4.22)
- ContractItem (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- InfrastructureRequiringItem (See S5000F UoF Infrastructure Availability, Para 4.44)
- MessageContextItem (See S5000F UoF Message, Para 4.55)
- ReportContextItem (See S5000F UoF Report, Para 4.73)
- SafetyItem (See S5000F UoF Safety, Para 4.78)
- SubjectOfPoliciesAndRegulations (See S5000F UoF Policies and Regulations, Para 4.68)
- WarrantyItem (See S5000F UoF Warranty, Para 4.96)

4.84.3.2 ServiceContract

ServiceContract is a <<relationship>> that allows a service being provided to be associated to a specific contract.

4.84.3.2.1 Attribute(s)

This class has the following attributes:

- serviceContractPeriod

4.84.3.2.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Contract

4.84.3.3 ServiceLevelAgreementClause

ServiceLevelAgreementClause is a contractual clause related to a service that determines the level of service to be provided.

4.84.3.3.1 Attribute(s)

This class has the following attributes:

- contractClauseIdentifier (inherited from ContractClause), one or many
- contractClauseDescription (inherited from ContractClause), optional
- contractClauseValidityPeriod (inherited from ContractClause), zero, one or many
- serviceLevelAgreementClauseDescription, optional

4.84.3.3.2 Associations

This class has the following associations:

- An aggregate association, one or many, to related object(s) of type Contract
- An association to object(s) of type ContractClauseRelationship
- An association to object(s) of type ItemWarranty
- An association to object(s) of type LaborRates

4.84.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- BudgetingItem (inherited from ContractClause) (See S5000F UoF Budget, Para 4.15)
- CostBreakdownContext (inherited from ContractClause) (See S5000F UoF Cost Breakdown, Para 4.25)
- ReportableMetricItem (See S5000F UoF Reportable Metric, Para 4.75)
- WorkBreakdownContext (inherited from ContractClause) (See S5000F UoF Work Breakdown, Para 4.97)

4.84.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from ContractClause) (See S5000F UoF Change Request, Para 4.22)

4.84.3.4 ServiceRelationship

ServiceRelationship is a <<relationship>> that allows to associate two Services.

4.84.3.4.1 Attribute(s)

This class has the following attributes:

- serviceRelationshipType, one or many

4.84.3.4.2 Associations

This class has the following associations:

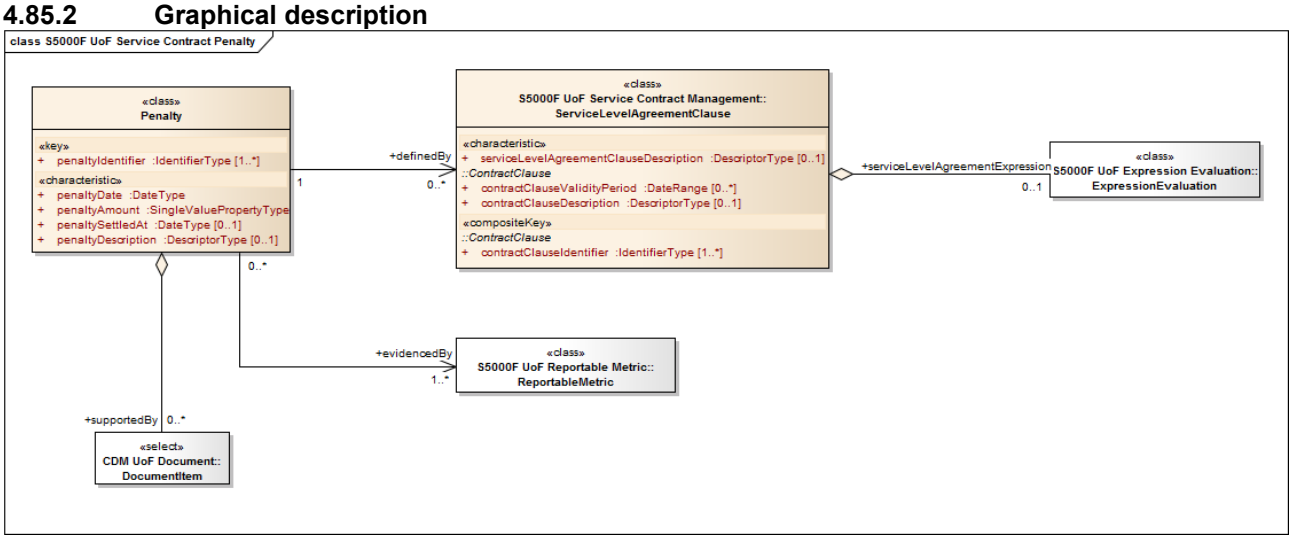
- An association, zero, one or many, to object(s) of type Service

4.85 S5000F UoF Service Contract Penalty

4.85.1 Description

The Service Contract Penalty UoF allows a Penalty and its cause to be associated to a specific contractual clause.

4.85.2 Graphical description



ICN-B6865-5000F15103-001-01

Fig 105 S5000F UoF Service Contract Penalty

4.85.3 Class definition

4.85.3.1 Penalty

Penalty is a <<class>> that represents a punishment imposed for breaking or not complying with a contract.

4.85.3.1.1 Attribute(s)

This class has the following attributes:

- penaltyIdentifier, one or many
- penaltyAmount
- penaltyDate
- penaltyDescription, optional
- penaltySettledAt, optional

4.85.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type ServiceLevelAgreementClause
- An association, zero, one or many, to object(s) of type ReportableMetric

4.85.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.85.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

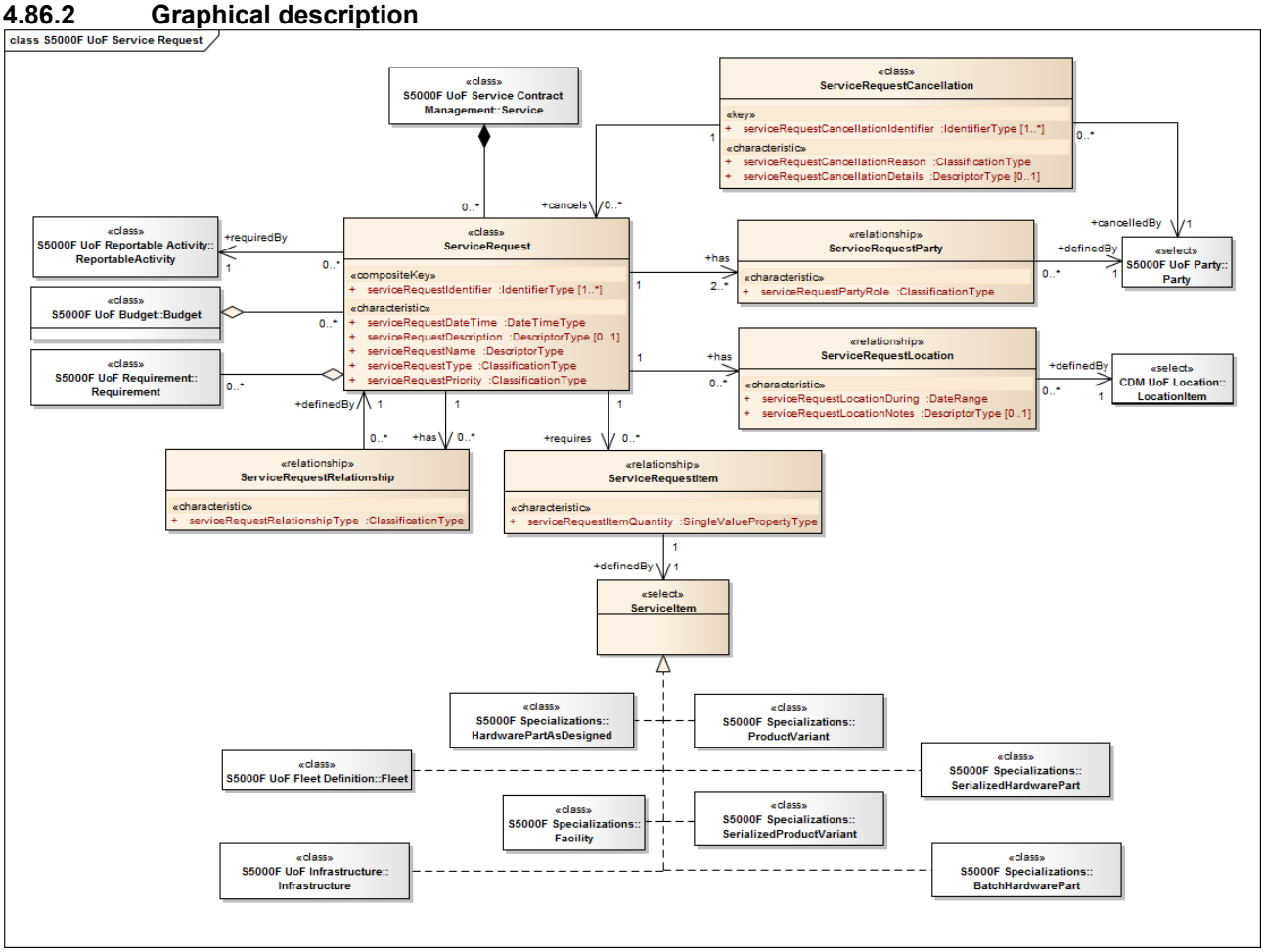
- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)

4.86 S5000F UoF Service Request

4.86.1 Description

The Service Request UoF provides the capability to generate a service request from one party to another party.

4.86.2 Graphical description



ICN-B6865-5000F15066-002-01

Fig 106 S5000F UoF Service Request

4.86.3 Class definition

4.86.3.1 ServiceItem

SericeItem is a <<select>> interface that allows to define the items for which a service can be requested.

4.86.3.2 ServiceRequest

ServiceRequest is a class representing a demand from one party to another partyto provide a service.

4.86.3.2.1 Attribute(s)

This class has the following attributes:

- serviceRequestIdentifier, one or many
- serviceRequestDateTime
- serviceRequestDescription, optional
- serviceRequestName
- serviceRequestPriority
- serviceRequestType

4.86.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type Service

- A composition association, zero, one or many, to child objects of type Budget
- An association to object(s) of type ServiceRequestItem
- An association to object(s) of type ServiceRequestLocation
- An association to object(s) of type ServiceRequestParty
- An association to object(s) of type ServiceRequestRelationship. A ServiceRequest can be related to zero, one or many other ServiceRequests (via the ServiceRequestRelationship <<relationship>>)
- An association, zero, one or many, to object(s) of type InventoryActivity
- An association, zero, one or many, to object(s) of type MaintenanceActivity
- An association, zero, one or many, to object(s) of type OperationalActivity
- An association, zero, one or many, to object(s) of type ReportableActivity

4.86.3.2.3 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)

4.86.3.3 ServiceRequestCancellation

ServiceRequestCancellation is a <<class>> that allows to cancel one or more Services by a Party.

4.86.3.3.1 Attribute(s)

This class has the following attributes:

- serviceRequestCancellationIdentifier, one or many
- serviceRequestCancellationDetails, optional
- serviceRequestCancellationReason

4.86.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type ServiceRequest
- An association, zero, one or many, to object(s) from classes that are members of Party

4.86.3.4 ServiceRequestItem

ServiceRequestItem is a <<relationship>> that allows to associate one or several items of a same type to a ServiceRequest.

4.86.3.4.1 Attribute(s)

This class has the following attributes:

- serviceRequestItemQuantity

4.86.3.4.2 Associations

This class has the following associations:

- An association to object(s) from classes that are members of ServiceItem

4.86.3.5 ServiceRequestLocation

ServiceRequestLocation is a <<relationship>> stating the locating where a ServiceRequest has to be complied with.

4.86.3.5.1 Attribute(s)

This class has the following attributes:

- serviceRequestLocationDuring
- serviceRequestLocationNotes, optional

4.86.3.5.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of LocationItem

4.86.3.6 ServiceRequestParty

ServiceRequestParty is a <<relationship>> that associates a ServiceRequest to the party that has demanded it or has to provide it.

Note

At least two relationships must exist, one for the Party demanding the ServiceRequest and one for the Party that will fulfill it.

Note

Additional relationships can exist, eg, for a subcontractor or another Party that will assist to that ServiceRequest.

4.86.3.6.1 Attribute(s)

This class has the following attributes:

– serviceRequestPartyRole

4.86.3.6.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of Party

4.86.3.7 ServiceRequestRelationship

ServiceRequestRelationship is a <<relationship>> that indicates the association between two different ServiceRequests.

4.86.3.7.1 Attribute(s)

This class has the following attributes:

– serviceRequestRelationshipType

4.86.3.7.2 Associations

This class has the following associations:

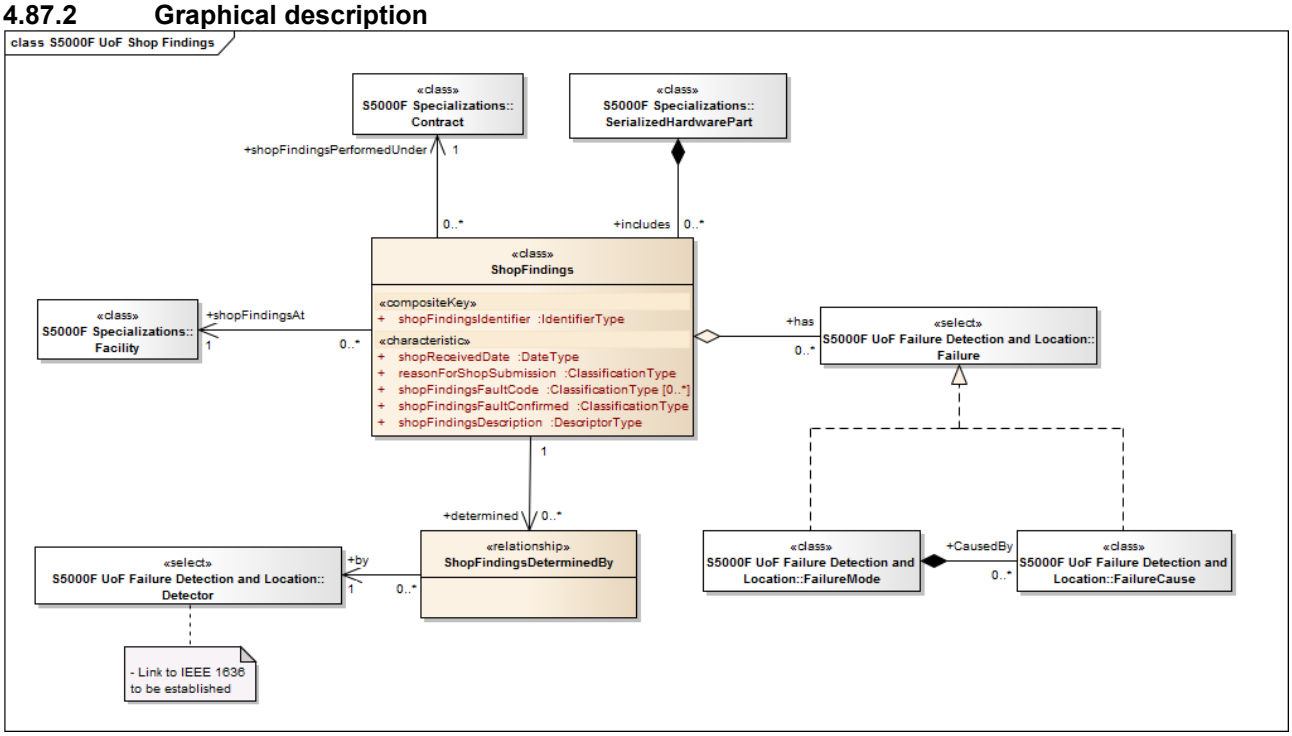
– An association, zero, one or many, to object(s) of type ServiceRequest

4.87 S5000F UoF Shop Findings

4.87.1 Description

The Shop Findings UoF provides the capability to report on the shop findings related to reported faults associated to an equipment.

4.87.2 Graphical description



ICN-B6865-5000F15056-002-01

Fig 107 S5000F UoF Shop Findings

4.87.3 Class definition

4.87.3.1 ShopFindings

ShopFindings is a class representing the results of a fault investigation performed on an equipment in a workshop.

4.87.3.1.1 Attribute(s)

This class has the following attributes:

- shopFindingsIdentifier
- reasonForShopSubmission
- shopFindingsDescription
- shopFindingsFaultCode, zero, one or many
- shopFindingsFaultConfirmed
- shopReceivedDate

4.87.3.1.2 Associations

This class has the following associations:

- An aggregate association, includes, zero, one or many, to related object(s) of type SerializedHardwarePart
- An aggregate association, includes, zero, one or many, to related object(s) of type SerializedSupportEquipment
- An association to object(s) of type ShopFindingsDeterminedBy
- An association, zero, one or many, to object(s) of type Contract
- An association, zero, one or many, to object(s) of type Facility
- An association, zero, one or many, to object(s) of type MaintenanceFacility
- An association, zero, one or many, to object(s) of type OperatingBase
- An association, zero, one or many, to object(s) of type OtherFacility
- An association, zero, one or many, to object(s) of type ParkingFacility
- An association, zero, one or many, to object(s) of type Warehouse

4.87.3.2 ShopFindingsDeterminedBy

ShopFindingsDeterminedBy is a <<relationship>> that allows ShopFindings to be associated to the DetectionMeans that allowed such findings.

4.87.3.2.1 Associations

This class has the following associations:

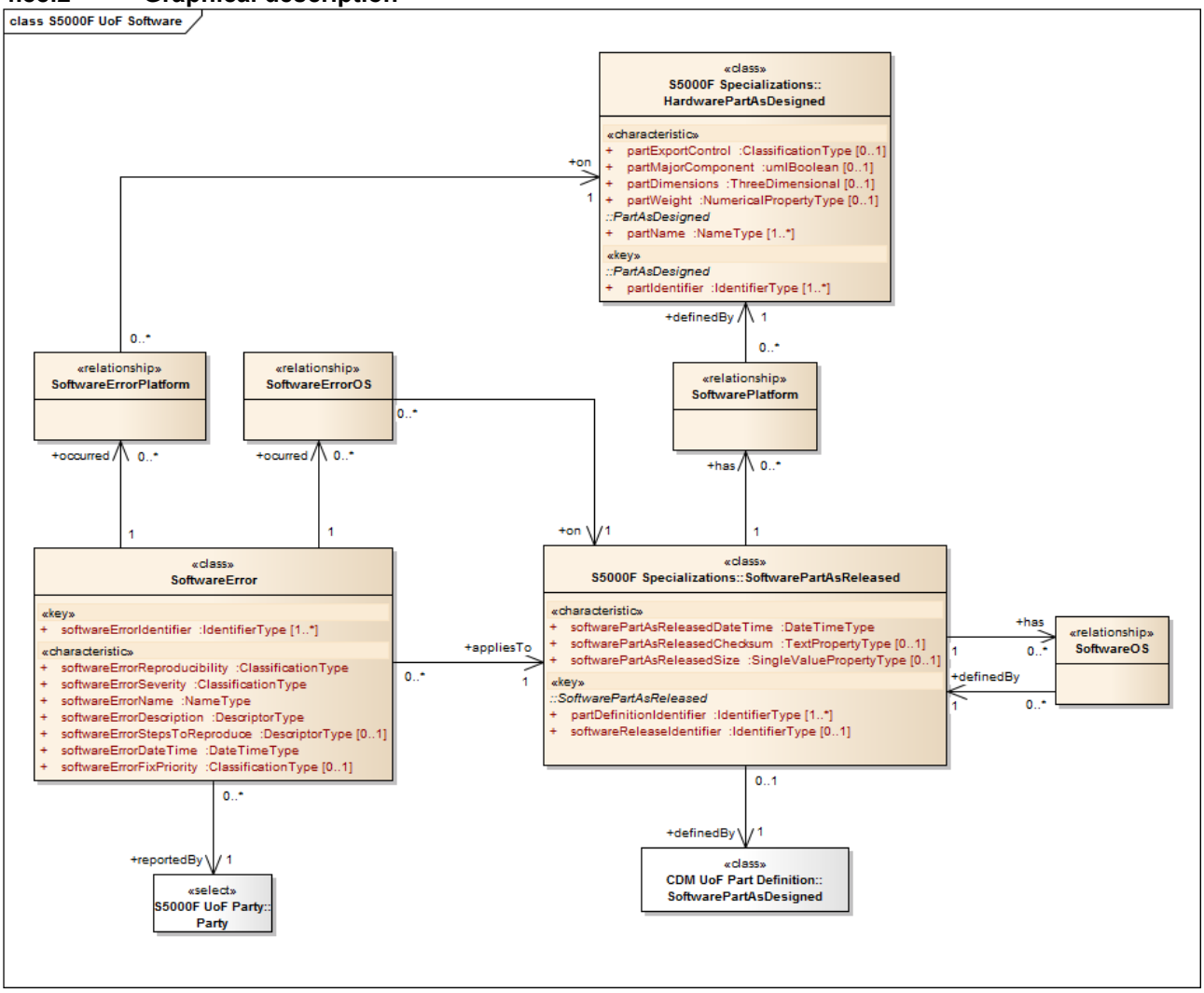
– An association, zero, one or many, to object(s) from classes that are members of Detector

4.88 S5000F UoF Software

4.88.1 Description

The Software UoF provides the capability to define the hardware and operating system on which software runs, as well as to report software errors.

4.88.2 Graphical description



ICN-B6865-5000F15104-001-01

Fig 108 S5000F UoF Software

4.88.3 Class definition

4.88.3.1 SoftwareError

SoftwareError is a <<class>> that represents a fault detected during the execution of a SoftwarePartAsReleased.

4.88.3.1.1 Attribute(s)

This class has the following attributes:

- softwareErrorIdentifier, one or many
- softwareErrorDateTime
- softwareErrorDescription
- softwareErrorFixPriority, optional
- softwareErrorName
- softwareErrorReproducibility
- softwareErrorSeverity
- softwareErrorStepsToReproduce, optional

4.88.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type SoftwareErrorOS
- An association to object(s) of type SoftwareErrorPlatform
- An association, zero, one or many, to object(s) of type DataSetAsReleased
- An association, zero, one or many, to object(s) of type SoftwarePartAsReleased
- An association, zero, one or many, to object(s) from classes that are members of Party

4.88.3.2 SoftwareErrorOS

SoftwareErrorOS is a <<relationship>> that indicates the operating system on which a SoftwarePartAsReleased was executing when a SoftwareError was detected.

4.88.3.2.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type DataSetAsReleased
- An association, zero, one or many, to object(s) of type SoftwarePartAsReleased

4.88.3.3 SoftwareErrorPlatform

SoftwareErrorPlatform is a <<relationship>> that indicates the HardwarePartAsDesigned on which a SoftwarePartAsReleased was executing when a SoftwareError was detected.

4.88.3.3.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Accelerometer
- An association, zero, one or many, to object(s) of type HardwarePartAsDesigned
- An association, zero, one or many, to object(s) of type PressureSensor
- An association, zero, one or many, to object(s) of type SensorType
- An association, zero, one or many, to object(s) of type StrainGauge
- An association, zero, one or many, to object(s) of type SupportEquipment
- An association, zero, one or many, to object(s) of type Tachometer
- An association, zero, one or many, to object(s) of type TemperatureSensor

4.88.3.4 SoftwareOS

SoftwareOS is a <<relationship>> that defines the operating system on which a SoftwarePartAsReleased executes.

4.88.3.4.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type DataSetAsReleased
- An association, zero, one or many, to object(s) of type SoftwarePartAsReleased

4.88.3.5 SoftwarePlatform

SoftwarePlatform is a <<relationship>> that indicates the HardwarePartAsDesigned on which a SoftwarePartAsReleased can execute.

4.88.3.5.1 Associations

This class has the following associations:

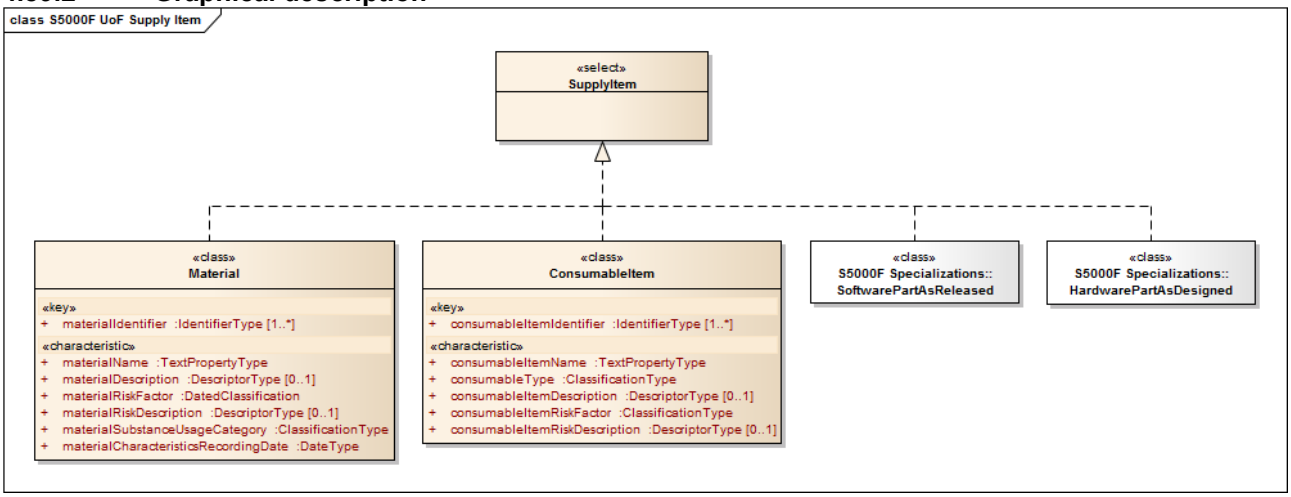
- An association, zero, one or many, to object(s) of type Accelerometer
- An association, zero, one or many, to object(s) of type HardwarePartAsDesigned
- An association, zero, one or many, to object(s) of type PressureSensor
- An association, zero, one or many, to object(s) of type SensorType
- An association, zero, one or many, to object(s) of type StrainGauge
- An association, zero, one or many, to object(s) of type SupportEquipment
- An association, zero, one or many, to object(s) of type Tachometer
- An association, zero, one or many, to object(s) of type TemperatureSensor

4.89 S5000F UoF Supply Item

4.89.1 Description

The Supply Item UoF allows to define the SupplyItems required for a MaintenanceActivity.

4.89.2 Graphical description



ICN-B6865-5000F15105-001-01

Fig 109 S5000F UoF Supply Item

4.89.3 Class definition

4.89.3.1 ConsumableItem

ConsumableItem is a supply item that is consumed and cannot be reused.

4.89.3.1.1 Example(s)

- detergent
- fuel
- grease
- oil

4.89.3.1.2 Attribute(s)

This class has the following attributes:

- consumableItemIdentifier, one or many
- consumableItemDescription, optional
- consumableItemName
- consumableItemRiskDescription, optional

- consumableItemRiskFactor
- consumableType

4.89.3.1.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.89.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- SupplyItem

4.89.3.2 Material

Material is a substance that can be refined in a manufacturing process.

4.89.3.2.1 Example(s)

- copper
- plastic
- sheet metal

4.89.3.2.2 Attribute(s)

This class has the following attributes:

- materialIdentifier, one or many
- materialCharacteristicsRecordingDate
- materialDescription, optional
- materialName
- materialRiskDescription, optional
- materialRiskFactor
- materialSubstanceUsageCategory

4.89.3.2.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.89.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)
- SupplyItem

4.89.3.3 SupplyItem

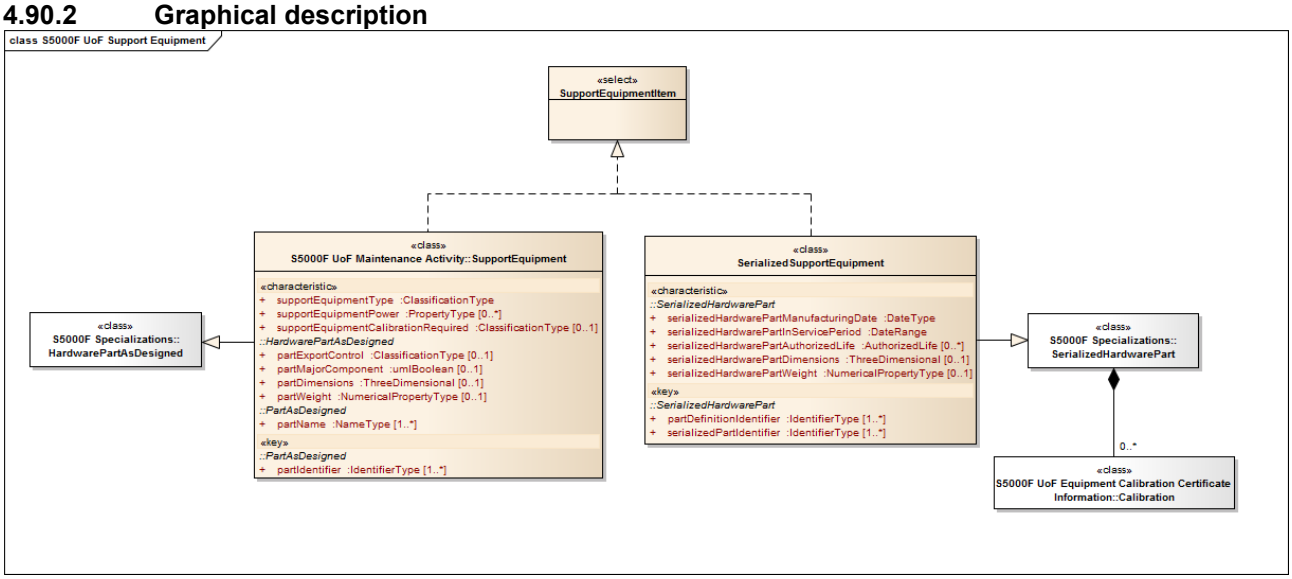
SupplyItem is a <<select>> interface representing an item that is used for maintenance or operation.

4.90 S5000F UoF Support Equipment

4.90.1 Description

The Support Equipment UoF provides the capability to define support equipments and serialized support equipments.

4.90.2 Graphical description



ICN-B6865-5000F15106-001-01

Fig 110 S5000F UoF Support Equipment

4.90.3 Class definition

4.90.3.1 SerializedSupportEquipment

SerializedSupportEquipment is a SerialiedHardwarePart that is used exclusively for support purposes.

4.90.3.1.1 Attribute(s)

This class has the following attributes:

- partDefinitionIdentifier (inherited from SerializedHardwarePart), one or many
- serializedPartIdentifier (inherited from SerializedHardwarePart), one or many
- serializedHardwarePartAuthorizedLife (inherited from SerializedHardwarePart), zero, one or many
- serializedHardwarePartDimensions (inherited from SerializedHardwarePart), optional
- serializedHardwarePartInServicePeriod (inherited from SerializedHardwarePart)
- serializedHardwarePartManufacturingDate (inherited from SerializedHardwarePart)
- serializedHardwarePartWeight (inherited from SerializedHardwarePart), optional

4.90.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type EquipmentOperation
- An association to object(s) of type EquipmentOwner
- An association to object(s) of type ModificationOf
- An association to object(s) of type SerializedPartDesignAssociation. A SerializedHardwarePart must be associated to one or many HarwarePartAsDesigned (via the SerializedPartDesignAssociation <<relationship>>)

4.90.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- AvailabilityItem (inherited from SerializedHardwarePart) (See S5000F UoF Availability, Para 4.13)
- ChangeControlledItem (inherited from SerializedHardwarePart) (See S5000F UoF Change Information, Para 4.21)

- CostBreakdownContext (inherited from SerializedHardwarePart) (See S5000F UoF Cost Breakdown, Para 4.25)
- DigitalFileReferencingItem (inherited from SerializedHardwarePart) (See S5000F UoF Digital File, Para 4.28)
- InfrastructureItem (inherited from SerializedHardwarePart) (See S5000F UoF Infrastructure, Para 4.43)
- ItemDamage (inherited from SerializedHardwarePart) (See S5000F UoF Damage, Para 4.26)
- ItemUnderExportControl (inherited from SerializedHardwarePart) (See S5000F UoF Export Control Requirement, Para 4.35)
- MaintenanceProgramItem (inherited from SerializedHardwarePart) (See S5000F UoF Maintenance Program, Para 4.52)
- MeasurementPointItem (inherited from SerializedHardwarePart) (See S5000F UoF Part As Realized, Para 4.65)
- SecurityClassificationItem (inherited from SerializedHardwarePart) (See S5000F UoF Security Classification, Para 4.79)
- SerializedItem (inherited from SerializedHardwarePart) (See S5000F UoF Serialized Item, Para 4.80)
- StoredPart (inherited from SerializedHardwarePart) (See S5000F UoF Warehouse and Spare Pool, Para 4.95)
- TrackablePart (inherited from SerializedHardwarePart) (See S5000F UoF Change Embodiment Planning, Para 4.18)
- TransportFeatures (inherited from SerializedHardwarePart) (See S5000F UoF Transportable Item, Para 4.92)
- WorkBreakdownContext (inherited from SerializedHardwarePart) (See S5000F UoF Work Breakdown, Para 4.97)

4.90.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestItem (inherited from SerializedHardwarePart) (See S5000F UoF Change Request, Para 4.22)
- ClassInstanceAssertItem (inherited from SerializedHardwarePart) (See S5000F UoF Applicability Statement, Para 4.11)
- ContractItem (inherited from SerializedHardwarePart) (See S5000F UoF Project and Contract, Para 4.71)
- CostEntryItem (inherited from SerializedHardwarePart) (See S5000F UoF Cost Breakdown, Para 4.25)
- DamagedItem (inherited from SerializedHardwarePart) (See S5000F UoF Damage, Para 4.26)
- DigitalFileReferencedItem (inherited from SerializedHardwarePart) (See S5000F UoF Digital File, Para 4.28)
- EventItem (inherited from SerializedHardwarePart) (See S5000F UoF Event, Para 4.33)
- ExportControlledItem (inherited from SerializedHardwarePart) (See S5000F UoF Export Control License, Para 4.34)
- InfrastructureNode (inherited from SerializedHardwarePart) (See S5000F UoF Infrastructure, Para 4.43)
- MaintenanceItem (inherited from SerializedHardwarePart) (See S5000F UoF Maintenance Activity, Para 4.48)
- MessageContextItem (inherited from SerializedHardwarePart) (See S5000F UoF Message, Para 4.55)
- NonAvailabilityCauseItem (inherited from SerializedHardwarePart) (See S5000F UoF Availability, Para 4.13)
- ObsolescenceItem (inherited from SerializedHardwarePart) (See S5000F UoF Obsolescence Management Candidates, Para 4.56)

- PoolItem (inherited from SerializedHardwarePart) (See S5000F UoF Warehouse and Spare Pool, Para 4.95)
- RealizedPart (inherited from SerializedHardwarePart) (See S5000F UoF Serialized Product Variant Configuration, Para 4.83)
- ReleasedDataSetItem (inherited from SerializedHardwarePart) (See S5000F UoF Data Sets, Para 4.27)
- ReportContextItem (inherited from SerializedHardwarePart) (See S5000F UoF Report, Para 4.73)
- ResourceItem (inherited from SerializedHardwarePart) (See S5000F UoF Resource Usage Request, Para 4.77)
- ServiceItem (inherited from SerializedHardwarePart) (See S5000F UoF Service Request, Para 4.86)
- SupportEquipmentItem
- TransportableItem (inherited from SerializedHardwarePart) (See S5000F UoF Transportable Item, Para 4.92)
- WarrantyItem (inherited from SerializedHardwarePart) (See S5000F UoF Warranty, Para 4.96)

4.90.3.2 SupportEquipmentItem

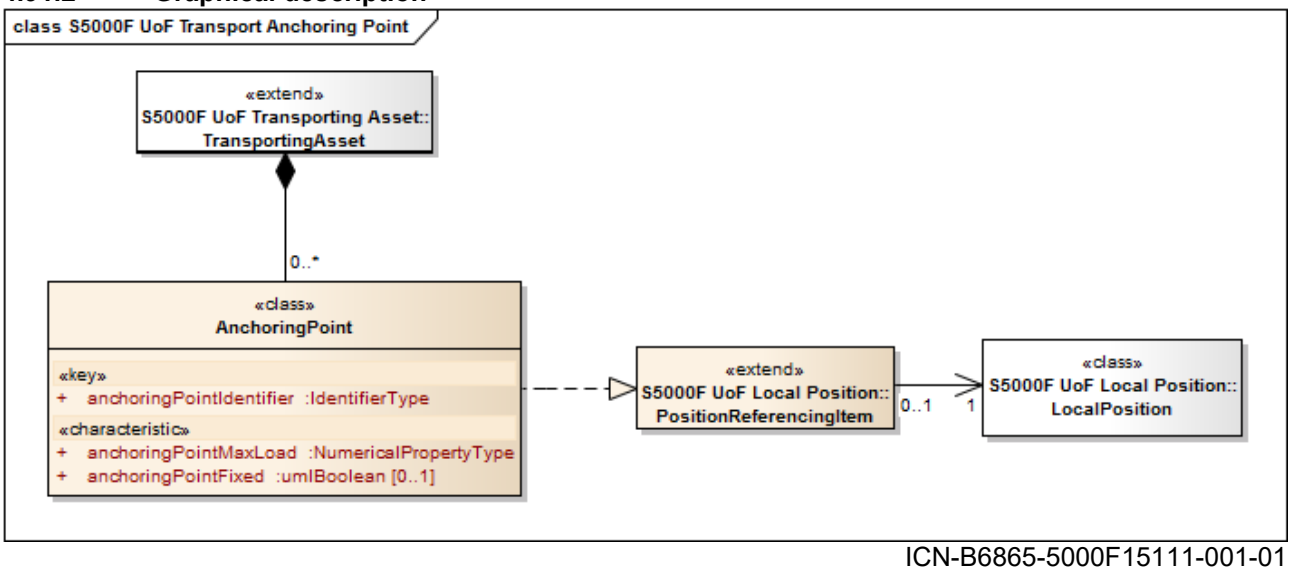
SupportEquipmentItem is a <<select>> interface that allows to choose between a generic SupportEquipment or a SerializedSupportEquipment.

4.91 S5000F UoF Transport Anchoring Point

4.91.1 Description

UoF Transport Anchoring Point provides the capability to define anchoring points on a TransportingAsset for mooring or tying down for transport purposes.

4.91.2 Graphical description



ICN-B6865-5000F15111-001-01

Fig 111 S5000F UoF Transport Anchoring Point

4.91.3 Class definition

4.91.3.1 AnchoringPoint

AnchoringPoint is a <<class>> representing a point where an item can be moored or tied down.

4.91.3.1.1 Attribute(s)

This class has the following attributes:

- anchoringPointIdentifier

– anchoringPointFixed, optional
– anchoringPointMaxLoad

4.91.3.1.2 Associations

This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type TransportingAsset

4.91.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

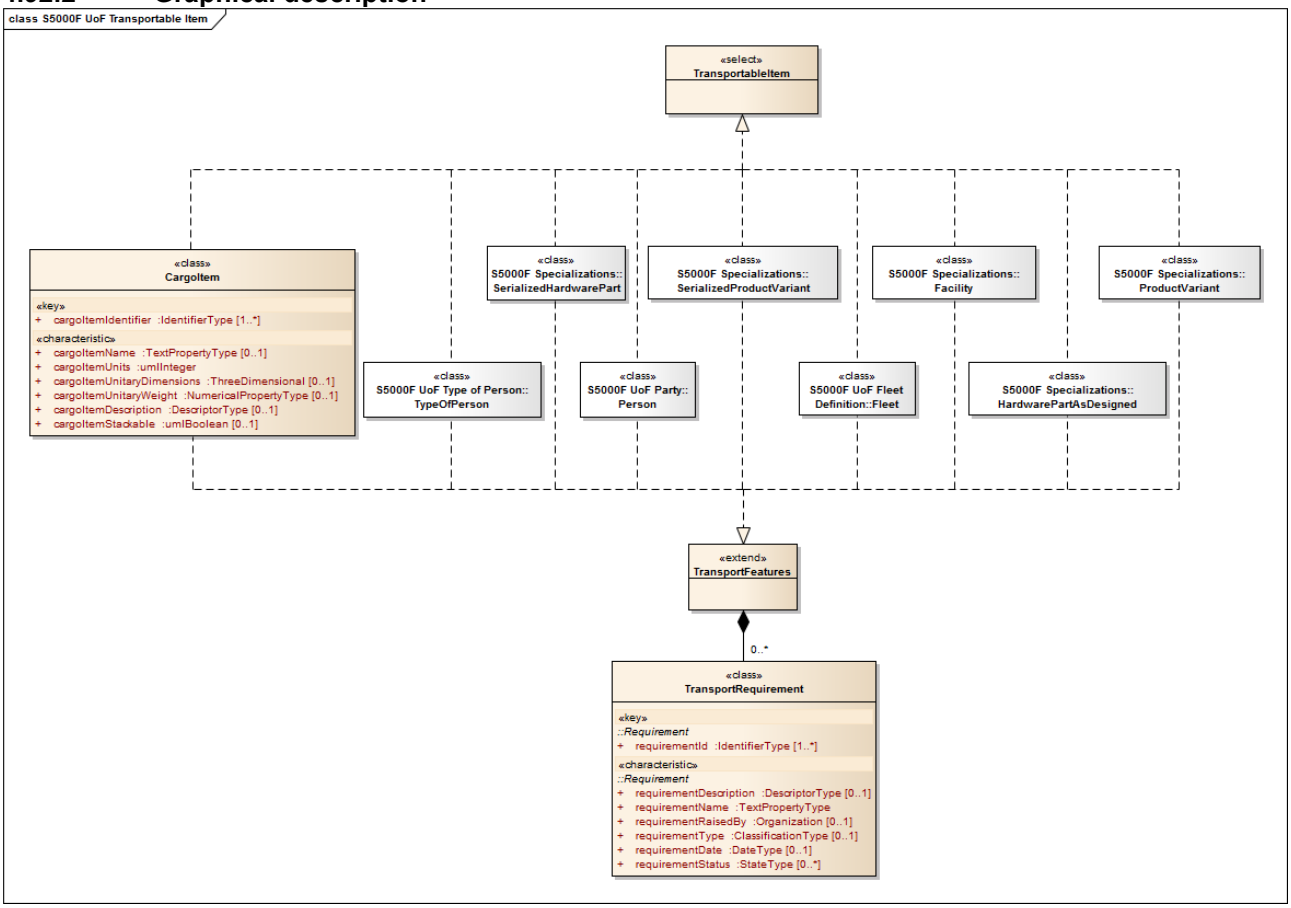
– PositionReferencingItem (See S5000F UoF Local Position, Para 4.45)

4.92 S5000F UoF Transportable Item

4.92.1 Description

Transportable Item UoF provides the capability to define items that can be transported.

4.92.2 Graphical description



ICN-B6865-5000F15107-001-01

Fig 112 S5000F UoF Transportable Item

4.92.3 Class definition

4.92.3.1 CargoItem

CargoItem is a class representing one or several items that need to be transported as part of a FleetTask.

Note

CargoItem can be used to designate several entities of a same type, such as 50 passengers for a bus, or 2 pallets to be loaded on a truck.

Note
The total volume can be only determined by summing up the volume of the different units.

Note
The total dimensions of the CargoItem cannot be determined in case it consists of several items, as the final dimensions will depend on the arrangement of the different items.

Note
The total weight of the CargoItem must be calculated by multiplying the unitary weight by the number of units.

4.92.3.1.1 Example(s)

- chicken cage(s)
- container(s)
- pallet(s)
- passenger(s)
- rug (s)

4.92.3.1.2 Attribute(s)

This class has the following attributes:

- cargoItemIdentifier, one or many
- cargoItemDescription, optional
- cargoItemName, optional
- cargoItemStackable, optional
- cargoItemUnitaryDimensions, optional
- cargoItemUnitaryWeight, optional
- cargoItemUnits

4.92.3.1.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback

4.92.3.1.4 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)
- TransportFeatures

4.92.3.1.5 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- TransportableItem

4.92.3.2 TransportableItem

TransportableItem is a <<select>> interface that allows to define an item that can be transported.

4.92.3.3 TransportFeatures

TransportFeatures is an <<extend>> interface that allows to associate specific transport features to transportable items.

4.92.3.4 TransportRequirement

TransportRequirement is a Requirement defining the condictions under which a TransportableItem can be transported.

4.92.3.4.1 Example(s)

- Oil reservoir must be emptied before transport.
- The tires of the vehicle must be deflated for transport.

4.92.3.4.2 Attribute(s)

This class has the following attributes:

- requirementId (inherited from Requirement), one or many
- requirementDate (inherited from Requirement), optional
- requirementDescription (inherited from Requirement), optional
- requirementName (inherited from Requirement)
- requirementRaisedBy (inherited from Requirement), optional
- requirementStatus (inherited from Requirement), zero, one or many
- requirementType (inherited from Requirement), optional

4.92.3.4.3 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An aggregate association, zero, one or many, to related object(s) of type TransportFeatures
- A composition association, zero, one or many, to child objects of type ServiceRequest
- An association to object(s) of type RequirementParty
- An association to object(s) of type RequirementRelationship
- An association, zero, one or many, to object(s) of type Document

4.92.3.4.4 Implementations

This class implements the following <<extend>> interfaces:

- ApplicabilityStatementItem (inherited from Requirement) (See S5000F UoF Applicability Statement, Para 4.11)
- ChangeControlledItem (inherited from Requirement) (See S5000F UoF Change Information, Para 4.21)
- MaintenanceWorkOrderSource (inherited from Requirement) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Requirement) (See S5000F UoF Security Classification, Para 4.79)

4.92.3.4.5 Selects

This class is a member of the following <<select>> interfaces:

- SafetyItem (inherited from Requirement) (See S5000F UoF Safety, Para 4.78)

4.93 S5000F UoF Transporting Asset

4.93.1 Description

Transporting Asset UoF provides the possibility to define items that can transport other items and the transport Capabilities associated to them.

4.93.2 Graphical description

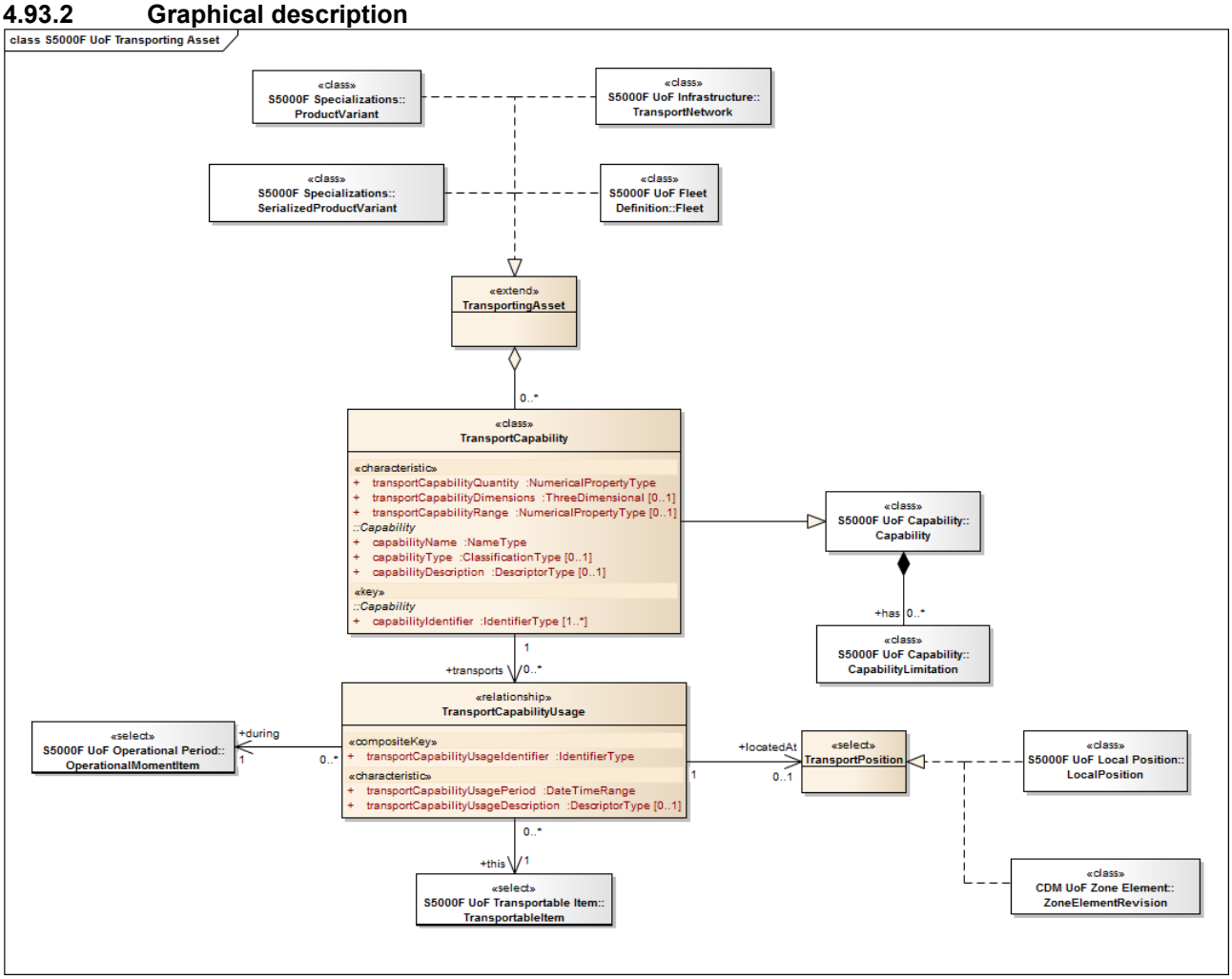


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Fig 113 S5000F UoF Transporting Asset

4.93.3 Class definition

4.93.3.1 TransportCapability

TransportCapability is a Capability associated to the capacity of transporting things.

4.93.3.1.1 Attribute(s)

This class has the following attributes:

- capabilityIdentifier (inherited from Capability), one or many
- capabilityDescription (inherited from Capability), optional
- capabilityName (inherited from Capability)
- capabilityType (inherited from Capability), optional
- transportCapabilityDimensions, optional
- transportCapabilityQuantity
- transportCapabilityRange, optional

4.93.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, zero, one or many, to child objects of type TransportingAsset

- A composition association, has, zero, one or many, to child objects of type CapabilityItem
- A composition association, has, zero, one or many, to child objects of type Service
- An association to object(s) of type TransportCapabilityUsage

4.93.3.2 TransportCapabilityUsage

TransportCapabilityUsage is a <<relationship>> that allows to associate a TransportCapability with the TransportableItems that it transports at a certain moment in time.

4.93.3.2.1 Attribute(s)

This class has the following attributes:

- transportCapabilityUsageIdentifier
- transportCapabilityUsageDescription, optional
- transportCapabilityUsagePeriod

4.93.3.2.2 Associations

This class has the following associations:

- An association to object(s) from classes that are members of TransportPosition
- An association, zero, one or many, to object(s) from classes that are members of OperationalMomentItem
- An association, zero, one or many, to object(s) from classes that are members of TransportableItem

4.93.3.3 TransportingAsset

TransportingAsset is an <<extend>> interfaces that allows to associate a TransportCapability to an item.

4.93.3.4 TransportPosition

TransportPosition is a <<select>> interface that allows to identify where a TransportableItem is positioned during a transport.

4.94 S5000F UoF Type of Person

4.94.1 Description

Type Of Person UoF provides information about the shared characteristics that can be associated to a group of Persons.

4.94.2 Graphical description

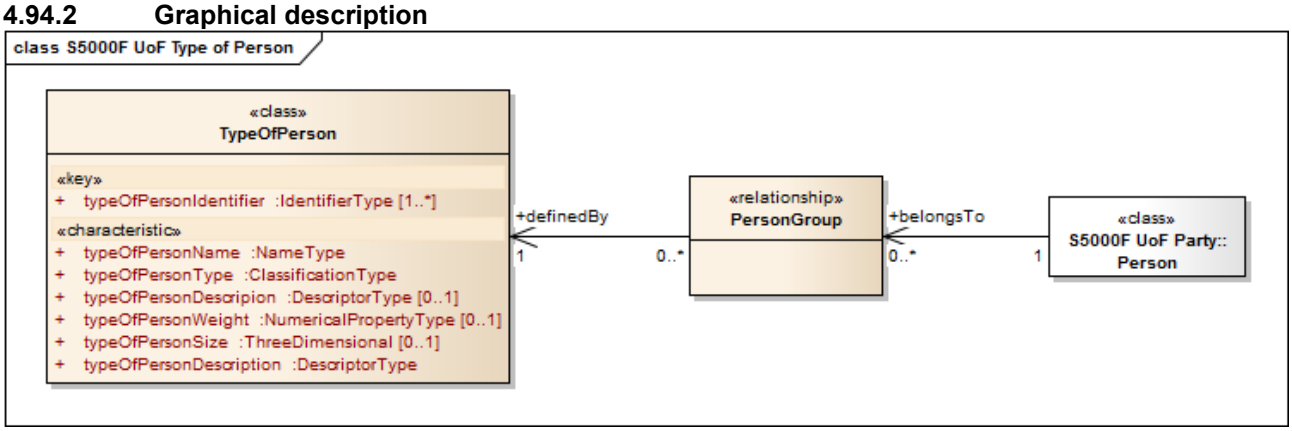

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Fig 114 S5000F UoF Type of Person

4.94.3 Class definition

4.94.3.1 PersonGroup

PersonGroup is a <<relationship>> that allows to associate a Person to different types of persons.

4.94.3.1.1 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type TypeOfPerson

4.94.3.2 TypeOfPerson

TypeOfPerson is a <<class>> representing a neutral non-individual person that presents a set of shared common characteristics of multiple Persons.

Note

A TypeOfPerson is used mainly for planning purposes, when the exact individual(s) that are going to be associated to an activity are not yet known.

4.94.3.2.1 Example(s)

- class 3 welder
- electronics engineer
- helicopter pilot
- mechanical technician
- paratrooper
- truck driver

4.94.3.2.2 Attribute(s)

This class has the following attributes:

- typeOfPersonIdentifier, one or many
- typeOfPersonDescripion, optional
- typeOfPersonDescription
- typeOfPersonName
- typeOfPersonSize, optional
- typeOfPersonType
- typeOfPersonWeight, optional

4.94.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- PersonCompetenceItem (See S5000F UoF Person Competences and Labor Rates, Para 4.67)
- TransportFeatures (See S5000F UoF Transportable Item, Para 4.92)

4.94.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- TransportableItem (See S5000F UoF Transportable Item, Para 4.92)

4.95 S5000F UoF Warehouse and Spare Pool

4.95.1 Description

Warehouse and Spare Pool UoF provides the capability to exchange information about warehouse stock and pools of spares.

4.95.2 Graphical description

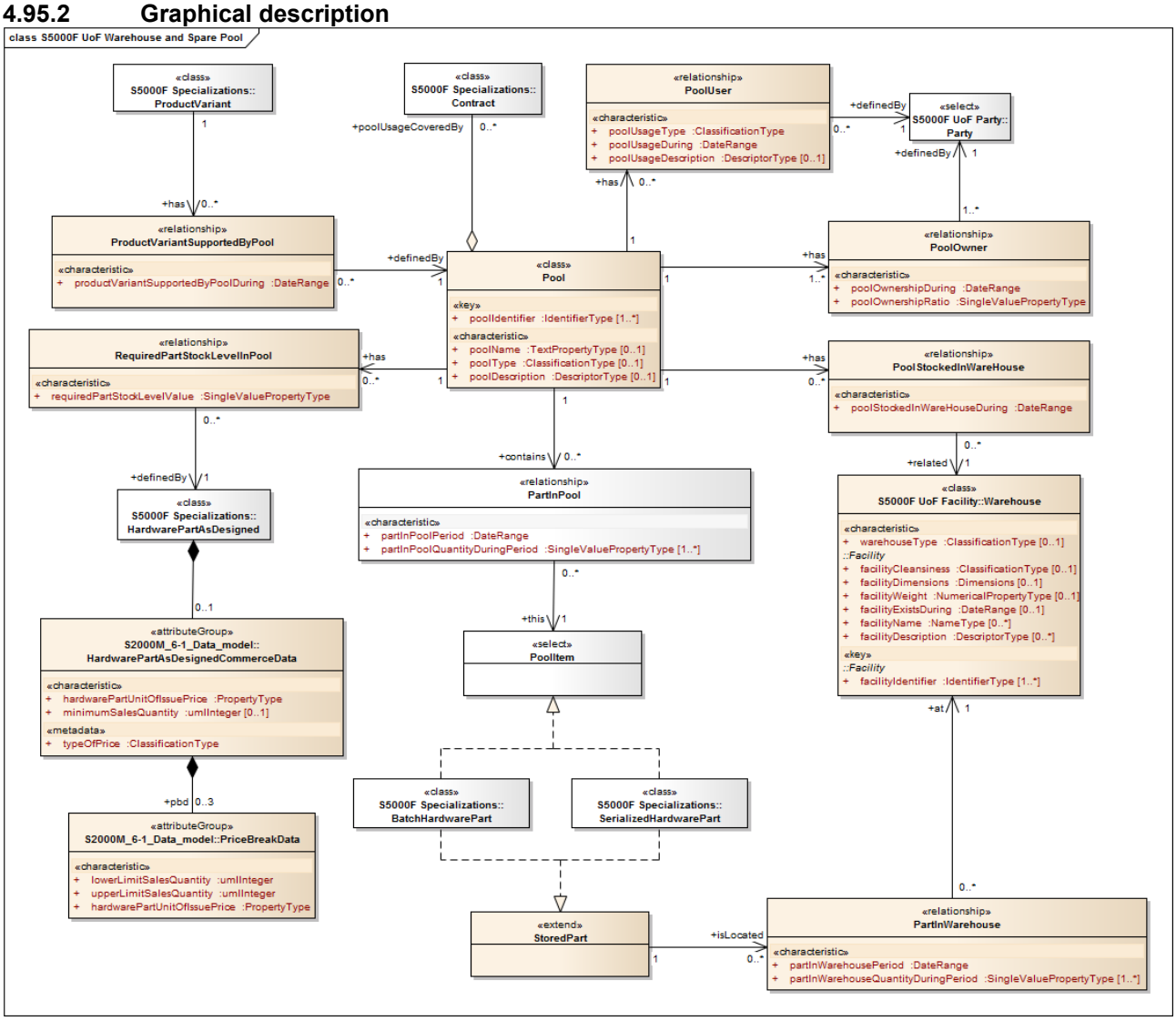

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Fig 115 S5000F UoF Warehouse and Spare Pool

4.95.3 Class definition

4.95.3.1 PartInPool

SerializedHardwareParentInPool is a <<relationship>> that indicates the period during which a SerializedHardwarePart has been in a defined Pool of parts.

4.95.3.1.1 Attribute(s)

This class has the following attributes:

- partInPoolPeriod
- partInPoolQuantityDuringPeriod, one or many

4.95.3.1.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of PoolItem

4.95.3.2 PartInWarehouse

PartInWarehouse is a <<relationship>> that defines the time that a SerializedHardwarePart has been stored in a Warehouse.

4.95.3.2.1 Attribute(s)

This class has the following attributes:

- partInWarehousePeriod
- partInWarehouseQuantityDuringPeriod, one or many

4.95.3.2.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Warehouse

4.95.3.3 Pool

Pool is a set of parts that are managed as a functional group and that is shared by different Parties.

4.95.3.3.1 Attribute(s)

This class has the following attributes:

- poolIdentifier, one or many
- poolDescription, optional
- poolName, optional
- poolType, optional

4.95.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type PartInPool
- An association to object(s) of type PoolOwner. A Pool can be associated (by means of the PoolOwer <<relationship>>) to zero, one or many Parties owning the Pool
- An association to object(s) of type PoolStockedInWareHouse. A Pool can be associated to zero, one or many Warehouses where it is stocked (via the PoolStockedInWareHouse <<relationship>>)
- An association to object(s) of type PoolUser. A Pool can be used by zero, one or many Person or Organization instances implementing the Party <<interface>> (via the PoolUser <<relationship>>)
- An association to object(s) of type RequiredPartStockLevelInPool

4.95.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)
- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.95.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)
- ReportContextItem (See S5000F UoF Report, Para 4.73)

4.95.3.4 PoolItem

PoolItem is a <<select>> interface that represents an item that belongs to a pool.

4.95.3.5 PoolOwner
PoolOwner is a <<relationship>> that defines the ownership ration and period of a Party over a Pool.

4.95.3.5.1 Attribute(s)
This class has the following attributes:

- poolOwnershipDuring
- poolOwnershipRatio

4.95.3.5.2 Associations
This class has the following associations:

- An association, one or many, to object(s) from classes that are members of Party

4.95.3.6 PoolStockedInWareHouse
PoolStockedInWareHouse is a <<relationship>> that allows to indicate the Warehouse or Warehouses where a Pool of parts is stocked.

4.95.3.6.1 Attribute(s)
This class has the following attributes:

- poolStockedInWareHouseDuring

4.95.3.6.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) of type Warehouse

4.95.3.7 PoolUser
PoolUser is a <<relationship>> that associates a spare Pool with the Parties that are allowed to access and use that SparePool.

4.95.3.7.1 Attribute(s)
This class has the following attributes:

- poolUsageDescription, optional
- poolUsageDuring
- poolUsageType

4.95.3.7.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) from classes that are members of Party

4.95.3.8 ProductVariantSupportedByPool
ProductVariantSupportedByPool is a <<relationship>> that indicates that a ProductVariant is supported by a defined part Pool.

4.95.3.8.1 Attribute(s)
This class has the following attributes:

- productVariantSupportedByPoolDuring

4.95.3.8.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) of type Pool

4.95.3.9 RequiredPartStockLevelInPool

RequiredPartStockLevelInPool is a <<relationship>> that defines the number of parts that must be stored in a Pool.

4.95.3.9.1 Attribute(s)

This class has the following attributes:

- requiredPartStockLevelValue

4.95.3.9.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type Accelerometer
- An association, zero, one or many, to object(s) of type HardwarePartAsDesigned
- An association, zero, one or many, to object(s) of type PressureSensor
- An association, zero, one or many, to object(s) of type SensorType
- An association, zero, one or many, to object(s) of type StrainGauge
- An association, zero, one or many, to object(s) of type SupportEquipment
- An association, zero, one or many, to object(s) of type Tachometer
- An association, zero, one or many, to object(s) of type TemperatureSensor

4.95.3.10 StoredPart

StoredPart is an <<extend>> interface that provides the capability to associate a Part the Warehouse where it is stored.

4.95.3.10.1 Associations

This class has the following associations:

- An association to object(s) of type PartInWarehouse

4.96 S5000F UoF Warranty

4.96.1 Description

Warranty UoF provides the information associated to the warranty process.

4.96.2 Graphical description

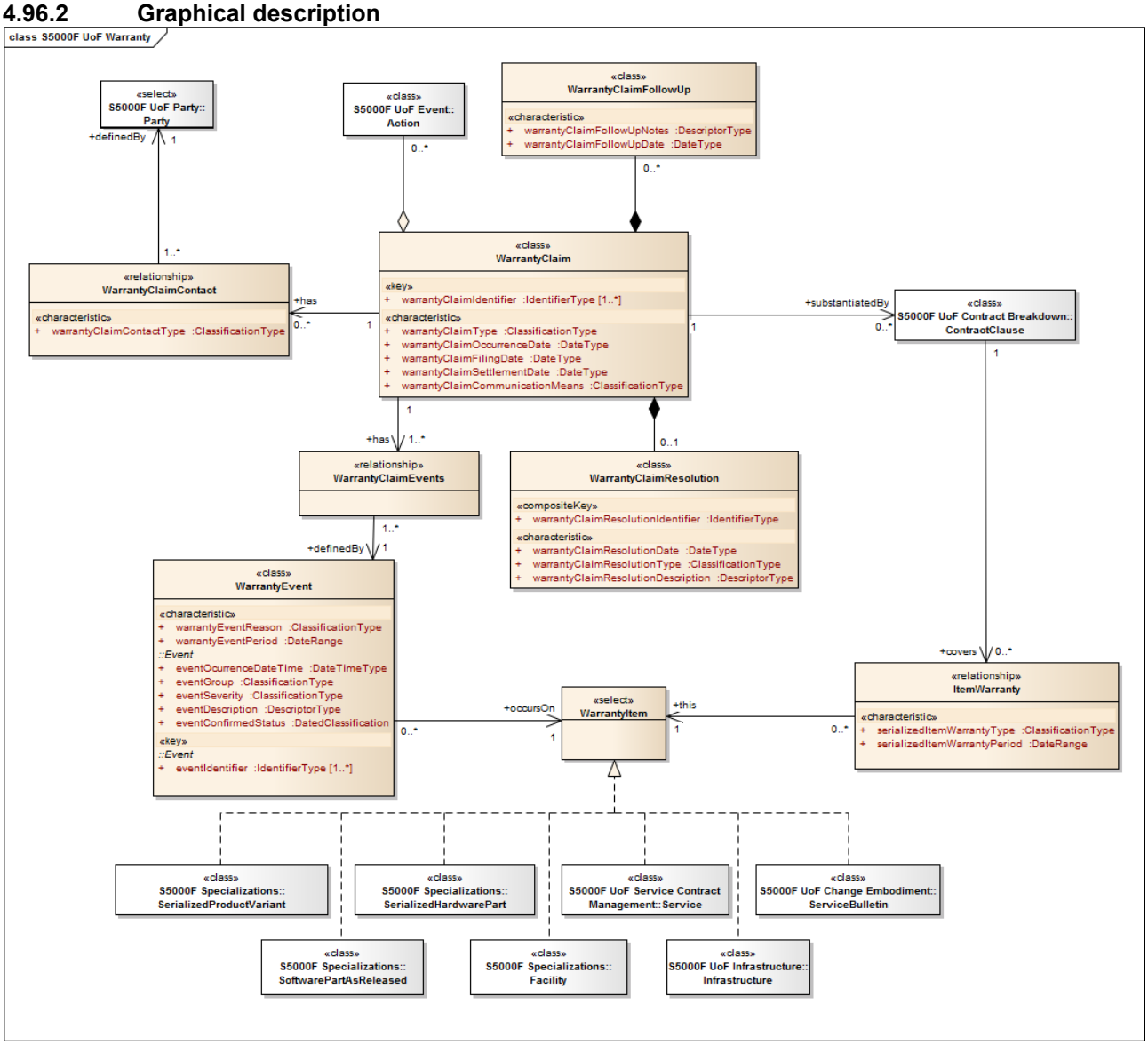

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Fig 116 S5000F UoF Warranty

4.96.3 Class definition

4.96.3.1 ItemWarranty

ItemWarranty is a <<relationship>> that defines the association between a WarrantyItem and the legal justification for the warranty of the WarrantyItem , such as a contract or contract clause.

4.96.3.1.1 Attribute(s)

This class has the following attributes:

- serializedItemWarrantyPeriod
- serializedItemWarrantyType

4.96.3.1.2 Associations

This class has the following associations:

– An association, zero, one or many, to object(s) from classes that are members of WarrantyItem

4.96.3.2 WarrantyClaim
WarrantyClaim is a class representing a customer's claim for repair or replacement of a defective item or non-performance of that item as established in a warranty contract.

4.96.3.2.1 Attribute(s)
This class has the following attributes:

– warrantyClaimIdentifier, one or many
– warrantyClaimCommunicationMeans
– warrantyClaimFilingDate
– warrantyClaimOccurrenceDate
– warrantyClaimSettlementDate
– warrantyClaimType

4.96.3.2.2 Associations
This class has the following associations:

– An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
– An association to object(s) of type ContractClause
– An association to object(s) of type ServiceLevelAgreementClause
– An association to object(s) of type WarrantyClaimContact
– An association to object(s) of type WarrantyClaimEvents

4.96.3.2.3 Implementations
This class implements the following <<extend>> interfaces:

– DigitalFileReferencingItem (See S5000F UoF Digital File, Para 4.28)

4.96.3.2.4 Selects
This class is a member of the following <<select>> interfaces:

– DigitalFileReferencedItem (See S5000F UoF Digital File, Para 4.28)

4.96.3.3 WarrantyClaimContact
WarrantyClaimContact is a <<relationship>> that associates a WarrantyClaim to a Party.

4.96.3.3.1 Attribute(s)
This class has the following attributes:

– warrantyClaimContactType

4.96.3.3.2 Associations
This class has the following associations:

– An association, one or many, to object(s) from classes that are members of Party

4.96.3.4 WarrantyClaimEvents
WarrantyClaimEvents is a <<relationship>> that associates WarrantyClaims to WarrantyEvents.

4.96.3.4.1 Associations
This class has the following associations:

– An association, one or many, to object(s) of type WarrantyEvent

4.96.3.5 WarrantyClaimFollowUp
WarrantyClaimFollowUp is a class that represents any follow-up associated to a WarrantyClaim.

4.96.3.5.1 Attribute(s)
This class has the following attributes:

- warrantyClaimFollowUpDate
- warrantyClaimFollowUpNotes

4.96.3.5.2 Associations
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type WarrantyClaim

4.96.3.6 WarrantyClaimResolution
WarrantyClaimResolution is a class that represents the conclusion of the WarrantyClaim.

4.96.3.6.1 Attribute(s)
This class has the following attributes:

- warrantyClaimResolutionIdentifier
- warrantyClaimResolutionDate
- warrantyClaimResolutionDescription
- warrantyClaimResolutionType

4.96.3.6.2 Associations
This class has the following associations:

- An aggregate association, optional, to related object(s) of type WarrantyClaim

4.96.3.6.3 Selects
This class is a member of the following <<select>> interfaces:

- CostEntryItem (See S5000F UoF Cost Breakdown, Para 4.25)

4.96.3.7 WarrantyEvent
WarrantyEvent is an Event that has as the consequence that a WarrantyClaim is raised.

4.96.3.7.1 Attribute(s)
This class has the following attributes:

- eventIdentifier (inherited from Event), one or many
- eventConfirmedStatus (inherited from Event)
- eventDescription (inherited from Event)
- eventGroup (inherited from Event)
- eventOcurrenceDateTime (inherited from Event)
- eventSeverity (inherited from Event)
- warrantyEventPeriod
- warrantyEventReason

4.96.3.7.2 Associations
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- An association to object(s) of type DownTimePeriod
- An association to object(s) of type EventAffectedBreakdownElement
- An association to object(s) of type EventExplanation. An Event can be associated to zero, one or many ExplanatoryFactors
- An association to object(s) of type EventRelationship
- An association to object(s) of type EventRelationshipItem
- An association to object(s) of type EventReporter

- An association to object(s) of type LogBookEntry. An Event instance can be optionally logged in a LogBookEntry instance
- An association, zero, one or many, to object(s) of type ProductUsagePhase
- An association, zero, one or many, to object(s) from classes that are members of WarrantyItem

4.96.3.7.3 Implementations

This class implements the following <<extend>> interfaces:

- DigitalFileReferencingItem (inherited from Event) (See S5000F UoF Digital File, Para 4.28)
- MaintenanceWorkOrderSource (inherited from Event) (See S5000F UoF Maintenance Work Order Source, Para 4.53)
- SecurityClassificationItem (inherited from Event) (See S5000F UoF Security Classification, Para 4.79)

4.96.3.7.4 Selects

This class is a member of the following <<select>> interfaces:

- ChangeRequestReasonItem (inherited from Event) (See S5000F UoF Change Request, Para 4.22)
- DigitalFileReferencedItem (inherited from Event) (See S5000F UoF Digital File, Para 4.28)
- NonAvailabilityCauseItem (inherited from Event) (See S5000F UoF Availability, Para 4.13)
- ReportContextItem (inherited from Event) (See S5000F UoF Report, Para 4.73)

4.96.3.8 WarrantyItem

WarrantyItem is a <<select>> interface that allows to define the items that are subject to Warranty or on which a Warranty Event occurs.

4.97 S5000F UoF Work Breakdown

4.97.1 Description

The Work Breakdown UoF provides the capability to define a Work Breakdown Structure (WBS).

4.97.2 Graphical description

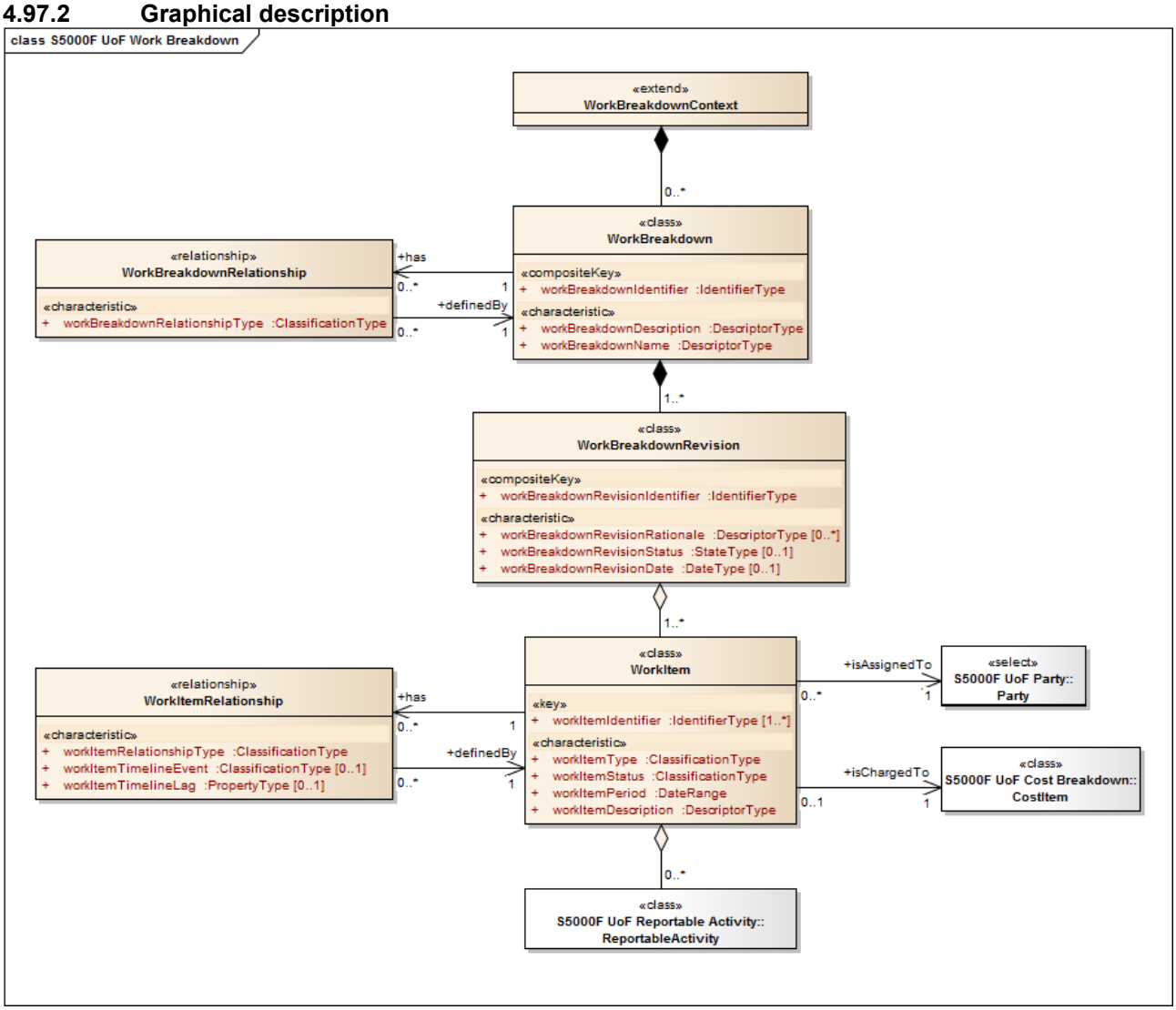

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Fig 117 S5000F UoF Work Breakdown

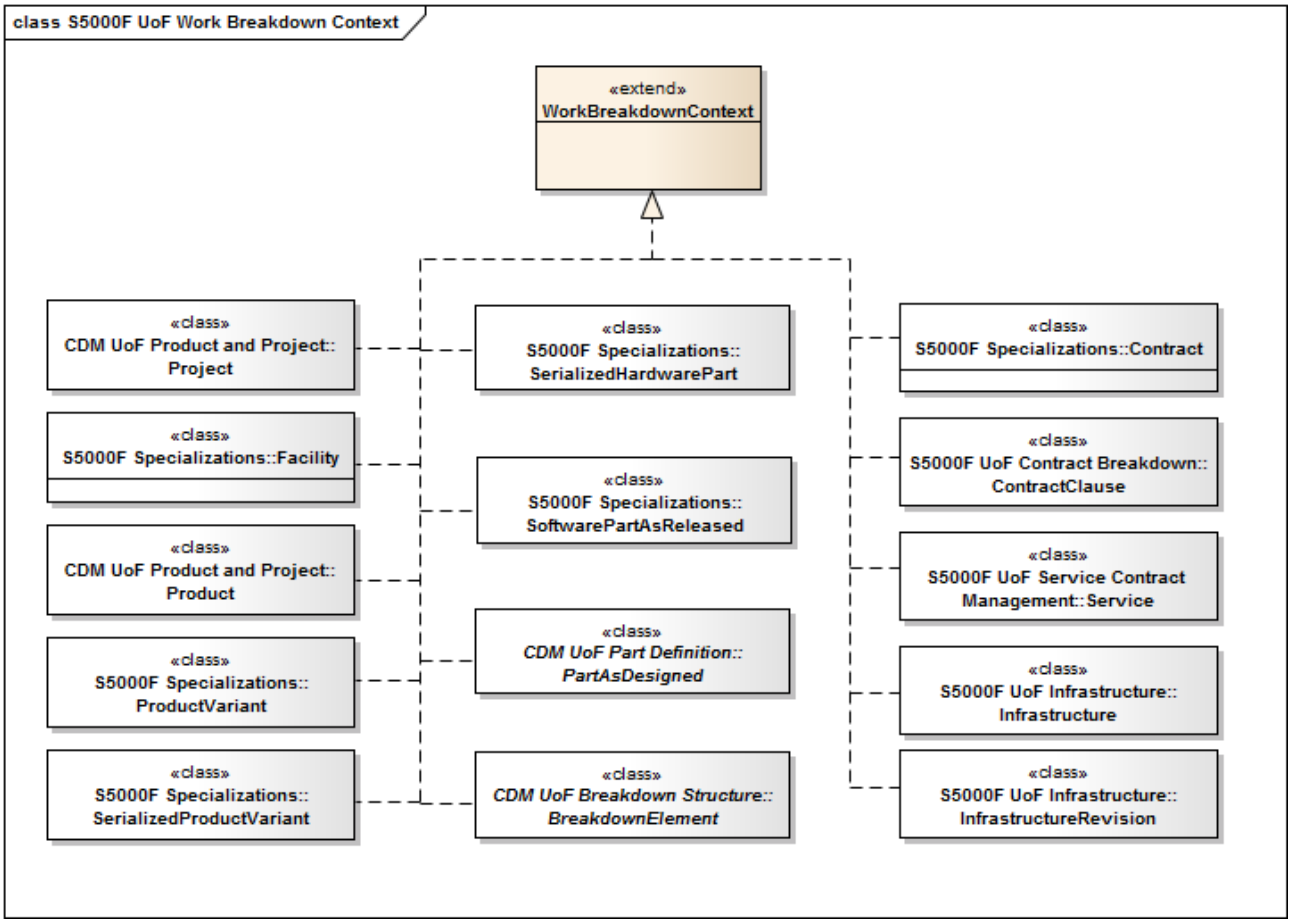

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Fig 118 S5000F UoF Work Breakdown Context

4.97.3 Class definition

4.97.3.1 WorkBreakdown

WorkBreakdown is a class used to group all the different activities associated to a particular purpose.

4.97.3.1.1 Attribute(s)

This class has the following attributes:

- workBreakdownIdentifier
- workBreakdownDescription
- workBreakdownName

4.97.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type WorkBreakdownContext
- An association to object(s) of type WorkBreakdownRelationship

4.97.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.97.3.2 WorkBreakdownContext
WorkBreakDownContext is an <<extend>> interface that allows to associated workBreakDowns to individual items.

4.97.3.3 WorkBreakdownRelationship
WorkBreakdownRelationship is a <<relationship>> that allows to associate different WorkBreakdowns.

4.97.3.3.1 Attribute(s)
This class has the following attributes:

- workBreakdownRelationshipType

4.97.3.3.2 Associations
This class has the following associations:

- An association, zero, one or many, to object(s) of type WorkBreakdown

4.97.3.4 WorkBreakdownRevision
WorkBreakdownRevision is an iteration that is applied to a WorkBreakdown.

4.97.3.4.1 Attribute(s)
This class has the following attributes:

- workBreakdownRevisionIdentifier
- workBreakdownRevisionDate, optional
- workBreakdownRevisionRationale, zero, one or many
- workBreakdownRevisionStatus, optional

4.97.3.4.2 Associations
This class has the following associations:

- An aggregate association, one or many, to related object(s) of type WorkBreakdown

4.97.3.5 WorkItem
A WorkItem is a generic concept defined to group individual activities for planning, costing or program management purposes.

Note
A same WorkItem can be associated to several WorkBreakdownRevisions.

4.97.3.5.1 Attribute(s)
This class has the following attributes:

- workItemIdentifier, one or many
- workItemDescription
- workItemPeriod
- workItemStatus
- workItemType

4.97.3.5.2 Associations
This class has the following associations:

- An aggregate association, zero, one or many, to related object(s) of type InServiceDataFeedback
- A composition association, one or many, to child objects of type WorkBreakdownRevision
- An association to object(s) of type WorkItemRelationship
- An association, optional, to object(s) of type CostItem
- An association, zero, one or many, to object(s) from classes that are members of Party

4.97.3.5.3 Implementations

This class implements the following <<extend>> interfaces:

- SecurityClassificationItem (See S5000F UoF Security Classification, Para 4.79)

4.97.3.6 WorkItemRelationship

WorkItemRelationship is a <<relationship>> that establishes the association between two instances of WorkItem.

The class allows to define both hierarchical associations and time-dependent associations.

For hierarchical associations, it defines the parent-child relationships.

For time-dependent relationships, the WorkItemRelationship class defines the event to which relating (successor) WorkItems refers, eg, start or end of the related (predecessor) WorkItem.

It also defines a possible lag, ie, duration from the time the related event occurs and the time when the relating WorkItem can be initiated (started).

4.97.3.6.1 Attribute(s)

This class has the following attributes:

- workItemRelationshipType
- workItemTimelineEvent, optional
- workItemTimelineLag, optional

4.97.3.6.2 Associations

This class has the following associations:

- An association, zero, one or many, to object(s) of type TechnicalOrder
- An association, zero, one or many, to object(s) of type WorkItem

4.98 S5000F Use Case All Core Message Content

4.98.1 Description

All Core Message Content UoF is the default use case that includes all core classes in the message content.

Other classes are sent embedded in these classes or as referenced items and not as part of the main message.

Note

Issue 2.0 does not currently include an UoF for the message content for the other use cases. This will be considered for the next issue, if it is perceived to bring additional value beyond the tables provided in Chap 20.

4.98.2 Graphical description

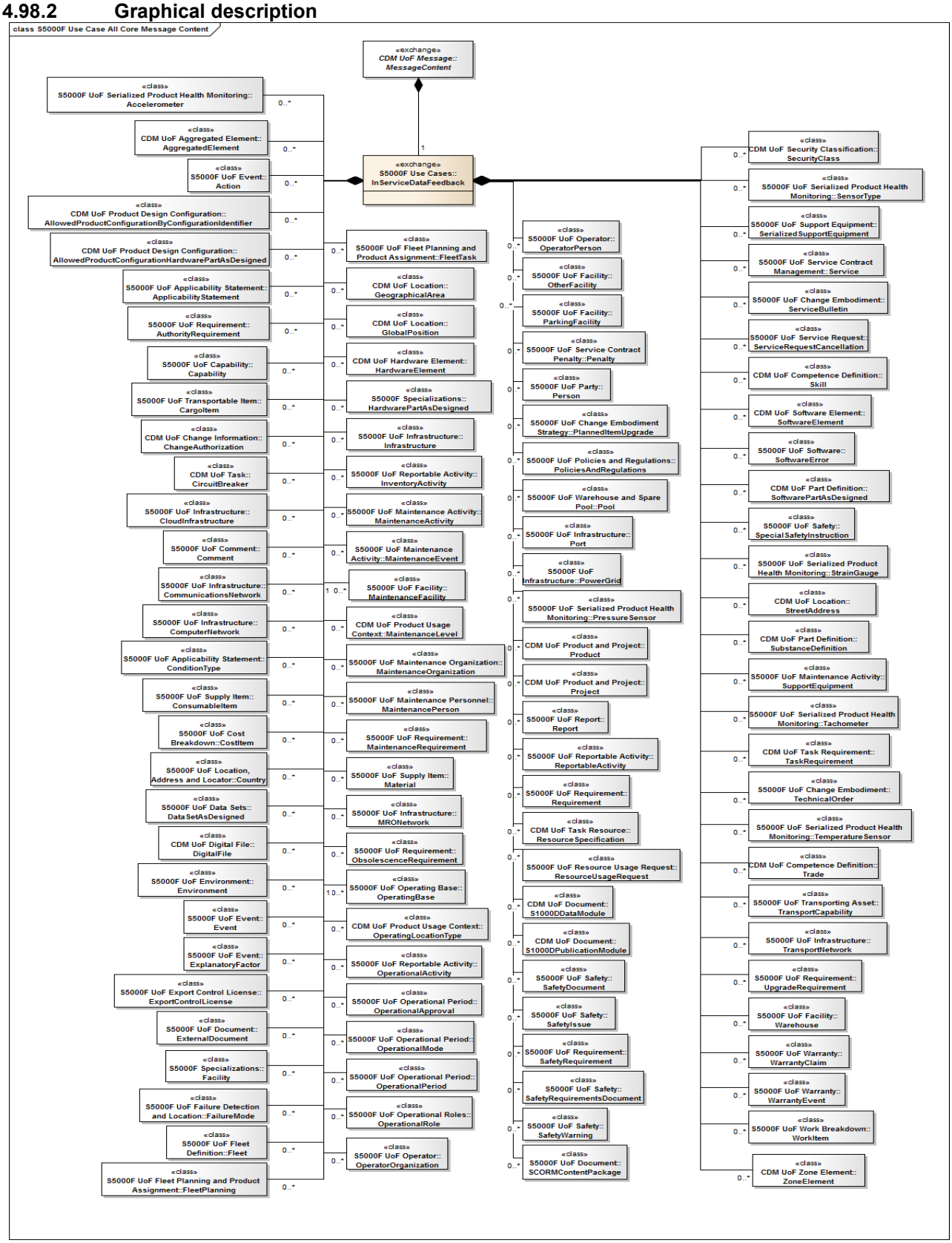

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Fig 119 S5000F Use Case All Core Message Content

Chapter 16.5

Data model - Mapping of use cases to individual UoFs

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Chap 9	Feedback data for the purpose of platform health and usage monitoring
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Chap 15	Feedback of non-predefined information
Chap 16.3	Data model - Common Data Model (CDM) units of functionality
Chap 16.4	Data model - Units of functionality
Chap 19	Tailoring and contracting against S5000F

1 General

The S5000F data model has been defined on the basis of the use cases defined throughout this specification. This will ensure that when applying a specific use case, all necessary information is available so as to be able to carry out that use case.

This chapter provides a mapping of the Units of Functionality (UoF) as defined in Chap 16.3 and Chap 16.4 that are required for each individual use case.

Note

It is important to observe that the mapping provided in this chapter is not mandatory and is just a guidance provided to assist the users in identifying the information that they could require for a specific use case.

2 Usage of UoFs for specific use cases

UoFs are snapshots of segments of the data model that cover a specific functionality. Data exchanges do not therefore have to fit exactly to a UoF. Classes that are not required can be dropped from the exchange, and related classes from a different UoF can be added to a specific use case as required.

Similarly, it is an acceptable practice to adding and/or removing UoFs to a specific use case as necessary is acceptable, as is defining project-specific use cases using arbitrary UoFs, provided that the data model is not changed.

Users of the specification are invited to propose new use cases to the S5000F Steering Committee by submitting a change request at http://www.sx000i.org/CPF.

Details about how to tailor a data exchange are provided in Chap 19.

For the definition of data exchanges for specific use cases, it is advised to start by looking at the UoFs of the following corresponding functional domains, as defined in Chap 16.4:

- **Configuration** - to exchange all information related to configuration aspects, including breakdown and change management
- **Elements** - to exchange information about individual components, irrespective of whether these are hardware, software, or data
- **Environment and Infrastructure** - to provide environmental information or fixed locations that are needed or referenced in the context of Product support
- **Events and Consequences** - to document things that have happened, as well as the potential damages and failures that could have occurred due to the occurred events
- **Fleet** - to identify and manage multiple supported items as a group
- **Information** - to provide documents or supplementary data to the use case information
- **Maintenance** - to provide information about the maintenance environment and execution
- **Management** - to provide management information required to manage or control a program
- **Material** - to exchange information for supply support, obsolescence and stock management or transport planning
- **Message** - to control the actual definition of a message exchange
- **Miscellaneous** - to cover the exchange of heterogeneous aspects such as the definition of requirements, capabilities, report on availability or measurements, as well as to define complex evaluation expressions
- **Operations** - to provide feedback on the actual Product operation
- **People and Organizations** - to define and provide information about organisations and individuals, including skills and labour rates
- **Product** - to identify the usage of a Product and provide feedback about individual serialized Products
- **Regulatory** - to provide information related to legal aspects such as policies, regulations, security or export control
- **Safety** - to exchange information on Safety issues

3 Mapping of use cases to UoFs

The following tables describe the UoFs that are used for each individual use case, using the following codes:

- X - mandatory
- O - optional/recommended
- (blank) - in principle, not used

As highlighted above, this mapping is a recommendation and it can be therefore tailored for each specific project.

3.1 UoFs for reliability, availability, maintainability, capability and testability use cases

The UoFs required for the different Reliability, Availability, Maintainability, Capability and Testability (RAMCT) use cases, as defined in Chap 3, are listed in Table 2. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

The Reliability use cases are as follows:

1 UC50301: Monitor the performance of equipment

2 UC50302: Influencing future designs

3 UC50303: Trends, Failures, Root Cause Analysis and Issue Warnings

The Availability use cases are as follows:

1 UC50304: Operations and deployment support, through-life support and equipment availability

2 UC50305: Maintenance Management and Contracting for availability

The Maintainability use cases are as follows:

1 UC50306: Maintenance Activities, Effectiveness of repairs, Specified Maintenance, predict Maintenance Periods, Products status

2 UC50307: Retaining Performance, Support manuals and Support Infrastructure

The Capability use cases are as follows:

1 UC50308: Mission capable, capability shortfalls

2 UC50309: Efficiency, Performance against specification

The Testability use cases are as follows:

1 UC503010: Can Product be tested

2 UC503011: Fault diagnosis, fault identification

Table 2 UoFs for RAMCT use cases

UoF Name	Reliability			Availa-bility		Main-taina-bility		Capa-bility		Testabi lity	
	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
CDM UoF Applicability Statement	X	X	X								
CDM UoF Breakdown Structure	X	X	X	O	X	X	X	O	X	X	X
CDM UoF Document	O	O	O	O	X		X		O		
CDM UoF Hardware Element	X	X	X	O	X	X	X	O	X	X	X
CDM UoF Part Definition	X	X	X	O	X	X	X	O	X	X	X
CDM UoF Product Design Configuration	X	X	X	O	O	X		X	X	X	X
CDM UoF Product Usage Context		X	X								
CDM UoF Software Element		X	X	O	X		X		X		
S5000F UoF Applicability Statement Items	X	X	X								
S5000F UoF Availability	X	X	X	X	X	X	X			X	X

UoF Name	Reliability			Availa-bility		Main-taina-bility		Capa-bility		Testabi lity	
	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
S5000F UoF Breakdown Item	X	X									
S5000F UoF Capability								X	X		
S5000F UoF Comment	O	O	O	O	O	O	O	O	O	O	O
S5000F UoF Comment Item	O	O	O	O	O	O	O	O	O	O	O
S5000F UoF Contract Breakdown					X						
S5000F UoF Cost Entry		X		O	O	O	O	O		O	
S5000F UoF Document	O	O	O	O	X		X		O		
S5000F UoF Environment			O								
S5000F UoF Equipment	X	X	X		O	X	X	O	X	X	X
S5000F UoF Equipment Calibration Certificate Information										X	X
S5000F UoF Event	X	X	X	X	O	X	X	X	X	X	X
S5000F UoF Expression Evaluation					X						
S5000F UoF Facility				O		X	X	O		O	X
S5000F UoF Failure Detection and Location			X							X	
S5000F UoF Fleet Monitoring				X	X						
S5000F UoF Fleet Planning and Product Assignment								X			
S5000F UoF Infrastructure				O			X	O			
S5000F UoF Infrastructure Availability				X			X	O			
S5000F UoF Logbook	X	X	X	X	O	X		X	X	X	X
S5000F UoF Maintenance Activity	X	X		X	X	X			X	X	X
S5000F UoF Maintenance Activity (Maintenance Item)	X	X			X	X			X	X	X
S5000F UoF Maintenance Facility Planning				X	X		X	X		O	O
S5000F UoF Maintenance Organization					X		X				
S5000F UoF Maintenance Personnel			X	O	X	X	X			O	O
S5000F UoF Maintenance Program			X		X					X	
S5000F UoF Maintenance Program Item			X		X					X	

UoF Name	Reliability			Availa-bility		Main-taina-bility		Capa-bility		Testabi lity	
	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
S5000F UoF Maintenance Work Order Source			X								
S5000F UoF MeasurementPoint			X								
S5000F UoF NonAvailabilityCauseItem	X	X	X	X	X	X	X			X	X
S5000F UoF Operational Environment		X	X	X				X	X	O	X
S5000F UoF Operational Event	X	X	X	X		X	X	X	X	X	X
S5000F UoF Operational Period			O	X	X						
S5000F UoF Operational Roles	X	X	X	X		X		X	X	X	
S5000F UoF Operational Times		X	X	X				X		O	
S5000F UoF Part As Realized			X								
S5000F UoF Policies and Regulations		X									
S5000F UoF Product Defined Operational Configuration		X	X	O	O	X	X	X			X
S5000F UoF Product Usage Phase		X									
S5000F UoF Project and Contract					X						
S5000F UoF Project Specific Attribute Definition	O	O	O	O	O	O	O	O	O	O	O
S5000F UoF Remark	O	O	O	O	O	O	O	O	O	O	O
S5000F UoF Report	O	O		O	O	X					X
S5000F UoF Report Context Item	O					X					X
S5000F UoF Reportable Activity	O	O	O	O		X					X
S5000F UoF Reportable Metric	O	O			X						
S5000F UoF Requirement		X									
S5000F UoF Safety	X	X	X	X						X	X
S5000F UoF Safety (Safety Item)	X	X	X	X						X	X
S5000F UoF Security Classification	O										
S5000F UoF Serialized Item	X	X	X	X	X	O	O	O	O	X	X
S5000F UoF Serialized Product Health Monitoring			X								X
S5000F UoF Serialized Product Variant	X		X	O	X	O	O	X	X	O	X
S5000F UoF Serialized Product Variant	X	X	X	O	O	X	X	X	X	X	X

UoF Name	Reliability			Availa-bility		Main-taina-bility		Capa-bility		Testabi lity	
	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
Configuration											
S5000F UoF Shop Findings											X
S5000F UoF Warranty		X									
S5000F UoF Zone Element		X									

3.2 UoFs for maintenance analysis use cases

The UoFs required for the different maintenance analysis use cases, as defined in Chap 4, are those listed in Table 3. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1 UC50401: Manufacturer maintenance schedule

2 UC50402: Product user maintenance program

3 UC50403: Maintenance performed

4 UC50404: Product performance

5 UC50405: New modifications for in-service Products

6 UC50406: Technical queries

7 UC50407: Component shop findings

8 UC50408: Structural damages

Table 3 UoFs for maintenance analysis use cases

UoFName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
CDM UoF Digital File						X		
CDM UoF Document	O	O	O		O	X		O
CDM UoF Product Usage Context				X				
S5000F UoF Availability				X				
S5000F UoF Change Embodiment					X			
S5000F UoF Change Embodiment Planning					X			
S5000F UoF Change Embodiment Reporting					X			
S5000F UoF Change Embodiment Strategy					X			

UoFName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
S5000F UoF Change Information					X			
S5000F UoF Change Request					X			
S5000F UoF Comment	O	O	O	O	O	X	O	O
S5000F UoF Comment Item	O	O	O	O	O	X	O	O
S5000F UoF Cost Entry							X	O
S5000F UoF Damage			X					X
S5000F UoF Digital File DigitalFileReferencedItem						X		
S5000F UoF Digital File DigitalFileReferencingItem						X		
S5000F UoF Document	O	O	O		O	X		O
S5000F UoF Equipment			X					
S5000F UoF Equipment Calibration Certificate Information			O					
S5000F UoF Event			X			X		X
S5000F UoF Failure Detection and Location			O				O	
S5000F UoF Maintenance Activity			X					
S5000F UoF Maintenance Activity (Maintenance Item)			X					
S5000F UoF Maintenance Facility Planning	O	O	X					
S5000F UoF Maintenance Organization	X	X	X					
S5000F UoF Maintenance Personnel	O	O	X					
S5000F UoF Maintenance Program	X	X						
S5000F UoF Maintenance Program Item	X	X						
S5000F UoF Maintenance Work Order Source	O	O	X					
S5000F UoF MeasurementPoint								
S5000F UoF NonAvailabilityCauseItem				X				
S5000F UoF Operating Base				X				
S5000F UoF Operational Environment				X		X		
S5000F UoF Operational Event				X		X		X
S5000F UoF Operational Period				X		O		
S5000F UoF Operational Roles				X		X		
S5000F UoF Operator				X				

UoFName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
S5000F UoF Part As Realized					X	X		
S5000F UoF Project Specific Attribute Definition	O	O	O	O	O	O	O	O
S5000F UoF Remark	O	O	O	O	O	O	O	O
S5000F UoF Safety						X		
S5000F UoF Safety (Safety Item)						X		
S5000F UoF Serialized Item			X					
S5000F UoF Shop Findings			X				X	
S5000F UoF Support Equipment			X					
S5000F UoF Zone Element								X

3.3 UoFs for safety analysis use cases

The UoFs required for the different safety use cases, as defined in Chap 5, are those listed in Table 4. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1 UC50501: Report safety issue

2 UC50502: Provide operational limitations due to safety issue

3 UC50503: Provide special safety instructions

Table 4 UoFs for safety analysis use cases

UoFName	UC50501	UC50502	UC50503
CDM UoF Applicability Statement	O	X	X
CDM UoF Document	O	O	O
CDM UoF Product Design Configuration	X	X	X
CDM UoF Software Element		X	X
S5000F UoF Applicability Statement Items		X	X
S5000F UoF Comment	O	O	O
S5000F UoF Comment Item	O	O	O
S5000F UoF Document	O	O	O
S5000F UoF Event	X		
S5000F UoF Logbook	X		

UoFName	UC50501	UC50502	UC50503
S5000F UoF Operational Environment	X		
S5000F UoF Operational Event	O		
S5000F UoF Operational Period	X		
S5000F UoF Part As Realized	X	X	X
S5000F UoF Party	X	X	X
S5000F UoF Product Defined Operational Configuration	X	X	
S5000F UoF Project Specific Attribute Definition	O	O	O
S5000F UoF Remark	O	O	O
S5000F UoF Report	X	X	
S5000F UoF Report Context Item	X		
S5000F UoF Requirement		X	X
S5000F UoF Safety	X	X	X
S5000F UoF Safety (Safety Item)	X	X	X
S5000F UoF Serialized Product Variant Configuration	O		

3.4 UoFs for supply support use cases

The UoFs required for the different supply support use cases, as defined in Chap 6, are those listed in Table 5. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1 UC50601: Inventory management

2 UC50602: Shelf life management

3 UC50603: Spares and SE pool management

4 UC50604: Logistic Response time

5 UC50605: Facilities management and maintenance

6 UC50606: Plan for transport

Table 5 UoFs for supply support use cases

UoFName	UC50601	UC50602	UC50603	UC50604	UC50605	UC50606
CDM UoF Part Definition		X				
S5000F UoF Comment	O	O	O	O	O	O

UoFName	UC50601	UC50602	UC50603	UC50604	UC50605	UC50606
S5000F UoF Comment Item	O	O	O	O	O	O
S5000F UoF Facility	O		X		X	
S5000F UoF Infrastructure					X	
S5000F UoF Infrastructure Availability					X	
S5000F UoF Operational Period						X
S5000F UoF Part As Realized		X	X			
S5000F UoF Project Specific Attribute Definition	O	O	O	O	O	O
S5000F UoF Remark	O	O	O	O	O	O
S5000F UoF Report	X			X	X	
S5000F UoF Report Context Item				X	X	
S5000F UoF Reportable Activity	X			X		
S5000F UoF Reportable Metric				X	X	
S5000F UoF Shop Findings	X					
S5000F UoF Transport Anchoring Point						X
S5000F UoF Transportable Item						X
S5000F UoF Transporting Asset						X
S5000F UoF Type of Person						X
S5000F UoF Warehouse and Spare Pool	X	X	X	X		
S5000F UoF Zone Element						X

3.5 UoFs for LCC analysis use cases

The UoFs required for the different LCC use cases, as defined in Chap 7, are those listed in Table 6. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1. UC50701: Provide cost breakdown structure
2. UC50702: Estimate maintenance costs
3. UC50703: Costs due to operational requirements
4. UC50704: Cost of modifications or upgrades
5. UC50705: Costs of in-service support

Table 6 UoFs for LCC analysis use cases

UoFName	UC50701	UC50702	UC50703	UC50704	UC50705
CDM UoF Document				X	
S5000F UoF Change Embodiment				O	
S5000F UoF Change Embodiment Reporting				X	
S5000F UoF Change Embodiment Strategy				O	
S5000F UoF Change Information				O	
S5000F UoF Change Request				X	
S5000F UoF Comment	O	O	O	O	O
S5000F UoF Comment Item	O	O	O	O	O
S5000F UoF Contract Breakdown			X	X	
S5000F UoF Cost Breakdown	X	X	X	X	X
S5000F UoF Cost Breakdown Context	X	X	X	X	X
S5000F UoF Cost Entry	X	X	X	X	X
S5000F UoF Document				X	
S5000F UoF Fleet Monitoring			X		
S5000F UoF Fleet Planning and Product Assignment			X		
S5000F UoF Operational Period			X		
S5000F UoF Operational Times			X		
S5000F UoF Project and Contract	O			O	X
S5000F UoF Project Specific Attribute Definition	O	O	O	O	O
S5000F UoF Remark	O	O	O	O	O
S5000F UoF Report		X	X	X	X
S5000F UoF Report Context Item		X	X	X	X
S5000F UoF Reportable Activity		X	X	X	X
S5000F UoF Requirement			X		
S5000F UoF Service Contract Management					X
S5000F UoF Service Contract Penalty					X
S5000F UoF Service Request					X

3.6 UoFs for warranty analysis use cases

The UoFs required for the different warranty use cases, as defined in Chap 8, are those listed in Table 7. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1. UC50801: Evaluate maintenance actions
2. UC50802: Collect warranty costs
3. UC50803: Determine misuse of warranty
4. UC50804: Identify items causing risk to warranty program
5. UC50805: Improve standard warranty rules and process

Table 7 UoFs for warranty analysis use cases

UoFName	UC50801	UC50802	UC50803	UC50804	UC50805
CDM UoF Product Design Configuration	O			X	X
S5000F UoF Change Embodiment Reporting					X
S5000F UoF Comment	O	O	O	O	O
S5000F UoF Comment Item	O	O	O	O	O
S5000F UoF Contract Breakdown		X	X		O
S5000F UoF Cost Breakdown		O			
S5000F UoF Cost Entry		X			
S5000F UoF Damage	X	X	X	X	X
S5000F UoF Equipment	X	X		X	X
S5000F UoF Equipment Calibration Certificate Information				X	X
S5000F UoF Event				X	
S5000F UoF Failure Detection and Location	O				
S5000F UoF Maintenance Activity	X				
S5000F UoF Maintenance Activity (Maintenance Item)	X				
S5000F UoF Maintenance Program	X				
S5000F UoF Maintenance Program Item	X				
S5000F UoF Operational Environment			X	X	X
S5000F UoF Operational Event	X		X		
S5000F UoF Operational Times			X		
S5000F UoF Part As Realized	O		X	X	X
S5000F UoF Project and Contract		O	X		O

S5000F UoF Project Specific Attribute Definition	O	O	O	O	O
S5000F UoF Remark	O	O	O	O	O
S5000F UoF Report		X	X		
S5000F UoF Report Context Item		X			
S5000F UoF Reportable Activity		X	X		
S5000F UoF Reportable Metric		O	O		
S5000F UoF Serialized Product Variant Configuration		O	O	O	X
S5000F UoF Shop Findings	X		X	X	X
S5000F UoF Warehouse and Spare Pool				X	
S5000F UoF Warranty	X	X	X	X	X

3.7 UoFs for platform usage & health monitoring use cases

The UoFs required for the different usage & health monitoring use cases, as defined in Chap 9, are those listed in Table 8. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1 UC50901: Record usage and health data

2 UC50902: Report usage information

3 UC50903: Respond to usage information

Table 8 UoFs for platform usage and health monitoring use cases

UoFName	UC50901	UC50902	UC50903
CDM UoF Digital File	X	X	
CDM UoF Product Usage Context			X
S5000F UoF Comment	O	O	O
S5000F UoF Comment Item	O	O	O
S5000F UoF Digital File DigitalFileReferencedItem	X	X	
S5000F UoF Digital File DigitalFileReferencingItem	X	X	
S5000F UoF Fleet Planning and Product Assignment			X
S5000F UoF Logbook	X	X	X
S5000F UoF Operational Period	X	X	
S5000F UoF Product Defined Operational Configuration			X
S5000F UoF Product Usage Phase		X	X

S5000F UoF Project Specific Attribute Definition	O	O	O
S5000F UoF Remark	O	O	O
S5000F UoF Serialized Product Health Monitoring	X	X	X

3.8 UoFs for obsolescence management use cases

The UoFs required for the different obsolescence use cases, as defined in Chap 10, are those listed in Table 9. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1 UC51001: Create basis for obsolescence management planning

2 UC51002: Determine obsolescence candidates /perform risk assessment

3 UC51003: Determine obsolescence strategy

4 UC51004: Obsolescence monitoring

5 UC51005: Solutions/proposals to solve obsolescence

6 UC51006: Provide obsolescence alert

Table 9 UoFs for obsolescence management use cases

UoFName	UC51001	UC51002	UC51003	UC51004	UC51005	UC51006
CDM UoF Document		O				
CDM UoF Product Design Configuration	X					
CDM UoF Product Usage Context	X					
CDM UoF Software Element	X					
S5000F UoF Change Embodiment Planning			X		**X**	
S5000F UoF Change Embodiment Reporting				X		X
S5000F UoF Change Embodiment Strategy					**X**	
S5000F UoF Comment	O	O	O	O	**O**	O
S5000F UoF Comment Item	O	O	O	O	**O**	O
S5000F UoF Contract Breakdown						O
S5000F UoF Document		O				O
S5000F UoF Equipment			X			
S5000F UoF Fleet Planning and Product Assignment			X			
S5000F UoF Logbook		X	X	X		
S5000F UoF Maintenance Activity		X				
S5000F UoF Maintenance Activity (Maintenance Item)		X				

UoFName	UC51001	UC51002	UC51003	UC51004	UC51005	UC51006
S5000F UoF Obsolescence Management Candidates		X				X
S5000F UoF Operational Period		X				
S5000F UoF Part As Realized	X					O
S5000F UoF Project Specific Attribute Definition	O	O	O	O	**O**	O
S5000F UoF Remark	O	O	O	O	**O**	O
S5000F UoF Report				X		X
S5000F UoF Reportable Activity				X		X
S5000F UoF Requirement		X	X			X
S5000F UoF Serialized Product Variant Configuration	X	X				
S5000F UoF Shop Findings				X		O
S5000F UoF Warehouse and Spare Pool		X	X	X		O

3.9 UoFs for integrated fleet management use cases

The UoFs required for the different integrated fleet management use cases, as defined in Chap 11, are those listed in Table 10. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1 UC51101: Assignment Proposal Elaboration

2 UC51102: Fleet task cancellation

3 UC51103: Fleet task modification

4 UC51104: Fleet availability plan elaboration

5 UC51105: Fleet Task Evaluation

6 UC51106: Product preparation for fleet task

7 UC51107: Product Recovery after fleet task

Table 10 UoFs for integrated fleet management use cases

UoFName	UC51101	UC51102	UC51103	UC51104	UC51105	UC51106	UC51107
CDM UoF Document		O	O	O			O
S5000F UoF Availability				X	X		
S5000F UoF Comment	O	O	O	O	O	O	O
S5000F UoF Comment Item	O	O	O	O	O	O	O

UoFName	UC51101	UC51102	UC51103	UC51104	UC51105	UC51106	UC51107
S5000F UoF Document		O	O	X			O
S5000F UoF Fleet Definition	X		X	X	X		
S5000F UoF Fleet Monitoring	X				X		X
S5000F UoF Fleet Planning and Product Assignment	X	X	X	X	X	X	X
S5000F UoF Fleet Task Cancellation		X					
S5000F UoF Infrastructure	O			X			
S5000F UoF Infrastructure Availability	O		X	X			
S5000F UoF Location, Address and Locator	X						
S5000F UoF Logbook					X		
S5000F UoF NonAvailabilityCauseItem				X	X		
S5000F UoF Obsolescence Management Candidates							
S5000F UoF Operating Base	X		X	X	X	X	X
S5000F UoF Operational Environment			X	X		X	
S5000F UoF Operational Event							X
S5000F UoF Operational Period							O
S5000F UoF Operational Roles	X					X	X
S5000F UoF Policies and Regulations				X			
S5000F UoF Product Defined Operational Configuration	X						
S5000F UoF Project Specific Attribute Definition	O	O	O	O	O	O	O
S5000F UoF Remark	O	O	O	O	O	O	O
S5000F UoF Serialized Product Variant Configuration						X	X
S5000F UoF Service Contract Management	X				X		
S5000F UoF Service Request					O		

3.10 UoFs for software support cases

The UoFs required for the different software support use cases, as defined in Chap 12, are those listed in Table 12. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1 UC51201: Request S/W feature

2 UC51202: Report S/W error

3 UC51203: Report S/W usability

4 UC51204: Report S/W documentation errors

5 UC51205v: Report Software and hardware interoperability

6 UC51206: Report S/W installation/unloading/erasure

7 UC51207: Report S/W configuration

8 UC51208: Report S/W maturity

9 UC51209: Report help desk tickets

10 UC51210: Report S/W delivery, deployment and servicing

11 UC51211: Report Data loading for software operations

Table 11 UoFs for software support use cases

UoFName	UC51201	UC51203	UC51203	UC51204	UC51205	UC51206	UC51207	UC51208	UC51209	UC51210	UC51211
CDM UoF Digital File									O		
CDM UoF Document	O			O	O	O	O		O		
CDM UoF Hardware Element					X		X		X		
CDM UoF Part Definition					X		X				
CDM UoF Product Design Configuration							O				
CDM UoF Software Element	X	X	X		X		X	X	X	X	
S5000F UoF Change Request	X										
S5000F UoF Comment	O	O	O	O	O	O	O	O	X	O	O
S5000F UoF Comment Item	O	O	O	O	O	O	O	O	X	O	O
S5000F UoF Data Sets											X
S5000F UoF Digital File DigitalFileReferencedItem									O		
S5000F UoF Digital File DigitalFileReferencingItem									O		
S5000F UoF Document	O			O	O	O	O		O		
S5000F UoF Part As Realized					X						
S5000F UoF Project Specific Attribute Definition	O	O	O	O	O	O	O	O	O	O	O
S5000F UoF Remark	O	O	O	O	O	O	O	O	O	O	O
S5000F UoF Report		X	X	O		O		X		X	
S5000F UoF Report Context Item		X	X	O				X		X	
S5000F UoF Reportable Activity						X				X	

UoFName	UC51201	UC51203	UC51203	UC51204	UC51205	UC51206	UC51207	UC51208	UC51209	UC51210	UC51211
S5000F UoF Reportable Metric		X	X					X			
S5000F UoF Requirement	X										
S5000F UoF Shop Findings					O						
S5000F UoF Software	X	X	X		X	X	X	X		X	
S5000F UoF Supply Item										X	

3.11 UoFs for configuration management use cases

The UoFs required for the different configuration management use cases, as defined in Chap 13, are those listed in Table 12. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1 UC51301: Provide as-delivered configuration

2 UC51302: Provide as-allowed configuration

3 UC51303: Provide operational configuration

4 UC51304: Provide customer modification

5 UC51305: Provide as-desired configuration

Table 12 UoFs for configuration management use cases

UoFName	UC51301	UC51302	UC51303	UC51304	UC51305
CDM UoF Applicability Statement	X	X	X	X	X
CDM UoF Breakdown Structure	X	X			
CDM UoF Digital File	O				
CDM UoF Document	O				O
CDM UoF Hardware Element	X	X		O	
CDM UoF Part Definition	X	X		O	
CDM UoF Product Design Configuration	X	X			
CDM UoF Product Usage Context					
CDM UoF Software Element	X	X		O	
S5000F UoF Applicability Statement Items	X	X	X	X	X
S5000F UoF As-desired Configuration	X				X
S5000F UoF Change Embodiment				O	
S5000F UoF Change Embodiment Planning				O	

UoFName	UC51301	UC51302	UC51303	UC51304	UC51305
S5000F UoF Change Embodiment Reporting				O	
S5000F UoF Change Embodiment Strategy				O	
S5000F UoF Change Information	X			X	
S5000F UoF Change Request				X	
S5000F UoF Comment	O	O	O	O	O
S5000F UoF Comment Item	O	O	O	O	O
S5000F UoF Digital File DigitalFileReferencedItem	O				
S5000F UoF Digital File DigitalFileReferencingItem	O				
S5000F UoF Document	O				O
S5000F UoF Logbook	X		X		
S5000F UoF Operational Roles			X		
S5000F UoF Part As Realized	X		X	X	
S5000F UoF Product Defined Operational Configuration			X		
S5000F UoF Project Specific Attribute Definition	O	O	O	O	O
S5000F UoF Remark	O	O	O	O	O
S5000F UoF Serialized Product Variant Configuration	X		X		

3.12 UoFs for management of in-service contracts use cases

The UoFs required for the different management of in-service contracts use cases, as defined in Chap 14, are those listed in Table 13. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1 UC51401: Provide contractual information

2 UC51402: Provide Work Breakdown Structure (WBS)

3 UC51403: Provide Cost Breakdown Structure (CBS)

4 UC51404: Provide Organisational Breakdown Structure (OBS)

5 UC51405: Provide/update activity planning

6 UC51406: Report Service Level Agreement (SLA) compliance

7 UC51407: Provide incurred contract costs

8 UC51408: Provide status report

9 UC51409: Provide information about locations and infrastructure

10 UC51410: Manage service request

11 UC51411: Request/grant/deny usage of resource

12 UC51412: Assign security classification

13 UC51413: Provide exchange export control information

14 UC51414: Provide labour rates

15 UC51415: Provide documentation traceability

Table 13 UoFs for in-service contract management use cases

UoFName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
CDM UoF Digital File														
CDM UoF Document	O	O	O	O	O		O	O				O	O	
CDM UoF Product Usage Context									O					
S5000F UoF Budget			O				O			O	O			
S5000F UoF Comment	O	O	O	O	O	O	O	O	O	O	O	O	O	O
S5000F UoF Comment Item	O	O	O	O	O	O	O	O	O	O	O	O	O	O
S5000F UoF Contract Breakdown	X		O			X	X	O			O			X
S5000F UoF Cost Breakdown	O		X				X				O			
S5000F UoF Cost Breakdown Context			X				X				O			
S5000F UoF Cost Entry			X				X				O			
S5000F UoF Document	O	O	O	O	O		O	O				O	O	
S5000F UoF Export Control License	O									O			X	
S5000F UoF Export Control Requirement	O									O			X	
S5000F UoF Expression Evaluation														
S5000F UoF Facility	O								X					
S5000F UoF Fleet Planning and Product Assignment					X									
S5000F UoF Infrastructure	O								X					
S5000F UoF Location, Address and Locator									X					
S5000F UoF Maintenance					X									

UoFName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
Facility Planning														
S5000F UoF Organizational Breakdown Structure	O			X	O									
S5000F UoF Part As Realized														
S5000F UoF Party	X	X		X				O			O			
S5000F UoF Person Competences and Labor Rates														X
S5000F UoF Policies and Regulations	X					O				X			X	
S5000F UoF Project and Contract	X	O		O			X			O				
S5000F UoF Project Specific Attribute Definition	O	O	O	O	O	O	O	O	O	O	O	O	O	O
S5000F UoF Remark	O	O	O	O	O	O	O	O	O	O	O	O	O	O
S5000F UoF Report					X	X		X						
S5000F UoF Report Context Item					X			X						
S5000F UoF Reportable Activity					X	O		X						
S5000F UoF Reportable Metric						X		X						
S5000F UoF Requirement										O				
S5000F UoF Resource Usage Request											X			
S5000F UoF Security Classification												X	O	
S5000F UoF Service Contract Management	X					X				O	O			
S5000F UoF Service Contract Penalty	X					X				O				
S5000F UoF Service Request	X									X				
S5000F UoF Type of Person														X
S5000F UoF Work Breakdown	O	X			X		O	O						

UoFName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
S5000F UoF Work Breakdown Context		X			X		O	O						

3.13 UoFs for non-predefined information use cases

The UoFs required for the different non-predefined information use cases, as defined in Chap 15, are those listed in Table 14. In order to avoid having to cross-check the use case numbers, a summary of each use case is provided below:

1 UC51501: Provide project-specific values

2 UC51502: Provide non-predefined information

Table 14 UoFs for non-predefined information use cases

UoFName	UC51501	UC51502
CDM UoF Digital File		X
CDM UoF Document	O	O
S5000F UoF Comment	O	O
S5000F UoF Comment Item	O	O
S5000F UoF Digital File DigitalFileReferencedItem		O
S5000F UoF Digital File DigitalFileReferencingItem	-	O
S5000F UoF Export Control License	-	O
S5000F UoF Export Control Requirement	-	O
S5000F UoF Project Specific Attribute Definition		X
S5000F UoF Remark	O	O
S5000F UoF Security Classification	O	O

3.14 Additional use cases

The following use cases were requested by the specification users after closure of the data model and are therefore not included in any chapter. They will be included in the next issue of S5000F:

1 UC50409: Provide equipment calibration certificate information

2 UC50410: Report support equipment usage

3 UC51415: Provide documentation traceability

Table 15 UoFs for additional use cases

UoFName	UC50409	UC50410	UC51415
CDM UoF Digital File			O
CDM UoF Document	O		X
CDM UoF Part Definition	X		
S5000F UoF Comment	O	O	O
S5000F UoF Comment Item	O	O	O
S5000F UoF Digital File DigitalFileReferencedItem			O
S5000F UoF Digital File DigitalFileReferencingItem			O
S5000F UoF Document	O		X
S5000F UoF Equipment Calibration Certificate Information	X	X	
S5000F UoF Export Control License			X
S5000F UoF Export Control Requirement			X
S5000F UoF Maintenance Activity		X	
S5000F UoF Party	O		O
S5000F UoF Project and Contract			O
S5000F UoF Project Specific Attribute Definition			
S5000F UoF Remark	O	O	O
S5000F UoF Security Classification			X
S5000F UoF Support Equipment	X	X	

Chapter 17

Data exchange

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References

Table 1 References

Chap No./Document No.	Title
Chap 16	Data Model
Chap 19	Tailoring and contracting against S5000F
Chap 20	Data required for the different use cases
S1000D	International specification for technical publications using a common source database
S3000L	International procedure specification for Logistic Support Analysis (LSA)
S3000X	Input specification for S3000L
SX000i	International guide for the use of the S-Series Integrated

	Product Support (IPS) specifications
SX002D	Common data model for the S-Series IPS Specifications
ISO 8000	Data Quality
ISO 10303-239 (AP239)	Product Life-Cycle Services (PLCS)

1 General

1.1 Introduction

The purpose for this chapter is to define a coherent set of guidelines for the implementation of the data exchange required for the operational and maintenance data feedback. The exchange of data for S5000F is defined using XML and XML Schemas.

The S5000F XML Schemas use the XML Schemas defined for SX002D to ensure the interoperability with the other S-Series IPS Specifications.

The S5000F XML Schemas are published separately on the S5000F website (http://www.s5000f.org).

1.2 Objective

The objective for this chapter is to describe how the S5000F SML schemas support the S5000F feedback and its interaction with other business processes.

1.3 Scope

The scope of the data exchange includes all mechanisms related to the operational and maintenance data feedback outlined in this specification, including:

- Overview of S5000F data exchange using S5000F XML Schemas
- Overview of the defined S5000F SML Schemas
- Relationship between the S5000F XML Schemas and ISO 10303-239
- Recommendations regarding an in-service data repository
- Recommendations regarding data quality

1.4 Out of scope

The data exchange does not cover potential the processing or cleansing of exchanged information.

1.5 Interoperability

This data exchange has considered for its development both the existing S5000F data model and the Common Data Model (CDM) that has been developed across all S-Series specifications, to ensure the interoperability of S5000F with the other S-Series specifications. Refer to SX002D.

This data exchange has also considered global policies as defined by the AIA/ASD Data Modelling and Exchange Working Group (DMEWG), to ensure the interoperability with the exchange of data with other S-Series specifications. Refer to SX000i.

2 Data exchange

Data exchange of S5000F data is performed by means of XML messages. The basic messages are defined in SX002D and replicated here in UoF Message. A message is a collection of information to be communicated from one party to another. Messages can provide new information (creation), modify existing information (update) or require deletion of existing information.

S5000F does not mandate the content of a specific message. It can be the information associated to a single class, or to multiple classes. Typically, information sets to be exchanged in one or multiple messages will include the information associated to one single use case. Information shared by multiple use cases should be sent as a separate message.

The messages to be sent, as well as their frequency and the business rules to which they should comply, must be defined during the guidance conference, as detailed in Chap 19.

It must be highlighted that the in-service feedback is not unidirectional (eg, from the operator to the OEM) but rather multi-directional, in the sense that different roles can be taken by Customer and Contractor in different contracts, and thus the data flows can change. The data formats remain the same, but the actors who provide and receive data can be different due to contractual arrangements. The responsibilities of who provides which information must be also defined as detailed in Chap 19.

Data exchanged should be logged, to provide traceability of the exchange. The data itself should be stored in an in-service data repository, as described in Para 6.

3 Feedback to other S-Series IPS specifications

S5000F does not provide a direct set of information for all other specifications. Though sharing the same common data model, some conversion could be required to feed the S5000F feedback data for the use of the individual specifications. Thus, data could be converted, filtered according to certain criteria or aggregated for their use. For example, failure data could require both filtering and aggregation to calculate the resulting in-service MTBF.

Such conversion/filtering/aggregation will be performed as defined in the corresponding input specification of the consumer specification. For example, S3000X will define how S5000F data will be used by S3000L for an in-service LSA.

Note that the individual specifications will receive only the information that is specific for them. Feedback that is common to several specifications will follow the process as defined in SX000i, typically through S3000L.

Fig 1 shows the example flow for both S3000L and S1000D.

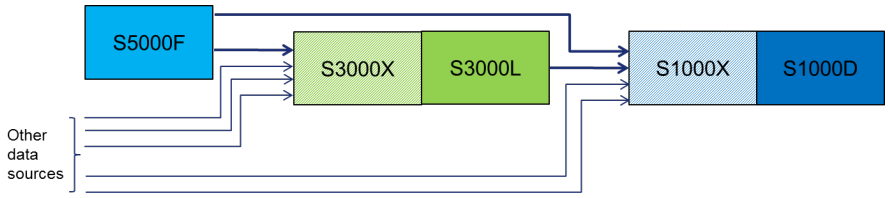

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Fig 1 Feedback to other S-Series IPS specifications

4 S5000F XML Schemas

The S5000F XML Schemas are derived from the S5000F data model defined in Chap 16. The method of mapping the S5000F data model to the S5000F XML Schemas is performed in accordance with the XML Schema Authoring Rules defined by the DMEWG, which is common to all S-Series IPS specifications.

An added feature for the exchange of in-service data feedback data using the XML Schemas of S5000F, is the option to only exchange updates. Update messages can be sent in between complete baseline messages and can accommodate both minor and major changes to the in-service data.

This means that the receiver of in-service data does not need to analyze what actions need to be taken to update the target data set (eg, in-service database).

The XML Schema used for complete baseline messages enforce all the rules defined in the S5000F data model in order to guarantee consistency in the exchanged data set.

The XML schemas of S5000F, support all the UoFs defined in Chap 16 and all Use Cases defined throughout the whole specification.

5 Product Life Cycle Support (PLCS)

The S5000F XML Schemas will provide mappings to ISO 10303-239 PLCS (Product Life Cycle Support) edition 3, in order to support continued use of ISO 10303-239 PLCS and enable mapping of the feedback data to design information through the internal Product Life-cycle Management (PLM) systems. These mappings will be an integral part of the respective S5000F XML schemas.

Thus, organizations wishing to use PLCS instead of the defined XML schemas, will be able to implement S5000F using ISO 10303-239 edition 3.

The rationale for introducing the S5000F XML Schemas as the basis for supporting S5000F data exchanges is to allow for organizations that do not have the required PLCS skills (eg, small and medium enterprises) to still support the S5000F specified data exchanges.

In awaiting ISO 10303-239 PLCS edition 3 and its associated data exchange development environment, all future S-Series IPS specifications will follow the same XML Schema approach as described for S5000F. Fig. 2 illustrates how the S-Series IPS specification XML Schemas should be viewed in general in respect of ISO 10303-239 PLCS and OASIS PLCS PSM. Note that the mapping to OASIS PSM is not envisaged but can be handled by other organizations.

The S-Series IPS Specifications XML Schemas are targeted to support data exchange at the Business Object Model (BOM) layer. However, each XML Schema will also include the mapping details required for an unambiguous mapping of each element and attribute to PLCS in order to enable PLCS-based data exchanges and/or PLCS-based data consolidation, as well as the future integration with other ISO 10303 (STEP) based data (eg, AP233, AP242).

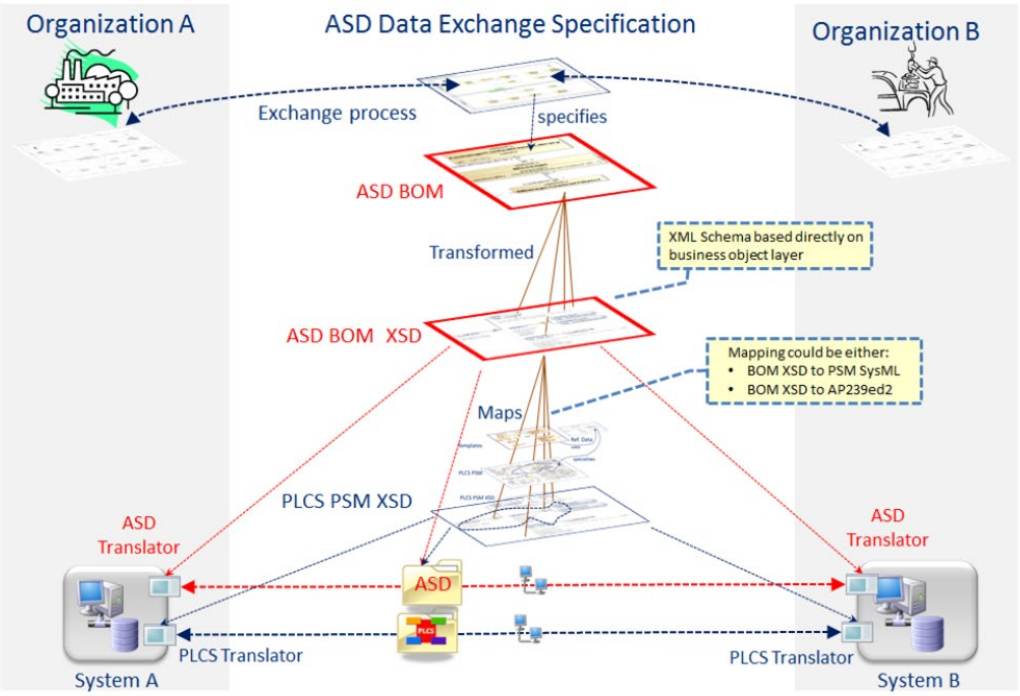

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Fig 2 ASD XML Schema to PLCS implementation mapping

This approach has been approved by the AIA/ASD IPS Specification Council for all S-Series IPS specifications.

6 In-service information database

It is recommended that all the information provided as part of the operational and maintenance feedback is stored in a common repository. The data model of this specification has been designed so that all data can be integrated into a single database, including project-specific information.

It is also recommended that the in-service feedback data is maintained separately from other logistic databases. The reasons for this include, but are not limited to:

1 The data received are likely to be received from multiple actors (eg, multiple OEMs or multiple customers/operators) and could require harmonization.

2 The data received will have different levels of quality and could require filtering and/or validation before it is useable.

3 The mapping of the received data always being mapped directly to other IPS databases (eg, the S3000L database) cannot be guaranteed, either because such databases do not exist at the other actor or because the actor at the other side of the exchange does not maintain the cross-referencing between the different logistic elements.

4 Each actor could have a different IT infrastructure and different applications. It is therefore advisable to have a common reference data set for all applications using in-service feedback data.

5 Having the same in-service database at both sides of the communication channel allows for proper synchronization of data, better data integration and improved data quality, easy clarification of doubts, and the dissociation of individual actor's IT systems and the way that the information is internally distributed in an organization from the actual exchange.

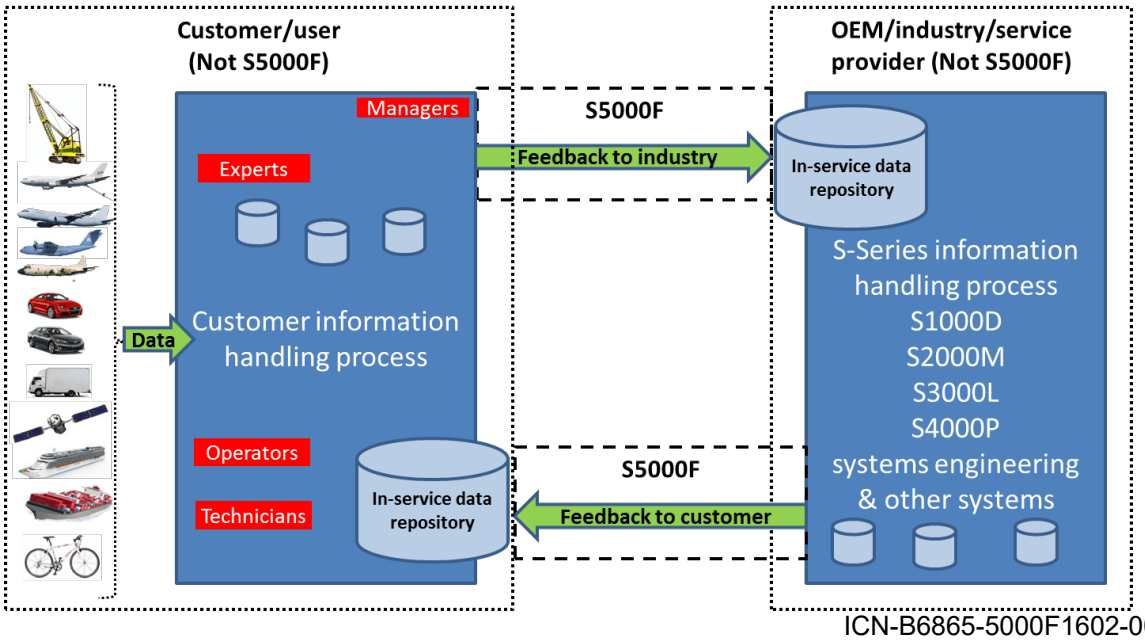

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Fig 3 Outline of data exchange and in-service databases

It is recommended that the data exchange is performed to/from the in-service repositories, to ensure consistency of the information. These in-service repositories would integrate the

information from different IT systems and would distribute the information to other internal IT systems, ensuring the consistency of the information sent and received.

This does NOT imply that the repositories on both sides of the exchange should contain the same information, nor even have the same database structure. Indeed, the information contained at both sides of the exchange will be different, as the operator/customer will store the in-service information for different Products and the OEM/industry will store the information for different customers. The importance of these in-service repositories is to have a single version of the truth at each side, rather than trying to reconcile multiple systems across multiple organizations. While it is possible to have a specific in-service repository that is the same at both sides of the exchange, this would imply higher costs and increase systems integration complexity, as repositories would be created for each different program and/or customer.

An important benefit of a single in-service database at the customer/user side is that all operational and maintenance data associated with the Product fleet is stored in one single repository, therefore allowing to control the performance across multiple Products from different vendors and assessing improvement measures.

On the OEM/industry side the benefit of a single in-service database is to have the data from multiple customers in one single repository, therefore having a statistically significant corpus of information for statistical analysis (eg, reliability purposes) even if the number of Products purchased by individual customers is not statistically significant. It also allows comparing customer information, to identify potential issues at one particular customer if their data deviates from the general pattern.

An additional benefit to all users of an integrated in-service database is that it provides a coherent repository of information that is unlikely to be achieved by integrating a set on heterogeneous in-service tools (usually at a great expense).

However, the establishment/usage of an integrated in-service information database does not imply the usage of a single tool for the in-service activities, neither at customer/user nor OEM/industry level. The integrated in-service information database is a consolidated repository of information, which can be created by the aggregation of information from different tools. Similarly, multiple tools can access this repository for the capture of in-service data, without the need to design ad-hoc interfaces with other related tools. The process of aggregating data into this integrated in-service information database exceeds the scope of this specification.

An in-service information repository can be created using the Data Model specified in Chap 16.

7 Data quality

In-service operational and maintenance data feedback is often dirty and usually cannot be used as is without some processing. While the implementation of this specification provides the means to transfer the data in a standard way, it does not provide the means to clean the data.

This dirtiness (or inadequacy of the data) is often due to four reasons:

– The data is incomplete: It lacks attribute values, lacks certain attributes of interest or contains only aggregated data. (eg, Missing country name). Incomplete data is usually due to:

  - Data values were not available when collected
  - Different criteria were used between the time when data was collected and when it was analyzed
  - Legacy systems did not include the necessary information, or collected it in a way that could not be properly transformed to be fed back in accordance with this specification
  - Human/Hardware/Software problems

– The data is noisy: The information contains errors or outliers (eg, spelling, phonetic and typing errors, word transpositions, multiple values in a single free-form field). Noisy data usually is due to the following factors:

  - Data collection by faulty instruments
  - Data entry: human or computer errors
  - Data transmission problems

  Examples:

  Age=-10

  Name="Jones", LastName="Mike"

  ManufacturingDate="31/12/9999"

– The data is inconsistent: The information contains discrepancies in codes and/or names (eg, synonyms and nicknames, prefix and suffix variations, abbreviations, truncation, and initials). Inconsistent and redundant data is usually due to:

  - Different data sources, so non-uniform naming conventions/data codes
  - Different data models across legacy applications
  - Functional dependency and/or referential integrity violation in source systems
  - Inadequate data conversion to the S5000F format

  Examples:

  Age = "42", Birthday="03/12/2012"

  Part number 203 Name="CAMU HW" and "CAMU H/W"

  Was rating "1,2,3", now rating is "A,B,C"

– The data is out of context: Some information can be meaningless and/or be misinterpreted if it is not supplied within a specific context. Out of context data is usually due to an incomplete definition of the required data.

  Examples:

  Date and time without a time zone reference can be misinterpreted.

  Product data without customer or contract reference cannot be processed.

The greatest impact of data quality is found in the collection and preparation of the raw data. Data quality controls should be established to ensure that the data that is collected and prepared for exchange is both complete and accurate. The later quality controls are introduced in the process, the higher the impact of the lack of data quality will be.

It is emphasized that implementing S5000F does not guarantee the adequacy or quality of the data, only that it is provided in a specific format and within specific ranges. Thus, the implementation of S5000F should be accompanied by business rules that provide the means to validate the received data. Refer to Chap 19.

For example, a business rule to ensure that the date of a maintenance task cannot take place before the Product delivery or Product manufacturing date. These business rules can be used not only for validation of received data, but also for checking data quality during the collection of the data, or at least before it is provided as feedback.

The application of a data quality process standard such as the ISO 8000 is also recommended so that the quality of both the prepared and the exchanged data is enhanced.

The cleansing of received data is usually performed as part of a process called staging, where received data is validated in accordance with business rules, supplemented with additional information if required, and then stored in the in-service database, where it is also cross-referenced to other IPS elements. The description of how this cleansing and cross-referencing should be performed is outside of the scope of S5000F. However, it is recommended that a record is kept of what the cleansing entailed, for full traceability of potential data transformations.

Similarly, the specific purpose for which the data is being exchanged must be taken into consideration. The incompleteness of the data, or the fact that it is out of context, can prevent the purpose of the exchange being fulfilled. Chap 20 provides a mapping of the use cases of S5000F to the classes that these use cases require. It is recommended that this mapping is used so that data being exchanged is always complete and within context, so that it will comply with a specific business scenario.

Notwithstanding these data quality checks, which are usually carried out at the data receiving party, it is emphasized that the responsibility for providing quality data always lies on the party providing such data, and that these checks should also be performed before the data is exchanged. It is recommended that a data quality group is established by both parties, so that data quality issues can be properly reported, and appropriate measures are taken by the party generating the data to correct any data quality issues.

Chapter 18

Data element list

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List of tables

References

Table 1 References

Chap No./Document No.	Title
SX001G	Glossary for the S-Series ILS specifications
SX002D	Common data model for the S-Series ILS specifications

1 General

This chapter defines all the classes, data elements (attributes) and valid values that are used in the S5000F data model, refer to Chap 16.

2 Classes

The full list of S5000F classes is provided in Table 2. This includes classes from SX002D used by S5000F but defined originally in SX001G. If the UoF is “S5000F Specializations”, then this class extends or restricts the class defined originally in SX002D.

Table 2 is organized alphabetically by the class name, and contains:

- Class name
- Class type and Stereotype (refer to Chap 16 on more details on class types and Stereotypes used in S5000F)
- Class definition contains a textual definition.

- Unit of Functionality (UoF), identifies the section in Chap 16 where the Class is defined. If the UoF name is preceded by “CDM”, then the UoF is originally defined in SX002D.
- For completeness, the classes of the UoFs used “as is” from SX002D are also listed in this specification, The UoFs from SX002D used by this specification are listed in Chap 16.3.
- A mapping of the classes and attributes required for the individual use cases can be found in Chap 20.

Table 2 List of classes

Class name	Type	Stereotype	Definition	UoF
CommentAction	Class	relationship	CommentAction is a <<relationship>> that allows to associate a Comment to one or several Actions performed in response to the Comment.	S5000F UoF Comment
CommentItem	Interface	extend	CommentItem is an <<extend>> interface allowing to establish an association between an item and the comments that are associated to it.	S5000F UoF Comment
CommentParty	Class	relationship	CommentParty is a <<relationship>> defining the association between a Comment and a Party.	S5000F UoF Comment
CommentRelationship	Class	relationship	CommentRelationship is a <<relationship>> that defines the association between two different Comments.	S5000F UoF Comment
CommunicationsNetwork	Class	class	CommunicationsNetwork is an Infrastructure that represents a number of machines, computers and communication lines that allow the communication between different parties or machines.	S5000F UoF Infrastructure
CommunicationsNetwork	Class	class	CommunicationsNetwork is an Infrastructure that represents a number of machines, computers and communication lines that allow the communication between different parties or machines.	S5000F UoF Infrastructure
CompetenceDefinitionItem	Interface	select	CompetenceDefinitionItem is a <<select>> interface that identifies items which define a competence.	CDM UoF Competence Definition
CompliesWith	Class	relationship	CompliesWith is a <<relationship>> that allows to associate an item with the PoliciesAndRegulations with which it complies.	S5000F UoF Policies and Regulations
ComputerNetwork	Class	class	ComputerNetwork is an Infrastructure that represents a number of interconnected computers, irrespectively of their location.	S5000F UoF Infrastructure

Class name	Type	Stereotype	Definition	UoF
ComputerNetwork	Class	class	ComputerNetwork is an Infrastructure that represents a number of interconnected computers, irrespectively of their location.	S5000F UoF Infrastructure
ConditionDefinitionItem	Interface	select	ConditionDefinitionItem is a <<select>> interface that identifies classes from which an instance can be used as the EvaluationByAssertionOfCondition assert condition.	S5000F UoF Applicability Statement
ConditionInstance	Class	class	ConditionInstance is a <<class>> that defines an individual concept or object having the characteristics of a generic ConditionType.	S5000F UoF Applicability Statement
ConditionType	Class	class	ConditionType is a <<class>> that defines a concept or an object that needs to be included in applicability statements where the concept or object is not already represented in the data model.	S5000F UoF Applicability Statement
ConditionType	Class	class	ConditionType is a <<class>> that defines a concept or an object that needs to be included in applicability statements where the concept or object is not already represented in the data model.	S5000F UoF Applicability Statement
ConditionTypeAssertMember	Class	class	ConditionTypeAssertMember is <<class>> that defines a member for a given ConditionType which can be mapped to a Boolean expression and be evaluated to be either TRUE or FALSE.	S5000F UoF Applicability Statement
Consequence	Class	class	Consequence is a class providing information about the consequences of an Event.	S5000F UoF Event
ConsumableItem	Class	class	ConsumableItem is a supply item that is consumed and cannot be reused.	S5000F UoF Supply Item
ConsumableItem	Class	class	ConsumableItem is a supply item that is consumed and cannot be reused.	S5000F UoF Supply Item
Consumption	Class	relationship	Consumption is a <<relationship>> that defines the Product(s) that have been consumed by a SerializedProductVariant as part of an operational period, movement or movement leg.	S5000F UoF Fleet Monitoring

Class name	Type	Stereotype	Definition	UoF
ContainedSubstance	Class	relationship	ContainedSubstance is a <<relationship>> that associates a HardwarePartAsDesigned with a contained SubstanceDefinition.	CDM UoF Part Definition
Contract	Class	class	Contract is a <<class» that represents a binding agreement between two or more parties	S5000F Specializations
Contract	Class	class	Contract is a <<class» that represents a binding agreement between two or more parties	S5000F Specializations
ContractClause	Class	class	ContractClause is a specific provision included in a Contract.	S5000F UoF Contract Breakdown
ContractClauseRelationship	Class	class	ContractClauseRelationship is a <<relationship>> that allows to associate different ContractClauses.	S5000F UoF Contract Breakdown
ContractItem	Interface	select	ContractItem is a <<select>> interface that identifies items which can be selected for the Contract.	CDM UoF Product and Project
ContractItemDetails	Class	relationship	ContractItemDetails is a <<relationship>> that identifies an item which is the subject of the Contract.	CDM UoF Product and Project
ContractParty	Class	relationship	ContractParty is a <<relationship>> that identifies a Contract stakeholder.	CDM UoF Product and Project
ContractRelationship	Class	relationship	ContractRelationship is a <<relationship>> where one Contract relates to another Contract.	CDM UoF Product and Project
CostBreakdown	Class	class	CostBreakdown is a class used to group all the different cost concepts associated to a particular purpose.	S5000F UoF Cost Breakdown
CostBreakdownContext	Interface	extend	CostBreakdownContext is an <<extend>> interface that allows to assign a CostBreakdown to an item.	S5000F UoF Cost Breakdown
CostBreakdownRelationship	Class	relationship	CostBreakdownRelationship is a <<relationship>> that allows to define associations between two different CostBreakdowns.	S5000F UoF Cost Breakdown

Class name	Type	Stereotype	Definition	UoF
CostBreakdownRevision	Class	class	CostBreakdownRevision is an iteration that is applied to a CostItem.	S5000F UoF Cost Breakdown
CostEntry	Class	class	A CostEntry is an individual expense made at a specific date for a specific amount that needs to be recorded for accounting purposes.	S5000F UoF Cost Breakdown
CostEntryItem	Interface	select	A CostEntryItem is an <<select>> interface that associates a CostEntry to the item whose cost has to be incurred.	S5000F UoF Cost Breakdown
CostItem	Class	class	A CostItem is a generic concept to group individual expenses for accounting or program management purposes.	S5000F UoF Cost Breakdown
CostItem	Class	class	A CostItem is a generic concept to group individual expenses for accounting or program management purposes.	S5000F UoF Cost Breakdown
CostItemRelationship	Class	relationship	CostItemRelationship is a <<relationship>> that establishes the association between two different CostItems.	S5000F UoF Cost Breakdown
Country	Class	class	Country is a GeographicalArea occupied by a nation with its own government.	S5000F UoF Location, Address and Locator
Country	Class	class	Country is a GeographicalArea occupied by a nation with its own government.	S5000F UoF Location, Address and Locator
Cuboid	Class	compoundAttribute	Cuboid represents a three-dimensional object where all its faces are rectangles and all angles are right angles.	S-Series Compound Attributes
Cylinder	Class	compoundAttribute	Cylinder represents a three-dimensional object with straight parallel sides and a circular section.	S-Series Compound Attributes
Damage	Class	class	Damage is a harm to an item resulting in loss of value or the impairment of usefulness.	S5000F UoF Damage
DamageCharacteristic	Class	class	DamageCharacteristic is a <<class>> that allows to document the characteristics of a Damage.	S5000F UoF Damage

Class name	Type	Stereotype	Definition	UoF
DamagedItem	Interface	select	DamagedItem is a <<select>> interface that allows to associate a Damage to the item where the Damage has occurred.	S5000F UoF Damage
DataSetAsDesigned	Class	class	DataSetAsDesigned is a class representing a data structure.	S5000F UoF Data Sets
DataSetAsDesigned	Class	class	DataSetAsDesigned is a class representing a data structure.	S5000F UoF Data Sets
DataSetAsReleased	Class	class	DataSetAsReleased is a class representing a set of actual data that are structured as a DataSetAsDesigned.	S5000F UoF Data Sets
DataSetAssociatedWith	Class	relationship	DataSetAssociatedWith is a <<relationship>> that allows to associate a DataSetAsDesigned to a PartAsDesigned	S5000F UoF Data Sets
DatedClassification	Class	compoundAttribute	DatedClassification is a <<compoundAttribute>> that represents a classification in conjunction with its recording date.	S-Series Compound Attributes
DatedClassification	Class	compoundAttribute	DatedClassification is a <<compoundAttribute>> that represents a classification in conjunction with its recording date.	S-Series Compound Attributes
DatedClassification	Class	compoundAttribute	DatedClassification is a <<compoundAttribute>> that represents a classification in conjunction with its recording date.	S-Series Compound Attributes
DateRange	Class	compoundAttribute	DateRange is a <<compoundAttribute>> that identifies an interval of dates.	S-Series Compound Attributes
DateRange	Class	compoundAttribute	DateRange is a <<compoundAttribute>> that identifies an interval of dates.	S-Series Compound Attributes
DateRange	Class	compoundAttribute	DateRange is a <<compoundAttribute>> that identifies an interval of dates.	S-Series Compound Attributes
DateTimeRange	Class	compoundAttribute	DateTimeRange is a <<compoundAttribute>> that identifies an interval of date and times.	S-Series Compound Attributes
DateTimeRange	Class	compoundAtt	DateTimeRange is a <<compoundAttribute>> that identifies an	S-Series Compound Attributes

Class name	Type	Stereotype	Definition	UoF
		ribute	interval of date and times.	
DateTimeRange	Class	compoundAttribute	DateTimeRange is a <<compoundAttribute>> that identifies an interval of date and times.	S-Series Compound Attributes
DetectionMean	Interface	extend	DetectionMean is an <<extend>> interface that allows to associate DetectionMeanCapabilities to the elements that allowed for detection of a failure.	S5000F UoF Failure Detection and Location
DetectionMeanCapability	Class	class	DetectionMeanCapability is a class that identifies the capability to detect a failure.	S5000F UoF Failure Detection and Location
DetectionMechanism	Class	class	DetectionMechanism is a class that allows to define the mechanism by means of which a failure is detected.	S5000F UoF Failure Detection and Location
Detector	Interface	select	Detector is a <<select>> interface representing the elements that can detect or have detected an anomalous behaviour (fault) in a SerializedHardwarePart.	S5000F UoF Failure Detection and Location
DigitalFile	Class	class	DigitalFile is a <<class>> that provides the identification of data stored on an electronic device that can be interpreted by a computer.	CDM UoF Digital File
DigitalFile	Class	class	DigitalFile is a <<class>> that provides the identification of data stored on an electronic device that can be interpreted by a computer.	CDM UoF Digital File
DigitalFileReference	Class	relationship	DigitalFileReference is a <<relationship>> that allows a DigitalFile to reference an item.	CDM UoF Digital File
DigitalFileReferencedItem	Interface	select	DigitalFileReferencingItem is a <<select>> interface that identifies an item which in some way is associated with the content of DigitalFile.	CDM UoF Digital File
DigitalFileReferencingItem	Interface	extend	DigitalFileReferencingItem is an <<extend>> interface that provides	CDM UoF Digital File

Class name	Type	Stereotype	Definition	UoF
			its associated data model to those classes that implement it.	
Dimensions	Class	compoundAttribute	Dimensions is a <<compoundAttribute>> that represents a set of values that define the measurable extent of a particular kind for a specific item.	S5000F Compound Attributes
Document	Class	class	Document is a <<class>> that represents a compiled set of information that serves a purpose.	S5000F Specializations
Document	Class	class	Document is a <<class>> that represents a compiled set of information that serves a purpose.	S5000F Specializations
DocumentCharacteristicItem	Interface	extend	DocumentCharacteristicItem is an <<extend>> interface that provides the capability to associate additional relationships to Documents and DocumentIssues..	S5000F UoF Document
DocumentIssue	Class	class	DocumentIssue is a <<class>> that represents a specific release of a Document	S5000F Specializations
DocumentIssue	Class	class	DocumentIssue is a <<class>> that represents a specific release of a Document	S5000F Specializations
DocumentItem	Interface	select	DocumentItem is a <<select>> interface that identifies items which can be selected as Document.	CDM UoF Document
DocumentItem	Interface	select	DocumentItem is a <<select>> interface that identifies items which can be selected as Document.	CDM UoF Document
Accelerometer	Class	class	Accelerometer is a SensorType that measures acceleration.	S5000F UoF Serialized Product Health Monitoring
Accelerometer	Class	class	Accelerometer is a SensorType that measures acceleration.	S5000F UoF Serialized Product Health Monitoring
Action	Class	class	Action is a fact or process of doing something, typically to achieve	S5000F UoF Event

Class name	Type	Stereotype	Definition	UoF
			an aim.	
Action	Class	class	Action is a fact or process of doing something, typically to achieve an aim.	S5000F UoF Event
AggregatedElement	Class	class	AggregatedElement is a BreakdownElement that is a container for a collection of BreakdownElements which are grouped for an identified purpose.	CDM UoF Aggregated Element
AggregatedElement	Class	class	AggregatedElement is a BreakdownElement that is a container for a collection of BreakdownElements which are grouped for an identified purpose.	CDM UoF Aggregated Element
AggregatedElementRevision	Class	class	AggregatedElementRevision is a BreakdownElementRevision representing an iteration applied to an AggregatedElement.	CDM UoF Aggregated Element
AllocatedTaskLocation	Class	class	AllocatedTaskLocation is a <<class>> that identifies where a Task is to be performed in the context of a given support solution.	CDM UoF Task Usage
AllowedProductConfiguration	Interface	extend	AllowedProductConfiguration is an <<extend>> interface that provides its associated data model to those classes that must define permitted combinations of hardware and software parts which can or must be installed in specific locations (positions).	CDM UoF Product Design Configuration
AllowedProductConfigurationByConfigurationIdentifier	Class	class	AllowedProductConfigurationByConfigurationIdentifier is a <<class>> that defines an AllowedProductConfiguration by means other than a part number.	CDM UoF Product Design Configuration
AllowedProductConfigurationByConfigurationIdentifier	Class	class	AllowedProductConfigurationByConfigurationIdentifier is a <<class>> that defines an AllowedProductConfiguration by means other than a part number.	CDM UoF Product Design Configuration
AllowedProductConfigurationHardwarePartAsDesigned	Class	class	AllowedProductConfigurationHardwarePartAsDesigned is a HardwarePartAsDesigned that is managed as an AllowedProductConfiguration.	CDM UoF Product Design Configuration

Class name	Type	Stereotype	Definition	UoF
AllowedProductConfigurationHardwarePartAsDesigned	Class	class	AllowedProductConfigurationHardwarePartAsDesigned is a HardwarePartAsDesigned that is managed as an AllowedProductConfiguration.	CDM UoF Product Design Configuration
AllowedProductConfigurationItem	Interface	select	AllowedProductConfigurationItem is a <<select>> interface that identifies items which can be selected as an allowed Product configuration.	CDM UoF Product Design Configuration
AllowedProductConfigurationPhysicalData	Class	attributeGroup	AllowedProductConfigurationPhysicalData is an <<attributeGroup>> that provides physical characteristics associated to an AllowedProductConfiguration.	S5000F UoF Operational Roles
AllowedProductConfigurationRole	Class	relationship	AllowedProductConfigurationRole is a <<relationship>> that defines what OperationalRoles can be performed by a specific AllowedProductConfiguration.	S5000F UoF Operational Roles
AllowedProductOperationalConfigurationItem	Interface	select	AllowedProductOperationalConfigurationItem is an <<interface>> that allows to define the items that can be included in the AllowedProductOperationalConfiguration.	S5000F UoF Product Defined Operational Configuration
AllowedRoleChange	Class	relationship	AllowedRoleChange is a <<relationship>> that defines the role changes that are possible to allow a Product in one specific role to be configured for a different role.	S5000F UoF Operational Roles
AlternatePartAsDesigned	Class	relationship	AlternatePartAsDesigned is a <<relationship>> that defines an alternate PartAsDesigned which can replace the base PartAsDesigned in all its usages ie, it is context independent, and is fit, form and function equivalent.	CDM UoF Part Definition
AnchoringPoint	Class	class	AnchoringPoint is a <<class>> representing a point where an item can be moored or tied down.	S5000F UoF Transport Anchoring Point
ApplicabilityStatement	Class	class	ApplicabilityStatement is a <<class>> that defines the situation or situations under which related items are valid.	S5000F UoF Applicability Statement

Class name	Type	Stereotype	Definition	UoF
ApplicabilityStatement	Class	class	ApplicabilityStatement is a <<class>> that defines the situation or situations under which related items are valid.	S5000F UoF Applicability Statement
ApplicabilityStatementItem	Interface	extend	ApplicabilityStatementItem is an <<extend>> interface that provides its associated data model to those classes which can have restricted validity as defined by an associated ApplicabilityStatement.	S5000F UoF Applicability Statement
Area	Class	compoundAttribute	Area is a <<class>> that represents the extent or measurement of a surface.	S5000F Compound Attributes
Area	Class	compoundAttribute	Area is a <<class>> that represents the extent or measurement of a surface.	S5000F Compound Attributes
Area	Class	compoundAttribute	Area is a <<class>> that represents the extent or measurement of a surface.	S5000F Compound Attributes
AuthorityRequirement	Class	class	AuthorityRequirement is a Requirement that has been issued by a technical or legal authority.	S5000F UoF Requirement
AuthorityRequirement	Class	class	AuthorityRequirement is a Requirement that has been issued by a technical or legal authority.	S5000F UoF Requirement
AuthorityToOperate	Class	class	AuthorityToOperate is a <<class>> that represents a certification allowing a specific configuration of a Product to be put into operation.	CDM UoF Product Design Configuration
AuthorizedLife	Class	compoundAttribute	AuthorizedLife is a <<compoundAttribute>> that identifies the maximum usage limit and upon reaching this limit any further usage of the item must be re-authorized.	S-Series Compound Attributes
AuthorizedLife	Class	compoundAttribute	AuthorizedLife is a <<compoundAttribute>> that identifies the maximum usage limit and upon reaching this limit any further usage of the item must be re-authorized.	S-Series Compound Attributes

Class name	Type	Stereotype	Definition	UoF
AuthorizedLife	Class	compoundAttribute	AuthorizedLife is a <<compoundAttribute>> that identifies the maximum usage limit and upon reaching this limit any further usage of the item must be re-authorized.	S-Series Compound Attributes
Availability	Class	class	Availability is an indication of the global availability status of an AvailabilityItem at a specific day.	S5000F UoF Availability
AvailabilityItem	Interface	extend	AvailabilityItem is an <<extend>> interface that allows to associate an Availability to an item.	S5000F UoF Availability
BaseObject	Class	metaclass	BaseObject is a <<class>> that represents the most elementary behaviour that is common to all S-Series classes.	S_Series_Base_Object_Definition_2-0_001-00
BaseObject	Class	metaclass	BaseObject is a <<class>> that represents the most elementary behaviour that is common to all S-Series classes.	S_Series_Base_Object_Definition_2-0_001-00
BatchHardwarePart	Class	class	BatchHardwarePart is a <<class>> that represents actual physical parts which can be identified by their batch membership.	S5000F Specializations
BatchHardwarePart	Class	class	BatchHardwarePart is a <<class>> that represents actual physical parts which can be identified by their batch membership.	S5000F Specializations
Breakdown	Class	class	Breakdown is a <<class>> that identifies a specific partitioning of a Product to form a parent-child structure of related instances of BreakdownElement.	CDM UoF Breakdown Structure
BreakdownElement	Class	class	BreakdownElement is a <<class>> defining a partition of a Product that is used in one or many instances of Breakdown.	CDM UoF Breakdown Structure
BreakdownElementInZone	Class	relationship	BreakdownElementInZone is a <<relationship>> where a BreakdownElementInZoneItem relates to the ZoneElement where it is located.	CDM UoF Zone Element

Class name	Type	Stereotype	Definition	UoF
BreakdownElementInZoneItem	Interface	extend	BreakdownElementInZoneItem is an <<extend>> interface that provides its associated data model to those classes that implement it.	CDM UoF Zone Element
BreakdownElementRevision	Class	class	BreakdownElementRevision is a <<class>> representing an iteration applied to a BreakdownElement.	CDM UoF Breakdown Structure
BreakdownElementRevisionRelationship	Class	relationship	BreakdownElementRevisionRelationship is a <<relationship>> where one BreakdownElementRevision relates to another BreakdownElement or BreakdownElementRevision.	CDM UoF Breakdown Structure
BreakdownElementRevisionRelationshipItem	Interface	select	BreakdownElementRevisionRelationshipItem is a <<select>> interface that provides the capability to be associated with a BreakdownElementRevision.	CDM UoF Breakdown Structure
BreakdownElementStructure	Class	relationship	BreakdownElementStructure is a <<relationship>> that establishes a hierarchical structure between two usages of BreakdownElement that belong to the same BreakdownRevision.	CDM UoF Breakdown Structure
BreakdownElementUsageInBreakdown	Class	class	BreakdownElementUsageInBreakdown is a <<class>> that represents a member of a BreakdownRevision.	CDM UoF Breakdown Structure
BreakdownElementUsageRelationship	Class	relationship	BreakdownElementUsageRelationship is a <<relationship>> where one usage of a BreakdownElement relates to the usage of another BreakdownElement.	CDM UoF Breakdown Structure
BreakdownItem	Interface	extend	BreakdownItem is an <<extend>> interface that provides its associated data model to those classes that implement it.	CDM UoF Breakdown Structure
BreakdownRevision	Class	class	BreakdownRevision is a <<class>> representing an iteration applied to a Breakdown.	CDM UoF Breakdown Structure
Budget	Class	class	Budget is a class representing a cost proposal to perform a specific	S5000F UoF Budget

Class name	Type	Stereotype	Definition	UoF
			service or provide a certain item.	
BudgetingItem	Interface	extend	BudgetingItem is an <<extend>> interface that allows to associate Budgets to specific items.	S5000F UoF Budget
Calibration	Class	class	Calibration is an <<attributeGroup> that provides historical data about calibration.	S5000F UoF Equipment Calibration Certificate Information
CalibrationDocument	Class	relationship	CalibrationDocument is a <<relationship>> that associates a Calibration to a Document.	S5000F UoF Equipment Calibration Certificate Information
CalibrationMeasurement	Class	attributeGroup	CalibrationMeasurement is a <<attributeGroup>> that provides the individual measurements performed to carry out an individual Calibration.	S5000F UoF Equipment Calibration Certificate Information
Capability	Class	class	Capability is a class that defines an ability or potential for an indicated use or deployment.	S5000F UoF Capability
Capability	Class	class	Capability is a class that defines an ability or potential for an indicated use or deployment.	S5000F UoF Capability
CapabilityItem	Interface	extend	CapabilityItem is an <<extend>> interface that allows to assign a Capabilities to an item.	S5000F UoF Capability
CapabilityLimitation	Class	class	CapabilityLimitation is a <<class>> that defines a limitation on the use of a specific Capability.	S5000F UoF Capability
CargoItem	Class	class	CargoItem is a class representing one or several items that need to be transported as part of a FleetTask.	S5000F UoF Transportable Item
CargoItem	Class	class	CargoItem is a class representing one or several items that need to be transported as part of a FleetTask.	S5000F UoF Transportable Item
ChangeAuthorization	Class	class	ChangeAuthorization is a <<class>> that is the record of the permission to modify product design, its procedures and/or	CDM UoF Change Information

Class name	Type	Stereotype	Definition	UoF
			associated product support data.	
ChangeAuthorization	Class	class	ChangeAuthorization is a <<class>> that is the record of the permission to modify product design, its procedures and/or associated product support data.	CDM UoF Change Information
ChangeControlledItem	Interface	extend	ChangeControlledItem is an <<extend>> interface that provides its associated data model to those classes that can be affected by a ChangeAuthorization.	CDM UoF Change Information
ChangedItemtAvailabilityRequirement	Class	relationship	ChangedItemAvailabilityRequirement is a <<relationship>> that defines the required availability of the SerializedProductVariant or ProductVariant fleet into which the item to be upgraded has to be embodied during the Product upgrade.	S5000F UoF Change Embodiment Strategy
ChangeEmbodimentRequirement	Class	class	ChangeEmbodimentRequirement is a Requirement to embody an authorized modification into one or several items.	S5000F UoF Requirement
ChangeNotification	Class	relationship	ChangeNotification is a <<relationship>> that identifies an item changed due to the associated ChangeAuthorization.	CDM UoF Change Information
ChangeRequest	Class	class	ChangeRequest is a <<class>> that represents a formal proposal for a modification to a configuration item upon a given baseline.	S5000F Specializations
ChangeRequest	Class	class	ChangeRequest is a <<class>> that represents a formal proposal for a modification to a configuration item upon a given baseline.	S5000F Specializations
ChangeRequestCause	Class	relationship	ChangeRequestCause is a <<relationship>> that allows to associate the underlying cause(s) for a ChangeRequest.	S5000F UoF Change Request
ChangeRequestItem	Interface	select	ChangeRequestItem is a <<select>> interface that allows to associate the item to be changed to a ChangeRequest.	S5000F UoF Change Request
ChangeRequestReasonItem	Interface	select	ChangeRequestReasonItem is a <<select>> interface that allows to associate the underlying cause for a ChangeRequest.	S5000F UoF Change Request

Class name	Type	Stereotype	Definition	UoF
Circle	Class	compoundAttribute	Circle is a <<class>> representing a geometrical round plane figure whose boundary (the circumference) consists of points equidistant from a fixed point (the center).	S5000F Compound Attributes
CircuitBreaker	Class	class	CircuitBreaker is a <<class>> that represents an individual circuit breaker identified in the context of a defined product.	CDM UoF Task
CircuitBreaker	Class	class	CircuitBreaker is a <<class>> that represents an individual circuit breaker identified in the context of a defined product.	CDM UoF Task
CircuitBreakerSetting	Class	class	CircuitBreakerSetting is a <<relationship>> that specifies an individual circuit breaker that must be in a specific state.	CDM UoF Task
CircuitBreakerSettings	Class	class	CircuitBreakerSettings is a <<class>> that identifies a set of circuit breakers that must be set in specific states.	CDM UoF Task
ClassInstanceAssertItem	Interface	select	ClassInstanceAssertItem is a <<select>> interface that identifies classes from which an instance can be used as the EvaluationByAssertionOfClassInstance assert item	S5000F UoF Applicability Statement
CloudInfrastructure	Class	class	CloudInfrastructure is an Infrastructure that represents a network of remote servers hosted on the Internet and used to store, manage, and process data in place of local servers or personal computers.	S5000F UoF Infrastructure
CloudInfrastructure	Class	class	CloudInfrastructure is an Infrastructure that represents a network of remote servers hosted on the Internet and used to store, manage, and process data in place of local servers or personal computers.	S5000F UoF Infrastructure
CodeProperty	Class	compoundAttribute	CodeProperty is a compoundAttribute representing an alphanumeric code with the classification of the assigning specification.	S5000F Compound Attributes
CodeProperty	Class	compoundAttribute	CodeProperty is a compoundAttribute representing an alphanumeric code with the classification of the assigning specification.	S5000F Compound Attributes

Class name	Type	Stereotype	Definition	UoF
CodeProperty	Class	compoundAttribute	CodeProperty is a compoundAttribute representing an alphanumeric code with the classification of the assigning specification.	S5000F Compound Attributes
Comment	Class	class	Comment is a textual statement about a related item that deals with an issue associated to that item that needs to be addressed.	S5000F UoF Comment
Comment	Class	class	Comment is a textual statement about a related item that deals with an issue associated to that item that needs to be addressed.	S5000F UoF Comment
DocumentParty	Class	relationship	DocumentParty is a <<relationship>> class that defines the association of a document with a specific Party.	S5000F UoF Document
DocumentReferencingItem	Interface	extend	DocumentReferencingItem is an <<extend>> interface that provides its associated data model to those classes that implement it.	CDM UoF Document
DocumentRelationship	Class	relationship	DocumentRelationship is a <<relationship>> that identifies how two different documents are associated with each other.	S5000F UoF Document
DownTimePeriod	Class	class	DownTimePeriod is a class representing a planned or actual downtime for a SerializedProductVariant.	S5000F UoF Change Embodiment Planning
EffectiveOnProductConfiguration	Class	relationship	EffectiveOnProductConfiguration is a <<relationship>> that identifies that a EffectiveOnProductConfigurationItem, included in the Breakdown for the overall Product, is effective in the associated AllowedProductConfiguration.	CDM UoF Product Design Configuration
EffectiveOnProductConfigurationItem	Interface	extend	EffectiveOnProductConfigurationItem is an <<extend>> interface that provides its associated data model to those classes that can be included in one or many instances of AllowedProductConfiguration.	CDM UoF Product Design Configuration
Environment	Class	class	Environment is a class that represents the environment in which the Product operation or maintenance takes place.	S5000F UoF Environment
Environment	Class	class	Environment is a class that represents the environment in which the Product operation or maintenance takes place.	S5000F UoF Environment

Class name	Type	Stereotype	Definition	UoF
EnvironmentRelationship	Class	relationship	EnvironmentRelationship is a <<relationship>> that allows associations between two different Environments to be defined.	S5000F UoF Environment
EnvironmentRevision	Class	class	EnvironmentRevision is a <<class>> representing an iteration applied to an Environment.	S5000F UoF Environment
EquipmentOperation	Class	relationship	EquipmentOperation is a <<relationship>> that defines which Party has operated a SerializedHardwarePart during a specific time period.	S5000F UoF Equipment
EquipmentOwner	Class	relationship	EquipmentOwner is a <<relationship>> defining who and to what extent is the equipment owner during a specific period of time.	S5000F UoF Equipment
EquipmentStatus	Class	attributeGroup	EquipmentStatus is an <<attributeGroup>> that represents the status of a SerializedHardwarePart during a specific period of time and the reason for such status.	S5000F UoF Equipment
EvaluationByAssertionOfClassInstance	Class	class	EvaluationByAssertionOfClassInstance is an EvaluationCriteria that identifies a class instance to be used as an assert item and be mapped to a Boolean expression which can be evaluated to be either TRUE or FALSE.	S5000F UoF Applicability Statement
EvaluationByAssertionOfCondition	Class	class	EvaluationByAssertionOfCondition is an EvaluationCriteria that identifies a combination of a defined condition and a defined value to be used as an assert item and be mapped to a Boolean expression which can be evaluated to be either TRUE or FALSE.	S5000F UoF Applicability Statement
EvaluationByAssertionOfSerializedItems	Class	class	EvaluationByAssertionOfSerializedItems is an EvaluationCriteria that identifies a class instance together with an associated serial number range to be used as an assert item and be mapped to a Boolean expression which can be evaluated to be either TRUE or	S5000F UoF Applicability Statement
EvaluationByNestedApplicabilityStatement	Class	class	EvaluationByNestedApplicabilityStatement is an EvaluationCriteria that enables an ApplicabilityStatement to be reused as part of this	S5000F UoF Applicability Statement

Class name	Type	Stereotype	Definition	UoF
			EvaluationCritieria.	
EvaluationByNestedExpression	Class	class	EvaluationByNestedExpression is an EvaluationCriteria that defines a Boolean expression between additional EvaluationCriteria that can be evaluated to either TRUE or FALSE.	S5000F UoF Expression Evaluation
EvaluationCriteria	Class	class	EvaluationCriteria is a <<classs>> that defines conditions that can be mapped to a Boolean expression which can be evaluated to be either TRUE or FALSE.	S5000F UoF Applicability Statement
Event	Class	class	Event is an important happening or occurrence at a specific point in time that requires to be documented or recorded.	S5000F UoF Event
Event	Class	class	Event is an important happening or occurrence at a specific point in time that requires to be documented or recorded.	S5000F UoF Event
EventAffectedBreakdownElement	Class	relationship	EventAffectedBreakdownElement is a <<relationship>> that allows to associate an Event to the BreakdownElements affected by it.	S5000F UoF Event
EventExplanation	Class	relationship	EventExplanation is a <<relationship>> that allows to associate an Event to the ExplanatoryFactors that explain it.	S5000F UoF Event
EventItem	Interface	select	EventItem is a <<select>> interface that allows to associate Events to items	S5000F UoF Event
EventRelationship	Class	relationship	EventRelationship is a <<relationship>> describing the association between two different events.	S5000F UoF Event
EventRelationshipItem	Class	relationship	EventRelationshipItem is a <<relationship>> that allows to associate an Event to an item.	S5000F UoF Event
EventReporter	Class	relationship	EventReporter is a <<relationship>> that permits to associate an event to the Party that has reported that Event.	S5000F UoF Event
ExplanatoryFactor	Class	class	ExplanatoryFactor is a class that provides information about the	S5000F UoF Event

Class name	Type	Stereotype	Definition	UoF
			factor that caused an Event.	
ExplanatoryFactor	Class	class	ExplanatoryFactor is a class that provides information about the factor that caused an Event.	S5000F UoF Event
ExportControlledItem	Interface	select	ExportControlledItem is a <<select>> interface that defines the items that can be subject to export control.	S5000F UoF Export Control License
ExportControlLicense	Class	class	ExportControlLicense is a <<class>> representing an authorization to one or more parties to export item(s) under the terms of an ExportControlRegulation.	S5000F UoF Export Control License
ExportControlLicense	Class	class	ExportControlLicense is a <<class>> representing an authorization to one or more parties to export item(s) under the terms of an ExportControlRegulation.	S5000F UoF Export Control License
ExportControlLicenseItem	Class	relationship	ExportControlLicenseItem is a <<relationship>> that associates an ExportControlLicense to the export-controlled items to which this license applies.	S5000F UoF Export Control License
ExportControlParty	Class	relationship	ExportControlParty is a <<relationship>> that associates an ExportControlLicense to the parties to which it applies or that control it.	S5000F UoF Export Control License
ExportControlRegulation	Class	class	ExportControlRegulation is a legal document that defines export control restrictions to one or several items or item categories.	S5000F UoF Export Control Requirement
ExportControlRequirementAppliedToCountry	Class	relationship	exportControlRequirementAppliedToCountry is a <<relationship>> that defines to which countries an ExportControlRegulation is applied.	S5000F UoF Export Control Requirement
ExpressionEvaluation	Class	class	ExpressiontEvaluation is a Boolean expression that can be evaluated to be either TRUE or FALSE.	S5000F UoF Expression Evaluation
ExternalDocument	Class	class	ExternalDocument is a specialization of class Document, and	S5000F UoF Document

Class name	Type	Stereotype	Definition	UoF
			represents all documents that do not have a specialied class.	
ExternalDocument	Class	class	ExternalDocument is a specialization of class Document, and represents all documents that do not have a specialied class.	S5000F UoF Document
Facility	Class	class	Facility is a <<class>>that represents an infrastructure which exists, or is intended to be built or installed, and is established to serve a particular purpose.	S5000F Specializations
Facility	Class	class	Facility is a <<class>>that represents an infrastructure which exists, or is intended to be built or installed, and is established to serve a particular purpose.	S5000F Specializations
Facility	Class	class	Facility is a <<class>>that represents an infrastructure which exists, or is intended to be built or installed, and is established to serve a particular purpose.	S5000F Specializations
FacilityLocation	Class	relationship	FacilityLocation is a <<relationship>> that defines at which Location a Facility is located.	S5000F UoF Facility
FacilityOperator	Class	relationship	FacilityOperator is a <<relationship>> that identifies the party responsible for running the Facility	S5000F Specializations
FacilityOperator	Class	relationship	FacilityOperator is a <<relationship>> that identifies the party responsible for running the Facility	S5000F Specializations
FacilityOperatorItem	Interface	select	FacilityOperatorItem is a <<select>> interface that identifies classes from which an instance can be selected to be the FacilityOperator.	CDM UoF Facility
FacilityOwner	Class	relationship	FacilityOwner is a <<relationship>> that defines the total or partial ownership of a facility by a specific party during a specific period of time.	S5000F UoF Facility
FacilityRelationship	Class	relationship	FacilityRelationship is a <<relationship>> that defines how two Facilities are related with each other.	S5000F UoF Facility

Class name	Type	Stereotype	Definition	UoF
Failure	Interface	select	Failure is a <<select>> interface that allows to identify the reason for an EquipmentFault.	S5000F UoF Failure Detection and Location
FailureCause	Class	class	The FailureCause class represents an unacceptable reduction of functionality of an item where the item cannot continue its intended use.	S5000F UoF Failure Detection and Location
FailureDetection	Class	relationship	FailureDetection is a <<relationship>> that allows to define which DetectionMechanism is capable of detecting a specific Failure.	S5000F UoF Failure Detection and Location
FailureMode	Class	class	FailureMode represents an identifiable condition in which one element of a redundant system has failed (no longer available) and impacts on the required function output of the system.	S5000F UoF Failure Detection and Location
FailureMode	Class	class	FailureMode represents an identifiable condition in which one element of a redundant system has failed (no longer available) and impacts on the required function output of the system.	S5000F UoF Failure Detection and Location
FailureModeEffect	Class	class	The FailureModeEffect class defines the consequences of an identified failure mode and its effect on the local/next higher/end item operation, function or status.	S5000F UoF Failure Detection and Location
Fault	Class	class	Fault represents an unidentified anomalous behavior that occurred on a specific item at a specific date.	S5000F UoF Actual Fault Indication
FaultCause	Class	relationship	FaultCause is a <<relationship>> that allows to associate a Fault to its underlying cause.	S5000F UoF Failure Detection and Location
FaultSymptom	Class	class	FaultSymptom is a <<class>> that represents an indication of the existence of a Fault.	S5000F UoF Actual Fault Indication
Fleet	Class	class	The Fleet class represents a group of SerializedProductVariants, representing vehicles that move together, are engaged in the same activity, belong to a same owner or are operated by a same	S5000F UoF Fleet Definition

Class name	Type	Stereotype	Definition	UoF
			organization.	
Fleet	Class	class	The Fleet class represents a group of SerializedProductVariants, representing vehicles that move together, are engaged in the same activity, belong to a same owner or are operated by a same organization.	S5000F UoF Fleet Definition
FleetBasedAt	Class	relationship	FleetBasedAt is a <<relationship>> that indicates the location at which as Fleet is based at a specific point in time.	S5000F UoF Fleet Definition
FleetManager	Interface	extend	FleetManager is an <<extend>> interface that allows to assign capabilities to the OperatorOrganization or OperatorPerson that manages a Fleet.	S5000F UoF Fleet Definition
FleetOperatedBy	Class	relationship	FleetOperator is <<relationship>> that allows to assign an Operator to a Fleet during a specific period of time.	S5000F UoF Fleet Definition
FleetOperatesAtLocation	Class	relationship	FleetOperatesAtLocation is a <<relationship>> that indicates the location at which as Fleet operates at a specific point in time.	S5000F UoF Fleet Definition
FleetOperator	Interface	select	FleetOperator is a <<select>> interface that allows to identify the operator of a Fleet.	S5000F UoF Fleet Definition
FleetPlanning	Class	class	FleetPlanning is a class representing the planned usage of a fleet during a specified period of time.	S5000F UoF Fleet Planning and Product Assignment
FleetPlanning	Class	class	FleetPlanning is a class representing the planned usage of a fleet during a specified period of time.	S5000F UoF Fleet Planning and Product Assignment
FleetRelationship	Class	relationship	FleetRelationship is a <<relationship>> that indicates how two Fleets are related with each other.	S5000F UoF Fleet Definition
FleetRequirement	Class	class	FleetRequirement is a Requirement (need) that a fleet must comply with.	S5000F UoF Fleet Planning and Product Assignment

Class name	Type	Stereotype	Definition	UoF
FleetTask	Class	class	The FleetTask class represents a planned activity to be carried out by a SerializedProductVariant as part of the activities that the fleet has to perform.	S5000F UoF Fleet Planning and Product Assignment
FleetTask	Class	class	The FleetTask class represents a planned activity to be carried out by a SerializedProductVariant as part of the activities that the fleet has to perform.	S5000F UoF Fleet Planning and Product Assignment
FleetTaskCancellationNotice	Class	class	FleetTaskCancellationNotice is a Document published by an Operator to cancel a FleetTask.	S5000F UoF Fleet Task Cancellation
FleetTaskCargo	Class	relationship	FleetTaskCargo is a <<relationship>> that allows to associate a CargoItem to a FleetTask.	S5000F UoF Fleet Planning and Product Assignment
FleetTaskList	Class	relationship	FleetTaskList is a <<relationship>> that defines which FleetTasks are performed by which Fleets for a specific FleetPlanning.	S5000F UoF Fleet Planning and Product Assignment
GeographicalArea	Class	class	GeographicalArea is a <<class>> that represents a particular extent of space.	CDM UoF Location
GeographicalArea	Class	class	GeographicalArea is a <<class>> that represents a particular extent of space.	CDM UoF Location
GeographicalAreaRelationship	Class	relationship	GeographicalAreaRelationship is a <<relationship>> that determines how a GeographicalArea is related to another one.	S5000F UoF Location, Address and Locator
GlobalPosition	Class	class	GlobalPosition is a <<class>> that identifies a point in space by a set of coordinates.	CDM UoF Location
GlobalPosition	Class	class	GlobalPosition is a <<class>> that identifies a point in space by a set of coordinates.	CDM UoF Location
HardwareElement	Class	class	HardwareElement is a BreakdownElement that is realized as a HardwarePartAsDesigned.	CDM UoF Hardware Element

Class name	Type	Stereotype	Definition	UoF
HardwareElement	Class	class	HardwareElement is a BreakdownElement that is realized as a HardwarePartAsDesigned.	CDM UoF Hardware Element
HardwareElementPartRealization	Class	relationship	HardwareElementPartRealization is a <<relationship>> where a HardwareElementRevision relates to an instance of HardwarePartAsDesigned which fulfills the HardwareElement specification.	CDM UoF Hardware Element
HardwareElementRevision	Class	class	HardwareElementRevision is a BreakdownElementRevision representing an iteration applied to a HardwareElement.	CDM UoF Hardware Element
HardwarePartAsDesigned	Class	class	HardwarePartAsDesigned is a PartAsDesigned that is to be realized as physical items (hardware) including non-countable material.	S5000F Specializations
HardwarePartAsDesigned	Class	class	HardwarePartAsDesigned is a PartAsDesigned that is to be realized as physical items (hardware) including non-countable material.	S5000F Specializations
HardwarePartAsDesigned	Class	class	HardwarePartAsDesigned is a PartAsDesigned that is to be realized as physical items (hardware) including non-countable material.	S5000F Specializations
HardwarePartAsDesignedCommerceData	Class	attributeGroup	HardwarePartAsDesignedCommerceData is an <<attributeGroup>> providing the information associated to the catalogue price of a HardwarePartAsDesigned.	S2000M_6-1_Data_model
HardwarePartAsDesignedDesignData	Class	attributeGroup	HardwarePartAsDesignedDesignData is an <<attributeGroup>> that collects HardwarePartAsDesigned characteristics identified during design activities.	CDM UoF Part Definition
HardwarePartAsDesignedSupportData	Class	attributeGroup	HardwarePartAsDesignedSupportData is an <<attributeGroup>> that collects HardwarePartAsDesigned characteristics identified during supportability analysis activities.	CDM UoF Part Definition
IdentifiedTaskRequirement	Class	relationship	IdentifiedTaskRequirement is a <<relationship>> that associates a TaskRequirement with a TaskRequirementAnalysisItem.	CDM UoF Task Requirement

Class name	Type	Stereotype	Definition	UoF
IndicatedFaultSymptom	Class	class	IndicatedFaultSymptom is a <<class>> that represents an indication of the existence of a Fault by some measuring or monitoring device.	S5000F UoF Actual Fault Indication
Infrastructure	Class	class	Infrastructure is a <<class>> that represents the basic physical and organizational structures and facilities needed for the operation of an organization or Product or required for the provision of a service.	S5000F UoF Infrastructure
Infrastructure	Class	class	Infrastructure is a <<class>> that represents the basic physical and organizational structures and facilities needed for the operation of an organization or Product or required for the provision of a service.	S5000F UoF Infrastructure
InfrastructureAvailable	Class	relationship	InfrastructureAvailableFor is a <<relationship>> that provides the capability of associating an Infrastructure to items that can use it.	S5000F UoF Infrastructure Availability
InfrastructureCompliance	Class	relationship	InfrastructureCompliance is a <<class>> that documents how the InfrastructureCompliantItem fulfills requirements stated in the associated ResourceSpecification.	CDM UoF Facility
InfrastructureCompliantItem	Interface	extend	InfrastructureCompliantItem is an <<extend>> interface that provides its associated data model to those classes that implement it.	CDM UoF Facility
InfrastructureItem	Interface	extend	InfrastructureItem is an <<extend>> interface that allows to associate additional capabilities to items that can belong to an Infrastructure.	S5000F UoF Infrastructure
InfrastructureNode	Interface	select	InfrastructureNode is a <<class>> representing one item that forms part of an Infrastructure.	S5000F UoF Infrastructure
InfrastructureNodeAtLocation	Class	relationship	InfrastructureNodeAtLocation is a <<relationship>> that defines the Location at which an InfrastructureNode is located.	S5000F UoF Infrastructure
InfrastructureParty	Class	relationship	InfrastructureParty is a <<relationship>> that associates a Party to an Infrastructure.	S5000F UoF Infrastructure

Class name	Type	Stereotype	Definition	UoF
InfrastructureRelationship	Class	relationship	InfrastructureRelationship is a <<relationship>> that defines how two Infrastructures are related with each other.	S5000F UoF Infrastructure
InfrastructureRequiringItem	Interface	select	InfrastructureRequiringItem ia a <<select>> interface that defines items requiring an Infrastructure.	S5000F UoF Infrastructure Availability
InfrastructureRevision	Class	class	InfrastructureRevision is a <<class>> representing an iteration applied to a InfrastructureRevision.	S5000F UoF Infrastructure
InServiceDataFeedback	Class	exchange	InServiceDataFeedback is a generic Use Case that allows sending all S5000F information.	S5000F Use Cases
InstallationLocation	Class	class	InstallationLocation is a <<class>> that represents a position within the associated SerializedProductVariant.	CDM UoF Serialized Product Variant Configuration
InstallationLocationDefinitionItem	Interface	select	InstallationLocationDefinitionItem is a <<select>> interface that identifies items which can contain the basic definition for the InstallationLocation.	CDM UoF Serialized Product Variant Configuration
InstalledPart	Class	class	InstalledPart is a <<class>> that identifies a period during a given RealizedPart is, or has been, installed at the InstallationLocation.	CDM UoF Serialized Product Variant Configuration
InstalledPartItem	Interface	extend	InstalledPartItem is an <<extend>> interface that allows to associate InstalledParts to different items.	CDM UoF Serialized Product Variant Configuration
InventoryActivity	Class	class	InventoryActivity is an Activity associated to the management of spares or warehouses-	S5000F UoF Reportable Activity
InventoryActivity	Class	class	InventoryActivity is an Activity associated to the management of spares or warehouses-	S5000F UoF Reportable Activity
ItemDamage	Interface	extend	ItemDamage is an <<extend>> interface that allows to document the Damage that an item has suffered.	S5000F UoF Damage
ItemExportControlRegulation	Class	relationship	ItemExportControlRegulation is a <<relationship>> that allows to	S5000F UoF Export Control

Class name	Type	Stereotype	Definition	UoF
			associate an ItemUnderExportControl with the ExportControlRegulation that governs its export,	Requirement
ItemUnderExportControl	Interface	extend	ItemUnderExportControl is an <<extend>> interface that allows to define items under export control rules.	S5000F UoF Export Control Requirement
ItemWarranty	Class	relationship	ItemWarranty is a <<relationship>> that defines the association between a WarrantyItem and the legal justification for the warranty of the WarrantyItem , such as a contract or contract clause.	S5000F UoF Warranty
LaborRateItem	Interface	select	LaborRateItem is a <<select>> interface that allows to associate a LaborRate to a skilled labor.	S5000F UoF Person Competences and Labor Rates
LaborRates	Class	relationship	LaborRates is a <<relationship>> that allows to assign labor rates to different skills, skill levels and trades.	S5000F UoF Contract Breakdown
LegalParty	Interface	select	LegalParty is a <<select>> interface identifies entities that has legal standing in the eyes of the law.	CDM UoF Product and Project
LocalPosition	Class	class	LocalPosition is a <<class>> representing the local coordinates that uniquely identify a position within a ZoneElementRevision.	S5000F UoF Local Position
Location	Interface	extend	Location is an <<extend>> interface that provides its associated data model to those classes that implement it.	CDM UoF Location
LocationEnvironment	Class	relationship	LocationEnvironment is a <<relationship>> that allows to associate a Location to the Environment(s) at that Location.	S5000F UoF Location, Address and Locator
LocationItem	Interface	select	LocationItem is a <<select>> interface that identifies items which can be selected to provide the definition of a geographic location.	CDM UoF Location
LocationRelationship	Class	relationship	LocationRelationship is a <<relationship>> where one LocationItem relates to another LocationItem	CDM UoF Location

Class name	Type	Stereotype	Definition	UoF
Locator	Class	class	Locator is a functional area that indicates where an item is physically placed at a specific location.	S5000F UoF Location, Address and Locator
LogBook	Class	class	LogBook is a class that represents a set of records called LogBookEntries that compile critical activities or events that need to be registered for a defined purpose.	S5000F UoF Logbook
LogBookEntry	Class	class	LogBookEntry is an individual entry into a logbook, defining one critical activity or event to be included in the LogBook.	S5000F UoF Logbook
LogBookEntryMeasurementPoint	Class	class	LogBookEntryCounter is the value of a specific Product counter when the logbook entry was performed.	S5000F UoF Logbook
LogicalAND	Class	class	LogicalAND is an EvaluationCriteria that defines a Boolean operation where the results of all its associated EvaluationCriteria must be TRUE for the result to be TRUE, otherwise the result is FALSE.	S5000F UoF Applicability Statement
LogicalNOT	Class	class	LogicalNOT is an EvaluationCriteria that defines a Boolean operation where the result from its associated EvaluationCritera must be FALSE for the result to be TRUE, otherwise the result is FALSE.	S5000F UoF Applicability Statement
LogicalOR	Class	class	LogicalOR is an EvaluationCriteria that defines a Boolean operation where the result from at least one of its associated EvaluationCriteria must be TRUE for the result to be TRUE, otherwise the result is FALSE.	S5000F UoF Applicability Statement
LogicalXOR	Class	class	LogicalXOR is an EvaluationCriteria that defines a Boolean operation where the result from one and only one of its associated EvaluationCriteria must be TRUE for the result to be TRUE, otherwise the result is FALSE.	S5000F UoF Applicability Statement
MaintenanceActivity	Class	class	MaintenanceActivity is a ReportableActivity that is associated to a	S5000F UoF Maintenance Activity

Class name	Type	Stereotype	Definition	UoF
			maintenance task.	
MaintenanceActivity	Class	class	MaintenanceActivity is a ReportableActivity that is associated to a maintenance task.	S5000F UoF Maintenance Activity
MaintenanceActivityDocument	Class	relationship	MaintenanceActivityDocument is a <<relationship>> that allows to associate documents (relating) to a MaintenanceActivity requiring them (related).	S5000F UoF Maintenance Activity
MaintenanceActivityParty	Class	relationship	MaintenanceActivityParty is a <<relationship>> that allows to associate a MaintenanceActivity to the person who is going to carry out the MaintenanceActivity.	S5000F UoF Maintenance Activity
MaintenanceActivityPlan	Class	attributeGroup	MaintenanceActivityPlan is an <<attributeGroup>> that details the information associated to the planning of a MaintenanceActivity.	S5000F UoF Maintenance Activity
MaintenanceActivityRecord	Class	attributeGroup	MaintenanceActivityRecord is an <<attributeGroup>> that details the information associated to the execution of a MaintenanceActivity.	S5000F UoF Maintenance Activity
MaintenanceEvent	Class	class	MaintenanceEvent is an event that consists in the realization of one or several maintenance activities or occurs as the result of a maintenance activity.	S5000F UoF Maintenance Activity
MaintenanceEvent	Class	class	MaintenanceEvent is an event that consists in the realization of one or several maintenance activities or occurs as the result of a maintenance activity.	S5000F UoF Maintenance Activity
MaintenanceFacility	Class	class	MaintenanceFacility is a Facility that is mainly established for providing product support.	S5000F UoF Facility
MaintenanceFacility	Class	class	MaintenanceFacility is a Facility that is mainly established for providing product support.	S5000F UoF Facility
MaintenanceFacilityLevel	Class	relationship	MaintenanceFacilityLevel is a <<relationship> that defines the MaintenanceLevels of a Facility.	S5000F UoF Maintenance Facility Planning

Class name	Type	Stereotype	Definition	UoF
MaintenanceFacilitySlot	Class	class	MaintenanceFacilitySlot is a fixed position within a MaintenanceFacility in which exactly one SerializedProductVariant can be accommodated.	S5000F UoF Maintenance Facility Planning
MaintenanceFacilitySlotAccomodation	Class	relationship	MaintenanceFacilitySlotAccomodation is a <<relationship>> that defines which ProductVariants can be accommodated in a specific MaintenanceFacilitySlot.	S5000F UoF Maintenance Facility Planning
MaintenanceFacilitySlotPlannedUsage	Class	relationship	MaintenanceFacilitySlotPlannedUsage is a <<relationship>> that indicates the planned allocation of a MaintenanceFacilitySlot to a specific SerializedProductVariant.	S5000F UoF Maintenance Facility Planning
MaintenanceItem	Interface	select	MaintenanceItem is a <<select interface>> that allows to select an item of a specific type that can be maintained.	S5000F UoF Maintenance Activity
MaintenanceLevel	Class	class	MaintenanceLevel is a <<class>> that represents the definition of a set of maintenance capabilities which will be made available to support a defined Product.	CDM UoF Product Usage Context
MaintenanceLevel	Class	class	MaintenanceLevel is a <<class>> that represents the definition of a set of maintenance capabilities which will be made available to support a defined Product.	CDM UoF Product Usage Context
MaintenanceLicense	Class	class	MaintenanceLicense is a class representing the authorization of an authority to a MaintenancePerson to perform specific maintenance tasks.	S5000F UoF Maintenance Personnel
MaintenanceOrganization	Class	class	MaintenanceOrganization is an organization approved to perform maintenance tasks on a specific set of Products or ProductVariants.	S5000F UoF Maintenance Organization
MaintenanceOrganization	Class	class	MaintenanceOrganization is an organization approved to perform maintenance tasks on a specific set of Products or ProductVariants.	S5000F UoF Maintenance Organization
MaintenanceOrganizationApproval	Class	relationship	MaintenanceOrganizationApproval is a <<relationship>> that identifies the authorization of an Organization to operate as a	S5000F UoF Maintenance

Class name	Type	Stereotype	Definition	UoF
			Maintenanceorganization for a specific period of time.	Organization
MaintenancePerson	Class	class	MaintenancePerson is a person with the skills to be able to perform maintenance activities.	S5000F UoF Maintenance Personnel
MaintenancePerson	Class	class	MaintenancePerson is a person with the skills to be able to perform maintenance activities.	S5000F UoF Maintenance Personnel
MaintenancePersonApprovedProduct	Class	relationship	MaintenancePersonApprovedProduct is a <<relationship>> that defines which MaintenancePersons have been approved to carry out maintenance on specific ProductVariants, possibly with a specific approval by an organization.	S5000F UoF Maintenance Personnel
MaintenancePersonFacility	Class	relationship	MaintenancePersonFacility is a <<relationship>> that documents the MaintenanceFacility where a MaintenancePerson is working during a specific period of time.	S5000F UoF Maintenance Personnel
MaintenanceProgram	Class	class	MaintenanceProgram is a class that represents a set of TaskRequirements that must be applied to a ProductVariant so as to maintain the ProductVariant in an operational state.	S5000F UoF Maintenance Program
MaintenanceProgramItem	Interface	extend	MaintenanceProgramItem is an <<extend>> interface that allows to associate a MaintenanceProgram to an item.	S5000F UoF Maintenance Program
MaintenanceProgramRevision	Class	class	MaintenanceProgramRevision is an iteration of a MaintenanceProgram.	S5000F UoF Maintenance Program
MaintenanceRequirement	Class	class	MaintenanceRequirement is a Requirement to carry out one or several maintenance actions.	S5000F UoF Requirement
MaintenanceRequirement	Class	class	MaintenanceRequirement is a Requirement to carry out one or several maintenance actions.	S5000F UoF Requirement
MaintenanceWorkOrderSource	Interface	extend	MaintenanceWorkOrderSource is an <<extend>> interface that allows to define the sources for WorkOrders.	S5000F UoF Maintenance Work Order Source

Class name	Type	Stereotype	Definition	UoF
MajorComponent	Class	relationship	MajorComponent is a <<relationship>> declaring that a SerializedHardwarePart is of special importance within a SerializedProductVariant and therefore needs special tracking.	S5000F UoF Serialized Product Variant
ManagedFleet	Class	relationship	ManagedFleet is a <<relationship>> that allows to associate a FleetManager to the Fleet that it manages during a specific period of time.	S5000F UoF Fleet Definition
Material	Class	class	Material is a substance that can be refined in a manufacturing process.	S5000F UoF Supply Item
Material	Class	class	Material is a substance that can be refined in a manufacturing process.	S5000F UoF Supply Item
MeasurementPoint	Class	class	MeasurementPoint is a <<class>> that represents a characteristic which can be recorded for the SerializedHardwarePart.	CDM UoF Part As Realized
MeasurementPointItem	Interface	extend	MeasurementPointItem is an <<extend>> interface that provides its associated data model to the classes that implemented it.	CDM UoF Part As Realized
Message	Class	class	Message is a <<class>> that represents the collection of information brought together by a message sender for the purpose of communicating it to another party.	CDM UoF Message
MessageContent	Class	exchange	MessageContent is an <<exchange>> that represents the collection of information that is the payload of the message.	CDM UoF Message
MessageContent	Class	exchange	MessageContent is an <<exchange>> that represents the collection of information that is the payload of the message.	CDM UoF Message
MessageContext	Class	relationship	MessageContext is a <<relationship>> between a message and the context for which it is being provided.	CDM UoF Message
MessageContextItem	Interface	select	MessageContextItem is a <<select>> interface that	CDM UoF Message

Class name	Type	Stereotype	Definition	UoF
			identifies items which can be selected as the context for a Message.	
MessageParty	Class	relationship	MessageParty is a <<relationship>> between a message and a stakeholder for the message.	CDM UoF Message
MessagePartyItem	Interface	select	The MessagePartyItem is an <<extend>> interface that represents the common behavior of those parties that can be identified as message stakeholders.	CDM UoF Message
MessageRelationship	Class	relationship	MessageRelationship is a <<relationship>> where one Message relates to another Message.	CDM UoF Message
ModificationOf	Class	relationship	ModificationOf is a <<relationship>> where a modified SerializedHardwarePart relates back to its previous design standard and its history.	CDM UoF Part As Realized
Movement	Class	class	Movement represents the act of autonomously changing the physical location or position of a SerializedProductVariant.	S5000F UoF Operational Period
MovementLeg	Class	class	MovementLeg is a class representing one of the individual displacements performed during a Movement, which will be at least one MovementLeg.	S5000F UoF Operational Period
MovementLegDelay	Class	class	MovementLegDelay is a class representing a delay that occurred during a travelLeg.	S5000F UoF Operational Period
MovementLegEnvironment	Class	relationship	MovementLegEnvironment is a <<relationship>> that allows to associate a MovementLeg to the Environment(s) where this took place.	S5000F UoF Operational Period
MovementLegPosition	Class	relationship	MovementLegPosition is a <<relationship>> that defines at which point in space a Product was at a certain moment during a MovementLeg.	S5000F UoF Operational Period
MRONetwork	Class	class	MRONetwork is an Infrastructure consisting or Maintenance, Repair	S5000F UoF Infrastructure

Class name	Type	Stereotype	Definition	UoF
			and Overhaul (MRO) facilities.	
MRONetwork	Class	class	MRONetwork is an Infrastructure consisting or Maintenance, Repair and Overhaul (MRO) facilities.	S5000F UoF Infrastructure
NestedAllowedProductConfiguration	Class	relationship	NestedAllowedProductConfiguration is a <<relationship>> that defines that one AllowedProductConfiguration includes a subordinate AllowedProductConfiguration.	CDM UoF Product Design Configuration
NestedProductVariant	Class	relationship	NestedProductVariant is a <<relationship>> that defines that one ProductVariant includes a subordinate ProductVariant.	CDM UoF Product Design Configuration
NestedSerializedProductVariant	Class	relationship	NestedSerializedProductVariant is a <<relationship>> that that defines that one SerializedProductVariant includes a subordinate SerializedProductVariant.	S5000F UoF Serialized Product Variant
NonAvailabilityAttribution	Interface	select	NonAvailabilityAttribution is a <<select>> interface that allows to associate a NonAvailability to the underlying responsible for the non-availability.	S5000F UoF Availability
NonAvailabilityCause	Class	class	NonAvailabilityCause is a <class>> that describes why a Availability was not achieved at a certain date.	S5000F UoF Availability
NonAvailabilityCauseItem	Interface	select	NonAvailabilityCauseItem is a <<select>> interface that allow to point out the root cause for a non-availability.	S5000F UoF Availability
NonConformanceData	Class	attributeGroup	NonConformanceData is an <<attributeGroup>> that collects information on how the EffectiveOnProductConfigurationItem does not comply with the requirements of its usage.	CDM UoF Product Design Configuration
ObservedFaultSymptom	Class	class	ObservedFaultSymptom is a <<class>> that represents an indication of the existence of a Fault by means of physical observation.	S5000F UoF Actual Fault Indication
ObsolescenceItem	Interface	select	ObsolescenceItem is a <<select>> interface that allows to define an item to which an ObsolescenceRequirement can apply.	S5000F UoF Obsolescence Management Candidates

Class name	Type	Stereotype	Definition	UoF
ObsolescenceParameter	Class	class	ObsolescenceParameter is a class representing a criterion that allows to evaluate whether an ObsolescenceRequirement has been met.	S5000F UoF Obsolescence Management Candidates
ObsolescenceRequirement	Class	class	ObsolescenceRequirement is a Requirement that indicates when an item becomes obsolete.	S5000F UoF Requirement
ObsolescenceRequirement	Class	class	ObsolescenceRequirement is a Requirement that indicates when an item becomes obsolete.	S5000F UoF Requirement
OperatingBase	Class	class	OperatingBase is a Facility that is mainly established for providing support for operations.	S5000F UoF Operating Base
OperatingBase	Class	class	OperatingBase is a Facility that is mainly established for providing support for operations.	S5000F UoF Operating Base
OperatingBaseCapacity	Class	relationship	OperatingBaseCapacity is a <<relationship>> that identifies the capacity of an OperatingBase to allow the operation of a specific ProductVariant.	S5000F UoF Operating Base
OperatingLocationType	Class	class	OperatingLocationType is a <<class>> that represents the definition of the nature of the environment in which a product will be operated.	CDM UoF Product Usage Context
OperatingLocationType	Class	class	OperatingLocationType is a <<class>> that represents the definition of the nature of the environment in which a product will be operated.	CDM UoF Product Usage Context
OperationalActivity	Class	class	OperationalActivity is an Activity associated to the operation of a SerializedProduct.	S5000F UoF Reportable Activity
OperationalActivity	Class	class	OperationalActivity is an Activity associated to the operation of a SerializedProduct.	S5000F UoF Reportable Activity
OperationalApproval	Class	class	OperationalApproval is a class that represents the authorization to a SerializedProductVariant for a specific mode of operation.	S5000F UoF Operational Period

Class name	Type	Stereotype	Definition	UoF
OperationalApproval	Class	class	OperationalApproval is a class that represents the authorization to a SerializedProductVariant for a specific mode of operation.	S5000F UoF Operational Period
OperationalConsumption	Interface	extend	OperationalConsumption is an <<extend>> interface that allows to associate a Product consumption to an operational period, movement or movement leg.	S5000F UoF Fleet Monitoring
OperationalEvent	Class	class	OperationalEvent is a class representing an Event during the SerializedProductVariant operation that can have an impact on the operation itself, on maintenance, or on safety.	S5000F UoF Operational Event
OperationalEventMessage	Class	class	OperationalEventMessage is a message, failure code or acoustic or visual warning that occurred during an OperationEvent.	S5000F UoF Operational Event
OperationalEventOperator	Class	relationship	OperationalEventOperator is a <<relationship>> that allows to associate an OperationalEvent to the Party that was operating the ProductVariant at that moment in time.	S5000F UoF Operational Event
OperationalMode	Class	class	OperationalMode represents the actual usage mode of a SerializedProductVariant during a specific OperationalPeriod.	S5000F UoF Operational Period
OperationalMode	Class	class	OperationalMode represents the actual usage mode of a SerializedProductVariant during a specific OperationalPeriod.	S5000F UoF Operational Period
OperationalModeStatus	Class	class	Mode of operation associated to a LogBookEntry.	S5000F UoF Operational Period
OperationalMoment	Interface	extend	OperationalMoment is an <<extend>> interface that allows to associate an operational moment to other items.	S5000F UoF Operational Period
OperationalMomentItem	Interface	select	OperationalMomentItem is a <<select>> interface that allows linking to a specific operational moment, such as an operating period, movement or travel leg.	S5000F UoF Operational Period
OperationalPeriod	Class	class	OperationalPeriod is a class that defines the characteristics of a time frame during which a SerializedProductVariant was operated.	S5000F UoF Operational Period

Class name	Type	Stereotype	Definition	UoF
OperationalPeriod	Class	class	OperationalPeriod is a class that defines the characteristics of a time frame during which a SerializedProductVariant was operated.	S5000F UoF Operational Period
OperationalPeriodOperator	Class	relationship	OperationalPeriodOperator is a <<relationship>> that defines which Party has carried out the operation during an OperationalPeriod.	S5000F UoF Operational Period
OperationalPeriodRelationship	Class	relationship	OperationalPeriodRelationship is a <<relationship>> that defines the association between two different OperationalPeriods.	S5000F UoF Operational Period
OperationalRequirement	Class	class	OperationalRequirement is a Requirement to perform a specific operation with a Product.	S5000F UoF Fleet Planning and Product Assignment
OperationalRequirementsPlanning	Class	relationship	OperationalRequirementsPlanning is a <<relationship>> that relates an OperationalRquirement to the FleetPlanning during one or several OperationalPeriods.	S5000F UoF Fleet Planning and Product Assignment
OperationalRole	Class	class	OperationalRole defines the capabilities that a product must be able to provide so as to perform a specific task or mission as part of its operation.	S5000F UoF Operational Roles
OperationalRole	Class	class	OperationalRole defines the capabilities that a product must be able to provide so as to perform a specific task or mission as part of its operation.	S5000F UoF Operational Roles
OperationalTime	Class	attributeGroup	OperationalTime is an <<attributeGroup>> that can be associated to an OperationalTimeItem.	S5000F UoF Operational Times
OperationalTimeItem	Interface	extend	OperationalTimeItem is an <<extend>> interface that can have operational time information associated to it.	S5000F UoF Operational Times
Operator	Interface	select	Operator is a <<select interface>> that represents the entities that operate one or several SerializedProductVariants.	S5000F UoF Operator
OperatorOrganization	Class	class	OperatorOrganization is an Organization that operates one or several SerializedProductVariants.	S5000F UoF Operator

Class name	Type	Stereotype	Definition	UoF
OperatorOrganization	Class	class	OperatorOrganization is an Organization that operates one or several SerializedProductVariants.	S5000F UoF Operator
OperatorPerson	Class	class	OperatorPerson is a Person that operates one or several ProductVariants.	S5000F UoF Operator
OperatorPerson	Class	class	OperatorPerson is a Person that operates one or several ProductVariants.	S5000F UoF Operator
Organization	Class	class	Organization is a <<class>> that represents an administrative structure with a particular purpose belonging to a legal entity.	S5000F Specializations
Organization	Class	class	Organization is a <<class>> that represents an administrative structure with a particular purpose belonging to a legal entity.	S5000F Specializations
OrganizationalBreakdownStructure	Interface	extend	OrganizationalBreakdownStructure is an <<extend>> interface that allows to relate an organizational structure to a Project or Contract.	S5000F UoF Organizational Breakdown Structure
OrganizationalBreakdownStructure Revision	Class	class	OrganizationalBreakdownStructureRevision is an class that represents a specific revision of an organizational breakdown structure.	S5000F UoF Organizational Breakdown Structure
OrganizationalRole	Class	relationship	OrganizationalRole is a <<relationship>> that defines the role that a Party performs within a project or contract-specific organizational structure.	S5000F UoF Organizational Breakdown Structure
OrganizationOperationsApproval	Class	relationship	OrganizationOperationsApproval is a <<relationship>> that identifies the authorization of an OperatorOrganization to operate a specific ProductVariant by a specific Organization for a specific period of time.	S5000F UoF Operator
OtherFacility	Class	class	OtherFacility is a Facility that has no specific classification.	S5000F UoF Facility
OtherFacility	Class	class	OtherFacility is a Facility that has no specific classification.	S5000F UoF Facility

Class name	Type	Stereotype	Definition	UoF
ParkingFacility	Class	class	ParkingFacility is a Facility used to park SerializedProductVariants that are mobile and can move beweeen different Locations.	S5000F UoF Facility
ParkingFacility	Class	class	ParkingFacility is a Facility used to park SerializedProductVariants that are mobile and can move beweeen different Locations.	S5000F UoF Facility
PartAction	Class	class	PartAction is an action performed on a part as a result of a MaintenanceActivity.	S5000F UoF Equipment
PartAsDesigned	Class	class	PartAsDesigned is a <<class>> that represents the definitional information for an artifact fullfilling a set of requirements, which can be produced or realized.	CDM UoF Part Definition
PartAsDesignedPartsList	Class	class	PartAsDesignedPartsList is a <<class>> that represents the definitional information for the collection of PartAsDesignedPartsListEntry included in the assembly of the parent PartAsDesigned.	CDM UoF Part Definition
PartAsDesignedPartsListEntry	Class	class	PartAsDesignedPartsListEntry is a <<class>> that represents the inclusion of a PartAsDesigned in a PartAsDesignedPartsListRevision.	CDM UoF Part Definition
PartAsDesignedPartsListRelationship	Class	relationship	PartAsDesignedPartsListRelationship is a <<relationship>> where one PartAsDesignedPartsList relates to another PartAsDesignedPartsList.	CDM UoF Part Definition
PartAsDesignedPartsListRevision	Class	class	PartAsDesignedPartsListRevision is a <<class>> representing an iteration applied to a PartAsDesignedPartsList.	CDM UoF Part Definition
PartInPool	Class	relationship	SerializedHardwareParentInPool is a <<relationship>> that indicates the period during which a SerializedHardwarePart has been in a defined Pool of parts.	S5000F UoF Warehouse and Spare Pool
PartInWarehouse	Class	relationship	PartInWarehouse is a <<relationship>> that defines the time that a	S5000F UoF Warehouse and

Class name	Type	Stereotype	Definition	UoF
			SerializedHardwarePart has been stored in a Warehouse.	Spare Pool
Party	Interface	select	Party is an <<interface>> representing an entity that is capable of signing a contract or carrying out actions by itself without being instructed to do so.	S5000F UoF Party
PartyAddress	Class	relationship	PartyAddress is a <<relationship>> that defines the association between a Party and an Address.	S5000F UoF Party
PartyContactData	Class	attributeGroup	PartyContactData is an <<attributeGroup>> that provides the contact details for a Party.	S5000F UoF Party
PartyItem	Interface	extend	PartyItem is an <<extend>> interface that allows to provide additional capabilities to Organizations and Persons.	S5000F UoF Party
PartyRelationship	Class	relationship	A PartyRelationship is a <<relationship>> existing between two Parties (organizations or people).	S5000F UoF Party
PartySecurityAssignment	Class	relationship	PartySecurityAssignment is a <<relationship>> that establishes the security clearance of a Party during a certain period of time.	S5000F UoF Security Classification
Penalty	Class	class	Penalty is a <<class>> that represents a punishment imposed for breaking or not complying with a contract.	S5000F UoF Service Contract Penalty
Penalty	Class	class	Penalty is a <<class>> that represents a punishment imposed for breaking or not complying with a contract.	S5000F UoF Service Contract Penalty
Person	Class	class	Person is a living human being.	S5000F UoF Party
Person	Class	class	Person is a living human being.	S5000F UoF Party
PersonCompetence	Class	relationship	The PersonCompetence is a <<relationship>> that defines the competences that a Person has acquired.	S5000F UoF Person Competences and Labor Rates
PersonCompetenceItem	Interface	extend	PersonCompetenceItem is an <<extend>> interface that allows to associate a PersonCompetence to a GenericPerson. or an	S5000F UoF Person Competences and Labor Rates

Class name	Type	Stereotype	Definition	UoF
			individual.	
PersonGroup	Class	relationship	PersonGroup is a <<relationship>> that allows to associate a Person to different types of persons.	S5000F UoF Type of Person
PersonOperationsApproval	Class	relationship	PersonOperationsApproval is a <<relationship>> that documents the authorization by an Organization to an OperatorPerson to operate a ProductVariant during a specific period of time.	S5000F UoF Operator
PlannedItemUpgrade	Class	class	PlannedUpgrade is a class that defines the planning for the upgrade for a ChangeEmbodimentRequirement for one or several items.	S5000F UoF Change Embodiment Strategy
PlannedItemUpgrade	Class	class	PlannedUpgrade is a class that defines the planning for the upgrade for a ChangeEmbodimentRequirement for one or several items.	S5000F UoF Change Embodiment Strategy
PlannedPartInstallationLocation	Class	relationship	PlannedPartInstallationLocation is a <<relationship>> that allows to indicate which Part was installed or uninstalled at which location on a specific SerializedProductVariant.	S5000F UoF Change Embodiment Planning
PlannedUpgradeTimescales	Class	class	PlannedUpgradeTimescales is a class that defines the planned periods of times during which a PlannedUpgrade will be performed on specific items.	S5000F UoF Change Embodiment Planning
PoliciesAndRegulations	Class	class	PoliciesAndRegulations is a Document that defines mandatory practices for a Project, Product, Contract, Service or major item requiring specific guidelines.	S5000F UoF Policies and Regulations
PoliciesAndRegulations	Class	class	PoliciesAndRegulations is a Document that defines mandatory practices for a Project, Product, Contract, Service or major item requiring specific guidelines.	S5000F UoF Policies and Regulations
PoliciesAndRegulationsCompliantItem	Interface	extend	PoliciesAndRegulationsCompliantItem is an <<extend>> interface that allows to associate an item to the PoliciesAndRegulations with which it complies	S5000F UoF Policies and Regulations

Class name	Type	Stereotype	Definition	UoF
Pool	Class	class	Pool is a set of parts that are managed as a functional group and that is shared by different Parties.	S5000F UoF Warehouse and Spare Pool
Pool	Class	class	Pool is a set of parts that are managed as a functional group and that is shared by different Parties.	S5000F UoF Warehouse and Spare Pool
PoolItem	Interface	select	PoolItem is a <<select>> interface that represents an item that belongs to a pool.	S5000F UoF Warehouse and Spare Pool
PoolOwner	Class	relationship	PoolOwner is a <<relationship>> that defines the ownership ration and period of a Party over a Pool.	S5000F UoF Warehouse and Spare Pool
PoolStockedInWareHouse	Class	relationship	PoolStockedInWareHouse is a <<relationship>> that allows to indicate the Warehouse or Warehouses where a Pool of parts is stocked.	S5000F UoF Warehouse and Spare Pool
PoolUser	Class	relationship	PoolUser is a <<relationship>> that associates a spare Pool with the Parties that are allowed to access and use that SparePool.	S5000F UoF Warehouse and Spare Pool
Port	Class	class	Port is an infrastructure used for the docking of ships.	S5000F UoF Infrastructure
Port	Class	class	Port is an infrastructure used for the docking of ships.	S5000F UoF Infrastructure
PositionReferencingItem	Interface	extend	PositionReferencingItem is an <<extend>> interface that allows to document the LocalPositions of an item.	S5000F UoF Local Position
PowerGrid	Class	class	PowerGrid is an Infrastructure used to generate, transport and distribute power.	S5000F UoF Infrastructure
PowerGrid	Class	class	PowerGrid is an Infrastructure used to generate, transport and distribute power.	S5000F UoF Infrastructure
PressureSensor	Class	class	PressureSensor is a SensorType that measures pressure.	S5000F UoF Serialized Product Health Monitoring

Class name	Type	Stereotype	Definition	UoF
PressureSensor	Class	class	PressureSensor is a SensorType that measures pressure.	S5000F UoF Serialized Product Health Monitoring
PriceBreakData	Class	attributeGroup	PriceBreakData is an <<attributeGroup>> that details price information for HardwarePartAsDesignedCommerceData.	S2000M_6-1_Data_model
Product	Class	class	Product is <<class>> that represents a family of items which share the same underlying design purpose.	S5000F Specializations
ProductParameterAtOperationalEvent	Class	class	ProductParameterAtOperationalEvent provides the value of a Product parameter when an operational event occurred.	S5000F UoF Operational Event
ProductUsagePhase	Class	class	ProductUsagePhase is a distinct period of time during which a Product, ProductVariant or SerializedProductVariant will be used in a specific way, which is different from any other ProductUsagePhase.	S5000F UoF Product Usage Phase
ProductUsagePhaseHierarchicalRelationship	Class	relationship	ProductUsagePhaseHierarchicalRelationship is a <<relationship>> that allows to define a hierarchical association between two ProductUsagePhases.	S5000F UoF Product Usage Phase
ProductUsagePhaseItem	Interface	extend	ProductUsagePhaseItem is anwxtend>> interface which associates a ProductUsagePhase to the item(s) that have that type of usage.	S5000F UoF Product Usage Phase
ProductUsagePhaseRelationship	Class	relationship	ProductUsagePhaseRelationship is a <<relationship>> that defines how two ProductUsagePhases are associated with each other.	S5000F UoF Product Usage Phase
ProductUsagePhaseSequentialRelationship	Class	relationship	ProductUsagePhaseSequentialRelationship is a <<relationship>> that allows to define a sequential association between two ProductUsagePhases.	S5000F UoF Product Usage Phase
ProductVariant	Class	class	A ProductVariant is a <<class>> that defines a member of a Product family which is configured for a specific purpose and is made available to the market.	S5000F Specializations

Class name	Type	Stereotype	Definition	UoF
ProductVariant	Class	class	A ProductVariant is a <<class>> that defines a member of a Product family which is configured for a specific purpose and is made available to the market.	S5000F Specializations
ProductVariantMaintenance	Class	relationship	ProductVariantMaintenance is a <<relationship>> allowing to associate a MaintenanceOrganisation (relating) to the ProductVariants it can maintain (related).	S5000F UoF Maintenance Organization
ProductVariantSupportedByPool	Class	relationship	ProductVariantSupportedByPool is a <<relationship>> that indicates that a ProductVariant is supported by a defined part Pool.	S5000F UoF Warehouse and Spare Pool
Project	Class	class	Project is a <<class>> that represents the overall set of IPS activities defined for a Product.	CDM UoF Product and Project
Project	Class	class	Project is a <<class>> that represents the overall set of IPS activities defined for a Product.	CDM UoF Product and Project
ProjectContract	Class	relationship	ProjectContract is a <<relationship>> that establishes an association between a Project and a Contract.	CDM UoF Product and Project
ProjectRelationship	Class	relationship	ProjectRelationShip is a <<relationship>> that defines an association between two different Projects.	S5000F UoF Project and Contract
ProjectSpecificAttribute	Class	class	ProjectSpecificAttribute is a <<class>> that allows to define an attribute that is specific to a project.	S_Series_Base_Object_Definition _2-0_001-00
ProjectSpecificAttributeValue	Interface	select	ProjectSpecificAttributeValue is a <<select>> interface that allows to associate an attribute type to a ProjectSpecificAttribute.	S_Series_Base_Object_Definition _2-0_001-00
ProjectSpecificExtensionItem	Interface	extend	ProjectSpecificExtensionItem is an <<extend>> interface that allows to associate one or several ProjectSpecificAttributes to any <<class>>.	S_Series_Base_Object_Definition _2-0_001-00
RealizedPart	Interface	select	RealizedPart is a <<select>> interface that identifies which items can be used as an InstalledPart.	CDM UoF Serialized Product Variant Configuration

Class name	Type	Stereotype	Definition	UoF
RecordedFaultSymptom	Class	class	RecordedFaultSymptom is a <<class>> that represents an indication of the existence of a Fault that has been recorded by a monitoring device.	S5000F UoF Actual Fault Indication
Rectangle	Class	compoundAttribute	Rectangle is a <<class>> representing a geometrical plane figure with four straight sides and four right angles, especially one with unequal adjacent sides, in contrast to a square.	S5000F Compound Attributes
ReferencedDigitalFile	Class	relationship	ReferencedDigitalFile is a <<relationship> that allows an item to refer to a DigitalFile.	CDM UoF Digital File
ReferencedDocument	Class	relationship	ReferencedDocument is a <<relationship>> where one DocumentReferencingItem relates to a DocumentItem.	CDM UoF Document
ReferencedPositionItem	Interface	select	ReferencedPositionItem is a <<select>> interface that represents the item where a LocalPosition is located.	S5000F UoF Local Position
ReleasedDataSetAssociatedWith	Class	relationship	ReleasedDataSetAssociatedWith is a <<relationship>> that allows to associate DataSetAsReleased with an item.	S5000F UoF Data Sets
ReleasedDataSetItem	Interface	select	ReleasedDataSetItem is a <<select>> interface that allows to associate items to a DataSetAsReleased.	S5000F UoF Data Sets
Remark	Class	class	Remark is a <<class>> that provides additional information about the associated item.	CDM UoF Remark
RemarkItem	Interface	extend	RemarkItem is an <<extend>> interface that provides its associated data model to those classes that implement it.	CDM UoF Remark
Report	Class	class	Report is a Document that provides information about the execution of certain activities or significant events that have taken place.	S5000F UoF Report
Report	Class	class	Report is a Document that provides information about the execution of certain activities or significant events that have taken place.	S5000F UoF Report

Class name	Type	Stereotype	Definition	UoF
ReportableActivity	Class	class	ReportableActivity is an activity that is part of work item that is deemed to be of sufficient importance as to be reported.	S5000F UoF Reportable Activity
ReportableActivity	Class	class	ReportableActivity is an activity that is part of work item that is deemed to be of sufficient importance as to be reported.	S5000F UoF Reportable Activity
ReportableItem	Interface	select	ReportableItem is a <<select interface>> representing everything that is worth reporting.	S5000F UoF Report
ReportableMetric	Class	class	ReportableMetric is a measure of a specific characteristic that can evolve over time and is reported periodically for program or contract management purposes.	S5000F UoF Reportable Metric
ReportableMetricItem	Interface	extend	ReportableMetricItem is an <<extend>> interface that allows to assign ReportableMetrics to different items.	S5000F UoF Reportable Metric
ReportContext	Class	relationship	ReportContext is a <<relationship>> that allows a Report to be associated to its context.	S5000F UoF Report
ReportContextItem	Interface	select	ReportContextItem is a <<select>> interface that allows to indicate on which items a Report provides information.	S5000F UoF Report
ReportingParty	Interface	select	ReportingParty is a <<select>> interface that allows to define the author of a Report.	S5000F UoF Report
ReportParty	Class	relationship	ReportParty is a <<relationship>> that allows a ReportingParty to be associated to a Report.	S5000F UoF Report
RequiredFleetRole	Class	relationship	RequiredFleetRole is a <<relationship>> that allows to define the OperationalRoles that a FleetRequirement must meet.	S5000F UoF Fleet Planning and Product Assignment
RequiredPartStockLevelInPool	Class	relationship	RequiredPartStockLevelInPool is a <<relationship>> that defines the number of parts that must be stored in a Pool.	S5000F UoF Warehouse and Spare Pool
RequiredSafetyAction	Class	class	RequiredSafetyAction is a <<class>> representing the action to be	S5000F UoF Safety

Class name	Type	Stereotype	Definition	UoF
			taken as part of a SpecialSafetyInstruction so as to ensure the Product safety.	
RequiredSafetyActionImplementation	Interface	select	RequiredSafetyActionImplementation is a <<select>> interface that allows to provide traceability between taken a RequiredSafetyAction and the actions effectively implementing it.	S5000F UoF Safety
Requirement	Class	class	Requirement is a documented need that has to be implemented.	S5000F UoF Requirement
Requirement	Class	class	Requirement is a documented need that has to be implemented.	S5000F UoF Requirement
RequirementParty	Class	relationship	RequirementParty is a <<relationship>> that associates a Requirement with a Party.	S5000F UoF Requirement
RequirementRelationship	Class	relationship	RequirementRelationship is a <<relationship>> that defines the association between two Requirements.	S5000F UoF Requirement
ResourceItem	Interface	select	ResourceItem is a <<select>> interface representing items whose usage can be requested for a specific period of time and during which they cannot be used by somebody else.	S5000F UoF Resource Usage Request
ResourceRealization	Class	relationship	ResourceRealization is a <<relationship>> where a ResourceSpecification relates to an instance of PartAsDesigned that fulfills the resource specification.	CDM UoF Task Resource
ResourceSpecification	Class	class	ResourceSpecification is a <<class>> that defines a resource by its characteristics.	CDM UoF Task Resource
ResourceSpecification	Class	class	ResourceSpecification is a <<class>> that defines a resource by its characteristics.	CDM UoF Task Resource
ResourceUsageParty	Class	relationship	ResourceUsageParty is a <<relationship>> that defines which party	S5000F UoF Resource Usage

Class name	Type	Stereotype	Definition	UoF
			request which one to use a resource.	Request
ResourceUsageRequest	Class	class	ResourceUsageRequest is a class representing a demand from a party to use a resource belonging to a different party.	S5000F UoF Resource Usage Request
ResourceUsageRequest	Class	class	ResourceUsageRequest is a class representing a demand from a party to use a resource belonging to a different party.	S5000F UoF Resource Usage Request
RoleCapability	Class	relationship	RoleCapability is a <<relationship>> that defines which product capabilities are provided by a specific OperationalRole.	S5000F UoF Operational Roles
S1000DDataModule	Class	class	S1000DDataModule is a Document that identifies a document written in accordance with an S1000D schema.	CDM UoF Document
S1000DDataModule	Class	class	S1000DDataModule is a Document that identifies a document written in accordance with an S1000D schema.	CDM UoF Document
S1000DDataModuleIssue	Class	class	S1000DDataModuleIssue is a DocumentIssue that identifies a specific issue of a data module produced in accordance with S1000D.	CDM UoF Document
S1000DPublicationModule	Class	class	S1000DPublicationModule is a Document that identifies a publication published in accordance with S1000D	CDM UoF Document
S1000DPublicationModule	Class	class	S1000DPublicationModule is a Document that identifies a publication published in accordance with S1000D	CDM UoF Document
S1000DPublicationModuleIssue	Class	class	S1000DPublicationModuleIssue is a DocumentIssue that identifies a specific issue of a publication module published in accordance with S1000D.	CDM UoF Document
SafetyDocument	Class	class	SafetyDocument is a Document associated to the safety of an item.	S5000F UoF Safety
SafetyDocument	Class	class	SafetyDocument is a Document associated to the safety of an item.	S5000F UoF Safety
SafetyIssue	Class	class	SafetyIssue is a SafetyDocument reporting a safety issue	S5000F UoF Safety

Class name	Type	Stereotype	Definition	UoF
			associated to the safety of a Product, Service or Part (hardware or software) item.	
SafetyIssue	Class	class	SafetyIssue is a SafetyDocument reporting a safety issue associated to the safety of a Product, Service or Part (hardware or software) item.	S5000F UoF Safety
SafetyIssueEvent	Class	relationship	SafetyIssueEvent is a <<relationship>> that allows to associate a SafetyIssue to associated Events.	S5000F UoF Safety
SafetyItem	Interface	select	SafetyItem is a <<select>> interface that allows to identify an item to which as SafetyDocument applies.	S5000F UoF Safety
SafetyRequirement	Class	class	SafetyRequirement is a Requirement that has to be applied for safety purposes..	S5000F UoF Requirement
SafetyRequirement	Class	class	SafetyRequirement is a Requirement that has to be applied for safety purposes..	S5000F UoF Requirement
SafetyRequirementsDocument	Class	class	SafetyRequirementsDocument is a SafetyDocument that defines the necessary SafetyRequirements for a specific purpose.	S5000F UoF Safety
SafetyRequirementsDocument	Class	class	SafetyRequirementsDocument is a SafetyDocument that defines the necessary SafetyRequirements for a specific purpose.	S5000F UoF Safety
SafetyWarning	Class	class	SafetyWarning is a SafetyDocument that provides information about potential safety issues associated to a Product, service or hardware or software items.	S5000F UoF Safety
SafetyWarning	Class	class	SafetyWarning is a SafetyDocument that provides information about potential safety issues associated to a Product, service or hardware or software items.	S5000F UoF Safety
SCORMContentPackage	Class	class	SCORMContentPackage is a specialization of class Document and represents a SCORM content package.	S5000F UoF Document

Class name	Type	Stereotype	Definition	UoF
SCORMContentPackage	Class	class	SCORMContentPackage is a specialization of class Document and represents a SCORM content package.	S5000F UoF Document
SecurityAssignmentParty	Interface	extend	SecurityAssignmentParty is an <<extend>> interface that allows to assign Security clearances to specific Parties.	S5000F UoF Security Classification
SecurityClass	Class	class	SecurityClass is a <<class>> that identifies a level of confidentiality which can be used to protect something against unauthorized access.	CDM UoF Security Classification
SecurityClass	Class	class	SecurityClass is a <<class>> that identifies a level of confidentiality which can be used to protect something against unauthorized access.	CDM UoF Security Classification
SecurityClassification	Class	relationship	SecurityClassification is a <<relationship>> that associates a given SecurityClass with the item that must be protected against unauthorized access or distribution	CDM UoF Security Classification
SecurityClassificationItem	Interface	extend	SecurityClassificationItem is an <<extend>> interface that provides its associated data model to those classes that implement it.	CDM UoF Security Classification
Sensor	Class	class	Sensor is an individual SensorType that has a unique identity and can be used to measure values of a specific type.	S5000F UoF Serialized Product Health Monitoring
SensorSample	Class	class	SensorSample is a particular reading of an individual sensor at a specific point in time.	S5000F UoF Serialized Product Health Monitoring
SensorType	Class	class	SensorType is HardwarePartAsDesigned that measures physical events and provides the information to external devices.	S5000F UoF Serialized Product Health Monitoring
SensorType	Class	class	SensorType is HardwarePartAsDesigned that measures physical events and provides the information to external devices.	S5000F UoF Serialized Product Health Monitoring
SerializedAssertItem	Interface	select	SerializedAssertItem is a <<select>> interface that identifies classes from which an instance can be used as the	S5000F UoF Applicability Statement

Class name	Type	Stereotype	Definition	UoF
			EvaluationByAssertionOfSerializedItems assert item	
SerializedHardwarePart	Class	class	SerializedHardwarePart is <<class>> that represent an actual physical part which can be identified as an individual.	S5000F Specializations
SerializedHardwarePart	Class	class	SerializedHardwarePart is <<class>> that represent an actual physical part which can be identified as an individual.	S5000F Specializations
SerializedItem	Interface	extend	SerializedItem is an <<extend>> interface class representing all serialized items.	S5000F UoF Serialized Item
SerializedItemOwner	Class	relationship	SerializedItemOwner is a <<relationship>> describing the party holding the partial or total ownership of an item implementing the SerializedItem <<interface>>.	S5000F UoF Serialized Item
SerializedPartDesignAssociation	Class	relationship	SerializedPartDesignAssociation is a <<relationship>> that associates a SerializedHardwarePart to the HardwarePartAsDesigned that defines its functionality during a specific period of time.	S5000F UoF Part As Realized
SerializedPartsListPosition	Class	class	SerializedPartsListPosition is a <<class>> that represents a position within the associated SerializedHardwarePart.	CDM UoF Serialized Part Configuration
SerializedProductOperationalPeriod	Class	relationship	SerializedProductOperationalPeriod is a <<relationship>> that describes the specific operational role of a SerializedProductVariant during a particular operational period.	S5000F UoF Operational Period
SerializedProductVariant	Class	class	SerializedProductVariant is a <<class>> that represent an actual product variant which is identified as an individual.	S5000F Specializations
SerializedProductVariant	Class	class	SerializedProductVariant is a <<class>> that represent an actual product variant which is identified as an individual.	S5000F Specializations
SerializedProductVariantAssignment	Class	relationship	SerializedProductVariantAssignment is a <<relationship>> between a FleetTask and the vehicle that has been assigned to perform that	S5000F UoF Fleet Planning and Product Assignment

Class name	Type	Stereotype	Definition	UoF
			FleetTask.	
SerializedProductVariantConfigurationConformance	Class	relationship	SerializedProductVariantConfigurationConformance is a <<relationship>> that identifies the allowed product configuration to which the SerializedProductVariant complies with during a defined period of time.	CDM UoF Serialized Product Variant Configuration
SerializedProductVariantEnvironment	Class	relationship	SerializedProductVariantEnvironment is a <<relationship>> that determines in which Environment a SerializedProductVariant has operated during a specific period of time.	S5000F UoF Operational Environment
SerializedProductVariantInFleet	Class	relationship	SerializedProductVariantInFleet is a <<relationship>> that defines the association between a SerializedProductVariant and the Fleet to which it belongs.	S5000F UoF Fleet Definition
SerializedProductVariantOperatingBase	Class	relationship	SerializedProductVariantOperatingBase is a <<relationship>> that establishes in which OperatingBase a SerializedProductVariant has been operating during a specific period of time.	S5000F UoF Operating Base
SerializedProductVariantOperator	Class	relationship	SerializedProductVariantOperator is a <<relationship>> defining the operation of a SerializedProductVariant during a specific period of time.	S5000F UoF Operator
SerializedProductVariantZone	Class	relationship	SerializedProductVariantZone is a <<relationship>> that allows to associate a Damage to a serialied ProductVariantZone.	S5000F UoF Damage
SerializedSupportEquipment	Class	class	SerializedSupportEquipment is a SerialiedHardwarePart that is used exclusively for support purposes.	S5000F UoF Support Equipment
SerializedSupportEquipment	Class	class	SerializedSupportEquipment is a SerialiedHardwarePart that is used exclusively for support purposes.	S5000F UoF Support Equipment
SerialNumberRange	Class	compoundAttribute	SerialNumberRange is a <<compoundAttribute>> that identifies an interval of serialized items.	S-Series Compound Attributes

Class name	Type	Stereotype	Definition	UoF
SerialNumberRange	Class	compoundAttribute	SerialNumberRange is a <<compoundAttribute>> that identifies an interval of serialized items.	S-Series Compound Attributes
SerialNumberRange	Class	compoundAttribute	SerialNumberRange is a <<compoundAttribute>> that identifies an interval of serialized items.	S-Series Compound Attributes
Service	Class	class	A Service is a contract where technical or intellectual work is performed but no delivery of goods takes place.	S5000F UoF Service Contract Management
Service	Class	class	A Service is a contract where technical or intellectual work is performed but no delivery of goods takes place.	S5000F UoF Service Contract Management
ServiceBulletin	Class	class	ServiceBulletin is a class representing a set of documentation, material, spares and possibly other resources required to embody a change embodiment requirement into a ProductVariant or SerializedProductVariant.	S5000F UoF Change Embodiment
ServiceBulletin	Class	class	ServiceBulletin is a class representing a set of documentation, material, spares and possibly other resources required to embody a change embodiment requirement into a ProductVariant or SerializedProductVariant.	S5000F UoF Change Embodiment
ServiceContract	Class	relationship	ServiceContract is a <<relationship>> that allows a service being provided to be associated to a specific contract.	S5000F UoF Service Contract Management
ServiceItem	Interface	select	SericeItem is a <<select>> interface that allows to define the items for which a service can be requested.	S5000F UoF Service Request
ServiceLevelAgreementClause	Class	class	ServiceLevelAgreementClause is a contractual clause related to a service that determines the level of service to be provided.	S5000F UoF Service Contract Management

Class name	Type	Stereotype	Definition	UoF
ServiceRelationship	Class	relationship	ServiceRelationship is a <<relationship>> that allows to associate two Services.	S5000F UoF Service Contract Management
ServiceRequest	Class	class	ServiceRequest is a class representing a demand from one party to another partyto provide a service.	S5000F UoF Service Request
ServiceRequestCancellation	Class	class	ServiceRequestCancellation is a <<class>> that allows to cancel one or more Services by a Party.	S5000F UoF Service Request
ServiceRequestCancellation	Class	class	ServiceRequestCancellation is a <<class>> that allows to cancel one or more Services by a Party.	S5000F UoF Service Request
ServiceRequestItem	Class	relationship	ServiceRequestItem is a <<relationship>> that allows to associate one or several items of a same type to a ServiceRequest.	S5000F UoF Service Request
ServiceRequestLocation	Class	relationship	ServiceRequestLocation is a <<relationship>> stating the locating where a ServiceRequest has to be complied with.	S5000F UoF Service Request
ServiceRequestParty	Class	relationship	ServiceRequestParty is a <<relationship>> that associates a ServiceRequest to the party that has demanded it or has to provide it.	S5000F UoF Service Request
ServiceRequestRelationship	Class	relationship	ServiceRequestRelationship is a <<relationship>> that indicates the association between two different ServiceRequests.	S5000F UoF Service Request
ShopFindings	Class	class	ShopFindings is a class representing the results of a fault investigation performed on an equipment in a workshop.	S5000F UoF Shop Findings
ShopFindingsDeterminedBy	Class	relationship	ShopFindingsDeterminedBy is a <<relationship>> that allows ShopFindings to be associated to the DetectionMeans that allowed such findings.	S5000F UoF Shop Findings
Skill	Class	class	Skill is a <<class>> that represents an ability required to perform a task.	CDM UoF Competence Definition

Class name	Type	Stereotype	Definition	UoF
Skill	Class	class	Skill is a <<class>> that represents an ability required to perform a task.	CDM UoF Competence Definition
SkillLevel	Class	class	SkillLevel is a <<class>> that represents a defined proficiency of a Trade.	CDM UoF Competence Definition
SoftwareElement	Class	class	SoftwareElement is a BreakdownElement that is realized as a SoftwarePartAsDesigned.	CDM UoF Software Element
SoftwareElement	Class	class	SoftwareElement is a BreakdownElement that is realized as a SoftwarePartAsDesigned.	CDM UoF Software Element
SoftwareElementPartRealization	Class	relationship	SoftwareElementPartRealization is a <<relationship>> where a SoftwareElementRevision relates to an instance of SoftwarePartAsDesigned which fulfills the SoftwareElement specification.	CDM UoF Software Element
SoftwareElementRevision	Class	class	SoftwareElementRevision is a BreakdownElementRevision representing an iteration applied to a SoftwareElement.	CDM UoF Software Element
SoftwareError	Class	class	SoftwareError is a <<class>> that represents a fault detected during the execution of a SoftwarePartAsReleased.	S5000F UoF Software
SoftwareError	Class	class	SoftwareError is a <<class>> that represents a fault detected during the execution of a SoftwarePartAsReleased.	S5000F UoF Software
SoftwareErrorOS	Class	relationship	SoftwareErrorOS is a <<relationship>> that indicates the operating system on which a SoftwarePartAsReleased was executing when a SoftwareError was detected.	S5000F UoF Software

Class name	Type	Stereotype	Definition	UoF
SoftwareErrorPlatform	Class	relationship	SoftwareErrorPlatform is a <<relationship>> that indicates the HardwarePartAsDesigned on which a SoftwarePartAsReleased was executing when a SoftwareError was detected.	S5000F UoF Software
SoftwareOS	Class	relationship	SoftwareOS is a <<relationship>> that defines the operating system on which a SoftwarePartAsReleased executes.	S5000F UoF Software
SoftwarePartAsDesigned	Class	class	SoftwarePartAsDesigned is a PartAsDesigned that is produced as an executable software or as a data file.	CDM UoF Part Definition
SoftwarePartAsDesigned	Class	class	SoftwarePartAsDesigned is a PartAsDesigned that is produced as an executable software or as a data file.	CDM UoF Part Definition
SoftwarePartAsReleased	Class	class	SoftwarePartAsReleased is <<class>> that represents actual build of a software which is delivered.	S5000F Specializations
SoftwarePartAsReleased	Class	class	SoftwarePartAsReleased is <<class>> that represents actual build of a software which is delivered.	S5000F Specializations
SoftwarePlatform	Class	relationship	SoftwarePlatform is a <<relationship>> that indicates the HardwarePartAsDesigned on which a SoftwarePartAsReleased can execute.	S5000F UoF Software
SpecialSafetyInstruction	Class	class	SpecialSafetyInstruction is a SafetyDocument providing specific mandatory instructions to be followed in addition to those existing in the standard documentation so as that special safety issues can be addressed.	S5000F UoF Safety
SpecialSafetyInstruction	Class	class	SpecialSafetyInstruction is a SafetyDocument providing specific mandatory instructions to be followed in addition to those existing in the standard documentation so as that special safety issues can be addressed.	S5000F UoF Safety
Sphere	Class	compoundAtt	Sphere represents a three-dimensional object where every point on	S-Series Compound Attributes

Class name	Type	Stereotype	Definition	UoF
		ribute	its surface is equidistant from its center.	
StoredPart	Interface	extend	StoredPart is an <<extend>> interface that provides the capability to associate a Part the Warehouse where it is stored.	S5000F UoF Warehouse and Spare Pool
StrainGauge	Class	class	StrainGauge is a SensorType whose resistance varies with applied force; it converts force, pressure, tension, weight, etc, into a change in electrical resistance which can then be measured.	S5000F UoF Serialized Product Health Monitoring
StrainGauge	Class	class	StrainGauge is a SensorType whose resistance varies with applied force; it converts force, pressure, tension, weight, etc, into a change in electrical resistance which can then be measured.	S5000F UoF Serialized Product Health Monitoring
StreetAddress	Class	class	StreetAddress is a <<class> that represents a locatable position along a road.	CDM UoF Location
StreetAddress	Class	class	StreetAddress is a <<class> that represents a locatable position along a road.	CDM UoF Location
SubjectOfPoliciesAndRegulations	Interface	select	SubjectofPoliciesAndRegulations is a <<select>> interface that allows to associate policies and regulations to the items to which they apply.	S5000F UoF Policies and Regulations
SubstanceDefinition	Class	class	SubstanceDefinition is a <<class>> that identifies high concern physical matter.	CDM UoF Part Definition
SubstanceDefinition	Class	class	SubstanceDefinition is a <<class>> that identifies high concern physical matter.	CDM UoF Part Definition
SubstitutePartAsDesigned	Class	relationship	SubstitutePartAsDesigned is a <<relationship>> that defines a substitute PartAsDesignedPartsListEntry which can replace the base PartAsDesignedPartsListEntry in the context of the parent PartAsDesignedPartsList.	CDM UoF Part Definition
Subtask	Class	class	Subtask is a <<class>> that represents the specification of a work	CDM UoF Task

Class name	Type	Stereotype	Definition	UoF
			step that is to be performed as part of a Task.	
SubtaskInZone	Class	relationship	SubtaskInZone is a <<relationship>> that identifies the zone where the Subtask is to be performed.	CDM UoF Task
SubtaskTimeline	Class	relationship	SubtaskTimeline is a <<relationship>> that identifies that there is a time dependency between two Subtasks within the same Task	CDM UoF Task
SubtaskWarningCautionNote	Class	relationship	SubtaskWarningCautionNote is a <<relationship>> that identifies a WarningCautionNote that is associated with a given Subtask	CDM UoF Task
SuppliesUsed	Class	relationship	SuppliesUsed is a <<relationship>> that describes the amount of supplies used for a MaintenanceActivity.	S5000F UoF Maintenance Activity
SupplyItem	Interface	select	SupplyItem is a <<select>> interface representing an item that is used for maintenance or operation.	S5000F UoF Supply Item
SupportEquipment	Class	class	SupportEquipment is a HardwareElement used exclusively for support purposes.	S5000F UoF Maintenance Activity
SupportEquipment	Class	class	SupportEquipment is a HardwareElement used exclusively for support purposes.	S5000F UoF Maintenance Activity
SupportEquipmentItem	Interface	select	SupportEquipmentItem is a <<select>> interface that allows to choose between a generic SupportEquipment or a SerializedSupportEquipment.	S5000F UoF Support Equipment
SupportEquipmentUsed	Class	relationship	SupportEquipmentUsed is a <<relationship>> that defines the equipment that has been used to perform a specific MaintenanceActivity.	S5000F UoF Maintenance Activity
Tachometer	Class	class	Tachometer is a SensorType that measures revolutions of a rotating item.	S5000F UoF Serialized Product Health Monitoring
Tachometer	Class	class	Tachometer is a SensorType that measures revolutions of a rotating	S5000F UoF Serialized Product

Class name	Type	Stereotype	Definition	UoF
			item.	Health Monitoring
Task	Class	class	Task is a <<class>> that represents the specification of work to be done or undertaken.	CDM UoF Task
TaskPersonnelResourceCompetence	Class	relationship	TaskPersonnelResourceCompetence is a <<relationship>> that identifies the proficiency required for TaskPersonnelResource.	CDM UoF Task Resource
TaskRequirement	Class	class	TaskRequirement is a <<class>> that represents the need for a procedure to be developed and documented.	CDM UoF Task Requirement
TaskRequirement	Class	class	TaskRequirement is a <<class>> that represents the need for a procedure to be developed and documented.	CDM UoF Task Requirement
TaskRequirementRevision	Class	class	TaskRequirementRevision is a <<class>> representing an iteration applied to a TaskRequirement.	CDM UoF Task Requirement
TaskResource	Class	class	TaskResource is a <<class>> that identifies means that have to be available to perform a specified amount of work.	CDM UoF Task Resource
TaskRevision	Class	class	TaskRevision is a <<class>> representing an iteration applied to a Task.	CDM UoF Task
TaskRevisionWarningCautionNote	Class	relationship	TaskRevisionWarningCautionNote is a <<relationship>> that identifies a WarningCautionNote that is associated with a given Task	CDM UoF Task
TaskUsage	Class	relationship	TaskUsage is a <<relationship>> that identifies a Task required for the TaskAnalysisItem.	CDM UoF Task Usage
TechnicalOrder	Class	class	TechnicalOrder is a WorkItem raised by Maintenance Engineering to carry out a change or maintenance on a SerializedItem.	S5000F UoF Change Embodiment
TechnicalOrder	Class	class	TechnicalOrder is a WorkItem raised by Maintenance Engineering to carry out a change or maintenance on a SerializedItem.	S5000F UoF Change Embodiment
TechnicalOrderEmbodied	Class	relationship	TechnicalOrderEmbodied is a <<relationship>> that allows to report	S5000F UoF Change Embodiment

Class name	Type	Stereotype	Definition	UoF
			the WorkOrder that embodies a TechnicalOrder on the item on which it needs to be embodied.	Reporting
TemperatureSensor	Class	class	TemperatureSensor is a SensorType that measures temperature.	S5000F UoF Serialized Product Health Monitoring
TemperatureSensor	Class	class	TemperatureSensor is a SensorType that measures temperature.	S5000F UoF Serialized Product Health Monitoring
ThreeDimensional	Class	compoundAttribute	ThreeDimensional is a <<compoundAttribute>> that represents spatial magnitudes.	S-Series Compound Attributes
ThreeDimensional	Class	compoundAttribute	ThreeDimensional is a <<compoundAttribute>> that represents spatial magnitudes.	S-Series Compound Attributes
ThreeDimensional	Class	compoundAttribute	ThreeDimensional is a <<compoundAttribute>> that represents spatial magnitudes.	S-Series Compound Attributes
ThreeDimensional	Class	compoundAttribute	ThreeDimensional is a <<compoundAttribute>> that represents spatial magnitudes.	S-Series Compound Attributes
ThresholdDefinition	Class	class	ThresholdDefinition is a <<class>> that represents the circumstance that is used as a trigger or threshold.	CDM UoF Time Limit
TimeOffset	Class	attributeGroup	TimeOffset is an <<attributeGroup>> that specifies an oriented offset from Coordinated Universal Time.	S_Series_Primitives_2-0_001-00
TimeStampedClassification	Class	compoundAttribute	TimeStampedClassification is <<compoundAttribute>> that represents a classification in conjunction with its recording time stamp.	S-Series Compound Attributes
TimeStampedClassification	Class	compoundAttribute	TimeStampedClassification is <<compoundAttribute>> that represents a classification in conjunction with its recording time stamp.	S-Series Compound Attributes

Class name	Type	Stereotype	Definition	UoF
TimeStampedClassification	Class	compoundAttribute	TimeStampedClassification is <<compoundAttribute>> that represents a classification in conjunction with its recording time stamp.	S-Series Compound Attributes
TrackablePart	Interface	extend	TrackablePart is an <<extend>> interface for those items against which actions performed need to be recorded.	S5000F UoF Change Embodiment Planning
Trade	Class	class	Trade is a <<class>> that represents a craft or profession.	CDM UoF Competence Definition
Trade	Class	class	Trade is a <<class>> that represents a craft or profession.	CDM UoF Competence Definition
TransportableItem	Interface	select	TransportableItem is a <<select>> interface that allows to define an item that can be transported.	S5000F UoF Transportable Item
TransportCapability	Class	class	TransportCapability is a Capability associated to the capacity of transporting things.	S5000F UoF Transporting Asset
TransportCapability	Class	class	TransportCapability is a Capability associated to the capacity of transporting things.	S5000F UoF Transporting Asset
TransportCapabilityUsage	Class	relationship	TransportCapabilityUsage is a <<relationship>> that allows to associate a TransportCapability with the TransportableItems that it transports at a certain moment in time.	S5000F UoF Transporting Asset
TransportFeatures	Interface	extend	TransportFeatures is an <<extend>> interface that allows to associate specific transport features to transportable items.	S5000F UoF Transportable Item
TransportingAsset	Interface	extend	TransportingAsset is an <<extend>> interfaces that allows to associate a TransportCapability to an item.	S5000F UoF Transporting Asset
TransportNetwork	Class	class	TransportNetwork is an Infrastructure used to transport items.	S5000F UoF Infrastructure
TransportNetwork	Class	class	TransportNetwork is an Infrastructure used to transport items.	S5000F UoF Infrastructure
TransportPosition	Interface	select	TransportPosition is a <<select>> interface that allows to identify	S5000F UoF Transporting Asset

Class name	Type	Stereotype	Definition	UoF
			where a TransportableItem is positioned during a transport.	
TransportRequirement	Class	class	TransportRequirement is a Requirement defining the condictions under which a TransportableItem can be transported.	S5000F UoF Transportable Item
Triangle	Class	compoundAttribute	Triangle is a <<class>> representing a geometrical plane figure with three straight sides and three angles.	S5000F Compound Attributes
TypeOfPerson	Class	class	TypeOfPerson is a <<class>> representing a neutral non-individual person that presents a set of shared common characteristics of multiple Persons.	S5000F UoF Type of Person
UpgradeRequirement	Class	class	UpgradeRequirement is a Requirement that must be applied during the embodiment of a change (upgrade).	S5000F UoF Requirement
UpgradeRequirement	Class	class	UpgradeRequirement is a Requirement that must be applied during the embodiment of a change (upgrade).	S5000F UoF Requirement
UsableOnItem	Interface	extend	UsableOnItem is an <<extend>> interface that provides its associated data model to those classes that can have a limited effectivity with respect to its usage in one or many instances of ProductVariant.	CDM UoF Product Design Configuration
UsableOnProductVariant	Class	relationship	UsableOnProductVariant is a <<relationship>> that defines that a UsableOnItem, included in the Breakdown for the overall Product, is effective in the associated ProductVariant.	CDM UoF Product Design Configuration
Warehouse	Class	class	Warehouse is a Facility used to store parts.	S5000F UoF Facility
Warehouse	Class	class	Warehouse is a Facility used to store parts.	S5000F UoF Facility
WarrantyClaim	Class	class	WarrantyClaim is a class representing a customer's claim for repair or replacement of a defective item or non-performance of that item as established in a warranty contract.	S5000F UoF Warranty

Class name	Type	Stereotype	Definition	UoF
WarrantyClaim	Class	class	WarrantyClaim is a class representing a customer's claim for repair or replacement of a defective item or non-performance of that item as established in a warranty contract.	S5000F UoF Warranty
WarrantyClaimContact	Class	relationship	WarrantyClaimContact is a <<relationship>> that associates a WarrantyClaim to a Party.	S5000F UoF Warranty
WarrantyClaimEvents	Class	relationship	WarrantyClaimEvents is a <<relationship>> that associates WarrantyClaims to WarrantyEvents.	S5000F UoF Warranty
WarrantyClaimFollowUp	Class	class	WarrantyClaimFollowUp is a class that represents any follow-up associated to a WarrantyClaim.	S5000F UoF Warranty
WarrantyClaimResolution	Class	class	WarrantyClaimResolution is a class that represents the conclusion of the WarrantyClaim.	S5000F UoF Warranty
WarrantyEvent	Class	class	WarrantyEvent is an Event that has as the consequence that a WarrantyClaim is raised.	S5000F UoF Warranty
WarrantyEvent	Class	class	WarrantyEvent is an Event that has as the consequence that a WarrantyClaim is raised.	S5000F UoF Warranty
WarrantyItem	Interface	select	WarrantyItem is a <<select>> interface that allows to define the items that are subject to Warranty or on which a Warranty Event occurs.	S5000F UoF Warranty
WorkBreakdown	Class	class	WorkBreakdown is a class used to group all the different activities associated to a particular purpose.	S5000F UoF Work Breakdown
WorkBreakdownContext	Interface	extend	WorkBreakDownContext is an <<extend>> interface that allows to associated workBreakDowns to individual items.	S5000F UoF Work Breakdown
WorkBreakdownRelationship	Class	relationship	WorkBreakdownRelationship is a <<relationship>> that allows to associate different WorkBreakdowns.	S5000F UoF Work Breakdown

Class name	Type	Stereotype	Definition	UoF
WorkBreakdownRevision	Class	class	WorkBreakdownRevision is an iteration that is applied to a WorkBreakdown.	S5000F UoF Work Breakdown
WorkItem	Class	class	A WorkItem is a generic concept defined to group individual activities for planning, costing or program management purposes.	S5000F UoF Work Breakdown
WorkItem	Class	class	A WorkItem is a generic concept defined to group individual activities for planning, costing or program management purposes.	S5000F UoF Work Breakdown
WorkItemRelationship	Class	relationship	WorkItemRelationship is a <<relationship>> that establishes the association between two instances of WorkItem. The class allows to define both hierarchical associations and time-dependent associations. For hierarchical associations, it defines the pa	S5000F UoF Work Breakdown
WorkOrder	Class	class	WorkOrder is an instruction to perform maintenance work on a SerializedItem.	S5000F UoF Maintenance Activity
ZoneElement	Class	class	ZoneElement is a BreakdownElement that represents a three-dimensional space related to a Product.	CDM UoF Zone Element
ZoneElement	Class	class	ZoneElement is a BreakdownElement that represents a three-dimensional space related to a Product.	CDM UoF Zone Element
ZoneElementRevision	Class	class	ZoneElementRevision is a BreakdownElementRevision representing an iteration applied to a ZoneElement.	CDM UoF Zone Element

3 Data element list

The full list of S5000F data elements is provided in Table 3 List of data elements

. This includes data elements from SX002D used by S5000F but defined in SX001G.

Table 3 List of data elements

is organized alphabetically by the data element name, and contains:

- Data element name
- Data element data type (refer to Chap 16 on more details on data types used in S5000F)
- Data element definition contains a textual definition.
- Class name identifies the classes in the S5000F data model where the data element is used as an attribute (Chap 16).
- Unit of Functionality (UoF), identifies the section in Chap 16 where the Class is defined. If the UoF name is preceded by “CDM”, then the UoF is originally defined in SX002D.

For completeness, the data elements of the UoFs used as is from SX002D are also listed in this specification, The UoFs from SX002D used by this specification are listed in Chap 16.

A mapping of the classes and attributes required for the individual use cases can be found in Chap 20.

Table 3 List of data elements

Attribute name	Type	Definition	Class name	UoF
actionCloseDate	DateType	actionCloseDate is the date at which the action was closed.	Action	S5000F UoF Event
actionCreationDate	DateType	actionCreationDate is the date at which the action is created.	Action	S5000F UoF Event
actionDescription	DescriptorType	actionDescription is a textual description of a taken action.	Action	S5000F UoF Event
actionIdentifier	IdentifierType	actionIdentifier is a string of characters used to uniquely identify an Action and to differentiate it from other Actions.	Action	S5000F UoF Event
actionPriority	ClassificationType	actionPriority is a classification that determines the urgency of an action.	Action	S5000F UoF Event
actionScheduledDate	DateType	actionScheduledDate is the date for which the action is scheduled.	Action	S5000F UoF Event
actionType	ClassificationType	actionType is a classification that characterizes an Action.	Action	S5000F UoF Event
additionalAddressInformation	DescriptorType	additionalAddressInformation is a description that provides additional information to further locate an address.	StreetAddress	CDM UoF Location

Attribute name	Type	Definition	Class name	UoF
aggregatedElementType	ClassificationType	aggregatedElementType is a classification that identifies further specialization for an AggregatedElement.	AggregatedElement	CDM UoF Aggregated Element
allowedProductConfigurationIdentifier	IdentifierType	allowedProductConfigurationIdentifier is an identifier that establishes a unique designator for a AllowedProductConfigurationByConfigurationIdentifier and to differentiate it from other instances of AllowedProductConfigurationByConfigurationIdentifier.	AllowedProductConfigurationByConfigurationIdentifier	CDM UoF Product Design Configuration
allowedProductConfigurationPhysicalDataDimensions	ThreeDimensional	allowedProductConfigurationPhysicalDataDimensions are the dimensions of a ProductVariant when it is in a specific AllowedProductConfiguration.	AllowedProductConfigurationPhysicalData	S5000F UoF Operational Roles
allowedProductConfigurationPhysicalDataParameter	PropertyType	allowedProductConfigurationPhysicalDataParameter is a parameter of a ProductVariant that varies when when it is in a specific AllowedProductConfiguration.	AllowedProductConfigurationPhysicalData	S5000F UoF Operational Roles
allowedProductConfigurationPhysicalDataWeight	NumericalPropertyType	allowedProductConfigurationPhysicalDataWeight is the weight of a ProductVariant when it is in a specific AllowedProductConfiguration.	AllowedProductConfigurationPhysicalData	S5000F UoF Operational Roles
allowedRoleChangeDuration	NumericalPropertyType	allowedRoleChangeDuration is the time that it takes to change from one specific OperationalRole to a different associated OperationalRole.	AllowedRoleChange	S5000F UoF Operational Roles
altitude	umlString	altitude is a string of characters that represents the height above or below a fixed reference point.	GlobalPosition	CDM UoF Location
anchoringPointFixed	umlBoolean	anchoringPointFixed is a <<boolean>> that indicates whether an anchoring point is permanent or can be removed.	AnchoringPoint	S5000F UoF Transport Anchoring Point
anchoringPointIdentifier	IdentifierType	anchoringPointIdentifier is a string of text that allows to uniquely identify an AnchoringPoint and differentiate it from other AnchoringPoints.	AnchoringPoint	S5000F UoF Transport Anchoring Point

Attribute name	Type	Definition	Class name	UoF
anchoringPointMaxLoad	NumericalPropertyType	anchoringPointMaxLoad is the maximum load that can be applied to an anchoring point.	AnchoringPoint	S5000F UoF Transport Anchoring Point
applicabilityStatementDateRange	DateRange	applicabilityStatementDateRange is a date range that defines the date interval for when the applicabillity evaluation can result in a TRUE result.	ApplicabilityStatement	S5000F UoF Applicability Statement
applicabilityStatementDescription	DescriptorType	applicabilityStatementDescription is a description that provides a human readable expression of the defined rule.	ApplicabilityStatement	S5000F UoF Applicability Statement
applicabilityStatementIdentifier	IdentifierType	applicabilityStatementIdentifier is an identifier that establishes a unique designator for an ApplicabilityStatement and to differentiate it from other instances of ApplicabilityStatement.	ApplicabilityStatement	S5000F UoF Applicability Statement
applicableSerialNumberRange	SerialNumberRange	applicableSerialNumberRange is a serial number range that identifies a limited effectivity with respect to a given interval of serialized items.	UsableOnProductVariant	CDM UoF Product Design Configuration
			EvaluationByAssertionOfSerializedItems	S5000F UoF Applicability Statement
			EffectiveOnProductConfiguration	CDM UoF Product Design Configuration
assembly	umlString	assembly is a string of characters that represents the unit or assembly attribute of the data module code.	S1000DDataModule	CDM UoF Document
assertValueRelationalOperator	ClassificationType	assertValueRelationalOperator is a classification that identifies a mathematical operation to be applied when testing a value against a defined conditionTypeAssertMemberAssertValue.	ConditionTypeAssertMember	S5000F UoF Applicability Statement
authorityToOperateIdentifier	IdentifierType	authorityToOperateIdentifier is an identifier that establishes a unique designator for an AuthorityToOperate and to differentiate it from other instances of AuthorityToOperate.	AuthorityToOperate	CDM UoF Product Design Configuration

Attribute name	Type	Definition	Class name	UoF
authorizedLifeValue	PropertyType	authorizedLifeValue is a property that specifies the maximum usage limit.	AuthorizedLife	S-Series Compound Attributes
availabilityDates	DateRange	availabilityDates is a period of time for which the availability of an AvailabilityItem is reported.	Availability	S5000F UoF Availability
availabilityDescription	DescriptorType	availabilityDescription is a narrative statement clarifying the status of the Availability.	Availability	S5000F UoF Availability
availabilityIdentifier	IdentifierType	availabilityIdentifier is a string of text that uniquely identifies an Availability entry and allows to differentiate it from other SerializedProductVariantAvailability entries.	Availability	S5000F UoF Availability
availabilityReportingDate	DateType	availabilityReportingDate is the date at which the Availability was reported.	Availability	S5000F UoF Availability
availabilityStatus	StateType	availabilityStatus is a classification that indicates the availability of an AvailabilityItem at a specific date.	Availability	S5000F UoF Availability
base	PropertyType	base is the longest side of a triangle.	Triangle	S5000F Compound Attributes
batchHardwarePartLife	AuthorizedLife	batchHardwarePartLife is the AuthorizedLife for a BatchHardwarePart.	BatchHardwarePart	S5000F Specializations
batchHardwarePartManufacturingDate	DateType	batchHardwarePartManufacturingDate is a Date at which a BatchHardwarePart was manufactured.	BatchHardwarePart	S5000F Specializations
breakdownElementEssentiality	ClassificationType	breakdownElementEssentiality is a classification that identifies the operational importance of the BreakdownElement at the Product level.	BreakdownElement	CDM UoF Breakdown Structure

Attribute name	Type	Definition	Class name	UoF
breakdownElementIdentifier	IdentifierType	breakdownElementIdentifier is an identifier that establishes a unique designator for a BreakdownElement and to differentiate it from other instances of BreakdownElement.	BreakdownElement	CDM UoF Breakdown Structure
breakdownElementName	NameType	breakdownElementName is a name by which the BreakdownElement is known and can be easily referenced.	BreakdownElement	CDM UoF Breakdown Structure
breakdownElementRevisionIdentifier	IdentifierType	breakdownElementRevisionIdentifier is an identifier that establishes a unique designator for a BreakdownElementRevision and to differentiate it from other instances of BreakdownElementRevision.	BreakdownElementRevision	CDM UoF Breakdown Structure
breakdownElementRevisionRelationshipType	ClassificationType	breakdownElementRevisionRelationshipType is a classification that identifies the meaning of the established relationship.	BreakdownElementRevisionRelationship	CDM UoF Breakdown Structure
breakdownElementRevisionStatus	StateType	breakdownElementRevisionStatus is a state that identifies the maturity of a BreakdownElementRevision.	BreakdownElementRevision	CDM UoF Breakdown Structure
breakdownElementUsageIdentifier	IdentifierType	breakdownElementUsageIdentifier is an identifier that establishes a unique designator for a BreakdownElementUsageInBreakdown and to differentiate it from other instances of BreakdownElementUsageInBreakdown.	BreakdownElementUsageInBreakdown	CDM UoF Breakdown Structure
breakdownElementUsageQuantity	PropertyType	breakdownElementUsageQuantity is a property that specifies the amount of the BreakdownElement used in its parent.	BreakdownElementUsageInBreakdown	CDM UoF Breakdown Structure
breakdownElementUsageRelationshipType	ClassificationType	breakdownElementUsageRelationshipType is a classification that identifies the meaning of the established relationship.	BreakdownElementUsageRelationship	CDM UoF Breakdown Structure
breakdownRevisionIdentifier	IdentifierType	breakdownRevisionIdentifier is an identifier that establishes a unique designator for a BreakdownRevision and to differentiate it from other instances of BreakdownRevision.	BreakdownRevision	CDM UoF Breakdown Structure

Attribute name	Type	Definition	Class name	UoF
breakdownRevisionStatus	StateType	breakdownRevisionStatus is a state that identifies the maturity of a BreakdownRevision.	BreakdownRevision	CDM UoF Breakdown Structure
breakdownType	ClassificationType	breakdownType is a classification that identifies the perspective from which the Breakdown is defined.	Breakdown	CDM UoF Breakdown Structure
budgetApprovedDate	DateType	budgetApprovedDate is the date at which a Budget was approved.	Budget	S5000F UoF Budget
budgetApprovedStatus	StateType	budgetApprovedStatus is the state at which a Budget proposal is.	Budget	S5000F UoF Budget
budgetDate	DateType	budgetDateTime is the date at which the budget was released.	Budget	S5000F UoF Budget
budgetDescription	DescriptorType	budgetDescription is a textual narrative explaining the Budget.	Budget	S5000F UoF Budget
budgetIdentifier	IdentifierType	budgetIdentifier is a string of text that uniquely identifies the Budget and allows to differentiate it from other Budgets.	Budget	S5000F UoF Budget
budgetName	DescriptorType	budgetName is a word or phrase by which the budget is commonly known.	Budget	S5000F UoF Budget
budgetType	ClassificationType	budgetType is a <<classification>> that allows to group similar Budgets.	Budget	S5000F UoF Budget
budgetValidUntilDate	DateType	budgetValidUntilDate is a date until which the budget is valid.	Budget	S5000F UoF Budget
calibrationDocumentType	ClassificationType	calibrationDocumentType is a <<classification>> that indicates the kind of relationship that is established between a Calibration and an associated Document.	CalibrationDocument	S5000F UoF Equipment Calibration Certificate Information
calibrationIdentifier	IdentifierType	calibrationIdentifier is an identifier that establishes an unique designator for a Calibration and to differentiate it from other instances of Calibration.	Calibration	S5000F UoF Equipment Calibration Certificate Information

Attribute name	Type	Definition	Class name	UoF
calibrationMeasurementNotes	DescriptorType	calibrationMeasurementNotes is a descriptive text that provides additional information to a specific CalibrationMeasurement.	CalibrationMeasurement	S5000F UoF Equipment Calibration Certificate Information
calibrationMeasurementPattern	NumericalPropertyType	calibrationMeasurementPattern is a <<numericPropertyType>> that provides the reference value used to calibrate or verify an instrument or measurement device.	CalibrationMeasurement	S5000F UoF Equipment Calibration Certificate Information
calibrationMeasurementReading	NumericalPropertyType	calibrationMeasurementReading is a <<numericPropertyType>> that provides the actual value obtained during calibration or verification of an instrument or measurement device.	CalibrationMeasurement	S5000F UoF Equipment Calibration Certificate Information
calibrationNotes	DescriptorType	calibrationNotes is a textual description of noteworthy items associated to the calibration performed on a specific date.	Calibration	S5000F UoF Equipment Calibration Certificate Information
calibrationResult	PropertyType	calibrationResult is a <<PropertyType>> that documents the result of the calibration.	Calibration	S5000F UoF Equipment Calibration Certificate Information
calibrationUncertainty	PropertyType	calibrationUncertainty is a <<PropertyType>> that defines the uncertainty of the calibration.	Calibration	S5000F UoF Equipment Calibration Certificate Information
capabilityDescription	DescriptorType	capabilityDescription is a narrative statement explaining the capability.	Capability	S5000F UoF Capability
capabilityIdentifier	IdentifierType	capabilityIdentifier is a string of characters that uniquely identifies a specific capability.	Capability	S5000F UoF Capability
capabilityLimitationDuration	DateRange	capabilityLimitationDuration is the period of time during which a Capability is limited.	CapabilityLimitation	S5000F UoF Capability
capabilityLimitationIde	IdentifierType	capabilityLimitationIdentifier is a <<compositeKey>> that allows	CapabilityLimitation	S5000F UoF Capability

Attribute name	Type	Definition	Class name	UoF
ntifier		with a master key to uniquely identify a CapabilityLimitation.		
capabilityLimitationName	NameType	capabilityLimitationName is a name by which the CapabilityLimitation is known and can be easily referenced.	CapabilityLimitation	S5000F UoF Capability
capabilityLimitationType	ClassificationType	capabilityLimitationType is a <<classification>> that allows to group similar CapabilityLimitations.	CapabilityLimitation	S5000F UoF Capability
capabilityLimitationValue	PropertyType	capabilityLimitationValue is a value that measures the CapabilityLimitation.	CapabilityLimitation	S5000F UoF Capability
capabilityName	NameType	capabilityName is a string of characters that represents the name under which the Capability is referenced or is known.	Capability	S5000F UoF Capability
capabilityType	ClassificationType	capabilityType is a <<classification» that allows to group different Capabilities in accordance with a same Capability purpose.	Capability	S5000F UoF Capability
cargoItemDescription	DescriptorType	cargoItemDescription is a narrative statement explaining the CargoItem.	CargoItem	S5000F UoF Transportable Item
cargoItemIdentifier	IdentifierType	cargoItemIdentifier is a string of text that allows to uniquely identify a CargoItem and differentiate it from other CargoItems.	CargoItem	S5000F UoF Transportable Item
cargoItemName	TextPropertyType	cargoItemName is a text by which a CargoItem is commonly known.	CargoItem	S5000F UoF Transportable Item
cargoItemStackable	umlBoolean	cargoItemStackable is a boolean that indicates whether a CargoItem can be stacked.	CargoItem	S5000F UoF Transportable Item
cargoItemUnitaryDimensions	ThreeDimensional	cargoItemUnitaryDimensions represents the dimensions (length, width and height) or each individual unit that forms part of the CargoItem.	CargoItem	S5000F UoF Transportable Item
cargoItemUnitaryWeight	NumericalPropertyType	cargoItemUnitaryWeight represents the weight of each individual unit that forms the CargoItem.	CargoItem	S5000F UoF Transportable Item

Attribute name	Type	Definition	Class name	UoF
cargoItemUnits	umlInteger	cargoItemUnits is an integer that represents the number of units of a same type that a CargoItem represents.	CargoItem	S5000F UoF Transportable Item
changeAuthorizationIdentifier	IdentifierType	changeAuthorizationIdentifier is an identifier that establishes a unique designator for a ChangeAuthorization and allows it to be differentiated from other instances of ChangeAuthorization.	ChangeAuthorization	CDM UoF Change Information
changeEmbodimentRequirementType	ClassificationType	changeEmbodimentRequirementType is a classification that allows to group similar ChangeEmbodimentRequirements	ChangeEmbodiment Requirement	S5000F UoF Requirement
changeNotificationDescription	DescriptorType	changeNotificationDescription is a description providing a summary of affects made to the related item due to a ChangeAuthorization.	ChangeNotification	CDM UoF Change Information
changeNotificationType	ClassificationType	changeNotificationType is a classification that identifies a change effect as belonging to a group of change effects sharing a particular characteristic or set of characteristics.	ChangeNotification	CDM UoF Change Information
changeRequestCauseIdentifier	IdentifierType	changeRequestCauseIdentifier is a string of text that uniquely identifies a ChangeRequestCause and differentiates it from other ChangeRequestCauses.	ChangeRequestCause	S5000F UoF Change Request
changeRequestName	NameType	changeRequestName is a text that summarizes the content of the ChangeRequest and provide a standard way to refer commonly to the ChangeRequest.	ChangeRequest	S5000F Specializations
circuitBreakerIdentifier	IdentifierType	circuitBreakerIdentifier is an identifier that establishes a unique designator for a CircuitBreaker and to differentiate it from other instances of CircuitBreaker.	CircuitBreaker	CDM UoF Task
circuitBreakerName	NameType	circuitBreakerName is a name by which the CircuitBreaker is known and can be easily referenced	CircuitBreaker	CDM UoF Task
circuitBreakerSettingI	IdentifierType	circuitBreakerSettingIdentifier is an identifier that establishes a unique designator for a defined circuit breaker setting, and to	CircuitBreakerSettin	CDM UoF Task

Attribute name	Type	Definition	Class name	UoF
dentifier		differentiate it from other instances of circuit breaker setting.	g	
circuitBreakerSettings Identifier	IdentifierType	circuitBreakerSettingsIdentifier is an identifier that establishes a unique designator for a defined set of circuit breaker settings, and to differentiate it from other instances of circuit breaker settings.	CircuitBreakerSettin gs	CDM UoF Task
circuitBreakerSettings Ordered	umlBoolean	circuitBreakerSettingsOrdered is a boolean that defines if the individual circuit breaker settings must be accomplished in the specified order.	CircuitBreakerSettin gs	CDM UoF Task
circuitBreakerState	StateType	circuitBreakerState is a state that identifies the position that a given circuit breaker must be in after the accomplishment of a defined circuit breaker setting.	CircuitBreakerSettin g	CDM UoF Task
circuitBreakerType	ClassificationType	circuitBreakerType is a classification that defines the technical principle for the CircuitBreaker.	CircuitBreaker	CDM UoF Task
cityName	NameType	cityName is a name by which an incorporated municipal unit is known and can be easily referenced.	StreetAddress	CDM UoF Location
classificationDate	DateType	classificationDate is a calendar date that identifies when the classification was recorded.	DatedClassification	S-Series Compound Attributes
classificationDateTim e	DateTimeType	classificationDateTime is a calendar date and time that identifies when the classification was recorded.	TimeStampedClassif ication	S-Series Compound Attributes
classifier	validValue	classifier is a word or code that represents the term used for classification.	DatedClassification	S-Series Compound Attributes
			TimeStampedClassif ication	S-Series Compound Attributes
codePropertyAssignm ent	ClassificationType	codePropertyAssignment is a classification that allows to separate assigned codes by the specification where these have been defined.	CodeProperty	S5000F Compound Attributes

Attribute name	Type	Definition	Class name	UoF
codePropertyDescription	DescriptorType	codePropertyDescription is a narrative statement explaining the meaning of a code.	CodeProperty	S5000F Compound Attributes
codePropertyValue	TextPropertyType	codePropertyValue is a text indicating a code defined by a specific specification.	CodeProperty	S5000F Compound Attributes
commentActionType	ClassificationType	commentActionType is a <<classification>> that allows to group similar CommentActions.	CommentAction	S5000F UoF Comment
commentDate	DateType	commentDate is the date at which a comment was raised.	Comment	S5000F UoF Comment
commentIdentifier	IdentifierType	commentIdentifier is a string of characters that is used to uniquely identify a Comment and to differentiate it from other Comments.	Comment	S5000F UoF Comment
commentPartyRole	ClassificationType	commentPartyRole is a classification that indicates the role of a specific Party in a specific Comment.	CommentParty	S5000F UoF Comment
commentPriority	ClassificationType	commentPriority is a classification that allows to define the importance of a comment and the need for an urgent response.	Comment	S5000F UoF Comment
commentRelationshipType	ClassificationType	commentRelationshipType is a classification that allows to identify the relationship between two comments.	CommentRelationship	S5000F UoF Comment
commentStatus	ClassificationType	commentStatus is a classification that allows to determine whether a comment has been responded to.	Comment	S5000F UoF Comment
commentText	DescriptorType	commentText is a text describing the comment.	Comment	S5000F UoF Comment
commentTitle	DescriptorType	commentTitle is a textual description that summarizes the comment.	Comment	S5000F UoF Comment
commentType	ClassificationType	commentType is a classification that allows the grouping of similar comments.	Comment	S5000F UoF Comment
conditionInstanceDes	DescriptorType	conditionInstanceDescription is a description that gives more	ConditionInstance	S5000F UoF Applicability

Attribute name	Type	Definition	Class name	UoF
cription		information on the meaning of the ConditionInstance.		Statement
conditionInstanceIdentifier	IdentifierType	conditionInstanceIdentifier is an identifier that establishes a unique designator for a ConditionInstance and to differentiate it from other instances of ConditionInstance.	ConditionInstance	S5000F UoF Applicability Statement
conditionInstanceName	NameType	conditionInstanceName is a name by which the ConditionInstance is known and can be easily referenced.	ConditionInstance	S5000F UoF Applicability Statement
conditionTypeAssertMemberAssertValue	PropertyType	conditionTypeAssertMemberAssertValue is a numerical property that specifies values which can be used to further characterize the ConditionTypeAssertMember.	ConditionTypeAssertMember	S5000F UoF Applicability Statement
conditionTypeAssertMemberDescription	DescriptorType	conditionTypeAssertMemberDescription is a description that gives more information on meaning of the condition type assert member.	ConditionTypeAssertMember	S5000F UoF Applicability Statement
conditionTypeAssertMemberName	NameType	conditionTypeValueName is a name that identifies a condition type member assert value.	ConditionTypeAssertMember	S5000F UoF Applicability Statement
conditionTypeDescription	DescriptorType	conditionTypeDescription is a description that gives more information on the meaning of the condition type.	ConditionType	S5000F UoF Applicability Statement
conditionTypeName	NameType	conditionTypeName is a name by which the ConditionType is known and can be easily referenced.	ConditionType	S5000F UoF Applicability Statement
configurationConformanceEndDateTime	DateTimeType	configurationConformanceEndDateTime is a date and time that specifies the point in time when the SerializedProductVariant no longer complies with the associated product configuration.	SerializedProductVariantConfigurationConformance	CDM UoF Serialized Product Variant Configuration
configurationConformanceStartDateTime	DateTimeType	configurationConformanceStartDateTime is a date and time that specifies the point in time when the SerializedProductVariant changed to the associated product configuration.	SerializedProductVariantConfigurationConformance	CDM UoF Serialized Product Variant Configuration
consequenceDescripti	DescriptorType	consequenceDescription is a textual narrative statement	Consequence	S5000F UoF Event

Attribute name	Type	Definition	Class name	UoF
on		explaining the consequence of an Event.		
consequenceIdentifier	IdentifierType	consequenceIdentifier is a string of text that uniquely identifies a Consequence in the context of an Event, differentiating it from otehr Consequences.	Consequence	S5000F UoF Event
consequenceType	ClassificationType	consequenceType is a classification that allows to group Consequences.	Consequence	S5000F UoF Event
consumableItemDescription	DescriptorType	consumableItemDescription is a narrative statement explaining the ConsumableItem.	ConsumableItem	S5000F UoF Supply Item
consumableItemIdentifier	IdentifierType	consumableItemItentifier is a string of text that uniquely identifies a ConsumableItem and differentiates it from other ConsumableItems.	ConsumableItem	S5000F UoF Supply Item
consumableItemName	TextPropertyType	consumableItemName is a text by which the ConsumableItem is commonly known.	ConsumableItem	S5000F UoF Supply Item
consumableItemRiskDescription	DescriptorType	consumableItemDescription is a narrative statement explaining the risk factor of the ConsumableItem.	ConsumableItem	S5000F UoF Supply Item
consumableItemRiskFactor	ClassificationType	The consumableItemRiskFactor is a classification that allows to define whether the ConsumableItem presents any safety issues or hazards.	ConsumableItem	S5000F UoF Supply Item
consumableType	ClassificationType	consumableItemType is a classification that allows to group ConsumableItems of similar characteristics.	ConsumableItem	S5000F UoF Supply Item
consumptionIdentifier	IdentifierType	consumptionIdentifier is a string that uniquely identifies a Consumption and differentiates it from other Consumptions.	Consumption	S5000F UoF Fleet Monitoring
consumptionType	ClassificationType	consumptionType is a <<classification>> that allows to differentiate between different types of Consumptions.	Consumption	S5000F UoF Fleet Monitoring

Attribute name	Type	Definition	Class name	UoF
consumptionValue	NumericalPropertyType	consumptionValue is the amount of a ConsumableItem consumed by the SerializedProductVariant during the associated operational period, movement or movement leg.	Consumption	S5000F UoF Fleet Monitoring
contractClauseDescription	DescriptorType	contractClauseDescription is a phrase stating the contract clause or summarizing the content of the contract clause.	ContractClause	S5000F UoF Contract Breakdown
contractClauseIdentifier	IdentifierType	contractClauseIdentifier is a string of characters that are unique to the ContractClause and is used to designate a ContractClause and to differentiate it from other ContractClauses.	ContractClause	S5000F UoF Contract Breakdown
contractClauseRelationshipType	ClassificationType	contractClauseRelationshipType is a <<classification>> that defines how two ContractClauses are related.	ContractClauseRelationship	S5000F UoF Contract Breakdown
contractClauseValidityPeriod	DateRange	contractClauseValidityPeriod is the period of time during which the ContractClause is in effect.	ContractClause	S5000F UoF Contract Breakdown
contractDescription	DescriptorType	contractDescription is a description that provides a human readable expression of a Contract.	Contract	S5000F Specializations
contractEffectivityDateTimes	DateTimeRange	contractEffectivityDateTimes is the range of time during which the Contract if effective.	Contract	S5000F Specializations
contractPartyRole	ClassificationType	contractPartyRole is a classification that identifies the association that a ContractParty has with the Contract.	ContractParty	CDM UoF Product and Project
contractRelationshipType	ClassificationType	contractRelationshipType is a classification that identifies the meaning of the established relationship.	ContractRelationship	CDM UoF Product and Project
contractSignatureDate	DateType	contractSignatureDate is the date at which the Contract was signed or agreed.	Contract	S5000F Specializations
contractStatus	StateType	contractStatus is a timestampedState that indicates the state of a Contract at a specific moment in time.	Contract	S5000F Specializations

Attribute name	Type	Definition	Class name	UoF
contractType	ClassificationType	contractType is a classification describing the Contract.	Contract	S5000F Specializations
contractValue	SingleValueProperty Type	contractValue is the amount of money that the Contract is worth.	Contract	S5000F Specializations
costBreakdownDescri ption	DescriptorType	costBreakdownDescription is a narrative statement explaining the CostBreakdown.	CostBreakdown	S5000F UoF Cost Breakdown
costBreakdownIdentifi er	IdentifierType	costBreakdownIdentifier is a string of text that uniquely identifies a CostBreakdown, allowing to differentiate it from all other CostBreakdowns.	CostBreakdown	S5000F UoF Cost Breakdown
costBreakdownName	DescriptorType	costBreakdownName is a word or phrase by which the CostBreakdown is commonly known.	CostBreakdown	S5000F UoF Cost Breakdown
costBreakdownRelati onshipType	ClassificationType	costBreakdownRelationshipType is a <<classification>> that defines how two CostBreakdowns are related.	CostBreakdownRelat ionship	S5000F UoF Cost Breakdown
costBreakdownRevisi onDate	DateType	costBreakdownRevisionDate is a Date that indicates when the CostBreakdownRevision was created.	CostBreakdownRevi sion	S5000F UoF Cost Breakdown
costBreakdownRevisi onIdentifier	IdentifierType	costBreakdownRevisionIdentifier is a string of characters that uniquely identifies a CostBreakdownRevision.	CostBreakdownRevi sion	S5000F UoF Cost Breakdown
costBreakdownRevisi onRationale	DescriptorType	costBreakdownRevisionRationale is a description that provides a human readable expression of a CostBreakdownRevision.	CostBreakdownRevi sion	S5000F UoF Cost Breakdown
costBreakdownRevisi onStatus	StateType	costBreakdownRevisionStatus is a state that defines the active status of a CostBreakdownRevision.	CostBreakdownRevi sion	S5000F UoF Cost Breakdown
costEntryDate	DateType	costEntryDate is the date at which the cost entry was made or incurred.	CostEntry	S5000F UoF Cost Breakdown
costEntryDescription	DescriptorType	costEntryDescription is a textual narrative statement explaining the nature of the CostEntry	CostEntry	S5000F UoF Cost Breakdown

Attribute name	Type	Definition	Class name	UoF
costEntryIdentifier	IdentifierType	costEntryIdentifier is a string of characters used to uniquely identify a CostEntry and differentiate it from other CostEntries.	CostEntry	S5000F UoF Cost Breakdown
costEntryPeriod	DateRange	costEntryPeriod is the period of time during which the cost for this CostEntry was incurred.	CostEntry	S5000F UoF Cost Breakdown
costEntryType	ClassificationType	costEntryType is a classification used to differentiate between different kinds of costs incurred.	CostEntry	S5000F UoF Cost Breakdown
costEntryValue	PropertyType	costEntryValue is the actual or estimated value of the cost.	CostEntry	S5000F UoF Cost Breakdown
costItemDescription	DescriptorType	costItemDescription is a narrative statement explaining what the CostItem is.	CostItem	S5000F UoF Cost Breakdown
costItemIdentifier	IdentifierType	costItemIdentifier is a string of characters that is used to uniquely designate a CostItem and to differentiate it from other CostItems.	CostItem	S5000F UoF Cost Breakdown
costItemRelationship Type	ClassificationType	costItemRelationshipType is a classification that defines the relationship between two CostItems.	CostItemRelationship	S5000F UoF Cost Breakdown
countryCode	ClassificationType	countryCode is a classification that identifies a nation.	StreetAddress	CDM UoF Location
			Country	S5000F UoF Location, Address and Locator
damageCharactericType	ClassificationType	damageCharactericType is a <<classification>> that defines the characteristics of a Damage.	DamageCharacteristic	S5000F UoF Damage
damageCharacteristic Description	DescriptorType	damageCharacteristicDescription is a description that provides a human readable expression of aDamageCharacteristic.	DamageCharacteristic	S5000F UoF Damage
damageCharacteristic Identifier	IdentifierType	damageCharacteristicIdentifier is a <<compositeKey>> that allows with a master key to uniquely identify a DamageCharacteristic.	DamageCharacteristic	S5000F UoF Damage

Attribute name	Type	Definition	Class name	UoF
damageColor	ClassificationType	damageColor is a <<classification>> that defines the color of a Damage.	Damage	S5000F UoF Damage
damageDescription	DescriptorType	damageDescription is a textual description of the damage.	Damage	S5000F UoF Damage
damageDimensions	Dimensions	damageDimensions is a set of values that define a geometrical figure that determines the extension of the damage.	DamageCharacteristic	S5000F UoF Damage
damageEstimatedCost	ValueRangePropertyType	damageEstimatedCost is a range of possible costs associated to a specific damage.	Damage	S5000F UoF Damage
damageFamily	ClassificationType	damageFamily is a classification that defines the type of damage.	Damage	S5000F UoF Damage
damageIdentifier	IdentifierType	damageIdentifier is a string of characters used to uniquely identify a Damage.	Damage	S5000F UoF Damage
damageRepairStatus	ClassificationType	damageRepairStatus is a <<classificationType>> that indicates the status of the Damage repair.	Damage	S5000F UoF Damage
damageSeverity	ClassificationType	damageSeverity is a classification that defines how serious a Damage is.	Damage	S5000F UoF Damage
damageStatus	DatedClassification	damageStatus is a classification that indicates the status of the damage at a specific moment in time.	Damage	S5000F UoF Damage
dataAssociatedWithType	ClassificationType	dataAssociatedWithType is a <<classification>> that allows to define the type of relationship between a DataSetAsDesigned and a ParAsDesigned.	DataSetAssociatedWith	S5000F UoF Data Sets
dataModuleIssueInWorkNumber	umlString	dataModuleIssueInWorkNumber is a string of characters used for monitoring and control of intermediate drafts of S1000DDataModuleIssue.	S1000DDataModuleIssue	CDM UoF Document
dataModuleIssueLanguage	ClassificationType	dataModuleIssueLanguage is a classification that identifies the language used to produce the content of the	S1000DDataModuleIssue	CDM UoF Document

Attribute name	Type	Definition	Class name	UoF
		S1000DDataModuleIssue.		
dataModuleIssueLanguageCountry	ClassificationType	dataModuleIssueLanguageCountry is a classification that identifies the country where the language, identified by dataModuleIssueLanguage, is spoken	S1000DDataModuleIssue	CDM UoF Document
dataModuleIssueNumber	umlString	dataModuleIssueNumber is a string of characters used to identify the release number of the S1000DDataModuleIssue	S1000DDataModuleIssue	CDM UoF Document
dataSetAsDesignedDescription	DescriptorType	dataSetAsDesignedDescription is a narrative description of a DataSetAsDesigned data structure.	DataSetAsDesigned	S5000F UoF Data Sets
dataSetAsDesignedType	ClassificationType	dataSetAsDesignedType is a classification that allows to group different DataSetAsDesigned data structures according to common characteristics.	DataSetAsDesigned	S5000F UoF Data Sets
dataSetAsReleasedNotes	DescriptorType	dataSetAsReleasedNotes is a narrative description that provides additional information about a specific DataSetAsReleased.	DataSetAsReleased	S5000F UoF Data Sets
dateRangeEnd	DateType	dateRangeEnd is a date that represents the conclusion of the range.	DateRange	S-Series Compound Attributes
dateRangeStart	DateType	dateRangeStart is a date that represents the beginning of the range.	DateRange	S-Series Compound Attributes
dateTimeRangeEnd	DateTimeType	dateTimeRangeEnd is a calendar date and time that represents the culmination of the range.	DateTimeRange	S-Series Compound Attributes
dateTimeRangeStart	DateTimeType	dateTimeRangeStart is a calendar date and time that represents the beginning of the range.	DateTimeRange	S-Series Compound Attributes
detectionMeanCapabilityCapabilityType	ClassificationType	detectionMeanCapabilityCapabilityType is a <<classification>> that allows to group different DetectionMeanCapabilities based on their individual characteristics.	DetectionMeanCapability	S5000F UoF Failure Detection and Location

Attribute name	Type	Definition	Class name	UoF
detectionMeanCapabilityDescription	DescriptorType	detectionMeanCapabilityDescription is a narrative statement that explains a DetectionMeanCapability.	DetectionMeanCapability	S5000F UoF Failure Detection and Location
detectionMeanCapabilityIdentifier	IdentifierType	detectionMeanCapabilityIdentifier is a string of text that uniquely identifies a DetectionMeanCapability and differentiates it from other DetectionMeanCapabilities.	DetectionMeanCapability	S5000F UoF Failure Detection and Location
detectionMechanismDescription	DescriptorType	detectionMechanismDescription is a textual narrative statement that explains a DetectionMechanism.	DetectionMechanism	S5000F UoF Failure Detection and Location
detectionMechanismFalseAlarmRate	PropertyType	detectionMechanismFalseAlarmRate is the frequency at which the DetectionMechanism is expected to raise a false alarm.	DetectionMechanism	S5000F UoF Failure Detection and Location
detectionMechanismIdentifier	IdentifierType	detectionMechanismIdentifier is a string of text that uniquely identifies a DetectionMechanism and differentiates it from other DetectionMechanisms.	DetectionMechanism	S5000F UoF Failure Detection and Location
detectionMechanismPresentation	DescriptorType	detectionMechanismPresentation is a textual narrative statement that indicates how the FailureMechanism is brought to the attention of the user.	DetectionMechanism	S5000F UoF Failure Detection and Location
detectionMechanismType	ClassificationType	detectionMechanismType is a classification that allows to group similar DetectionMechanisms.	DetectionMechanism	S5000F UoF Failure Detection and Location
diameter	PropertyType	diameter is a property that specifies the longitudinal dimension of a circular section when measured through its center.	Sphere	S-Series Compound Attributes
			Cylinder	S-Series Compound Attributes
			Circle	S5000F Compound Attributes
digitalFileContentClass	ClassificationType	digitalFileContentClass is a classification that determine the meaning of the information within the DigitalFile.	DigitalFile	CDM UoF Digital File

Attribute name	Type	Definition	Class name	UoF
digitalFileContentDescription	DescriptorType	digitalFileContentDescription is a phrase that gives more details about the information contained in the DigitalFile	DigitalFile	CDM UoF Digital File
digitalFileLocator	IdentifierType	digitalFileName is an identifier that establishes a unique designator for a DigitalFile used to locate and identify a DigitalFile and to differentiate it from other instances of DigitalFile.	DigitalFile	CDM UoF Digital File
digitalFileReferenceJustification	DescriptorType	digitalFileReferenceJustification is a phrase that provides more on information on the reason why the DigitalFileReferencedItem is referenced.	DigitalFileReference	CDM UoF Digital File
digitalFileRepresentation	umlString	digitalFileRepresentation is a string of characters representing the content of the DigitalFile.	DigitalFile	CDM UoF Digital File
digitalFileType	ClassificationType	digitalFileType is a classification that specifies the format of the data within the DigitalFile.	DigitalFile	CDM UoF Digital File
disassemblyCode	umlString	disassemblyCode is a string of characters that represents the disassembly code attribute of the data module code.	S1000DDataModule	CDM UoF Document
disassemblyCodeVariant	umlString	disassemblyCodeVariant is a string of characters that represents the disassembly code variant attribute of the data module code.	S1000DDataModule	CDM UoF Document
documentCreationDate	DateType	documentCreationDate is the date at which the document was published.	Document	S5000F Specializations
documentDescription	DescriptorType	documentDescription is a textual narrative statement that explains what the document is about.	Document	S5000F Specializations
documentIssueReason	ClassificationType	documentIssueReason is a <<classification>> that allows to group DocumentIssues bythe different causes for their release.	DocumentIssue	S5000F Specializations
documentPartyRelationshipType	DatedClassification	documentPartyRelationshipType is a relationship identifying the type of association between a document and a Party at a specific date.	DocumentPartyRelationship	S5000F UoF Document

Attribute name	Type	Definition	Class name	UoF
documentRelationshipType	ClassificationType	documentRelationshipType is a classification describing the type of relationship between two documents.	DocumentRelationship	S5000F UoF Document
documentStatus	StateType	documentStatus is a state that indicates the status of the document.	Document	S5000F Specializations
downTimeIdentifier	IdentifierType	downTimeIdentifier is a string of text that uniquely identifies a DownTimePeriod and differentiates it from other DownTimePeriods.	DownTimePeriod	S5000F UoF Change Embodiment Planning
downTimePeriodReason	ClassificationType	downTimePeriodReason is a narrative text providing information about the DownTimePeriod.	DownTimePeriod	S5000F UoF Change Embodiment Planning
downTimePeriodValue	DateTimeRange	downTimePeriodValue is a period of time during which the SerializedProductVariant is or will be not available.	DownTimePeriod	S5000F UoF Change Embodiment Planning
downTimeStatus	ClassificationType	downTimeStatus is a classification allowing to determine the validity of a DownTime.	DownTimePeriod	S5000F UoF Change Embodiment Planning
environmentCondition	NumericalPropertyType	environmentCondition is a <<NumericPropertyType>> that describes the normal quantitative values that define an Environment and differentiate it from other Environments.	Environment	S5000F UoF Environment
environmentDescription	DescriptorType	environmentDescription is a textual description of an environment.	Environment	S5000F UoF Environment
environmentIdentifier	IdentifierType	environmentIdentifier is a string of characters used to uniquely identify an Environment and to differentiate it from other Environments.	Environment	S5000F UoF Environment
environmentName	NameType	environmentName is a name by which the Environment is known and can be easily referenced.	Environment	S5000F UoF Environment
environmentRelationshipType	ClassificationType	environmentRelationshipType is a <<classification>> that allows to indicate the kind of relationship between two Environments.	EnvironmentRelationship	S5000F UoF Environment

Attribute name	Type	Definition	Class name	UoF
environmentRevisionCondition	NumericalPropertyType	environmentRevisionCondition is a <<NumericPropertyType>> that describes the quantitative conditions that define an environmentRevision and differentiate it from other environmentRevisions.	EnvironmentRevision	S5000F UoF Environment
environmentRevisionDate	DateType	environmentRevisionDate is the date at which the EnvironmentRevision was created.	EnvironmentRevision	S5000F UoF Environment
environmentRevisionIdentifier	IdentifierType	environmentRevisionIdentifier is a <<compositeKey>> that allows with a master key to uniquely identify an EnvironmentRevision.	EnvironmentRevision	S5000F UoF Environment
environmentRevisionRationale	DescriptorType	environmentRevisionRationale is a decription that provides a justification for the EnvironmentRevision.	EnvironmentRevision	S5000F UoF Environment
environmentRevisionStatus	StateType	environmentRevisionStatus is a state that identifies the maturity of an EnvironmentRevision.	EnvironmentRevision	S5000F UoF Environment
environmentRevisionType	ClassificationType	environmentRevisionType is a <<classification>> that allows to group similar EnvironmentRevisions.	EnvironmentRevision	S5000F UoF Environment
environmentRevisionValidity	DateRange	environmentRevisionValidity is a DateRange during which an EnvironmentRevision is valid.	EnvironmentRevision	S5000F UoF Environment
environmentType	ClassificationType	environmentType is a classification that allows to group different Environments by their characteristics.	Environment	S5000F UoF Environment
equipmentOperatingPeriod	DateRange	equipmentOperatingPeriod is the period during which the equipment is operated by a specific Party.	EquipmentOperation	S5000F UoF Equipment
equipmentOwnershipPeriod	DateRange	equipmentOwnershipPeriod is the period during which the item was owned by a specific Party.	EquipmentOwner	S5000F UoF Equipment
equipmentStatusPeriod	DateTimeRange	equipmentStatusPeriod is the period during which the equipment had that specific status.	EquipmentStatus	S5000F UoF Equipment

Attribute name	Type	Definition	Class name	UoF
equipmentStatusReason	ClassificationType	equipmentStatusReason is a classification indicating the reason for which an equipment has been in that status during a specific period of time.	EquipmentStatus	S5000F UoF Equipment
equipmentStatusType	ClassificationType	equipmentStatusType is a classification that describes the status of the equipment.	EquipmentStatus	S5000F UoF Equipment
evaluationByAssertionRole	ClassificationType	evaluationByAssertionRole is a classification that defines the context in which the EvaluationByAssertionOfClassInstance is being referenced.	EvaluationByAssertionOfClassInstance	S5000F UoF Applicability Statement
eventConfirmedStatus	DatedClassification	eventConfirmedStatus is a classification at a specific moment in time describing whether the event has or not been confirmed.	Event	S5000F UoF Event
eventDescription	DescriptorType	eventDescription is a narrative statement explaining an Event or the circumstances surrounding it.	Event	S5000F UoF Event
eventGroup	ClassificationType	eventGroup is a classification that is used to categorize the type of Event.	Event	S5000F UoF Event
eventIdentifier	IdentifierType	eventIdentifier is a string of characters that uniquely identifies an Event so as to differentiate it from other Events.	Event	S5000F UoF Event
eventOcurrenceDateTime	DateTimeType	eventOcurrenceDateTime is the date and time at which the Event occurred.	Event	S5000F UoF Event
eventRelationshipItemRole	ClassificationType	eventRelationshipItemRole is a <<classification>> that allows to indicate the type of relationship that an item has regarding an Event.	EventRelationshipItem	S5000F UoF Event
eventRelationshipType	ClassificationType	eventRelationshipType is a classification that indicates the type of relationship between two different Events.	EventRelationship	S5000F UoF Event
eventReporterDateTime	DateTimeType	eventReporterDateTime is a DateTime which represents the date and time at which the EventReporter reported the Event.	EventReporter	S5000F UoF Event

Attribute name	Type	Definition	Class name	UoF
eventSeverity	ClassificationType	eventSeverity is a <<classification>> that allows to indicate the impact of the event.	Event	S5000F UoF Event
explanatoryFactorDescription	DescriptorType	explanatoryFactorDescription is a textual explanation of the ExplanatoryFactor.	ExplanatoryFactor	S5000F UoF Event
explanatoryFactorIdentifier	IdentifierType	explanatoryFactor is a unique identifier that allows to differentiate between one ExplanatoryFactor and another one.	ExplanatoryFactor	S5000F UoF Event
explanatoryFactorName	DescriptorType	explanatoryFactorName is a short textual description that allows to identify an explanatoryFactor.	ExplanatoryFactor	S5000F UoF Event
explanatoryFactorOrganization	Organization	explanatoryFactorOrganization is the Organization that has defined the ExplanatoryFactor.	ExplanatoryFactor	S5000F UoF Event
exportControlLicenseDescription	DescriptorType	exportControlLicenseDescription is a description that provides a human readable expression of an ExportControlLicense.	ExportControlLicense	S5000F UoF Export Control License
exportControlLicenseIdentifier	IdentifierType	exportControlLicenseIdentifier is a string of characters that uniquely identifies an ExportControlLicense.	ExportControlLicense	S5000F UoF Export Control License
exportControlLicenseItemCategory	ClassificationType	exportControlLicenseItemCategory is a <<classification>> that allows to group ExportControlLicenseItems.	ExportControlLicenseItem	S5000F UoF Export Control License
exportControlLicenseItemidentifier	IdentifierType	exportControlLicenseItemidentifier is a string of characters that uniquely identifies an ExportControlLicenseItem.	ExportControlLicenseItem	S5000F UoF Export Control License
exportControlLicenseItemQuantity	umlInteger	exportControlLicenseItemQuantity is a numeric value representing the number of items covered by an ExportControlLicense.	ExportControlLicenseItem	S5000F UoF Export Control License
exportControlLicenseItemSubCategory	ClassificationType	exportControlLicenseItemSubCategory is a <<classification>> that allows to further subgroup ExportControlLicenseItems.	ExportControlLicenseItem	S5000F UoF Export Control License
exportControlLicense	DescriptorType	exportControlLicensePurpose is a description that provides a	ExportControlLicens	S5000F UoF Export Control

Attribute name	Type	Definition	Class name	UoF
Purpose		human readable expression of the purpose of an ExportControlLicense.	e	License
exportControlLicenseType	ClassificationType	exportControlLicenseType is a <<classification>>; that defines the type of export control license.	ExportControlLicense	S5000F UoF Export Control License
exportControlPartyClearanceCode	ClassificationType	exportControlPartyClearanceCode is a classification that indicates the type of clearance that the exportControlParty has received to house export-controlled goods.	ExportControlParty	S5000F UoF Export Control License
exportControlPartyClearanceDate	DateType	exportControlPartyClearanceDate is a date that indicates when the exportControlParty has received the clearance to house export-controlled goods.	ExportControlParty	S5000F UoF Export Control License
exportControlPartyClearanceLevel	ClassificationType	exportControlPartyClearanceLevel is a classification that indicates the level of the clearance that the exportControlParty has received to house export-controlled goods.	ExportControlParty	S5000F UoF Export Control License
exportControlPartyIdentifier	IdentifierType	exportControlPartyIdentifier is a string of characters that uniquely identifies an ExportControlParty.	ExportControlParty	S5000F UoF Export Control License
exportControlPartyRole	ClassificationType	exportControlPartyRole is a <<classification>> that defines the role of an ExportControlParty.	ExportControlParty	S5000F UoF Export Control License
exportControlPartyType	ClassificationType	exportControlPartyType is a <<classification» that indicates the characteristic of the Party involved in the export control.	ExportControlParty	S5000F UoF Export Control License
exportControlRegulationLegalCode	ClassificationType	exportControlRegulationLegalCode is a <<classification>> that provides the identifier for the legal export control regulation.	ExportControlRegulation	S5000F UoF Export Control Requirement
exportControlRegulationtPeculiarityCode	ClassificationType	exportControlRegulationtPeculiarityCode is a <<classification>> that allows to use codes used by different ExportControlRegulations.	ExportControlRegulation	S5000F UoF Export Control Requirement
exportControlRequire	DescriptorType	exportControlRequirementAppliedToCountryDescription is a	ExportControlRequir	S5000F UoF Export Control

Attribute name	Type	Definition	Class name	UoF
mentAppliedToCountryDescription		description that provides a human readable expression of how or why an ExportControlRequirement is applied to Country.	ementAppliedToCountry	Requirement
exportControlRequirementAppliedToCountryDuring	DateRange	exportControlRequirementAppliedToCountryDuring is a DataRange during which an ExportControlRequirement is applied to a specific country.	ExportControlRequirementAppliedToCountry	S5000F UoF Export Control Requirement
exportControlRequirementGrouping	ClassificationType	exportControlRequirementGrouping is a <<classification>> that allows to group similar ExportControlRegulations.	ExportControlRegulation	S5000F UoF Export Control Requirement
expressionEvaluationDateRange	DateRange	expressionEvaluationDateRange is a date range that defines the date interval for when the defined evaluation can result in a TRUE result.	ExpressionEvaluation	S5000F UoF Expression Evaluation
expressionEvaluationDescription	DescriptorType	expressionEvaluationDescription is a description that provides a human readable expression of the defined rule.	ExpressionEvaluation	S5000F UoF Expression Evaluation
expressionEvaluationIdentifier	IdentifierType	expressionEvaluationIdentifieris an identifier that establishes a unique designator for an ExpressionEvaluation and to differentiate it from other instances of ExpressionEvaluation.	ExpressionEvaluation	S5000F UoF Expression Evaluation
extensionCode	umlString	extensionCode is a string of characters used to identify the organization receiving the customized data module.	S1000DDataModule	CDM UoF Document
			S1000DPublicationModule	CDM UoF Document
extensionProducer	umlString	extensionProducer is a string of characters used to identify the organization providing the customized data module.	S1000DDataModule	CDM UoF Document
			S1000DPublicationModule	CDM UoF Document
externalDocumentType	ClassificationType	externalDocumentType is a classification that allows to group ExternalDocuments of a similar nature.	ExternalDocument	S5000F UoF Document
facilityCleansiness	ClassificationType	facilityCleansiness is a classification that indicates the	Facility	S5000F Specializations

Attribute name	Type	Definition	Class name	UoF
		cleansiness that is required for the facility.		
facilityDimensions	Dimensions	facilityDimensions are the dimensions (length, width, height) of the Facility.	Facility	S5000F Specializations
facilityExistsDuring	DateRange	facilityExistsDuring represents the period of time during which a tempoerarty Facility exists.	Facility	S5000F Specializations
facilityLocationIdentifier	IdentifierType	facilityLocationIdentifier is a string of characters that uniquely identifies a FacilityLocation.	FacilityLocation	S5000F UoF Facility
facilityLocationPeriod	DateRange	facilityLocationPeriod is a DateRange during which a Facility is located at a specific Location.	FacilityLocation	S5000F UoF Facility
facilityOperatorDuring	DateRange	facilityOperatorDuring is the period during which a certain Party operates a Facility.	FacilityOperator	S5000F Specializations
facilityOwnedDuring	DateRange	facilityOwnedDuring is the period during which a facility is or has been owned by a specific Party.	FacilityOwner	S5000F UoF Facility
facilityOwnershipRatio	SingleValueProperty Type	facilityOwnerRatio is the percentage of ownership that a Party has over the associated facility during the associated period.	FacilityOwner	S5000F UoF Facility
facilityRelationshipType	ClassificationType	facilityRelationshipType is a classification that describes the relationship between two facilities.	FacilityRelationship	S5000F UoF Facility
facilityWeight	NumericalPropertyType	facilityWeight represents the weight of the Facility.	Facility	S5000F Specializations
failureCauseCode	ClassificationType	failureCauseCode is a classification that allows to group different failures.	FailureCause	S5000F UoF Failure Detection and Location
failureCauseDescription	DescriptorType	failureCauseDescription is a textual explanation that describes a failure.	FailureCause	S5000F UoF Failure Detection and Location
failureCauseIdentifier	IdentifierType	failureCauseIdentifier is a string of characters that identifies a	FailureCause	S5000F UoF Failure

Attribute name	Type	Definition	Class name	UoF
		Failure and allows to differentiate it from other Failures.		Detection and Location
failureDetectionRate	ClassificationType	failureDetectionRate is a classification that indicates the rate at which a failure can be detected.	FailureDetection	S5000F UoF Failure Detection and Location
failureModeDescriptio n	DescriptorType	failureModeDescription is a textual explanation that describes the reason for a failure mode.	FailureMode	S5000F UoF Failure Detection and Location
failureModeEffectDes cription	DescriptorType	failureModeEffectDescription is a narrative text explaining the eefect of a FailurMode.	FailureModeEffect	S5000F UoF Failure Detection and Location
failureModeEffectIden tifier	IdentifierType	failureModeEffectIdentifier is a string that allows to uniquely identify a FailureModeEffect and differentiate it from othe FailureModeEffects.	FailureModeEffect	S5000F UoF Failure Detection and Location
failureModeIdentifier	IdentifierType	failureModeIdentifier is a string of characters that identifies a FailureMode and allows to differentiate it from other FailureModes.	FailureMode	S5000F UoF Failure Detection and Location
faultDeferredToDate	DateType	faultDeferred is the date that indicates when resolution of a Fault will be solved.	Fault	S5000F UoF Actual Fault Indication
faultDetectedDate	DateType	faultDetectedDate is the date at which the Fault has been detected.	Fault	S5000F UoF Actual Fault Indication
faultFixedDate	DateType	faultFixedDate is the date at which the Fault was fixed.	Fault	S5000F UoF Actual Fault Indication
faultIdentifier	IdentifierType	FaultIdentifier is a string of characters that is used to uniquely identify a Fault and to differentiate it from other Faults.	Fault	S5000F UoF Actual Fault Indication
faultStatus	ClassificationType	faultStatus is a classification that indicates whether a Fault has been resolved or not.	Fault	S5000F UoF Actual Fault Indication
faultSymptomDateTi	DateTimeType	faultSymptomDateTime is a DateTime which represents the date	FaultSymptom	S5000F UoF Actual Fault

Attribute name	Type	Definition	Class name	UoF
me		and time at which the Fault occurred.		Indication
faultSymptomIdentifier	IdentifierType	faultSymptomIdentifier is a <<compositeKey>> that allows with a master key to uniquely identify a FaultSymptom.	FaultSymptom	S5000F UoF Actual Fault Indication
fleetBasedAtDuring	DateRange	fleetBasedAtDuring is a DateRange during which a Fleet is based at a specific location.	FleetBasedAt	S5000F UoF Fleet Definition
fleetDescription	DescriptorType	fleetDescription is a narrative statement explaining the Fleet.	Fleet	S5000F UoF Fleet Definition
fleetIdentifier	IdentifierType	fleetIdentifier is a string of text that uniquely identifies a Fleet and differentiates it from other Fleets.	Fleet	S5000F UoF Fleet Definition
fleetOperatedByDuring	DateRange	fleetOperatedByDuring is a <<DateRange>> that indicates the period of time during which a Fleet is operated by a specific Operator.	FleetOperatedBy	S5000F UoF Fleet Definition
fleetOperatesAtLocationDuring	DateRange	fleetOperatesAtLocationDuring is a DateRange during which a Fleet has operated at a specific location.	FleetOperatesAtLocation	S5000F UoF Fleet Definition
fleetPlanningDescription	DescriptorType	fleetPlanningDescription is a narrative statement explaining the FleetPlanning.	FleetPlanning	S5000F UoF Fleet Planning and Product Assignment
fleetPlanningIdentifier	IdentifierType	fleetPlanningIdentifier is a string of text that uniquely identifies a FleetPlanning and allows to differentiate it from other FleetPlannings.	FleetPlanning	S5000F UoF Fleet Planning and Product Assignment
fleetPlanningPeriod	DateRange	fleetPlanningPeriod is a range of dates for which the FleetPlanning is being performed.	FleetPlanning	S5000F UoF Fleet Planning and Product Assignment
fleetPlanningStatus	ClassificationType	fleetPlanningStatus is a classification that allows to define the validity of a FleetPlanning.	FleetPlanning	S5000F UoF Fleet Planning and Product Assignment
fleetRelationshipType	ClassificationType	fleetRelationshipType is a <<classification>> that defines how two Fleets are related.	FleetRelationship	S5000F UoF Fleet Definition

Attribute name	Type	Definition	Class name	UoF
fleetRequirementAvailability	SingleValueProperty Type	fleetRequirementAvailability is the availability that the fleet must have to comply with a specific FLeetRequirement.	FleetRequirement	S5000F UoF Fleet Planning and Product Assignment
fleetRequirementDate	DateType	fleetRequirementDate is the date at which a FleetRequirement has been defined.	FleetRequirement	S5000F UoF Fleet Planning and Product Assignment
fleetRequirementMinimumFleetSize	umlInteger	fleetRequirementMinimumFleetSize is the minimum number of vehicles that a fleet must contain so as to comply with the FleetRequirement.	FleetRequirement	S5000F UoF Fleet Planning and Product Assignment
fleetRequirementPeriod	DateRange	fleetRequirementPeriod is the period of time during which a fleet must meet this requirement.	FleetRequirement	S5000F UoF Fleet Planning and Product Assignment
fleetRequirementUsage	SingleValueProperty Type	fleetRequirementUsage reflects the planned usage of the fleet.	FleetRequirement	S5000F UoF Fleet Planning and Product Assignment
fleetRequirementUsageLimitation	DescriptorType	fleetRequirementUsageLimitation is a narrative statement explaining potential limitations of usage of the fleet.	FleetRequirement	S5000F UoF Fleet Planning and Product Assignment
fleetTaskCancellationNoticeDatetime	DateTimeType	fleetTaskCancellationNoticeDatetime is a DateTime which represents the date and time at which the FleetTaskCancellationNotice took place.	FleetTaskCancellationNotice	S5000F UoF Fleet Task Cancellation
fleetTaskCancellationNoticeIdentifier	IdentifierType	fleetTaskCancellationNoticeIdentifier is a string of text that uniquely identifies a FleetTaskCancellationNotice and differentiates it from other FleetTaskCancellationNotices.	FleetTaskCancellationNotice	S5000F UoF Fleet Task Cancellation
fleetTaskCancellationNoticeReason	DescriptorType	fleetTaskCancellationNoticeReason is a description that provides a human readable expression of why the FleetTaskCancellationNotice took place.	FleetTaskCancellationNotice	S5000F UoF Fleet Task Cancellation
fleetTaskDescription	DescriptorType	fleetTaskDescription is a narrative statement explaining the FleetTask.	FleetTask	S5000F UoF Fleet Planning and Product Assignment
fleetTaskExpectedEn	DateTimeType	fleetTaskExpectedEnd is the date and time at which the	FleetTask	S5000F UoF Fleet Planning

Attribute name	Type	Definition	Class name	UoF
d		FleetTask is expected to end.		and Product Assignment
fleetTaskExpectedStart	DateTimeType	fleetTaskExpectedStart is the date and time at which the FleetTask is expected to start.	FleetTask	S5000F UoF Fleet Planning and Product Assignment
fleetTaskIdentifier	IdentifierType	fleetTaskIdentifier is a string of text that uniquely identifies a FleetTask and differentiates it from other FleetTasks.	FleetTask	S5000F UoF Fleet Planning and Product Assignment
fleetTaskPriority	ClassificationType	fleetTaskPriority is a classification that allows to define the importance of a FleetTask.	FleetTask	S5000F UoF Fleet Planning and Product Assignment
fleetTaskRequiredFuel	SingleValueProperty Type	fleetTaskRequiredFuel is the amount of fuel estimated to be required to carry out the FleetTask.	FleetTask	S5000F UoF Fleet Planning and Product Assignment
geographicalAreaDescription	DescriptorType	geographicalAreaDescription is a description that provides more information about the GeographicalArea.	GeographicalArea	CDM UoF Location
geographicalAreaName	NameType	geographicalAreaName is a name by which the GeographicalArea is known and can be easily referenced.	GeographicalArea	CDM UoF Location
geographicalAreaRelationshipType	ClassificationType	geographicalAreaRelationshipType is a classification that allows to indicate the relationship between two different GeographicalAreas.	GeographicalAreaRelationship	S5000F UoF Location, Address and Locator
geographicalAreaType	ClassificationType	geographicalAreaType is a classification that identifies the nature of the GeographicalArea.	GeographicalArea	CDM UoF Location
geographicalCoordinateSystem	ClassificationType	geographicalCoordinateSystem is a classification that identifies the geographical coordinate system used to determine latitude and longitude.	GlobalPosition	CDM UoF Location
hardwareElementRepairability	ClassificationType	hardwareElementRepairability is a classification that indicates whether its realization is expected to be repairable from a technical standpoint, independent of customer maintenance concepts.	HardwareElementRevision	CDM UoF Hardware Element

Attribute name	Type	Definition	Class name	UoF
hardwareElementReplaceability	ClassificationType	hardwareElementReplaceability is a classification that identifies whether its realization is expected to be replaceable from a technical standpoint, independent of customer maintenance concepts.	HardwareElementRevision	CDM UoF Hardware Element
hardwareElementType	ClassificationType	hardwareElementType is a classification that identifies further specialization for a HardwareElement.	HardwareElement	CDM UoF Hardware Element
hardwarePartHazardousClass	ClassificationType	hardwarePartHazardousClass is a classification that identifies to what extent a HardwarePartAsDesigned is capable of posing a significant risk to health, safety or property during transportation, handing or storage.	HardwarePartAsDesignedDesignData	CDM UoF Part Definition
hardwarePartLogisticsCategory	ClassificationType	hardwarePartLogisticsCategory is a classification that defines the role of the HardwarePartAsDesigned in the context of product support.	HardwarePartAsDesignedSupportData	CDM UoF Part Definition
hardwarePartOperationalAuthorizedLife	AuthorizedLife	hardwarePartOperationalAuthorizedLife is an extended property that identifies the maximum usage limit for which an item can be operated, and upon reaching this limit, any further usage of the item must be re-authorized.	HardwarePartAsDesignedDesignData	CDM UoF Part Definition
hardwarePartRepairability	ClassificationType	hardwarePartRepairability is a classification that identifies the extent to which the HardwarePartAsDesigned is repairable from a technical perspective, independent of customer maintenance concepts.	HardwarePartAsDesignedSupportData	CDM UoF Part Definition
hardwarePartScrapRate	NumericalPropertyType	hardwarePartScrapRate is a property that defines the fraction of repairable units which, when removed from service, will be found to be beyond economic repair and therefore have to be scrapped.	HardwarePartAsDesignedSupportData	CDM UoF Part Definition
hardwarePartUnitOfIssuePrice	PropertyType	hardwarePartUnitOfIssuePrice is used to indicate the price of an item related to: - Unit of isue	PriceBreakData	S2000M_6-1_Data_model
			HardwarePartAsDesi	S2000M_6-1_Data_model

Attribute name	Type	Definition	Class name	UoF
		- Currency - Economic conditions - Type of price - Price condition	gnedCommerceData	
height	PropertyType	height is a property that specifies the vertical longitudinal dimension of an object.	Cuboid	S-Series Compound Attributes
hourOffset	umlInteger	hourOffset is an Integer that represents the number of hours by which a time is offset from Coordinated Universal Time expressed as a value between '0' and '14'.	TimeOffset	S_Series_Primitives_2-0_001-00
informationCode	umlString	informationCode is a string of characters that represents the information code attribute of the data module code.	S1000DDataModule	CDM UoF Document
informationCodeVariant	umlString	informationCodeVariant is a string of characters that represents the information code variant attribute of the data module code.	S1000DDataModule	CDM UoF Document
infrastructureAvailableDuring	DateRange	infrastructureAvailableDuring is a DateRange that represents the period during which an Infrastructure is or not available for an item.	InfrastructureAvailable	S5000F UoF Infrastructure Availability
infrastructureAvailableRestriction	DescriptorType	infrastructureAvailableRestriction is a textual description explaining an infrastructure restriction during the specific period of time.	InfrastructureAvailable	S5000F UoF Infrastructure Availability
infrastructureAvailableType	ClassificationType	infrastructureAvailableType is a <<classification>> that provides information about the type of availability that is available for an item.	InfrastructureAvailable	S5000F UoF Infrastructure Availability
infrastructureComplianceDate	DateType	infrastructureComplianceDate is a date that defines when infrastructure compliance was declared.	InfrastructureCompliance	CDM UoF Facility
infrastructureComplia	DescriptorType	infrastructureComplianceDescription is a description that gives	InfrastructureCompli	CDM UoF Facility

Attribute name	Type	Definition	Class name	UoF
nceDescription		more information on compliance fulfillment.	ance	
infrastructureComplianceLevel	ClassificationType	infrastructureComplianceLevel is a classification that specifies the degree of compliance.	InfrastructureCompliance	CDM UoF Facility
infrastructureDescription	DescriptorType	infrastructureDescription is a description that provides a human readable expression of an Infrastructure.	Infrastructure	S5000F UoF Infrastructure
infrastructureIdentifier	IdentifierType	infrastructureIdentifier is a string of characters that uniquely identifies an Infrastructure.	Infrastructure	S5000F UoF Infrastructure
infrastructureName	NameType	infrastructureName is a name by which the Infrastructure is known and can be easily referenced.	Infrastructure	S5000F UoF Infrastructure
infrastructureNodeLocatedAtDuring	DateRange	infrastructureNodeLocatedAtDuring is a DateRange during which an InfrastructureNote has been located at a specific place.	InfrastructureNodeAtLocation	S5000F UoF Infrastructure
infrastructurePartyRole	ClassificationType	infrastructurePartyRole is a <<classification>> that defines the role of an InfrastructureParty.	InfrastructureParty	S5000F UoF Infrastructure
infrastructurePartyRoleDuring	DateRange	infrastructurePartyRoleDuring is a DateRange during which a Party has a specific role regarding a specific Infrastructure.	InfrastructureParty	S5000F UoF Infrastructure
infrastructureRelationshipType	ClassificationType	infrastructureRelationshipType is a <<classification>> that defines how two Infrastructures are related.	InfrastructureRelationship	S5000F UoF Infrastructure
infrastructureRevisionDate	DateType	infrastructureRevisionDate is the date at which the InfrastructureRevision was created.	InfrastructureRevision	S5000F UoF Infrastructure
infrastructureRevisionIdentifier	IdentifierType	infrastructureRevisionIdentifier is a string of characters that uniquely identifies an InfrastructureRevision.	InfrastructureRevision	S5000F UoF Infrastructure
infrastructureRevisionRationale	DescriptorType	infrastructureRevisionRationale is a description of the reason for the creation of the InfrastructureRevision.	InfrastructureRevision	S5000F UoF Infrastructure
infrastructureRevision	StateType	infrastructureRevisionStatus is a state that identifies the maturity	InfrastructureRevisio	S5000F UoF Infrastructure

Attribute name	Type	Definition	Class name	UoF
Status		of an InfrastructureRevision.	n	
infrastructureRevisionValidity	DateRange	infrastructureRevisionValidity is a DateRange during which an InfrastructureRevision is valid.	InfrastructureRevision	S5000F UoF Infrastructure
installationLocationIdentifier	IdentifierType	installationLocationIdentifier is an identifier that establishes a unique designator for a InstallationLocation and to differentiate it from other instances of InstallationLocation.	InstallationLocation	CDM UoF Serialized Product Variant Configuration
installationLocationName	NameType	installationLocationName is a name by which the InstallationLocation is known and can be easily referenced.	InstallationLocation	CDM UoF Serialized Product Variant Configuration
installedDateTime	DateTimeType	installedDateTime is a date and time that specifies the exact point in time when the RealizedPart was installed at the InstallationLocation.	InstalledPart	CDM UoF Serialized Product Variant Configuration
itemExportControlRegulationClassification	ClassificationType	itemExportControlRegulationClassification is the classification that is associated to an export-controlled item under a specific ExportControlRegulation.	ItemExportControlRegulation	S5000F UoF Export Control Requirement
itemLocationCode	umlString	itemLocationCode is a string of characters that represents the item location code attribute of the data module code.	S1000DDataModule	CDM UoF Document
laborRate	NumericalPropertyType	laborRate is a value indicating the monetary value of an hour of a person with particular skills or competences.	LaborRates	S5000F UoF Contract Breakdown
latitude	umlString	latitude is a string of characters that contributes to uniquely identifies a GlobalPosition.	GlobalPosition	CDM UoF Location
learnCode	umlString	learnCode is a string of characters that represents the learn code attribute of the data module code.	S1000DDataModule	CDM UoF Document
learnEventCode	umlString	learnEventCode is a string of characters that represents the learn event code attribute of the data module code.	S1000DDataModule	CDM UoF Document

Attribute name	Type	Definition	Class name	UoF
length	PropertyType	length is a property that specifies the most extended longitudinal dimension of an object.	Cuboid	S-Series Compound Attributes
			Rectangle	S5000F Compound Attributes
			Cylinder	S-Series Compound Attributes
lifeAuthorizingOrganization	Organization	lifeAuthorizingOrganization identifies the organization that is the authoritative source for the authorizedLifeValue.	AuthorizedLife	S-Series Compound Attributes
localPositionDescription	DescriptorType	localPositionDescription is a narrative text explaining the rationale for a LocalPosition.	LocalPosition	S5000F UoF Local Position
localPositionIdentifier	IdentifierType	localPositionIdentifier is a string of text that uniquely identifies a LocalPosition and differentiates it from other LocalPositions.	LocalPosition	S5000F UoF Local Position
localPositionName	NameType	localPositionName is a text by which a LocalPosition is commonly known.	LocalPosition	S5000F UoF Local Position
localPositionRefType	ClassificationType	localPositionRefType is a classification that determines the point in a referenced item where all LocalPosition coordinates are zero.	LocalPosition	S5000F UoF Local Position
locationRelationshipType	ClassificationType	locationRelationshipType is a classification that identifies the meaning of the established relationship.	LocationRelationship	CDM UoF Location
locatorDescription	DescriptorType	locationDescription is a narrative statement about the locator.	Locator	S5000F UoF Location, Address and Locator
locatorIdentifier	IdentifierType	locatorIdentifier is a string of characters used to uniquely identify a Locator.	Locator	S5000F UoF Location, Address and Locator
locatorName	TextPropertyType	locatorName is a word or phrase by which a locator is known and can easily be referenced.	Locator	S5000F UoF Location, Address and Locator

Attribute name	Type	Definition	Class name	UoF
logBookDescription	DescriptorType	logBookDescription is a narrative statement explaining what the LogBook is.	LogBook	S5000F UoF Logbook
logBookEntryComment	DescriptorType	logBookEntryComment is a textual wording providing additional information to a logBookEntry.	LogBookEntry	S5000F UoF Logbook
logBookEntryDateTime	DateTimeType	logBookEntryDateTime is the date and time at which the logbook entry was recorded.	LogBookEntry	S5000F UoF Logbook
logBookEntryIdentifier	IdentifierType	logBookEntryIdentifier is a string of characters used to uniquely identify a LogBookEntry, thus being able to differentiate it from other LogBookEntries.	LogBookEntry	S5000F UoF Logbook
logbookEntryMeasurementNote	DescriptorType	logbookEntryMeasurementNote is a description that provides a human readable expression of a LogBookEntryMeasurementPoint.	LogBookEntryMeasurementPoint	S5000F UoF Logbook
logbookEntryMeasurementType	ClassificationType	logBookEntryCounterType is a classification that allows to group LogBookEntryCounter entries.	LogBookEntryMeasurementPoint	S5000F UoF Logbook
logBookEntryType	ClassificationType	logBookEntryType is a classification that is valid for a specific LogBookEntry.	LogBookEntry	S5000F UoF Logbook
logBookIdentifier	IdentifierType	logBookIdentifier is a string of characters used to uniquely identify a LogBook, thus being able to differentiate it from other logBooks.	LogBook	S5000F UoF Logbook
logBookType	ClassificationType	logBookType is a classification that allows to define the purpose of a logbook.	LogBook	S5000F UoF Logbook
longitude	umlString	longitude is a string of characters that represents a geographic coordinate specifying the east–west position of a point.	GlobalPosition	CDM UoF Location
lowerBound	umlString	lowerBound is a string of characters that represents the lower limit of the range.	SerialNumberRange	S-Series Compound Attributes

Attribute name	Type	Definition	Class name	UoF
lowerLimitSalesQuantity	umlInteger	lowerLimitSalesQuantity is an integer indicating the minimum quantity of items for which the unit of price (UOP) applies.	PriceBreakData	S2000M_6-1_Data_model
maintenanceActivityNote	DescriptorType	maintenanceActivityNote is a narrative statement about potential issues encountered during the MaintenanceActivity.	MaintenanceActivity	S5000F UoF Maintenance Activity
maintenanceActivityPartyRole	ClassificationType	maintenanceActivityPartyRole is a <<classification>> that defines the role of a Party in the context of a MaintenanceActivity.	MaintenanceActivity Party	S5000F UoF Maintenance Activity
maintenanceActivityPartyTime	NumericalPropertyType	maintenanceActivityPartyTime is the period of time spent by a Party during a MaintenanceActivity on a specific role.	MaintenanceActivity Party	S5000F UoF Maintenance Activity
maintenanceActivityPlanAccessHours	SingleValueProperty Type	maintenanceActivityPlanAccessHours is the is the expected time to be spent in gaining access for the MaintenanceActivity.	MaintenanceActivity Plan	S5000F UoF Maintenance Activity
maintenanceActivityPlanExecutionHours	SingleValueProperty Type	maintenanceActivityPlanExecutionHours is the planned time to be spent carrying out the MaintenanceActivity.	MaintenanceActivity Plan	S5000F UoF Maintenance Activity
maintenanceActivityPlanPeriod	DateTimeRange	maintenanceActivityPlanPeriod is the period of time during which the MaintenanceActivity is or was planned.	MaintenanceActivity Plan	S5000F UoF Maintenance Activity
maintenanceActivityPlanPreparationHours	SingleValueProperty Type	maintenanceActivityPlanPreparationHours is the expected time to be spect on preparation for the MaintenanceActivity.	MaintenanceActivity Plan	S5000F UoF Maintenance Activity
maintenanceActivityRecordAccessHours	SingleValueProperty Type	maintenanceActivityRecordAccessHours is the real time in hours spent in gaining access for the MaintenanceActivity.	MaintenanceActivity Record	S5000F UoF Maintenance Activity
maintenanceActivityRecordApprovalTime	DateTimeType	maintenanceActivityRecordApprovalTime is the date and time at which the MaintenanceActivity was approved.	MaintenanceActivity Record	S5000F UoF Maintenance Activity
maintenanceActivityRecordExecutionHours	SingleValueProperty Type	maintenanceActivityRecordExecutionHours is the real time in hours spent carrying out the MaintenanceActivity.	MaintenanceActivity Record	S5000F UoF Maintenance Activity
maintenanceActivityRecordPeriod	DateTimeRange	maintenanceActivityRecordPeriod is the period of time during which the maintenance was actually executed.	MaintenanceActivity Record	S5000F UoF Maintenance Activity

Attribute name	Type	Definition	Class name	UoF
maintenanceActivityRecordPreparationHours	SingleValueProperty Type	maintenanceActivityRecordPreparationHours is the real time in hours spent for the preparation of the MaintenanceActivity.	MaintenanceActivity Record	S5000F UoF Maintenance Activity
maintenanceActivityRecordWorkDone	TextPropertyType	maintenanceActivityRecordWorkDone is a text that briefly describes the work that has been done as part of a MaintenanceActivity.	MaintenanceActivity Record	S5000F UoF Maintenance Activity
maintenanceActivitySequence	umlInteger	maintenanceActivity is an integer that indicates the sequence number of the MaintenanceActivity in a set of MaintenanceActivities that are part of a WorkOrder.	MaintenanceActivity	S5000F UoF Maintenance Activity
maintenanceEventCategoryType	ClassificationType	maintenanceEventCategoryType is a classification that indicates a characteristic of a MaintenanceEvent.	MaintenanceEvent	S5000F UoF Maintenance Activity
maintenanceFacilityShifts	umlInteger	maintenanceFacilityShifts is the number of staff shifts in a MaintenanceFacility.	MaintenanceFacility	S5000F UoF Facility
maintenanceFacilitySlotDescription	DescriptorType	maintenanceFacilitySlotDescription is a textual explanation of the characteristics of a MaintenanceFacilitySlot.	MaintenanceFacility Slot	S5000F UoF Maintenance Facility Planning
maintenanceFacilitySlotIdentifier	IdentifierType	maintenanceFacilitySlotIdentifier is a string of characters that allows to uniquely identify a MaintenanceFacilitySlot and differentiate it from other MaintenanceFacilitySlots.	MaintenanceFacility Slot	S5000F UoF Maintenance Facility Planning
maintenanceFacilitySlotPlannedUsagePeriod	DateRange	maintenanceFacilitySlotPlannedUsagePeriod is a period of time in which a specific MaintenanceFacilitySlot has been allocated to a specific SerializedProductVariant.	MaintenanceFacility SlotPlannedUsage	S5000F UoF Maintenance Facility Planning
maintenanceFacilitySlotType	ClassificationType	maintenanceFacilitySlotType is a classification that allows to group MaintenanceFacilitySlots.	MaintenanceFacility Slot	S5000F UoF Maintenance Facility Planning
maintenanceFacilityType	ClassificationType	maintenanceFacilityType is a classification that identifies further specialization for a MaintenanceFacility.	MaintenanceFacility	S5000F UoF Facility

Attribute name	Type	Definition	Class name	UoF
maintenanceLevelCapabilityDescription	DescriptorType	maintenanceLevelCapabilityDescription is a description that gives more information on the ability to perform maintenance based on availability of support resources and environmental conditions.	MaintenanceLevel	CDM UoF Product Usage Context
maintenanceLevelIdentifier	IdentifierType	maintenanceLevelIdentifier is an identifier that establishes a unique designator for a MaintenanceLevel and to differentiate it from other instances of MaintenanceLevel.	MaintenanceLevel	CDM UoF Product Usage Context
maintenanceLevelName	NameType	maintenanceLevelName is a name by which the MaintenanceLevel is known and can be easily referenced.	MaintenanceLevel	CDM UoF Product Usage Context
maintenanceLicenceIdentifier	IdentifierType	maintenanceLicenceIdentifier is a string of characters that allows to uniquely identify a MaintenanceLicense and differentiate it from other MaintenanceLicenses.	MaintenanceLicense	S5000F UoF Maintenance Personnel
maintenanceLicenceName	DescriptorType	maintenanceLicenceName is a name or short phrase by which a MaintenanceLicense is usually known.	MaintenanceLicense	S5000F UoF Maintenance Personnel
maintenanceLicenceType	DatedClassification	maintenanceLicenceType is a DatedClassification that defines the kind of MaintenanceLicence that has been granted.	MaintenanceLicense	S5000F UoF Maintenance Personnel
maintenanceLicenceValidity	DateRange	maintenanceLicenceValidity is the standard duration for which a maintenance license is granted.	MaintenanceLicense	S5000F UoF Maintenance Personnel
maintenanceOrganizationApprovalDuring	DateRange	maintenanceOrganizationApprovalDuring is a period during which a specific MaintenanceOrganizationApproval is in effect.	MaintenanceOrganizationApproval	S5000F UoF Maintenance Organization
maintenanceOrganizationApprovalType	ClassificationType	maintenanceOrganizationApprovalType is a classification that defines the kind of MaintenanceOrganizationApproval that has been granted.	MaintenanceOrganizationApproval	S5000F UoF Maintenance Organization
maintenancePersonApprovedProductPerio	DateRange	maintenancePersonApprovedProductPeriod is a period of time during which a MaintenancePerson has been approved to work	MaintenancePersonApprovedProduct	S5000F UoF Maintenance Personnel

Attribute name	Type	Definition	Class name	UoF
d		on a specific ProductVariant.		
maintenancePersonFacilityPeriod	DateRange	maintenancePersonFacilityPeriod is the time period during which a MaintenancePerson has worked at a specific MaintenanceFacility.	MaintenancePersonFacility	S5000F UoF Maintenance Personnel
maintenancePersonJobType	ClassificationType	maintenancePersonJobType is a classification that identifies the kind of maintenance job that a MaintenancePerson has.	MaintenancePerson	S5000F UoF Maintenance Personnel
maintenancePersonRemarks	DescriptorType	maintenancePersonRemarks is a textual statement related to a person.	MaintenancePerson	S5000F UoF Maintenance Personnel
maintenanceProgramRevisionDescription	DescriptorType	maintenanceProgramRevisionDescription is a narrative statement explaining the MaintenanceProgramRevision and/or the changes that have been made to the MaintenanceProgram.	MaintenanceProgramRevision	S5000F UoF Maintenance Program
maintenanceProgramRevisionIdentifier	IdentifierType	maintenanceProgramRevisionIdentifier is a string of text that uniquely identifies a MaintenanceProgramRevision and allows to differentiate it from other MaintenanceProgramRevisions.	MaintenanceProgramRevision	S5000F UoF Maintenance Program
maintenanceProgramRevisionStatus	StateType	maintenanceProgramRevisionStatus is a state that identifies the maturity of a MaintenanceProgramRevision	MaintenanceProgramRevision	S5000F UoF Maintenance Program
maintenanceProgramType	ClassificationType	maintenanceProgramType is a classification that allows to group different types of Maintenance Programs.	MaintenanceProgram	S5000F UoF Maintenance Program
maintenanceSignificantOrRelevant	ClassificationType	maintenanceSignificantOrRelevant is a classfication that identifies whether a BreakdownElement requires maintenance activities or not.	BreakdownElementRevision	CDM UoF Breakdown Structure
managedFleetDuring	DateRange	managedFleetDuring is a <<DateRange>> that represents the period during which a FleetManager manages a specific Fleet.	ManagedFleet	S5000F UoF Fleet Definition
materialCharacteristicsRecordingDate	DateType	materialCharacteristicsRecordingDate is the date at which the Material information was last recorded or updated.	Material	S5000F UoF Supply Item

Attribute name	Type	Definition	Class name	UoF
materialDescription	DescriptorType	materialDescription is a narrative statement explaining the Material.	Material	S5000F UoF Supply Item
materialIdentifier	IdentifierType	materialIdentifier is a string of text that uniquely identifies a Material and differentiates it from other materials.	Material	S5000F UoF Supply Item
materialItemCategory Code	umlString	materialItemCategoryCode is a string of characters that represents the material item category code attribute of the data module code.	S1000DDataModule	CDM UoF Document
materialName	TextPropertyType	materialName is a text under which the Material is commonly known.	Material	S5000F UoF Supply Item
materialRiskDescripti on	DescriptorType	materialRiskDescription is a narrative statement explaining the Material risk.	Material	S5000F UoF Supply Item
materialRiskFactor	DatedClassification	materialRiskFactor is a classification that allows to determine whether the Material presents some safety or hazard risk.	Material	S5000F UoF Supply Item
materialSubstanceUs ageCategory	ClassificationType	materialSubstanceUsageCategory is a classification that defines the purpose for which the Material is used.	Material	S5000F UoF Supply Item
measurementPointIde ntifier	IdentifierType	measurementPointIdentifier is an identifier that establishes a unique designator for a MeasurementPoint and to differentiate it from other instances of MeasurementPoint.	MeasurementPoint	CDM UoF Part As Realized
measurementPointVal ue	PropertyType	measurementPointValue is a property that represents the value that is recorded for the MeasurementPoint.	MeasurementPoint	CDM UoF Part As Realized
messageContentStat us	StateType	messageContentStatus is a state that identifies the quality assurance status of the message content.	Message	CDM UoF Message
messageContentType	ClassificationType	messageContentType is a classification that characterizes the information included in the message content.	Message	CDM UoF Message

Attribute name	Type	Definition	Class name	UoF
messageCreationDateTime	DateTimeType	messageCreateDateTime is a date and time that defines when the Message was generated.	Message	CDM UoF Message
messageIdentifier	IdentifierType	messageIdentifier is an identifier that establishes a unique designator for a Message and allows it to be differentiated from other instances of Messages.	Message	CDM UoF Message
messageLanguage	ClassificationType	messageLanguage is a classification that identifies the language of the information in the message content.	Message	CDM UoF Message
messagePartyType	ClassificationType	messagePartyType is a classification that identifies the role of the associated Party.	MessageParty	CDM UoF Message
messageRelationshipType	ClassificationType	messageRelationshipType is a classification that characterizes the relationship that is established between two Messages.	MessageRelationship	CDM UoF Message
minimumSalesQuantity	umlInteger	Identifies the minimum quantity that can be purchased at the quoted unitOfIssuePrice (UOP).	HardwarePartAsDesignedCommerceData	S2000M_6-1_Data_model
minuteOffset	umlInteger	minuteOffset is an Integer that represents the number of minutes within an hour by which a time is offset from Coordinated Universal Time expressed as either '0', '15', '30' or '45'.	TimeOffset	S_Series_Primitives_2-0_001-00
modelIdentificationCode	umlString	modelIdentificationCode is a string of characters that represents the model identification code attribute of the data module code.	S1000DPublicationModule	CDM UoF Document
			S1000DDataModule	CDM UoF Document
modificationDate	DateType	modificationDate is a date that identifies when a SerializedHardwarePart changed its design standard.	ModificationOf	CDM UoF Part As Realized
movementIdentifier	IdentifierType	movementIdentifier is a string of characters that uniquely defines a Movement and allows to differentiate it from other Movements.	Movement	S5000F UoF Operational Period
movementLegDelayC	DescriptorType	movementLegDelayCause is a textual narrative describing the	MovementLegDelay	S5000F UoF Operational

Attribute name	Type	Definition	Class name	UoF
ause		reason for the delay.		Period
movementLegDelayDate	DateType	movementLegDelayDate is the date at which the delay took place.	MovementLegDelay	S5000F UoF Operational Period
movementLegDelayDuration	SingleValueProperty Type	movementLegDelayDuration represents the duration of the travel leg delay.	MovementLegDelay	S5000F UoF Operational Period
movementLegDelayIdentifier	IdentifierType	movementLegDelayIdentifier is a string of text that allows to uniquely identify a MovementLegDelay and differentiate it from other MovementLegDelays.	MovementLegDelay	S5000F UoF Operational Period
movementLegDelayType	ClassificationType	movementLegDelayType is a classification that permits to group the MovementLegDelays.	MovementLegDelay	S5000F UoF Operational Period
movementLegGeoLocationTime	DateTimeType	movementLegGeoLocationTime is the time at which a serialized product variant was at a specific geo-location during a movement leg.	MovementLegPosition	S5000F UoF Operational Period
movementLegIdentifier	IdentifierType	movementLegIdentifier s a string of characters used to uniquely identify a MovementLeg and differentiate it from other MovementLegs.	MovementLeg	S5000F UoF Operational Period
movementLegPeriod	DateTimeRange	movementLegPeriod is the period during which the product is performing a travel leg (is in transit).	MovementLeg	S5000F UoF Operational Period
movementLegResult	ClassificationType	movementLegResult is a classification that allows to group different movement legs based on the result of the MovementLeg.	MovementLeg	S5000F UoF Operational Period
movementLegSequence	umlInteger	movementLegSequence is an integer that indicates the sequence in which the travel leg has been performed during a specific product movement.	MovementLeg	S5000F UoF Operational Period
movementResult	ClassificationType	movementResult is a classification that allows to group different movement legs based on the result of the Movement.	Movement	S5000F UoF Operational Period

Attribute name	Type	Definition	Class name	UoF
movementTransit	DateTimeRange	movementTransit is the period during which the product has been in movement from its start location until its end location, considering both the individual travel legs and intermediate times that can have taken place between different travel legs.	Movement	S5000F UoF Operational Period
movementType	ClassificationType	movementType is a classification of the movement of the product. (eg, ferry, transport, etc)	Movement	S5000F UoF Operational Period
nonAvailabilityCause Description	DescriptorType	nonAvailabilityCauseDescription is a description that provides a human readable expression of a NonAvailabilityCause.	NonAvailabilityCaus e	S5000F UoF Availability
nonAvailabilityCauseI dentifier	IdentifierType	nonAvailabilityCauseIdentifier is a string of characters that uniquely identifies a NonAvailabilityCause.	NonAvailabilityCaus e	S5000F UoF Availability
nonAvailabilityCause Type	ClassificationType	nonAvailabilityCauseType is a <<classification>> that allows to group similar NonAvailabilityCauses.	NonAvailabilityCaus e	S5000F UoF Availability
nonConformanceDes cription	DescriptorType	nonConformanceDescription is a description that gives more information on how the EffectiveOnProductConfigurationItem does not comply with its requirements.	NonConformanceDat a	CDM UoF Product Design Configuration
nonConformanceRest riction	DescriptorType	nonConformanceRestriction is a description that gives more information on how the use of the related EffectiveOnProductConfigurationItem restricts the specified capabilities of the AllowedProductConfiguration in which it is contained.	NonConformanceDat a	CDM UoF Product Design Configuration
nonConformanceTyp e	ClassificationType	nonConformanceType is a classification that identifies in which way the EffectiveOnProductConfigurationItem does not comply with its requirements.	NonConformanceDat a	CDM UoF Product Design Configuration
obsolescenceParame terDescription	DescriptorType	obsolescenceParameterDescription is a narrative statement describing the ObsolescenceParameter.	ObsolescenceParam eter	S5000F UoF Obsolescence Management Candidates

Attribute name	Type	Definition	Class name	UoF
obsolescenceParameterId	IdentifierType	obsolescenceParameterId is a string of text that uniquely identifies an ObsolescenceParameter and differentiates it from other ObsolescenceParameters.	ObsolescenceParameter	S5000F UoF Obsolescence Management Candidates
obsolescenceParameterName	DescriptorType	obsolescenceParameterName is a text that represents an identifier by which an ObsolescenceParamenter is commonly known.	ObsolescenceParameter	S5000F UoF Obsolescence Management Candidates
obsolescenceParameterType	ClassificationType	obsolescenceParameterType is a classification that describes the type of parameter (eg,. obsolescence parameter, order, reliability, etc)	ObsolescenceParameter	S5000F UoF Obsolescence Management Candidates
obsolescenceParameterValue	PropertyType	obsolescenceParameterValue is a property that represents the value of the ObsolescenceParameter that indicates that an item is obsolete.	ObsolescenceParameter	S5000F UoF Obsolescence Management Candidates
operatingBaseCapacityIdentifier	IdentifierType	operatingBaseCapacityIdentifier is a string that uniquely identifies an OperatingBaseCapacity and allows to differentiate it from other OperatingBaseCapacities.	OperatingBaseCapacity	S5000F UoF Operating Base
operatingBaseProductVariantCapacity	umlInteger	operatingBaseProductVariantCapacity is the number of ProductVariants that can operate simultaneously at a specific OperatingBase.	OperatingBaseCapacity	S5000F UoF Operating Base
operatingBaseType	ClassificationType	operatingBaseType is a classification that identifies further specialization for a OperatingBase.	OperatingBase	S5000F UoF Operating Base
operatingEnvironmentPeriod	DateRange	operatingEnvironmentPeriod is a range of dates that represent a period during which a SerializedProductVariant operated in a specific OperatingEnvironment.	SerializedProductVariantEnvironment	S5000F UoF Operational Environment
operatingLocationTypeDescription	DescriptorType	operatingLocationTypeDescription is a description that gives more information on the OperatingLocationType, including environmental conditions to be expected.	OperatingLocationType	CDM UoF Product Usage Context

Attribute name	Type	Definition	Class name	UoF
operatingLocationTypeIdentifier	IdentifierType	operatingLocationTypeIdentifier is an identifier that establishes a unique designator for an OperatingLocationType and to differentiate it from other instances of OperatingLocationType.	OperatingLocationType	CDM UoF Product Usage Context
operatingLocationTypeName	NameType	operatingLocationTypeName is a name by which the OperatingLocationType is known and can be easily referenced.	OperatingLocationType	CDM UoF Product Usage Context
operationalApprovalIdentifier	IdentifierType	operationalApprovalIdentifier is a string that allows to uniquely identify an OperationalApproval and differentiate it from other OperationalApprovals.	OperationalApproval	S5000F UoF Operational Period
operationalApprovalType	DatedClassification	operationalApprovalType is a dated classification that describes the type of operational approval that is approved for use.	OperationalApproval	S5000F UoF Operational Period
operationalEventCategoryType	ClassificationType	operationalEventCategoryType is a classification that indicates a characteristic of an OperationalEvent.	OperationalEvent	S5000F UoF Operational Event
operationalEventMaintenanceDown	ClassificationType	operationalEventMaintenanceDown is a classification indicating that the OperationalEvent caused a maintenance down time to the SerializedProductVariant.	OperationalEvent	S5000F UoF Operational Event
operationalEventMaintenanceNotificationDateTime	DateTimeType	operationalEventMaintenanceNotificationDateTime is the date and time where the maintenance organization has been notified that maintenance was required due to the OperationalEvent.	OperationalEvent	S5000F UoF Operational Event
operationalEventMaintenanceReleasedDateTime	DateTimeType	operationalEventMaintenanceReleasedDateTime is the date and time at which the maintenance organization released the serialized product from maintenance after solving the issues caused by the operational event.	OperationalEvent	S5000F UoF Operational Event
operationalEventMessageIdentifier	IdentifierType	operationalEventMessageIdentifier is a string of characters used to uniquely identify an OperationalEventMessage and to differentiate it from other operationalEventMessages.	OperationalEventMessage	S5000F UoF Operational Event

Attribute name	Type	Definition	Class name	UoF
operationalEventMessageSequence	umlInteger	operationalEventMessageSequence is an integer stating the sequence in which a particular OperationalEventMessage was made.	OperationalEventMessage	S5000F UoF Operational Event
operationalEventMessageText	DescriptorType	operationalEventMessageText is a text that appears during or as a consequence of an OperationalEvent (eg, on an operator display or maintenance panel).	OperationalEventMessage	S5000F UoF Operational Event
operationalEventMessageType	ClassificationType	operationalEventMessageType is a classification of the operationalEventMessage.	OperationalEventMessage	S5000F UoF Operational Event
operationalEventOperationalMode	ClassificationType	operationalEventOperationalMode is a classification indicating the specific operational mode during which the operationalEvent occurred.	OperationalEvent	S5000F UoF Operational Event
operationalEventReportedDate	DateType	operationalEventReportedDate is the date at which the operational event was reported.	OperationalEvent	S5000F UoF Operational Event
operationalEventSymptom	ClassificationType	operationalEventSymptom is a classification of the symptom that the product presents during the OperationalEvent.	OperationalEvent	S5000F UoF Operational Event
operationalModeClassification	ClassificationType	operationalModeClassification is a classification that allows to assign an OperationalMode to a specific category or place the operationalModeIdentifier in context.	OperationalMode	S5000F UoF Operational Period
operationalModeDescription	DescriptorType	operationalModeDescription is a textual explanation of an OperationalMode.	OperationalMode	S5000F UoF Operational Period
operationalModeIdentifier	IdentifierType	operationalModeIdentifier is an unique identifier that allows to distinguish one OperationalMode from a different one.	OperationalMode	S5000F UoF Operational Period
operationalModeName	TextPropertyType	operationalModeName is a text that identifies an OperationalMode in an understandable way.	OperationalMode	S5000F UoF Operational Period
operationalModeStatu	ClassificationType	operationalModeStatusType is a classification of the operational	OperationalModeSta	S5000F UoF Operational

Attribute name	Type	Definition	Class name	UoF
sType		mode.	tus	Period
operationalModeStatusUsed	PropertyType	An indicator of whether the operationModeType was or not used, and how.	OperationalModeStatus	S5000F UoF Operational Period
operationalPeriodActual	DateTimeRange	operationalPeriodActual is the period of time during which the OperationalPeriod took effectively place.	OperationalPeriod	S5000F UoF Operational Period
operationalPeriodIdentifier	IdentifierType	operationalPeriodIdentifier is a string of characters used to uniquely identify an OperationalPeriod of an individual Product instance.	OperationalPeriod	S5000F UoF Operational Period
operationalPeriodName	TextPropertyType	operationalPeriodName is a word or phrase by which an Operational Period is commonly known and can be easily referenced.	OperationalPeriod	S5000F UoF Operational Period
operationalPeriodPhase	ClassificationType	operationalPeriodPhase is a classification that allows to classify an OperationalPeriod.	OperationalPeriod	S5000F UoF Operational Period
operationalPeriodRelationshipType	ClassificationType	operationalPeriodRelationshipType is a classification that defines the association between two individual operational periods.	OperationalPeriodRelationship	S5000F UoF Operational Period
operationalPeriodResult	ClassificationType	operationalPeriodResult is a classification that defines the result of the OperationalPeriod.	OperationalPeriod	S5000F UoF Operational Period
operationalPeriodScheduled	DateTimeRange	operationalPeriodScheduled is the period of time during which it was forseen that the OperationalPeriod would take place.	OperationalPeriod	S5000F UoF Operational Period
operationalRequirementPeriod	DateRange	operationalRequirementPeriod is a period of time during which an OperationalRequirement is in effect.	OperationalRequirement	S5000F UoF Fleet Planning and Product Assignment
operationalRoleDelta	ValueWithTolerancesPropertyType	operationalRoleDelta is a value that describes the delta regarding the baseline configuration of the OperationalRole for a specific ProductVariant.	OperationalRole	S5000F UoF Operational Roles

Attribute name	Type	Definition	Class name	UoF
operationalRoleDescription	DescriptorType	operationalRoleDescription is a narrative statement of what a specific OperationalRole is.	OperationalRole	S5000F UoF Operational Roles
operationalRoleidentifier	IdentifierType	operationalRoleIdentifier is a string of characters that uniquely identifies an OperationalRole.	OperationalRole	S5000F UoF Operational Roles
operationalRoleTime	PropertyType	operationalRoleTime is a period of time associated to the OperationalRole.	OperationalRole	S5000F UoF Operational Roles
operationalRoleType	ClassificationType	operationalRoleType is a classification that allows to group different OperationalRoles.	OperationalRole	S5000F UoF Operational Roles
operationalTimeType	ClassificationType	operationalTimeType is a <<classificationType>> that determines the type of operationalTime that is being measured.	OperationalTime	S5000F UoF Operational Times
operationalTimeValue	NumericalPropertyType	operationalTimeValue is a time that defines the duration of a specific operationalTime.	OperationalTime	S5000F UoF Operational Times
oppositeAngle	PropertyType	oppositeAngle is the angle between the two sides opposite of the base of a triangle.	Triangle	S5000F Compound Attributes
organizationalBreakdownStructureRevisionDate	DateType	organizationalBreakdownStructureRevisionDate is the date at which the OrganizationalBreakdownStructureRevision was created.	OrganizationalBreakdownStructureRevision	S5000F UoF Organizational Breakdown Structure
organizationalBreakdownStructureRevisionIdentifier	IdentifierType	organizationalBreakdownStructureRevisionIdentifier is a string of characters that allow to uniquely identify an OrganizationalBreakdownStructureRevision and differentiate it from other OrganizationalBreakdownStructureRevisions.	OrganizationalBreakdownStructureRevision	S5000F UoF Organizational Breakdown Structure
organizationalBreakdownStructureRevisionPeriod	DateRange	organizationalBreakdownStructureRevisionPeriod is the period of time during which an OrganizationalBreakdownStructureRevision is or has been in effect.	OrganizationalBreakdownStructureRevision	S5000F UoF Organizational Breakdown Structure
organizationalBreakd	DescriptorType	organizationalBreakdownStructureRevisionRationale is a	OrganizationalBreak	S5000F UoF Organizational

Attribute name	Type	Definition	Class name	UoF
ownStructureRevision Rationale		description that indicates the reason for this OrganizationalBreakdownStructureRevision.	downStructureRevision	Breakdown Structure
organizationalBreakdownStructureRevision Status	StateType	organizationalBreakdownStructureRevisionStatus is a state that identifies the maturity of an OrganizationalBreakdownStructureRevision.	OrganizationalBreakdownStructureRevision	S5000F UoF Organizational Breakdown Structure
organizationalRoleDescription	DescriptorType	organisationalRoleDescription is a textual narrative statement describing an OrganizationalRole	OrganizationalRole	S5000F UoF Organizational Breakdown Structure
organizationalRoleType	ClassificationType	organisationalRoleType is a classification that allows to group similar OrganisationalRoles.	OrganizationalRole	S5000F UoF Organizational Breakdown Structure
organizationDates	DateRange	organizationDates is a period of time during which the organization exists.	Organization	S5000F Specializations
organizationDescription	DescriptorType	organizationDescription is a textual narrative statement that explains what the Organization is.	Organization	S5000F Specializations
organizationOperationsApprovalDuring	DateRange	organizationOperationsApprovalDuring is the period of time during which the approval of an OperatorOrganization to operate during a specific product variant is in effect.	OrganizationOperationsApproval	S5000F UoF Operator
organizationType	ClassificationType	organizationType is a classification that allows to define groups of organizations.	Organization	S5000F Specializations
otherFacilityType	ClassificationType	otherFacilityType is a classification that allows to differentiate between different classes of OtherFacilities.	OtherFacility	S5000F UoF Facility
parkingFacilityType	ClassificationType	parkingFacilityType is a classification that allows to differentiate between different classes of ParkingFacilities.	ParkingFacility	S5000F UoF Facility
partActionCause	ClassificationType	A classification describing the cause for a specific PartAction.	PartAction	S5000F UoF Equipment
partActionCauseDesc	DescriptorType	A textual description describing the underlying cause for a	PartAction	S5000F UoF Equipment

Attribute name	Type	Definition	Class name	UoF
ription		PartAction.		
partActionDate	DateTimeType	partActionDate is the date at which a specific PartAction was performed.	PartAction	S5000F UoF Equipment
partActionIdentifier	IdentifierType	partActionIdentifier is a string that uniquely identifies a PartAction and differentiates it from other PartActions.	PartAction	S5000F UoF Equipment
partActionTimeSince New	SingleValueProperty Type	partActionTimeSinceNew is the elapsed time since the part was put into service at the moment of the PartAction.	PartAction	S5000F UoF Equipment
partActionTimeSince Overhaul	SingleValueProperty Type	partActionTimeSinceOverhaul is the elapsed time since the part was overhauled for the last time at the moment that the PartAction took place.	PartAction	S5000F UoF Equipment
partActionType	ClassificationType	partActionType is a classification describing the PartAction that has been performed on a part.	PartAction	S5000F UoF Equipment
partAsDesignedParts ListRelationshipType	ClassificationType	partAsDesignedPartsListRelationshipType is a classification that identifies the meaning of the established relationship.	PartAsDesignedPart sListRelationship	CDM UoF Part Definition
partDimensions	ThreeDimensional	partDimensions are the ThreeDimensional characteristics of a HardwarePartAsDesigned.	HardwarePartAsDesi gned	S5000F Specializations
partExportControl	ClassificationType	partExportControl is a classification that indicates whether the part is subject to export control restrictions.	HardwarePartAsDesi gned	S5000F Specializations
partIdentifier	IdentifierType	partIdentifier is an identifier that establishes a unique designator for a PartAsDesigned and to differentiate it from other instances of PartAsDesigned.	PartAsDesigned	CDM UoF Part Definition
partInPoolPeriod	DateRange	partInPoolPeriod is a range of dates representing the period during which a HardwarePart belonged to a specific Pool of parts.	PartInPool	S5000F UoF Warehouse and Spare Pool
partInPoolQuantityDu	SingleValueProperty	partInPoolQuantityDuringPeriod is a value representing the quantity of HardwareParts stocked in a Pool during the specified	PartInPool	S5000F UoF Warehouse and

Attribute name	Type	Definition	Class name	UoF
ringPeriod	Type	period of time.		Spare Pool
partInWarehousePeriod	DateRange	partInWarehousePeriod is the period of time that a part is stored in a specific warehouse.	PartInWarehouse	S5000F UoF Warehouse and Spare Pool
partInWarehouseQuantityDuringPeriod	SingleValueProperty Type	partInWarehouseQuantityDuringPeriod is a value representing the quantity of HardwareParts stocked in a warehouse during the specified period.	PartInWarehouse	S5000F UoF Warehouse and Spare Pool
partMajorComponent	umlBoolean	partMajorComponent is a classification that indicates that a part needs separate tracking because it can be considered a major SerializedProductVariant by its own right.	HardwarePartAsDesigned	S5000F Specializations
partName	NameType	partName is a name by which the PartAsDesigned is known and can be easily referenced.	PartAsDesigned	CDM UoF Part Definition
partsListEntryIdentifier	IdentifierType	partsListEntryIdentifier is an identifier that establishes a unique designator for a PartAsDesignedPartsListEntry and to differentiate it from other instances of PartAsDesignedPartsListEntry.	PartAsDesignedPartsListEntry	CDM UoF Part Definition
partsListEntryQuantity	PropertyType	partsListEntryQuantity is a property that specifies the amount of the PartAsDesigned used in its parent PartAsDesignedPartsListRevision.	PartAsDesignedPartsListEntry	CDM UoF Part Definition
partsListRevisionIdentifier	IdentifierType	partsListRevisionIdentifier is an identifier that establishes a unique designator for a PartAsDesignedPartsListRevision and to differentiate it from other instances of PartAsDesignedPartsListRevision for the same partsListType.	PartAsDesignedPartsListRevision	CDM UoF Part Definition
partsListRevisionStatus	StateType	partsListRevisionStatus is a state that identifies the maturity of a PartAsDesignedPartsListRevision.	PartAsDesignedPartsListRevision	CDM UoF Part Definition
partsListType	ClassificationType	partsListType is a classification that identifies the context and intended use of the PartAsDesignedPartsList.	PartAsDesignedPartsList	CDM UoF Part Definition

Attribute name	Type	Definition	Class name	UoF
partWeight	NumericalPropertyType	partWeight is a numeric value indcating the weight of a HardwarePartAsDesigned.	HardwarePartAsDesigned	S5000F Specializations
partyAddressDuration	DateRange	Period of time during which the address of a Party is valid.	PartyAddress	S5000F UoF Party
partyAddressType	ClassificationType	partyAddressType is a <<classification>> describing the type of relationship between a Party and an Address.	PartyAddress	S5000F UoF Party
partyContactDataDetails	DescriptorType	partyContactDataDetails is a description that provides further details on the contact data of a Party.	PartyContactData	S5000F UoF Party
partyContactDataType	ClassificationType	partyContactDataType is a <<classification>> that allows to qualify the PartyContactData.	PartyContactData	S5000F UoF Party
partyRelationshipDescription	DescriptorType	partyRelationshipDescription is a textual narrative statement explaining the association between two Parties.	PartyRelationship	S5000F UoF Party
partyRelationshipDuration	DateRange	The date range during which the association between two parties exists.	PartyRelationship	S5000F UoF Party
partyRelationshipType	ClassificationType	partyRelationshipType is a relationship describing how two Parties are associated.	PartyRelationship	S5000F UoF Party
partySecurityAssignmentPeriod	DateRange	partySecurityAssignmentPeriod is range of dates that indicates during which a Party has been assigned a certain security clearance.	PartySecurityAssignment	S5000F UoF Security Classification
penaltyAmount	SingleValueProperty Type	penaltyAmount is a number that represents the amount corresponding to a Penalty.	Penalty	S5000F UoF Service Contract Penalty
penaltyDate	DateType	penaltyDate is a Date at which a Penalty was established.	Penalty	S5000F UoF Service Contract Penalty
penaltyDescription	DescriptorType	penaltyDescription is a description that provides a human readable expression of a Penalty.	Penalty	S5000F UoF Service Contract Penalty

Attribute name	Type	Definition	Class name	UoF
penaltyIdentifier	IdentifierType	penaltyIdentifier is a string of characters that uniquely identifies a Penalty.	Penalty	S5000F UoF Service Contract Penalty
penaltySettledAt	DateType	penaltySettledAt is a Date at which a Penalty was settled.	Penalty	S5000F UoF Service Contract Penalty
personCompetenceAcquired	DateType	personCompetenceAcquired is a Date at which a PersonCompetence was acquired.	PersonCompetence	S5000F UoF Person Competences and Labor Rates
personDates	DateRange	personDates are the dates during which a Person exists.	Person	S5000F UoF Party
personFamilyName	TextPropertyType	PersonFamilyName is a text that indicates the family name of a Person.	Person	S5000F UoF Party
personIdentifier	IdentifierType	personIdentifier is an unique identifier that differentiates a Person from any other Person.	Person	S5000F UoF Party
personMiddleName	TextPropertyType	personMiddleName is a text that indicates the middle name of a person.	Person	S5000F UoF Party
personName	TextPropertyType	personName is a textual description used normally to identify a Person	Person	S5000F UoF Party
personOperationsApprovalDuring	DateRange	personOperationsApprovalDuring is the period of time during which the approval of an OperatorPerson to operate during a specific product variant is in effect.	PersonOperationsApproval	S5000F UoF Operator
personPrefixTitle	ClassificationType	personPrefixTitle is a classification indicating a title that is used before a Person's name.	Person	S5000F UoF Party
personSuffixTitle	ClassificationType	personSuffixTitle is a classification indicating a title that is added after a Person name.	Person	S5000F UoF Party
plannedItemUpgradeI	IdentifierType	plannedItemUpgradeIdentifier is a string of text that uniquely	PlannedItemUpgrad	S5000F UoF Change

Attribute name	Type	Definition	Class name	UoF
dentifier		identifies a PlannedItemUpgrade and differentiates it from all othe rplanned PlannedItemUpgrades.	e	Embodiment Strategy
plannedItemUpgrade Priority	ClassificationType	plannedProductUpgradeIdentifier is a string of characters that uniquely identifies a PlannedProductUpgrade, differentiating it from all other PlannedProductUpgrades.	PlannedItemUpgrad e	S5000F UoF Change Embodiment Strategy
plannedItemUpgrade Reason	ClassificationType	plannedItemUpgradeReason is a <<classification>> that allows to group different PlannedItemUpgrades by the root causes for such upgrade.	PlannedItemUpgrad e	S5000F UoF Change Embodiment Strategy
plannedUpgradePerio d	DateTimeRange	plannedUpgradePeriod is the range of time during which the product update has been planned.	PlannedUpgradeTim escales	S5000F UoF Change Embodiment Planning
plannedUpgradeTime scaleIdentifier	IdentifierType	plannedUpgradeTimescaleIdentifier is a string of text that uniquely identifies a PlannedProductUpgrade and differentiates it from the other PlannedProductUpgrades.	PlannedUpgradeTim escales	S5000F UoF Change Embodiment Planning
plannedUpgradeTime scaleVersion	IdentifierType	plannedUpgradeTimescaleVersion is a string of text that allows to differentiate a different version for a same PlannedProductUpgrade.	PlannedUpgradeTim escales	S5000F UoF Change Embodiment Planning
policiesAndRegulatio nsEffectivity	DateRange	policiesAndRegulationsEffectivity is the period of time during which a policy or regulation is in effect.	PoliciesAndRegulati ons	S5000F UoF Policies and Regulations
poolDescription	DescriptorType	poolDescription is textual narrative statement explaining the purpose of a Pool.	Pool	S5000F UoF Warehouse and Spare Pool
poolIdentifier	IdentifierType	poolIdentifier is string of characters that allows to uniquely identify a specific Pool among other Pools.	Pool	S5000F UoF Warehouse and Spare Pool
poolName	TextPropertyType	poolName is a word or phrase under which the Pool is commonly known and to which it can be referred.	Pool	S5000F UoF Warehouse and Spare Pool
poolOwnershipDuring	DateRange	poolOwnershipDuring defines the period of time during which the	PoolOwner	S5000F UoF Warehouse and

Attribute name	Type	Definition	Class name	UoF
		ownership of a Pool by a specific Part is valid.		Spare Pool
poolOwnershipRatio	SingleValueProperty Type	poolOwnershipRatio is the percentage of ownership of a Pool by a specific Party during a specific period of time.	PoolOwner	S5000F UoF Warehouse and Spare Pool
poolStockedInWareHouseDuring	DateRange	poolStockedInWareHouseDuring is a range of dates indicating the period during which a Pool of parts was stocked at a defined Warehouse.	PoolStockedInWare House	S5000F UoF Warehouse and Spare Pool
poolType	ClassificationType	poolType is a classification that allows to determine the kind of Pool.	Pool	S5000F UoF Warehouse and Spare Pool
poolUsageDescription	DescriptorType	poolUsageDescription is a textual narrative statement explaining the usage of a Pool by a specific Party.	PoolUser	S5000F UoF Warehouse and Spare Pool
poolUsageDuring	DateRange	poolUsageDuring is the period during which a Party can have a certain type of access to a spares Pool.	PoolUser	S5000F UoF Warehouse and Spare Pool
poolUsageType	ClassificationType	poolUsageType is a classification that defines the kind of usage that a Party can have on a specific spares Pool.	PoolUser	S5000F UoF Warehouse and Spare Pool
postalCode	umlString	postalcode is a string of characters that represents a short code used by the postal service to identify a geographical area.	StreetAddress	CDM UoF Location
productLife	DateRange	productLife is a date range that indicates the expected or actual life of a Product.	Product	S5000F Specializations
productParameterAtOperationalEventName	DescriptorType	productParameterAtOperationalEventName is a word or phrase by which the productParameter that occurred at an OperationalEvent is known.	ProductParameterAt OperationalEvent	S5000F UoF Operational Event
productParameterAtOperationalEventValue	PropertyType	productParametersAtOperationalEventValue is the value of the productParametersAtOperationalEvent.	ProductParameterAt OperationalEvent	S5000F UoF Operational Event
productParametersAt OperationalEventIden	IdentifierType	productParametersAtOperationalEventIdentifier is a string of text that uniquely identifies a ProductParameterAtOperationalEvent	ProductParameterAt	S5000F UoF Operational

Attribute name	Type	Definition	Class name	UoF
tifier		and allows to differentiate it from other ProductParameterAtOperationalEvent.	OperationalEvent	Event
productUsagePhaseDescription	DescriptorType	productUsagePhaseDescription is a textual narrative statement explaining a ProductUsagePhase.	ProductUsagePhase	S5000F UoF Product Usage Phase
productUsagePhaseDuration	PropertyType	productUsagePhaseDuration is a property indicating the period of time during which the ProductUsagePhase extends.	ProductUsagePhase	S5000F UoF Product Usage Phase
productUsagePhaseIdentifier	IdentifierType	productUsagePhaseIdentifier is a string that uniquely identifies a ProductUsagePhase and differentiates it from other ProductUsagePhases.	ProductUsagePhase	S5000F UoF Product Usage Phase
productUsagePhaseRelationshipIdentifier	IdentifierType	productUsagePhaseRelationShipIdentifier is a string of characters that uniquely identifies a ProductUsagePhaseRelationship.	ProductUsagePhase Relationship	S5000F UoF Product Usage Phase
productUsagePhaseRelationshipType	ClassificationType	productUsagePhaseRelationShipType is a <<classification>> that defines how two ProductUsagePhases are related.	ProductUsagePhase Relationship	S5000F UoF Product Usage Phase
productVariantDescription	DescriptorType	productVariantDescription is a narrative text explaining a ProductVariant.	ProductVariant	S5000F Specializations
productVariantDimensions	ThreeDimensional	productVariantDimensions are the ThreeDimensional characteristics of a ProductVariant,	ProductVariant	S5000F Specializations
productVariantEntryIntoServiceDate	DateType	productVariantEntryIntoServiceDate is the date at which the first item or product of a specific ProductVariant entered service.	ProductVariant	S5000F Specializations
productVariantLastBuyDate	DateType	productVariantLastBuyDate is the last date at which a ProductVariant can be purchased.	ProductVariant	S5000F Specializations
productVariantMaintenancePeriod	DateRange	productVariantMaintenancePeriod is a DateRange during which a ProductVariantMaintenance takes place.	ProductVariantMaintenance	S5000F UoF Maintenance Organization

Attribute name	Type	Definition	Class name	UoF
productVariantProductionDates	DateRange	productVariantProductionDates is the period of time during which a ProductVariant is in production.	ProductVariant	S5000F Specializations
productVariantSupportedByPoolDuring	DateRange	productVariantSupportedByPoolDuring is a range of dates indicating the period of time during which a ProductVariant is supported by a defined parts Pool.	ProductVariantSupportedByPool	S5000F UoF Warehouse and Spare Pool
productVariantWeight	NumericalPropertyType	productVariantWeight is a number that represents the weight of a ProductVariant.	ProductVariant	S5000F Specializations
projectIdentifier	IdentifierType	projectIdentifier is an identifier that establishes a unique designator for a Project and to differentiate it from other instances of Project.	Project	CDM UoF Product and Project
projectName	NameType	projectName is a name by which the Project is known and can be easily referenced.	Project	CDM UoF Product and Project
projectRelationshipType	ClassificationType	projectRelationshipType is a classification that defines the type of relationship between two Projects.	ProjectRelationship	S5000F UoF Project and Contract
projectSpecificAttributeName	validValue	projectSpecificAttributeName is a valid value that uniquely identifies a ProjectSpecificAttribute.	ProjectSpecificAttribute	S_Series_Base_Object_Definition_2-0_001-00
publicationModuleIssueInWorkNumber	umlString	publicationModuleIssueInWorkNumber is a string of characters used for monitoring and control of intermediate drafts of S1000DPublicationModuleIssue.	S1000DPublicationModuleIssue	CDM UoF Document
publicationModuleIssueLanguage	ClassificationType	publicationModuleIssueLanguage is a classification that identifies the language used to produce the content of the S1000DPublicationModuleIssue.	S1000DPublicationModuleIssue	CDM UoF Document
publicationModuleIssueLanguageCountry	ClassificationType	publicationModuleIssueLanguageCountry is a classification that identifies the country where the language, identified by publicationModuleIssueLanguage, is spoken	S1000DPublicationModuleIssue	CDM UoF Document

Attribute name	Type	Definition	Class name	UoF
publicationModuleIssueNumber	umlString	publicationModuleIssueNumber is a string of characters used to identify the release number of the S1000DPublicationModuleIssue.	S1000DPublicationModuleIssue	CDM UoF Document
publicationModuleIssuer	umlString	publicationModuleIssuer is a string of characters that represents the issuing authority attribute of the publication module code.	S1000DPublicationModule	CDM UoF Document
publicationModuleNumber	umlString	publicationModuleNumber is a string of characters that represents the number of the publication module attribute of the publication module code.	S1000DPublicationModule	CDM UoF Document
publicationModuleVolume	umlString	publicationModuleVolume is a string of characters that represents the volume of the publication attribute of the publication module code.	S1000DPublicationModule	CDM UoF Document
quantityOfContainedSubstance	PropertyType	quantityOfContainedSubstance is a property that identifies the amount of the substance included in the HardwarePartAsDesigned.	ContainedSubstance	CDM UoF Part Definition
quantityOfContractItem	PropertyType	quantityOfContractItem is a property that identifies the number of ContractItems that are included in the Contract	ContractItemDetails	CDM UoF Product and Project
reasonForShopSubmission	ClassificationType	reasonForShopSubmission is a classification that provides the justification for the submission of an equipment to a workshop.	ShopFindings	S5000F UoF Shop Findings
referencedDigitalFileJustification	DescriptorType	referencedDigitalFileJustification is a phrase that provides more on information on the reason why the DigitalFile is referenced.	ReferencedDigitalFile	CDM UoF Digital File
referencedDocumentPortion	DescriptorType	referencedDocumentPortion is a description that provides a reference to the portion of a document which is of interest in a specific usage.	ReferencedDocument	CDM UoF Document
referencedDocumentRole	ClassificationType	referencedDocumentRole is a classification that identifies the function of the established relationship.	ReferencedDocument	CDM UoF Document

Attribute name	Type	Definition	Class name	UoF
referenceDesignator	IdentifierType	referenceDesignator is a identifier that establishes a unique designator for a location within the overall Product, and to differentiate it from other locations.	BreakdownElementUsageInBreakdown	CDM UoF Breakdown Structure
			PartAsDesignedPartsListEntry	CDM UoF Part Definition
releasedDataSetAssociatedWithType	ClassificationType	releasedDataSetAssociatedWithType is a classification that allows to establish the type of relationship with which a DataSetAsReleased is associated with another item.	ReleasedDataSetAssociatedWith	S5000F UoF Data Sets
remarkText	DescriptorType	remarkText is a description that provides the text of the additional information.	Remark	CDM UoF Remark
remarkType	ClassificationType	remarkType is a classification that defines the purpose of the remark.	Remark	CDM UoF Remark
removedDateTime	DateTimeType	removedDateTime is a date and time that specifies the exact point in time when the RealizedPart was uninstalled from the InstallationLocation.	InstalledPart	CDM UoF Serialized Product Variant Configuration
reportableActivityIdentifier	IdentifierType	reportableActivityIdentifier is a string of characters that is used to uniquely identify a ReportableActivity and to differentiate it from other ReportableActivities.	ReportableActivity	S5000F UoF Reportable Activity
reportableActivityPeriod	DateRange	reportableActivityPeriod is the period of time on which the reporting is performed.	ReportableActivity	S5000F UoF Reportable Activity
reportableActivityReportingDate	DateType	reportableActivityDate is the date at which the reporting is performed.	ReportableActivity	S5000F UoF Reportable Activity
reportableMetricDescription	DescriptorType	reportableMetricDescription is a textual narrative explaining the reportableMetric details.	ReportableMetric	S5000F UoF Reportable Metric
reportableMetricIdentifier	IdentifierType	reportableMetricIdentifier is an unique identifier that allows to uniquely identify a ReportableMetric from any other one.	ReportableMetric	S5000F UoF Reportable Metric

Attribute name	Type	Definition	Class name	UoF
reportableMetricPeriod	DateTimeRange	reportableMetricPeriod is the period of time over which the metric was collected.	ReportableMetric	S5000F UoF Reportable Metric
reportableMetricType	ClassificationType	reportableMetricType is a classification that allows to group ReportabaleMetrics by its characteristics.	ReportableMetric	S5000F UoF Reportable Metric
reportableMetricValue	PropertyType	reportableMetricValue is a PropertyType providing the measurable value that a ReportableMetric has during a specific reporting period.	ReportableMetric	S5000F UoF Reportable Metric
reportPartyRole	ClassificationType	reportPartyRole is a <<classification>> that allows to define the role of a Party in relationship with a Report.	ReportParty	S5000F UoF Report
reportPeriod	DateRange	reportPeriod is the period of time on which a report is providing information.	Report	S5000F UoF Report
requiredFleetRoleAvailability	SingleValueProperty Type	requiredFleetRoleAvailability defines the necessary availability in a specific OperationalRole to be able to comply with a FleetRequirement.	RequiredFleetRole	S5000F UoF Fleet Planning and Product Assignment
requiredPartStockLevelValue	SingleValueProperty Type	requiredPartStockLevelInPool is a value indicating the required number of parts that have to be stocked for a specific spare pool.	RequiredPartStockLevelInPool	S5000F UoF Warehouse and Spare Pool
requirementDate	DateType	requirementDate is the date at which a Requirement was defined.	Requirement	S5000F UoF Requirement
requirementDescription	DescriptorType	requirementDescription is a narrative statement that explains what the requirement is.	Requirement	S5000F UoF Requirement
requirementId	IdentifierType	requirementId is a string of text that allows to uniquely identify a Requirement and differentiate it from other Requirements.	Requirement	S5000F UoF Requirement
requirementName	TextPropertyType	requirementName is a text that provides an identifier by which a Requirement is commonly known.	Requirement	S5000F UoF Requirement
requirementPartyRole	ClassificationType	requirementPartyRole is a <<classification>> that defines the role	RequirementParty	S5000F UoF Requirement

Attribute name	Type	Definition	Class name	UoF
		of a Party with regard to a Requirement.		
requirementRaisedBy	Organization	requirementRaisedBy represents the organization that has raised a requirement.	Requirement	S5000F UoF Requirement
requirementRelationshipType	ClassificationType	requirementRelationshipType is a <<classification>> that defines how two Requirements are related.	RequirementRelationship	S5000F UoF Requirement
requirementStatus	StateType	requirementStatus is a state that identifies the status of the Requirement.	Requirement	S5000F UoF Requirement
requirementType	ClassificationType	requirementType is a classification that allows to group Requirements of a same kind.	Requirement	S5000F UoF Requirement
resourceSpecificationDescription	DescriptorType	resourceSpecificationDescription is a description that gives more information on the characteristics that a part realization must fulfill in order to qualify as a possible resource.	ResourceSpecification	CDM UoF Task Resource
resourceSpecificationIdentifier	IdentifierType	resourceSpecificationIdentifier is an identifier that establishes a unique designator for a ResourceSpecification and to differentiate it from other instances of ResourceSpecification.	ResourceSpecification	CDM UoF Task Resource
resourceSpecificationName	NameType	resourceSpecificationName is a name by which the ResourceSpecification is known and can be easily referenced.	ResourceSpecification	CDM UoF Task Resource
resourceUsagePartyRole	ClassificationType	resourceUsagePartyRole is the role that the party is performing for a specific ResourceUsageRequest.	ResourceUsageParty	S5000F UoF Resource Usage Request
resourceUsageRequestDate	DateType	resourceUsageRequestDate is the date at which a ResourceUsageRequest was perfromed.	ResourceUsageRequest	S5000F UoF Resource Usage Request
resourceUsageRequestDescription	DescriptorType	resourceUsageRequestDescription is a textual narrative explaining the ResourceUsageRequest.	ResourceUsageRequest	S5000F UoF Resource Usage Request
resourceUsageReque	IdentifierType	resourceUsageRequestIdentifier is a text that uniquely identifies a ResourceUsageRequest and differentiates it from other	ResourceUsageReq	S5000F UoF Resource

Attribute name	Type	Definition	Class name	UoF
stIdentifier		ResourceUsageRequests.	uest	Usage Request
resourceUsageRequestName	DescriptorType	resourceUsageRequestName is a string of text that summarizes the ResourceUsageRequest and can be used to easily reference it in common speech.	ResourceUsageRequest	S5000F UoF Resource Usage Request
resourceUsageRequestPeriod	DateRange	resourceUsageRequestPeriod is the period of time during which a Resource is requested.	ResourceUsageRequest	S5000F UoF Resource Usage Request
resourceUsageRequestStatus	StateType	resourceUsageRequestStatus is a state indicating what the current status of a ResourceUsageRequest is.	ResourceUsageRequest	S5000F UoF Resource Usage Request
roleCapabilityLevel	ClassificationType	roleCapabilityLevel is a <<classification>> that allows to define the level of a RoleCapability.	RoleCapability	S5000F UoF Operational Roles
safetyDocumentCriticality	ClassificationType	safetyDocumentCriticality is a classification on the criticality of a safety issue addressed in a SafetyDocument.	SafetyDocument	S5000F UoF Safety
safetyIsssueReportingDateTime	DateTimeType	safetyIssueReportingDateTime is the date and time at which the SafetyIssue was reported.	SafetyIssue	S5000F UoF Safety
safetyIssueAssessmentBy	Organization	safetyIssueAssessmentBy is the Orgamization that has to assess the safety issue.	SafetyIssue	S5000F UoF Safety
safetyIssueFirstIdentificationDateTime	DateTimeType	safetyIssueFirstIdentificationDateTime is the date and time at which the SafetyIssue was first identified.	SafetyIssue	S5000F UoF Safety
safetyWarningAplicabilityDates	DateRange	safetyWarningAplicabilityDates is the period of time during which a SafetyWarning is applicable.	SafetyWarning	S5000F UoF Safety
safetyWarningPriority	ClassificationType	safetyWarningPriority is a <<classification>> that allows to group SafetyWarnings by their priority.	SafetyWarning	S5000F UoF Safety
securityClassificationDate	DateType	securityClassificationDate is a date when the security classification is declared.	SecurityClassification	CDM UoF Security Classification

Attribute name	Type	Definition	Class name	UoF
securityClassValue	NameType	securityClassValue is a name that defines the level of confidentiality.	SecurityClass	CDM UoF Security Classification
sense	validValue	sense is a word or a code that defines the direction of the offset.	TimeOffset	S_Series_Primitives_2-0_001-00
sensorDetectionRange	ValueRangeProperty Type	sensorDetectionRange is the range of values measured by the SensorType.	SensorType	S5000F UoF Serialized Product Health Monitoring
sensorIdentifier	IdentifierType	sensorIdentifier is a string of text that uniquely identifies a Sensor and differentiates it from any other Sensor.	Sensor	S5000F UoF Serialized Product Health Monitoring
sensorName	TextPropertyType	sensorName is a string of text that is used to commonly refer to a sensor of a specific type.	Sensor	S5000F UoF Serialized Product Health Monitoring
sensorSamplingMode	ClassificationType	sensorSampleMode is a classification of the type of sensor sampling if it can provide multiple samples or error codes.	SensorSample	S5000F UoF Serialized Product Health Monitoring
sensorSamplingRate	ValueRangeProperty Type	sensorSamplingRate is the frequency by which a SensorType measures values.	SensorType	S5000F UoF Serialized Product Health Monitoring
sensorSensitivity	ValueRangeProperty Type	sensorSensitivity is the range of values that a SensorType can measure.	SensorType	S5000F UoF Serialized Product Health Monitoring
serializedHardwarePartAuthorizedLife	AuthorizedLife	serializedHardwarePartAuthorizedLife is the AuthorizedLife for a SerializedHardwarePart	SerializedHardwarePart	S5000F Specializations
serializedHardwarePartDimensions	ThreeDimensional	serializedHardwarePartDimensions are the ThreeDimensional characteristics of a SerializedHardwarePart.	SerializedHardwarePart	S5000F Specializations
serializedHardwarePartInServicePeriod	DateRange	serializedHardwarePartInServicePeriod is a date range during which the serialized hardware part was in service.	SerializedHardwarePart	S5000F Specializations
serializedHardwarePartManufacturingDate	DateType	serializedHardwarePartManufacturingDate is the date when the Equipment was manufactured.	SerializedHardwarePart	S5000F Specializations

Attribute name	Type	Definition	Class name	UoF
serializedHardwarePartWeight	NumericalPropertyType	serializedHardwarePartWeight is a number that represents the weight of a SerializedHardwarePartWeight.	SerializedHardwarePart	S5000F Specializations
serializedItemOwnerDuring	DateRange	serializedItemOwnerDuring is a date range that indicates during which time a SerializedItemOwner held ownership of a serialized item.	SerializedItemOwner	S5000F UoF Serialized Item
serializedItemOwnerRatio	SingleValueProperty Type	serializedItemOwnerRatio is the percentage of ownership of the serialized item by the owner during the period of time defined for that ownership period.	SerializedItemOwner	S5000F UoF Serialized Item
serializedItemWarrantyPeriod	DateRange	serializedItemWarrantyPeriod is the period of time during which the warranty for a SerializedItem is in effect.	ItemWarranty	S5000F UoF Warranty
serializedItemWarrantyType	ClassificationType	serializedItemWarrantyType is a classification that allows to categorize a SerielizedItem warranty.	ItemWarranty	S5000F UoF Warranty
serializedPartEffectivityPeriod	DateRange	serializedPartEffectivityPeriod is the period of time during which a serializedHardwarePart has complied with the specification that defines it.	SerializedPartDesign Association	S5000F UoF Part As Realized
serializedPartsListPositionIdentifier	IdentifierType	serializedPartsListPositionIdentifier is an identifier that establishes a unique designator for a SerializedPartsListPosition and to differentiate it from other instances of SerializedPartsListPosition.	SerializedPartsListPosition	CDM UoF Serialized Part Configuration
serializedPartsListPositionName	NameType	serializedPartsListPositionName is a name by which the SerializedPartsListPosition is known and can be easily referenced.	SerializedPartsListPosition	CDM UoF Serialized Part Configuration
serializedProductVariantAssignmentDate	DateType	serializedProductVariantAssignmentDate is the date at which a specific serializedProductVariant was assigned to perform a specific OperationalRole.	SerializedProductVariantAssignment	S5000F UoF Fleet Planning and Product Assignment

Attribute name	Type	Definition	Class name	UoF
serializedProductVariantAssignmentIdentifier	IdentifierType	serializedProductVariantAssignmentIdentifier is an unique identifier that unambiguously allows to identify different OperationalRole assignments to individual serializedProductVariants as specific moments in time ("tasking").	SerializedProductVariantAssignment	S5000F UoF Fleet Planning and Product Assignment
serializedProductVariantAssignmentStatus	ClassificationType	serializedProductVariantAssignmentStatus is a classification that allows to determine the status of an assignment of a serializedProductVariant to carry out a specific OperationalRole.	SerializedProductVariantAssignment	S5000F UoF Fleet Planning and Product Assignment
serializedProductVariantAssignmentType	ClassificationType	serializedProductVariantAssignmentType is a classification that allows to define the type of assignment of a specific serializedProductVariant to an OperationalRole.	SerializedProductVariantAssignment	S5000F UoF Fleet Planning and Product Assignment
serializedProductVariantDimensions	ThreeDimensional	serializedProductVariantDimensions are the ThreeDimensional characteristics of a SerializedProductVariant.	SerializedProductVariant	S5000F Specializations
serializedProductVariantEndOfServiceDate	DateType	serializedProductVariantEndOfServiceDate is the date at which the serialized product variant was retired from service.	SerializedProductVariant	S5000F Specializations
serializedProductVariantEntryIntoServiceDate	DateType	The date at which the serialized product variant entered into service.	SerializedProductVariant	S5000F Specializations
serializedProductVariantInFleetDuring	DateRange	serializedProductVariantInFleetDuring is a range of dates that indicate the period of time during which a SerializedProductVariant belongs to a specific fleet.	SerializedProductVariantInFleet	S5000F UoF Fleet Definition
serializedProductVariantManufacturer	Organization	serializedProductVariantManufacturer is the organization which has manufactured a SerializedProductVariant.	SerializedProductVariant	S5000F Specializations
serializedProductVariantManufacturingDate	DateType	serializedProductVariantManufacturingDate is the date at which the manufacturing of a SerializedProductVariant was finished.	SerializedProductVariant	S5000F Specializations
serializedProductVariantOperatingBasePeri	DateRange	serializedProductVariantOperatingBasePeriod is a range of dates during which a SerializedProductVariant was operating at a	SerializedProductVar	S5000F UoF Operating Base

Attribute name	Type	Definition	Class name	UoF
od		specific OperatingBase.	iantOperatingBase	
serializedProductVariantOperatorDuring	DateRange	serializedProductVariantOperatorDuring is the period of time during which the SerializedProductVariant was operated by a specific operator.	SerializedProductVariantOperator	S5000F UoF Operator
serializedProductVariantWeight	NumericalPropertyType	serializedProductVariantWeight is a number that represents the weight of a SerializedProductVariantWeight.	SerializedProductVariant	S5000F Specializations
serviceBulletinCost	SingleValueProperty Type	serviceBulletinCost is the monetary cost of a ServiceBulletin.	ServiceBulletin	S5000F UoF Change Embodiment
serviceBulletinEmbodimentLimit	DateType	serviceBulletinEmbodimentLimit is a Date by which a ServiceBulletin must be mandatorily embodied.	ServiceBulletin	S5000F UoF Change Embodiment
serviceBulletinPriority	ClassificationType	serviceBulletinPriority is a classification that determines the urgency with which a ServiceBulletin should be embodied.	ServiceBulletin	S5000F UoF Change Embodiment
serviceBulletinType	ClassificationType	serviceBulletinType is classification that allows to group different types of ServiceBulletins.	ServiceBulletin	S5000F UoF Change Embodiment
serviceContractPeriod	DateRange	serviceContractPeriod is the period of time during which a Service is associated to a Contract.	ServiceContract	S5000F UoF Service Contract Management
serviceDescription	DescriptorType	serviceDescription is a narrative statement explaining a Service.	Service	S5000F UoF Service Contract Management
serviceIdentifier	IdentifierType	serviceIdentifier is an unique identifier that allows to uniquely identify a Service from any other one.	Service	S5000F UoF Service Contract Management
serviceLevelAgreementClauseDescription	DescriptorType	serviceLevelAgreementClauseDescription is a narrative statement of the meaning of serviceLevelAgreementClause.	ServiceLevelAgreementClause	S5000F UoF Service Contract Management
serviceRelationshipType	ClassificationType	ServiceRelationship is a <<classification>> that defines how two Services are related.	ServiceRelationship	S5000F UoF Service Contract Management

Attribute name	Type	Definition	Class name	UoF
serviceRequestCancellationDetails	DescriptorType	serviceRequestCancellationDetails is a description that provides a human readable expression of ServiceRequestCancellation.	ServiceRequestCancellation	S5000F UoF Service Request
serviceRequestCancellationIdentifier	IdentifierType	serviceRequestCancellationIdentifier is a string of characters that uniquely identifies a ServiceRequestCancellation	ServiceRequestCancellation	S5000F UoF Service Request
serviceRequestCancellationReason	ClassificationType	serviceRequestCancellationReason is a <<classification>> that defines the reason for a ServiceRequestCancellation.	ServiceRequestCancellation	S5000F UoF Service Request
serviceRequestDateTime	DateTimeType	serviceRequestDateTime is teh date and time at which a ServiceRequest has been made.	ServiceRequest	S5000F UoF Service Request
serviceRequestDescription	DescriptorType	serviceRequestDescription is a narrative statement explaining the ServiceRequest.	ServiceRequest	S5000F UoF Service Request
serviceRequestIdentifier	IdentifierType	serviceRequestIdentifier is a string of text that uniquely identifies a ServiceRequest and differentiates it from other ServiceRequests.	ServiceRequest	S5000F UoF Service Request
serviceRequestItemQuantity	SingleValueProperty Type	serviceRequestItemQuantity is a the number of ServiceItems that are requested as part of a ServiceRequest.	ServiceRequestItem	S5000F UoF Service Request
serviceRequestLocationDuring	DateRange	serviceRequestlocationDuring is the period during which the service is requested at a specific location.	ServiceRequestLocation	S5000F UoF Service Request
serviceRequestLocationNotes	DescriptorType	serviceRequestLocationNotes is a textual narrative providing clarifications about when the location where the service has t be provided.	ServiceRequestLocation	S5000F UoF Service Request
serviceRequestName	DescriptorType	serviceRequestName is a string of characters by which a ServiceRequest is commonly known.	ServiceRequest	S5000F UoF Service Request
serviceRequestPartyRole	ClassificationType	serviceRequestpartyRole is a classification that allows to determine the role of a Party regarding a ServiceRequest.	ServiceRequestParty	S5000F UoF Service Request

Attribute name	Type	Definition	Class name	UoF
serviceRequestPriority	ClassificationType	serviceRequestPriority is a classification that allows to determine how urgent a ServiceRequest is.	ServiceRequest	S5000F UoF Service Request
serviceRequestRelationshipType	ClassificationType	serviceRequestRelationshipType is a classification that defines the type of relationship between two ServiceRequests.	ServiceRequestRelationship	S5000F UoF Service Request
serviceRequestType	ClassificationType	serviceRequestType is a classification that allows to group different types of ServiceRequests.	ServiceRequest	S5000F UoF Service Request
shopFindingsDescription	DescriptorType	shopFindingsDescription is a narrative text explaining the ShopFindings.	ShopFindings	S5000F UoF Shop Findings
shopFindingsFaultCode	ClassificationType	shopFindingsFaultCode is a classification that represents a fault code that the equipment under test has provided during the problem investigation.	ShopFindings	S5000F UoF Shop Findings
shopFindingsFaultConfirmed	ClassificationType	shopFindingsFaultConfirmed is a classification of the fault that has been confirmed as part of the shop findings.	ShopFindings	S5000F UoF Shop Findings
shopFindingsIdentifier	IdentifierType	shopFindingsIdentifier is a string of characters that uniquely identifies a ShopFinding and differentiates it from other ShopFindings.	ShopFindings	S5000F UoF Shop Findings
shopReceivedDate	DateType	shopReceivedDate is the Date at which an equipment was received at a workshop for diagnostics.	ShopFindings	S5000F UoF Shop Findings
skillCode	IdentifierType	skillCode is an identifier that establishes a unique designator for a Skill and to differentiate it from other instances of Skill.	Skill	CDM UoF Competence Definition
skillLevelDescription	DescriptorType	skillLevelDescription is a description that gives more information on a proficiency.	SkillLevel	CDM UoF Competence Definition
skillLevelName	NameType	skillLevelName is a name that uniquely establishes a proficiency.	SkillLevel	CDM UoF Competence Definition

Attribute name	Type	Definition	Class name	UoF
softwareElementModificationFrequency	PropertyType	softwareElementModificationFrequency is a property that defines the expected frequency with which the SoftwarePartAsDesigned which realizes this SoftwareElementRevision will be modified.	SoftwareElementRevision	CDM UoF Software Element
softwareElementSize	PropertyType	softwareElementSize is a property that defines the size of the SoftwarePartAsDesigned which realizes this SoftwareElementRevision.	SoftwareElementRevision	CDM UoF Software Element
softwareElementType	ClassificationType	softwareElementType is a classification that identifies further specialization for a SoftwareElement.	SoftwareElement	CDM UoF Software Element
softwareErrorDateTime	DateTimeType	softwareErrorDateTime is the date and time at which a SoftwareError occurred.	SoftwareError	S5000F UoF Software
softwareErrorDescription	DescriptorType	softwareErrorDescription is a description that provides a human readable expression of a SoftwareError.	SoftwareError	S5000F UoF Software
softwareErrorFixPriority	ClassificationType	softwareErrorFixPriority is a classification that allows to determnie the urgency to fix a SoftwareError	SoftwareError	S5000F UoF Software
softwareErrorIdentifier	IdentifierType	softwareErrorIdentifier is a string of characters that uniquely identifies a SoftwareError.	SoftwareError	S5000F UoF Software
softwareErrorName	NameType	softwareErrorName is a name by which the SoftwareError is known and can be easily referenced.	SoftwareError	S5000F UoF Software
softwareErrorReproducibility	ClassificationType	softwareErrorReproducibility is a <<classification>> that allows to qualify the reproducibility of a SoftwareError.	SoftwareError	S5000F UoF Software
softwareErrorSeverity	ClassificationType	softwareErrorSeverity is a <<classification>> about how severe a SoftwareError is.	SoftwareError	S5000F UoF Software
softwareErrorStepsToReproduce	DescriptorType	softwareErrorStepsToReproduce is a description that provides a human readable expression of the steps required to reproduce a SoftwareError.	SoftwareError	S5000F UoF Software

Attribute name	Type	Definition	Class name	UoF
softwarePartAsReleasedChecksum	TextPropertyType	softwarePartAsReleasedChecksum is a string of text used verify that the code of a SoftwarePartAsReleased has not been corrupted or tampered with.	SoftwarePartAsReleased	S5000F Specializations
softwarePartAsReleasedDateTime	DateTimeType	softwarePartAsReleasedDateTime is the date and time at which a software part was released for service.	SoftwarePartAsReleased	S5000F Specializations
softwarePartAsReleasedSize	SingleValueProperty Type	softwarePartAsReleasedSize is a value representing the actual size of the delivered code of a software part.	SoftwarePartAsReleased	S5000F Specializations
specialSafetyInstructionApplicabilityDates	DateRange	specialSafetyInstructionApplicabilityDates is the period during which the SpecialSafetyInstruction must be applied.	SpecialSafetyInstruction	S5000F UoF Safety
specialSafetyInstructionPriority	ClassificationType	specialSafetyInstructionPriority is a classification that defines the urgency of a SpecialSafetyInstruction.	SpecialSafetyInstruction	S5000F UoF Safety
strainGaugeFactor	SingleValueProperty Type	strainGaugeFactor is the gauge factor (also called strain factor) of a StrainGauge.	StrainGauge	S5000F UoF Serialized Product Health Monitoring
streetName	NameType	streetName is the name by which a road is officially known and can be easily referenced.	StreetAddress	CDM UoF Location
streetNumber	umlString	streetNumber is a string of characters that represents the position along a street	StreetAddress	CDM UoF Location
substanceIdentifier	IdentifierType	substanceIdentifier is an identifier that establishes a unique designator for a SubstanceDefinition and to differentiate it from other instances of SubstanceDefinition.	SubstanceDefinition	CDM UoF Part Definition
substanceName	NameType	substanceName is a name by which the SubstanceDefinition is known and can be easily referenced.	SubstanceDefinition	CDM UoF Part Definition
subSubSystem	umlString	subSubSystem is a string of characters that represents the sub-subsystem attribute of the data module code.	S1000DDataModule	CDM UoF Document

Attribute name	Type	Definition	Class name	UoF
subSystem	umlString	subSystem is a string of characters that represents the subsystem attribute of the data module code.	S1000DDataModule	CDM UoF Document
subtaskIdentifier	IdentifierType	subtaskIdentifier is an identifier that establishes a unique designator for a Subtask and to differentiate it from other instances of Subtask.	Subtask	CDM UoF Task
subtaskRole	ClassificationType	subtaskRole is a classification that identifies how the Subtask is related to the main function of the Task.	Subtask	CDM UoF Task
subtaskTimelineEvent	ClassificationType	subtaskTimelineEvent is a classification that identifies how the starting point for a Subtask depends upon its preceding Subtask	SubtaskTimeline	CDM UoF Task
subtaskTimelineLag	PropertyType	subtaskTimelineLag is a property that specifies the time that must elapse before the Subtask under consideration can start, in relation to its associated timeline event.	SubtaskTimeline	CDM UoF Task
suppliesUsedAmount	SingleValueProperty Type	suppliesUsedAmount is the amount of supply items used for a MaintenanceActivity.	SuppliesUsed	S5000F UoF Maintenance Activity
supportEquipmentCali brationRequired	ClassificationType	supportEquipmentCalibrationRequired is a classification that indicates whether a support equipment requires calibration.	SupportEquipment	S5000F UoF Maintenance Activity
supportEquipmentPo wer	PropertyType	supportEquipmentPower indicates the type of power that a support equipment requires.	SupportEquipment	S5000F UoF Maintenance Activity
supportEquipmentTyp e	ClassificationType	supportEquipmentType is a classification that allows to group different types of support equipment.	SupportEquipment	S5000F UoF Maintenance Activity
supportEquipmentUs edAmount	umlInteger	supportEquipmentUsedAmount is the number of a specific SupportEquipment that has been used in a MaintenanceActivity.	SupportEquipmentU sed	S5000F UoF Maintenance Activity
supportEquipmentUs edDuration	SingleValueProperty Type	supportEquipmentUsedDuration is the time that the SupportEquiment is used during a MaintenanceActivity.	SupportEquipmentU sed	S5000F UoF Maintenance Activity

Attribute name	Type	Definition	Class name	UoF
system	umlString	system is a string of characters that represents the system attribute of the data module code.	S1000DDataModule	CDM UoF Document
systemDifferenceCode	umlString	systemDifferenceCode is a string of characters that represents the system difference code attribute of the data module code.	S1000DDataModule	CDM UoF Document
taskDuration	PropertyType	taskDuration is a property that specifies the average time required for the performance of a Task, regardless of the number of personnel working simultaneously.	TaskRevision	CDM UoF Task
taskIdentifier	IdentifierType	taskIdentifier is an identifier that establishes a unique designator for a Task and to differentiate it from other instances of Task.	Task	CDM UoF Task
taskInformationCode	ClassificationType	taskInformationCode is a classification that identifies the main purpose for the Task.	TaskRevision	CDM UoF Task
taskName	NameType	taskName is a name by which the Task is known and can be easily referenced.	TaskRevision	CDM UoF Task
taskRequirementDate	DateType	taskRequirementDate is a date that defines when a TaskRequirementRevision was defined.	TaskRequirementRevision	CDM UoF Task Requirement
taskRequirementDescription	DescriptorType	taskRequirementDescription is a description that summarizes the procedure that needs to be performed based on the outcome of a support analysis activity.	TaskRequirementRevision	CDM UoF Task Requirement
taskRequirementIdentifier	IdentifierType	taskRequirementIdentifier is an identifier that establishes a unique designator for a TaskRequirement and to differentiate it from other instances of TaskRequirement.	TaskRequirement	CDM UoF Task Requirement
taskRequirementInformationCode	ClassificationType	taskRequirementInformationCode is a classification that identifies the main purpose for the TaskRequirement.	TaskRequirementRevision	CDM UoF Task Requirement
taskRequirementRevisionChangeDescriptio	DescriptorType	taskRequirementRevisionChangeDescription is description that gives more information on content that has been altered between	TaskRequirementRevision	CDM UoF Task Requirement

Attribute name	Type	Definition	Class name	UoF
n		two revisions of a TaskRequirement.		
taskRequirementRevisionIdentifier	IdentifierType	taskRequirementRevisonIdentifier is an identifier that establishes a unique designator for a TaskRequirementRevision and to differentiate it from other instances of TaskRequirementRevision.	TaskRequirementRevision	CDM UoF Task Requirement
taskRequirementRevisionStatus	StateType	taskRequirementRevisionStatus is a state that identifies the readiness decided for a TaskRequirementRevision.	TaskRequirementRevision	CDM UoF Task Requirement
taskRequirementSpecialResourceRequirement	DescriptorType	taskRequirementSpecialResourceRequirement is a description that gives more information on unusual resources which are needed for the performance of the required Task.	TaskRequirementRevision	CDM UoF Task Requirement
taskResourceDuration	PropertyType	taskResourceDuration is a property that specifies the average time that a TaskResource is needed to perform a specified amount of work.	TaskResource	CDM UoF Task Resource
taskResourceIdentifier	IdentifierType	taskResourceIdentifier is an identifier that establishes a unique designator for a TaskResource and to differentiate it from other instances of TaskResource.	TaskResource	CDM UoF Task Resource
taskRevisionChangeDescription	DescriptorType	taskRevisionChangeDescription is a description that gives more information on content that has been altered between two revisions of a Task.	TaskRevision	CDM UoF Task
taskRevisionIdentifier	IdentifierType	taskRevisonIdentifier is an identifier that establishes a unique designator for a TaskRevision and to differentiate it from other instances of TaskRevision.	TaskRevision	CDM UoF Task
taskRevisionStatus	StateType	taskRevisionStatus is a state that identifies the progress on the development of a TaskRevision.	TaskRevision	CDM UoF Task
taskTotalLaborTime	PropertyType	taskTotalLaborTime is a property that specifies the total time to be expended during a task.	TaskRevision	CDM UoF Task

Attribute name	Type	Definition	Class name	UoF
technicalOrderEmbodimentDate	DateType	technicalOrderEmbodimentDate is a Date at which a TechnicalOrder was embodied.	TechnicalOrderEmbodied	S5000F UoF Change Embodiment Reporting
technicalOrderIdentifier	IdentifierType	technicalOrderIdentifier is a string of text that allows to uinquely identify a TechnicalOrder and differentiate it from otehr TechnicalOrders.	TechnicalOrder	S5000F UoF Change Embodiment
technicalOrderPriority	ClassificationType	technicalOrderPriority is a classification that indicates the urgency with which an TechnicalOrder must be implemented.	TechnicalOrder	S5000F UoF Change Embodiment
technicalOrderRequiredImplementationDate	DateType	technicalOrderRequiredImplementationDate is the mandatory date by which the TechnicalOrder must be executed.	TechnicalOrder	S5000F UoF Change Embodiment
tradeName	NameType	tradeName is a name that uniquely establishes a craft or profession.	Trade	CDM UoF Competence Definition
transportCapabilityDimensions	ThreeDimensional	transportCapabilityDimensions are the ThreeDimensional characteristics of a ThreeDimensional.	TransportCapability	S5000F UoF Transporting Asset
transportCapabilityLimitationDescription	DescriptorType	transportCapabilityLimitationDescription is a description that provides a human readable expression of a CapabilityLimitation.	CapabilityLimitation	S5000F UoF Capability
transportCapabilityQuantity	NumericalPropertyType	transportCapabilityQuantity is a number that defines how many items of a specific type can be transported as part of a TransportCapability.	TransportCapability	S5000F UoF Transporting Asset
transportCapabilityRange	NumericalPropertyType	transportCapabilityRange is a number that represents the distance to which a TransportCapability can transport items.	TransportCapability	S5000F UoF Transporting Asset
transportCapabilityUsageDescription	DescriptorType	transportCapabilityUsageDescription is a description that provides a human readable expression of a TransportCapabilityUsage.	TransportCapabilityUsage	S5000F UoF Transporting Asset
transportCapabilityUs	IdentifierType	transportCapabilityUsageIdentifier is a <<compositeKey>> that	TransportCapabilityU	S5000F UoF Transporting

Attribute name	Type	Definition	Class name	UoF
ageIdentifier		allows with a master key to uniquely identify a TransportCapabilityUsage.	sage	Asset
transportCapabilityUsagePeriod	DateTimeRange	transportCapabilityUsagePeriod is a DateTimeRange representing the period of time during which a TransportCapability is used.	TransportCapabilityUsage	S5000F UoF Transporting Asset
typeOfPersonDescripion	DescriptorType	typeOfPersonDescription is a textual narrative statement explaining a TypeOfPerson	TypeOfPerson	S5000F UoF Type of Person
typeOfPersonDescription	DescriptorType	typeOfPersonDescription is a narrative statement explaining the TypeOfPerson.	TypeOfPerson	S5000F UoF Type of Person
typeOfPersonIdentifier	IdentifierType	typeOfPersonIdentifier is a string of characters that uniquely defines a TypeOfPerson and allows to differentiate it from other TypeOfPersons.	TypeOfPerson	S5000F UoF Type of Person
typeOfPersonName	NameType	typeOfPersonName is a text by which a TypeOfPerson is commonly known.	TypeOfPerson	S5000F UoF Type of Person
typeOfPersonSize	ThreeDimensional	typeOfPersonSize is the average size of Persons of the TypeOfPerson.	TypeOfPerson	S5000F UoF Type of Person
typeOfPersonType	ClassificationType	typeOfPersonType is a <<classification>> that allows to group different Persons that sahre the same characteristics.	TypeOfPerson	S5000F UoF Type of Person
typeOfPersonWeight	NumericalPropertyType	typeOfPersonWeight is the average weight of Persons of the TypeOfPerson.	TypeOfPerson	S5000F UoF Type of Person
typeOfPrice	ClassificationType	Used to define the availability of an item price or repair cost/price value and the type of that price value. (UNIT PRICE, ADDITIVE UNIT PRICE, PRICE BREAK DATA, ADJUSTABLE COST).	HardwarePartAsDesignedCommerceData	S2000M_6-1_Data_model
upperBound	umlString	upperBound is a string of characters that represents the upper limit of the range.	SerialNumberRange	S-Series Compound Attributes

Attribute name	Type	Definition	Class name	UoF
upperLimitSalesQuantity	umlInteger	upperLimitSalesQuantity is an integer indicating the maximum quantity of items for which the unit of price (UOP) applies.	PriceBreakData	S2000M_6-1_Data_model
warehouseType	ClassificationType	warehouseType is a classification that allows to differentiate between different classes of Warehouses.	Warehouse	S5000F UoF Facility
warrantyClaimCommunicationMeans	ClassificationType	warrantyClaimCommunicationMeans is a classification that defines the means by which a WarrantyClaim was raised.	WarrantyClaim	S5000F UoF Warranty
warrantyClaimContactType	ClassificationType	warrantyClaimContactType is a classification that allows to group different types of WarrantyClaimContacts.	WarrantyClaimContact	S5000F UoF Warranty
warrantyClaimFilingDate	DateType	warrantyClaimFilingDate is the date at which the Warranty Claim has been sent.	WarrantyClaim	S5000F UoF Warranty
warrantyClaimFollowUpDate	DateType	warrantyClaimFollowUpDate is a date at which the WarrantyFollowUp took place.	WarrantyClaimFollowUp	S5000F UoF Warranty
warrantyClaimFollowUpNotes	DescriptorType	warrantyClaimFollowUpNotes is a narrative text describing the follow-up of a WarrantyClaim.	WarrantyClaimFollowUp	S5000F UoF Warranty
warrantyClaimIdentifier	IdentifierType	warrantyClaimIdentifier is a string of text that uniquely identifies a WarrantyClaim and differentiates it from other WarrantyClaims.	WarrantyClaim	S5000F UoF Warranty
warrantyClaimOccurrenceDate	DateType	warrantyClaimOccurrenceDate is the date at which the event that generated the claim occurred.	WarrantyClaim	S5000F UoF Warranty
warrantyClaimResolutionDate	DateType	warrantyClaimResolutionType is a classification that indicates the kind of resolution that was taken.	WarrantyClaimResolution	S5000F UoF Warranty
warrantyClaimResolutionDescription	DescriptorType	warrantyClaimResolutionDescription is a narrative text explaining the WarrantyClaimResolution.	WarrantyClaimResolution	S5000F UoF Warranty
warrantyClaimResolutionIdentifier	IdentifierType	warrantyClaimResolutionIdentifier is a string that allows to uniquely identify a WarrantyClaimResolution and differentiate it	WarrantyClaimResolution	S5000F UoF Warranty

Attribute name	Type	Definition	Class name	UoF
		from other WarrantyClaimResolutions.		
warrantyClaimResolutionType	ClassificationType	warrantyClaimResolutionType is a <<classification>> that allows to group the WarrantyClaimResolutions by different criteria.	WarrantyClaimResolution	S5000F UoF Warranty
warrantyClaimSettlementDate	DateType	warrantyClaimSettlementDate is the date at which the WarrantyClaim has been settled.	WarrantyClaim	S5000F UoF Warranty
warrantyClaimType	ClassificationType	warrantyClaimType is a classification that permits to group different types of WarrantyClaims.	WarrantyClaim	S5000F UoF Warranty
warrantyEventPeriod	DateRange	warrantyEventPeriod is the period of time during which the WarrantyEvent extended.	WarrantyEvent	S5000F UoF Warranty
warrantyEventReason	ClassificationType	warrantyEventReason is a classification that describes the type of WarrantyEvent.	WarrantyEvent	S5000F UoF Warranty
width	PropertyType	width is a property that specifies the less extended longitudinal dimension of an object.	Cuboid	S-Series Compound Attributes
			Rectangle	S5000F Compound Attributes
workBreakdownDescription	DescriptorType	workBreakdownDescription is a narrative statement explaining the WorkBreakdown.	WorkBreakdown	S5000F UoF Work Breakdown
workBreakdownIdentifier	IdentifierType	workBreakdownIdentifier is a string of text that uniquely identifies a WorkBreakdown, allowing to differentiate it from all other WorkBreakdowns.	WorkBreakdown	S5000F UoF Work Breakdown
workBreakdownName	DescriptorType	workBreakdownName is a word or phrase by which the WorkBreakdown is commonly known.	WorkBreakdown	S5000F UoF Work Breakdown
workBreakdownRelationshipType	ClassificationType	workBreakdownRelationshipType is a <<classification>> that defines how two WorkBreakdowns are related.	WorkBreakdownRelationship	S5000F UoF Work Breakdown

Attribute name	Type	Definition	Class name	UoF
workBreakdownRevisionDate	DateType	workBreakdownRevisionDate is a date that indicates when a WorkBreadownRevision was created.	WorkBreakdownRevision	S5000F UoF Work Breakdown
workBreakdownRevisionIdentifier	IdentifierType	workBreakdownRevisionIdentifier is a string of characters which uniquely identifies a WorkBreakdownRevision.	WorkBreakdownRevision	S5000F UoF Work Breakdown
workBreakdownRevisionRationale	DescriptorType	workBreakdownRevisionRationale is a description of why the revision for the WorkBreakdown was created.	WorkBreakdownRevision	S5000F UoF Work Breakdown
workBreakdownRevisionStatus	StateType	workBreakdownRevisionStatus is a state that identifies the maturity of a WorkBreakdownRevision.	WorkBreakdownRevision	S5000F UoF Work Breakdown
workItemDescription	DescriptorType	workItemDescription is a narrative statement explaining what the WorkItem is.	WorkItem	S5000F UoF Work Breakdown
workItemIdentifier	IdentifierType	workItemIdentifier is a string of characters that uniquely identifies a WorkItem.	WorkItem	S5000F UoF Work Breakdown
workItemPeriod	DateRange	workItemPeriod is the period during which a WorkItem has to take place.	WorkItem	S5000F UoF Work Breakdown
workItemRelationshipType	ClassificationType	workItemRelationshipType is a classification indicating the relationship type between two WorkItems.	WorkItemRelationship	S5000F UoF Work Breakdown
workItemStatus	ClassificationType	workItemStatus is a classification that defines the situation of a WorkItem.	WorkItem	S5000F UoF Work Breakdown
workItemTimelineEvent	ClassificationType	workItemTimelineEvent is a classification which identifies the starting point for the WorkItem under consideration in relation to the start or end point of the WorkItem playing the role of its predecessor, if any.	WorkItemRelationship	S5000F UoF Work Breakdown
workItemTimelineLag	PropertyType	workItemTimelineLag is the time between the related WorkItem timeline event (start/end) and the start for the WorkItem under consideration.	WorkItemRelationship	S5000F UoF Work Breakdown

Attribute name	Type	Definition	Class name	UoF
workItemType	ClassificationType	workItemType is a classification that allows to define different categories of work for a WorkItems.	WorkItem	S5000F UoF Work Breakdown
workOrderDateRaised	DateType	workOrderDateRaised is the date at which the work order was raised.	WorkOrder	S5000F UoF Maintenance Activity
workOrderDescription	DescriptorType	workOrderDescription is a narrative statement explaining the WorkOrder.	WorkOrder	S5000F UoF Maintenance Activity
workOrderExecutionPeriod	DateTimeRange	workOrderExecutionPeriod is the period of time during which the work order must be carried out.	WorkOrder	S5000F UoF Maintenance Activity
workOrderIdentifier	IdentifierType	workOrderIdentifier is a string of text that uniquely identifies a WorkOrder and allows to distinguish it from other WorkOrders.	WorkOrder	S5000F UoF Maintenance Activity
workOrderImplementationTimeLimit	DateTimeType	workOrderImplementationTimeLimit is a DateTime which represents the date and time at which the WorkOrder was implemented.	WorkOrder	S5000F UoF Maintenance Activity
workOrderPriority	ClassificationType	workOrderPriority is a <<classification>> that allows to define the priority of a WorkOrder.	WorkOrder	S5000F UoF Maintenance Activity
workOrderStatus	StateType	workOrderStatus is a state describing the current status of the WorkOrder.	WorkOrder	S5000F UoF Maintenance Activity
workOrderType	ClassificationType	workOrderType is a classification that allows to group different WorkOrders of similar characteristics.	WorkOrder	S5000F UoF Maintenance Activity
xCoordinate	NumericalPropertyType	xCoordinate is a numerical value representing the longitudinal coordinate of a position within the referenced area.	LocalPosition	S5000F UoF Local Position
yCoordinate	NumericalPropertyType	yCoordinate is a numerical value representing the tramnsversal coordinate of a position within the referenced area.	LocalPosition	S5000F UoF Local Position
zCoordinate	NumericalPropertyTy	zCoordinate is a numerical value representing the height	LocalPosition	S5000F UoF Local Position

Attribute name	Type	Definition	Class name	UoF
	pe	coordinate of a position within the referenced area.		
zoneElementType	ClassificationType	zoneElementType is a classification that identifies further specialization for a ZoneElement.	ZoneElement	CDM UoF Zone Element

4 Data element valid values

The full list of S5000F attribute valid values is provided in Table 4. This includes valid values from SX002D used by S5000F but defined in SX001G.

Note

The specification does not yet define valid values for all classification types and identifiers that may require one. Similarly, it should be highlighted that the valid values are recommended values and not mandatory. Refer to Chap 19 for the tailoring of the valid values.

Table 4 List of valid values

Attribute name	Valid value	Valid value name
actionPriority	C	criticalAction
	R	routineAction
	U	urgentAction
actionType	ANA	analyzeAction
	APP	approveAction
	BLK	blockAction
	CHG	changeAction
	DIS	discardAction
	HLD	putOnHoldAction
	INS	inspectAction
	RED	redesignAction
	REJ	rejectAction
	REP	repairAction
	RPL	replaceAction
	RPT	reportAction
	WDR	withdrawAction
aggregatedElementType	FA	familyElement
	FU	functionElement
	SL	slotElement
	SY	systemElement
allowedProductConfigurationIdentifier	CID	allowedProductConfigurationIdentifier
authorityToOperateIdentifier	TC	typeCertificate
availabilityStatus	A	available

Attribute name	Valid value	Valid value name
	L	locked
	N	notAvailable
breakdownElementEssentiality	1	criticalItem
	2	partialCriticalItem
	3	nonCriticalItem
breakdownElementIdentifier	ASD	asdSystemHardwareIdentificationCode
	BEI	breakdownElementIdentifier
	CSN	catalogueSequenceNumber
	ISN	itemSequenceNumber
	LCN	logisticsControlNumber
	SNS	standardNumberingSystem
breakdownElementRevisionIdentifier	ISS	issueNumber
	REV	revisionIdentification
breakdownElementRevisionRelationshipType	ALT	alternateBreakdownElement
	AP	accessPoint
	FUPH	functionalPhysicalRelationship
breakdownElementRevisionStatus	A	approved
	IW	inWork
breakdownRevisionIdentifier	ISS	issueNumber
	REV	revisionIdentification
breakdownRevisionStatus	A	approved
	IW	inWork
breakdownType	ASD	asdSystemHardwareBreakdown
	FAM	familyBreakdown
	FU	functionalBreakdown
	HY	hybridBreakdown
	IP	initalProvisioningBreakdown
	PH	physicalBreakdown
	SY	systemBreakdown
	ZONE	zonalBreakdown

Attribute name	Valid value	Valid value name
budgetApprovedStatus	A	approved
	C	cancelled
	D	draft
	E	expired
	P	pendingApproval
budgetIdentifier	BI	budgetIdentifierCode
budgetType	C	cashFlowBudget
	F	financialBudget
	M	masterBudget
	O	operationalBudget
	P	provisionalBudget
	S	staticBudget
calibrationDocumentType	CER	calibrationCertificate
	PR	calibrationProcedure
	SP	calibrationSpecification
calibrationIdentifier	CAL	calibratingOrganisation
capabilityIdentifier	OEM	originalEquipmentManufacturer
	OP	operator
capabilityLimitationIdentifier	OEM	originalEquipmentManufacturer
	OP	operator
capabilityLimitationType	ALT	altitudeCapabilityLimitation
	DEP	depthCapabilityLimitation
	DIS	distanceCapabilityLimitation
	HGT	heightCapabilityLimitation
	LEN	lengthCapabilityLimitation
	NUM	numericUnitCapabilityLimitation
	PERF	performanceCapabilityLimitation
	VOL	volumeCapabilityLimitation
	WGT	weightCapabilityLimitation
	WID	widthCapabilityLimitation

Attribute name	Valid value	Valid value name
capabilityType	MAN	manufacturingCapabilit
	RE	repairCapability
	ST	storageCapability
	TR	transportCapability
cargoItemIdentifier	OPER	operator
changeAuthorizationIdentifier	AMN	amendmentNumber
	CAN	changeAuthorityNumber
changeEmbodimentRequirementType	M	mandatoryEmbodiment
	O	optionalEmbodiment
	R	recommendedEmbodiment
circuitBreakerState	C	closeCircuitBreaker
	O	openCircuitBreaker
	VC	verifyCloseCircuitBreaker
	VO	verifyOpenCircuitBreaker
circuitBreakerType	CLIP	dummyCircuitBreaker
	ELMEC	electroMechanicCircuitBreaker
	ELTRO	electronicCircuitBreaker
codePropertyAssignment	S1000D	codeFromS1000D
	S2000M	codeFromS2000M
	S3000L	codeFromS3000L
	S4000P	codeFromS4000P
	S5000F	codeFromS5000F
commentActionType	AP	commentApproved
	CLA	commentClarificationRequested
	CLO	commentClosed
	CR	commentRaised
	RJ	commentRejected
	RP	commentResponded
	UI	commentUnderInvestigation
commentIdentifier	C	commentId

Attribute name	Valid value	Valid value name
commentPartyRole	A	analyst
	C	commenter
	R	responder
commentPriority	C	critical
	L	low
	N	normal
	U	urgent
commentRelationshipType	A	associatedTo
	C	clarifiesOrComplements
	R	respondsTo
commentStatus	A	answered
	C	closed
	O	open
	R	reopened
commentType	F	failure
	G	general comment
	P	problem report
	Q	question or query
	R	recommendation
conditionInstanceIdentifier	CI	conditionInstanceIdentifier
	SB	serviceBulletinIdentifier
consequenceIdentifier	AUTH	authorities
	OEM	originalEquipmentManufacturer
	OPER	operator
consequenceType	DEA	death
	DEL	delay
	DES	productDestruction
	INJ	injuries
	LOSS	economicLoss
	MAT	MaterialDamage

Attribute name	Valid value	Valid value name
	NONE	noConsequences
consumableItemIdentifier	M	manufacturer
consumableItemRiskFactor	R10	flammable
	R20	harmfulByInhalation
	R21	harmfulInContactWithSkin
	R22	harmfulIfSwallowed
	R23	toxicByInhalation
	R24	toxicInContactWith Skin
	R25	ToxicIfSwallowed
	R34	causes Burns
	R35	causesSevereBurns
	R36	irritatingToEyes
	R37	irritatingToRespiratorySystem
	R38	irritatingToSkin
	R5	heatingMayCauseAnExplosion
consumableType	BOLT	bolt
	FUEL	fuel
	GRE	grease
	OIL	oil
	SCRW	screw
	WIRE	wire
consumptionIdentifier	S	sensor
contractClauseIdentifier	C	contract
contractClauseRelationshipType	BE	belongsTo
	CL	clarifies
	RE	replaces
	SU	subordinateTo
contractIdentifier	CID	contractIdentifier
contractPartyRole	AGE	agent
	CTR	contractor

Attribute name	Valid value	Valid value name
	CUS	customer
	SUB	subcontractor
contractRelationshipType	RELC	relatedContract
	SUBC	subContract
contractStatus	A	contractAgreedButNotSigned
	C	contractCancelled
	D	contractInDraft
	E	contractExtended
	N	contractUnderNegotiation
	P	contractInPrincipleAgreed
	S	contractSigned
contractType	CI	costIncentivesContract
	CO	costContract
	CON	consultingContract
	CPIF	costPlusIncentiveFeeContract
	CR	costReimbursementContract
	CS	costSharingContract
	DEV	developmentContract
	DI	deliveryIncentivesContract
	EIS	entryIntoServiceContract
	FCP	fixedCeilingPriceContract
	FCPP	fixedPriceProspectivePriceRedeterminationContract
	FCPR	fixedCeilingPriceRetroactivePriceRedeterminationContract
	FFP	firmFixedPriceContract
	FFPL	firmFixedPriceLevelOfEffortTermContract
	FPA	fixedPriceEconomicPriceAdjustmentContract
	FPI	fixedPriceIncentiveContract
	LAB	laborHoursContract
	MAN	manufacturing contract

Attribute name	Valid value	Valid value name
	MI	multipleIncentivesContract
	MOD	modificationContract
	PI	performanceIncentivesContract
	PRO	procurementContract
	RES	researchContract
	SERV	serviceContract
	SUP	supplyContract
	TAM	timeAndMaterialsContract
	THRU	troughLifeContract
costBreakdownIdentifier	CBS	costBreakdownStructure
costBreakdownRelationshipType	AS	associatedTo
	IN	includes
	RE	replaces
	SI	similarTo
costBreakdownRevisionIdentifier	CBSRID	costBreakdownStructureRevisionId
costBreakdownRevisionStatus	A	approved
	C	cancelled
	D	draft
	R	underReview
costEntryIdentifier	C	contract
	O	organization
	P	project
costEntryType	EXP	expenses
	HR	hours
	INT	interest
	LAB	labour
	MAT	material
	PEN	penalty
	PRO	procurement
	SRV	services

Attribute name	Valid value	Valid value name
	TAX	taxes
costItemIdentifier	CI	costIdentifier
costItemRelationshipType	IN	includes
	PA	isPartOf
	RE	relatedTo
countryCode		Refer to countryCode valid value library.
damageCharactericType	AB	abrasion
	BE	bend
	BL	blisters
	BR	brinelling
	BU	burn
	CK	crack
	CN	contamination
	CO	corrosion
	CP	creep
	CR	crease
	DB	debonding
	DL	delamination
	DN	dent
	DS	distortion
	FI	fireDamage
	FR	fretting
	GO	gouge
	GR	grinding
	HO	hole
	LK	leakage
	ME	melting
	MK	mark
	MS	misalignment
	NK	nick

Attribute name	Valid value	Valid value name
	RB	rubbing
	RU	rupture
	SC	scratch
	SH	shortcircuit
	SO	soaked
	SR	shear
	SZ	seizure
	TO	torn
	WA	waterDamage
	WE	wear
damageColor	BE	blue
	BK	black
	BR	brown
	CY	cyan
	GN	green
	GY	grey
	OR	orange
	PU	purple
	RE	red
	VI	violet
	WH	white
	YE	yellow
damageFamily	A	aestheticDamage
	C	corrosionDamage
	E	electromagneticalDamager
	F	fireDamage
	M	mechanicalDamage
	O	opticalDamage
	P	personalInjuries
	S	structuralDamage

Attribute name	Valid value	Valid value name
	U	unclassifiedDamage
	W	waterDamage
damageIdentifier	MAIN	maintainer
	OEM	originalEquipmentManufacturer
	OPER	operator
	OWN	owner
	THIRD	thirdParty
damageRepairStatus	P	:pendingRepair
	R	:repaired
	U	:unrepairable
damageSeverity	M	minorDamage
	N	negligibleDamage
	R	repairableDamage
	S	severeDamage
	U	unknownDamageSeverity
	UR	unrepairableDamage
damageStatus	C	confirmed
	P	preliminary
	U	unconfirmed
dataAssociatedWithType	C	dataSetConfigures
	G	dataSetGeneratedBy
	I	datasetIncompatibleWith
	L	dataSetLoadedInto
	R	dataSetRequiredBy
dataModuleIssueLanguage		Refer to languageCodeValues valid value library.
dataModuleIssueLanguageCountry		Refer to countryCode valid value library.
dataSetAsDesignedType	B	builtInTestData
	C	configurationData
	CL	cALIBRATIONdATA
	D	diagnosticData

Attribute name	Valid value	Valid value name
	M	missionData
	MP	measurementPointData
	N	navigationData
	T	testData
descriptorLanguage		Refer to languageCodeValues valid value library.
detectionMeanCapabilityCapabilityType	HU	human
	HW	hardware
	SW	software
detectionMeanCapabilityIdentifier	OEM	originalEquipmentManufacturer
detectionMechanismIdentifier	OEM	originalEquipmentManufacturer
detectionMechanismType	BIT	builtInTest
	CUE	visualOrAudioCue
	INS	inspection
	MAL	malfunction
	SND	sound
	TRB	troubleshooting
	TST	test
	VIS	visualInspection
	WRN	warning
digitalFileContentClass	BIT	builtInTest
	DRW	drawing
	HUM	healthAndUsageData
	INS	instructions
	INV	invoice
	MAN	manual
	OTH	other
	PHO	photograph
	REP	report
	SCH	schematics
	SOU	sound

Attribute name	Valid value	Valid value name
	TST	testResults
	VID	video
	WIR	wiring
digitalFileType	ASF	advanceSystemsFormatFileType
	AVI	audioVideoInterleavedFileType
	BIN	binaryFileType
	CGM	computerGraphicsMetafileFileType
	DOC	formattedDocumentFileType
	EDF	europeanDataFormatSigalFileType
	JPEG	jointPhotographicExpertsGroupFileType
	MOV	quickTimeMovieFileType
	MP3	mp3AudioFileType
	MPEG	motionPictureExpertsGroupMovieFileType
	OTH	otherFileType
	PDF	portableDocumentFormatFileType
	PNG	portableNetworkGraphicsFileType
	RAW	rawSampleAudioFileType
	TIFF	taggedImageFileFormatFileType
	TXT	textFileType
	UNK	unknownFileType
	WAV	waveformAudioFileType
documentIdentifier	DOCID	documentIdentifier
documentIssueReason	E	editorialChange
	N	newDocument
	T	technicalChange
documentPartyRelationshipType	AP	approver
	AU	author
	CO	consumer
	RE	reviewer
documentRelationshipType	AN	annexTo

Attribute name	Valid value	Valid value name
	AS	associatedTo
	OR	originalOf
	RB	requiredBy
	RE	relatedTo
	RV	revisionOf
	SU	supplementaryInformationTo
documentStatus	A	approved
	C	cancelled
	D	draft
	I	issued
	R	underReview
	S	superseded
documentType	DRW	drawing
	SPEC	specification
	STD	standard
	TR	technicalReport
downTimeIdentifier	OPER	operator
downTimePeriodReason	D	investigatingDamage
	F	investigatingFailure
	OV	undergoingOverhaul
	PM	undergoingPreventiveMaintenance
	SB	serviceBulletinEmbodiment
	SF	blockedOrImpoundedForSafetyReasons
	SM	undergoingScheduledMaintenance
	SR	sentForRepairOrOverhaul
	WA	waitingForAuthorization
	WC	waitingForCalibration
	WE	waitingForEquipment
	WI	waitingForInvestigation
	WM	waitingForMaterial

Attribute name	Valid value	Valid value name
	WP	waitingForPersonnel
	WS	waitingForSpares
downTimeStatus	D	down
	OP	operational
	SF	equipmentNotAvalableDueToSafetyRestriction
environmentIdentifier	OEM	originalEquipmentManufacturer
	OPER	operator
environmentRelationshipType	CAN	cancels
	REF	refinementOf
	STA	stationalVersionOf
	TEM	temporaryVersionOf
environmentRevisionIdentifier	OEM	originalEquipmentManufacturer
	OPER	operator
environmentRevisionStatus	A	approved
	C	canceled
	D	draft
	R	underReview
environmentRevisionType	CLI	climateChange
	SEA	seasonalChange
	TEM	temporaryChange
environmentType	ART	artic
	CON	continental
	DES	desertic
	MAR	maritime
	TRO	tropical
	VOL	volcanic
equipmentStatusReason	D	damage
	F	failure
	OK	equipmentOK
	OP	currentlyUnderOperation

Attribute name	Valid value	Valid value name
	SF	blockedOrImpoundedForSafetyReasons
	SR	sentForRepair
	WA	waitingForAuthorization
	WC	waitingForCalibration
	WE	waitingForEquipment
	WI	waitingForInvestigation
	WM	waitingForMaterial
	WP	waitingForPersonnel
	WS	waitingForSpares
equipmentStatusType	FL	equipmentFailed
	OP	equipmentOperational
	SC	equipmentScrapped
	SF	equipmentNotAvalableDueToSafetyRestriction
eventConfirmedStatus	C	confirmed
	U	unconfirmed
eventGroup	C	contractual
	M	maintenance
	O	operational
	T	technical
eventIdentifier	M	maintainer
	O	operator
	R	reporter
eventRelationshipItemRole	A	
	C	y
	O	n
eventRelationshipType	AFT	after
	BEF	before
	CAU	causeFor
	CON	consequenceOf
	DUR	during

Attribute name	Valid value	Valid value name
	INP	inParallelTo
	REL	relatedTo
eventSeverity	C	critical
	M	minor
	R	routine
	S	serious
explanatoryFactorIdentifier	AUTH	authorities
	OEM	originalEquipmentManufacturer
	OPER	operator
exportControlLicenseType	PRM	permanent
	TMP	temporary
exportControlPartyRole	CON	consignor
	FRE	freightForwarder
	MAN	manufacturer
	SEL	seller
	SRC	source
	USR	endUser
exportControlPartyType	G	government
	I	industry
exportControlRegulationLegalCode	AWV	AWV
	AWV9	AWV9
	EAR	EAR
	EG	EG
	ESA11	ESA11
	ESA12	ESA12
	ESA22	ESA22
	ESA31	ESA31
	FRMTG	FRMTG
	FRNAT	FRNAT
	ITAR	ITAR

Attribute name	Valid value	Valid value name
	KWKG	KWKG
	UKMIL	UKMIL
externalDocumentType	O	other
facilityCleansiness	C	cleanRoom
	N	normal
	S	substandard
facilityIdentifier	L	legalIdentifier
	O	ownerIdentifier
facilityLocationIdentifier	OPER	operator
	OWN	owner
facilityRelationshipType	ALT	isAlternateFor
	COL	colocatedWith
	INC	includes
	ISP	isPartOf
	SUB	isSubsidiaryOf
failureCauseCode	C	corrosion
	D	damage
	E	electrical failure
	F	fire
	H	hardware failure
	O	other
	S	software fault
	W	wear
	X	explosion
failureCauseIdentifier	OEM	originalEquipmentManufacturer
failureDetectionRate	C	continuously
	I	intermitently
	O	occasionally
failureModeEffectIdentifier	OEM	originalEquipmentManufacturer
failureModeIdentifier	OEM	originalEquipmentManufacturer

Attribute name	Valid value	Valid value name
faultIdentifier	MAIN	maintainer
	OPER	operator
faultStatus	D	deferredRepair
	P	pendingRepair
	R	repaired
fleetIdentifier	OEM	originalEquipmentManufacturer
	OPER	operator
fleetPlanningIdentifier	OPER	operator
fleetPlanningStatus	A	approved
	C	cancelled
	D	draft
fleetRelationshipType	AS	associatedWith
	IN	includes
	RE	replaces
fleetTaskCancellationNoticeIdentifier	OP	operator
	OWN	owner
fleetTaskIdentifier	OPER	operator
	SERV	serviceProvider
fleetTaskPriority	C	criticalPriority
	H	highPriority
	L	lowPriority
	R	routinePriority
geographicalAreaRelationshipType	A	associatedTo
	C	closeTo
	E	eastOf
	I	includedIn
	N	northOf
	P	isPartOf
	S	southOf
	W	westOf

Attribute name	Valid value	Valid value name
	Y	adyacentTo
geographicalAreaType	CITY	city
	CON	continent
	CTRY	country
	CTYG	countrygroup
	DES	desert
	DIS	district
	ISL	island
	LAN	landmass
	LND	landmark
	MOU	mountainRange
	OCE	ocean
	PROV	province
	REG	region
	RES	restrictedArea
	SEA	sea
	ST	state
hardwareElementRepairability	N	nonRepairable
	P	partialRepairable
	R	repairable
hardwareElementReplaceability	N	nonReplaceable
	NA	notApplicable
	R	replaceable
hardwareElementType	AP	accessPoint
	DO	door
	EP	electricalPanel
	EQ	equipment
	PN	panel
hardwarePartHazardousClass	C	consumable
	D	disposable

Attribute name	Valid value	Valid value name
	E	espendable
	M	material
	R	repairable
	SE	supportEquipment
	SP	spare
	SY	supply
hardwarePartLogisticsCategory	C	consumable
	D	disposable
	E	expendable
	M	material
	R	repairable
	SE	supportEquipment
	SP	spare
	SY	supply
hardwarePartRepairability	N	nonRepairable
	P	partialRepairable
	R	repairable
infrastructureAvailableType	F	fullyAvailable
	N	notAvailable
	P	partiallyAvailable
	R	availableWithRestrictions
	S	availableOnSharedBasis
infrastructureIdentifier	OPER	operator
	OWN	owner
infrastructurePartyRole	OP	infrastructureOperator
	OW	infrastructureOwner
	USR	infrastructureUser
infrastructureRelationshipType	CO	competitorOf
	CP	complements
	P	isPartOf

Attribute name	Valid value	Valid value name
	RE	relatedWith
	RP	replacementOf
infrastructureRevisionIdentifier	OPER	operator
	OWN	owner
infrastructureRevisionStatus	A	approved
	C	cancelled
	D	draft
locatorIdentifier	LCRID	locatorIdentifier
logBookEntryIdentifier	MAIN	maintainer
	OPER	operator
	PROD	productGenerated
logbookEntryMeasurementType	EQ	equipmentCounter
	OP	operatingHourCounter
	OTH	otherCounterType
	PR	productCounter
	TO	timeSinceOverHaulCounter
logBookEntryType	ACC	accident
	BIT	builtInTest
	CHK	check
	FAIL	failure
	HUM	healthAndUsageMonitrong
	INC	incident
	INS	install
	OPEV	operationalEvent
	UNI	uninstall
logBookIdentifier	AUTO	automaticGeneration
	OEM	originalEquipmentManufacturer
	OPER	operator
logBookType	MAIN	maintenance
	OPER	operational

Attribute name	Valid value	Valid value name
maintenanceActivityPartyRole	AP	approvesMaintenance
	EX	executesMaintenance
	IN	inspectsMaintenance
maintenanceEventCategoryType	AC	accident
	AS	assembly
	CL	cleaning
	DI	disassembly
	IN	inspection
	OT	other
maintenanceFacilitySlotIdentifier	OPER	operator
	OWN	owner
maintenanceFacilitySlotType	D	dock
	H	hangar
	O	other
	R	repairStation
maintenanceFacilityType	BAT	batteryShop
	CAL	calibrationFacility
	HAN	hangar
	HYD	hydraulicShop
	REP	repairShop
	SHOP	generalShop
maintenanceLicenceIdentifier	MLID	maintenanceLicenseID
maintenanceLicenceType	A1	easa66CatA1
	A2	easa66CatA2
	A3	easa66CatA3
	B1.1	easa66CatB1.1
	B1.2	easa66CatB1.2
	B1.3	easa66CatB1.3
	B1.4	easa66CatB1.4
	B2	easa66CatB2

Attribute name	Valid value	Valid value name
	B3	easa66CatB3
	C	easa66CatC
maintenanceOrganizationApprovalType	145	aviationPart145
	147	aviationPart147
	21	aviationPart21
	571	aviationCAR571
	573	aviationCAR573
	66	aviationPart66
	A823	AviationBcarA8-23
	A824	AviationBcarA8-24
	A825	AviationBcarA8-25
	AMC	AMC
	ARC	aviationPartMSubpartGARC
	M	aviationPartM
	MF	aviationPartMSubpartF
	MG	aviationPartMSubpartG
maintenancePersonJobType	E	electrician
	M	mechanic
maintenanceProgramRevisionIdentifier	OEM	originalEquipmentManufacturer
maintenanceProgramRevisionStatus	A	approved
	C	cancelled
	D	draft
	R	underReview
maintenanceProgramType	DEP	deploymentSpecific
	ENV	environmentSpecific
	OEM	originalEquipmentManufacturer
	OPE	operatorSpecific
maintenanceSignificantOrRelevant	MR	maintenanceRelevant
	MS	maintenanceSignificant
	NA	notApplicable

Attribute name	Valid value	Valid value name
	NM	nonMaintenanceSignificantOrRelevant
materialIdentifier	M	manufacturer
materialRiskFactor	A	authorizedSubstance
	AL	authorizedWithLimitationSubstance
	F	forbiddenSubstance
materialSubstanceUsageCategory	CAS	chemicalAbstractsServiceNumber
	EINECS	europeanInventoryOfExistingChemicalSubstancesNumber
	SI	substanceIdentifier
measurementPointIdentifier	AS	assigned
	AU	automaticallyGenerated
messageContentStatus	D	draftMessageContent
	F	finalMessageContent
	P	preliminaryMessageContent
messageIdentifier	MID	messageIdentifier
	MSN	messageSequenceNumber
messageLanguage		Refer to languageCodeValues valid value library.
messagePartyType	F	forwarder
	R	receiver
	S	sender
messageRelationshipType	A	messageAcknowledgement
	O	messageObservation
	R	messageReply
	U	messageUpdate
monthComponent	1	January
	10	October
	11	November
	12	December
	2	February
	3	March

Attribute name	Valid value	Valid value name
	4	April
	5	May
	6	June
	7	July
	8	August
	9	September
movementIdentifier	OPER	operator
movementLegDelayIdentifier	OPER	operator
movementLegDelayType	AUTH	delayDueToLackOfAuthorization
	CAR	delayDueToCargo
	FAIL	delayDueToEquipmentFailure
	FUEL	delayDueToFuel
	OTH	delayDueToOtherReasons
	WEA	delayDueToWeather
movementLegIdentifier	OPER	operator
movementLegLocationType	D	destinationLocation
	S	sourceLocation
movementLegResult	AB	movementLegAborted
	CA	movementLegCancelled
	DE	movementLegDelayed
	DI	movementLegDiverted
	OK	movementLegOK
movementLocationType	D	destinationLOcation
	S	sourceLocation
movementResult	AB	movementAborted
	CA	movementCancelled
	DE	movementDelayed
	DI	movementDiverted
	OK	movementOK
movementType	DEP	deployment

Attribute name	Valid value	Valid value name
	FE	ferry
	MIS	mission
	TR	transport
	TRN	training
nameLanguage		Refer to languageCodeValues valid value library.
nonAvailabilityCauseType	CUS	customerRelated
	OTH	other
	SB	serviceBulletin
	SCH	scheduledMaintenance
	UNSR	unserviceable
	USCH	unscheduledMaintenance
nonConformanceType	C	concession
	W	waiver
obsolescenceParameterType	AGE	obsolescenceDueToAge
	ALL	obsolescenceDueToAllocation
	CHG	obsolescenceDueToMarketChange
	ENV	obsolescenceDueToEnvironmentalRestrictions
	PLA	plannedObsolescence
	PRO	obsolescenceDueToProcurementLastBuy
	TEC	tecnologicalObsolescence
operatingBaseCapacityIdentifier	OPER	operator
	OWN	owner
operatingBaseType	AIR	airport
	BUS	busStation
	CAR	carPark
	CIV	civilianBase
	CONS	constructionSite
	DEPLOY	deployedBase
	MIL	militaryBase
	PORT	port

Attribute name	Valid value	Valid value name
	TRAIN	trainStation
operationalApprovalIdentifier	AUTH	legalAuthority
	OEM	originalEquipmentManufacturer
operationalApprovalType	C	cargoTransportOnly
	E	extendedOperations
	F	fullOperationalApproval
	L	operationalApprovalWithLimitations
	P	passengerTransportOnly
	X	experimentalOrProtypeUseOnly
operationalEventCategoryType	A	accident
	I	incident
	N	normalOperation
	S	safetyCriticalIncident
operationalEventMaintenanceDown	D	eventAllowsDeferredMaintenance
	M	eventRequiresMandatoryMaintenance
	N	eventRequiresNoMaintenance
operationalEventMessageIdentifier	MID	messageIdentifier
	MSN	messageSequenceNumber
operationalEventMessageType	AW	audibleWarning
	MP	maintenancePanel
	OP	operatorConsole
	VW	visualWarning
operationalEventOperationalMode	AIR	flying
	CR	cruising
	GR	onGround
	ORB	orbiting
	STA	stationaryPosition
	SUB	immersed
	SUR	onSurface
operationalEventSymptom	AN	anomalousBehaviour

Attribute name	Valid value	Valid value name
	FI	fire
	HT	abnormalHeating
	IF	intermintentFailure
	MA	malfunction
	NO	noise
	SC	shortcircuit
	SH	shutdown
	TF	totalFailure
	VI	vibration
operationalModeClassification	CG	cargoTransport
	CO	combat
	ME	medicalEvacuation
	MT	mixedModeTransport
	PT	passengerTransport
	RE	reconnaissance
	TR	productTransfer
operationalModeIdentifier	OEM	originalEquipmentManufacturer
	OPER	operator
operationalModeStatusType	E	ETOPS
	F	fullPower
	H	halfPower
	I	idle
	Q	quarterPower
	S	stopped
operationalPeriodIdentifier	OPER	operator
operationalPeriodPhase	ASC	ascending
	CRU	cruise
	DES	descending
	IDL	idle
	IMM	immersed

Attribute name	Valid value	Valid value name
	LAN	landing
	RUN	running
	STA	starting
	STP	stopped
	SUR	surface
	TAG	touchAndGo
	TOF	takeOff
operationalPeriodRelationshipType	A	after
	B	before
	IF	includes
	O	overlapping
	P	inParallelTo
operationalPeriodResult	CAN	operationaPeriodCancellation
	DEL	operationaPeriodDelay
	OK	operationaPeriodOK
	PAR	operationalPeriodPartialSuccess
operationalRoleidentifier	OEM	originalEquipmentManufacturer
	OPER	operator
operationalRoleType	R	routine
	S	special
	T	training
operationalTimeType	POS	postOperationTime
	PRE	preparationTime
	STA	startupTime
	STP	shutdownTime
	TAT	turnAroundTime
organizationalBreakdownStructureRevisionIdentifier	C	contract
	P	project
organizationalBreakdownStructureRevisionStatus	A	approved
	C	cancelled

Attribute name	Valid value	Valid value name
	D	draft
	R	underReview
organizationalRoleType	CM	configurationManager
	DM	dataManager
	PJ	projectManager
	PR	productManager
	SM	securityManager
	WP	workPackageManager
organizationIdentifier	CAGE	cageCode
organizationType	BRA	companyBranch
	DEF	defenseOrganization
	DEP	department
	DIV	companyDivision
	GOV	government
	JV	jointVenture
	MUL	multinationalOrganization
	NGO	nonGovernmentOrganization
	PAR	paramilitaryOrPolice
	PRIV	privateCompany
	PROJ	projectOrganization
	PUB	publicSector
	STAN	standardizationOrganization
otherFacilityType	BLD	generalBuilding
	COM	computingCenter
	MFG	manufacturingSite
	OFF	office
	PWR	powerStation
	RAIL	railStation
parkingFacilityType	APR	apron
	CAR	carPark

Attribute name	Valid value	Valid value name
	DOCK	dock
	GAR	garage
	HAN	hangar
	PAR	generalParking
	STA	station
partActionCause	F	failure
	O	other
	R	rob
	S	scheduledMaintenance
	U	unrob
partActionIdentifier	AU	automaticallyAssigned
	MA	setManually
partActionType	C	checkOrInspect
	I	install
	S	service
	U	uninstall
partExportControl	EAR99	Not in Commerce Control List (CCL)
partIdentifier	CPNO	customerPartNumber
	NSN	natoStockNumber
	OEM	oemPartNumber
	PNO	partNumber
	REF	referencePartNumber
	SPNO	supplierPartNumber
	STD	standardsReferenceDesignator
partsListType	EBOM	engineeringPartsList
	MBOM	manufacturingPartsList
	PBOM	provisioningPartsList
	SBOM	supportPartsList
partyAddressType	A	alternateAddress
	M	mainAddress

Attribute name	Valid value	Valid value name
partyContactDataType	E	eMail
	F	fax
	P	phone
partyRelationshipType	ASC	isAssociatedWith
	BEL	belongsTo
	CUS	isCustomerOf
	OWN	owns
	SUB	isSubcontractorOf
	SUP	isSupplierOf
	WOR	worksFor
penaltyIdentifier	CON	contractualPenaltyIdentifier
personIdentifier	A	anonymizingIdentifier
	E	employeeNumber
	I	identificationCard
	P	passportNumber
	S	socialSecurityNumber
personPrefixTitle	Dr.	doctor
	Mr.	mister
	Mrs.	Mrs
	Ms.	miss
	Prof.	professor
personSuffixTitle	Jr.	junior
	Sr.	senior
plannedItemUpgradePriority	C	critical
	L	low
	N	normal
	U	urgent
plannedItemUpgradeReason	A	aesthetic
	F	functional
	I	improvement

Attribute name	Valid value	Valid value name
	O	obsolescence
	S	safety
poolIdentifier	OWN	owner
poolType	COM	commitedForSpecificPurpose
	CON	contractorOwned
	CSHA	CustomerSharedContractorOwned
	CUS	customerOwned
	OEM	originalEquipmentManufacturerOwned
	REG	regionalPool
	SHAC	sharedCustomerOwned
poolUsageType	EXT	externalRequestUsage
	INT	internalUsage
	PAR	partialAccessAlowed
	UNL	unlimitedUse
productParametersAtOperationalEventIdentifier	P	product
productUsagePhaseIdentifier	OEM	originalEquipmentManufacturer
productUsagePhaseRelationshipType	A	after
	B	before
	D	during
productVariantIdentifier	MOI	modelIdentificationCode
	MOV	modelVersionIdentifier
	PVC	productVariantIdentificationCode
	UOC	systemEndItem
projectIdentifier	MOI	modelIdentifier
	PID	projectIdentifier
projectRelationshipType	C	contributingTo
	R	relatedTo
	S	subproject
publicationModuleIssueLanguage		Refer to languageCodeValues valid value library.

Attribute name	Valid value	Valid value name
publicationModuleIssueLanguageCountry		Refer to countryCode valid value library.
reasonForShopSubmission	F	fault investigation
	O	other
	R	repair
referenceDesignator	RFD	referenceDesignator
releasedDataSetAssociatedWithType	C	dataSetConfigures
	G	dataSetGeneratedBy
	I	dataSetIncompatibleWith
	L	dataSetLoadedInto
	R	dataSetRequiredBy
remarkType	COM	comment
	NTE	note
	REM	remark
	RSP	response
reportableMetricIdentifier	KPI	keyPerformanceIndicator
reportableMetricType	A	availability
	C	cost
	M	milestone achievement
	O	operational
	OT	other
	P	performance
	R	reliability
reportPartyRole	A	addressee
	R	reporter
requirementPartyRole	ORG	originator
	OWN	owner
	STK	stakeholder
requirementRelationshipType	A	associatedWith
	C	complementaryTo
	P	isPartOf

Attribute name	Valid value	Valid value name
requirementStatus	A	requirementStatusApproved
	C	requirementCancelled
	D	requirementStatusDraft
	R	requirementStatusUnderReview
requirementType	FU	functional
	OB	obsolescence
	OP	operational
	PH	physical
	SF	safety
	TE	technical
	TR	training
resourceUsagePartyRole	O	resourceOwner
	R	resourceRequester
resourceUsageRequestIdentifier	O	owner
	R	requester
resourceUsageRequestStatus	A	accepted
	C	cancelled
	D	denied
	H	onHoldByGrantor
	N	underNegotiation
	R	raised
	S	suspendedByRequester
roleCapabilityLevel	F	full
	P	partial
safetyDocumentCriticality	C	critical
	L	low
	R	routine
	T	lifeThreatening
	U	urgent
safetyWarningPriority	C	critical

Attribute name	Valid value	Valid value name
	R	routine
	U	urgent
securityClassValue	C	confidential
	CC	companyConfidential
	R	restricted
	S	secret
	TS	topSecret
	UC	unclassified
sensorIdentifier	OEM	originalEquipmentManufacturer
sensorSamplingMode	C	continuous
	E	on event
	P	periodic
	T	on threshold
serializedItemWarrantyType	E	extended warranty
	L	life warranty
	M	manufacturing defect
serializedProductVariantAssignmentIdentifier	OPER	operator
	PLAN	planner
	SERV	serviceProvider
serializedProductVariantAssignmentStatus	KO	assigmentStatusNotReady
	OK	assigmentStatusReady
	PL	assigmentStatusPlanned
serializedProductVariantAssignmentType	A	assigned
	B	assignedAsBackup
	P	potentialAssignment
serviceBulletinPriority	C	critical
	L	low
	N	normal
	U	urgent
serviceBulletinType	A	authorityRequirement

Attribute name	Valid value	Valid value name
	C	critical
	F	functional
	M	mandatory
	O	operationalImprovement
	R	reliabilityImprovement
	S	safetyRelated
serviceIdentifier	S	serviceProvider
serviceRelationshipType	AS	associatedTo
	CO	complements
	EX	extensionOf
	IN	incompatibleWith
	PO	partOf
	RE	replaces
	SI	similarTo
serviceRequestCancellationIdentifier	OPER	operator
serviceRequestCancellationReason	C	customerCancellation
	N	serviceRequestItemNotAvailable
serviceRequestIdentifier	R	serviceRequester
	S	serviceProvider
serviceRequestPartyRole	AG	agent
	CUS	customer
	INT	internalStaff
	MAN	mantainer
	OP	operator
	SRV	serviceProvider
	SUP	supplier
serviceRequestPriority	C	critical
	L	low
	R	routine
	U	urgent

Attribute name	Valid value	Valid value name
serviceRequestRelationshipType	CAN	cancels
	REL	relatedTo
serviceRequestType	CAL	calibrate
	LOAN	loan
	OVR	overhaul
	REP	replace
	SND	send
	TRN	train
	USE	use
shopFindingsFaultCode	C	corrosion
	D	damage
	E	electrical failure
	F	fire
	H	hardware failure
	O	other
	S	software fault
	X	explosion
shopFindingsFaultConfirmed	C	confirmed
	N	noFaultFound
shopFindingsIdentifier	S	shop
softwareElementType	D	distributed
	E	embedded
	L	loadable
softwareErrorFixPriority	H	highPriority
	N	normalPriority
	U	urgentPriority
softwareErrorReproducibility	A	swErrorAlwaysReproducible
	I	swErrorIntermitentlyReproduceable
	N	swErrorNotReproduceable
softwareErrorSeverity	B	blockingSoftwareError

Attribute name	Valid value	Valid value name
	C	criticalSoftwareError
	F	featureSoftwareError
	K	tweakSoftwareError
	M	majorSoftwareError
	R	minorSoftwareError
	T	trivialSoftwareError
	X	textSoftwareError
specialSafetyInstructionPriority	C	critical
	R	routine
	U	urgent
substanceIdentifier	CAS	chemicalAbstractsServiceNumber
	EINECS	europeanInventoryOfExistingChemicalSubstancesNumber
	SI	substanceIdentifier
subtaskRole	CL	closeupSubtask
	CON	coreNoRequiredConditionsSubtask
	COR	coreSubtask
	ST	startupSubtask
subtaskTimelineEvent	END	subtaskEnd
	START	subtaskStart
supportEquipmentCalibrationRequired	A	asRequired
	D	daily
	M	monthly
	N	none
	W	weekly
	Y	yearly
supportEquipmentType	ATE	automaticTestEquipment
	CA	calibrationTool
	HO	hoistingTool
	HT	handTool
	OTH	other

Attribute name	Valid value	Valid value name
	ST	supportingTool
	TST	testTool
	VE	vehicle
taskRevisionStatus	A	approved
	IW	inWork
technicalOrderIdentifier	OEM	originalEquipmentManufacturer
technicalOrderPriority	C	critical
	L	low
	R	routine
	U	urgent
transportCapabilityUsageIdentifier	OPER	operator
typeOfPrice	ACTU	Actual
	ASKK	Ask
	AUCT	Auction
	AVER	Average
	AVOV	AverageOverride
	BIDE	Bid
	CALC	Calculated
	CANC	Cancellation
	CLEN	Clean
	COMB	Combined
	CREA	Creation
	DDVR	DailyDividendRate
	DIRT	Dirty
	DRAW	Draw
	EGAV	EstimatedGAV
	ENAV	EstimatedNAV
	FAVA	FairValue
	GAVL	GrossAssetValue
	GREX	GrossOfAll

Attribute name	Valid value	Valid value name
	GUAR	Guaranteed
	INDC	Indicative
	INPA	IndicativePaid
	INTE	Interim
	KASA	Kassa
	LIMI	Limit
	MIDD	Mid
	MRKT	Market
	NAUP	NonAdjustedUnpublished
	NAVL	NetAssetValue
	NAVS	SidePocketNAV
	NDIS	NetDisclosed
	NET1	NetOfAll
	NET2	Net
	NOGR	NotionalGross
	NUND	NetUndisclosed
	OFFR	Offer
	OTHR	Other
	PAID	Paid
	PARV	ParValue
	RDAV	RoundedAverage
	REDN	RedemptionNAV
	RINV	Reinvestment
	SETM	Settlement
	SPRE	Spread
	STOP	Stop
	SUBN	SubscriptionNAV
	SWIC	Switch
	SWNG	Swing
	TAXE	Tax

Attribute name	Valid value	Valid value name
	TISC	TaxableIncomePerShareCalculated
valueDetermination	ALC	allocatedValue
	CALC	calculatedValue
	CONTR	contractedValue
	DSG	designedValue
	EMP	empiricalValue
	EST	estimatedValue
	MEAS	measuredValue
	PLAN	plannedValue
	REQ	requirementsValue
	SET	setPointValue
	SPEC	specifiedValue
warehouseType	PHY	physical
	VIR	virtual
warrantyClaimCommunicationMeans	E	eMail
	F	fax
	M	mail
	P	phone
	T	telex
warrantyClaimContactType	A	agent
	C	customer/warranty holder
	F	finance
	L	legal
	R	warranty reporter
	W	warrantor
warrantyClaimIdentifier	OEM	originalEquipmentManufacturer
warrantyClaimResolutionIdentifier	OEM	originalEquipmentManufacturer
warrantyClaimResolutionType	A	approved
	C	closed
	D	draft

Attribute name	Valid value	Valid value name
	DF	deferred
	P	partiallyApproved
	R	rejected
	S	settled
warrantyClaimType	DAM	damage
	EXP	expenses
	EXT	extended
	HRS	laborHours
	INS	inspection
	MAT	material
	REC	recall
	RES	restore
	REV	lostRevenue
	STD	standard
	TRA	transport
	UPD	productUpdate
warrantyEventReason	D	manufacturingDefect
	DE	delay
	DT	downTime
	F	failure
	O	other
workBreakdownIdentifier	C	contract
workBreakdownRelationshipType	IN	includes
	RE	relatedTo
	RP	replaces
workBreakdownRevisionIdentifier	WBSRID	workBreakdownStructureRevisionId
workBreakdownRevisionStatus	A	approved
	C	cancelled
	D	draft
	R	underReview

Attribute name	Valid value	Valid value name
workItemIdentifier	WIID	workItemIdentifier
workItemRelationshipType	A	startsAfter
	AS	endsAtSameTimeAs
	B	before
	C	isChildOf
	CS	cannotStartBefore
	P	isParentOf
	R	relatedTo
	S	simultaneousTo
workItemStatus	A	approved
	C	contracted
	D	draft
	F	finished
	S	started
workItemTimelineEvent	M	milestone
	T	task
workItemType	C	common
	D	development
	I	internal
	M	manufacturing
	P	projectManagement
	R	research
	S	subcontracted
	T	training
workOrderIdentifier	MAIN	maintainer
workOrderPriority	H	highPriority
	L	lowPriority
	R	routinePriority
workOrderStatus	C	closed
	D	deferred

Attribute name	Valid value	Valid value name
	E	execution
	O	open
workOrderType	COR	correctiveWorkOrder
	INS	inspectWorkOrder
	MOD	modificationWorkOrder
	PRE	predictiveWorkOrder
	PRV	preventiveWorkOrder
	TST	testWorkOrder
zoneElementType	WA	workArea
	Z	zone

5 Valid value libraries

The list of valid value libraries used by S5000F is provided in Table 5. These libraries include codes from international specifications. Please refer to these specifications for a full list of valid value codes.

Table 5 List of valid value libraries

Library name	Source
countryCode	ISO 3166-1
currencyUnit	ISO 4217
languageCodeValues	ISO 639-1

Chapter 19

Tailoring and contracting against S5000F

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References

Table 1 References

Chap No./Document No.	Title
Chap 1	Introduction
Chap 15	Feedback of non-predefined information
Chap 16.5	Mapping of use cases to individual UoFs
Chap 20	Data required for the different use cases
SX000i	International guide for the use of the S-Series Integrated Logistics Support (IPS) specifications
SX001G	Glossary for the S-Series IPS Specifications
SX005G	S-Series IPS specifications XML schema implementation guidance

1 General

1.1 Introduction

The purpose of this chapter is to define the general rules to be followed when tailoring or contracting against this specification, thus providing a contractual framework that can be invoked between two parties.

1.2 Scope

The scope only extends to tailoring and contractual aspects, and does not cover the data model itself, the data to be exchanged or the mechanism of exchange, only the means to agree to the exchange.

2 Tailoring

Tailoring of the specification is the adaptation of it for a specific purpose and is therefore not different from the contracting steps listed below, as the tailoring is usually part of the contract or technical negotiations.

S5000F is very large containing over a 1000 data elements (attributes). However, it is not intended to be used in its entirety, but rather designed to be tailored. Tailoring, in this context, means using just the information that is required for a particular purpose, usually for the activities to be carried out in the context of a contract. Depending on the contract and required information, the necessary data elements to implement S5000F can range from a few hundred to less than a dozen.

In order to tailor the specification for internal purposes without a contract, proceed with the steps listed in Para 3, Para 4.1 and Para 4.2. In this case, replace the word Contract by Agreement between involved organizations. In this particular case, Para 4.3 is not necessary, but its use is recommended. An example is provided in Para 5.

3 Basic contracting process

3.1 Contracting principles

As every contracting process is different due to different contractual environments and applicable laws, S5000F provides a simple mechanism for contracting. All data are directly

associated to the use of such data (use cases), and hence the contracting mechanism is not associated to the data itself, but to the activity that is carried out, which requires such data. That is, a contract will define the use cases (activities) to be carried out by the contractor and customer, and the data required for that particular use case will be delivered by the customer or contractor, as applicable, depending on who will carry out the activity.

S5000F does not indicate the direction of the data flow, because the same activities can be performed by different actors, depending on the contract. The receiver of the data will always be the party carrying out the activity for which the data is required.

However, there can be the need for data that are not directly associated to an activity. This information can be necessary from a legal or controlling point of view, or on specific customer request. This is a special case that has been also considered in the contracting process.

3.2 Contracting steps

The contracting process can be defined as follows:

3.2.1 Activity contracting

The customer and the contractor must agree on the activities to be carried out by the contractor and the customer. It is recommended that all activities are defined so that each of them maps exactly to one single use case as defined in S5000F.

The associated use cases for each activity will be identified in the different chapters. If no equivalent use case is found for a certain activity, proceed as indicated in Para 3.2.3.

The contract must also define the basic data delivery intervals required to perform each activity in a reasonable manner.

Note

Different activities can require different data delivery intervals, ranging from real-time delivery to a monthly delivery.

These activities and their required information must be included in the work breakdown structure.

The basic contractual data to be delivered for each work item (activity) are those that correspond to the associated use case in S5000F. For that purpose, the tables provided in Chap 20 and the use cases of each chapter are the only normative portion of S5000F and must be called upon in the contract for the definition of the data to be provided. The rest of the specification must be treated as informative.

3.2.2 Shared activities

In case an activity is shared by several parties, it must be documented who will provide the data for the activity to be carried out and who is responsible for providing the resulting data from the activity. This is particularly important for reporting purposes. Normally, the party that must provide the resulting data for a specific activity is the party that is accountable for such activity.

3.2.3 Special activities

If an activity to be carried out contractually is not defined as a use case in S5000F, the recommended way to contract such an activity as follows:

1. Identify the Units of Functionality (UoF) that provide the necessary information to carry out that activity, in a similar way as that in Chap 16.5.
2. Within each UoF, identify the classes that provide the necessary data, including the intermediate classes that provide the required relationships between the data.
3. Create a table similar to those listed in Chap 20 and include it in the contract and/or work breakdown structure document, associated to that particular activity, together with the

exchange frequency. Alternatively, the technical data exchange document defined in Para 4.3 can be used for this purpose.

It is recommended that, should special activities be encountered, a comment is raised against S5000F (refer to Chap 1) defining the activity and required UoFs/classes, so as to include it in a future S5000F issue as a new use case.

3.2.4 Reporting

Each individual program will have different reporting requirements. S5000F provides a mechanism for providing reports in a structured way that can be automatically processed. S5000F however does not mandate explicit reporting information, as this will be usually specific to each program.

To define the reporting in a contractual manner, the contract must define the information that needs to be exchanged for reporting purposes and its periodicity. This will usually be in the form of Key Performance Indicators (KPIs), activity reporting and textual information. The UoF Reporting, UoF Reportable Activity, UoF Cost Entries and UoF Service Contract Management will cover probably most of the reporting requirements.

4 Contract details

No matter how descriptive a contract is, there are always technical details that can escape the global negotiation or that are left for later agreement in order to speed up the contractual negotiations. For this purpose, it is recommended to have a guidance conference to establish the main exchange agreements/framework and a technical exchange document defining the detailed exchange parameters. Both the guidance conference and the technical data exchange document must be called upon in the contract.

The guidance conference must be held after a global IPS guidance conference has been held as required by SX000i, and ideally after the guidance conference of the individual IPS elements that are affected by this data exchange, so as to ensure that their data feedback requirements are properly covered.

4.1 Guidance conference

It is recommended to hold a guidance conference between all parties affected by S5000F exchange so as to:

- Agree implementation timescales
- Define organizational aspects
- Define the exchange mechanism
- Confirm the data delivery responsibilities
- Define data security and access
- Define the data exchange frequency
- Refine the agreed data exchange
- Define project-specific values and data
- Define master data sources
- Define specific business rules
- Define data analysis guidelines
- Data quality and data feedback reporting
- Any other aspect that can require agreement regarding the data exchange

The results of the agreements of this guidance conference must be documented in a technical data exchange document. Refer to Para 4.1.1 through Para 4.1.12.

4.1.1 Agree implementation timescales

Normally, an IT system needs to be put in place to carry out the exchange. Even though the contract will define a specific data for the exchange system to be in place, it is necessary to test

it before going live, and an agreement is required between both sides about when such testing will be performed, as both will have to commit resources for this purpose.

4.1.2 Define organizational aspects

It is necessary to identify on both sides the organizations that are involved in the exchange, including technical focal points for IT problems or data quality issues, so that potential problems can be solved quickly.

4.1.3 Define the exchange mechanism

This can be either pull (the receiving party extracts the data) or push (the data is sent by the data originating party). The usual mechanism is push, because the party sending the data is usually the one that knows when the data is ready. Similarly, the exchange can be synchronous or asynchronous. The exchange method can be also by means of FTP, http, web services or similar, and needs to be agreed. It is necessary to agree on the data exchange handshake, and to ensure that this handshake effectively occurs, including error recovery. Finally, it is necessary to define whether the data will be sent in full or only the modified (delta) data will be exchanged.

As part of the exchange mechanism definition it can be also necessary to define the message file naming conventions if the S5000F data are exchanged by means of files (eg, if using FTP). This allows for automatic validation and processing of the files by the receiver.

S5000F does not require a specific naming convention, but it is recommended to use something along the lines recommended by SX005G:

S5000F_2-0_isfdataset_uc27_contract1_001-02.xml

Where:

- S5000F_2-0_isfdataset indicates the specification and its version
- uc27 indicates the use case for which data is sent
- contract1 indicates the contract for which the data is sent
- 001 indicates the message sequence, and
- 02 indicates that it has been re-sent twice (eg, due to transmission errors)

4.1.4 Confirm the data delivery responsibilities

Normally, the responsibility for delivering a data set for a specific activity will be already established in the contract. However, lower-level data exchanges can sometimes not have been covered. The guidance conference must in that case ensure that all data exchanges have a responsible assigned for such data delivery, including the responsibility for data quality. It is recommended that the data exchanges are defined at use case level. The responsibility for defining master data should be also established at the guidance conference.

4.1.5 Define data security and access

If not contractually specified, it is necessary to agree on the security classification of the data, the security of the networks and encryption mechanisms for the data exchange. Whether there are restrictions on the access to the data that is being provided, and whether it can be mixed or not with data from other customers or a physical or functional segregation is required, must be defined.

Part of the data access agreements can include read/write rights by individual organizations. If not already contractually established, these agreements can also cover the intellectual property of the created data, and the processed data (analysis results).

Note

Such restrictions can have an impact on other contractual aspects. (eg, if data cannot be consolidated, a comparison analysis of customer fleet behavior in respect to the overall fleet behavior, across all customers, cannot be performed and this can mask potential fleet problems.)

4.1.6 Define the data exchange frequency

This frequency will usually be established based on the activity for which the data is required. An activity that is performed once a month (eg, reliability analysis) does not require a daily data exchange. Other activities (eg, fleet management) can require data to be exchanged in (near) real time. Typical exchange rates will be quarterly, monthly, weekly or daily. In special cases, hourly or real-time exchange can be required. Depending on the activity, specific dates can also be required for the data delivery (eg, one week before the activity is due to start, due to data processing requirements).

There can also be restrictions on the times at which the data can be exchanged (eg, only at certain hours or on certain days) due to infrastructure issues or security constraints.

4.1.7 Refine the agreed data exchange

The tables provided in Chap 20 provide an overview of what data is required for each use case/contractual activity. However, in some cases, there can be issues because some data can be unavailable for one or several Products or because the effort to collect the data does not justify the benefit of receiving that information. In some cases, the tables in Chap 20 will have to be modified or reduced by mutual agreement. Para 5 provides a practical example about how such tables can be adapted to the peculiarities of a program.

4.1.8 Define project-specific values and data

If not already identified in the contract, it will be necessary to agree on project-specific values (eg, a special data classification for a particular attribute), so that the project-specific values can be included in the XML file. The standard S5000F allowed values, supplemented by the project-specific values, are commonly referred to as reference data. Reference data (eg, country codes, units of measure or project codes) typically does not change over the lifetime of a project, thought it can require periodic revisions.

Note

The list of valid values listed in the XSD ValidValues file for the individual attributes is recommended and not mandatory. It is permitted by the specification to remove unwanted values or add necessary values to a specific attribute in the XSD ValidValues file. When adding new values, it is recommended not to use one of the recommended codes but rather add a new one, in order to maintain the compatibility with other projects that can share a same S5000F database, refer to Para 5.5. If it is determined that a code is necessary across multiple projects, then a change request should be submitted to the specification.

Similarly, there can be a need for a specific project data set that is not covered in the standard S5000F data elements set. S5000F provides the means to include project-specific data, but it is necessary to define such data, as well as its data types. Refer to Chap 15. Para 5 provides also a practical example about how to add such project-specific information.

4.1.9 Define master data and primary data sources

It is essential that define standard business objects that need to be referred to across the project and across all involved systems (organizations, locations, etc) are defined. This information, commonly referred to as master data, must be managed by a single entity, in order to ensure data consistency. Given that master data tends to change over the lifetime of a project, the guidance conference needs to nominate a single entity that is responsible for the maintenance of the master data, and the process to update the master data to ensure that all the involved actors are aware of a necessary change.

In some cases, specifying which data sources will be used as the primary data for the delivery of the information can be required. This is especially true if certain data can come from several systems and can be subject to transformation and/or different validation rules within those systems. In these cases, it is essential that all parties reference the same data from the same source. For example, flight hours can be extracted by electronic operators, an aircraft/helicopter

logbook or by a ground station. The usage of different primary data sources by the different parties involved in a project will inevitably lead to data quality issues.

4.1.10 Define specific business rules

S5000F provides a mechanism for data exchange. It does not, however, mandate specific business rules for data validation, which must be defined by a project. Such rules can, for example, require that part identifiers are based on a NATO Stock Number (NSN), have a specific part number range or adhere to a project-specific codification. Refer to Chap 16.

4.1.11 Define data analysis guidelines

If data analysis is required, the rules for the analysis must be agreed, including potential analysis extensions, such as root cause analysis, for anomalies detected during the analysis.

4.1.12 Data quality and data feedback reporting

A specific reporting of the data feedback itself can be agreed, so that the adequacy of the data feedback is ensured. Specifically, it is important to ensure that this data feedback report is used to continuously improve data quality at the data source systems when systematic data quality problems are detected, and to correct potentially incorrect source data.

Note

This data feedback reporting can be also performed using S5000F constructs. An example of data feedback reporting is provided at Fig 1. S5000F does not mandate any specific data feedback report.

Typically, the entity responsible for the data quality is the producer of such data, refer to Para 4.1.4. However, it is convenient that one single entity controls all the data quality and data exchange at project level, and reports this information to all involved stakeholders, so that a unified view of all data exchange issues is ensured. It is recommended that data quality is either a fixed point of the agenda in the periodic project review meetings, or an ad-hoc data quality working group is established between all the involved parties.

Data feedback report		
Project: XYZ Manufacturing robot line	Product: HiTech Rob-32	Reported by: Robot-X Associates
Reporting date: 2016-09-01	Reporting period: 2016-08	Days: 31
Messages received: 3765 Total data transfer: 1.7 Gbytes Message rejection rate: 0.61% Total data objects: 647581	Messages rejected: 23 Average message size: 459 kbytes Message repetition rate: 0.16% Average data objects/message: 172	Messages repeated: 11 Average messages/day: 121.5 Transfer availability: 99.97% Non-predefined info files: 134
Messages rejected: 334, 476, 544, 545, 612, 752, 1033, 1489, 2131, 2541, 2917, 3002, 3047, 2541 Causes for message rejection: - Wrong sender/wrong recipient: 544, 545 - Invalid XML schema: 334, 2131, 2541, 3002 - Not S5000D data: 1033 - Business rule #12: 476, 3047 - Business rule #15: 752 - Corrupted information: 2917 - Other: 612, 1489		
Messages repeated: 734 (3x), 1095 (2x), 2376 (1x), 2917 (5x)	**Main reasons for message repetition:** Timeout, data corruption	
Data quality errors: Average data object errors: 2.6% Business rule violations: 1026 Master data violations: 1720 Reference data violations: 955	Dubious data object information: 0.7% Average business rule violations: 0.16% Average master data violations: 2.54% Average reference data violations: 0.15%	
Top 5 BR violations: BR32, BR17, BR52, BR78, BR5 Top 5 MASTERDATA violations: Contract, Organization, Location, Facility, Fleet Top 5 REFDATA violations: unit, partsListType, securityClass, zoneElementType, amountCurrency Refer to Annex for detailed data quality report.		

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Fig 1 Example top-level data feedback report

4.2 Additional technical meetings

It can be necessary to have additional technical meetings to refine the agreements of the guidance conference (eg, to discuss specific points between specialists). Additional technical meetings can be also required to reflect potential contract amendments, based on the updated technical requirements.

These meetings must be properly recorded in meeting minutes, all agreements be properly documented, and such agreements must be included in the technical data exchange document.

4.3 Technical data exchange document

Not to be confused with an interface control document (ICD), which defines a technical interface between computer systems, the technical data exchange document provides a detailed description of the data exchange, including but not limited to:

- Responsible organizations and points of contact at both sides (for IT and data quality)
- Planning/implementation timescales (including testing)
- Infrastructure details (eg, IP addresses)

- Help desk
- Reporting on exchange issues
- Security requirements (eg, https, ftps, encryption mechanisms, etc)
- Responsible entity for the maintenance of the master data and change process for such data
- Responsible entity for delivery of each individual data set and delivery frequency
- Exchange mechanisms
- Exact data to be exchanged (copying the tables from Chap 20 as necessary, including changes agreed at the guidance conference and any additional technical meetings)
- XML schema for project-specific values
- Business rules for data validation
- Service-level agreement, exchange times (if synchronous)

The technical data exchange document will be an official delivery and must be considered as being contractual. This document will contain all technical aspects agreed at the guidance conference and possible ad-hoc additional technical meetings. It must be approved by both parties involved in the exchange and its modifications must be properly approved by authorized personnel.

4.4 Stepwise implementation

It should be noted that S5000F does not require that all required data sets are implemented at the same time, as different activities can start to be performed at different times. Therefore, it is possible to implement S5000F in a step-by-step manner, (eg, initially exchanging only the program-level information, then later extending the exchange to include maintenance, then later, RAMCT or fleet management).

Contractual changes implying new activities after the original contract was developed are also feasible. Refer to Para 4. The data exchange should in no way be affected by these contractual changes, except for the need to send (and process) additional data that can be required by the new contract.

5 Practical tailoring example

This example shows how the data exchange can be reduced to its essential aspects.

5.1 Contractual requirement

In this example, the contract states:

> *The Contractor shall provide safety instructions on how to proceed in case of a safety issue.*

In this case, the mapping to the contractual requirement is trivial, as this corresponds to Use Case 3 of Chap 5. Other contractual requirements can be more complex, and can correspond to several use cases, or even to a new use case.

Note

This particular contractual requirement (and Use Case) assumes that the safety issue has already been sent.

5.2 Identifying the UoFs of the contractual requirement

Checking the required UoFs in Chap 16.5 for this particular use case, the following UoFs are obtained:

- CDM UoF Remark. This UoF provides the capability to attach remarks to an item. It is not essential to this example, so it can be discarded.
- S5000F UoF Applicability Assignment Item. This UoF provides the capability to manage an item's applicability. In this example, however only the document that identifies the safety

issue related to the item is required. Since the applicability of the safety issue is the same as that of the safety recommendation, this UoF can be discarded.

- S5000F UoF Comment. This UoF provides the capability to raise comments against an item. It is not essential to this example, so it can be discarded.
- S5000F UoF Document. This UoF provides the capability to establish relationships between documents. Since only the relationship to the safety issue is required, which is covered by the UoF Safety, this UoF can be discarded.
- S5000F UoF Safety. This UoF will include the required instructions.

5.3 Removing unnecessary classes from the UoF

S5000F UoF Safety includes 12 classes, but, in this example, not all are needed.

For example, since applicability's are not required, the class *ApplicabilityStatementitem* can be removed. Also, the implementation of the required safety action corresponds to the customer, therefore the classes *RequiredSafetyActionImplementation*, *Action* and *PartAction* can also be removed. The class SafetyWarning is not required since it is a warning that a safety issue exists and not the instruction. Similarly, the relationship of the *SafetyIssue* with the Event that caused it is not required because this is not related to the *SpecialSafetyInstruction* itself.

On the other hand, we do not require to send (again) the *SafetyIssue*, only a reference to it, so we will also ignore it.

The tailoring so far results in the schema at Fig 2.

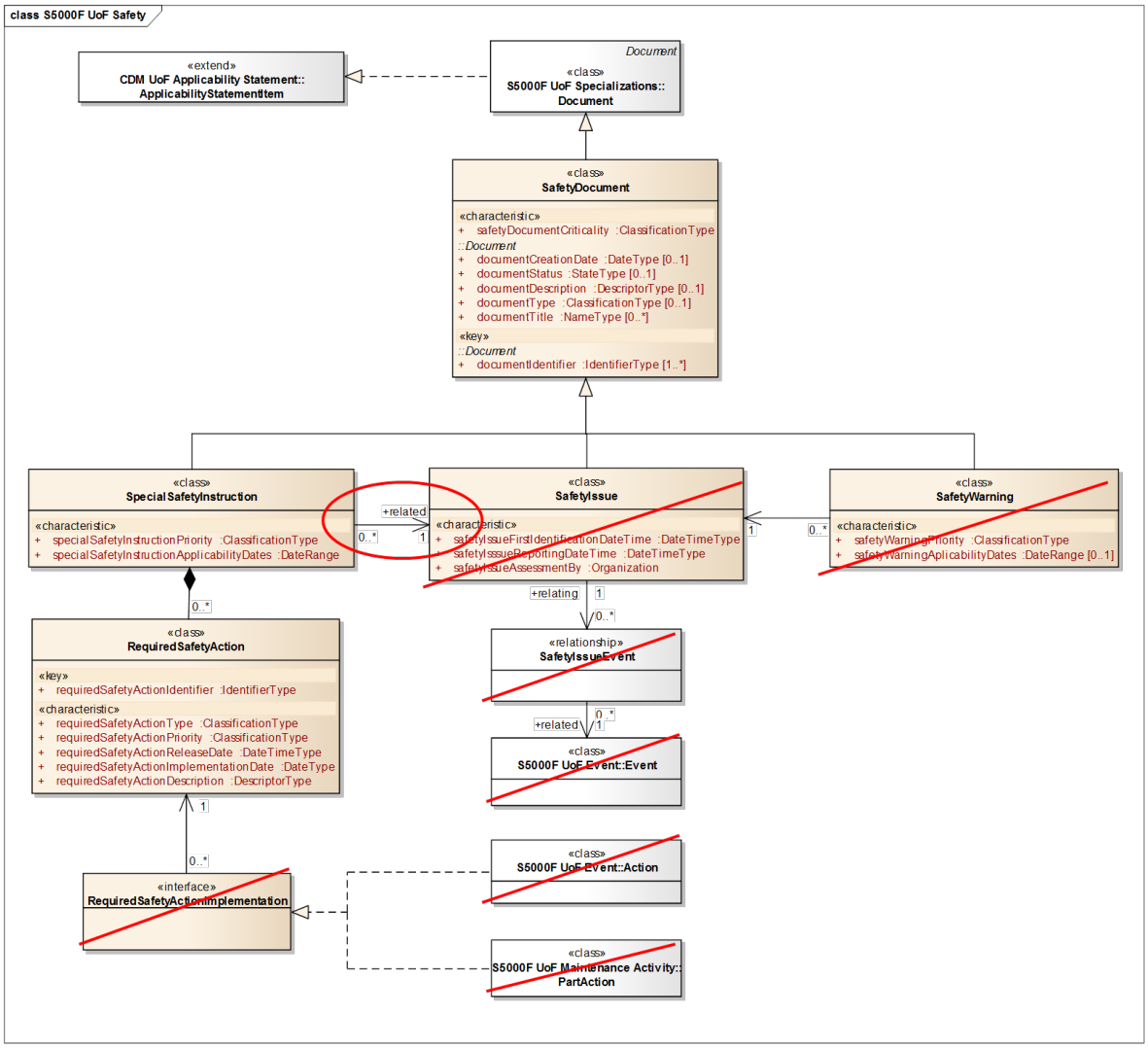

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Fig 2 Reduction of UoF Safey to the essential information for SpecialSafetyInstruction

However, the classes *Document* and *SafetyDocument* are parent classes of the class *SpecialSafetyInstruction*, so, as the class *SpecialSafetyInstruction* inherits the properties of its parents, the UoF Safety is reduced to that shown in ICN-B6865-S5000F19001-001-00

Fig 3.

This example has shown how five UoFs and their classes have been reduced to one UoF with two classes and one reference to the *SafetyIssue* to which it is related. Though the UoFs show all the relationships between the information, it is not necessary to send again information that has already been submitted.

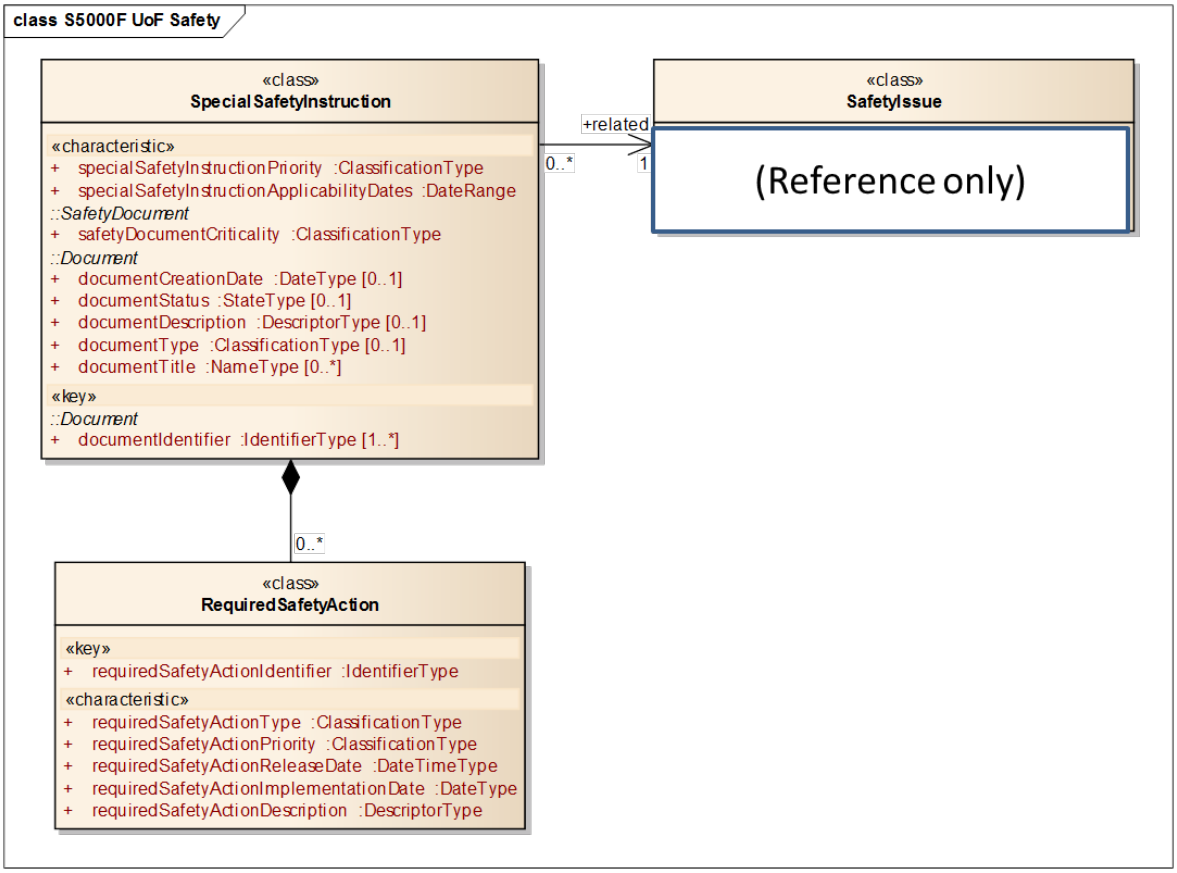

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Fig 3 Reduced UoF Safety

5.4 Tailoring of data elements

The data elements that are required for this use case are the attributes (data elements) listed in ICN-B6865-S5000F19001-001-00

Fig 3.

It should be highlighted that quite a few of the inherited attributes are optional (ie, those that have “[0..1]” or “[0..*]” after their name). Strictly speaking, the whole use case could therefore be implemented with just 10 attributes (ie, those that are not optional) and one reference.

Similarly, the tailoring described in Para 4.1.7 can include one or several additional optional data elements, and/or some additional project-specific information. Refer to Chap 15.

5.5 Tailoring of valid values

Para 4.1.8 states that the valid values listed in the S5000F XSD file are the recommended values to be used. They are not mandatory and can be removed or complemented as necessary. For example, an *ashoreOrAfloadCondition* value would be applicable for a ship, but not for a ground vehicle, aircraft, factory robot or other machinery. In this case, this value should be removed from the valid values file.

Project-specific values for existing attributes are also allowed. For example, the attribute *requiredSafetyActionType* could have a project specific value of "recallFleet", or similar. This project specific value would be agreed (refer to Para 4.1.8) and included in the valid values file of the XML Schema.

It is recommended that additional values have:

- A value that is not the same as a value defined in SX001G
- The associated *source* annotation uses the end item acronym code (EIAC) of the applicable project for its namespace definition. This will prevent using the wrong values on the wrong project if data from multiple projects is stored in a same database.

Example of deletion and addition of code values:

```
<xsd:simpleType name="zoneElementTypeCodeValues">
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="WA">
            <xsd:annotation>
                <xsd:appinfo>
                    <source>SX001G:workArea</source>
                </xsd:appinfo>
            </xsd:annotation>
        </xsd:enumeration>
        <xsd:enumeration value="Z">
            <xsd:annotation>
                <xsd:appinfo>
                    <source>SX001G:zone</source>
                </xsd:appinfo>
            </xsd:annotation>
        </xsd:enumeration>
    </xsd:restriction>
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="X">
            <xsd:annotation>
                <xsd:appinfo>
                    <source>ProjXXX:underwaterSpace</source>
                </xsd:appinfo>
            </xsd:annotation>
        </xsd:enumeration>
</xsd:simpleType>
```

In the example above, the value "WA" has been deleted because it is not applicable, and a new value "X" has been defined that is only applicable to project XXX.

Chapter 20

Data required for the different use cases

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References

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Chap 3	Feedback data for the purpose of reliability, availability, maintainability, capability and testability analysis
Chap 4	Feedback of data for maintenance analysis
Chap 5	Feedback of safety data
Chap 6	Feedback of data for supply support
Chap 7	Feedback for Life Cycle Cost analysis
Chap 8	Feedback of data for warranty analysis
Chap 9	Feedback data for the purpose of product health and usage monitoring
Chap 10	Feedback of data to support obsolescence management
Chap 11	Feedback of integrated fleet management data
Chap 12	Feedback of data for software support
Chap 13	Feedback of data for configuration management
Chap 14	Feedback of data to support the management of in-service contracts
Chap 15	Feedback of non-predefined information
Chap 16	Data model
Chap 19	Tailoring and contracting against S5000F

1 General

This chapter provides a mapping of the classes and data elements (attributes) as defined in the data model described in Chap 16 against the individual use cases described in the different chapters. The purpose of this mapping is to enable a quick determination of what information is required to carry out the activities for a specific use case. This also facilitates tailoring and contracting for the data as described in Chap 19.

2 Mapping of use cases against data model classes

The current section provides a detailed mapping of all data model classes to the use cases of each individual chapter, for easy cross-referencing.

Note

It is important to observe that the mapping provided in this chapter is **not** mandatory and is just a guidance provided to assist the users in identifying the information that they could require for a specific use case.

Note

It is an acceptable practice to remove unnecessary classes from a specific use case, in the same way that it is acceptable to add related classes to it, provided that the data model is not modified. Refer to Chap 19.

The following tables describe the classes that are used for each individual use case, using the following codes:

- "X" - mandatory
- "O" - optional/recommended
- (blank) - not used

Note

This mapping is a recommendation and can be tailored for each specific project. If a class is not used, then it cannot be mandatory. For example, if during an operational phase (use case UC50703) there is no movement because the product is stationary (eg, a machine in a permanent location), then the classes *Movement* and *MovementLeg* should not be mandatory.

2.1 Classes for reliability, availability, maintainability, capability and testability

The classes used for each Reliability, Availability, Maintainability, Capability and Testability (RAMCT) use case as defined in Chap 3 are listed in Table 2.The use cases are numbered:

Reliability use cases:

1 UC50301: Monitor the performance of equipment

2 UC50302: Influencing future designs

3 UC50303: Trends, failures, root cause analysis, and issue warnings

Availability use cases:

4 UC50304: Operations and deployment support, through-life support and equipment availability

5 UC50305: Maintenance management and contracting for availability

Maintainability use cases:

6 UC50306: Maintenance activities, effectiveness of repairs, specified maintenance, predict maintenance periods, Product status

7 UC50307: Retaining performance, support manuals and support infrastructure

Capability use cases:

8 UC50308: Mission capable, capability shortfalls

9 UC50309: Efficiency, performance against specification

Testability use cases:

10 UC50310: Can product be tested

11 UC50311: Fault diagnosis, fault identification

Table 2 Classes used for RAMCT use cases

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
Accelerometer			X								X

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
Action	X	X	X	X	O	X	X	X	X	X	X
AllocatedTaskLocation	X	X	X								
AllowedProductConfiguration	X	X	X	X	O	X	X	X	X	X	X
AllowedProductConfigurationByConfigurationIdentifier	X	X	X	O	O	X		X	X	X	X
AllowedProductConfigurationHardwarePartAsDesigned	X	X	X	O	O	X		X	X	X	X
AllowedProductConfigurationItem	X	X	X	O	O	X	X	X	X	X	X
AllowedProductConfigurationPhysicalData	X	X	X	X		X		X	X	X	
AllowedProductConfigurationRole	X	X	X	X	O	X	X	X	X	X	X
AllowedProductOperationalConfigurationItem		X	X	O	O	X	X	X			X
AllowedRoleChange	X	X	X	X		X		X	X	X	
AlternatePartAsDesigned	X	X	X	O	X	X	X	O	X	X	X
ApplicabilityStatement	X	X	X								
ApplicabilityStatementItem	X	X	X	X						X	X
AuthorityRequirement		X	X		X					X	
AuthorityToOperate	X	X	X	O	O	X		X	X	X	X
AuthorizedLife	X	X	X	X	O	O	O	O	O	X	X
Availability	X	X	X	X	X	X	X			X	X
AvailabilityItem	X	X	X	X	X	X	X	X	X	X	X
BatchHardwarePart	X	X	X	O	O	X	X	X	X	X	X
Breakdown	X	X	X	O	X	X	X	O	X	X	X
BreakdownElement	X	X	X	X	X	X	X	X	X	X	X
BreakdownElementInZone	X	X	X	X						X	X
BreakdownElementInZoneItem		X									
BreakdownElementRevision	X	X	X	O	X	X	X	O	X	X	X
BreakdownElementRevisionRelationship	X	X	X	X	X	X	X	O	X	X	X
BreakdownElementRevisionRelationshipItem	X	X	X	O	X	X	X	O	X	X	X
BreakdownElementStructure	X	X	X	O	X	X	X	O	X	X	X

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
BreakdownElementUsageInBreakdown	X	X	X	X	X	X	X	X	X	X	X
BreakdownElementUsageRelationship	X	X	X	X	X	X	X	O	X	X	X
BreakdownItem	X	X	X	O	X	X	X	O	X	X	X
BreakdownRevision	X	X	X	O	X	X	X	O	X	X	X
Calibration										X	X
CalibrationDocument										X	X
CalibrationMeasurement										X	X
Capability	X	X	X	X		X		X	X	X	
CapabilityItem	X	X	X	X		X		X	X	X	
CapabilityLimitation								X	X		
CargoItem	O							X			
ChangeAuthorization	X	X	X								
ChangeEmbodimentRequirement		X		O	O	O	O	O		O	
ChangeRequest	X	X	X	X	O	O	O	O		X	X
CircuitBreaker	X	X	X	X						X	X
CircuitBreakerSetting	X	X	X	X						X	X
CircuitBreakerSettings	X	X	X	X						X	X
ClassInstanceAssertItem	X	X	X								
CloudInfrastructure				O			X	O			
Comment	O	O	O	O	O	O	O	O	O	O	O
CommentAction	O	O	O	O	O	O	O	O	O	O	O
CommentItem	O	O	O	O	O	O	O	O	O	O	O
CommentParty	O	O	O	O	O	O	O	O	O	O	O
CommentRelationship	O	O	O	O	O	O	O	O	O	O	O
CommunicationsNetwork				O			X	O			
CompliesWith		X									
ComputerNetwork				O			X	O			
ConditionDefinitionItem	X	X	X		X						
ConditionInstance	X	X	X		X						
ConditionType	X	X	X		X						

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
ConditionTypeAssertMember	X	X	X		X						
Consequence	X	X	X	X	O	X	X	X	X	X	X
ConsumableItem				X	X						
Consumption				X	X						
ContainedSubstance	X	X	X	O	X	X	X	O	X	X	X
Contract	X	X	X	X	X	X	X	O		X	X
ContractClause		X			X						
ContractClauseRelationship					X						
ContractItem					X						
ContractItemDetails					X						
ContractParty					X						
ContractRelationship					X						
CostBreakdownContext					X						
CostEntry	O	X	O	O	O	X	O	O		O	X
CostEntryItem	O	X	O	O	O	X	O	O		O	X
CostItem	O										
Damage	X	X	X	X	O	X	X	X	X	X	X
DetectionMean			X							X	
DetectionMeanCapability			X							X	
DetectionMechanism			X							X	
Detector			X							X	X
DigitalFile	O										
Document	X	X	X	X	X	X	X		X	X	X
DocumentCharacteristicItem	O	O	O	O	X		X		O		
DocumentIssue	O	O	X	O	X		X		O	X	
DocumentItem	O	O	O	O	X		X		O	X	X
DocumentParty	O	O	O	O	X		X		O		
DocumentReferencingItem	O	O	O	O	X		X		O		
DocumentRelationship	O	O	O	O	X		X		O		
DownTimePeriod	X	X	X	X	X	X	X	X	X	X	X

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
EffectiveOnProductConfiguration	X	X	X	O	O	X		X	X	X	X
EffectiveOnProductConfigurationItem	X	X	X	O	O	X		X	X	X	X
Environment	X	X	X	X	X	X	X	X	X	X	X
EnvironmentRelationship			O								
EnvironmentRevision			O							X	X
EquipmentOperation	X	X	X		O	X	X	O	X	X	X
EquipmentOwner	X	X	X		O	X	X	O	X	X	X
EquipmentStatus	X	X	X		O	X	X	O	X	X	X
EvaluationByAssertionOfClassInstance	X	X	X								
EvaluationByAssertionOfCondition	X	X	X		X						
EvaluationByAssertionOfSerializedItems	X	X	X								
EvaluationByNestedApplicabilityStatement	X	X	X								
EvaluationByNestedExpression					X						
EvaluationCriteria	X	X	X		X						
Event	X	X	X	X	X	X	X	X	X	X	X
EventAffectedBreakdownElement	X	X	X	X	O	X	X	X	X	X	X
EventExplanation	X	X	X	X	O	X	X	X	X	X	X
EventItem	X	X	X	X	O	X	X	X	X	X	X
EventRelationship	X	X	X	X	O	X	X	X	X	X	X
EventRelationshipItem	X	X	X	X	O	X	X	X	X	X	X
EventReporter	X	X	X	X	O	X	X	X	X	X	X
ExplanatoryFactor	X	X	X	X	O	X	X	X	X	X	X
ExportControlLicense	O										
ExportControlRegulation		X									
ExpressionEvaluation					X						
ExternalDocument	O	O	O	O	X		X		O		
Facility	X	X	X	X	X	X	X	X	X	X	X
FacilityLocation				O		X	X	O		O	X
FacilityOperator	X	X	X	X		X	X	O		X	X

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
FacilityOperatorItem				O		X	X	O		O	X
FacilityOwner				O		X	X	O		O	X
FacilityRelationship				O		X	X	O		O	X
Failure			X							X	X
FailureCause			X							X	X
FailureDetection			X							X	
FailureMode			X							X	X
FailureModeEffect			X							X	
Fault			X							X	
FaultCause			X							X	
Fleet	X	X	X	X	X	X	X	X	X	X	X
FleetManager								X			
FleetPlanning								X			
FleetRequirement		X						X			
FleetTask				X	X			X			
FleetTaskCancellationNotice	O	O	O	O	X		X		O		
FleetTaskCargo								X			
FleetTaskList								X			
GeographicalArea	X	X	X								
HardwareElement	X	X	X	O	X	X	X	X	X	X	X
HardwareElementPartRealization	X	X	X	X	X	X	X	X	X	X	X
HardwareElementRevision	X	X	X	O	X	X	X	O	X	X	X
HardwarePartAsDesigned	X	X	X	O	X	X	X	X	X	X	X
HardwarePartAsDesignedDesignData	X	X	X	O	X	X	X	O	X	X	X
HardwarePartAsDesignedSupportData	X	X	X	O	X	X	X	O	X	X	X
IdentifiedTaskRequirement	X	X	X								
Infrastructure	X	X	X	X	X	X	X	X	X	X	X
InfrastructureAvailable				X			X	O			
InfrastructureCompliance				O			X	O			
InfrastructureCompliantItem				X			X	O			

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
InfrastructureItem				O			X	O			
InfrastructureNode				O			X	O			
InfrastructureNodeAtLocation				O			X	O			
InfrastructureParty				O			X	O			
InfrastructureRelationship				O			X	O			
InfrastructureRequiringItem				X			X	O			
InfrastructureRevision	O			X			X	O			
InstallationLocation	X	X	X	O	O	X	X	X	X	X	X
InstallationLocationDefinitionItem	X	X	X	O	O	X	X	X	X	X	X
InstalledPart	X	X	X	O	O	X	X	X	X	X	X
InstalledPartItem	X	X	X	O	O	X	X	X	X	X	X
InventoryActivity	O	O	O	O		X					X
ItemWarranty		X									
LaborRateItem					X						
LaborRates					X						
LegalParty					X						
LocationItem			O	X	X	X	X	O		O	X
Locator	O	O	O	O	X		X		O		
LogBook	X	X	X	X	X	X	X	X	X	X	X
LogBookEntry	X	X	X	X	O	X	X	X	X	X	X
LogBookEntryMeasurementPoint	X	X	X	X	O	X		X	X	X	X
LogicalAND	X	X	X		X						
LogicalNOT	X	X	X		X						
LogicalOR	X	X	X		X						
LogicalXOR	X	X	X		X						
MaintenanceActivity	X	X	O	X	X	X			X	X	X
MaintenanceActivityDocument	X	X		X	X	X			X	X	X
MaintenanceActivityParty	X	X		X	X	X			X	X	X
MaintenanceActivityPlan	X	X		X	X	X			X	X	X
MaintenanceActivityRecord	X	X		X	X	X			X	X	X

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
MaintenanceEvent	X	X	X	X	X	X	X	X	X	X	X
MaintenanceFacility	X	X	X	X	X	X	X	X	X	X	X
MaintenanceFacilityLevel				X	X		X	X		O	O
MaintenanceFacilitySlot				X	X		X	X		O	O
MaintenanceFacilitySlotAccomodation				X	X		X	X		O	O
MaintenanceFacilitySlotPlannedUsage				X	X		X	X		O	O
MaintenanceItem	X	X	X	X	X	X	O	O	X	X	X
MaintenanceLevel	X	X	X	X	X		X	X		O	O
MaintenanceLicense			X	O	X	X	X			O	O
MaintenanceOrganization					X		X				
MaintenanceOrganizationApproval					X		X				
MaintenancePerson	X	X	X	X	X	X	X		X	X	X
MaintenancePersonApprovedProduct			X	O	X	X	X			O	O
MaintenancePersonFacility			X	O	X	X	X			O	O
MaintenanceProgram	X	X	X	X	X		X		O	X	X
MaintenanceProgramItem			X		X					X	
MaintenanceProgramRevision			X		X					X	
MaintenanceRequirement		X									
MaintenanceWorkOrderSource	X	X	X	X	X	X			X	X	X
MajorComponent	X		X	O	X	O	O	X	X	O	X
Material		X		O	O	O	O	O		O	
MeasurementPoint	X	X	X	X	X	X	X	X	X	X	X
MeasurementPointItem	X	X	X	X	X	X	X	X	X	X	X
Message	O										
ModificationOf			X								
Movement	O	X	X	X	X	O	O	O		O	
MovementLeg	O	X	X	X	X	O	O	O		O	
MovementLegDelay			O	X	X						
MovementLegEnvironment			O	X	X						
MovementLegPosition			O	X	X						

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
MRONetwork				O			X	O			
NestedAllowedProductConfiguration	X	X	X	O	O	X		X	X	X	X
NestedProductVariant	X	X	X	O	O	X		X	X	X	X
NestedSerializedProductVariant	X		X	O	X	O	O	X	X	O	X
NonAvailabilityAttribution	X	X	X	X	X	X	X			X	X
NonAvailabilityCause	X	X	X	X	X	X	X			X	X
NonAvailabilityCauseItem	X	X	X	X	X	X	X			X	X
NonConformanceData	X	X	X	O	O	X		X	X	X	X
ObsolescenceRequirement		X									
OperatingBase	X	X	X	X	X	X	X	X	X	O	X
OperatingLocationType	X	X	X								
OperationalActivity	O	O	O	O		X					X
OperationalApproval		X	X	X				X	X	O	X
OperationalConsumption				X	X						
OperationalEvent	X	X	X	X	O	X	X	X	X	X	X
OperationalEventMessage	X	X	X	X		X	X	X	X	X	X
OperationalEventOperator	X	X	X	X		X	X	X	X	X	X
OperationalMode			O	X	X						
OperationalModeStatus	X	X	X	X	O	X		X	X	X	X
OperationalMoment	X	X	X	X	X	X		X	X	X	X
OperationalMomentItem	X	X	X	X	O	X		X	X	X	X
OperationalPeriod			X	X	X						
OperationalPeriodOperator			O	X	X						
OperationalPeriodRelationship			O	X	X						
OperationalRequirement		X						X			
OperationalRequirementsPlanning								X			
OperationalRole	X	X	X	X	X	X	X	X	X	X	X
OperationalTime		X	X	X				X		O	
OperationalTimeItem		X	X	X				X		O	
Operator	X	X	X	X	X	X	X	X	X	X	X

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
Organization	X	X	X	X	X	X	X	O		X	X
OtherFacility				O		X	X	O		O	X
ParkingFacility				O		X	X	O		O	X
PartAction	X	X	X	X	X	X	X	X	X	X	X
PartAsDesigned	X	X	X	O	X	X	X	X	X	X	X
PartAsDesignedPartsList	X	X	X	O	X	X	X	O	X	X	X
PartAsDesignedPartsListEntry	X	X	X	O	X	X	X	X	X	X	X
PartAsDesignedPartsListRelationship	X	X	X	O	X	X	X	O	X	X	X
PartAsDesignedPartsListRevision	X	X	X	O	X	X	X	X	X	X	X
Party	X	X	X	X	X	X	X	X	X	X	X
PartySecurityAssignment	O										
Penalty	O	X		O	O	O	O	O		O	
Person	X	X	X	X	X	X	X	O		X	X
PoliciesAndRegulations		X									
PoliciesAndRegulationsCompliantItem		X									
Pool	O					X					X
Port				O			X	O			
PowerGrid				O			X	O			
PressureSensor			X								X
Product	X	X	X	X	X	X	X	X	X	O	X
ProductParameterAtOperationalEvent	X	X	X	X		X	X	X	X	X	X
ProductUsagePhase	X	X	X	X	O	X	X	X	X	X	X
ProductUsagePhaseHierarchicalRelationship		X									
ProductUsagePhaseItem		X									
ProductUsagePhaseRelationship		X									
productUsagePhaseSequentialRelationship		X									
ProductVariant	X	X	X	X	X	X	X	X	X	X	X
ProductVariantMaintenance					X		X				
Project	X	X	X	X	X	X				X	X

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
ProjectContract					X						
ProjectRelationship					X						
ProjectSpecificAttribute	O	O	O	O	O	O	O	O	O	O	O
ProjectSpecificAttributeValue	O	O	O	O	O	O	O	O	O	O	O
ProjectSpecificExtensionItem	O	O	O	O	O	O	O	O	O	O	O
RealizedPart	X	X	X	O	O	X	X	X	X	X	X
ReferencedDocument	X	X	X	X	X		X		O	X	X
Remark	O	O	O	O	O	O	O	O	O	O	O
RemarkItem	O	O	O	O	O	O	O	O	O	O	O
Report	O	O	O	O	X	X	X	X	O		X
ReportableActivity	O	X	O	O	O	X	O	O		O	X
ReportableItem	O	O	O	O	O	X					X
ReportableMetric	O	O		O	X	X					X
ReportableMetricItem	O	O			X						
ReportContext	O	O		O	O	X					X
ReportContextItem	O	O		O	O	X					X
ReportingParty	O	O		O	O	X					X
ReportParty	O	O		O	O	X					X
RequiredFleetRole								X			
RequiredSafetyAction	X	X	X	X						X	X
RequiredSafetyActionImplementation	X	X	X	X						X	X
Requirement	X	X	X	X						X	X
RequirementParty		X									
RequirementRelationship		X									
ResourceRealization	X	X	X								
ResourceUsageRequest		X		O	O	O	O	O		O	
RoleCapability	X	X	X	X		X		X	X	X	
S1000DDataModule	O	O	O	O	X		X		O		
S1000DDataModuleIssue	O	O	O	O	X		X		O		
S1000DPublicationModule	O	O	O	O	X		X		O		

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
S1000DPublicationModuleIssue	O	O	O	O	X		X		O		
SafetyDocument	X	X	X	X	X		X		O	X	X
SafetyIssue	X	X	X	X						X	X
SafetyIssueEvent	X	X	X	X						X	X
SafetyItem	X	X	X	X						X	X
SafetyRequirement	X	X	X	X						X	X
SafetyRequirementsDocument	X	X	X	X						X	X
SafetyWarning	X	X	X	X						X	X
SCORMContentPackage	O	O	O	O	X		X		O		
SecurityAssignmentParty	O										
SecurityClass	O										
SecurityClassification	X	X	X								
SecurityClassificationItem	O										
Sensor			X								X
SensorSample			X								X
SensorType			X								X
SerializedAssertItem	X	X	X								
SerializedHardwarePart	X	X	X	X	X	X	X	X	X	X	X
SerializedItem	X	X	X	X	X	X	X	X	X	X	X
SerializedItemOwner	X	X	X	X	X	O	O	O	O	X	X
SerializedPartDesignAssociation			X								
SerializedProductOperationalPeriod			O	X	X						
SerializedProductVariant	X	X	X	X	X	X	X	X	X	X	X
SerializedProductVariantAssignment				X	X			X			
SerializedProductVariantConfigurationConformance	X	X	X	O	O	X	X	X	X	X	X
SerializedProductVariantEnvironment		X	X	X				X	X	O	X
SerializedProductVariantInFleet	X	X	X	X	X	O	O	X	X	O	X
SerializedProductVariantOperatingBase	X	X	X	X	X	O	O	X	X	O	X
SerializedProductVariantOperator	X	X	X	X	X	O	O	X	X	O	X

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
SerialNumberRange	O	O	O	O	O	O	O	O	O	O	O
Service	X	X	X	X	X	X	X	O		X	X
ServiceBulletin	X	X	X	X	X	X	X	O	O	X	X
ServiceLevelAgreementClause	O	O			X						
ServiceRequest		X		O	O	O	O	O		O	
ShopFindings											X
ShopFindingsDeterminedBy											X
SoftwareElement	X	X	X	O	X	X	X	X	X	X	X
SoftwareElementPartRealization	X	X	X	X	X	X	X	X	X	X	X
SoftwareElementRevision		X	X	O	X		X		X		
SoftwarePartAsDesigned	X	X	X	O	X	X	X	O	X	X	X
SoftwarePartAsReleased	X	X	X	X	X	X	X	X	X	X	X
SoftwarePlatform											
SpecialSafetyInstruction	X	X	X	X						X	X
StrainGauge			X								X
SubjectOfPoliciesAndRegulations		X									
SubstanceDefinition	X	X	X	O	X	X	X	O	X	X	X
SubstitutePartAsDesigned	X	X	X	O	X	X	X	O	X	X	X
Subtask	X	X	X	X						X	X
SubtaskInZone	X	X	X								
SubtaskTimeline	X	X	X								
SubtaskWarningCautionNote	X	X	X								
SuppliesUsed	X	X		X	X	X			X	X	X
SupplyItem	X	X		X	X	X			X	X	X
SupportEquipment				O		X	X	O		O	X
SupportEquipmentItem	X	X		X	X	X			X	X	X
SupportEquipmentUsed	X	X		X	X	X			X	X	X
Tachometer			X								X
Task	O										
TaskPersonnelResourceCompetence	X	X	X								

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
TaskRequirement	O										
TaskResource	X	X	X								
TaskRevision	X	X	X	X	X	X			X	X	X
TaskRevisionWarningCautionNote	X	X	X								
TaskUsage	X	X	X								
TechnicalOrder			X								
TemperatureSensor			X								X
ThresholdDefinition	X	X	X	X						X	X
TimeStampedClassification	O	O	O	O	O	O	O	O	O	O	O
TrackablePart	X	X	X		O	X	X	O	X	X	X
TransportCapability								X	X		
TransportNetwork				O			X	O			
TransportRequirement		O									
UpgradeRequirement		X									
UsableOnItem	X	X	X	O	O	X		X	X	X	X
UsableOnProductVariant	X	X	X	O	O	X		X	X	X	X
Warehouse				O		X	X	O		O	X
WarrantyClaim		X									
WarrantyClaimContact		X									
WarrantyClaimEvents		X									
WarrantyClaimFollowUp		X									
WarrantyClaimResolution		X		O	O	O	O	O		O	
WarrantyEvent	X	X	X	X	O	X	X	X	X	X	X
WarrantyItem		X									
WorkBreakdown	O										
WorkBreakdownContext					X						
WorkItem	O	O	O	O		X					X
WorkItemRelationship											
WorkOrder	X	X	X	X	X	X	O	O	X	X	X
ZoneElement	X	X		X	X	X			X	X	X

ClassName	UC50301	UC50302	UC50303	UC50304	UC50305	UC50306	UC50307	UC50308	UC50309	UC50310	UC50311
ZoneElementRevision		X									

2.2 Classes for maintenance analysis

The classes used for each maintenance analysis use case as defined in Chap 4 are listed in Table 3. The use cases are numbered:

1 UC50401: Manufacturer maintenance schedule

2 UC50402: Product user maintenance program

3 UC50403: Maintenance performed

4 UC50404: Product performance

5 UC50405: New modifications for in-service products

6 UC50406: Technical queries

7 UC50407: Component Shop Findings

8 UC50408: Structural Damages

Table 3 Classes used for maintenance analysis use cases

ClassName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
Action	O	O	X	O	X	X	O	X
AllowedProductConfiguration				X		X		
AllowedProductConfigurationPhysicalData				X		X		
AllowedProductConfigurationRole				X		X		
AllowedRoleChange				X		X		
AlternatePartAsDesigned					X			
AnchoringPoint								O
ApplicabilityStatementItem						X		
AuthorityRequirement	X	X						
AuthorizedLife	O	O	O	O	O	X	O	O
Availability				X				
AvailabilityItem				X				
BatchHardwarePart					X	X		
Breakdown						X		X

ClassName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
BreakdownElement			X			X		X
BreakdownElementInZone						X		X
BreakdownElementInZoneItem								X
BreakdownElementRevision			O		X		O	X
BreakdownElementRevisionRelationship						X		
BreakdownElementUsageInBreakdown					X	X		X
BreakdownElementUsageRelationship						X		
BreakdownRevision					X			
Calibration			X					
CalibrationDocument			O					
CalibrationMeasurement			O					
Capability				X		X		
CapabilityItem				X		X		
CapabilityLimitation								
CargoItem						X		
ChangeAuthorization					X			
ChangeControlledItem					X			
ChangedItemtAvailabilityRequirement					X			
ChangeEmbodimentRequirement					X		X	O
ChangeNotification					X			
ChangeRequest					X	X	X	O
ChangeRequestCause					X			
ChangeRequestItem					X			
ChangeRequestReasonItem					X			
CircuitBreaker						X		
CircuitBreakerSetting						X		
CircuitBreakerSettings						X		
Comment	O	O	O	O	O	X	O	O
CommentAction	O	O	O	O	O	X	O	O

ClassName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
CommentItem	O	O	O	O	O	X	O	O
CommentParty	O	O	O	O	O	X	O	O
CommentRelationship	O	O	O	O	O	X	O	O
Consequence			X			X		X
Contract			X	X	X	X	X	O
ContractClause					X			
CostEntry							X	O
CostEntryItem							X	O
Damage			X			X	X	X
DamageCharacteristic			X					X
DamagedItem			X					X
DetectionMean			O				O	
DetectionMeanCapability			O				O	
DetectionMechanism			O				O	
Detector			X				X	
DigitalFile						X		
DigitalFileReference						X		
DigitalFileReferencedItem						X		
DigitalFileReferencingItem						X		
Dimensions			X					X
Document	X	X	X		O	X		O
DocumentCharacteristicItem	O	O	O		O	X		O
DocumentIssue	X	X	O		X	X		O
DocumentItem	O	O	O		O	X		O
DocumentParty	O	O	O		O	X		O
DocumentReferencingItem	O	O	O		O	X		O
DocumentRelationship	O	O	O		O	X		O
DownTimePeriod			X	X	X	X		X
EffectiveOnProductConfiguration					X			
Environment				X		X		X

ClassName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
EnvironmentRevision			O					
EquipmentOperation			X					
EquipmentOwner			X					
EquipmentStatus			X					
Event	O	O	X	X	X	X		X
EventAffectedBreakdownElement			X			X		X
EventExplanation			X			X		X
EventItem			X			X		X
EventRelationship			X			X		X
EventRelationshipItem			X			X		X
EventReporter			X			X		X
ExplanatoryFactor			X			X		X
ExternalDocument	O	O	O		O	X		O
Facility	X	X	X	X	X	X	X	O
FacilityOperator						X		
Failure			X				X	
FailureCause			X				X	
FailureDetection			O				O	
FailureMode			X				X	
FailureModeEffect			O				O	
Fault	O	O	X				O	
FaultCause			O				O	
Fleet				X	X	X	X	O
FleetTaskCancellationNotice	O	O	O		O	X		O
GeographicalArea						X		
HardwareElement					X			
HardwareElementPartRealization					X	X		
HardwarePartAsDesigned	X	X	X		X	X	X	O
Infrastructure	X	X	X	X	X	X	X	O
InfrastructureRevision					X			

ClassName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
InstallationLocation			X			X		
InstallationLocationDefinitionItem			X					
InstalledPart					X			
ItemDamage			X					X
LocalPosition			X					X
LocationItem				X		O		
LocationRelationship								
Locator	O	O	O		O	X		O
LogBook			X					
LogBookEntry			X			X		X
MaintenanceActivity			X		X			
MaintenanceActivityDocument			X					
MaintenanceActivityParty			X					
MaintenanceActivityPlan			X					
MaintenanceActivityRecord			X					
MaintenanceEvent			X			X		X
MaintenanceFacility	X	X	X					
MaintenanceFacilityLevel	O	O	X					
MaintenanceFacilitySlot	O	O	X					
MaintenanceFacilitySlotAccomodation	O	O	X					
MaintenanceFacilitySlotPlannedUsage	O	O	X					
MaintenanceItem			X					
MaintenanceLevel	O	O	X	X				
MaintenanceLicense	O	O	X					
MaintenanceOrganization	X	X	X					
MaintenanceOrganizationApproval	X	X	X					
MaintenancePerson	O	O	X					
MaintenancePersonApprovedProduct	O	O	X					
MaintenancePersonFacility	O	O	X					
MaintenanceProgram	X	X	X		O	X		O

ClassName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
MaintenanceProgramItem	X	X						
MaintenanceProgramRevision	X	X						
MaintenanceWorkOrderSource	O	O	X		X			
Material							X	O
MeasurementPoint					X	X		
MeasurementPointItem					X	X		
ModificationOf					X	X		
Movement				X		O	X	O
MovementLeg				X		O	X	O
MovementLegDelay				X		O		
MovementLegEnvironment				X		O		
MovementLegPosition				X		O		
NonAvailabilityAttribution				X				
NonAvailabilityCause				X				
NonAvailabilityCauseItem				X				
OperatingBase				X	X	X		
OperatingBaseCapacity				X				
OperatingLocationType				X				
OperationalApproval				X		X		
OperationalEvent			X	X		X		X
OperationalEventMessage				X		X		X
OperationalEventOperator				X		X		X
OperationalMode				X		O		
OperationalMoment				X		O		
OperationalPeriod				X	X	O		
OperationalPeriodOperator				X		O		
OperationalPeriodRelationship				X		O		
OperationalRole				X		X		
Operator				X		X		X
OperatorOrganization				X				

ClassName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
OperatorPerson				X				
Organization	X	X	X	X		X	X	O
OrganizationOperationsApproval				X				
PartAction			X		X	X		
PartAsDesigned			O		X	X	O	
PartAsDesignedPartsListEntry					X			
PartAsDesignedPartsListRevision					X			
Party	O	O	X	X	X	X	O	X
Penalty							X	O
Person	O	O	X	X		X	X	O
PersonOperationsApproval				X				
PlannedItemUpgrade					X			
PlannedPartInstallationLocation					X			
PlannedUpgradeTimescales					X			
Pool						X		
PositionReferencingItem								O
Product					X	X	X	O
ProductParameterAtOperationalEvent				X		X		X
ProductUsagePhase			X			X		X
ProductVariant	X	X	X	X	X	X	X	O
ProductVariantMaintenance	X	X	X					
Project						X		
ProjectSpecificAttribute	O	O	O	O	O	O	O	O
ProjectSpecificAttributeValue	O	O	O	O	O	O	O	O
ProjectSpecificExtensionItem	O	O	O	O	O	O	O	O
ReferencedDigitalFile						X		
ReferencedDocument	O	O	O		O	X		O
ReferencedPositionItem								O
Remark	O	O	O	O	O	X	O	O
RemarkItem	O	O	O	O	O	O	O	O

ClassName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
Report	O	O	O		O	X		O
ReportableActivity							X	O
RequiredSafetyAction						X		
RequiredSafetyActionImplementation						X		
Requirement	O	O	X		X	X		
ResourceSpecification						X		
ResourceUsageRequest							X	O
RoleCapability				X		X		
S1000DDataModule	O	O	O		O	X		O
S1000DDataModuleIssue	O	O	O		O	X		O
S1000DPublicationModule	O	O	O		O	X		O
S1000DPublicationModuleIssue	O	O	O		O	X		O
SafetyDocument	O	O	O		O	X		O
SafetyIssue					X	X		
SafetyIssueEvent						X		
SafetyItem						X		
SafetyRequirement						X		
SafetyRequirementsDocument						X		
SafetyWarning						X		
SCORMContentPackage	O	O	O		O	X		O
SecurityClassification						X		
SerializedHardwarePart	X	X	X	X	X	X	X	X
SerializedItem			X		X	X		
SerializedItemOwner			X					
SerializedPartDesignAssociation					X	X		
SerializedPartsListPosition					X			
SerializedProductOperationalPeriod				X		O		
SerializedProductVariant	X	X	X	X	X	X	X	X
SerializedProductVariantEnvironment				X		X		
SerializedProductVariantInFleet				X		X		

ClassName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
SerializedProductVariantOperatingBase				X	X	X		
SerializedProductVariantOperator				X		X		
SerializedProductVariantZone			X					X
SerializedSupportEquipment			X					
Service					X	X	X	O
ServiceBulletin	O	O	O	X	X	X	X	O
ServiceRequest							X	O
ShopFindings			X				X	
ShopFindingsDeterminedBy			X				X	
SoftwareElement					X			
SoftwareElementPartRealization					X	X		
SoftwarePartAsDesigned					X	X		
SoftwarePartAsReleased				X	X	X	X	O
SpecialSafetyInstruction						X		
StreetAddress						X		
SubstanceDefinition						X		
Subtask						X		
SuppliesUsed			X					
SupplyItem			X					
SupportEquipment			X					
SupportEquipmentItem			X					
SupportEquipmentUsed			X					
Task						X		
TaskRequirementRevision					X			
TaskRevision	X	X	X		X			
TechnicalOrder	O	O	X		X			
TechnicalOrderEmbodied					X			
ThresholdDefinition						X		
TrackablePart			X		X			

ClassName	UC50401	UC50402	UC50403	UC50404	UC50405	UC50406	UC50407	UC50408
UpgradeRequirement					X			
UsableOnProductVariant					X			
WarrantyClaim						X		
WarrantyClaimResolution							X	O
WarrantyEvent			X			X		X
WorkItem					X			
WorkOrder	O	O	X		X		X	O
ZoneElement			X					X
ZoneElementRevision			X			X		X

2.3 Classes for safety analysis

The classes used for each safety analysis use case as defined in Chap 5 are listed in Table 4. The use cases are numbered:

1 UC50501: Report safety issue

2 UC50502: Provide operational limitations due to safety issue

3 UC50503: Provide special safety instructions

Table 4 Classes used for safety analysis use cases

ClassName	UC50501	UC50502	UC50503
Action	X	X	X
AllocatedTaskLocation		X	X
AllowedProductConfiguration	X	X	X
AllowedProductConfigurationByConfigurationIdentifier	X	X	X
AllowedProductConfigurationHardwarePartAsDesigned	X	X	X
AllowedProductConfigurationItem	X	X	X
AllowedProductConfigurationRole	X	X	
AllowedProductOperationalConfigurationItem	X	X	
ApplicabilityStatement	O	X	X

ClassName	UC50501	UC50502	UC50503
ApplicabilityStatementItem	X	X	X
AuthorityRequirement		X	X
AuthorityToOperate	X	X	X
AuthorizedLife	X	X	X
Availability	X	X	
BatchHardwarePart	X	X	X
Breakdown	X	X	X
BreakdownElement	X	X	X
BreakdownElementInZone	X	X	X
BreakdownElementRevision		X	X
BreakdownElementRevisionRelationship	X	X	X
BreakdownElementUsageInBreakdown	X	X	X
BreakdownElementUsageRelationship	X	X	X
ChangeAuthorization	O	X	X
ChangeEmbodimentRequirement		X	X
ChangeRequest	X	X	X
CircuitBreaker	X	X	X
CircuitBreakerSetting	X	X	X
CircuitBreakerSettings	X	X	X
ClassInstanceAssertItem	O	X	X
Comment	O	O	O
CommentAction	O	O	O
CommentItem	O	O	O
CommentParty	O	O	O
CommentRelationship	O	O	O
ConditionDefinitionItem	O	X	X
ConditionInstance	O	X	X
ConditionType	O	X	X
ConditionTypeAssertMember	O	X	X

ClassName	UC50501	UC50502	UC50503
Consequence	X		
Contract	X	X	X
CostEntry	X	X	
Damage	X		
Document	X	X	X
DocumentCharacteristicItem	O	O	O
DocumentIssue	O	O	O
DocumentItem	O	O	O
DocumentParty	O	O	O
DocumentReferencingItem	O	O	O
DocumentRelationship	O	O	O
DownTimePeriod	X		
EffectiveOnProductConfiguration	X	X	X
EffectiveOnProductConfigurationItem	X	X	X
Environment	X		
EvaluationByAssertionOfClassInstance	O	X	X
EvaluationByAssertionOfCondition	O	X	X
EvaluationByAssertionOfSerializedItems	O	X	X
EvaluationByNestedApplicabilityStatement	O	X	X
EvaluationCriteria	O	X	X
Event	X	X	X
EventAffectedBreakdownElement	X		
EventExplanation	X		
EventItem	X		
EventRelationship	X		
EventRelationshipItem	X		
EventReporter	X		
ExplanatoryFactor	X		
ExternalDocument	O	O	O

ClassName	UC50501	UC50502	UC50503
Facility	X	X	X
FacilityOperator	X	X	X
Fleet	X	X	X
FleetRequirement		X	X
FleetTaskCancellationNotice	O	O	O
GeographicalArea	O	X	X
HardwareElement	O		
HardwareElementPartRealization	X	X	X
HardwarePartAsDesigned	X	X	X
IdentifiedTaskRequirement		X	X
Infrastructure	X	X	X
InstallationLocation	O		
InstallationLocationDefinitionItem	O		
InstalledPart	O		
InstalledPartItem	O		
LocationItem	X		
Locator	O	O	O
LogBook	X		
LogBookEntry	X		
LogBookEntryMeasurementPoint	X		
LogicalAND	O	X	X
LogicalNOT	O	X	X
LogicalOR	O	X	X
LogicalXOR	O	X	X
MaintenanceEvent	X		
MaintenanceLevel	O	X	X
MaintenanceOrganization	X	X	X
MaintenancePerson	X	X	X
MaintenanceProgram	X	X	X
MaintenanceRequirement		X	X

ClassName	UC50501	UC50502	UC50503
MeasurementPoint	X	X	X
MeasurementPointItem	X	X	X
ModificationOf	X	X	X
Movement	X		
MovementLeg	X		
MovementLegDelay	X		
MovementLegEnvironment	X		
MovementLegPosition	X		
NestedAllowedProductConfiguration	X	X	X
NestedProductVariant	X	X	X
NonConformanceData	X	X	X
ObsolescenceRequirement		X	X
OperatingBase	X		
OperatingBaseCapacity			
OperatingLocationType	O	X	X
OperationalApproval	X		
OperationalEvent	X	X	
OperationalEventMessage	O		
OperationalEventOperator	O		
OperationalMode	X		
OperationalModeStatus	X		
OperationalMoment	X		
OperationalMomentItem	X		
OperationalPeriod	X		
OperationalPeriodOperator	X		
OperationalPeriodRelationship	X		
OperationalRequirement		X	X
OperationalRole	X	X	
Operator	X		
OperatorOrganization	X	X	X

ClassName	UC50501	UC50502	UC50503
OperatorPerson	X	X	X
Organization	X	X	X
PartAction	X	X	X
PartAsDesigned	X	X	X
PartAsDesignedPartsListEntry	X	X	X
PartAsDesignedPartsListRevision	X	X	X
Party	X	X	X
PartyAddress	X	X	X
PartyContactData	X	X	X
PartyItem	X	X	X
PartyRelationship	X	X	X
Person	X	X	X
Pool	X		
Product	X	X	X
ProductParameterAtOperationalEvent	O		
ProductUsagePhase	X		
ProductVariant	X	X	X
Project	X	X	X
ProjectSpecificAttribute	O	O	O
ProjectSpecificAttributeValue	O	O	O
ProjectSpecificExtensionItem	O	O	O
RealizedPart	O		
ReferencedDocument	X	X	X
Remark	O	O	O
RemarkItem	O	O	O
Report	X	X	O
ReportableActivity	X	X	
ReportableItem	X	X	
ReportableMetric	X	X	
ReportContext	X	X	

ClassName	UC50501	UC50502	UC50503
ReportContextItem	X	X	
ReportingParty	X	X	
ReportParty	X	X	
RequiredSafetyAction	X	X	X
RequiredSafetyActionImplementation	X	X	X
Requirement	X	X	X
RequirementParty		X	X
RequirementRelationship		X	X
ResourceRealization		X	X
S1000DDataModule	O	O	O
S1000DDataModuleIssue	O	O	O
S1000DPublicationModule	O	O	O
S1000DPublicationModuleIssue	O	O	O
SafetyDocument	X	X	X
SafetyIssue	X	X	X
SafetyIssueEvent	X	X	X
SafetyItem	X	X	X
SafetyRequirement	X	X	X
SafetyRequirementsDocument	X	X	X
SafetyWarning	X	X	X
SCORMContentPackage	O	O	O
SecurityClassification		X	X
SerializedAssertItem	O	X	X
SerializedHardwarePart	X	X	X
SerializedItem	X	X	X
SerializedPartDesignAssociation	X	X	X
SerializedProductOperationalPeriod	X		
SerializedProductVariant	X	X	X
SerializedProductVariantConfigurationConformance	O		
SerializedProductVariantEnvironment	X		

ClassName	UC50501	UC50502	UC50503
SerializedProductVariantInFleet	X		
SerializedProductVariantOperatingBase	X		
SerializedProductVariantOperator	X		
Service	X	X	X
ServiceBulletin	O	O	O
SoftwareElement	O	X	X
SoftwareElementPartRealization	X	X	X
SoftwareElementRevision		X	X
SoftwarePartAsDesigned	X	X	X
SoftwarePartAsReleased	X	X	X
SpecialSafetyInstruction	X	X	X
StreetAddress	X	X	X
Subtask	X	X	X
SubtaskInZone		X	X
SubtaskTimeline		X	X
SubtaskWarningCautionNote		X	X
TaskPersonnelResourceCompetence		X	X
TaskResource		X	X
TaskRevisionWarningCautionNote		X	X
TaskUsage		X	X
ThresholdDefinition	X	X	X
TransportRequirement		O	O
UpgradeRequirement		X	X
UsableOnItem	X	X	X
UsableOnProductVariant	X	X	X
WarrantyEvent	X		
WorkOrder	X	X	

2.4 Classes for supply support

The classes used for each supply support use case as defined in Chap 6 are listed in Table 5. The use cases are numbered:

1 UC50601: Inventory management

2 UC50602: Shelf life management

3 UC50603: Spares and support equipment pool management

4 UC50604: Logistic response time

5 UC50605: Facilities management and maintenance

6 UC50606: Plan for transport

Table 5 Classes used for supply support use cases

ClassName	UC50601	UC50602	UC50603	UC50604	UC50605	UC50606
Action	O	O	O	O	O	O
AlternatePartAsDesigned		X				
AnchoringPoint						X
Availability	X			X	X	
BatchHardwarePart	X	X	X	X		
Capability						X
CapabilityLimitation						X
CargoItem						X
CloudInfrastructure					X	
Comment	O	O	O	O	O	O
CommentAction	O	O	O	O	O	O
CommentItem	O	O	O	O	O	O
CommentParty	O	O	O	O	O	O
CommentRelationship	O	O	O	O	O	O
CommunicationsNetwork					X	
CompetenceDefinitionItem						
ComputerNetwork					X	
ContainedSubstance		X				
Contract	X	X	X	X	X	
CostEntry	X			X	X	
CostEntryItem	X			X		
Detector	X					
Document	X			X	X	

ClassName	UC50601	UC50602	UC50603	UC50604	UC50605	UC50606
DownTimePeriod						X
Environment	O		X	X	X	X
Event				X	X	
Facility	X		X	X	X	X
FacilityLocation	O		X		X	
FacilityOperator	O		X		X	
FacilityOperatorItem	O		X		X	
FacilityOwner	O		X		X	
FacilityRelationship	O		X		X	
Failure	X					
FailureCause	X					
FailureMode	X					
Fleet				X	X	X
HardwareElement					X	
HardwarePartAsDesigned	X	X	X	X	X	X
HardwarePartAsDesignedCommerceData	X	X	X	X		
HardwarePartAsDesignedDesignData		X				
HardwarePartAsDesignedSupportData		X				
Infrastructure	O		X	X	X	
InfrastructureAvailable					X	
InfrastructureCompliance					X	
InfrastructureCompliantItem					X	
InfrastructureItem					X	
InfrastructureNode					X	
InfrastructureNodeAtLocation					X	
InfrastructureParty					X	
InfrastructureRelationship					X	
InfrastructureRequiringItem					X	
InfrastructureRevision					X	
InventoryActivity	X			X		

ClassName	UC50601	UC50602	UC50603	UC50604	UC50605	UC50606
LocalPosition						X
LocationItem	O		X		X	X
MaintenanceActivity	X			X		
MaintenanceFacility	O		X		X	
MeasurementPoint		X	X			
MeasurementPointItem		X	X			
Message						
ModificationOf		X	X			
Movement						X
MovementLeg						X
MovementLegDelay						X
MovementLegEnvironment						X
MovementLegPosition						X
MRONetwork					X	
OperatingBase	O		X		X	
OperationalActivity	X			X		
OperationalEvent	X			X	X	
OperationalMode						X
OperationalMoment						X
OperationalMomentItem						X
OperationalPeriod						X
OperationalPeriodOperator						X
OperationalPeriodRelationship						X
OperationalRole						X
Operator						X
Organization	O		X	X	X	
OtherFacility	O		X		X	
ParkingFacility	O		X		X	
PartAsDesigned		X	X			
PartAsDesignedPartsList		X				

ClassName	UC50601	UC50602	UC50603	UC50604	UC50605	UC50606
PartAsDesignedPartsListEntry		X				
PartAsDesignedPartsListRelationship		X				
PartAsDesignedPartsListRevision		X				
PartInPool	X	X	X	X		
PartInWarehouse	X	X	X	X		
Party	X	X	X	X	X	O
Person						X
Pool	X	X	X	X	X	
PoolItem	X	X	X	X		
PoolOwner	X	X	X	X		
PoolStockedInWareHouse	X	X	X	X		
PoolUser	X	X	X	X		
Port					X	
PositionReferencingItem						X
PowerGrid					X	
PriceBreakData	X	X	X	X		
Product				X	X	
ProductVariant	X	X	X	X	X	X
ProductVariantMaintenance						
ProductVariantSupportedByPool	X	X	X	X		
Project				X	X	
ProjectSpecificAttribute	O	O	O	O	O	O
ProjectSpecificAttributeValue	O	O	O	O	O	O
ProjectSpecificExtensionItem	O	O	O	O	O	O
Remark	O	O	O	O	O	O
RemarkItem	O	O	O	O	O	O
Report	X			X	X	
ReportableActivity	X			X	X	
ReportableItem	X			X	X	
ReportableMetric	X			X	X	

ClassName	UC50601	UC50602	UC50603	UC50604	UC50605	UC50606
ReportableMetricItem				X	X	
ReportContext	X			X	X	
ReportContextItem	X			X	X	
ReportingParty	X			X	X	
ReportParty	X			X	X	
RequiredPartStockLevelInPool	X	X	X	X		
SerializedHardwarePart	X	X	X	X	X	X
SerializedItem		X	X			
SerializedPartDesignAssociation		X	X			
SerializedProductOperationalPeriod						X
SerializedProductVariant				X	X	X
Service				X	X	
ServiceLevelAgreementClause				X	X	
ShopFindings	X					
ShopFindingsDeterminedBy	X					
SoftwareElement					X	
SoftwarePartAsDesigned		X	X			
SoftwarePartAsReleased		X	X	X	X	
StoredPart	X	X	X	X		
SubstanceDefinition		X				
SubstitutePartAsDesigned		X				
SupportEquipment	O		X		X	
TransportableItem						X
TransportCapability						X
TransportCapabilityUsage						X
TransportingAsset						X
TransportFeatures						X
TransportPosition						X
TransportRequirement						X
TransportNetwork					X	X

ClassName	UC50601	UC50602	UC50603	UC50604	UC50605	UC50606
TypeOfPerson						X
Warehouse	X	X	X	X	X	
WorkItem	X			X		
WorkOrder	X			X	X	

2.5 Classes for life cycle cost analysis

The classes used for each LCC use case as defined in Chap 7 are listed in Table 6. The use cases are numbered:

1 UC50701: Provide cost breakdown structure

2 UC50702: Estimate maintenance costs

3 UC50703: Costs due to operational requirements

4 UC50704: Cost of modifications or upgrades

5 UC50705: Costs of in-service support

Table 6 Classes used for LCC use cases

ClassName	UC50701	UC50702	UC50703	UC50704	UC50705
Action	O	O	O	X	O
AlternatePartAsDesigned				O	
AuthorityRequirement			X		
Availability		X	X	X	X
BatchHardwarePart					X
BreakdownElement	X	X	X	X	X
BreakdownElementRevision				O	
BreakdownElementUsageInBreakdown				O	
BreakdownRevision				O	
Budget	X	X	X	X	X
Capability					X
CargoItem			X		
ChangeAuthorization				O	
ChangeControlledItem				O	

ClassName	UC50701	UC50702	UC50703	UC50704	UC50705
ChangedItemtAvailabilityRequirement				O	
ChangeEmbodimentRequirement	X	X	X	X	X
ChangeNotification				O	
ChangeRequest	X	X	X	X	X
ChangeRequestCause				X	
ChangeRequestItem				X	
ChangeRequestReasonItem				X	
Comment	O	O	O	O	O
CommentAction	O	O	O	O	O
CommentItem	O	O	O	O	O
CommentParty	O	O	O	O	O
CommentRelationship	O	O	O	O	O
ConsumableItem			X		
Consumption			X		
Contract	X	X	X	X	X
ContractClause	X	X	X	X	X
ContractClauseRelationship			X	X	
ContractItem	O			O	X
ContractItemDetails	O			O	X
ContractParty	O			O	X
ContractRelationship	O		X	X	X
CostBreakdown	X	X	X	X	X
CostBreakdownContext	X	X	X	X	X
CostBreakdownRelationship	X	X	X	X	X
CostBreakdownRevision	X	X	X	X	X
CostEntry	X	X	X	X	X
CostEntryItem	X	X	X	X	X
CostItem	X	X	X	X	X
CostItemRelationship	X	X	X	X	X
Damage	X	X	X	X	X

ClassName	UC50701	UC50702	UC50703	UC50704	UC50705
Document		X	X	X	X
DocumentCharacteristicItem				X	
DocumentIssue				X	
DocumentItem				X	X
DocumentParty				X	
DocumentReferencingItem				X	
DocumentRelationship				X	
DownTimePeriod			X		
EffectiveOnProductConfiguration				O	
Environment		X	X	X	X
Event		X	X	X	X
ExpressionEvaluation					X
ExternalDocument				X	
Facility	X	X	X	X	X
Fleet	X	X	X	X	X
FleetManager			X		
FleetPlanning			X		
FleetRequirement			X		
FleetTask			X		
FleetTaskCancellationNotice				X	
FleetTaskCargo			X		
FleetTaskList			X		
HardwareElement				X	
HardwareElementPartRealization				O	
HardwarePartAsDesigned	X	X	X	X	X
Infrastructure	X	X	X	X	X
InfrastructureRevision				X	
InstalledPart				O	
InventoryActivity		X	X	X	X
LaborRateItem			X	X	

ClassName	UC50701	UC50702	UC50703	UC50704	UC50705
LaborRates			X	X	
LegalParty	O			O	X
LocationItem			X		X
Locator				X	
MaintenanceActivity		X	X	X	X
MaintenanceProgram				X	
MaintenanceRequirement			X		
MaintenanceWorkOrderSource				X	
Material	X	X	X	X	X
MeasurementPoint			X		
MeasurementPointItem			X		
ModificationOf				O	
Movement	X	X	X	X	X
MovementLeg	X	X	X	X	X
MovementLegDelay			X		
MovementLegEnvironment			X		
MovementLegPosition			X		
ObsolescenceRequirement			X		
OperationalActivity		X	X	X	X
OperationalConsumption			X		
OperationalEvent		X	X	X	X
OperationalMode			X		
OperationalMoment			X		
OperationalPeriod			X	X	
OperationalPeriodOperator			X		
OperationalPeriodRelationship			X		
OperationalRequirement			X		
OperationalRequirementsPlanning			X		
OperationalRole			X		
OperationalTime			X		

ClassName	UC50701	UC50702	UC50703	UC50704	UC50705
OperationalTimeItem			X		
Operator			X		
Organization	X	X	X	X	X
PartAsDesigned	X	X	X	X	X
PartAsDesignedPartsListEntry				O	
PartAsDesignedPartsListRevision				O	
Party	X	X	X	X	X
Penalty	X	X	X	X	X
Person	X	X	X	X	X
PlannedItemUpgrade				O	
PlannedUpgradeTimescales				O	
Pool		X	X	X	X
Product	X	X	X	X	X
ProductVariant	X	X	X	X	X
Project	X	X	X	X	X
ProjectContract	O			O	X
ProjectRelationship	O			O	X
ProjectSpecificAttribute	O	O	O	O	O
ProjectSpecificAttributeValue	O	O	O	O	O
ProjectSpecificExtensionItem	O	O	O	O	O
ReferencedDocument				X	
Remark	O	O	O	O	O
RemarkItem	O	O	O	O	O
Report		X	X	X	X
ReportableActivity	X	X	X	X	X
ReportableItem		X	X	X	X
ReportableMetric		X	X	X	X
ReportContext		X	X	X	X
ReportContextItem		X	X	X	X
ReportingParty		X	X	X	X

ClassName	UC50701	UC50702	UC50703	UC50704	UC50705
ReportParty		X	X	X	X
RequiredFleetRole			X		
Requirement			X	O	X
RequirementParty			X		
RequirementRelationship			X		
ResourceUsageRequest	X	X	X	X	X
S1000DDataModule				X	
S1000DDataModuleIssue				X	
S1000DPublicationModule				X	
S1000DPublicationModuleIssue				X	
SafetyDocument				X	
SafetyIssue				X	
SafetyRequirement			X		
SCORMContentPackage				X	
SerializedHardwarePart	X	X	X	X	X
SerializedPartsListPosition				O	
SerializedProductOperationalPeriod			X		
SerializedProductVariant	X	X	X	X	X
SerializedProductVariantAssignment			X		
SerializedProductVariantEnvironment			X		
SerializedProductVariantInFleet			X		
Service	X	X	X	X	X
ServiceBulletin	X	X	X	X	X
ServiceContract					X
ServiceItem					X
ServiceLevelAgreementClause			X	X	X
ServiceRelationship					X
ServiceRequest	X	X	X	X	X
ServiceRequestCancellation					X
ServiceRequestItem					X

ClassName	UC50701	UC50702	UC50703	UC50704	UC50705
ServiceRequestLocation					X
ServiceRequestParty					X
ServiceRequestRelationship					X
SoftwareElement				X	
SoftwareElementPartRealization				O	
SoftwarePartAsDesigned	O			O	X
SoftwarePartAsReleased	X	X	X	X	X
TaskRequirementRevision				O	
TaskRevision				O	
TechnicalOrder				X	
TechnicalOrderEmbodied				X	
TransportRequirement			X		
UpgradeRequirement			X	O	
UsableOnProductVariant				O	
WarrantyClaimResolution	X	X	X	X	X
WorkBreakdownContext			X	X	
WorkItem		X	X	X	X
WorkOrder	X	X	X	X	X

2.6 Classes for warranty analysis

The classes used for each warranty analyis use case as defined in Chap 8 are listed in Table 7. The use cases are numbered:

1. UC50801: Evaluate maintenance actions
2. UC50802: Collect warranty costs
3. UC50803: Determine misuse of warranty
4. UC50804: Identify items causing risk to warranty program
5. UC50805: Improve standard warranty rules and process

Table 7 Classes used for warranty analysis use cases

ClassName	UC50801	UC50802	UC50803	UC50804	UC50805
Action	X	X	X	X	X
AllowedProductConfiguration	O			X	X
AllowedProductConfigurationByConfigurationIdentifier	O			X	X
AllowedProductConfigurationHardwarePartAsDesigned	O			X	X
AllowedProductConfigurationItem	O	O	O	X	X
AuthorityRequirement	X				
AuthorityToOperate	O			X	X
Availability		X	X		
AvailabilityItem					
BatchHardwarePart	O	O	X	X	X
BreakdownElement				X	
BreakdownElementRevision	O				
BreakdownElementUsageInBreakdown	O	O	O	X	X
Calibration				X	X
CalibrationDocument				X	X
CalibrationMeasurement				X	X
ChangeEmbodimentRequirement		X			
ChangeRequest		X			
ChangeRequestItem					X
Comment	O	O	O	O	O
CommentAction	O	O	O	O	O
CommentItem	O	O	O	O	O
CommentParty	O	O	O	O	O
CommentRelationship	O	O	O	O	O
Consequence				X	
Contract	X	X	X	X	X
ContractClause	X	X	X	X	X
ContractClauseRelationship		X	X		O

ClassName	UC50801	UC50802	UC50803	UC50804	UC50805
ContractItem		O	X		O
ContractItemDetails		O	X		O
ContractParty		O	X		O
ContractRelationship		X	X		O
CostBreakdown		O			
CostBreakdownContext		X	X		O
CostBreakdownRelationship		O			
CostBreakdownRevision		O			
CostEntry		X	X		
CostEntryItem		X	X		
CostItem		O			
CostItemRelationship		O			
Damage	X	X	X	X	X
DamageCharacteristic	X	X	X	X	X
DamagedItem	X	X	X	X	X
DetectionMean	O				
DetectionMeanCapability	O				
DetectionMechanism	O				
Detector	X		X	X	X
Dimensions	X	X	X	X	X
Document	X	X	X		
DocumentIssue	X				
DocumentItem				X	X
DownTimePeriod				X	
EffectiveOnProductConfiguration	O			X	X
EffectiveOnProductConfigurationItem	O			X	X
Environment	X	X	X	X	X
EnvironmentRevision				X	X
EquipmentOperation	X	X		X	X
EquipmentOwner	X	X		X	X

ClassName	UC50801	UC50802	UC50803	UC50804	UC50805
EquipmentStatus	X	X		X	X
Event	X	X	X	X	X
EventAffectedBreakdownElement				X	
EventExplanation				X	
EventItem				X	
EventRelationship				X	
EventRelationshipItem				X	
EventReporter				X	
ExplanatoryFactor				X	
Facility	X	X	X	X	X
Failure	X		X	X	X
FailureCause	X		X	X	X
FailureDetection	O				
FailureMode	X		X	X	X
FailureModeEffect	O				
Fault	O				
FaultCause	O				
Fleet		X	X	X	X
HardwareElement		O	O	O	X
HardwareElementPartRealization	O			X	X
HardwarePartAsDesigned	X	X	X	X	X
HardwarePartAsDesignedCommerceData				X	
Infrastructure	X	X	X		O
InstallationLocation	X	X	O	X	X
InstallationLocationDefinitionItem	X	X	O	X	X
InstalledPart		O	O	O	X
InstalledPartItem		O	O	O	X
InventoryActivity		X	X		
ItemDamage	X	X	X	X	X

ClassName	UC50801	UC50802	UC50803	UC50804	UC50805
ItemWarranty	X	X	X	X	X
LaborRateItem		X	X		O
LaborRates		X	X		O
LegalParty		O	X		O
LocalPosition	X	X	X	X	X
LogBook	X	X		X	X
LogBookEntry	X	X		X	X
MaintenanceActivity	X	X	X		
MaintenanceActivityDocument	X				
MaintenanceActivityParty	X				
MaintenanceActivityPlan	X				
MaintenanceActivityRecord	X				
MaintenanceEvent	X			X	
MaintenanceFacility	X				
MaintenanceItem	X				
MaintenancePerson	X				
MaintenanceProgram	X				
MaintenanceProgramItem	X				
MaintenanceProgramRevision	X				
MaintenanceWorkOrderSource	X				X
Material		X			
MeasurementPoint	O	O	X	X	X
MeasurementPointItem	O	O	X	X	X
ModificationOf	O		X	X	X
Movement		X			
MovementLeg		X			
NestedAllowedProductConfiguration	O			X	X
NestedProductVariant	O			X	X
NonConformanceData	O			X	X
OperatingBase			X	X	X

ClassName	UC50801	UC50802	UC50803	UC50804	UC50805
OperationalActivity		X	X		
OperationalApproval			X	X	X
OperationalEvent	X	X	X	X	
OperationalEventMessage	X		X		
OperationalEventOperator	X		X		
OperationalTime			X		
OperationalTimeItem			X		
Operator	X		X		
Organization	X	X	X	X	X
PartAction	X	X		X	X
PartAsDesigned	O	O	X	X	X
PartAsDesignedPartsList					
PartAsDesignedPartsListEntry	O			X	X
PartAsDesignedPartsListRelationship					
PartAsDesignedPartsListRevision	O			X	X
PartInPool				X	
PartInWarehouse				X	
Party	X	X	X	X	X
Penalty		X			
Person	O	X	X	X	X
Pool		X		X	
PoolItem				X	
PoolOwner				X	
PoolStockedInWareHouse				X	
PoolUser				X	
PriceBreakData				X	
Product		X	X		O
ProductParameterAtOperationalEvent	X		X		
ProductUsagePhase				X	
ProductVariant	X	X	X	X	X

ClassName	UC50801	UC50802	UC50803	UC50804	UC50805
ProductVariantSupportedByPool				X	
Project		X	X		O
ProjectContract		O	X		O
ProjectRelationship		O	X		O
ProjectSpecificAttribute	O	O	O	O	O
ProjectSpecificAttributeValue	O	O	O	O	O
ProjectSpecificExtensionItem	O	O	O	O	O
RealizedPart		O	O	O	X
Remark	O	O	O	O	O
RemarkItem	O	O	O	O	O
Report		X	X		
ReportableActivity		X	X		
ReportableItem		X	X		
ReportableMetric		X	X		
ReportableMetricItem		O	O		
ReportContext		X	X		
ReportContextItem		X	X		
ReportingParty		X	X		
ReportParty		X	X		
RequiredPartStockLevelInPool				X	
ResourceUsageRequest		X			
SerializedHardwarePart	X	X	X	X	X
SerializedItem	X	X	X	X	X
SerializedItemOwner					
SerializedPartDesignAssociation	O		X	X	X
SerializedPartsListPosition					
SerializedProductVariant	X	X	X	X	X
SerializedProductVariantConfigurationConformance		O	O	O	X
SerializedProductVariantEnvironment			X	X	X
SerializedProductVariantInFleet			X	X	X

ClassName	UC50801	UC50802	UC50803	UC50804	UC50805
SerializedProductVariantOperatingBase			X	X	X
SerializedProductVariantOperator			X	X	X
SerializedProductVariantZone	X	X	X	X	X
Service	X	X	X	X	X
ServiceBulletin	X	X	X	X	X
ServiceLevelAgreementClause		X	X		O
ServiceRequest		X			
ShopFindings	X		X	X	X
ShopFindingsDeterminedBy	X		X	X	X
SoftwareElement		O	O	O	X
SoftwareElementPartRealization	O			X	X
SoftwarePartAsDesigned	O	O	X	X	X
SoftwarePartAsReleased	O	X	X	X	X
StoredPart				X	
SuppliesUsed	X				
SupplyItem	X				
SupportEquipmentItem	X			X	X
SupportEquipmentUsed	X				
TaskRevision	X				
TechnicalOrder					X
TechnicalOrderEmbodied					X
TrackablePart	X	X		X	X
UsableOnItem	O			X	X
UsableOnProductVariant	O			X	X
Warehouse				X	
WarrantyClaim	X	X	X	X	X
WarrantyClaimContact	X	X	X	X	X
WarrantyClaimEvents	X	X	X	X	X
WarrantyClaimFollowUp	X	X	X	X	X

ClassName	UC50801	UC50802	UC50803	UC50804	UC50805
WarrantyClaimResolution	X	X	X	X	X
WarrantyEvent	X	X	X	X	X
WarrantyItem	X	X	X	X	X
WorkBreakdownContext		X	X		O
WorkItem		X	X		
WorkOrder	X	X	X		X
ZoneElement	X				
ZoneElementRevision	X	X	X	X	X

2.7 Classes for product health and usage monitoring

The classes used for each poduct health and usage monitoring use case as defined in Chap 9 are listed in Table 8. The use cases are numbered:

1 UC50901: Record usage and health data

2 UC50902: Report usage information

3 UC50903: Respond to usage information

Table 8 Classes used for product health and usage monitoring use cases

ClassName	UC50901	UC50902	UC50903
Accelerometer	X	X	X
Action	O	O	O
AllowedProductConfiguration			X
AllowedProductConfigurationRole			X
AllowedProductOperationalConfigurationItem			X
BatchHardwarePart	X	X	
BreakdownElementUsageInBreakdown			X
CargoItem	X	X	X
ChangeRequest	X	X	
CircuitBreaker	X	X	
Comment	O	O	O
CommentAction	O	O	O

ClassName	UC50901	UC50902	UC50903
CommentItem	O	O	O
CommentParty	O	O	O
CommentRelationship	O	O	O
Contract	X	X	
DigitalFile	X	X	
DigitalFileReference	X	X	
DigitalFileReferencedItem	X	X	
DigitalFileReferencingItem	X	X	
Document	X	X	
DocumentIssue	X	X	
DownTimePeriod	X	X	X
Environment	X	X	
Event	X	X	X
Facility	X	X	
Fleet	X	X	X
FleetManager			X
FleetPlanning			X
FleetRequirement			X
FleetTask			X
FleetTaskCargo			X
FleetTaskList			X
GeographicalArea	X	X	
HardwarePartAsDesigned	X	X	X
InstallationLocation	X	X	
LocationItem	X	X	
LogBook	X	X	X
LogBookEntry	X	X	X
LogBookEntryMeasurementPoint	X	X	X
MaintenanceLevel			X
MeasurementPoint	X	X	X

ClassName	UC50901	UC50902	UC50903
Movement	X	X	
MovementLeg	X	X	
MovementLegDelay	X	X	
MovementLegEnvironment	X	X	
MovementLegPosition	X	X	
OperatingLocationType			X
OperationalMode	X	X	
OperationalModeStatus	X	X	X
OperationalMoment	X	X	X
OperationalMomentItem	X	X	X
OperationalPeriod	X	X	
OperationalPeriodOperator	X	X	
OperationalPeriodRelationship	X	X	
OperationalRequirement			X
OperationalRequirementsPlanning			X
OperationalRole	X	X	X
Operator	X	X	
Organization	X	X	
PartAction	X	X	X
PartAsDesigned	X	X	
Party	O	O	O
Pool	X	X	
PressureSensor	X	X	X
Product	X	X	
ProductUsagePhase		X	X
ProductUsagePhaseHierarchicalRelationship		X	X
ProductUsagePhaseItem		X	X
ProductUsagePhaseRelationship		X	X
ProductUsagePhaseSequentialRelationship		X	X

ClassName	UC50901	UC50902	UC50903
ProductVariant	X	X	X
ProjectSpecificAttribute	O	O	O
ProjectSpecificAttributeValue	O	O	O
ProjectSpecificExtensionItem	O	O	O
ReferencedDigitalFile	X	X	
Remark	X	X	O
RemarkItem	O	O	O
Report			X
RequiredFleetRole			X
ResourceSpecification	X	X	
SecurityClassification	X	X	
Sensor	X	X	X
SensorSample	X	X	X
SensorType	X	X	X
SerializedHardwarePart	X	X	
SerializedItem	X	X	X
SerializedProductOperationalPeriod	X	X	
SerializedProductVariant	X	X	X
SerializedProductVariantAssignment			X
SerializedProductVariantInFleet			X
Service	X	X	
SoftwarePartAsReleased			X
StrainGauge	X	X	X
StreetAddress	X	X	
SubstanceDefinition	X	X	
Tachometer	X	X	X
Task	X	X	
TemperatureSensor	X	X	X
WarrantyClaim	X	X	
ZoneElementRevision	X	X	

2.8 Classes for obsolescence management

The classes used for each obsolescence management use case as defined in Chap 10 are listed in Table 9. The use cases are numbered:

1 UC51001: Create basis for obsolescence management planning

2 UC51002: Determine obsolescence candidates /perform risk assessment

3 UC51003: Determine obsolescence strategy

4 UC51004: Obsolescence monitoring

5 UC51005: Solutions /proposals to solve obsolescence

Table 9 Classes used for obsolescence management use cases

ClassName	UC51001	UC51002	UC51003	UC51004	UC51005
Action	O	O	O	O	O
AllowedProductConfiguration	X				
AllowedProductConfigurationByConfigurationIdentifier	X				
AllowedProductConfigurationHardwarePartAsDesigned	X				
AllowedProductConfigurationItem	X	X			
AuthorityRequirement		X	X		
AuthorityToOperate	X				
Availability				X	
BatchHardwarePart	X	X	X	X	
BreakdownElement	X				
BreakdownElementRevision	X				
BreakdownElementUsageInBreakdown	X	X			
CargoItem			X		
ChangeAuthorization					X
ChangeControlledItem		X	X		X
ChangedItemtAvailabilityRequirement					X
ChangeEmbodimentRequirement		X	X		X
ChangeNotification					X
ChangeRequestItem				X	

ClassName	UC51001	UC51002	UC51003	UC51004	UC51005
Comment	O	O	O	O	O
CommentAction	O	O	O	O	O
CommentItem	O	O	O	O	O
CommentParty	O	O	O	O	O
CommentRelationship	O	O	O	O	O
Contract		X	X	X	
CostEntry				X	
CostEntryItem				X	
Detector				X	
Document		X	X	X	
DocumentCharacteristicItem		O			
DocumentIssue		O			
DocumentItem		O			
DocumentParty		O			
DocumentReferencingItem		O			
DocumentRelationship		O			
DownTimePeriod		X	X		X
EffectiveOnProductConfiguration	X				
EffectiveOnProductConfigurationItem	X				
Environment		X			
EquipmentOperation			X		
EquipmentOwner			X		
EquipmentStatus			X		
Event		X	X	X	
ExternalDocument		O			
Facility		X		X	
Failure				X	
FailureCause				X	
FailureMode				X	
Fleet			X		

ClassName	UC51001	UC51002	UC51003	UC51004	UC51005
FleetManager			X		
FleetPlanning			X		
FleetRequirement		X	X		
FleetTask			X		
FleetTaskCancellationNotice		O			
FleetTaskCargo			X		
FleetTaskList			X		
HardwareElement	X	X			
HardwareElementPartRealization	X				
HardwarePartAsDesigned	X	X	X	X	
HardwarePartAsDesignedCommerceData		X	X	X	
Infrastructure		X			
InstallationLocation	X	X	X		
InstallationLocationDefinitionItem	X	X	X		
InstalledPart	X	X			
InstalledPartItem	X	X			
InventoryActivity				X	
LocationItem		X			
Locator		O			
LogBook		X	X	X	
LogBookEntry		X	X	X	
LogBookEntryMeasurementPoint		X	X	X	
MaintenanceActivity		X		X	
MaintenanceActivityDocument		X			
MaintenanceActivityParty		X			
MaintenanceActivityPlan		X			
MaintenanceActivityRecord		X			
MaintenanceEvent		X			
MaintenanceFacility		X			

ClassName	UC51001	UC51002	UC51003	UC51004	UC51005
MaintenanceItem		X			
MaintenanceLevel	X				
MaintenancePerson		X			
MaintenanceProgram		O			
MaintenanceRequirement		X	X		
MaintenanceWorkOrderSource		X		X	
MeasurementPoint	X	X	X	X	
MeasurementPointItem	X	X			
ModificationOf	X				
Movement		X			
MovementLeg		X			
MovementLegDelay		X			
MovementLegEnvironment		X			
MovementLegPosition		X			
NestedAllowedProductConfiguration	X				
NestedProductVariant	X				
NonConformanceData	X				
ObsolescenceItem		X			
ObsolescenceParameter		X			
ObsolescenceRequirement		X	X		
OperatingBase			X		X
OperatingLocationType	X				
OperationalActivity				X	
OperationalEvent				X	
OperationalMode		X			
OperationalModeStatus		X	X	X	
OperationalMoment		X	X	X	
OperationalMomentItem		X	X	X	
OperationalPeriod		X			
OperationalPeriodOperator		X			

ClassName	UC51001	UC51002	UC51003	UC51004	UC51005
OperationalPeriodRelationship		X			
OperationalRequirement		X	X		
OperationalRequirementsPlanning			X		
OperationalRole		X	X		
Operator		X			
PartAction		X	X	X	X
PartAsDesigned	X	X			
PartAsDesignedPartsListEntry	X				
PartAsDesignedPartsListRevision	X				
PartInPool		X	X	X	
PartInWarehouse		X	X	X	
Party	O	X	X	X	O
PlannedItemUpgrade					X
PlannedPartInstallationLocation			X		X
PlannedUpgradeTimescales			X		X
Pool		X	X	X	
PoolItem		X	X	X	
PoolOwner		X	X	X	
PoolStockedInWareHouse		X	X	X	
PoolUser		X	X	X	
PriceBreakData		X	X	X	
Product		X			
ProductVariant	X	X	X	X	
ProductVariantSupportedByPool		X	X	X	
ProjectSpecificAttribute	O	O	O	O	O
ProjectSpecificAttributeValue	O	O	O	O	O
ProjectSpecificExtensionItem	O	O	O	O	O
RealizedPart	X	X			
ReferencedDocument		O			
Remark	O	O	O	O	O

ClassName	UC51001	UC51002	UC51003	UC51004	UC51005
RemarkItem	O	O	O	O	O
Report		O	X	X	
ReportableActivity				X	
ReportableItem				X	
ReportableMetric				X	
ReportContext				X	
ReportContextItem				X	
ReportingParty				X	
ReportParty				X	
RequiredFleetRole			X		
RequiredPartStockLevelInPool		X	X	X	
Requirement		X	X		
RequirementParty		X	X		
RequirementRelationship		X	X		
S1000DDataModule		O			
S1000DDataModuleIssue		O			
S1000DPublicationModule		O			
S1000DPublicationModuleIssue		O			
SafetyDocument		O			
SafetyRequirement		X	X		
SCORMContentPackage		O			
SerializedHardwarePart	X	X	X	X	X
SerializedItem	X	X	X	X	
SerializedPartDesignAssociation	X				
SerializedProductOperationalPeriod		X			
SerializedProductVariant	X	X	X		X
SerializedProductVariantAssignment			X		
SerializedProductVariantConfigurationConformance	X	X			
SerializedProductVariantInFleet			X		

ClassName	UC51001	UC51002	UC51003	UC51004	UC51005
SerializedProductVariantOperatingBase			X		X
ServiceBulletin		O		X	
ShopFindings				X	
ShopFindingsDeterminedBy				X	
SoftwareElement	X	X			
SoftwareElementPartRealization	X				
SoftwareElementRevision	X				
SoftwarePartAsDesigned	X				
SoftwarePartAsReleased	X	X	X		X
StoredPart		X	X	X	
SuppliesUsed		X			
SupplyItem		X			
SupportEquipmentItem		X			
SupportEquipmentUsed		X			
TaskRevision		X			
TechnicalOrder				X	
TechnicalOrderEmbodied				X	
TransportRequirement		O	O		
TrackablePart			X		X
UpgradeRequirement		X	X		X
UsableOnItem	X				
UsableOnProductVariant	X				
Warehouse		X	X	X	
WorkItem				X	
WorkOrder		X		X	
ZoneElement		X			

2.9 Classes for integrated fleet management

The classes used for each integrated fleet management use case as defined in Chap 11 are listed in Table 10. The use cases are numbered:

1 UC51101: Assignment proposal elaboration

2 UC51102: Fleet task cancellation

3 UC51103: Fleet task modification

4 UC51104: Fleet availability plan elaboration

5 UC51105: Fleet task evaluation

6 UC51106: Product preparation for fleet task

7 UC51107: Product recovery after fleet task

Table 10 Classes used for integrated fleet management use cases

ClassName	UC51101	UC51102	UC51103	UC51104	UC51105	UC51106	UC51107
Action	O	O	O	O	O	O	O
AllowedProductConfiguration	X					X	X
AllowedProductConfigurationItem						X	X
AllowedProductConfigurationPhysicalData		X					X
AllowedProductConfigurationRole	X					X	X
AllowedProductOperationalConfigurationItem	X						
AllowedRoleChange	X					X	X
Availability				X	X		
AvailabilityItem				X	X		
BatchHardwarePart					O	X	X
BreakdownElementUsageInBreakdown	X					X	X
Budget					O		
Capability	X				X	X	X
CapabilityItem	X					X	X
CargoItem	X	X	X	X	X	X	X
CloudInfrastructure	O			X			
Comment	O	O	O	O	O	O	O
CommentAction	O	O	O	O	O	O	O
CommentItem	O	O	O	O	O	O	O
CommentParty	O	O	O	O	O	O	O
CommentRelationship	O	O	O	O	O	O	O
CommunicationsNetwork	O			X			

ClassName	UC51101	UC51102	UC51103	UC51104	UC51105	UC51106	UC51107
CompliesWith				X			
ComputerNetwork	O			X			
ConsumableItem	X				X		X
Consumption	X				X		X
Contract	X			X	X		
ContractClause	X				X		
Country	X						
Document		O	O	X			O
DocumentCharacteristicItem		O	O	X			O
DocumentIssue		O	O	X			O
DocumentItem		O	O	O			O
DocumentParty		O	O	X			O
DocumentReferencingItem		O	O	O			O
DocumentRelationship		O	O	X			O
DownTimePeriod	X	X	X	X	X	X	X
Environment	X		X	X	X	X	X
Event				X	X		X
ExportControlRegulation				X			
ExpressionEvaluation	X				X		
ExternalDocument		O	O	X			O
Facility	X		X	X	X	X	X
Fleet	X	X	X	X	X	X	X
FleetBasedAt	X		X	X	X		
FleetManager	X	X	X	X	X	X	X
FleetOperatedBy	X		X	X	X		
FleetOperatesAtLocation	X		X	X	X		
FleetOperator	X		X	X	X		
FleetPlanning	X	X	X	X	X	X	X
FleetRelationship	X		X	X	X		
FleetRequirement	X	X	X	X	X	X	X

ClassName	UC51101	UC51102	UC51103	UC51104	UC51105	UC51106	UC51107
FleetTask	X	X	X	X	X	X	X
FleetTaskCancellationNotice		X	O	X			O
FleetTaskCargo	X	X	X	X	X	X	X
FleetTaskList	X	X	X	X	X	X	X
GeographicalArea	X						
GeographicalAreaRelationship	X						
GlobalPosition	X						
HardwareElement	O			X		X	X
HardwarePartAsDesigned	X				O		
Infrastructure	O		X	X	X		
InfrastructureAvailable	O		X	X			
InfrastructureCompliance		O			X		
InfrastructureCompliantItem	O		X	X			
InfrastructureItem	O			X			
InfrastructureNode	O			X			
InfrastructureNodeAtLocation	O			X			
InfrastructureParty	O			X			
InfrastructureRelationship	O			X			
InfrastructureRequiringItem	O		X	X			
InfrastructureRevision	O		X	X			
InstallationLocation						X	X
InstallationLocationDefinitionItem						X	X
InstalledPart						X	X
InstalledPartItem						X	X
Location	X						
LocationEnvironment	X						
LocationItem	X			X	O		O
LocationRelationship	X						
Locator	X	O	O	X			O
LogBook					X		

ClassName	UC51101	UC51102	UC51103	UC51104	UC51105	UC51106	UC51107
LogBookEntry					X		
LogBookEntryMeasurementPoint					X		
MaintenanceProgram		O	O	X			O
ManagedFleet	X		X	X	X		
MeasurementPoint	X				X	X	X
MeasurementPointItem	X				X	X	X
Movement	X				X		X
MovementLeg	X				X		X
MovementLegDelay	X				X		X
MovementLegEnvironment							O
MovementLegPosition							O
MRONetwork	O			X			
NonAvailabilityAttribution				X	X		
NonAvailabilityCause				X	X		
NonAvailabilityCauseItem				X	X		
OperatingBase	X		X	X	X	X	X
OperatingBaseCapacity	X		X	X	X	X	X
OperatingLocationType	X		X	X	X		
OperationalApproval			X	X		X	
OperationalConsumption	X				X		X
OperationalEvent							X
OperationalEventMessage							X
OperationalEventOperator							X
OperationalMode							O
OperationalModeStatus					X		
OperationalMoment					X		O
OperationalMomentItem					X		
OperationalPeriod	X				X		X
OperationalPeriodOperator							O
OperationalPeriodRelationship							O

ClassName	UC51101	UC51102	UC51103	UC51104	UC51105	UC51106	UC51107
OperationalRequirement	X	X	X	X	X	X	X
OperationalRequirementsPlanning	X	X	X	X	X	X	X
OperationalRole	X	X	X	X	X	X	X
Operator							X
OperatorOrganization	X		X	X	X		
OperatorPerson	X		X	X	X		
Organization				X	X		
PartAction					X		
PartAsDesigned						X	X
Party	O	O	O	X	X	O	O
Person				X	X		
PoliciesAndRegulations				X			
PoliciesAndRegulationsCompliantItem				X			
Port	O			X			
PowerGrid	O			X			
Product	O		X	X			
ProductParameterAtOperationalEvent							X
ProductVariant	X		X	X	X	X	X
Project				X			
ProjectSpecificAttribute	O	O	O	O	O	O	O
ProjectSpecificAttributeValue	O	O	O	O	O	O	O
ProjectSpecificExtensionItem	O	O	O	O	O	O	O
RealizedPart						X	X
ReferencedDocument		O	O	O			O
Remark	O	O	O	O	O	O	O
RemarkItem	O	O	O	O	O	O	O
Report	X	X	X	X	X	X	X
ReportingParty	X						
RequiredFleetRole	X	X	X	X	X	X	X
Requirement					O		

ClassName	UC51101	UC51102	UC51103	UC51104	UC51105	UC51106	UC51107
RoleCapability	X					X	X
S1000DDataModule		O	O	O			O
S1000DDataModuleIssue		O	O	O			O
S1000DPublicationModule		O	O	O			O
S1000DPublicationModuleIssue		O	O	O			O
SafetyDocument		O	O	X			O
SCORMContentPackage		O	O	X			O
SerializedHardwarePart	O			X	X	X	X
SerializedItem					X		
SerializedProductOperationalPeriod	X				X		X
SerializedProductVariant	X	X	X	X	X	X	X
SerializedProductVariantAssignment	X	X	X	X	X	X	X
SerializedProductVariantConfigurationConformance						X	X
SerializedProductVariantEnvironment			X	X		X	
SerializedProductVariantInFleet	X	X	X	X	X	X	X
SerializedProductVariantOperatingBase	X		X	X	X	X	X
SerializedProductVariantOperator			X	X		X	
Service	X		X	X	X		
ServiceBulletin		O	O	X	X		O
ServiceContract	X				X		
ServiceItem					O		
ServiceLevelAgreementClause	X				X		
ServiceRelationship	X				X		
ServiceRequest					O		
ServiceRequestCancellation					O		
ServiceRequestItem					O		
ServiceRequestLocation					O		
ServiceRequestParty					O		
ServiceRequestRelationship					O		

ClassName	UC51101	UC51102	UC51103	UC51104	UC51105	UC51106	UC51107
SoftwareElement	O			X		X	X
SoftwarePartAsReleased	X			X	X	X	X
StreetAddress	X						
SubjectOfPoliciesAndRegulations				X			
TransportRequirement	X						
TransportNetwork	O			X			

2.10 Classes for software support cases

The classes used for the different software support use cases, as defined in Chap 12, are those listed in Table 11. The use cases are numbered:

1 UC51201: Request S/W feature

2 UC51202: Report S/W error

3 UC51203: Report S/W usability

4 UC51204: Report S/W documentation errors

5 UC51205: Report Software and hardware interoperability

6 UC51206: Report S/W installation/unloading/erasure

7 UC51207: Report S/W configuration

8 UC51208: Report S/W maturity

9 UC51209: Report help desk tickets

10 UC51210: Report S/W delivery, deployment and servicing

11 UC51211: Report Data loading for software operations

Table 11 Classes used for software support use cases

ClassName	UC51201	UC51203	UC51204	UC51205	UC51206	UC51207	UC51208	UC51209	UC51210	UC51211
Action	X	O	O	O	O	O	O	X	O	O
AllowedProductConfiguration						O				
AllowedProductConfigurationByConfigurationIdentifier						O				
AllowedProductConfigurationHardwarePartAsDesigned						O				
AllowedProductConfigurationItem						O				

ClassName	UC51201	UC51203	UC51204	UC51205	UC51206	UC51207	UC51208	UC51209	UC51210	UC51211
AllowedProductConfigurationPhysicalData	X									
AlternatePartAsDesigned				X		X				
AuthorityRequirement	X									
AuthorityToOperate						O				
Availability		X	O		O		X		X	
AvailabilityItem										
BatchHardwarePart				X				O		
BreakdownElement	X	X		X		X	X	X	X	
BreakdownElementRevision	X	X		X		X	X	X	X	
BreakdownElementUsageInBreakdown						O				
CargoItem								O		
ChangeEmbodimentRequirement	X									
ChangeRequest	X							O		
ChangeRequestCause	X									
ChangeRequestItem	X									
ChangeRequestReasonItem	X									
CircuitBreaker								O		
Comment	O	O	O	O	O	O	O	X	O	O
CommentAction	O	O	O	O	O	O	O	X	O	O
CommentItem	O	O	O	O	O	O	O	X	O	O
CommentParty	O	O	O	O	O	O	O	X	O	O
CommentRelationship	O	O	O	O	O	O	O	X	O	O
ConsumableItem									X	
ContainedSubstance				X		X				
Contract	X	X	O	O			X	O	X	
ContractClause	X									
CostEntry		X	O		X		X		X	
CostEntryItem					X				X	
DataSetAsDesigned										X
DataSetAsReleased										X

ClassName	UC51201	UC51203	UC51204	UC51205	UC51206	UC51207	UC51208	UC51209	UC51210	UC51211
DataSetAssociatedWith										X
Detector				O						
DigitalFile								O		
DigitalFileReference								O		
DigitalFileReferencedItem								O		
DigitalFileReferencingItem								O		
Document	X	X	O	O	O	O	X	O	X	
DocumentCharacteristicItem	O		O	O	O	O		O		
DocumentIssue	X		O	O	O	O		O		
DocumentItem	O		O	O	O	O		O		
DocumentParty	O		O	O	O	O		O		
DocumentReferencingItem	O		O	O	O	O		O		
DocumentRelationship	O		O	O	O	O		O		
EffectiveOnProductConfiguration						O				
EffectiveOnProductConfigurationItem						O				
Environment		X	O				X	O	X	
Event	X	X	O				X	O	X	
ExternalDocument	O		O	O	O	O		O		
Facility	X	X	O	O			X	O	X	
Failure				O						
FailureCause				O						
FailureMode				O						
Fleet	X	X	O				X	O	X	
FleetRequirement	X									
FleetTaskCancellationNotice	O		O	O	O	O		O		
GeographicalArea								O		
HardwareElement	X			X		X		X		
HardwareElementPartRealization				X		X		X		
HardwareElementRevision				X		X		X		
HardwarePartAsDesigned	X	X	O	X	X	X	X	X	X	X

ClassName	UC51201	UC51203	UC51204	UC51205	UC51206	UC51207	UC51208	UC51209	UC51210	UC51211
HardwarePartAsDesignedDesignData				X		X				
HardwarePartAsDesignedSupportData				X		X				
Infrastructure	X	X	O				X		X	
InfrastructureRevision	X									
InstallationLocation								O		
InventoryActivity					X				X	
Locator	O		O	O	O	O		O		
MaintenanceActivity	X				X				X	
MaintenanceProgram	O		O	O	O	O		O		
MaintenanceRequirement	X									
Material									X	
MeasurementPoint				X				O		X
MeasurementPointItem				X						
ModificationOf				X						
NestedAllowedProductConfiguration						O				
NestedProductVariant						O				
NonConformanceData						O				
ObsolescenceRequirement	X									
OperationalActivity					X				X	
OperationalEvent		X	O		O		X		X	
OperationalPeriod	X									
OperationalRequirement	X									
Organization		X	O				X	O	X	
PartAsDesigned				X		X		O		X
PartAsDesignedPartsList				X		X				
PartAsDesignedPartsListEntry				X		X				
PartAsDesignedPartsListRelationship				X		X				
PartAsDesignedPartsListRevision				X		X				
Party	X	X	O	X	X	X	X	X	X	O
Pool		X	O				X	O	X	

ClassName	UC51201	UC51203	UC51204	UC51205	UC51206	UC51207	UC51208	UC51209	UC51210	UC51211
Product	X	X	O				X	O	X	
ProductParameterAtOperationalEvent										X
ProductVariant	X	X	O			O	X	O	X	
Project		X	O				X		X	
ProjectSpecificAttribute	O	O	O	O	O	O	O	O	O	O
ProjectSpecificAttributeValue	O	O	O	O	O	O	O	O	O	O
ProjectSpecificExtensionItem	O	O	O	O	O	O	O	O	O	O
ReferencedDigitalFile								O		
ReferencedDocument	O		O	O	O	O		O		
ReleasedDataSetAssociatedWith										X
ReleasedDataSetItem										X
Remark	O	O	O	O	O	O	O	O	O	O
RemarkItem	O	O	O	O	O	O	O	O	O	O
Report	O	X	O	O	O	O	X	O	X	
ReportableActivity		X	O		X		X		X	
ReportableItem		X	O		X		X		X	
ReportableMetric		X	O		O		X		X	
ReportableMetricItem		X					X			
ReportContext		X	O		O		X		X	
ReportContextItem		X	O		O		X		X	
ReportParty		X	O		O		X		X	
ReportingParty				X	O		O		X	
Requirement	X									
RequirementParty	X									
RequirementRelationship	X									
ResourceSpecification								O		
S1000DDataModule	O		O	O	O	O		O		
S1000DDataModuleIssue	O		O	O	O	O		O		
S1000DPublicationModule	O		O	O	O	O		O		
S1000DPublicationModuleIssue	O		O	O	O	O		O		

ClassName	UC51201	UC51203	UC51204	UC51205	UC51206	UC51207	UC51208	UC51209	UC51210	UC51211
SafetyDocument	O		O	O	O	O		O		
SafetyIssue	X									
SafetyRequirement	X									
SCORMContentPackage	O		O	O	O	O		O		
SecurityClassification								O		
SerializedHardwarePart	X	X	O	X			X	O	X	X
SerializedItem				X						
SerializedPartDesignAssociation				X						
SerializedProductVariant	X	X	O				X	O	X	
Service	X	X	O				X	O	X	
ServiceBulletin	O		O	O	O	O		O		
ServiceLevelAgreementClause		X					X			
ShopFindings				O						
ShopFindingsDeterminedBy				O						
SoftwareElement	X	X		X		X	X	X	X	
SoftwareElementPartRealization	X	X		X		X	X	X	X	
SoftwareElementRevision	X	X		X		X	X	X	X	
SoftwareError	X	X		X	X	X	X		X	
SoftwareErrorOS	X	X		X	X	X	X		X	
SoftwareErrorPlatform	X	X		X	X	X	X		X	
SoftwareOS	X	X		X	X	X	X		X	
SoftwarePartAsDesigned	X	X		X	X	X	X	X	X	X
SoftwarePartAsReleased	X	X	O	X	X	X	X		X	X
SoftwarePlatform	X	X		X	X	X	X		X	
StreetAddress								O		
SubstanceDefinition				X		X		O		
SubstitutePartAsDesigned				X		X				
SupplyItem									X	
Task								O		
TransportRequirement										

ClassName	UC51201	UC51203	UC51204	UC51205	UC51206	UC51207	UC51208	UC51209	UC51210	UC51211
UpgradeRequirement	X									
UsableOnItem						O				
UsableOnProductVariant						O				
WarrantyClaim								O		
WorkItem					X				X	
WorkOrder		X	O		O		X		X	
ZoneElementRevision								O		

2.11 Classes for configuration management

The classes used for each configuration management use case as defined in Chap 13 are listed in Table 12. The use cases are numbered:

1 UC51301: Provide as-delivered configuration

2 UC51302: Provide as-allowed configuration

3 UC51303: Provide operational configuration

4 UC51304: Provide customer modification

5 UC51305: Provide as-desired configuration

Table 12 Classes used for configuration management use cases

ClassName	UC51301	UC51302	UC51303	UC51304	UC51305
Action	O	O	O	X	O
AllocatedTaskLocation	X	X	X	X	X
AllowedProductConfiguration	X	X	X		X
AllowedProductConfigurationByConfigurationIdentifier	X	X	X	X	X
AllowedProductConfigurationHardwarePartAsDesigned	X	X			
AllowedProductConfigurationItem	X	X	X		X
AllowedProductConfigurationPhysicalData					X
AllowedProductConfigurationRole	X		X		X
AllowedProductOperationalConfigurationItem			X		
AllowedRoleChange			X		

ClassName	UC51301	UC51302	UC51303	UC51304	UC51305
AlternatePartAsDesigned	X	X		X	
ApplicabilityStatement	X	X	X	X	X
ApplicabilityStatementItem	X	X	X	X	X
AuthorityToOperate	X	X			X
BatchHardwarePart	X		X	X	
Breakdown	X	X			
BreakdownElement	X	X	X	X	X
BreakdownElementInZone	X	X	X	X	X
BreakdownElementRevision	X	X		X	
BreakdownElementRevisionRelationship	X	X	X	X	X
BreakdownElementRevisionRelationshipItem	X	X			
BreakdownElementStructure	X	X			
BreakdownElementUsageInBreakdown	X	X	X	X	X
BreakdownElementUsageRelationship	X	X	X	X	X
BreakdownItem	X	X			
BreakdownRevision	X	X		X	
Capability			X		
CapabilityItem			X		
CargoItem	O				
ChangeAuthorization	X	X	X	X	X
ChangeControlledItem	X			X	
ChangedItemtAvailabilityRequirement				O	
ChangeEmbodimentRequirement				O	
ChangeNotification	X			X	
ChangeRequest	X	X	X	X	X
ChangeRequestCause				X	
ChangeRequestItem				X	
ChangeRequestReasonItem				X	
CircuitBreaker	X	X	X	X	X
CircuitBreakerSetting	X	X	X	X	X

ClassName	UC51301	UC51302	UC51303	UC51304	UC51305
CircuitBreakerSettings	X	X	X	X	X
ClassInstanceAssertItem	X	X	X	X	X
Comment	O	O	O	O	O
CommentAction	O	O	O	O	O
CommentItem	O	O	O	O	O
CommentParty	O	O	O	O	O
CommentRelationship	O	O	O	O	O
ConditionDefinitionItem	X	X	X	X	X
ConditionInstance	X	X	X	X	X
ConditionType	X	X	X	X	X
ConditionTypeAssertMember	X	X	X	X	X
ContainedSubstance	X	X		O	
Contract	X	X	X	X	X
ContractClause				X	
DigitalFile	O				
DigitalFileReference	O				
DigitalFileReferencedItem	O				
DigitalFileReferencingItem	O				
Document	O				O
DocumentCharacteristicItem	O				O
DocumentIssue	X			X	O
DocumentItem	O				O
DocumentParty	O				O
DocumentReferencingItem	O				O
DocumentRelationship	O				O
DownTimePeriod				O	
EffectiveOnProductConfiguration	X	X		X	
EffectiveOnProductConfigurationItem	X	X			
Environment	O				
EvaluationByAssertionOfClassInstance	X	X	X	X	X

ClassName	UC51301	UC51302	UC51303	UC51304	UC51305
EvaluationByAssertionOfCondition	X	X	X	X	X
EvaluationByAssertionOfSerializedItems	X	X	X	X	X
EvaluationByNestedApplicabilityStatement	X	X	X	X	X
EvaluationByNestedExpression					
EvaluationCriteria	X	X	X	X	X
Event	X		X	X	
ExternalDocument	O				O
Facility	X	X	X	X	X
FacilityOperator	X	X	X	X	X
Fleet	X	X	X	X	X
FleetTask	X				X
FleetTaskCancellationNotice	O				O
GeographicalArea	X	X	X	X	X
HardwareElement	X	X	X	X	
HardwareElementPartRealization	X	X	X	X	X
HardwareElementRevision	X	X		O	
HardwarePartAsDesigned	X	X	X	X	
HardwarePartAsDesignedDesignData	X	X		O	
HardwarePartAsDesignedSupportData	X	X		O	
IdentifiedTaskRequirement	X	X	X	X	X
Infrastructure	X	X	X	X	X
InfrastructureRevision	X			X	
InstallationLocation	X		X		
InstallationLocationDefinitionItem	X		X		
InstalledPart	X		X	X	
InstalledPartItem	X		X		
Locator	O				O
LogBook	X		X		
LogBookEntry	X		X		
LogBookEntryMeasurementPoint	X		X		

ClassName	UC51301	UC51302	UC51303	UC51304	UC51305
LogicalAND	X	X	X	X	X
LogicalNOT	X	X	X	X	X
LogicalOR	X	X	X	X	X
LogicalXOR	X	X	X	X	X
MaintenanceActivity				X	
MaintenanceLevel	X	X	X	X	X
MaintenanceProgram	O				O
MaintenanceWorkOrderSource				O	
MeasurementPoint	X		X	X	
MeasurementPointItem	X		X	X	
ModificationOf	X		X	X	
NestedAllowedProductConfiguration	X	X			X
NestedProductVariant	X	X			
NonConformanceData	X	X			
OperatingBase				O	
OperatingLocationType	X	X	X	X	X
OperationalModeStatus	X		X		
OperationalMoment	X		X		
OperationalMomentItem			X		X
OperationalPeriod				X	
OperationalRole	X		X		X
Organization	X	X	X	X	X
PartAction	X		X	O	
PartAsDesigned	X	X	X	X	X
PartAsDesignedPartsList	X	X		O	
PartAsDesignedPartsListEntry	X	X		X	
PartAsDesignedPartsListRelationship	X	X		O	
PartAsDesignedPartsListRevision	X	X		X	
Party	O	O	O	X	O
PlannedItemUpgrade				O	

ClassName	UC51301	UC51302	UC51303	UC51304	UC51305
PlannedPartInstallationLocation				O	
PlannedUpgradeTimescales				O	
Pool	O				
Product	X	X	X	X	X
ProductVariant	X	X	X	X	X
Project	X	X	X	X	X
ProjectSpecificAttribute	O	O	O	O	O
ProjectSpecificAttributeValue	O	O	O	O	O
ProjectSpecificExtensionItem	O	O	O	O	O
RealizedPart	X		X		
ReferencedDigitalFile	O				
ReferencedDocument	X	X	X	X	X
Remark	O	O	O	O	O
RemarkItem	O	O	O	O	O
Report	O				O
ReportingParty	X				
Requirement	X	X	X	X	X
ResourceRealization	X	X	X	X	X
ResourceSpecification	O				
RoleCapability			X		
S1000DDataModule	O				O
S1000DDataModuleIssue	O				O
S1000DPublicationModule	O				O
S1000DPublicationModuleIssue	O				O
SafetyDocument	O				O
SafetyIssue				X	
SCORMContentPackage	O				O
SecurityClassification	X	X	X	X	X
SerializedAssertItem	X	X	X	X	X
SerializedHardwarePart	X	X	X	X	X

ClassName	UC51301	UC51302	UC51303	UC51304	UC51305
SerializedItem	X		X	X	
SerializedPartDesignAssociation	X		X	X	
SerializedPartsListPosition	X			X	
SerializedProductVariant	X	X	X	X	X
SerializedProductVariantAssignment	X				X
SerializedProductVariantConfigurationConformance	X		X		X
SerializedProductVariantOperatingBase				O	
Service	X	X	X	X	X
ServiceBulletin	O			O	O
SoftwareElement	X	X	X	X	
SoftwareElementPartRealization	X	X	X	X	X
SoftwareElementRevision	X	X		O	
SoftwarePartAsDesigned	X	X	X	X	
SoftwarePartAsReleased	X	X	X	X	X
StreetAddress	O				
SubstanceDefinition	X	X		O	
SubstitutePartAsDesigned	X	X		O	
Subtask	X	X	X	X	X
SubtaskInZone	X	X	X	X	X
SubtaskTimeline	X	X	X	X	X
SubtaskWarningCautionNote	X	X	X	X	X
Task	O				
TaskPersonnelResourceCompetence	X	X	X	X	X
TaskRequirement					
TaskRequirementRevision	X			X	
TaskResource	X	X	X	X	X
TaskRevision	X			X	
TaskRevisionWarningCautionNote	X	X	X	X	X
TaskUsage	X	X	X	X	X
TechnicalOrder				O	

ClassName	UC51301	UC51302	UC51303	UC51304	UC51305
TechnicalOrderEmbodied				O	
ThresholdDefinition	X	X	X	X	X
TrackablePart				O	
UpgradeRequirement				O	
UsableOnItem	X	X			
UsableOnProductVariant	X	X		X	
WarrantyClaim	O				
WorkItem				O	
WorkOrder				O	
ZoneElementRevision	O				

2.12 Classes used for in-service contract management

The classes used for each in-service contract management use case as defined in Chap 14 are listed in Table 13. The use cases are numbered:

1 UC51401: Provide contractual information

2 UC51402: Provide Work Breakdown Structure (WBS)

3 UC51403: Provide Cost Breakdown Structure (CBS)

4 UC51404: Provide Organisational Breakdown Structure (OBS)

5 UC51405: Provide /update activity planning

6 UC51406: Report Service Level Agreement (SLA) compliance

7 UC51407: Provide contract incurred costs

8 UC51408: Provide status report

9 UC51409: Provide information about locations and infrastructure

10 UC51410: Manage service request

11 UC51411: Request /grant/deny usage of resource

12 UC51412: Assign security classification

13 UC51413: Provide exchange export control information

14 UC51414: Provide labour rates

Table 13 Classes used for in-service contract management use cases

ClassName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
Action	O	O	O	O	O	O	O	O	O	O	O	O	O	O
AuthorityRequirement										O				
Availability					X	X		X						
BatchHardwarePart	X									X				
BreakdownElement		X	X		X		X	O			O	X	O	
Budget	X		X				X			X	X			
BudgetingItem			O				O			O	O			
Capability	X					X				O	O			
CargoItem					X							X	O	
ChangeEmbodimentRequirement			X				X			O	O			
ChangeRequest			X				X				O	X	O	
CloudInfrastructure	O								X					
Comment	O	O	O	O	O	O	O	O	O	O	O	X	O	O
CommentAction	O	O	O	O	O	O	O	O	O	O	O	O	O	O
CommentItem	O	O	O	O	O	O	O	O	O	O	O	O	O	O
CommentParty	O	O	O	O	O	O	O	O	O	O	O	O	O	O
CommentRelationship	O	O	O	O	O	O	O	O	O	O	O	O	O	O
CommunicationsNetwork	O								X					
CompetenceDefinitionItem														X
CompliesWith	X					O				X			X	
ComputerNetwork	O								X					
ConditionDefinitionItem	X					X				O				
ConditionInstance	X					X				O				
ConditionType	X					X				O				
ConditionTypeAssertMember	X					X				O				
Contract	X	X	X	X	X	X	X	X		X	X	X	X	X
ContractClause	X	X	X		X	X	X	O		O	O			X
ContractClauseRelationship	X		O			X	X	O			O			X

ClassName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
ContractItem	X	O		O			X			O				
ContractItemDetails	X	O		O			X			O				
ContractParty	X	O		O			X			O				
ContractRelationship	X	O	O	O		X	X	O		O	O			X
CostBreakdown	O		X				X				O			
CostBreakdownContext	X		X			X	X	O			O			X
CostBreakdownRelationship	O		X				X				O			
CostBreakdownRevision	O		X				X				O			
CostEntry	O		X		X	X	X	X			O	X	O	
CostEntryItem	O		X		X	O	X	X			O			
CostItem	O	X	X		X		X	O			X	X	O	
CostItemRelationship	O		X				X				O			
Country	O								X	O			X	
Damage			X				X				O			
DigitalFile												X	O	
Document	X	O	O	O	X	X	O	X		X		X	X	
DocumentCharacteristicItem	O	O	O	O	O		O	O				O	O	
DocumentIssue	O	O	O	O	O		O	O		O		O	X	
DocumentItem	X	O	O	O	O	X	O	O		O		O	O	
DocumentParty	O	O	O	O	O		O	O				O	O	
DocumentReferencingItem	O	O	O	O	O		O	O				O	O	
DocumentRelationship	O	O	O	O	O		O	O				O	O	
DownTimePeriod					X									
Environment	O				X			X	X			X	O	
EvaluationByAssertionOfCondition	X					X				O				
EvaluationByNestedExpression	X					X				O				
EvaluationCriteria	X					X				O				
Event					X			X				X	O	
ExportControlledItem	O									O			X	

ClassName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
ExportControlLicense	O									O		X	X	
ExportControlLicenseItem	O									O			X	
ExportControlParty	O									O			X	
ExportControlRegulation	X					O				X			X	
ExportControlRequirementAppliedToCountry	O									O			X	
ExpressionEvaluation	X					X				O	O			
ExternalDocument	O	O	O	O	O		O	O				O	O	
Facility	X	X	X	O	X	O	X	X	X	X	X	X	X	
FacilityLocation	O								X					
FacilityOperator	O								X					
FacilityOperatorItem	O								X					
FacilityOwner	O								X					
FacilityRelationship	O								X					
Fleet	X	O	X	O	X		X	X		X	X	X	O	
FleetManager					X									
FleetPlanning					X									
FleetRequirement					X					O				
FleetTask					X									
FleetTaskCancellationNotice	O	O	O	O	O		O	O				O	O	
FleetTaskCargo					X									
FleetTaskList					X									
GeographicalArea									X					
GeographicalAreaRelationship									X					
GlobalPosition									X					
HardwareElement	O								X					
HardwarePartAsDesigned	X	O	X	O	X		X	X		X	X		X	
Infrastructure	X	X	X	O	X		X	X	X	X	X	X	O	
InfrastructureCompliance			O								X			

ClassName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
InfrastructureCompliantItem	O								X					
InfrastructureItem	O								X					
InfrastructureNode	O								X					
InfrastructureNodeAtLocation	O								X					
InfrastructureParty	O								X					
InfrastructureRelationship	O								X					
InfrastructureRevision	O	X			X		O	O	X			X	O	
InventoryActivity					X	O		X						
ItemExportControlRegulation	O									O			X	
ItemUnderExportControl	O									O			X	
ItemWarranty														
LaborRateItem	X		O			X	X	O			O			X
LaborRates	X		O			X	X	O			O			X
LegalParty	X	O		O			X			O				
Location									X					
LocationEnvironment									X					
LocationItem	X								X	X				
LocationRelationship									X					
Locator	O	O	O	O	O		O	O	X			O	O	
LogicalAND	X					X				O				
LogicalNOT	X					X				O				
LogicalOR	X					X				O				
LogicalXOR	X					X				O				
MaintenanceActivity					X	O		X						
MaintenanceFacility	O				X				X					
MaintenanceFacilityLevel					X									
MaintenanceFacilitySlot					X									
MaintenanceFacilitySlotAccomodation					X									
MaintenanceFacilitySlotPlannedUsage					X									

ClassName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
MaintenanceLevel					X				O					
MaintenanceOrganization	X	X		X				O			O			
MaintenancePerson	X	X		X				O			O			
MaintenanceProgram	O	O	O	O	O		O	O				O	O	
MaintenanceRequirement										O				
Material			X				X				O			
Message												X	O	
Movement			X				X				O	X	O	
MovementLeg			X				X				O	X	O	
MRONetwork	O								X					
ObsolescenceRequirement										O				
OperatingBase	O								X					
OperatingLocationType									O					
OperationalActivity					X	O		X						
OperationalEvent					X	X		X						
OperationalRequirement					X					O				
OperationalRequirementsPlanning					X									
OperationalRole					X									
OperatorOrganization	X	X		X				O			O			
OperatorPerson	X	X		X				O			O			
Organization	X	X	X	X	X	O	X	X	X	X	O	X	X	
OrganizationalBreakdownStructure	O			X	O									
OrganizationalBreakdownStructureRevision	O			X	O									
OrganizationalRole	O			X	O									
OtherFacility	O								X					
ParkingFacility	O								X					
PartAsDesigned		X	X		X		X	O			O	X	O	
Party	X	X	X	X	X	X	X	X	X	X	X	O	X	O

ClassName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
PartyAddress	X	X		X				O			O			
PartyContactData	X	X		X				O			O			
PartyItem	X	X		X				O			O			
PartyRelationship	X	X		X	O			O			O			
PartySecurityAssignment												X	O	
Penalty	X		X			X	X			O	O	X	O	
Person	X	X	X	X			X	O		O	X	X	O	X
PersonCompetence														X
PoliciesAndRegulations	X					O				X			X	
PoliciesAndRegulationsCompliantItem	X					O				X			X	
Pool					X			X				X	O	
Port	O								X					
PowerGrid	O								X					
Product	X	X	X	O	X	O	X	X		X	O	X	X	
ProductVariant	X	X	X	O	X	X	X	X	X	X	X	X	X	
Project	X	X	X	X	X	O	X	X		X	O	X	X	
ProjectContract	X	O		O			X			O				
ProjectRelationship	X	O		O			X			O				
ProjectSpecificAttribute	O	O	O	O	O	O	O	O	O	O	O	O	O	O
ProjectSpecificAttributeValue	O	O	O	O	O	O	O	O	O	O	O	O	O	O
ProjectSpecificExtensionItem	O	O	O	O	O	O	O	O	O	O	O	O	O	O
ReferencedDocument	O	O	O	O	O		O	O				O	O	
Remark	O	O	O	O	O	O	O	O	O	O	O	O	O	O
RemarkItem	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Report	O	O	O	O	X	X	O	X				O	O	
ReportableActivity	O	X	X		X	X	X	X			O			
ReportableItem					X	X		X						
ReportableMetric	X				X	X		X		O		X	O	
ReportableMetricItem						X		X						

ClassName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
ReportContext					X	X		X						
ReportContextItem					X	X		X						
ReportingParty							X	X		X				
ReportParty					X	X		X						
RequiredFleetRole					X									
Requirement	X									X		X	O	
RequirementParty										O				
RequirementRelationship										O				
ResourceItem											X			
ResourceUsageParty											X			
ResourceUsageRequest			X				X				X			
S1000DDataModule	O	O	O	O	O		O	O				O	O	
S1000DDataModuleIssue	O	O	O	O	O		O	O				O	O	
S1000DPublicationModule	O	O	O	O	O		O	O				O	O	
S1000DPublicationModuleIssue	O	O	O	O	O		O	O				O	O	
SafetyDocument	O	O	O	O	O		O	O				O	O	
SafetyRequirement										O				
SCORMContentPackage	O	O	O	O	O		O	O				O	O	
SecurityAssignmentParty												X	O	
SecurityClass												X	O	
SecurityClassification												X	O	
SecurityClassificationItem												X	O	
SerializedHardwarePart	X	X	X	O	X		X	X	X	X	X	X	X	
SerializedProductVariant	X	X	X	O	X	X	X	X	X	X	X	X	X	
SerializedProductVariantAssignment					X									
SerializedProductVariantInFleet					X									
Service	X	X	X	O	X	X	X	X		X	O	X	X	
ServiceBulletin	O	O	X	O	O		X	O			O	O	O	

ClassName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
ServiceContract	X					X				O	O			
ServiceItem	X									X				
ServiceLevelAgreementClause	X		O			X	X	X		O	O			X
ServiceRelationship	X					X				O	O			
ServiceRequest	X		X				X			X	O			
ServiceRequestCancellation	X									X				
ServiceRequestItem	X									X				
ServiceRequestLocation	X									X				
ServiceRequestParty	X									X				
ServiceRequestRelationship	X									X				
Skill														X
SkillLevel														X
SoftwareElement	O								X					
SoftwarePartAsDesigned	X	O		O			X			O			X	
SoftwarePartAsReleased	X	X	X	O	X		X	X	X	O	O		X	
StreetAddress	X	X		X				O	X		O			
SubjectOfPoliciesAndRegulations	X					O				X			X	
Subtask												X	O	
SupportEquipment	O								X					
Task												X	O	
TaskRequirement												X	O	
Trade														X
TransportNetwork	O								X					
TransportRequirement											O			
UpgradeRequirement										O				
Warehouse	O								X					
WarrantyClaimResolution			X				X				O			
WorkBreakdown	O	X			X		O	O				X	O	

ClassName	UC51401	UC51402	UC51403	UC51404	UC51405	UC51406	UC51407	UC51408	UC51409	UC51410	UC51411	UC51412	UC51413	UC51414
WorkBreakdownContext	X	X	O		X	X	X	O			O			X
WorkBreakdownRelationship	O	X			X		O	O						
WorkBreakdownRevision	O	X			X		O	O						
WorkItem	O	X			X	O	O	X				X	O	
WorkItemRelationship	O	X			X		O	O						
WorkOrder			X		X	X	X	X			O			

2.13 Classes used for non-predefined information

The classes used for each non-predefined information use case as defined in Chap 15 are listed in Table 14. The use cases are numbered:

1 UC51501: Provide project-specific values

2 UC51502: Provide non-predefined information

Table 14 Classes for used non-predefined information use cases

ClassName	UC51501	UC51502
Action	O	O
BatchHardwarePart		X
CargoItem		X
ChangeRequest		X
CircuitBreaker		X
Comment	O	O
CommentAction	O	O
CommentItem	O	O
CommentParty	O	O
CommentRelationship	O	O
Contract		X
DigitalFileReference		X
DigitalFileReferencedItem		X
DigitalFileReferencingItem		X
Document		X

ClassName	UC51501	UC51502
DocumentIssue		X
Environment		X
Event		X
Facility		X
Fleet		X
GeographicalArea		X
InstallationLocation		X
MeasurementPoint		X
Organization		X
PartAsDesigned		X
Party	O	O
Pool		X
Product		X
ProductVariant		X
ProjectSpecificAttribute	X	O
ProjectSpecificAttributeValue	X	O
ProjectSpecificExtensionItem	X	O
Remark	O	X
RemarkItem	O	O
ResourceSpecification		X
SecurityClassification		X
SerializedHardwarePart		X
SerializedProductVariant		X
Service		X
StreetAddress		X
SubstanceDefinition		X
Task		X
WarrantyClaim		X
ZoneElementRevision		X

2.14 Classes for additional use cases

The use cases in Table 15 were requested by the specification users after closure of the data model and are therefore not included in any chapter. They will be included in the next Issue of S5000F:

1 UC50409: Provide equipment calibration certificate information

2 UC50410: Report support equipment usage

3 UC51415: Provide documentation traceability

Table 15 Classes for additional use cases

ClassName	UC50409	UC50410	UC51415
Action	O	O	O
AlternatePartAsDesigned	X		
BatchHardwarePart			O
BreakdownElement			X
Calibration	X	X	
CalibrationDocument	X	X	
CalibrationMeasurement	X	X	
CargoItem			X
ChangeRequest			X
CircuitBreaker			O
Comment	O	O	X
CommentAction	O	O	O
CommentItem	O	O	O
CommentParty	O	O	O
CommentRelationship	O	O	O
ContainedSubstance	X		
Contract			X
ContractItem			O
ContractItemDetails			O
ContractParty			O
ContractRelationship			O
CostEntry			X
CostItem			X

ClassName	UC50409	UC50410	UC51415
Country			X
DigitalFile			X
DigitalFileReference			O
DigitalFileReferencedItem			O
DigitalFileReferencingItem			O
Document	O	X	X
DocumentCharacteristicItem	O		X
DocumentIssue	O		X
DocumentItem	X	X	X
DocumentParty	O		X
DocumentReferencingItem	O		X
DocumentRelationship	O		X
Environment			X
EnvironmentRevision	X	X	
Event			X
ExportControlledItem			X
ExportControlLicense			X
ExportControlLicenseItem			X
ExportControlParty			X
ExportControlRegulation			X
ExportControlRequirementAppliedToCountry			X
ExternalDocument	O		X
Facility			X
Fleet			X
FleetTaskCancellationNotice	O		X
GeographicalArea			O
HardwarePartAsDesigned	X	X	X
HardwarePartAsDesignedDesignData	X		
HardwarePartAsDesignedSupportData	X		
Infrastructure			X

ClassName	UC50409	UC50410	UC51415
InfrastructureRevision			X
InstallationLocation			O
ItemExportControlRegulation			X
ItemUnderExportControl			X
LegalParty			O
Locator	O		X
MaintenanceActivity		X	
MaintenanceActivityDocument		X	
MaintenanceActivityParty		X	
MaintenanceActivityPlan		X	
MaintenanceActivityRecord		X	
MaintenanceEvent		X	
MaintenanceFacility		X	
MaintenanceItem		X	
MaintenanceOrganization	O		O
MaintenancePerson	O	X	O
MaintenanceProgram	O		X
MaintenanceWorkOrderSource		X	
MeasurementPoint			O
Message			X
Movement			X
MovementLeg			X
OperatorOrganization	O		O
OperatorPerson	O		O
Organization	X	X	X
PartAction		X	
PartAsDesigned	X		X
PartAsDesignedPartsList	X		
PartAsDesignedPartsListEntry	X		
PartAsDesignedPartsListRelationship	X		

ClassName	UC50409	UC50410	UC51415
PartAsDesignedPartsListRevision	X		
Party	O	X	X
PartyAddress	O		O
PartyContactData	O		O
PartyItem	O		O
PartyRelationship	O		O
PartySecurityAssignment			X
Penalty			X
Person	X	X	X
PoliciesAndRegulations			X
Pool			X
Product			X
ProductVariant			X
Project			X
ProjectContract			O
ProjectRelationship			O
ReferencedDigitalFile			O
ReferencedDocument	O		X
Remark	O	O	O
RemarkItem	O	O	O
Report	O		X
ReportableMetric			X
Requirement			X
ResourceSpecification			O
S1000DDataModule	O		X
S1000DDataModuleIssue	O		X
S1000DPublicationModule	O		X
S1000DPublicationModuleIssue	O		X
SafetyDocument	O		X
SCORMContentPackage	O		X

ClassName	UC50409	UC50410	UC51415
SecurityAssignmentParty			X
SecurityClass			X
SecurityClassification			X
SecurityClassificationItem			X
SerializedHardwarePart	X	X	X
SerializedProductVariant			X
SerializedSupportEquipment	X	X	
Service			X
ServiceBulletin	O		X
SoftwarePartAsDesigned	X		X
SoftwarePartAsReleased			X
StreetAddress	O		O
SubstanceDefinition	X		O
SubstitutePartAsDesigned	X		
Subtask			X
SuppliesUsed		X	
SupplyItem		X	
SupportEquipment	X	X	
SupportEquipmentItem	X	X	
SupportEquipmentUsed		X	
Task			X
TaskRequirement			X
TaskRevision		X	
WarrantyClaim			O
WorkBreakdown			X
WorkItem			X
WorkOrder		X	
ZoneElement		X	
ZoneElementRevision			O

3 Mapping of data elements against chapter use cases

The previous issue of S5000F included a mapping of the individual data elements against chapter use cases. This has been found to be counter-productive, as projects tried to implement the specification by selecting individual data elements for the different use cases, without consideration of the classes including them, hence that this part has been removed.

It must be highlighted that the individual data elements cannot exist without the classes for which they form the attributes. Thus, an *operationalPeriodResult* data element cannot exist if the *OperationalPeriod* class is not implemented. This is because of grouping, and the relationships between different elements being defined at the class level and not at the data element level. Therefore, the relationship between the data element *operationalPeriodResult* and the *SerializedProductVariant* that performed that *OperationalPeriod* cannot be established if only this data element was selected. It is not possible to choose the individual data elements, ignoring their classes, based on some arbitrary criteria while aiming to keep a consistent data model.

The process for defining the data elements required for each individual use case is:

- Select the UoFs required for your specific use case
- Identify the classes in those UoFs that you do require for the use case
- Ensure that all necessary relationships are included in the list (eg, if the association of an *OperationalPeriod* to a *SerializedProductVariant* is desired, then the << relationship>> *SerializedProductOperationalPeriod*) is required)
- For each selected class, identify the attributes (data elements) that are mandatory. These must be included for a proper data exchange
- Attributes whose multiplicity starts with zero (0 ..1, 0 ..*, or similar) are optional. Decide which of those attributes are required for your particular use case

A practical example is provided in Chap 19.

Chapter 21

Terms, abbreviations and acronyms

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References

Table 1 References

Chap No./Document No.	Title
S3000L	International procedure specification for Logistics Support Analysis (LSA)
S4000P	International specification for developing and continuously improving preventive maintenance
SX000i	International specification for Integrated Product Support (IPS)
SX001G	Glossary for the S-Series IPS specifications
ARMP-7	NATO R&M terminology applicable to ARMPs
DEF STAN 00-42	Reliability & Maintainability (R&M) Assurance Guide
DEF STAN 00-56	Safety Management Requirements for Defence Systems
IEC 60050-191	International Electrotechnical Vocabulary. Chapter 191: Dependability and quality of service
ISO 10303-239	Industrial automation systems and integration -- Product data representation and exchange -- Part 239: Application protocol: Product life cycle support
MIL-HDBK-61A	Military Handbook Configuration Management Guide
RTCA DO-178B	Software Considerations in Airborne Systems and Equipment Certification

1 Introduction

It is necessary to be precise in the usage of terms across the whole specification and clarify the use of acronyms and abbreviations across this document.

2 Scope

This chapter includes a comprehensive terminology dictionary for the terms used throughout this specification in Para 3. A complete list of abbreviations and acronyms used throughout this specification is included in Para 4. Both the definitions of the terms and the abbreviations and acronyms are consolidated with those of the other S-Series IPS specifications in SX001G.

3 Terms

The terms defined in Table 2 have been taken as far as feasible from S3000Lor other S-Series IPS specifications. When no definition for a term could be found, an alternative was sought referencing other international specifications; a new definition was created only when no alternative could be found.

Table 2 Terms

Term	Definition
Administrative delay time	Administrative time for which maintenance action cannot proceed due to administrative reasons (eg, awaiting approval to start maintenance, budget limitations, coordination requirements). Refer to IEC 60050-191.
Allowed configurations	The different configuration statuses authorized by the Product OEM Engineering, or design authority, in which a Product can be at a given moment during actual operation (Refer to SX000i).
As delivered configuration	The actual configuration (including serial numbers) that the Product has at the moment of the handover from the OEM to the Customer for the entry into service.
As desired configuration	The specified allowed configuration baseline that must be achieved at a certain moment (eg, to return a Product to service or to perform a specific mission).
As-is configuration	As-is configuration is the product configuration (including serial numbers) that exists at a given moment during the in-service (Refer to SX000i).
As maintained configuration	Refer to As-is configuration.
Availability	Availability is the measure of the degree to which an item is in an operable and ready-to-use state at the start of a mission or operation, when the mission or operation is called for at an unknown time. This is sometimes called operational readiness. Refer to S3000L.
Availability Instantaneous (Point Availability)	Probability that an item is in a state to perform as required at a given instant. Refer to IEC 60050-191.
Availability, Intrinsic (inherent)	Availability value determined when maintenance and operational conditions are assumed to be ideal. Refer to IEC 60050-191.

Term	Definition
Availability, Operational	The probability than an equipment/ system at any instant in the required operating time will operate satisfactorily under stated conditions where the time considered includes operating, corrective and preventative maintenance administrative delay time and logistic delay time. Refer to ARMP-7.
Aviation Critical Safety Item	A part, an assembly, installation equipment, launch equipment, recovery equipment, or support equipment for an aircraft or aviation weapon system if the part, assembly, or equipment contains a characteristic any failure, malfunction, or absence of which could cause a catastrophic or critical failure resulting in the loss of or serious damage to the aircraft or weapon system, an unacceptable risk of personal injury or loss of life, or an non-commanded engine shutdown that jeopardizes safety. (Refer to Public law 108-136, sec 802.
Baseline Configuration	A basic allowed configuration from which by means of equipment exchange all other allowed configurations can be achieved without having to embody a modification.
Built -In Test	Built in tests (BIT) are implemented on items to enable them to carry out some self-testing up to a given degree. Usually three types of built in test are implemented: (a) power-on built-in tests (P-BIT) executed at start-up of the item (b) continuous built-in tests (C-BIT), periodically and automatically executed during the operation of the item, without any intervention from the operating crew (c) initiated built-in tests (I-BIT), executed upon order from the operator or from the maintenance team. Each of these types of tests detects specific categories of failures. Refer to S3000L.
Capability (of an item)	The ability to meet a service demand of given quantitative characteristics under given conditions. Refer to IEC 60050-191.
Cataloguing	The process of accounting for items and arranging them systematically with descriptive details to include naming, describing, classifying and assigning a unique combination of letters and numerals, or both, for easy retrieval of the item information.
Cause, external	A cause is said to be external when an event independent of Product usage occurs, eg, a bird-strike. Refer to S3000L.

Term	Definition
Certification	Legal recognition by the certification authority that a Product, service, organization or person complies with the requirements. Such certification comprises the activity of technically checking the Product, service, organization or person and the formal recognition of compliance with the applicable requirements by issue of a certificate, license, approval or other documents as required by national laws and procedures. Specifically, certification of a Product involves: (a) the process of assessing the design of a Product to ensure that it complies with a set of standards applicable to that type of Product to demonstrate an acceptable level of safety (b) the process of assessing an individual Product to ensure that it conforms with the certified type design (c) the issuance of a certificate required by national laws to declare that compliance or conformity has been found with standards in accordance with items (a) or (b) above. Refer to RTCA DO-178B.
Certification Authority	The organization or person responsible within the state or country concerned with the certification of compliance with the requirements. Refer to RTCA DO-178B.
Combat Capability	The potential ability to do combat work, perform a combat function or combat mission, achieve a combat objective or provide a combat service
Commercial Off-The-Shelf	Software or hardware, generally technology Products, that are ready-made and available for sale, lease, or license to the general public. Refer to S3000L.
Common Cause	Some failures can lead to several malfunctions. For instance, the failure of a power supply leads to a malfunction of all its supplied items. This type of failure with multiple impacts is called a common cause. Refer to S3000L.
Condition Based Maintenance	Maintenance initiated as a result of knowledge of the condition of an item of equipment gained from routine or continuous monitoring. Refer to JSP 817.
Condition monitoring	Obtaining information about physical state or operational parameters. Refer to IEC 60050-191.
Configuration control	1) The establishment of an agreed build standard for an item and the procedure for controlling change to that standard, in order that it can be defined at any time. Refer to ARMP-7. 2) A systematic process that ensures that changes to released configuration documentation are properly identified, documented, evaluated for impact, approved by an appropriate level of authority, incorporated, and verified. Refer to MIL-HDBK-61A.
Configuration identification	(1) The process of designating the configuration items in a system and recording their characteristic. Refer to RTCA DO-178B. (2) The approved documentation that defines a configuration item Refer to RTCA DO-178B. (3) The systematic process of selecting the system attributes, organizing associated information about the attributes, and stating the attributes. Refer to MIL-HDBK-61A.

Term	Definition
Configuration item	An element or set of elements, being hardware, software or a combination of both, or any of its discrete parts, which performs a final function, and which is decided to be subject to configuration control. This is an element that forms part of the configuration tree.
Configuration Item	A hardware, software, or combination of both that satisfies an end user function and is designed for separate configuration management. Refer to MIL-HDBK-61A.
Configuration management	(1) The process of identifying and defining the configuration items of a system, controlling the release and change of these items throughout the software life cycle, recording and reporting the status of configuration items and change requests and verifying the completeness and correctness of configuration items. (2) A discipline applying technical and administrative direction and surveillance to: (a) identify and record the functional and physical characteristics of a configuration item (b) control changes to those characteristics (c) record and report change control processing and implementation status. Refer to RTCA DO-178B. (3) A management process for establishing and maintaining consistency of a system's performance, functional, and physical attributes with its requirements, design and operational information throughout its life. Refer to MIL-HDBK-61A.
Configuration slot	Specific position within the Product configuration tree that can be occupied by a configuration item. A configuration item is identified by the configuration item identifier and the position it occupies. For less complex Products (eg, equipment) where the position is irrelevant, the configuration item can be identified exclusively by its identifier.
Configuration status accounting	The recording and reporting of the information necessary to manage a configuration effectively, including a listing of the approved configuration identification, the status of proposed changes to the configuration and the implementation status of approved changes. Refer to RTCA DO-178B.
Configuration tree	The representation of the Product baseline configuration, formed by blocks and structured hierarchically.
Damage	A loss or reduction of functionality, excluding inherent failure (intrinsic reliabilities). Normally a maintenance task will be required. Damages can be grouped into damage families, eg, concerning structures; typical damage can be identified like scratches, dents or cracks. These damage families are typical candidates for a standard repair procedure. Refer to S3000L.
Damage, accidental	Physical deterioration of an item caused by contact or impact with an object or influence which is not part of the Product, or by human error during manufacturing, operation of the Product, or maintenance practices. Refer to S4000P.

Term	Definition
Data	Recorded information of any nature (including administrative, managerial, financial, and technical) regardless of medium or characteristics. Refer to MIL-HDBK-61A. Reinterpretable representation of information in a formalized manner suitable for communication, interpretation, or processing. Refer to IEC 2382-1 101-12-03.
Data cluster	Family of data related to a single concept.
Data element	1) a value contained in a single message field 2) atomic unit of data
Data element list	List of selected data elements or an output of a data element tailoring process. This list can contain additional data elements required for a special project, which are not predefined in any standard. Refer to S3000L.
Data Item	A document or collection of documents that must be submitted by the performing activity to the procuring or tasking activity to fulfill a contract or tasking directive requirement for the delivery of information. Refer to MIL-HDBK-61A.
Data sub-cluster	Subset of a data cluster focused on a specific type of data. As an example, Flight Fault Reports is a sub-cluster of Technical Information. Organizational Level removals is a sub-cluster of Organizational Level Events. Depot Level Events is a sub-cluster of Shop Events. Applicable configuration is a sub-cluster of Reference Data. The sub-cluster concept has only been created to ease the analysis of data elements required to implement feedback processes. It is a first-tier breakdown of data clusters.
Defect	Any non-conformance of an item with its specified requirements is a defect. Note that a defect does not necessarily result in the failure of an item. Refer to S3000L.
Deviation	Authorized approval to depart from a particular requirement of a Product approved configuration documentation for a specified period of time. This allows the acceptance of an Product which departs from the particular requirement but is considered as suitable for use 'as is' or after repair by an approved method. Refer to S3000L.
Dependability	The collective term used to describe the availability performance and its influencing factors: reliability performance, maintainability performance and maintenance support performance. Refer to IEC 60050-191.
Diagnostic test	Test procedure carried out in order to make a diagnosis. Refer to IEC 60050-191.
Dispatch Interruption Rate	Ratio of the number of delays and cancellations, whose imputation is technical and intrinsic to the Product, on the number of scheduled sorties (%)

Term	Definition
Document	A self-contained body of information or data that can be packaged for delivery on a single medium. (eg, drawings, reports, standards, databases, application software, engineering designs, virtual part-models, etc). Refer to MIL-HDBK-61A.
Down time (maximum)	The acceptable (maximum) down time (MDT), where MDT is the time where an item is non-operational.
Durability	Ability to perform as required under given conditions of use and maintenance until a limiting state is reached. Refer to IEC 60050-191.
Engineering Change Proposal	The documentation by which a proposed engineering change is described, justified, and submitted to: (a) the current document change authority for approval or disapproval of the design change in the documentation (b) to the procuring activity for approval or disapproval of implementing the design change in units to be delivered or retrofit into assets already delivered. Refer to MIL-HDBK-61A.
Event	An important happening or occurrence at a specific point in time that needs to be documented or recorded.
Event description	Description of the failure event or special event that can cause a related failure mode.
Event record	Record which describes the action performed on a Product, and its results
Failure	An unacceptable reduction of functionality of an item where the item cannot continue in its intended use. The failure occurs inherently during proper usage of the item. Refer to S3000L.
Failure cause	A failure cause is any circumstance during design, manufacture or use which led to the failure Refer to S3000L.
Failure condition	The effect on the Product and its occupants, both direct and consequential, caused or contributed to by one or more failures, considering relevant adverse operational or environmental conditions. Refer to S4000P.
Failure criteria	Are predefined conditions or limits to be accepted as conclusive evidence of failure. Refer to IEC 60050-191 Ed 2.0.
Failure effect	The consequence of a failure in terms of operation function or status of the item and higher system levels. Refer to IEC 60050-191 Ed 2.0.
Failure mechanism	The process that leads to failure. Refer to IEC 60050-191 Ed 2.0.
Failure mode	The manner in which the failure occurs and can be defined by the function lost or the state transition that occurred. Refer to IEC 60050-191 Ed 2.0. A failure mode is a predicted or observed physical, mechanical, thermal or other process which leads to failure. The result of this process is stated in relation to the operating conditions at the time of the failure. Refer to S3000L.
Failure mode probability	Defines how often a specific event (failure, damage or special event) results in a specific failure mode.

Term	Definition
Failure rate	The number of failures of an item per unit of measure, expressed in hours cycles, kilometers as applicable to the item. Refer to IEC 60050-191. The failure rate is the probability of failure per unit of time of items in operation. Refer to S3000L.
Failure, critical	A failure that could result in injury to persons or that prevents an item from performing an essential mission. Refer to IEC 60050-191.
Failure, primary	A failure not caused either directly or indirectly by a failure or fault of another item Refer to IEC 60050-191.
Fault	State characterized by an inability to perform as required. Refer to IEC 60050-191 Ed 2.0. An identifiable condition in which one element of a redundant system has failed (no longer available) without impact on the required function output of the system (MSI). At the system level, a fault is not considered a functional failure. Refer to S4000P.
Fault found, Primary	A failure not caused either directly or indirectly by a failure or fault of another item. Refer to IEC 60050-191.
Fault found, Secondary	All failures which are not originally caused by the equipment itself. Refer to IEC 60050-191.
Fault, software	A condition of a software item (software bug) that can prevent it from performing as required. Refer to IEC 60050-191.
Fault Diagnosis	An action to identify and characterize the fault. Refer to IEC 60050-191.
Feedback	Any data transfer process between different stakeholders during the in-service of a Product.
Field loadable software	Software that can be installed to one or several equipment on a Product without need to dismount the target from its installation location. Refer to S3000L.
Firmware	Software that can be loaded into an LRU or SRU but requires the target to be dismounted from its installation on the operational system and requiring the replacement of a component. Refer to S3000L.
Fleet	A group of Products operated under unified control (eg, ships, aircraft, trucks, buses, sensors, computers, etc).
Function	The normal characteristic actions of an item. Refer to S4000P.
Functional characteristics	Quantitative performance parameters and design constraints, including operational and logistic parameters and their respective tolerances. Functional characteristics include all performance parameters, such as range, speed, lethality, reliability, maintainability, and safety. Refer to MIL-HDBK-61A.
Functional check	A quantitative check to determine if one or more functions of an item or a system perform within specified limits. The task must be able to detect degradation, eg, wear, leakage, etc, and not just the complete failure. Refer to S4000P.

Term	Definition
Functional configuration audit	The formal examination of functional characteristics of a configuration item, or system to verify that the item has achieved the requirements specified in its functional and/or allocated configuration documentation. Refer to MIL-HDBK-61A.
Functional failure	Failure of an item or system to perform its intended function within specified limits. Refer to S4000P.
Functional symptom	A functional symptom characterizes a failure detected by a functional check and/or by loss or degradation of an operational function. It is detectable when the system is currently operated or checked via a functional check. Refer to S3000L.
Functions required	A characteristic or combination of characteristics considered necessary to complete a mission or tasks. Refer to IEC 60050-191.
Hardware part material hazardous class	Identifies articles or substances which are capable of posing a significant risk to health, safety or property during transportation, handling or storage.
Integrated Product Support (IPS)	Integrated Product Support (IPS) is the management and the technical process of support activities for a Product throughout its life cycle. Refer to SX000i.
Internal cause	A cause is said internal when it comes from Product usage by itself, eg, excessive vibration. Refer to S3000L.
Item	An item can be a part, component, device, subsystem, functional unit, equipment or system that can be individually considered. An item can consist of hardware, software or both. A group of items can be considered as an item. Refer to IEC 60050-191.
Labor time	The summarized duration of personnel work. The duration should be addressed against the sub tasks. If more than one person is working in parallel on a subtask, the Labor time for each different skill must be summarized. Refer to S3000L.
Life Cycle Cost (LCC)	All direct costs plus indirect-variable costs associated with the procurement, O&S and disposal of the system. Indirect costs can include linked costs such as additional common support equipment, additional administrative personnel and non-linked costs such as new recruiters to recruit additional personnel. All indirect costs related to activities or resources that are not affected by the introduction of the system are not part of LCC. (NATO)
Line Replaceable Unit (LRU)	Any item or component that is designed to be removed from the Product at its operating location.
Localization (failure)	An indication of which item or group of items has failed. This localization is generally a complement to failure detection. Refer to S3000L.
Logistic delay time	Accumulative time excluding administrative taken to provide resources needed for maintenance to proceed. Refer to IEC 60050-191.

Term	Definition
Logistics Support Analysis (LSA)	The selective application of scientific and engineering efforts undertaken during the development process and continuing throughout the complete life cycle, as part of the system engineering and design process, to assist in complying with the supportability and other Integrated Logistics Support activities. Refer to S3000L.
Maintainability	The measure of the ability of an item to be retained in or restored to a specified condition, when maintenance is performed by personnel having specified skill levels, using prescribed procedures and resources, at each prescribed level of maintenance and repair. Refer to S3000L.
Maintenance	All actions taken in order to retain or to restore an item system etc to a specified level of performance. It combines all necessary technical and administrative actions. Refer to IEC 60050-191.
Maintenance Concept	A statement of maintenance considerations, constraints and strategy for the operational support that governs the maintenance levels and type of maintenance activities to be carried out for the system/equipment under analysis. Refer to S3000L.
Maintenance free operating period	The acceptable (minimum) maintenance free operating period, where maintenance free operating period is the interval in which no maintenance actions occur.
Maintenance level type name	The name by which a maintenance level type is known
Maintenance Man hours	Sum of the individual personnel times taken to carry out a maintenance action. Refer to IEC 60050-191.
Maintenance significant item	Item that fails often and therefore requires many maintenance actions or that has a significant cost and its maintenance needs therefore to be assessed with special care.
Maintenance time	Time interval for which maintenance is performed including time attributed to maintenance actions and technical and logistic delays. Refer to IEC 60050-191.
Maintenance Time, Active	That part of the overall maintenance time taken to physically perform a maintenance action and therefore includes fault isolation diagnosis of failure and subsequent testing. Logistic delays are excluded. Refer to IEC 60050-191.
Maintenance, Corrective	All maintenance activities which are carried out to reset a faulty item to full functionality. Refer to S3000L.
Maintenance, Preventive	Maintenance activities to prevent the occurrence of critical failures or damages in conjunction with safety, economical or ecological aspects. The Preventive Maintenance also includes activities after special events where these events, chronological intervals or regular thresholds cannot be defined. Refer to S3000L.
Maintenance, Scheduled	Maintenance activities to prevent the occurrence of critical failures or damages in conjunction with safety, economical or ecological aspects. These maintenance tasks are defined with a corresponding interval or threshold, eg, after a certain time, cycles, rounds, distance. Scheduled maintenance is a subset of the preventive maintenance. Refer to S3000L.

Term	Definition
Maritime Critical Safety Item	A maritime critical safety item means any ship part, assembly, or support equipment containing a characteristic the failure, malfunction, or absence of which could cause: (1) A catastrophic or critical failure resulting in loss of or serious damage to the ship (2) An unacceptable risk of personal injury or loss of life Refer to 48 CFR 209.270.
Master data	Master data represents the business objects which are agreed on and shared across an enterprise or a project. Master data is a single source of common business data used across multiple systems, applications, and/or processes. Examples of master data are organizations, part numbers, parties, locations, etc.
Mean Active Corrective Maintenance Time	The sum of the average active scheduled/ corrective maintenance times respectively factored by their frequency of repair. Refer to IEC 60050-191.
Mean Time Between Failures (MTBF)	The predicted elapsed time between inherent failures of a system during operation. MTBF can be calculated as the arithmetic mean (average) time between failures of a system. The MTBF is typically part of a model that assumes the failed system is immediately repaired (zero elapsed time), as a part of a renewal process. This is in contrast to the Mean Time To Failure (MTTF), which measures average time between failures with the modeling assumption that the failed system is not repaired. Refer to S3000L.
Mean time to First failure	Expected value of the operating time to first failure. Refer to IEC 60050-191.
Mean Variant Between failures (MVBF)	Similar to MTBF but any other variants than time or distance should use MVBF where the variant as appropriate should be defined separately. Refer to IEC 60050-191.
Mission Capability	Material condition of a Product indicating it can perform at least one and potentially all its designated missions or assigned tasks.
Mission Profile	A time phased description of the events and environments an item experiences from initiation to completion of a specified mission. It identifies the tasks events durations operating conditions and environments for each phase of a mission. Refer to ARMP-7.
Model Identifier	The Model Identifier is a code, which uniquely identifies the Product variant. It is recommended to use the model identifier in conjunction with other identifiers within the entire IPS process. Refer to S3000L.
No Fault Found	When the item is sent for repair with a report of failure but subsequently it is not possible to reproduce or detect the reported failure and the item meets its requirements for return to service.
Non repairable item	Any part or assembly for which user-maintenance is limited to replenishment of consumables and replacement of the part or assembly upon failure or malfunction. Refer to MIL-HDBK-61A.

Term	Definition
Obsolescence	Obsolescence is the state of being which occurs when an object, service, or practice is no longer wanted even though it can still be in good working order. Obsolescence frequently occurs because a replacement has become available that has more advantages when compared to the disadvantages incurred by maintaining or repairing the original item, when the item in question is no longer available or it can no longer adequately perform the function for which it was created.
Operating requirement	Value of the (annual) operating requirement per operating location type and contracted Product.
Operating Time	The time when the system or equipment is turned on and/or actively performing at least one of its functions.
Operating Time, essential	The time period during a mission when it is essential that the item is required to be in an operating state. Refer to IEC 60050-191.
Operational check	An operational check is a task to determine that an item is fulfilling its intended purpose. Does not require quantitative tolerances. This is a failure finding task. Refer to S4000P.
Operational Readiness	The capability of a Product to perform the missions or functions for which it is organized or designed. Can be used in a general sense or to express a level or degree of readiness.
Part Number	A set of numbers, letters or other characters used to identify an item.
Physical breakdown	A top-down representation of hardware and software of a Product based on the engineering design model/drawings. Refer to S3000L.
Physical Configuration Audit (PCA)	The formal examination of the as-built configuration of a configuration item against its technical documentation to establish or verify the configuration item's system baseline. Refer to MIL-HDBK-61A.
Physical symptom	A physical symptom characterizes a failure detected by visual inspection, measurement of a wear-out parameter, material degradation. It is detectable or measurable when the system is currently operated or if it is undergoing inspection or maintenance. Refer to S3000L.
Preventative maintenance	Maintenance carried out to reduce the probability of failure or degradation. Refer to IEC 60050-191.
Product	A final combination of systems, subsystems, component parts/materials, etc, such as an aircraft, a ship, vehicle, or a complex technical system. The Product always represents the top level of any hierarchical breakdown. The S3000Ldefinition is: Any platform, system, or equipment (air, sea, land vehicle, equipment, or facility, civil or military).
Product service life	The number of years the LSA candidate is expected to be in service.
Prognostics	The process of using one or more parameters to predict the condition of an item at a defined point in its future operation and when it will no longer be able to perform its intended function.
R&M case	A reasoned auditable argument created to support the condition that a defined system will satisfy the Reliability & Maintainability requirements. Refer to DEF STAN 00-42 part 3.

Term	Definition
Record	Two or more values or variables stored in consecutive memory positions or database entries.
Recoverability	The ability to achieve restoration (with or without repair) following a failure. Refer to IEC 60050-191.
Rectifying Task	A maintenance activity which resolves an event such as failures, damages, special events or thresholds. A rectifying task contains subtasks in terms of referenced supporting tasks and/or definite working steps. Refer to S3000L.
Reference data	The set of permissible values to be used by other (master or transaction) data fields. Typical examples of reference data are units of measure, country codes, fixed conversion rates (eg, weight, temperature or length).
Reliability	The duration or probability of failure free performance of a Product or system under stated conditions, or the probability that an item can perform its intended function, under stated conditions, is a prime driver of support resources. Refer to S3000L.
Reliability Centered Maintenance	A disciplined logic or methodology used to identify scheduled maintenance tasks to maintain the inherent reliability of equipment at a minimum expenditure of resources. Refer to S3000L.
Reliability growth tests	Iterative process to improve reliability through testing until failure analysis implementing corrective action and continuing the test. Refer to IEC 60050-191.
Reliability, Basic	The ability of an item to perform its required functions without failure or defect for the duration of its life profile. Refer to ARMP-7.
Reliability, Mission	The probability that an item will perform its required functions for the duration of a specified mission profile. Refer to ARMP-7.
Repair	(1) See rectifying task (2) A procedure which reduces, but does not completely eliminate, a nonconformance. Repair is distinguished from rework in that the characteristic after repair still does not completely conform to the applicable drawings, specifications, or contract requirements. Refer to MIL-HDBK-61A.
Repair Time	The part of maintenance time taken to conduct the repair action comprising of fault localization, fault correction and functional check but excludes technical administration and logistic delay. Refer to IEC 60050-191.
Repairable item	Any part or assembly which, upon failure or malfunction, is intended to be repaired or reworked. Refer to MIL-HDBK-61A.
Replacement item	One which is interchangeable with another item, but which differs physically from the original item in that the installation of the replacement item requires operations such as drilling, reaming, cutting, filing, shimming, etc, in addition to the normal application and methods of attachment. Refer to MIL-HDBK-61A.
Required time	The time interval for which the user requires the item to be in an up state (available). Refer to IEC 60050-191.
Routine inspection	Line maintenance of a Product. eg, on an aircraft: Daily- pre-flight, turnaround-/transit-, post-flight inspections. Refer to S4000P.

Term	Definition
Safety case	A safety case is a reasoned and supported argument, one way of documenting and providing assurance to the stakeholders that a system is acceptably safe. A safety case generally consists of the argument, usually based upon following a particular safety standard, and the supporting evidence, such as is summarized in or referenced by the hazard log. Refer to DEF STAN 00-56.
Safety Case	A safety case is a structured argument, supported by a body of evidence, that provides a compelling, comprehensible and valid case that a system is safe for a given application in a given environment. Refer to DEF STAN 00-56.
Scheduled maintenance interval	The (minimum) number of operational units (eg, rounds, miles, hours, etc) between scheduled maintenance
Self-diagnose	The ability to detect, react to and highlight an anomaly; where the anomaly could lead to a failure or a failure to perform as defined.
Self-checking	Built-in capability for detecting errors in its own function. Refer to IEC 60050-191.
Self-testing	Built-in test capability for assessing internal system status. Refer to IEC 60050-191.
Serial number	An identifying number consisting of alpha numeric characters which is assigned sequentially in the order of manufacture or final test and which, in conjunction with a manufacturer's identifying CAGE code, uniquely identifies a single item within a group of similar items identified by a common system-tracking base-identifier. Refer to MIL-HDBK-61A.
Serialized item	Item that has been allocated an individual identifier by the OEM and/or end user so as to be able to track its individual life, status, condition and location.
Service Level Agreement (SLA)	A contract for the provision of a service that establishes a defined measure of the response time or level of service expected from the service provider.
Servicing	Any act of lubricating or any other servicing tasks like eg, washing, replenishment of consumables, etc, for the purpose of maintaining inherent design capabilities. Refer to S4000P.
Sharable Content Object Reference Model (SCORM)	SCORM is a standard format that different authoring applications use to format content in such a way that the content can easily be imported into a learning management system.
Shop Loadable Software	Software that can be loaded into an LRU but requires the target LRU to be dismounted from where in the system it is located. Refer to S3000L.
Software	Computer programs and, possibly, associated documentation and data pertaining to the operation of a computer system. Refer to RTCA DO-178B.
Standby time	The time interval for which a standby (non-operating time) exists. Refer to IEC 60050-191.

Term	Definition
Status record	A record which describes an item at a given moment in time.
Support equipment	Equipment and computer software required to maintain, test, or operate a system or facility in its intended environment. Refer to MIL-HDBK-61A.
System Configuration Documentation	A CI's detail design documentation including those verifications necessary for accepting system deliveries (first article and acceptance inspections.) Based on program production/ procurement strategies, the design information contained in the system configuration documentation can be as simple as identifying a specific part number or as complex as full design disclosure. Refer to MIL-HDBK-61A.
System Effectiveness	The probability that the system can successfully meet an operational demand within a given time when operated under specific conditions. Refer to IEC 60050-191.
Task personnel resource labor time	Time expended within a task/subtask per required human resource.
Task total labor time	Total time expended within a task. Includes the labor time for all required personnel resources.
Technical data	Technical data is recorded information (regardless of the form or method of recording) of a scientific or technical nature (including computer software documentation.) Refer to MIL-HDBK-61A.
Technical data package (TDP)	A technical description of an item adequate for supporting an acquisition strategy, production, engineering, and logistics support. The description defines the required design configuration and procedures required to ensure adequacy of item performance. It consists of all applicable technical data such as drawings and associated lists, specifications, standards, performance requirements, quality assurance provisions, and packaging details. Refer to MIL-HDBK-61A.
Technical delay	Accumulative time necessary to perform auxiliary technical actions associated with but not part of the maintenance action. Refer to IEC 60050-191.
Test	Procedure carried out to determine or verify one or more characteristics. Refer to IEC 60050-191.
Testability	Degree to which an item facilitates the establishment of test criteria and the performance of tests. Refer to IEC 60050-191.
Total Ownership Cost (TOC)	All elements that are part of LCC plus the indirect, fixed, linked costs. These latter can include items such as common support equipment, common facilities, personnel required for unit command, administration, supervision, operations planning and control, fuel and munitions handling. (NATO)
Training equipment	Items used in the support of training, such as trainers, operational equipment, and other associated hardware. Refer to MIL-HDBK-61A.
Troubleshooting	Troubleshooting consists of localizing failed replaceable units when this is not obvious or previously done by other means. Troubleshooting is carried out after a failure has been detected. Refer to S3000L.
Unexpected behavior	System behavior which is neither desired by the system designer nor by the system user, but which however cannot be qualified as non-compliant.

Term	Definition
Use Case	A description of a system's behavior as it responds to a request that originates from outside of that system. In other words, a use case describes who can do what with the system in question. The use case technique is used to capture a system's behavioral requirements by detailing scenario-driven threads through the functional requirements.
Useful Life	Under given conditions, the time interval beginning at a given instant of time and ending when the failure intensity becomes unacceptable or when the item is considered un-repairable as a result of a fault. Refer to IEC 60050-191.
Warranty	A warranty is an expressed or implied promise from the seller that certain facts about the items or services being sold are true and that a compensation will be provided if this proves to be not correct.
Whole Life Cost (WLC)	All elements that are part of TOC plus indirect, fixed, non-linked costs. These latter can include items such as family housing, medical services, ceremonial units, basic training, headquarters and staff, academies, recruiters. In WLC all costs or expenses that are made by the organization are attributed to the systems or Products they produce. (NATO)

4 Abbreviations and acronyms

Table 3 Abbreviations and acronyms

Abbreviation	Definition
A/C	Aircraft
AD	Airworthiness Directive
ADR	Alternative Dispute Resolution
AIA	Aerospace Industries Association
AOG	Aircraft On Ground
ARMP	Allied Reliability and Maintainability Publication
ASD	AeroSpace and Defence Industries Association of Europe
ATA	Air Transport Association
ATE	Automatic Test Equipment
BEI	Breakdown Element Identifier
BIT	Built-In Test
BITE	Built-In Test Equipment
BOM	Business Object Model
CAA	Civil Aviation Authority (UK)
CAD	Computer-Aided Design
CAMO	Continuous Airworthiness Management Organization

Abbreviation	Definition
C-BIT	Continuous Built-In Test
CBS	Cost Breakdown Structure
CDM	Common Data Model
CHAP	Chapter
CI	Configuration Item
COTS	Commercial Of The Shelf
CRM	Customer Relationship Management
D/L	Depot Level – also called ML3
DB	Database
DEX	Data EXchange specification
DGAC-F	French Direction Générale de l'Aviation Civile
DIN	Deutsches Institut für Normung e.V.
DIR	Dispatch Interruption Rate
DMC	Direct Maintenance Cost
DMEWG	Data Modelling and Exchange Working Group
DOD	Department Of Defense (USA)
EASA	European Aviation Safety Agency
EBS	Equipment Breakdown Structure
ECCAIRS	European Co-ordination Centre for Accident and Incident Reporting Systems
EOSL	End Of Service Life
EN	European Norm
ERC	Engineering Record Card
ESG	Elektoniksystem- und Logistik-GmbH
ETOPS	Extended-range Twin-engine Operational Performance Standards
FAA	Federal Aviation Authority (USA)
FFR	Flight Fault Report
FMECA	Failure Mode Effect Criticality Analysis
GCBS	Generic Cost Breakdown Structure
GFF	Government Furnished Facilities
GFI	Government Furnished Information
HMD	Health Monitoring Data
HUMS	Health and Usage Monitoring System

Abbreviation	Definition
HW	Hardware
I/L	Intermediate Level – also called ML2
I-BIT	Initiated Built-In Test
ICD	Interface Control Document
ICOR	Input, Control, Output, Resource
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IETP	Interactive Electronic Technical Publication
IFM	Integrated Fleet Management
IPS	Integrated Product Support
ISMO	In-Service Maintenance Optimization
ISO	International Organization for Standardization
KPI	Key Progress Indicator
LCC	Life Cycle Cost
LRI	Liner Replaceable Item
LRU	Line Replaceable Unit
LSA	Logistics Support Analysis
LSAR	Logistics Support Analysis Report
LTB	Last Time Buy
MC	Maintenance Cost
MDT	Mean Down Time
ML	Maintenance Level
ML2	Intermediate Level – also called I/L
ML3	Depot Level – also called D/L
MMH	Mean Man-Hours
MMS	Maintenance Management System
MoD	Ministry of Defence (UK)
MRBR	Maintenance Review Board Report
MRO	Maintenance, Repair and Overhaul
MRT	Mean Repair Time
MTBF	Mean Time Between Failures
MTBUR	Mean Time Between Unscheduled Removal

Abbreviation	Definition
MTTR	Mean Time To Repair
NATO	North Atlantic Treaty Organization
NFF	No Fault Found
NSN	National Stock Number / NATO Stock Number
O/L	Organizational Level - also called ML1
OASIS	Organization for the Advancement of Structured Information Standards
OBS	Organizational Breakdown Structure
OCM	Original Component Manufacturer
OEM	Original Equipment Manufacturer
OMP	Obsolescence Management Plan
P/N	Part Number
PARA	Paragraph
P-BIT	Power-on Built-In Test
PBL	Performance-Based Logistics
PCA	Physical Configuration Audit
PDF	Portable Document Format
PDM	Product Data Management
PHST	Packaging, Handling, Storage and Transportation
PIREP	Pilot Report
PLCS	Product Life-Cycle Support Refer to ISO 10303-239.
PLM	Product Life-cycle Management
PM	Product Manufacturer
PMA	Product Maintainer
POL	Petroleum, Oil and Lubricants
PSM	Platform Specific Model
RAMCT	Reliability, Availability, Maintainability, Capability and Testability
RBS	Readiness Based Sparing
RMT	Reliability, Availability and Maintainability
RNAV	Area Navigation, Random navigation
RTCA	Radio Technical Commission for Aeronautics
S/N	Serial Number
SB	Service Bulletin

Abbreviation	Definition
SCM	Supply Chain Management
SCORM	Sharable Content Object Reference Model
SE	Support Equipment
SHM	Structural Health Monitoring
SLA	Service Level Agreement
SM	Specific Means
SMR	Source, Maintenance and Recoverability
SMS	Safety Management System
SRU	Shop Replaceable Unit
SSG	Symbolic Stream Generator
STANAG	Standardization Agreement
STEP	STandard for the Exchange of Product model data
SW	Software
TAT	Turn Around Time
TDP	Technical Data Package
TIR	Technical Investigation Report
TOC	Total Ownership Cost
UK	United Kingdom
UML	Unified Modeling Language
UOF	Unit Of Functionality
WBS	Work Breakdown Structure
WLC	Whole Life Cost
XML	EXtended Mark-up Language