

International specification for Integrated Product Support (IPS)

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S-Series IPS specifications
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Highlights

This issue includes updates to the Copyright, user agreement and special usage rights only. There have been no technical changes in this issue. The highlights below are those of the 2021 Block Release.

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Chap 2	IPS framework
Chap 3	Use of the S-Series specifications in an IPS program
Chap 7	Data management
Chap 9	IPS program data model
Chap 10	IPS program data elements
Chap 11	Terms, abbreviations and acronyms
SX000H	Harmonized Suite of the S-Series Integrated Product Support (IPS) specifications

Table 2 [Chap 1](#)

Para	Summary of changes
1.2	- Added new Para 1.2 - Harmonization - Added reference to SX000H - Harmonized Suite of the S-Series Integrated Product Support (IPS) specifications

Table 3 [Chap 2](#)

Para	Summary of changes
All	Only editorial changes for better comprehension.

Table 4 [Chap 3](#)

Para	Summary of changes
All	Editorial changes for better comprehension.

Table 5 [Chap 7](#)

Para	Summary of changes
All	New chapter (Data management)

Table 6 [Chap 9](#)

Para	Summary of changes
All	Updated data model for compliance with SX002D Issue 2.1
All	UoF paragraphs renumbered due to replacement of former SX000i UoFs by new ones from SX002D Issue 2.1.
3	Created Location Information functional area to group Location-related information.
5.2	Replaced SX000i UoF Location by new CDM UoF Location from SX002D Issue 2.1.
5.2	Replaced SX000i UoF Location by updated CDM UoF Location as defined in SX002D Issue 2.1.
5.4	Replaced SX000i UoF Product Usage Phase by new SX000i UoF Product Usage Phase from SX002D Issue 2.1.
5.5	Added new CDM UoF Resource Specification from SX002D Issue 2.1.
5.6	Added Project to the ActionContextItem <<select>> interface in SX000i UoF Action tracking
5.17	DocumentRelationship <<relationship>> class deleted in SX000i UoF Document because it is a duplication of ReferencedDocument .
5.18	Modified SX000i UoF Environment Definition Item, correcting typo in EnvironmentDefinitionCharacteristic class name and two of its attributes.
5.22	Modified SX000i UoF Facility to use new classes as defined in CDM Facility from SX002D Issue 2.1. Replace also ResourceSpecification by ResourceSpecificationRevision in diagram.
5.25	Modified SX000i UoF Infrastructure to adjust to new CDM UoF Resource Specification SX002D Issue 2.1.
5.34	Replaced classes in SX000i UoF Mission Definition by those defined in the new CDM UoF Mission Definition from SX002D Issue 2.1.
5.35	Replaced classes in SX000i UoF Capability Definition by those from new CDM UoF Capability Definition from SX002D Issue 2.1.
5.35	Removed LocationItem <<select>> interface from SX000i UoF Operating Base because this inherited from the Facility <<class>> in the CDM.

Applicable to: All

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Para	Summary of changes
5.43	Party Extensions UoF diagram is renamed as Party Selects UoF diagram, for consistency with its contents.
5.44	Replaced classes in SX000i UoF Performance Parameter by those defined in new CDM UoF Performance Parameter as defined in SX002D Issue 2.1. Added also Project to the PerformanceparameterItem <<extend>> interface.
5.46	Added Project to the PlannedItem <<extend>> interface in SX000i UoF Planning.
5.58	Modified SX000i UoF Requirement, SX000i UoF Mission Definition and SX000i UoF Operational Roles, to use <<class>> CapabilityDefinitionRevision instead of CapabilityDefinition
5.64	Added Fleet to the SX000i UoF Supported Item IPSConceptRequiringItem <<extend>> interface.

Table 7 [Chap 10](#)

Para	Summary of changes
All	Updated class names, attribute names and stereotypes with new style format. So as to align with new authoring guidelines
2	Updated class definitions in accordance with SX001G Issue 2.1.
3	Updated attribute definitions in accordance with SX001G Issue 2.1
4	Updated list of valid values to align with new valid values defined in SX001G Issue 2.1
5	Updated list of library descriptions to align with new authoring guidelines

Table 8 [Chap 11](#)

Para	Summary of changes
All	Updated definitions to align with those of the Terminology Working Group and SX001G.

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Chap 5	IPS activities for each life cycle phase contract type	SX000i-A-05-00-0000-00A-040A-A	All
Chap 6	Support system design effectiveness	SX000i-A-06-00-0000-00A-040A-A	All
Chap 7	Data management	SX000i-A-07-00-0000-00A-040A-A	All
Chap 8	Tailoring and contracting against SX000i	SX000i-A-08-00-0000-00A-040A-A	All
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Chapter 1

Introduction

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Chap 9	IPS program data model

Applicable to: All

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Chap 1

Chap No./Document No.	Title
Chap 10	Data element list
Chap 11	Terms, abbreviations and acronyms
Chap 12	Comparison of specification terminology
S1000D	International specification for technical publications using a common source database
SX000H	Harmonized Suite of the S-Series Integrated Product Support (IPS) Specifications
ILSC-2018-001	Governance of the S-Series Specifications
ISO 10303-239	Product Life Cycle Support (PLCS)

1 General

SX000i provides information, guidance and instructions to ensure compatibility and the commonality of Integrated Product Support (IPS) processes among the suite of S-Series IPS specifications jointly developed by the AeroSpace and Defence Industries Association of Europe (ASD) and the Aerospace Industries Association of America (AIA).

1.1 Background

Over the past 20 years, the international aerospace and defense community has invested considerable effort in the development of specifications in the field of IPS. The work was accomplished by integrated Working Groups (WG) composed of industry and customer organizations in a collaborative environment. Working group participants included representatives from national ministries and departments of defense from Europe and the United States. Aerospace and defense associations provided guidance and supported the work as required. The structure and functional coverage of these specifications was largely determined by North Atlantic Treaty Organization (NATO) requirements specified during an international workshop in Paris in 1993.

Beginning in 2003, the relationships between supporting industry organizations were formalized through a series of Memoranda of Understanding (MOU). Initially, AIA and ASD signed an MOU to jointly develop and maintain S1000D (International specification for technical publications using a common source database). In 2007, AIA, ASD and the Air Transport Association of America (ATA) signed a new MOU expanding S1000D development and maintenance to cover commercial aviation.

In 2010, AIA and ASD signed an MOU “to promote a common, interoperable, international suite of Integrated Logistics Support (ILS) specifications” and jointly develop, what was originally, the ASD suite of S-Series ILS specifications (later renamed to S-Series IPS specifications).

The 2010 AIA/ASD MOU authorized the formation of an ILS specifications Council (now IPS Council) with members from AIA and ASD. The Council’s tasks include liaising between AIA and ASD, developing and maintaining the S-Series IPS specifications, administering joint meetings, and identifying additional areas of harmonization. Multiple IPS specifications are currently available or are in the process of development, including those listed in [Table 1](#).

The development of the initial draft specifications is managed by WGs operating under the supervision of the IPS specification Council. Once approved for release, a specification’s maintenance and future development is guided by a Steering Committee (SC), which also operates under guidance of the IPS Specification Council.

Development and maintenance of S1000D is accomplished through a separate ASD/AIA/ATA S1000D Council. Representatives from the S1000D Council and S1000D SC participate on the IPS Council as observers in order to achieve harmonization between S1000D and other specifications from the S-Series IPS specifications.

1.2 Harmonization

In 2021, the S-Series Integrated Product Support (IPS) Council decided to harmonize all 14 of the S-Series IPS specifications. To achieve this, an overarching handbook has been developed that brings all the specifications together in an integrated manner. The issue date for SX000H and all the S-Series IPS specifications was 2021-04-30. Refer to SX000H.

1.3 Vision for the S-Series IPS specifications

The vision for the S-Series IPS specifications is that all stakeholders will be able to apply common Product support processes to enable the sharing and exchange of data securely through the life of Products and services.

1.4 Objectives of the S-Series IPS specifications

The objective for the S-Series IPS specifications will be achieved by establishing and adopting a coherent set of global IPS specifications, which will accomplish the following objectives:

- establish a common understanding of IPS and its global processes that integrate all the necessary elements and resources throughout the whole Product life cycle
- optimize the life cycle cost and performance of the Product and its support system
- respond quickly to initial and changing requirements, to further optimize processes, improve data quality and drive out unnecessary costs, by identifying the most appropriate solutions and their integration
- enable collaboration between customers and industry through the simplification of electronic information exchange

1.5 Value proposition for using the S-Series IPS specifications

It is evident that the use of specifications provides added value. The S-Series IPS specifications are intended to bring value not only at individual specification level, but also through the combined application of the specifications.

The S-Series IPS specifications are globally accepted because:

- it is industry and customer driven, hence focused on results
- it includes a broad range of customer stakeholders to ensure suitability
- it is integrated and interoperable
- it is internationally developed by the US and Europe

It reduces the set-up costs of projects and associated IT tools by:

- minimizing project dependency by defining clear guidance and by avoiding the inclusion of project and national specific rules and constructs
- ensuring commonality between the IPS related specifications to support re-use across projects
- sharing a common core data model, which ensures the specifications' interoperability
- establishing well defined data exchange mechanisms between the different support disciplines/IPS elements based on ISO 10303-239 Product Life Cycle Support (PLCS)
- preventing tool lock-in and not requiring partners/customers to procure proprietary tools
- enabling the establishment of organic and Performance Based Logistics (PBL) and other support contracts

It is global and reduces project complexity by:

- covering all aspects of supportability over the entire life cycle of a Product.

- being the contractual baseline for industry and customers
- being a single solution for Product support data (buy in)
- providing a standard approach to Product Lifecycle data (repeatable)
- enabling seamless global knowledge exchange (collaboration)
- providing a common architecture and data model (common attributes/elements)
- supporting the common theme of Trust and Efficiency

It guarantees being future proof by:

- being up to date with the technical development and changes in support philosophy
- building on the ISO 10303-239 PLCS specification
- supporting the LOng-Term Archiving and Retrieval (LOTAR) strategy for long-term archiving
- not trying to "re-invent the wheel" but by collaborating with other standardization groups to ensure specification interoperability with other domains (eg, engineering, manufacturing, trade, environmental policy, etc)

2 Introduction to SX000i

During the development of the S-Series IPS specifications, the different WGs identified the need for a top-level specification that would ensure compatibility and commonality of IPS processes among those specifications. In 2011, the decision was made to develop, publish and maintain an ILS Guide that would provide a common ILS process for use in the other ILS specifications. Development of SX000i was viewed by the ILS Council as an essential step to achieving the vision for the S-Series IPS specifications.

In June of 2011, the SX000i WG was formed and SX000i development commenced. The original title of SX000i, (International guide for the use of the S-Series Integrated Logistics Support (ILS) specifications), was approved by the ILS Council in June of 2012. The current title of SX000i, (International specification for Integrated Product Support (IPS) specifications), was approved by the IPS Council in April 2019.

A first issue of SX000i was published in December 2015. Successive issues were published in July 2016 (Issue 1.1) and July 2018 (Issue 1.2).

Following the formation of the SX000i WG, the ASD/AIA Data Model and Exchange Working Group (DMEWG) was formed by the ILS Council in October 2011. Working in close coordination with the SX000i WG, the DMEWG coordinates the data modeling activities that are performed within the IPS specification SCs committees and WGs, so that data requirements are harmonized and consolidated into one coherent data model.

Publication of SX000i, and continuing DMEWG coordination activities, enable the achievement of the vision for the S-Series IPS specifications, namely, to apply common Product support processes to enable the sharing and exchange of data securely through the life of Products and services.

2.1 Purpose of SX000i

SX000i provides a guide for the use of the S-Series IPS specifications by IPS managers and practitioners, as well as for the management and future development of the specifications by the IPS Council and IPS specification SCs and WGs. This purpose is achieved by:

- explaining the vision and objectives for the S-Series IPS specifications
- providing a framework that documents the global IPS process and interactions
- explaining how the S-Series IPS specifications interface with other standardization domains including:
 - project management
 - global supply chain management

- engineering
 - manufacturing
 - security
 - safety
 - configuration Management
 - quality
 - data Exchange & Integration
 - life Cycle Cost
- providing guidance on how to satisfy specific business requirements using an appropriate selection of defined processes and specifications, as well as how to carry out an IPS program
 - providing guidelines on contracting for integrated product support, and in particular contracting against SX000i and the rest of the S-Series IPS specifications
 - delivering a data model and a set of data elements together with the associated XML schema that can be used to exchange IPS-level information between the stakeholders of the different IPS elements and associated domains

2.2 Scope

Using a global IPS framework, SX000i describes the synchronization and management of IPS processes. Based on existing ILS and IPS handbooks and standards, SX000i makes maximum use of lessons learned from current projects and Products. Specifically, SX000i:

- defines global requirements for common IPS interfaces for the S-Series IPS specifications.

Note

The activity model and information exchange capabilities provided by ISO 10303-239 and other ISO and EN baseline documents were considered in the development of SX000i.

- provides guidance on tailoring the global IPS framework and the selection of the IPS specifications to satisfy specific business requirements for a particular customer or Product.
- provides global governance and an integrated configuration management framework for the development and maintenance of the S-Series IPS specifications for use by the IPS Council and the specification SCs and WGs.

2.3 Intended use

The application of the S-Series IPS specifications provides guidance for the required management activities and criteria for tailoring and customizing. It also provides guidance on the policy, implementation and responsibilities for the application of the S-Series IPS specifications. It does not specify the use of specific tools, but establishes the essential information required to initiate, maintain and schedule the IPS activities, that apply through the entire Product life cycle, as well as the necessary deliverables.

SX000i is intended to:

- be a starting point for any potential users or new projects that would want to use the S-Series IPS specifications
- be an overview and coordinating document for all members of the international IPS community, engaged in the use and development of the S-Series IPS specifications on existing projects
- provide guidelines for the execution of an IPS project
- define and allow the exchange of the IPS-level data that needs to be shared among different IPS elements and domains.

2.4 Target audience

2.4.1 Contractors

SX000i can be used by prime contractors, original equipment manufacturers, and suppliers as a reference for initially establishing their Product support strategies and plans and selecting specifications to support those plans. SX000i can also be used to evaluate existing Product support strategies and projects.

2.4.2 Customers

SX000i can be used by customers to determine support requirements for new Products they are acquiring, or fielded Products for which they are seeking support, and to identify IPS specifications to be cited in solicitations.

2.4.3 IPS Council

The IPS Council uses SX000i to promote a commonality and interoperability among the S-Series IPS specifications.

2.4.4 IPS specification SCs and WGs

SCs and WGs developing specifications use SX000i as a basis for describing relationships and interfaces between the IPS elements that their specification covers and:

- the other integrated Product support elements
- the standardization domains

SCs use SX000i to ensure the compatibility of their specification with the other IPS specifications.

The DMEWG uses SX000i to harmonize and consolidate data requirements into one coherent data model supporting all the IPS specifications.

The SCs and WGs both use SX000i to ensure compliance with IPS Council governance requirements.

2.5 How to use SX000i

SX000i is organized into twelve chapters. A general description of each chapter is given below. Also described is how specific SX000i chapters and paragraphs can be used in new Product development, existing system, or Product support, and IPS specification development and maintenance.

2.5.1 Using SX000i in Product support activities

SX000i was developed for three primary applications:

- new Product development
- support of existing Products
- coordination between different S-Series IPS specifications for their common use

2.5.2 Use of the chapters

Each chapter in SX000i deals with these three primary applications in different ways.

2.5.2.1 Chapter 1 (Introduction)

[Chap 1](#) provides background information on the S-Series IPS specifications and SX000i.

SX000i supports for new Product development by providing guidance on defining requirements for, or developing a Product support strategy, for organizations that are acquiring new Products or developing new Products.

It supports existing Products by enabling prime contractors, original equipment manufacturers, suppliers and customers seeking to evaluate their current Product support strategies and projects can use SX000i as a Product support baseline.

2.5.2.2 Chapter 2 (Integrated product support framework)

[Chap 2](#) documents a global IPS process and interactions at the IPS element level. This chapter establishes the foundation for the remainder of SX000i chapters and all the S-Series IPS specifications.

It supports new Product development by:

- describing the life cycle phases of a Product, the standardization domains associated with Product development and support, and the roles and responsibilities of the various stakeholders involved in Product development and support
- providing an overview and an examination of IPS throughout a Product's life cycle, the role of IPS in the systems engineering process and identification of the IPS elements
- providing a global IPS process including a description of each IPS element and of the information exchanges among the IPS elements. Guidance is also provided on how to tailor the global IPS process to support specific business requirements.

It supports existing Products by defining the specific elements that an effective Product support strategy including their interrelationships with each other and the standardization domains.

It coordinates all the S-Series IPS specifications for their common use by providing a global process that clearly defines the touch points between the different specifications and the deliverables that each individual activity provides.

2.5.2.3 Chapter 3 (Use of the S-Series IPS specifications in an IPS project)

[Chap 3](#) explains how the S-Series IPS specifications relate to the global IPS process and elements, and how to use them as part of an IPS project.

It supports new Product development by:

- identifying the S-Series IPS specifications supporting the global IPS process by a mapping to specific IPS elements, as well as the interface between the IPS specifications and the other standardization domains. It also provides a detailed mapping between the specifications and the IPS elements and activities described in [Chap 2](#).
- providing guidance on selecting the appropriate S-Series IPS specifications using specific criteria such as specification issue number, interoperability, customer requirements, business requirements, and tools required. It also describes the considerations for implementing the S-Series IPS specifications including organizational structure, personnel, skills, tool validation, data exchange methods, criteria for data integration, as well as criteria for the establishment of the necessary IT infrastructure.

It supports existing Products by associating the S-Series IPS specifications with each global IPS process element. Each specification can be used for a detailed evaluation of the specific IPS elements with which the specification is associated.

It coordinates all the S-Series IPS specifications for their common use by identifying the S-Series IPS specifications that detail the processes for performing the individual activities, thus enabling any individual specification to identify their touch points and the interaction with other specifications.

2.5.2.4 Chapter 4 (IPS program guidance)

[Chap 4](#) documents and explains how to carry out an IPS program to develop, enable, and execute a sustainment strategy that will deliver optimum operational readiness, consistent with Stakeholder requirements, at a best value cost throughout the Product life cycle.

It supports new Product development and existing Products by providing the guidelines for managing an IPS program throughout the support life.

It coordinates the different S-Series IPS specifications for their common use by providing guidance on managing a global program in which the different specifications are involved.

- 2.5.2.5 Chapter 5 (IPS activities for each life cycle stage-contract type)
[Chap 5](#) identifies the IPS activities that are recommended to be performed along the different life-cycle phases of a Product and for different contract types.
- It supports new Product development and existing Products by providing guidelines on performing the activities during the support phase and the whole lifecycle and any required necessary tailoring.
- It coordinates all the S-Series IPS specifications for their common use by providing guidelines for when the different specification activities are performed during the different lifecycle phases, and the depth to which the activity should be exercises.
- 2.5.2.6 Chapter 6 (Support system effectiveness)
[Chap 6](#) provides guidance for the definition of a set of Measures Of Effectiveness (MOE) related to the support system. The list suggested in this chapter is not exhaustive but provides the framework to be adapted for the specifics of each individual program.
- It supports new Product development and existing Products by recommending metrics used to measure the overall support system effectiveness.
- It coordinates all the S-Series IPS specifications for their common use by providing reference metrics that can be used to measure the efficiency with which the different specifications work together.
- 2.5.2.7 Chapter 7 (Data management)
[Chap 7](#) provides an approach to manage the data dimension of IPS and addresses automation, standardization, data quality, contractual matters, and the control of data within the information technology system.
- 2.5.2.8 Chapter 8 (Tailoring and contracting against SX000i)
[Chap 8](#) provides guidelines on writing effective contractual statements in order to contract against the SX000i specification.
- It supports new Product development by providing guidelines on contracting against IPS and SX000i in particular. It also provides recommendations on tailoring the specification to specific contractual needs.
- It supports existing Products by providing guidelines on revisiting existing contracts in the scope of a support environment.
- It coordinates all the S-Series IPS specifications for their common use by providing the global guidelines on contracting jointly for several specifications.
- 2.5.2.9 Chapter 9 (IPS Program data model)
[Chap 9](#) defines a coherent data model for the data that can be exchanged as part of an IPS program with the different IPS elements, domains and associated stakeholders.
- It supports new Product development and existing Products by providing reference data for consideration, when determining the scope of a support contract.
- It coordinates all the S-Series IPS specifications for their common use by providing reference data that can be shared between different specifications.
- 2.5.2.10 Chapter 10 (IPS program data elements)
[Chap 10](#) provides a full list of all the classes, data elements and valid values defined by SX000i in its data model, including their individual descriptions and locations.
- It supports new Product development and existing Products by providing detailed lists of all electronic data that can be exchanged as part of a support program and expanding or reducing the data set, as necessary.

It coordinates all the S-Series IPS specifications for their common use by providing a detailed listing of all electronic data that can be exchanged as part of a support program, in order to assess specific needs of the different specifications.

2.5.2.11 Chapter 11 (Terms, abbreviations and acronyms)
[Chap 11](#) provides the definition of the main terms used in this specification, as well as a list of all the abbreviations and acronyms.

2.5.2.12 Chapter 12 (Comparison of specification terminology)
[Chap 12](#) provides a comparison of the terms, life cycle phases and IPS elements between SX000i and other international and military specifications, to enable users to better understand the underlying concepts.

It supports for new Product development by providing a matrix that:

- shows how the SX000i Product life cycle phases compare with other international life cycle approaches
- compares the SX000i IPS elements to other international ILS/IPS element approaches

It supports existing Products by providing a matrix showing how the terminology used in SX000i compared with that of other specifications.

It coordinates all the S-Series IPS specifications for their common use by providing a matrix showing the comparison between the terminology used in SX000i and those in other specifications.

3 Maintenance of SX000i

SX000i is maintained by the SX000i SC operating under the supervision of the IPS Council. Both the SX000i SC and the IPS Council include representatives from AIA and ASD member companies and nations.

Technical issues related to SX000i can be raised using the change request application located at www.sx000i.org/CPF. Technical issues can, in due course, become a Change Proposal (CP), both of which should be submitted with the understanding that any revisions to SX000i can affect one or more of the other S-Series IPS specifications, and that proposed changes are subject to international agreement from AIA and ASD member companies and nations.

Upon receipt of a CP, the SX000i SC will follow the change management process described in ILSC-2018-001, that includes obtaining an agreement from the participating organizations prior to the publication of changes. The SX000i SC considers CPs at each meeting and ratifies them for incorporation in the specification or otherwise. The SX000i SC also decides when changes will be published in SX000i.

4 Development of SX000i

SX000i could not have been developed without the contribution of a great number of AIA and ASD member companies and customer organizations. Their support and contribution, as well as that of the members that have represented them, is gratefully acknowledged.

The companies/organizations that have contributed to the development and publication of SX000i are (in alphabetic order):

- Airbus (France)
- Airbus Defence and Space (Germany & Spain)
- Boeing Defense Systems (USA)
- Bundeswehr (Germany)
- ESG Elektroniksystem und Logistik GmbH (Germany)
- FACC Operations GmbH (Austria)

-
- Department of National Defence (Canada)
 - HEME GmbH (Germany)
 - Leonardo (Italy)
 - Lockheed Martin (USA)
 - O'Neil & Associates Inc (USA)
 - OCCAR-EA (European)
 - Rockwell Collins (USA)
 - Saab (Sweden)
 - Schiebel (Austria)
 - Turkish Aerospace Industries - TAI (Turkey)
 - UK MoD (UK)

Chapter 2

IPS framework

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Table 1 References

Chap No./Document No.	Title
Chap 3	Use of the S-Series IPS specifications in an IPS program
Chap 8	Tailoring and contracting against SX000i
Chap 11	Terms, abbreviations and acronyms
S2000M	International specification for material management - Integrated data processing
Chap 12	Comparison of specification terminology
S3000L	International procedure specification for Logistics Support Analysis (LSA)
ISO/IEC 15288	Systems and software engineering - System life cycle processes
INCOSE-TP-2003-002-03	Systems Engineering Handbook: A Guide for System Life Cycle Processes and Activities
NASA/SP-2007-6105	NASA Systems Engineering Handbook

1 Introduction

1.1 Purpose

The purpose of this chapter is to establish a common understanding of Integrated Product Support (IPS) and to define a common and generic IPS process throughout the life cycle of the Product.

This generic IPS process is the basis for the use and the benefits of the S-Series IPS specifications. Refer to [Chap 3](#).

1.2 Scope

The IPS process is based on best practices used throughout world-wide Product support processes, handbooks and standards and makes maximum use of lessons learned from current systems. It is not the intention of this chapter to develop a new IPS process.

This chapter gives an overview of the

- Product life cycle
- Interface between systems engineering and IPS processes
- IPS elements
- Inputs and outputs of the IPS activities.

The IPS process in this chapter is generic and described to the level of detail necessary to be able to apply the S-Series IPS specifications to it.

2 Product life cycle overview

2.1 Product life cycle phases

Every Product has a life cycle.

The Product life cycle describes the life of a product from beginning to end using a functional model with distinct sequential phases.

These phases provide an organization with a framework for decision gates and ensuring high-level visibility and control of project and technical processes.

At each decision gate, progress into the following phase is decided.

However, usually phases will overlap due to operational or organizational needs.

For example, for a complex Product with different configurations some configurations could be at a development phase while the other ones are still in production and in-service, which would lead to an overlap of three phases.

As depicted in [Chap 12](#), there could be many different Product life cycle models, depending on the organization's approach. For the S-Series Integrated Logistic Support (IPS) Specifications, the following phases are defined and mapped in [Chap 12](#) to other specification models:

- Preparation phase
- Development phase
- Production phase
- In-service phase
- Disposal phase

2.2 Product life cycle domains

A domain is a specialized field of action, thought, influence or area of responsibility that contributes to the design, production, support or operation of a Product through the Product life cycle.

The following domains are considered for the Product life cycle. Their application at each phase of the Product life cycle depends on the complexity of the program and the requirements. These domains are:

- Program management
- Global supply chain
- Engineering
- Manufacturing
- Security
- Safety
- Configuration Management (CM)
- Quality
- IPS.

Refer to [Chap 11](#) for the definitions of these domains.

2.3 Stakeholders and their roles and responsibilities

Throughout the Product life cycle phases, the roles of the different stakeholders must be clearly defined. The target audience for SX000i includes, but is not limited to, OEMs, prime contractors, suppliers and customers. In addition, application vendors are involved in providing the necessary tools for performing the different life cycle activities.

The different roles are:

- Prime contractors
- Subcontractors
- Original Equipment Manufacturer (OEM)
- Suppliers
- Application vendors
- Customers.

Business case and requirements are subject to changes throughout the Product life cycle. The customer needs to manage these changes in coordination with the prime contractor and/or the OEMs.

3 IPS overview

IPS is the management and technical process through which the support activities (eg, supportability and support considerations of material solutions hardware or software) and elements of support are planned, acquired, implemented, tested and provided in a timely and cost-effective manner.

The objective of IPS is to develop the support solution to optimize supportability and life cycle costs while the product meets the required performance, by:

- Designing for support focusing on product designs that minimize operation, maintenance, training, support tasks and Life Cycle Costs (LCC) while optimizing operational readiness
- Developing support for the design, development, funding, and test of all support resources needed to assure optimum performance and readiness of the Product in its intended operational environment and mission profiles
- Acquiring the support to provide the resources required to support the Product for a given period. Ensuring that the physical deliverables of the support solution are in place to meet the Logistic Support Date (LSD) requirements.
- Providing the support from the beginning of the life cycle of the Product until the disposal phase is completed. Ensuring that the physical deliverables of the support solution are adjusted to changing operating requirements and new technologies.

Support, as viewed from a total Product perspective, includes activities throughout each phase of the Product life cycle. Support requirements are applicable in each of the phases of the life cycle of Product identified in [Para 2.1](#). Furthermore, there is an overlap and it is essential that the support requirements be addressed together with the Product development.

The support requirements are initially determined during the early life cycle phases, and the design of the prime mission related elements of the Products must reflect the design for supportability.

3.1 IPS in the Product life cycle

IPS takes place within each of the Product life cycle phases, including preparation, development, production, in-service and disposal phases.

IPS participates within the systems engineering process to ensure that supportability requirements are included within the Product design. IPS considerations ensure cross-functional coordination among the IPS elements and related domains.

The following summary descriptions show some of the major support activities within the life cycle phases.

3.1.1 Preparation phase

During the preparation phase IPS is responsible for the development of a support concept and defining the support requirements.

The support concept defines the strategies and basic support requirements for all future considerations of the Product life and is mainly based on the operational requirements and usage scenarios.

The support concept can include factors for affordability, availability, reliability, maintainability, supportability and testability.

The support concept can also include different support alternatives (eg, transactional, performance based, 2 or 3 level of support) which must be assessed and evaluated in terms of required resources, cost implications and associated risks.

3.1.2 Development phase

Throughout the detailed design and development process, IPS is supporting engineering while considering the support concept objectives. This can include:

- Performance of trade-off studies for supportability
- Participation in the selection of equipment and suppliers
- Making allocations and predictions for availability, reliability, maintainability and testability
- Participation in progressive formal and informal design reviews
- Participation in the test and evaluation of engineering models and prototype equipment

IPS is also responsible for the planning and development of the support system consisting of all IPS elements. Other activities that occur in this phase include the planning and development of key support resources that enable the support of test and evaluation activities and Product deliveries.

3.1.3 Production phase

During the production phase, IPS is responsible for the development of all IPS elements, associated activities and deliverables, including but not limited to:

- Initial training for operating and maintaining the Product
- Technical data and documentation
- Initial provisioning (initial packages of spares and support equipment)
- Maintenance services including mission and test equipment
- Infrastructure and facilities

3.1.4 In-service phase

During this phase, IPS is responsible for:

- Operational and supportability analyses throughout the in-service phase, various feedback data (eg, operational and maintenance data) are collected for:
 - Safety analysis
 - Trend analysis
 - Trade-off analysis
 - Accident/incident investigation
 - Failure/event reporting and corrective actions
- Support services including:
 - Contractual provided support (eg, “Performance Based Logistics” (PBL))
 - Technical documentation updates
 - New and follow-on training
 - Product modifications/upgrades including software
 - Engineering and technical support
 - Obsolescence management
 - Maintenance services and repairs
 - Fleet management
 - Facilities management
- Hardware deliveries including:
 - Spares packages
 - Equipment
 - Consumables

- Support and test equipment
- Training equipment

In cases of modifications/upgrades, the support system must be reviewed to ensure that the support is adapted to the modified/upgraded Product.

3.1.5 Disposal phase

When the decision for retiring the Product from operation is taken, the following tasks must be considered:

- Hardware components must be phased out of the inventory stock
- Items must be disposed of or recycled as appropriate
- Support services and facilities must be decommissioned

Appropriate resources are needed for Product disposal and phase-out as well as respected processes that must be in place for recycling or disposal of the items.

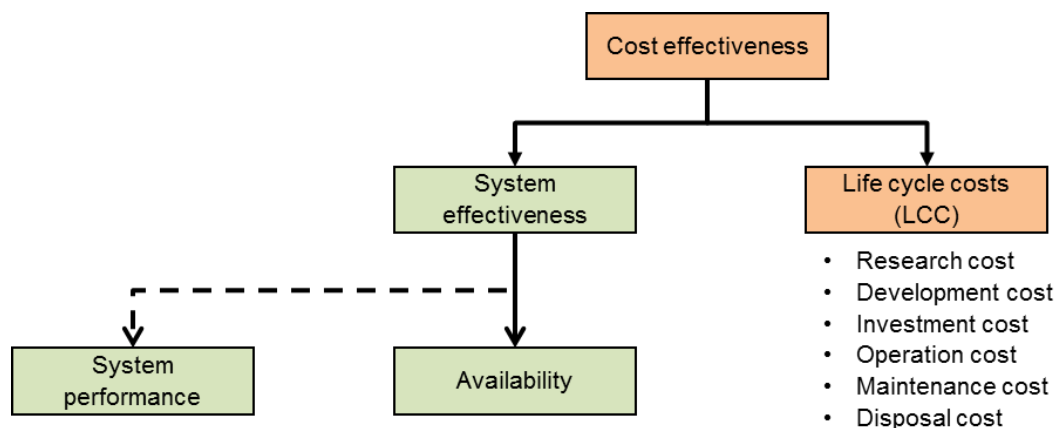
The applicable regulations must be taken in account for the disposal process.

3.2 IPS in the system engineering process

Systems engineering is a structured process for an integrated development and realization of a Product which meets the stakeholder expectations. In order to achieve this goal, the system engineering process must:

- Plan and organize the technical factors of the project
- Consider the total Product including corresponding support as well as the internal and external operational environment
- Analyze the stakeholders' needs:
 - Identify the stakeholders' issues and convert needs and expectations into requirements and measures of effectiveness
 - Develop technical requirements to the extent necessary to enable feasible and economical design solutions
- Evaluate the alternatives, which can satisfy these needs and expectations and select a balanced solution for each Product element as well as a balanced solution for the total Product
- Design and implement the selected solution
- Ensure that the solution meets the stakeholders' requirements

For the purpose of finding the most cost-effective solution, the support activities must be integrated with the systems engineering process to deliver cost effective Product support while the Product meets the required performance.



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Fig 1 Effectiveness - Balancing availability and life cycle costs

The IPS activities and associated support products differ in their extent according to technical complexity, flexibility, cost of the Product, etc.

Depending on the type of Product and the life cycle phase, in some cases, performing the activities of all IPS elements (eg, new development item) or a set of activities to the specific needs (eg, maintain support functions) integrated in the systems engineering process, are necessary.

This tailoring and alignment of support activities to the system engineering process will need to be modified during the Product's life cycle.

The International Standard ISO/IEC 15288, INCOSE-TP-2003-002-03 (SEBoK) and NASA/SP-2007-6105 call the activities that can be performed during the Product's life cycle, a "Product life cycle processes". [Table 2](#) provides a top-level mapping between the life cycle processes and exemplary content of IPS products. This mapping is provided as a resource and should not be interpreted as a substitute for customizing the IPS tasks to the project needs.

Table 2 Interface between system engineering processes and IPS tasks

System engineering process	IPS task/product
Project planning process	Systems Engineering (Management) Plan (SEMP), IPS plan, IPS element plan
Stakeholder requirements definition process	Concept of operations, concept of support, concept of disposal, scenario analysis
Requirements analysis process	Feasibility study, scenario and what-if analysis, IPS requirements, health and safety, Human factors engineering (HFE)/Human Systems Integration (HSI) requirements
Architectural design process	Trade studies, sensitivity analysis, risk analysis, product element requirements, technical performance measures, Life Cycle Cost Analysis (LCCA), preliminary safety and health analysis
Implementation process	Realization of IPS products on elements hierarchy like packaging, training, electronic documentation, supply support procedures and supply chain agreements, LSA, cost-effectiveness analysis, LCCA, safety and health hazards, human factors

System engineering process	IPS task/product
Integration process	Inherent availability, realization of IPS products or total Product like packaging, training, electronic documentation, supply support procedures and supply chain agreements, LSA, cost-effectiveness analysis, LCCA, health and safety hazards, training needs analysis, human factors
Verification process	Verification of support requirements and products according to specification
Transition process	Support products finalized and ready for use
Validation process	Measured availability, verification of support requirements and products according to stakeholder's requirements
Operation process	Operational availability, sustaining service and usage, operational support, sustaining health and safety measures
Maintenance process	Sustaining Product capability, replacement services, support, sustaining health and safety measures
Disposal process	Disposal concept, hazardous material, remaining hazards

3.2.1 Project planning process

The project planning process determines the scope of the project management and activities, identifies process outputs, project tasks and deliverables, establishes schedules for project task conduct including assessment criteria, and required resources to accomplish project tasks. In this process the following two interrelated planning activities must be implemented as a minimum:

- Inclusion of interfaces to the IPS elements in the SEMP. Approval and authorization of the SEMP involves the relevant IPS actors working together with roles such as process owners, chief engineers, project managers, head of design and relevant line managers.
- Inclusion in the IPS plan and specific IPS element plan interfaces to system engineering including "Reliability, Availability, Maintainability and Testability" (RAMT) activities

3.2.2 Stakeholder requirements definition process

The stakeholder requirements definition process delivers the baseline for the Product's development and forms the basis for the technical description of the deliverables, typically at Product level, and defines interfaces at the Product boundaries. The operational and support scenarios of the Product must be analyzed in its intended environment, taking the identification of potential stakeholders and their needs, expectations and constraints throughout the Product's life cycle into account. Requirements can then be identified that were not formally specified by the stakeholder (eg, expected training or protective equipment). The concepts of operation, support and disposal must be established within this process.

3.2.2.1 Requirements analysis

During requirements analysis the stakeholder requirements are transformed into functional, non-functional and performance requirements of the total Product including support requirements. A close collaboration of domains is necessary to provide a complete, practicable and accurate set of requirements. IPS requirements must be addressed from the earliest phases to ensure that they will be satisfied.

3.2.2.2 Architectural design

The architectural design is a creative process, and usually there is no unique solution to satisfying user requirements, especially for complex Products. If Product availability and

operation, cost effectiveness, support functionalities or the in-service processes are affected by the requirements, the support engineer must perform studies and analysis. This involves:

- Establishing design criteria for each IPS element. Typically, the criteria include physical, performance, behavioral, durability and sustainable service characteristics.
- Deciding which Product requirements are related to operators, to consider the limitations of human capabilities, integration of human performance and health and safety of personnel
- Modeling alternative designs, to the appropriate level of detail, so that a comparison between them ensures that the constraints are taken into account in the design and to perform effectiveness assessments, trade-off and risk analyses to determine an optimum design solution

3.2.3 Implementation process

The implementation process designs and manufactures product elements in accordance with the detailed description of the element. This includes identifying IPS products, such as training, electronic publications, computer resources, supply support procedures and supply chain agreements. The implementation planning process starts with the definition of data needs for implementing the IPS products. This includes taking into account analysis data such as failure detection and isolation, operation and maintenance of the Product, health and safety and human factors. Once these are in place, the initial IPS capabilities and products can be prepared. Finally, the implementation provides evidence that the architectural design meets the requirements on the element level and is consistent with legacy and organizational policy. Within this process most of the LSA analyses are performed on Product elements level. Refer to S3000L. With the exception of the requirements processes, this process is likely to most effectively influence the design.

3.2.4 Integration process

The purpose of the integration process is to assemble the product elements towards the total Product and to provide evidence that the total Product will perform the required functionalities expected. To achieve this, the internal and external interfaces must be validated and verified so that the correct flow of information can be confirmed, and the constituent assembly is verified at the total Product level. These tasks include the validation of the Product and support products against the support acceptance criteria established in the requirements analysis process. The integration actions must be analyzed, recorded and reported so that any non-conformances are detected, recorded and reported and corrective and improvement actions recommended.

3.2.5 Verification process

The verification process is closely linked with other life cycle processes where the verification process is implemented. A key outcome of the verification process is the creation of project procedures and processes that specify the forms of support product and element assessments. Verification activities are inspection, analysis, test and certification.

3.2.6 Transition process

The transition process transfers the product and its supporting elements, such as support services, operator and user training and warehousing, from one organization to another. Successful completion of the transition process typically marks the beginning of the in-service phase of the Product's life cycle. As a result, the Product is installed in the operational environment and the requirements are met and all support products and services needed for keeping the Product available are in place.

3.2.7 Validation process

The validation process guarantees that the stakeholder requirements are met and provides the total Product including the related services the right solution to the customer's problem.

3.2.8 Operation process

The operation process provides the Product's usage by assigning personnel for operating the Product and monitoring the performance. This includes operational support (eg, material

consumption, service sustainment/handling activities, etc). The in-service phase accounts for a large portion of the total life cycle costs. Consequently, this phase has performance indicators and measurements to be monitored. If respective parameters are outside the acceptance levels, this can indicate the need for corrective actions. Constraints are reported with the objective to influence future design and specification of similar Products or product elements.

3.2.9 Maintenance process

The maintenance process sustains the Product's capability. It accounts for the Product's availability, is responsible for replacements of product elements and support, maintenance, personnel and analysis, training and staff requirements. It develops the maintenance strategy and maintenance plan for the total Product, plans the storage locations and stock of replacement parts and replacement rate and upgrade frequency. Reporting failures and recommendations for actions, recording maintenance constraints to influence future Product requirements and/or design, and gathering failure and lifetime performance data, is an ongoing task that is required in order to evaluate process performance.

3.2.10 Disposal process

The purpose of the disposal process is to end the existence of a Product. The process represents the interval from withdrawing a Product from operational service to its disassembly to parts and potential destruction. The withdrawal of a Product from operational service will also affect the maintenance and operation support functions provided to the end-user, in such a way that they can be scaled down in a controlled manner. The disposal concept must be reviewed and updated, taking into account hazardous material with the intention of defining the disposal strategy for deactivating and disassembling the Product.

4 IPS process

4.1 Overall IPS process diagram

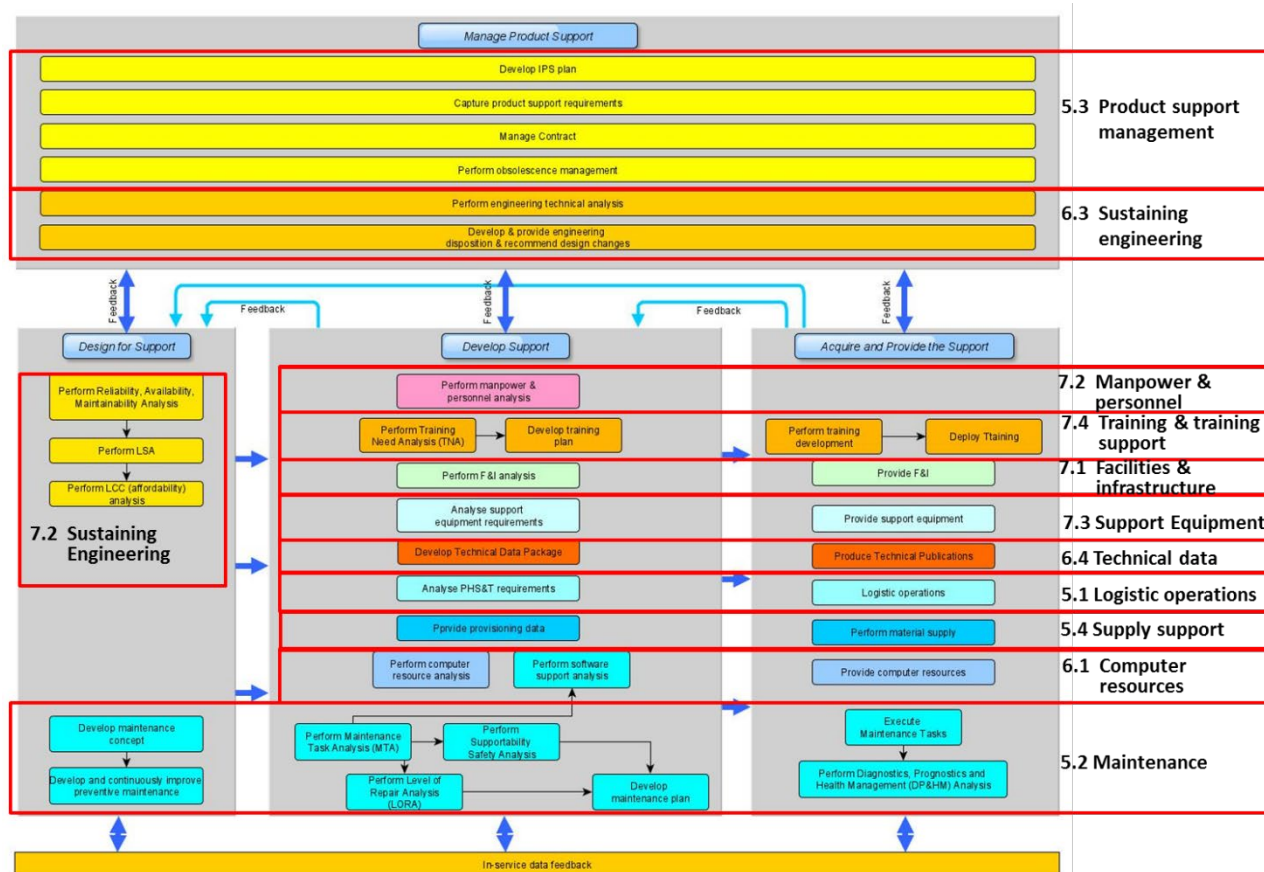
The top level IPS process defines the framework in which the planning, development, implementation, management, and execution of the support activities take place.

The process describes the methodology to develop the optimized support solution by:

- Designing for support
- Developing support
- Acquiring the support
- Providing the support
- Withdraw the support

Refer to [Para 3](#).

The main activities performed as part of the individual IPS elements throughout these activity groups are described in [Fig 2](#).



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Fig 2 Top level IPS process

Note

The numbers in the boxes of [Fig 2](#) correspond to the Para numbers where such activity is described.

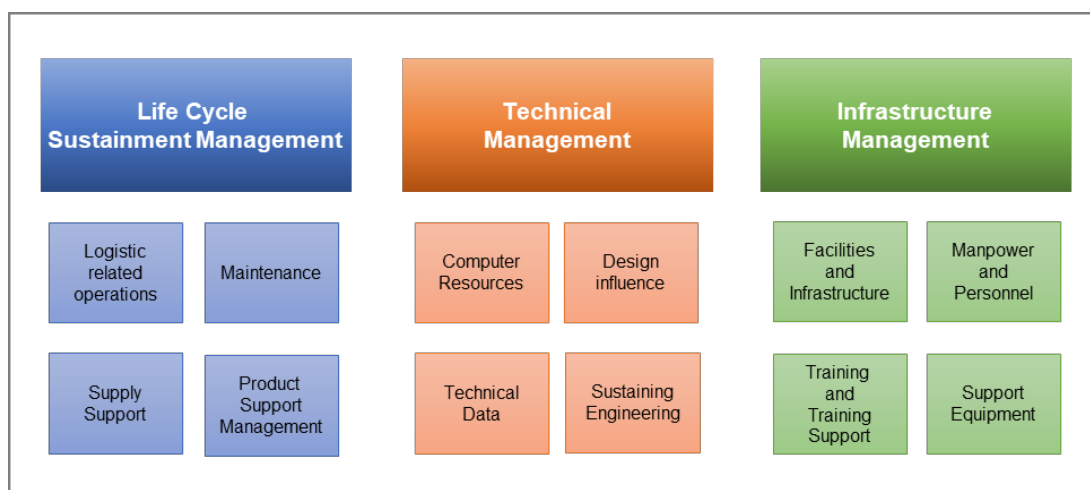
4.2

Overview of IPS elements

IPS relies on understanding and integrating all the functions to develop the support solution in order to optimize supportability and life cycle costs while the Product meets the requirements.

These functions are grouped into twelve categories called the IPS elements. These twelve elements, described in detail in [Para 5](#), can be grouped into three top level topics. The three topics are:

- Life Cycle Sustainment Management
- Technical Management
- Infrastructure Management



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Fig 3 Overview of IPS Elements

5 Life Cycle Sustainment Management

Life cycle sustainment management is a key functionality of sustainment-dominated Products to develop long term organizational capabilities. The goal of life cycle sustainment management is to maximize readiness by delivering the desired Product support outcomes at affordable cost.

The performance of sustainment activities begins with the fielding of the first production units. However, sustainment management begins at the earliest stages of the Product life cycle. Successful post-fielding sustainment performance depends on critical thinking during requirements development and analysis in the preparation and development phase.

5.1 Logistic related operations

As well as the activities associated with the maintenance and repair of a Product, there are additional aspects concerning the operation and the handling that must be considered. This IPS element covers tasks, which cannot be assigned to an area of the direct operation and maintenance of a Product. However, these tasks can be important for the proper use of a Product. For this purpose, a support-related operations analysis is carried out.

This analysis includes the identification of related tasks and requirements concerning personnel, support equipment, consumables, spare parts, facilities, technical documentation and training. The outcomes are documented in the support-related operations report. Some of the tasks require early consideration in the life cycle, while others can be considered later, (eg, when a prototype of the Product is available).

5.1.1 Analyze handling and usage aspects

The activities that support the handling and usage of the Product include, but are not limited to:

- Safety precautions
- Preparation for usage
- Servicing
- Loading and unloading
- Towing
- Role change
- Deployment
- Product recovery
- De-icing an aircraft or ship
- Checking electrical charge

- Checking the strength of magnetic fields during storage

5.1.2 Analyze packaging, handling, storage and transport requirement

Packing, Handling, Storage and Transport (PHST) activities include, but are not limited to:

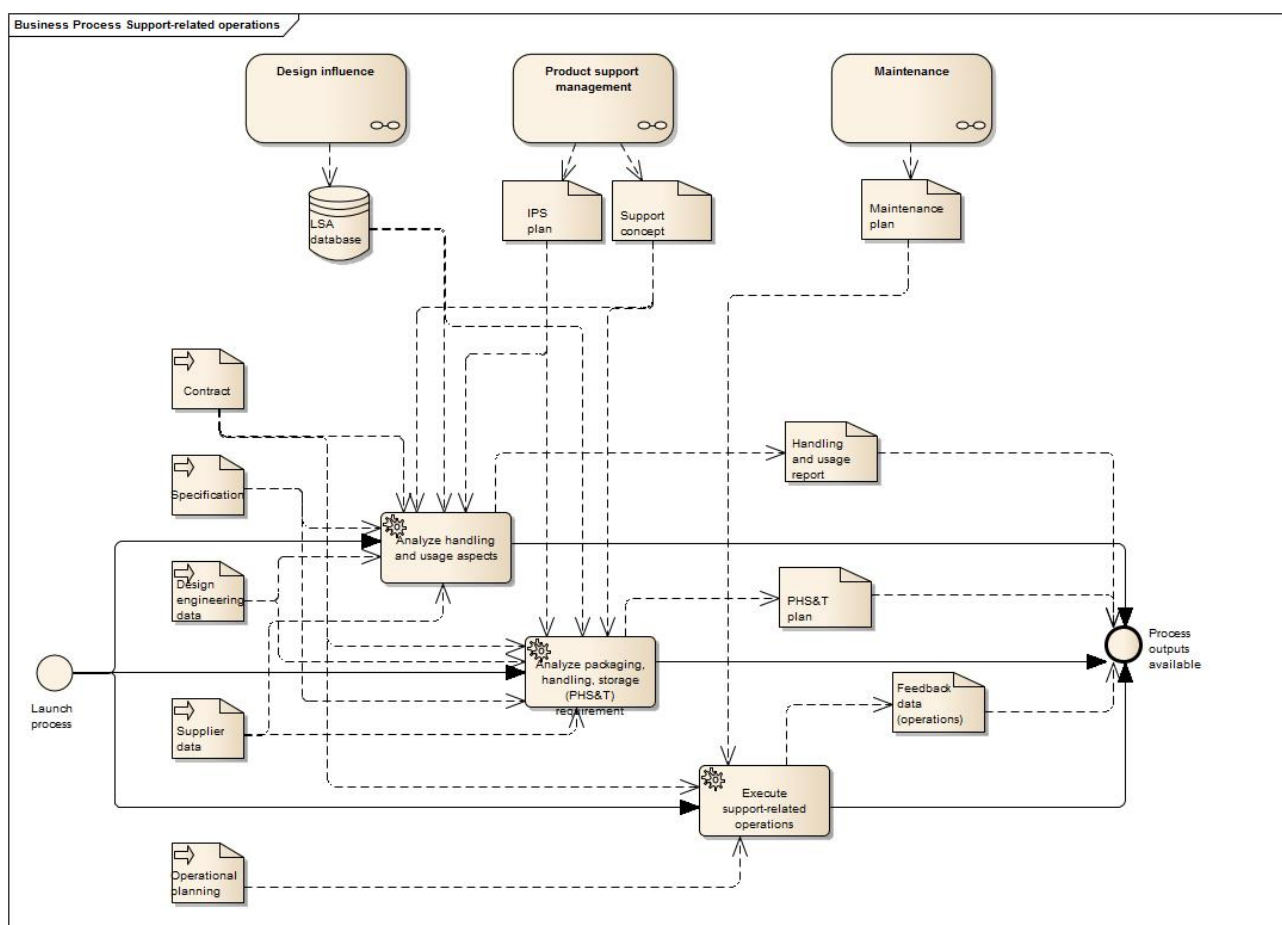
- Packing and unpacking
- Securing
- Conservation
- Storage
- Hazardous cargo
- Container concept
- Lifting
- Transportation

5.1.3 Execute logistic related operations

Using the contract, the operations and maintenance plan, support-relevant operations are executed to ensure that the Product is available for use as intended by the user or the maintenance organization.

Table 3 Main activities for Execute logistic related operations

Input	Activity	Output
Contract	Analyze handling and usage aspects	Handling and usage report
Design engineering data		
IPS plan		
LSA database		
Specification		
Supplier data		
Support concept		
Contract	Analyze PHST requirements	PHST plan
Design engineering data		
IPS plan		
LSA database		
Specification		
Supplier data		
Support concept		
Contract	Execute logistic related operations	Feedback data (operations)
Operational planning		
Maintenance plan		



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Fig 4 Process view of the main activities for support-related operations

5.2 Maintenance

Maintenance establishes maintenance concepts and requirements for the life cycle of the Product. This element has a major impact on the planning, development and acquisition of other product support elements.

The objective of maintenance is to identify, plan, resource, and implement maintenance concepts and requirements as well as to execute the maintenance to ensure the best possible equipment/capability is available at an affordable cost. For that purpose, ten activities are performed.

5.2.1 Develop the maintenance concept

During this activity the IPS plan and support concept are used to develop the maintenance concept.

5.2.2 Develop maintenance plan

Using the contract, IPS plan, Level of Repair Analysis (LORA) report and the maintenance concept, the maintenance plan is developed.

5.2.3 Develop preventive maintenance task requirements

Using the design engineering data, IPS plan and support engineering reports, supplier data and LSA database, the Preventive Maintenance Task Requirements (PMTR) are developed.

5.2.4 **Execute maintenance activities**

Using the contract and the maintenance plan, the maintenance activities are executed. This includes also Maintenance, Repair and Overhaul (MRO) and incorporation of changes such as upgrades.

5.2.5 **Perform diagnostics, prognostics and health management analysis**

Using the contract, design engineering data, IPS plan and Support engineering reports, the Diagnostics, Prognostics and Health Management (DPHM) analysis is performed.

5.2.6 **Perform level of repair analysis**

Using the contract, design engineering data, IPS plan, Software Support Analysis (SSA) report, support engineering reports and support concept, the LORA is performed.

5.2.7 **Perform maintenance task analysis**

Using the contract, design engineering data, IPS plan, LORA report, support engineering reports, scheduled maintenance plan and support concept, the Maintenance Task Analysis (MTA) is performed.

5.2.8 **Perform in-service maintenance optimization**

Several factors can impact a Product and its IPS elements during the in-service phase. These impacts can even change Product maintenance concepts and can, therefore, impact preventive maintenance tasks previously developed as PMTR. For the evaluation of the effectivity of the preventive maintenance tasks documented in a Product maintenance program, the review and optimization processes become essential.

The In-Service Maintenance Optimization (ISMO) covers three functions:

- (1) Identification of gaps in the Product analysis and identification of respective PMTR amendments to close the gaps.
- (2) Evaluation of the effectivity of the existing repetitive scheduled maintenance tasks with intervals documented, including the initiating PMTR.
- (3) Evaluation of frequent unscheduled maintenance tasks for Product systems, structure and or zone resulting in a high maintenance effort that was not preventively maintained by the existing Product maintenance program.

5.2.9 **Perform software support analysis**

Using the design engineering data, IPS plan, LORA report, MTA report, support engineering report and support Concept, the SSA is performed to identify what impact software has on the Product operation or maintenance.

5.2.10 **Perform supportability safety analysis**

Using the design engineering data, IPS plan, LSA database, MTA report and support engineering report, the supportability safety analysis is performed.

Table 4 Main activities for maintenance

Input	Activity	Output
Contract	Develop maintenance concept	Maintenance concept
IPS plan		
Support concept		
Contract	Develop maintenance plan	Maintenance plan
IPS plan		

Applicable to: All

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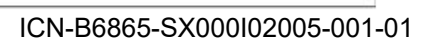
Input	Activity	Output
LORA report		
Maintenance concept		
Preventive maintenance task requirements (PMTR)		
Design engineering data	Develop preventive maintenance task requirements (PMTR)	Preventive maintenance task requirements (PMTR)
IPS plan		
Supportability engineering reports		
Supplier data		
LSA database		
Contract	Execute maintenance activities	Maintenance report
Maintenance plan		Feedback data
Contract	Perform Diagnostics, Prognostics and Health Management (DPHM) Analysis	Testability report
Design engineering data		
IPS plan		
Support engineering reports		
Contract	Perform Level of Repair Analysis (LORA)	LORA report
Design engineering data		
IPS plan		
MTA report		
Support engineering reports		
Support concept		
Contract	Perform Maintenance Task Analysis (MTA)	MTA report
Design engineering data		
IPS plan		
LORA report		
Support engineering reports		
Support concept		
Preventive maintenance task requirements (PMTR)	Perform In-Service Maintenance Optimization (ISMO)	In-service PMTR
LSA database		
IPS Plan		

Applicable to: All

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Input	Activity	Output
Supplier data		
Supportability Engineering reports		
Design engineering data		
Feedback information		
Design engineering data	Perform software support analysis (SSA)	SSA report
IPS plan		
LORA report		
MTA report		
Support engineering reports		
Support concept		
Contract	Perform supportability safety analysis	Supportability safety analysis report
Design engineering data		
IPS plan		
LSA database		
MTA report		
Support engineering reports		



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Fig 5 Process view of the main activities for maintenance

5.3 Product support management

The Product support management function consists of elaborating the support concept, the IPS plan and providing obsolescence report. For that purpose, eight activities are performed.

5.3.1 Analyze alternatives

Using the initial capability document, alternatives and the design engineering data are collected and used to:

- Conduct appropriate trade and feasibility studies and analyses for each potential alternative to determine and validate the support concept for the selected alternative
- Create the operational requirements document
- Create the usage requirements document
- Integrate all IPS elements to assure customer capabilities are expressed in terms of readiness and ownership costs

In addition, the impact of the introduction of the new Product on existing Products must be assessed and considered as part of this activity. This assessment examines impacts on support organization capability in terms of personnel, infrastructure, support equipment, transport systems and training.

5.3.2 Develop the integrated product support plan (IPS plan)

The IPS plan is a live document that is maintained throughout the Product life. Using the same information as above, this activity consists of describing the links to subordinate plans covering specific IPS activities and to define all interfaces between the delegated authorities and domains. It must include the support strategy, organizations (roles, responsibilities, IPS manager, IPS integrator, etc), requirements, tasks, the operational support process (eg, customer support, data feedback collection) and an integrated master schedule, with identification of key milestones and decision points, for the current phase and plans for the succeeding stages concerning logistic support.

5.3.3 Document lessons learned

Lessons learned is the documentation of a systematic collection, evaluation and consolidation of experiences, developments, hints and risks from projects. In structured, accessible archived form, for example in a project database, the results serve the preparation of similar projects. Looking at several such documents across a series of projects can lead to ideas on how to structurally improve the IPS management of a Product. For this reason, it is advantageous to mandate evaluation of the lessons learned from previous projects at the beginning of a new project.

5.3.4 Manage configuration

Configuration management in the context of IPS consists in providing the Product owner or operator with the configuration(s) that the Product is allowed to have in order to operate properly and safely, so that it can be ensured that no unauthorized equipment is installed or that the Product does not operate without critical equipment. Configuration management during in-service also controls the configuration of the actual Product(s), so as to ensure that it adheres to the allowed configuration, but also to assure that proper support can be provided for a specific configuration in the event of troubleshooting or the provision of spares.

5.3.5 Manage contract

This activity ensures the compliance and execution of existing contracts, including generation of subcontracts and agreement of support contracts. Support contracts are grouped into four broad categories:

- (1) Fixed price contracts: Fixed price contracts, also known as lump sum contracts, have straightforward terms, the seller and the buyer agree on a fixed price for the project. The

contractor agrees to provide specific services in exchange for a cash payment and there must be fully detailed specifications, checklists, often written with fixed payment milestones, project scope statements from the seller side which the buyer will use.

- (2) Cost reimbursement contracts: the contractor is reimbursed for all allowable expenses and paid an additional amount as profit. The contractor is paid for the project expenses no matter how much they can exceed the initial estimate and will work for a fixed time period and will raise the bill after finishing work.
- (3) Time and material contracts: Time and materials contracts are a combination of fixed contracts and cost reimbursement contracts. Like a fixed contract, the labor rate per hour is agreed upon and fixed when the contract is signed. The contract should include direct labor rate factors in the actual wages, job overhead, general and administrative expenses and profit.
- (4) Performance based contracts: performance-based contracting is an outcome-oriented contracting method focused on the operational performance and ties at least a portion of a contractor's payment to the achievement of specific, measurable performance standards and requirements. These contracts can include both monetary and non-monetary incentives and disincentives.

5.3.6 Manage fleet

Fleet management is the daily task of providing the right number of systems, at the right time and the right configuration for operational use to the customer. This means that the operational requests by the customer must be harmonized with the support capacity and linked with all downstream activities. Functions such as financing, maintenance, Product user (eg, driver, pilot) management, Petrol, Oil and Lubricants (POL) and spares management are not part of operational fleet management but have a major influence and the interfaces need to be managed carefully. The actual and forecasted end users demand, as well as its associated support system must be accurately planned and documented through life. Any changes in the way the Product is operated and supported including the respective environment will affect the fleet management and adjustments must be made on daily basis.

5.3.7 Manage in-service IPS activities

Once the Product enters into service the operation of the support system must be monitored, supported and developed further. The actual performance of the Product and its associated support system must be accurately recorded, through life in the body of evidence. Any changes in the way the Product is operated and supported including the respective environment must be fully documented. Risks to support must be identified and managed.

A need for the Product to be modified can arise during its life to meet changing needs, to overcome obsolescence issues or to gain benefits from technologic opportunities. Evidence must be supplied that engineering change requests are still meeting the Product support requirements and/or generate appropriate mitigation for identified risks.

5.3.8 Perform obsolescence management

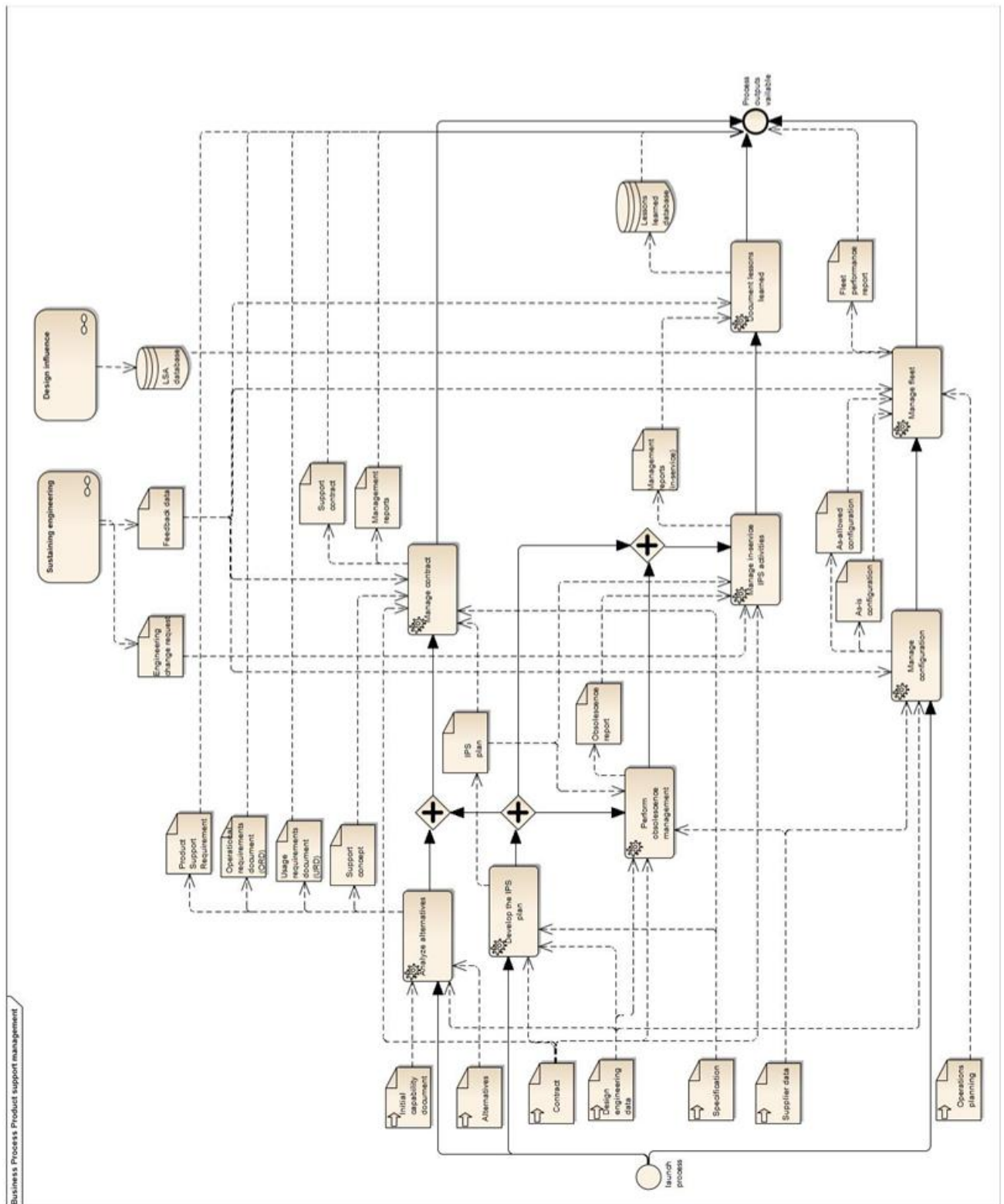
Obsolescence is the emergence or occurrence of unavailability of materials, components, resources, processes, services or know-how. Obsolescence is based on technological aging, changes in legal requirements or economic decisions. This applies equally to hardware (HW) and software (SW). Obsolescence management is the set of measures that ensure the operational readiness of a Product economically, on time and in compliance with legal requirements by avoiding, limiting or eliminating the effects of obsolescence. This activity consists of defining an obsolescence strategy, developing an obsolescence management plan and implementing obsolescence, including technology refresh solutions. The results of these activities are collected in the obsolescence report.

Table 5 Main activities for Product support management

Input	Activity	Output
Initial capability document	Analyze alternatives	Support concept
Design engineering data		Usage Requirements Document (URD)
Alternatives		Product Support Requirement Operational Requirements Document (ORD)
Contract	Develop IPS plan	IPS plan
Design engineering data		
Specification		
Feedback data	Document lessons learned	Lessons learned database
Management reports (in-service)		
Design engineering data	Manage configuration	Allowed configuration
Supplier data		As-is configuration
Feedback data		
Contract	Manage contract	Management reports
Feedback data		
IPS plan		
Specification		Support contract
Support concept		
Operations planning	Manage fleet	Fleet performance report
Allowed configuration		
As maintained configuration		
Feedback data		
LSA database		



Input	Activity	Output
Engineering change request	Manage in-service IPS activities	Management reports (in-service)
Obsolescence report		
IPS plan		
Contract		
Contract	Perform obsolescence management	Obsolescence report
Design engineering data		
IPS plan		
Supplier data		



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Fig 6 Process view of the main activities for Product support management

5.4 Supply support

The objective of the IPS element, supply support is to identify, plan for, resource, and implement management actions to acquire repair parts, spares, and all classes of supply to ensure the best capability is available to support at the lowest possible life cycle cost. This means having the right spares, repair parts and supplies available, in the right quantities and quality, at the right place, at the right time, at the right price.

Supply support consists of all management actions, procedures, and techniques necessary to determine requirements to acquire, catalog, receive, store, transfer, issue and dispose of spares, repair parts, and supplies. The process includes provisioning for initial support, as well as acquiring, distributing, and replenishing inventories. For that purpose, four activities are performed.

5.4.1 Manage stocks/stores

Stock and stores management is the practice of ordering, storing, tracking and controlling inventory. This activity includes initially ranging, scaling, and controlling a stock level, through a spares provisioning list, whilst preventing overstocking and under stocking problems. Efficient stock control requires understanding the mix of different kinds of stock and the demands on that stock. There are two types of warehousing models:

- Deterministic
- Stochastic

In the case of deterministic warehousing models, quantity quantities are in the foreground. The primary decision parameter is the order quantity. For stochastic storage models, the determination of order times is in the foreground. The disposition is inventory controlled.

In addition, there exists a wide variety of techniques optimizing the stock level, starting with analytical approaches up to simulations using cutting edge mathematics to optimize assortment and allocation of spare parts, so that the highest possible performance can be achieved at the lowest possible cost. For this optimization approach, it is important to consider the technical data related to the Product (eg, reliability, repairability, etc), the support organization (transport and turnaround times, etc), the operational usage and costs of the Product (spares prices, orders, etc).

5.4.2 Manage warranty

This activity consists of managing warranty claims. Physical activities like distribution, deliveries and repairs are not part of this activity. The management of warranty claims, in its most simple form, is a reporting and transfer of information concerning an in-service Product failure. The process includes:

- 1 Customer detects an in-service Product failure.
- 2 Part identification and defect analysis by maintenance personnel.
- 3 Record warranty claim and reporting to the manufacturer or supplier.
- 4 Investigation of warranty claim by the respective warranty analysis center.
- 5 Rejection of warranty claim where the item is returned to the customer (including the warranty claim not verified information).
- 6 Acceptance of warranty claim and order for repair or replacement (including the warranty claim verified information).
- 7 Notification of an incident to interested parties such as suppliers, manufacturers and engineering, leading to engineering technical analysis being performed.

Note

This top-level process description is indicative and not normative and can vary depending on the context or contract. For an example of a full warranty process, refer to S2000M.

5.4.3 Perform material supply

This activity consists of the management of orders from customers and ensuring that they are fulfilled by means of existing stock or are relayed to suppliers in the event that no stock is available. It is executed partly by the customer and by the contractor, and consists of the generation of quotations, orders, deliveries and invoices for supplies being delivered, as well as the management of the activity outputs.

5.4.4 Provide provisioning data

This activity consists of obtaining the provisioning data, including necessary quantities of the supplies that need to be procured in order to provide the necessary support. The codification ensures that equipment, components and parts of the supply systems are uniformly named, described and classified in a standard and unambiguous manner.

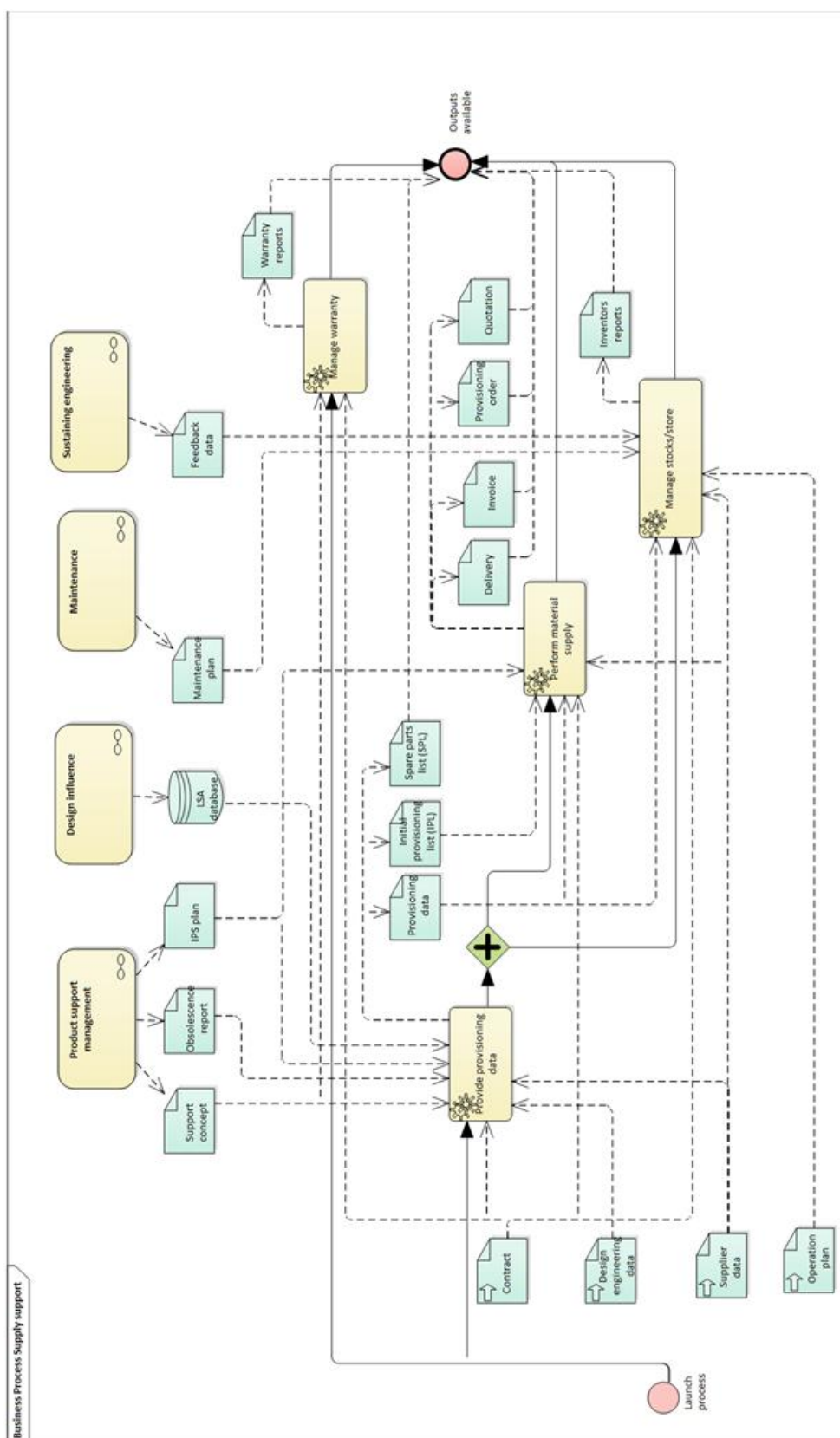
Table 6 Main activities for supply support

Input	Activity	Output
Contract	Manage stocks/stores	Inventory reports
Operation plan		
Maintenance plan		
Provisioning data		
Feedback data		
Supplier data		
Contract	Manage warranty	Warranty reports
Support concept		
Design engineering data		
IPS plan		
LSA database		
Obsolescence report		Initial Provisioning List (IPL)
Supplier data		Spare Parts List (SPL)
Support concept		
Provisioning data	Perform material supply	Quotation
IPL		
Contract		
Provisioning order		Provisioning order
Supplier data		Delivery
IPS plan		Invoice
Contract	Provide provisioning data	Provisioning data

Applicable to: All

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Fig 7 View of the main activities for supply support

6 Technical Management

Technical management activities are required to measure progress, evaluate and select alternatives, and document data and decisions. These activities apply to all steps of the systems engineering and performance-based life cycle Product support process and occur during all phases of the Product's life cycle.

Technical management analysis activities include trade-off studies, effectiveness and design analyses. They evaluate alternative approaches to meet technical requirements and program objectives and provide a consistent and transparent quantitative basis for selecting performance, functional, and design requirements. Analysis tools are used to provide input to analysis activities and include modeling, simulation, experimentation and test.

6.1 Computer resources

The objective of the IPS element "Computer Resources" is to identify, plan and resource facilities, hardware, software, documentation, manpower and personnel necessary for planning and management of mission critical computer hardware and/or software systems.

Computer resources encompass the facilities, hardware, software, documentation, manpower, and personnel needed to operate and support mission critical computer hardware/software systems. This IPS element includes three activities.

6.1.1 Manage computer resources for IPS program

The management consists of the identification of the computer resources required for the execution of an IPS program, as well as the definition, required implementation timescales and budget allocation for necessary modifications/upgrades and required interfaces, in order to obtain a single continuous digital thread of all data that is exchanged during the IPS program, both internally and with external stakeholders (suppliers, partners, customers). The management also includes the definition of the data exchange policy and concept of operation of the different IT systems in the context of the IPS program.

6.1.2 Perform computer resource analysis

This analysis determines and documents the computer resource requirements derived from the IPS plan or from demands identified by other IPS elements. Existing computer resources must be taken into account, as well as new, modified, expanded or upgraded computer resources. It should also take into account the disposal plans for computer resources (eg, data archiving).

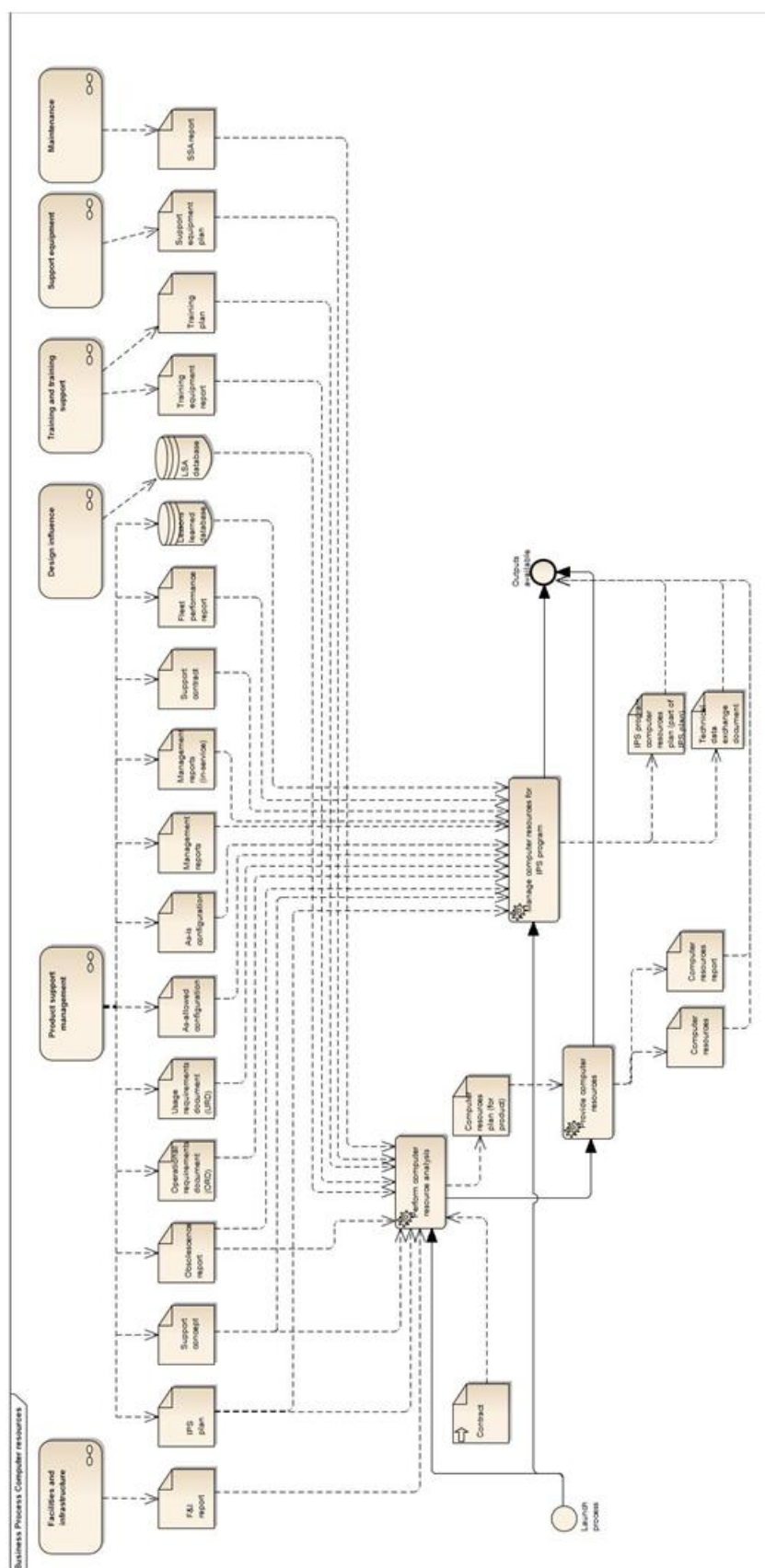
6.1.3 Provide computer resources

This consists of developing, producing, procuring, installing and maintaining computer resources. During the Product life cycle phases the computer resources report gives a current summary of the computer resources conditions to the stakeholder's management.

Table 7 Main activities for computer resources

Input	Activity	Output
Contract	Perform computer resources analysis	Computer resources plan (for Product)
Facilities and Infrastructure (F&I) report		
IPS plan		
LSA database		
Obsolescence report		
SSA report		

Input	Activity	Output
Support concept		
Support equipment plan		
Training equipment report		
Training plan		
Computer resource plan	Provide computer resources	Computer resources
		Computer resources report
Support concept	Manage computer resources for IPS program	IPS program computer resources plan (part of IPS plan)
URD		
ORD		
IPS plan		
Lessons Learned database		
Allowed configuration		
As-is configuration		Technical data exchange document
Management reports		
Support contract		
Fleet Performance Report		
Management reports (in-service)		
Obsolescence report		



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Fig 8 Process view of the main activities for computer resources

6.2 Design influence

Participating in the systems engineering process to influence the design from its inception through the Product life cycle to facilitate supportability and to optimize the design for availability, effectiveness, and ownership costs.

Design influence is the integration of the quantitative design characteristics of systems engineering (eg, RAMCT, supportability, affordability) with the functional IPS elements. It reflects the driving relationship between Product design parameters and Product support resource requirements.

Where a COTS solution is being proposed, design influence may be limited. On these occasions, IPS influence must be directed at the system integration solution.

These design parameters are expressed in operational terms rather than as inherent values and specifically relate to Product requirements. Thus, Product support requirements are derived to ensure that the Product meets its availability goals and design costs, and that support costs of the Product are effectively balanced. For that purpose, three activities are performed.

6.2.1 Perform life cycle cost (affordability) analysis

LCC consists of the costs associated with the development, production, procurement, operation, support and disposal of a Product.

LCCA determines the most cost-effective option among different competing designs and support alternatives for a Product. It includes also trade studies for integration of new equipment, evaluation of technological opportunities and impact on transitioning to new IPS programs. LCCA is mainly intended to:

- Determine the forecast of future spending and income depending on the perspective of the customer, operator or manufacturer
- Quantify the risk, uncertainty and the relative advantages and disadvantages of the alternatives to be considered in terms of cost
- Show the cost sensitivity of each alternative to possible changes in key assumptions
- Help decision makers in determining whether or not any of the proposed alternatives offer sufficient operational and/or economic benefit to be worth the cost
- Support a tender evaluation process

6.2.2 Perform Product support analysis

This activity builds a LSA database in accordance with standards such as S3000L. For the S-Series IPS specifications, the LSA database is the single entity in which all support data is stored. This means that the data flow between IPS elements is always routed through the LSA database to ensure data consistency among all IPS elements and domains.

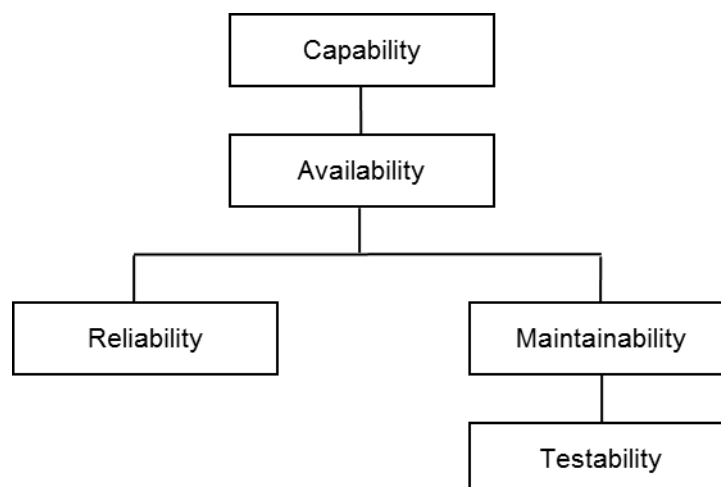
6.2.3 Perform support engineering analysis

Support engineering analysis is a design analysis process that must be integral part of the overall systems engineering effort and is therefore a main interface between the IPS and systems engineering domain. Support engineering measures the impact of the five system performance characteristics on the Product's effectiveness, its safety, its supportability or its mission reliability. These characteristics are:

- Reliability
- Availability
- Maintainability
- Capability
- Testability

Support engineering provides other processes in two ways:

- 1 Support engineering activities should be used to influence system design (eg, the Product depends on availability and testability requirements).
- 2 Support engineering activities must be used as part of Product verification process.



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Fig 9 Support engineering relationship

Table 8 Main activities for design influence

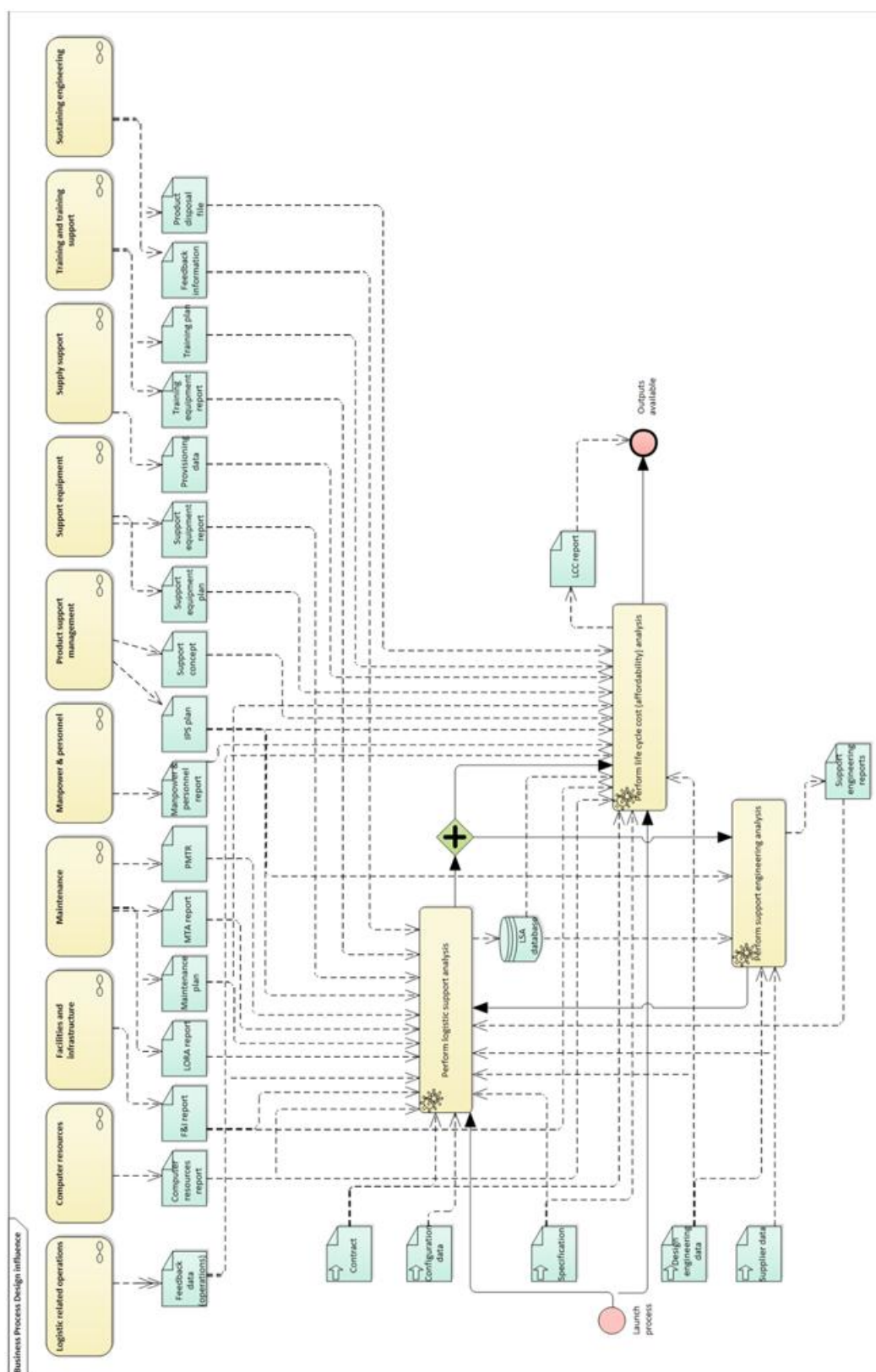
Input	Activity	Output
Computer resource report	Perform logistic support analysis (LSA)	LSA database
Configuration data		
Contract		
Design engineering data		
F&I report		
Feedback information		
IPS plan		
LORA report		
Maintenance plan		
MTA report		
Feedback data (operations)		
Support engineering reports		
Specification		
Supplier data		
Support equipment report		
Training equipment report		
PMTR		

Applicable to: All

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Input	Activity	Output
Design engineering data	Perform support engineering analysis	Support engineering reports
IPS plan		
LSA database		
Supplier data		
Computer resource report	Perform life cycle cost (affordability) analysis	LCC report
Contract		
Design engineering data		
Product disposal file		
F&I report		
IPS plan		
LSA database		
Maintenance plan		
Manpower & personnel report		
Feedback data (operations)		
Provisioning data		
Specification		
Support concept		
Support equipment plan		
Training plan		



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Fig 10 Process view of the main activities for design influence

6.3 Sustaining engineering

Sustaining engineering supports Products in their operational environments. This activity includes the technical tasks (eg, engineering and support investigations and analyses) that ensure continued operation and maintenance of a Product until its disposal.

It also involves the identification, review, assessment, and resolution of deficiencies throughout a Product's life cycle.

It returns a Product to its baseline configuration and capability, while identifying opportunities for performance and capability enhancement. It includes the measurement, identification and verification of Product technical and supportability deficiencies, associated root cause analyses, evaluation of the potential for deficiency correction and the development of a range of corrective action options.

Sustaining engineering also includes the implementation of selected corrective actions to include configuration or maintenance processes and the monitoring of key sustainment health metrics. For that purpose, four activities are performed.

6.3.1 Develop and provide engineering disposition and recommend design changes

This activity evaluates the deficiency and develops actions to complete, improve, or correct a situation with the end result of improving sustainment metric outcomes, and developing proposed modifications to the Product. These modifications include upgrades to the Product.

6.3.2 Evaluate operational suitability

Operational suitability is defined as the degree to which a Product can be deployed satisfactorily in its intended environment and integrated with existing systems and infrastructure. It ensures that the Product operates properly for its required usage.

6.3.3 Manage disposal

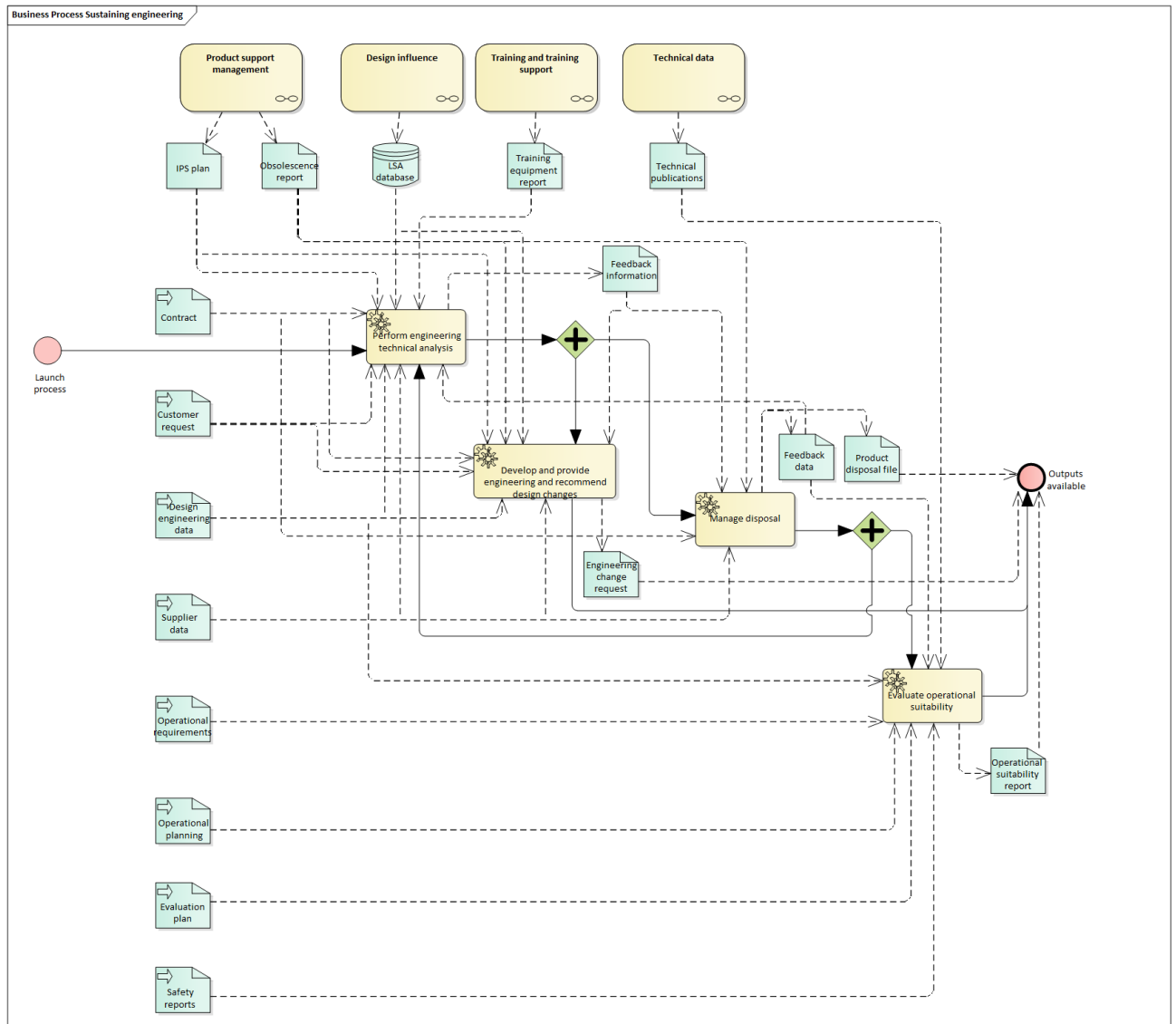
Manage disposal is the efficient, effective and safe disposal of a Product, together with its spares and consumables while in-service or at the end of life. The disposal of a Product must be considered starting at the design phase and continuously updated through all stages. The reduction of the content of hazardous and potentially hazardous materials must be considered at the design stage. Disposal activities must consider and document the possibilities of re-deployment, sale, waste disposal, the environmental impacts and the possible disposal of recovered material by sale within the Product disposal file.

6.3.4 Perform engineering technical analysis

This activity includes help desk (eg, front office) for solving technical queries, engineering analysis (eg, back office) and the initiation of service bulletins when applicable. In some contexts, a field service representative could be appointed at the customer premises.

Table 9 Main activities for sustaining engineering

Input	Activity	Output
Contract	Develop & provide engineering disposition & recommend design changes	Engineering change request
Customer request		
Design engineering data		
Feedback information		
IPS plan		
LSA database		
Obsolescence report		
Supplier data		
Operational requirements	Evaluate operational suitability	Operational suitability report
Operational planning		
Evaluation plan		
Design engineering data		
Feedback data		
Safety reports		
Technical publications		
Feedback information	Manage disposal	Product disposal file
Obsolescence report		Feedback data
contract		
Supplier data		
Contract	Perform engineering technical analysis	Feedback information
Customer request		
Design engineering data		
Feedback data		
IPS plan		
LSA database		
Supplier data		
Training equipment report		



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Fig 11 Process view of the main activities for sustaining engineering

6.4 Technical data

Technical data is recorded information, regardless of the form or method of the recording, of a scientific or technical nature including documentation. Technical data does not include computer software or contract administration data such as financial or management information.

The objective of this IPS element "Technical data" is twofold:

- To identify, plan, validate, resource and implement actions to develop, acquire and maintain information
- To plan, develop, produce and maintain technical publications. For that purpose, two activities are performed

6.4.1 Develop technical data package

A Technical Data Package (TDP) is a technical description of an item that is adequate for supporting an acquisition strategy, development, manufacturing development, production,

engineering, and Product support throughout the Product's life cycle. It defines the required design configuration and procedures required to ensure adequacy of item performance. A TDP consists of a variety of data that defines the item. The categories of data that can be included in a TDP include, but are not limited to:

- Product definition data
- Engineering drawings and modeling data
- Associated lists
- Specifications
- Standards
- Performance requirements
- Quality assurance provisions
- Reliability data
- Packaging details

Technical data must be organized and managed to support a variety of functions. The development of a TDP includes the identification and control of data requirements and rights, timely and economical acquisition of all related data, assurance of the adequacy of data for its intended use, distribution/communication of data to the point of use and actual data analysis.

6.4.2 Produce technical publications

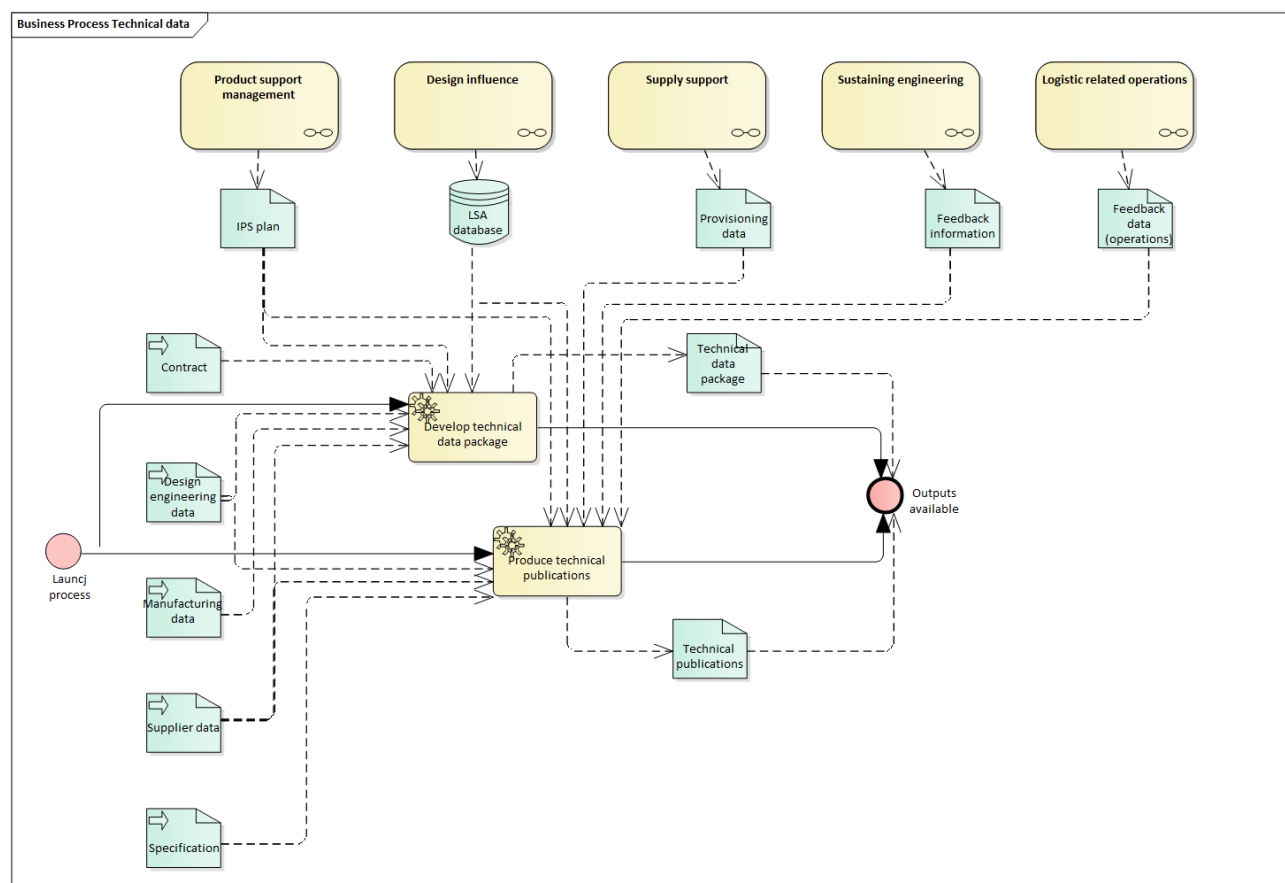
Technical publications are any type of documentation that describes handling, functionality and architecture of a Product. It normally includes operational and maintenance instructions, parts lists or parts breakdown, and related technical information and procedures. The intended recipient for technical publications is the end user. Technical publications can be presented in any format, which includes, but is not limited to:

- Hard copy
- Audio and visual displays
- Magnetic tape, discs

Table 10 Main activities for technical data

Input	Activity	Output
Contract	Develop technical data package	Technical data package
Design engineering data		
IPS plan		
LSA database		
Manufacturing data		
Supplier data		
Design engineering data	Produce technical publications	Technical publications
Feedback information		
IPS plan		
LSA database		
Feedback data (operations)		
Provisioning data		
Specification		

Input	Activity	Output
Supplier data		



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Fig 12 Process view of the main activities for technical data

7 Infrastructure Management

The trends of increasing dynamic collaboration, resource sharing, asset visibility, and demand uncertainty have several implications and challenges for infrastructure management, especially because changes within this area will only have long term effects.

7.1 Facilities and infrastructure

F&I consists of the permanent and semi-permanent real property assets or mobile facilities required to integrate, support and operate a Product. It includes studies to define types of facilities (eg, training, equipment storage, maintenance, supply storage, hazardous goods storage, computer hardware/software systems, network and communication systems) or facility improvements, location, space needs, environmental and security requirements and equipment.

Due to the potential long lead times in funding, acquisition or construction, planning F&I requirements must be considered as early as possible in the Product life cycle. To provide F&I, two activities are performed.

7.1.1 Perform F&I analysis

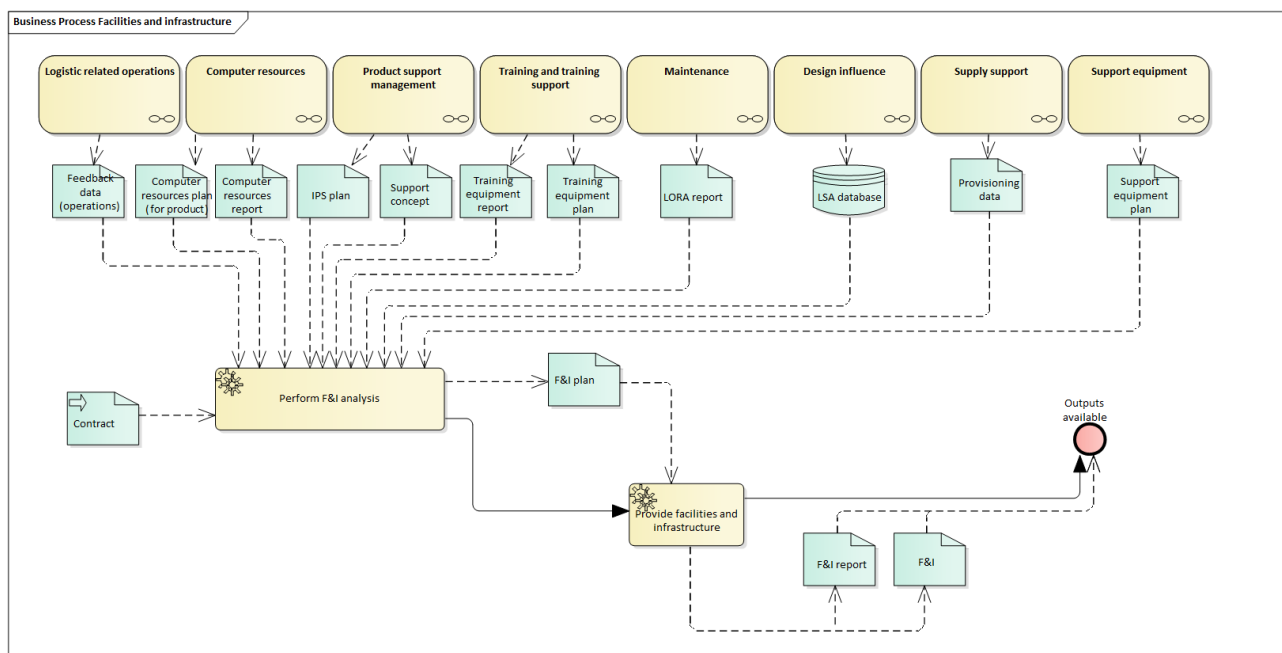
This analysis determines and documents the F&I requirements derived from the IPS plan or from demands identified by other IPS elements. These F&I requirements form the basis for the optimal F&I solution. Existing F&I must be taken into account, as well as new, constructed, expanded or upgraded F&I. The analysis must also take into account the disposal plans for F&I (eg, sale, cannibalization, recycling or demolition).

7.1.2 Provide facilities and infrastructure

This activity consists of developing, building, acquiring and maintaining F&I. It is usually performed under separate contractual arrangements and goes thru its own life cycle. During the life cycle phases the F&I report gives a snapshot summary of the F&I conditions to the stakeholder's management.

Table 11 Main activities for F&I

Input	Activity	Output
Computer resource plan	Perform F&I analysis	F&I plan
Computer resource report		
Contract		
IPS plan		
LORA report		
LSA database		
Feedback data (operations)		
Provisioning data		
Support concept		
Support equipment plan		
Training equipment report		
Training plan		
F&I plan	Provide facilities and infrastructure	F&I report
		F&I



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Fig 13 Process view of the main activities for F&I

7.2 Manpower and personnel

The objective of manpower and personnel is to identify, plan and resource personnel, which have the necessary qualifications and skills.

7.2.1 Perform manpower and personnel analysis

This analysis involves the identification and allocation of personnel with the qualifications and skills required to operate, maintain, and support Products over their lifetime.

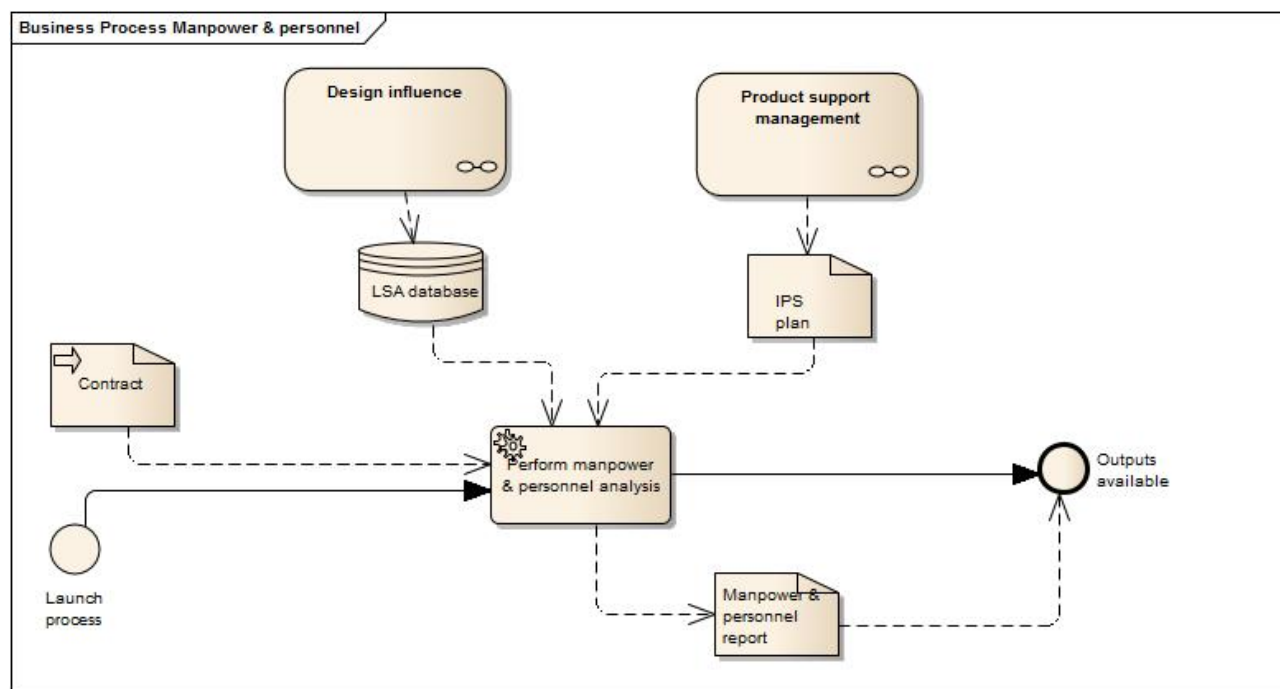
The qualifications and skills are required to:

- Operate equipment and Product, to effectively complete the missions, and support the operations.
- Provide adequate support and to ensure the best capability is available when and as needed.

Manpower represents the number of personnel or positions required to perform a specific task, whereas personnel indicates those human aptitudes and capabilities, knowledge, skills, abilities, and experience levels that are needed to properly perform a task. For that purpose, a manpower and personnel analysis is performed.

Table 12 Main activities for manpower and personnel

Input	Activity	Output
Contract	Perform manpower and personnel analysis	Manpower and personnel report
IPS plan		
LSA database		



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Fig 14 Process view of the main activities for manpower and personnel

7.3 Support equipment

The objective of the IPS element “Support Equipment” is to identify, plan, resource and implement management actions to acquire and support the equipment (mobile or fixed) required to sustain the operation, maintenance and supply of the Product to ensure that the Product is available to the user when it is needed at the lowest life cycle cost.

During the acquisition of Products, program managers are expected to reduce the proliferation of support equipment within the inventory by minimizing the development of new support equipment and giving more attention to the use of existing equipment. For that purpose, two activities are performed.

7.3.1 Analyze support equipment requirements

This analysis determines and documents the support equipment requirements derived from the IPS plan or from requirements identified by other IPS elements. Existing support equipment must be taken into account, as well as new, modified, expanded or upgraded support equipment. It should also take into account the disposal plans for support equipment.

7.3.2 Provide support equipment

This activity consists of developing, producing, procuring, installing and maintaining support equipment. During the Product life cycle phases, the support equipment report gives a snapshot summary of the support equipment conditions to the stakeholder’s managements.

Table 13 Main activities for support equipment

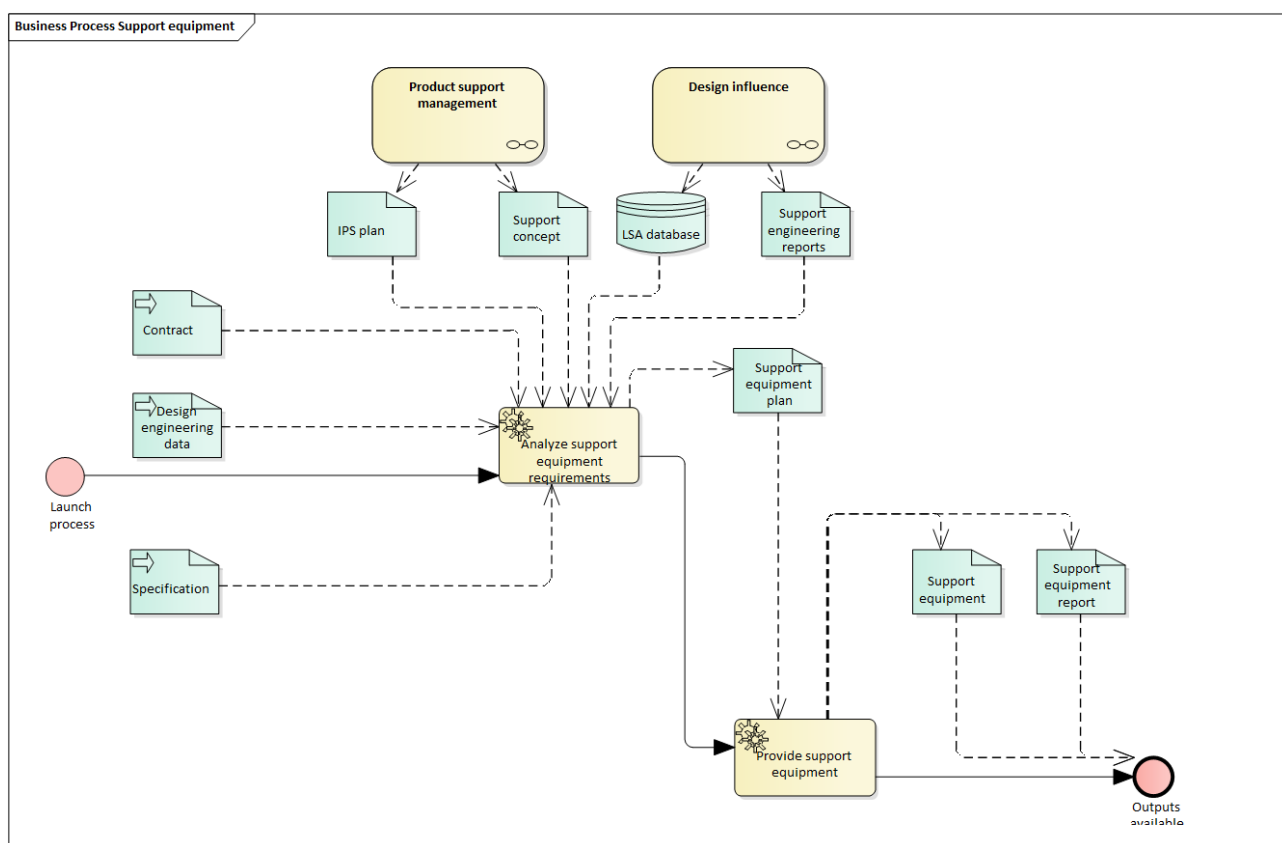
Input	Activity	Output
Contract	Analyze support equipment requirements	Support equipment plan
Design engineering data		

Applicable to: All

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Chap 2

Input	Activity	Output
IPS plan		
LSA database		
Support engineering reports		
Specification		
Support concept		
Support equipment plan	Provide support equipment	Support equipment
		Support equipment report



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Fig 15 Process view of the main activities for support equipment

7.4 Training and training support

The objective for this is to identify, plan and resource training support and implement a training strategy and to train personnel to operate, maintain and support the Product throughout its life cycle to assure optimum performance and readiness of the Product.

7.4.1 Analyze training equipment requirements

This analysis determines and documents the training equipment requirements derived from the IPS plan or from requirements identified by other IPS elements. Existing facilities and training

equipment must be taken into account, as well as new, modified, expanded or upgraded training equipment. It should also take into account the disposal plans for training equipment.

7.4.2 Deploy training

This activity consists of conducting, procuring, and maintaining the training. Two phases of training can be identified:

- Initial training, which trains the operator and maintenance personnel who will operate or maintain the Product when it is fielded. This training is normally conducted just prior to and during initial fielding of the Product
- Sustainment training, which provides refresher training to personnel that operate and maintain the Product, including training for new personnel. This training starts as initial training ends, and continues throughout the life cycle of the Product

7.4.3 Develop training plan

This activity consists of the initial development and continuously updating the training plan. The training plan is a subset of, or an attachment to the IPS plan. Therefore, it is a living document.

The initial training plan must include the approach, audience, purpose, roles and responsibilities, delivery methods, timeline, and evaluation to develop and conduct the training program.

The updates must include in addition to the updated sections the summary of the training strategy, training needs analysis, training equipment Products, course design, support and technology requirements.

7.4.4 Perform training development

Using the training plan, Training Needs Analysis (TNA) report, LSA database and technical publications this activity consists of the development and production of the courseware.

7.4.5 Perform training need analysis

TNA is a systematic process in which the gap between employee, actual capabilities and performance requirements of the new Product to derive the development and training needs, is identified.

A TNA must look at every aspect of the operational area of the job so that the concepts and attitudes of the human elements of a Product can be effectively identified and appropriate training can be specified.

7.4.6 Provide training equipment

This activity consists of procuring, installing and maintaining training equipment. During the Product life cycle phases, the training equipment report gives a snapshot summary of the training equipment conditions to the stakeholder's managements and engineering technical analysis.

Table 14 Main activities for training and training support

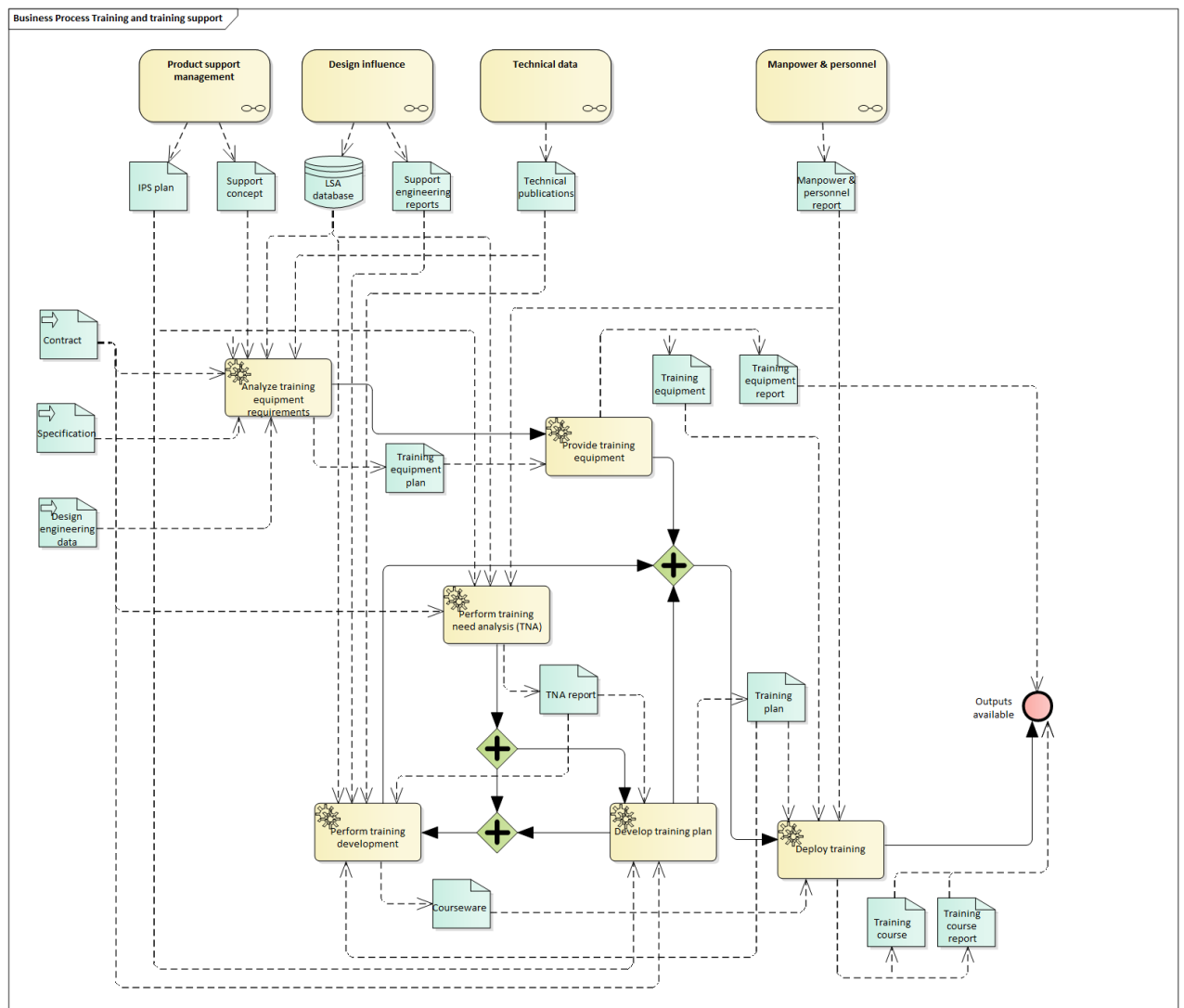
Input	Activity	Output
Contract	Analyze training equipment requirements	Training equipment plan
Design engineering data		
IPS plan		
LSA database		
Specification		

Applicable to: All

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Chap 2

Input	Activity	Output
Support concept		
Technical publications		
Courseware	Deploy training	Training course
Training equipment		Training course report
Training plan		
Manpower & personnel report		
Contract	Develop training plan	Training plan
IPS plan		
TNA report		
Contract	Perform training need analysis (TNA)	TNA report
IPS plan		
LSA database		
Manpower & personnel report		
LSA database	Perform training development	Courseware
Support engineering reports		
Technical publications		
TNA report		
Training plan		
Contract	Provide training equipment	Training equipment
Training equipment plan		Training equipment report



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Fig 16 Process view of the main activities for training and training support

8 Activity inputs/outputs

This activity defines the data that are exchanged between IPS elements and other IPS elements or domains.

8.1 Alternatives

Alternatives are the opportunity for deciding between two or more things. This can include technical insertion and opportunities, process improvements, etc.

8.2 Allowed configuration

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.

Allowed configuration is provided in the IPS element "Product Support Management".

8.3 As-is configuration

As-is configuration is the Product configuration, including serial numbers, that exists at a given moment during the in-service.

As-is configuration is provided in the IPS element “Product Support Management”.

8.4 Computer resource

A computer resource can be hardware, software, facilities, documentation, personnel and manpower required to develop and sustain computer resources for operation and maintenance of a Product, including planning and support requirements for post-deployment software.

A computer resource is provided in the IPS element “Computer Resources”.

8.5 Computer resource plan

The computer resource plan defines all the management actions, procedures, and techniques used in determining requirements and acquiring hardware, software, facilities, documentation, personnel and manpower required to develop and sustain computer resources for operation and maintenance of a Product, including planning and support requirements for post-deployment software.

The computer resource plan is generated in the IPS element “Computer Resources”.

8.6 Computer resource report

The computer resource report details necessary information about the acquired computer resources for operation and maintenance of a Product.

The computer resource report is generated in the IPS element “Computer Resources”.

8.7 Configuration data

The configuration data generated by the configuration management domain includes the detailed recording, updating and control of information that describes an enterprise’s hardware, software and data.

8.8 Contract

A contract is a mutually binding agreement that obligates the seller to provide the specified Product, service or result and obligates the buyer to pay for it.

8.9 Customer request

A customer request is defined as a request for carrying out a corrective action based on contractual obligations.

8.10 Courseware

Courseware is training material on paper, on a diskette, CD or DVD, or downloaded from the internet, for use with a self-learning or coach assisted training program.

Courseware is developed in the IPS element “Training and Training Support”.

8.11 Delivery

The delivery is the transfer of possession by actual delivery.

8.12 Design engineering data

Design engineering data is defined as any recorded or documented information of a scientific or technical nature whatever the format, documentary characteristics or other medium of presentation. The information can include, but is not limited to:

- Experimental and test data
- Specifications
- Designs and design processes
- Inventions and discoveries patentable or otherwise protectable by law
- Technical descriptions and other works of a technical nature

- Semiconductor topography mask works
- Technical and manufacturing data packages
- Know-how trade secrets and information relating to industrial techniques

Design engineering data can be presented in the form of documents, pictorial reproduction, drawings and other graphic representations, disc and film recordings (eg, magnetic, optical and laser), computer software both programmatic and database, and computer memory, printouts or data retained in computer memory or any other form.

8.13 Engineering change request

An engineering change request is a formal proposal to modify a Product, document or any other contractual item.

8.14 Evaluation plan

The evaluation plan contains the verification concerning the suitability of a Product.

8.15 Facilities and infrastructure

The entire physical infrastructure and associated services required to integrate, operate, repair and maintain a Product.

F&I is generated in the IPS element “Facilities and Infrastructure”.

8.16 Facilities and infrastructure plan

The F&I plan defines all the management actions, procedures and techniques and the requirements for facilities and infrastructure that are required to support and operate a Product.

The F&I plan is generated in the IPS element “Facilities and Infrastructure”.

8.17 Facilities and infrastructure report

The F&I report details the necessary information about the acquired facilities and infrastructure that are required to support and operate a Product.

The F&I report is generated in the IPS element “Facilities and Infrastructure”.

8.18 Feedback data

Feedback data can be any data exchanged between different stakeholders during the operation and support of a Product or the operation of a service.

8.19 Feedback data (operations)

Feedback data (operations) can be any logistic related operations data exchanged between different stakeholders during the operation of a Product or the operation of a service.

8.20 Feedback information

A feedback information summarizes the results of a technical analysis of feedback data for a Product or service.

Feedback information is generated in the IPS element “Sustaining Engineering”.

8.21 Fleet performance report

The fleet performance report contains all necessary information concerning the efficiency of a Product.

8.22 Handling and usage report

The handling and usage report details the necessary resources, procedures and methods to ensure that the Product, the support items and particularly the hazardous materials are handled/used in conformance with appropriate legislation, including health & safety.

8.23 IPS plan

The IPS plan is the primary document that details the approach to IPS, tailored to meet the needs of a specific Product or service. The IPS plan should include detailed information for the planning, implementation and co-ordination of the IPS program, together with element plans detailing how the appropriate IPS elements are addressed and an IPS work breakdown structure.

It is continuously updated and will apply throughout the whole life cycle.

The IPS plan is generated in the IPS element "Product Support Management".

8.24 IPS program computer resources plan (part of IPS plan)

The IPS program computer resources plan details necessary tasks concerning the computer resources needed for the IPS program.

The IPS program computer resources plan is generated in the IPS element "Computer Resources".

8.25 Initial capability document

The initial capability document defines the capability gap in terms of the functional area, the relevant range of operation and desired effects.

The initial capability document is generated in the IPS element "Product Support Management".

8.26 Initial provisioning list

IPL contains the range and quantity of items (ie, spares and repair parts, special tools, test equipment, and support equipment) required to support and maintain an item for an initial period of service.

8.27 Inventory reports

The inventory reports summarize the results of an inventory analysis for storage facilities.

The inventory reports are generated in the IPS element "Supply Support".

8.28 Invoice

An invoice is a non-negotiable commercial instrument issued by a seller to a buyer. It identifies both the trading parties and lists, describes, and quantifies the items sold, shows the date of shipment and mode of transport, prices and discounts (if any), and delivery and payment terms.

In certain cases (especially when it is signed by the seller or seller's agent), an invoice serves as a demand for payment and becomes a document of title when paid in full.

Invoices are generated in the IPS element "Supply Support".

8.29 LCC report

An LCC report summarizes the results of an LCC analysis for a Product or service.

The LCC report is generated in the IPS element "Design Influence".

8.30 Lessons learned database

The lessons learned database contains in a structured, accessible archived form a systematic collection, evaluation and consolidation of experiences, developments, hints and risks from projects.

The lessons learned database is generated in the IPS element “Product Support Management”.

8.31 LORA report

The LORA report summarizes the results of a LORA.

The LORA report is generated in the IPS element “Maintenance”.

8.32 LSA database

A Logistic Support Analysis database is a database, which is used to record resultant data from the LSA process. It is used as the single source of information for the design and development of support resource requirements.

The LSA database is generated in the IPS element “Design Influence”.

8.33 Maintenance concept

A Maintenance concept is 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 Product under analysis.

The maintenance concept is generated in the IPS element “Maintenance”.

8.34 Maintenance plan

The maintenance plan specifies when, where, and which maintenance tasks will be performed on the Product including both preventive and corrective maintenance. The purpose of the maintenance plan is to ensure that the Product can be maintained effectively, economically and safely while following legal regulations at the desired level of readiness after it is placed in operational use.

The maintenance plan is generated in the IPS element “Maintenance”.

8.35 Maintenance report

A maintenance report documents a maintenance task and summarizes (eg, the performed corrective actions, used material or spares, test results or any other important data).

The maintenance report is generated in the IPS element “Maintenance”.

8.36 Management report

The management report can be any official report generated by the Product support manager.

The management report is generated in the IPS element “Product Support Management”.

8.37 Manpower and personnel report

The manpower and personnel report defines personnel with the right skills and grades required to operate and support a Product over its lifetime or to provide a service.

The manpower and personnel report is generated in the IPS element “Manpower and Personnel”.

8.38 Manufacturing data

Manufacturing data is defined as any recorded or documented information of a scientific or technical nature about the manufacturing of a Product whatever the format, documentary

characteristics or other medium of presentation. The information can include, but is not limited to, any of:

- Experimental and test data
- Specifications
- Designs and design processes
- Technical descriptions and other works of a technical nature
- Semiconductor topography mask works
- Technical and manufacturing data packages
- Know-how, trade secrets and information relating to industrial techniques

8.39 MTA report

The MTA report summarizes the results of an MTA.

The MTA report is generated in the IPS element “Maintenance”.

8.40 Obsolescence report

The obsolescence report summarizes the results of the obsolescence management (eg, survey data, risk analysis data and related recovery actions) or technology refreshment.

The obsolescence report is generated in the IPS element “Product Support Management”.

8.41 Operation plan

The operation plan is the plan for long term operations on corporate level.

8.42 Operational requirements

The operational requirements are presented by the customer and details the specific operational parameters of the operational scenarios for the Product.

8.43 Operational requirements document

The ORD is a formatted statement containing performance and related operational parameters for the proposed concept/Product.

The ORD is generated in the IPS element “Product Support Management”.

8.44 Operational planning

Operational planning is the breaking down of the operation plan on unit level a day to day basis.

8.45 Packaging, Handling, Storage and Transport plan

The PHST plan defines the resources, procedures, design considerations and methods necessary to ensure that the Product and support items are packaged, handled, stored and transported in conformance with appropriate legislation, including health and safety and particularly for hazardous materials. This includes environmental limitations, Product preservation requirements for short- and long-term storage, the handling of items during repair tasks and transport requirements.

The PHST plan is generated in the IPS element “Logistic Related Operations”.

8.46 Preventive maintenance task requirements

The PMTR defines and selects the requirements for preventive maintenance tasks with intervals for systems, including installed components and equipment.

The PMTR are generated in the IPS element “Maintenance”.

8.47 Procurement plan

The procurement plan defines the Products and services that must be obtained from external suppliers and describes the process to appoint those suppliers contractually. Generally, the procurement plan defines the items that must be procured, defines the process for acquiring those items and finally, schedules the time frames for delivery.

The procurement plan is generated in the IPS element "Supply Support".

8.48 Product disposal file

The Product disposal file contains the disposal activities under consideration and documentation of the possibilities of re-deployment, sale, waste disposal, the environmental impacts and the possible disposal of recovered material by sale.

The Product disposal file is generated in the IPS element "Sustaining Engineering".

8.49 Product Support Requirement

A Product support requirement is a singular documented functional or non-functional need that a particular Product or process must satisfy with respect to support issues.

It can be any function, attribute, capability, characteristic, or quality of a Product support system.

The Product support requirement is generated in the IPS element "Product Support Management"

8.50 Provisioning data

Provisioning data is defined as any recorded or documented information prepared explicitly for the identification, description, installation location and verification of items, materials, supplies, and services that are to be purchased, inspected, packaged, packed and supplied, or delivered to users.

The provisioning data is generated in the IPS element "Supply Support".

8.51 Provisioning order

The provisioning order is a document that describes the required supplies or services needed to initiate procurement.

The provisioning order is generated in the IPS element "Supply Support".

8.52 Quotation

The quotation is a formal statement of promise (usually submitted in response to a request for quotation) by a potential supplier to supply the goods or services required by a customer, at specified prices, and within a specified period. A quotation can also contain terms of sale, payment and warranties.

The quotation is generated in the IPS element "Supply Support".

8.53 Safety reports

The safety reports summarize the results of safety analyses.

8.54 Specification

A specification is a document that defines the requirements, design, behavior or other characteristics of a Product, result or service and the procedures for determining whether these provisions have been satisfied in a complete, precise and verifiable manner. (eg, requirement specification, design specification, Product specification and test specification).

8.55 Spare parts list

The SPL is a listing of spare parts mainly based on provisioning data charged with business data (eg, prices, contract numbers, effective expiry dates). Its purpose is to enable customers and the contractors processing parts data without using complex provisioning processes by integration of the customer. It places negotiated parts data at customers' disposal (eg, for recording purposes of material) and enables material supply processes.

The SPL is generated in the IPS element "Supply Support".

8.56 Software support analysis report

The SSA report summarizes the results of software support analyses.

The SSA report is generated in the IPS element "Maintenance".

8.57 Supplier data

Supplier data is defined as any recorded or documented information provided by supply chain management to support the IPS activities for a Product or for services.

8.58 Support concept

The support concept describes the scheme for support, which is derived from the support requirements. The concept is the basis for planning, executing and documenting the support as well as for activation, use, maintenance/repair and disposal of a Product. It describes the required support resources.

The support concept is generated in the IPS element "Product Support Management".

8.59 Support contract

A support contract is a contract for any service necessary to support and operate a Product.

A support contract is generated in the IPS element "Product Support Management".

8.60 Support engineering reports

The support engineering report summarizes the results of analyses for reliability, availability, maintainability and testability. It can include the capability of a Product.

The support engineering report is generated in the IPS element "Design influence".

8.61 Support equipment

Support equipment can be all equipment (mobile or fixed) required to support the operation and maintenance of a Product. This includes associated multi-use support items, ground-handling and maintenance equipment, tools, meteorology and calibration equipment, and manual/automatic test equipment.

The support equipment is provided by the IPS element "Support Equipment".

8.62 Support equipment plan

The support equipment plan defines all support equipment. It also includes the acquisition of support for the support equipment itself.

The support equipment plan is generated in the IPS element "Support Equipment".

8.63 Support equipment report

The support equipment report details necessary information about the acquired support equipment that is required to support and operate a Product.

The support equipment report is generated in the IPS element "Support Equipment".

8.64 Supportability safety analysis report

The supportability safety analysis report summarizes the results of any analyses for safety of supportability task of a Product or service.

The supportability safety analysis report is generated in the IPS element “Maintenance”.

8.65 Technical data exchange document

The technical data exchange document is a technical description of the requirements for the technical information infrastructure, protocols and actors involved to support the exchange of information during the life of a support program. Refer to [Chap 8](#).

The technical data exchange document is generated in the IPS element “Manage computer resources for IPS program”.

8.66 Technical data package

A TDP is technical description of an item adequate for supporting an acquisition strategy, production, engineering, and support. The description defines the required design configuration and procedures to ensure adequacy of item performance. It consists of all applicable technical information (eg, drawings, associated lists, specifications, standards, performance requirements, quality assurance provisions, technical publications, and packaging details).

A TDP is generated in the IPS element “Technical Data”.

8.67 Technical publications

Technical publications are manuals that contain instructions for the installation, operation, maintenance, training, and support of systems and support equipment. Technical publications can be presented in any form or characteristic, including but not limited to hard copy, audio and visual displays, magnetic tape, discs, and other electronic devices. Technical publications normally include operational and maintenance instructions, parts lists or parts breakdown, and related technical information or procedures exclusive of administrative procedures.

Technical publications are generated in the IPS element “Technical data”.

8.68 Testability report

The testability report summarizes the results of any DPHM analyses of a Product.

The testability report is generated in the IPS element “Maintenance”.

8.69 TNA report

The TNA report summarizes the results of an analysis of the requirements for training concerning the operational and maintenance activities.

The TNA Report is developed in the IPS element “Training and Training Support”.

8.70 Training course

A training course is one or a series of lessons to teach the skills and knowledge for a job or activity.

A training course is developed and conducted in the IPS element “Training and Training Support”.

8.71 Training course report

A training course report summarizes the results of a conducted training course.

A training course report is developed and conducted in the IPS element “Training and Training Support”.

8.72 Training equipment

Training equipment is any hardware, software, multi-media player, projector, etc, used in a training process.

The training equipment is defined in the IPS element “Training and Training Support”.

8.73 Training equipment plan

The training equipment plan summarizes the results of all training equipment requirements analyses.

The training equipment plan is generated in the IPS element “Training and Training Support”.

8.74 Training equipment report

The training equipment report defines the qualitative and quantitative requirements for training equipment.

The training equipment report is developed in the IPS element “Training and Training Support”.

8.75 Training plan

The training plan defines qualitative and quantitative requirements for the training of operating and support personnel throughout the life cycle of the Product. It includes requirements for:

- Competencies management
- Factory training
- Instructor and key personnel training
- New equipment training team
- Resident training
- Sustainment training
- User training
- HAZMAT (hazardous material) disposal and safe procedures training

The training plan is developed in the IPS element “Training and Training Support”.

8.76 Usage requirements document (URD)

The URD defines the user requirement in the form of the outputs or results that the users require from the Product.

The URD is generated in the IPS element Product Support Management.

8.77 Warranty reports

The warranty reports contain the management of warranty claims concerning in-service Product failures.

The warranty reports are generated in the IPS element “Supply Support”.

Chapter 3

Use of the S-Series IPS specifications in an IPS program

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Table 1 References

Chap No./Document No.	Title
Chap 1	Introduction
Chap 2	IPS framework
S1000D	International specification for technical publications using a common source database
S2000M	International specification for materiel management
S3000L	International procedure specification for Logistics Support Analysis (LSA)
S4000P	International specification for developing and continuously improving preventive maintenance
S5000F	International specification for in-service feedback
S6000T	International specification for training analysis and design
ISO 10303:239 PLCS	Product Life Cycle Support (PLCS)

1 Introduction

The successful operation and use of a Product depends on diligent planning, proper management and successfully providing Product support to achieve the required level of performance throughout the entire Product life cycle.

This chapter provides guidance, for the use of defined Integrated Product Support (IPS) processes and specifications, to satisfy specific business requirements. It explains how the processes and specifications interface and integrate with other life cycle domains, IPS elements and IPS activities throughout the life cycle of a Product.

1.1 Objective

This chapter explains how to apply the S-Series IPS specifications in an IPS program. It provides a set of suitable IPS activities to enable standard-based communication and information/data exchange among involved stakeholders to achieve the main IPS objectives: design the Product for optimal support; initiate the most cost-efficient support solution, and acquire and provide the support for the Product.

It provides guidelines for appropriate tailoring to achieve an efficient and cost-effective Product support solution to satisfy the Product needs and application.

Support arrangements can range from informal agreements to formal contracts.

1.2 Scope

The scope of this chapter addresses the entire Product life cycle from preparation to final disposal. Refer to [Chap 1](#).

This chapter is directed to Project Managers (PM) and IPS managers on both the customer and contractor side.

This chapter relates to all types of Products, (eg, a one-of-a-kind Product, mass-produced Products, adapted or customized Products). It also applies to stand-alone Products and Products to be embedded or integrated into larger systems.

It is focused on S-Series IPS specifications including linkage to the life cycle domains.

2 Interfaces of the S-Series IPS specifications

This chapter explains where the interconnections are and the benefits that can be achieved by using the S-Series IPS specifications in developing the operational in-service support activities and associated IPS elements, with the goal of optimizing the usage and the support system of any operational Product.

The interdisciplinary character of supportability is highlighted throughout the following paragraphs for each of the IPS specifications.

2.1 S1000D

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

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

A data module contains the following information:

- an identification and status section with all management information
- a content section

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

- applicability cross-reference information
- business rules information
- common information repository
- conditions cross-reference information
- container information
- crew/operator information
- descriptive information
- fault information
- front matter information
- IPD information
- maintenance checklists and inspections
- maintenance planning information
- procedural information
- process information
- products cross-reference information
- service bulletin information
- training information
- wiring data information
- wiring data description information

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

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

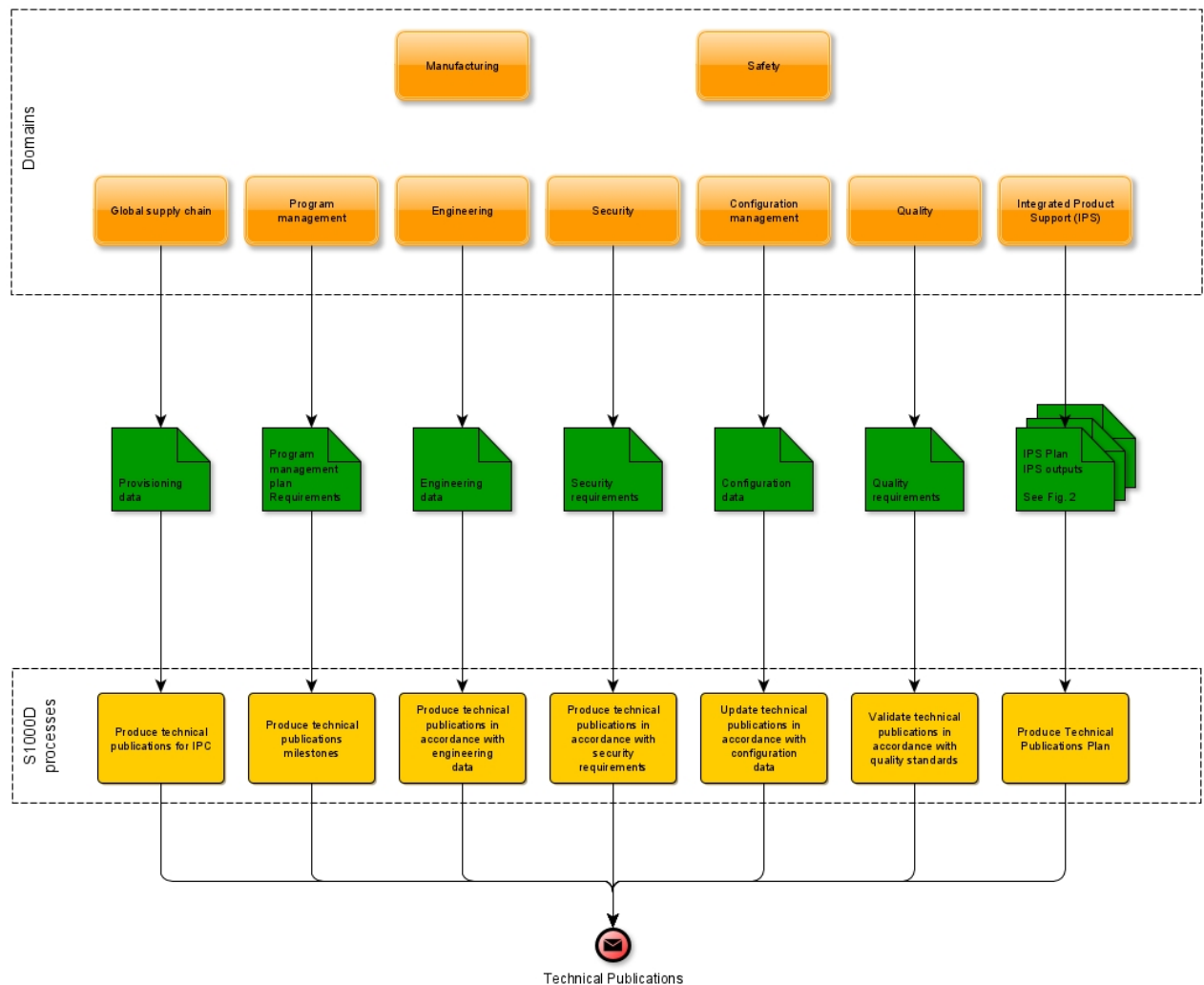
Data managed in S1000D is not duplicated in the CSDB. Data modules enable data to be stored once and used for multiple outputs. A single change to an individual data module can update multiple outputs and multiple deliveries.

Other benefits of using S1000D are that:

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

2.1.1 Domains

How S1000D interfaces with specific domains is shown in [Fig 1](#).



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Fig 1 Mapping of S1000D business process interfaces with specific domains

2.1.1.1 Global supply chain

The global supply chain generated provisioning data contains information for the identification, description, and verification of items, materials, supplies, and services that will be purchased, inspected, packaged and supplied, or delivered to users.

This data is generated in accordance with S2000M, which defines the data structure. Since this data structure is identical to S1000D Illustrated Parts Data (IPD) data modules, the data can be mapped directly and published as an IPD/IPC that maintainers use as a reference for identification of items used in maintenance procedures.

2.1.1.2 Program management

The program management plan is generated by the program management domain and used to define the technical publication program plan and corresponding milestones affected by the process.

- 2.1.1.3 **Engineering**
The interface between engineering and technical publications is focused on the review of drawings and/or 3D models, specifications, or any other documentation from the engineering domain, in order to obtain sufficient information to produce technical publications to support the description, operation and maintenance of the Product or Service.
- 2.1.1.4 **Security**
The interface between security and technical publications focuses on the security requirements generated by the security domain. The requirements identify and explain the process to protect the Product and Service, complete with its associated information, against any harm due to unauthorized access, corruption, or manipulation.

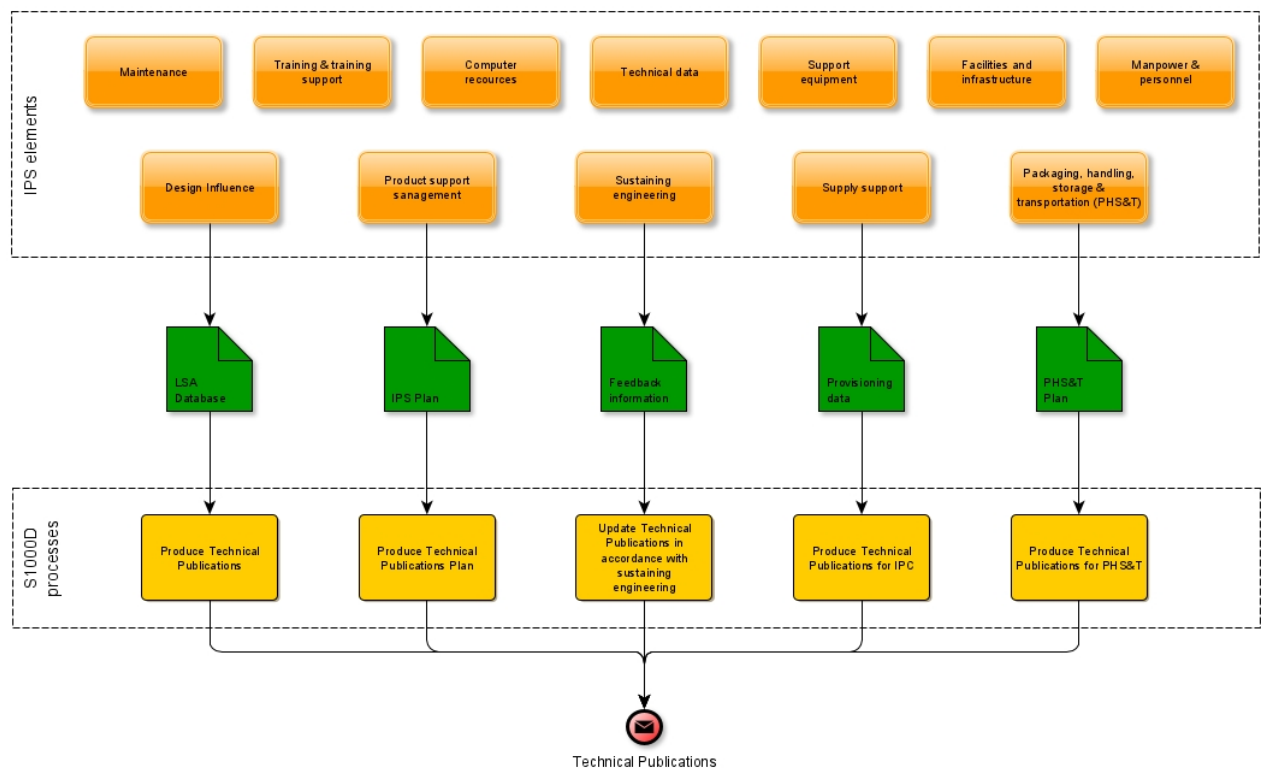
The data modules generated in accordance with S1000D contain the security information appropriate for the content of the data module, in the data module's identification and status section.
- 2.1.1.5 **Configuration management**
The configuration data generated by the configuration management domain details the recording, updating and control of information that describes an enterprise's hardware, software and data.

Initially, this interface establishes the implementation and control of the early Product configurations within the technical publication, at the beginning of the Product's life cycle. The "as delivered" Product must be considered in the "as delivered" configuration in accordance with the production baseline build standard configuration. Subsequently, there can be changes to build standard to be accounted for, where retrofit, modifications or service bulletin information will be incorporated into the technical publications.

The configuration management interface is also important to the maintenance of the Product safety documentation; safety documentation will identify the Issue number of the Product configuration statement when it defines the scope of the system being assessed.
- 2.1.1.6 **Quality**
The interface with the quality domain focuses on generation of quality requirements to ensure that the customer's requirements, enterprise's, national and international regulations for a Product or Service are met during the life cycle.

This interface is intended to identify all assurance activities that are carried out to ensure that the Products are safe to use, fit for purpose and technically accurate. These assurance activities can vary in style and complexity between land, sea and air projects and can include regulatory and legislative requirements.

The technical publications produced in accordance with S1000D contain specific quality statements that provide the quality status in each data module.
- 2.1.1.7 **IPS domain**
The IPS domain provides a series of outputs that are essential for the preparation of technical publications. Refer to [Para 2.1.2](#).
- 2.1.2 IPS elements**
The interface between S1000D and the IPS elements is shown in [Fig 2](#).



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Fig 2 S1000D business process interface with IPS elements

2.1.2.1

Design influence

The information generated by the design influence activity as part of the IPS elements, comprises the LSA database, and is used as the single source of information to produce technical publications. The LSA database is the single location for storing all Product support data that is routed to all IPS elements and domains.

The LSA database contains configuration data, Level of Repair Analysis (LORA) and Maintenance Task Analysis (MTA) reports, Supplier data, maintenance concept and maintenance plans, fault diagnosis information, facilities and infrastructures reports, preventive and corrective maintenance tasks, etc.

These data elements stored in LSA database (from S3000L activities) can be directly translated into S1000D technical publications data elements contained in data modules, thus, ensuring data consistency and optimization of Through Life Costs (TLC).

2.1.2.2

Product support management

The IPS Plan (IPSP) generated by the Product support management activity, is the primary document that details the IPS needs of a specific Product or Service. The IPSP includes detailed information for the planning, implementation, and coordination of all IPS elements.

The IPSP is used to establish a specific, technical publication plan that includes the definition of the specific milestones and the related achievement reports.

2.1.2.3

Sustaining engineering

The feedback information generated by the sustaining engineering activity summarizes the results of technical analysis of feedback data for a Product or Service.

This feedback can be processed through the technical publications Change Proposal (CP) process or integrated into other IPS element's deliveries.

2.1.2.4 Supply support

The provisioning data generated by the supply support activity, contains information for the identification, description, and verification of items, materials, supplies, and services that will be purchased, inspected, packaged and supplied, or delivered to users.

This information is generated in accordance with S2000M, which defines the structure of the data. Since this structure is identical to S1000D IPD data modules, the data can be mapped directly and published as an IPD/IPC that maintainers use as a common reference for identification of items used in maintenance procedures. The IPD/IPC technical publication also provides a common reference for identification of items used in maintenance procedures.

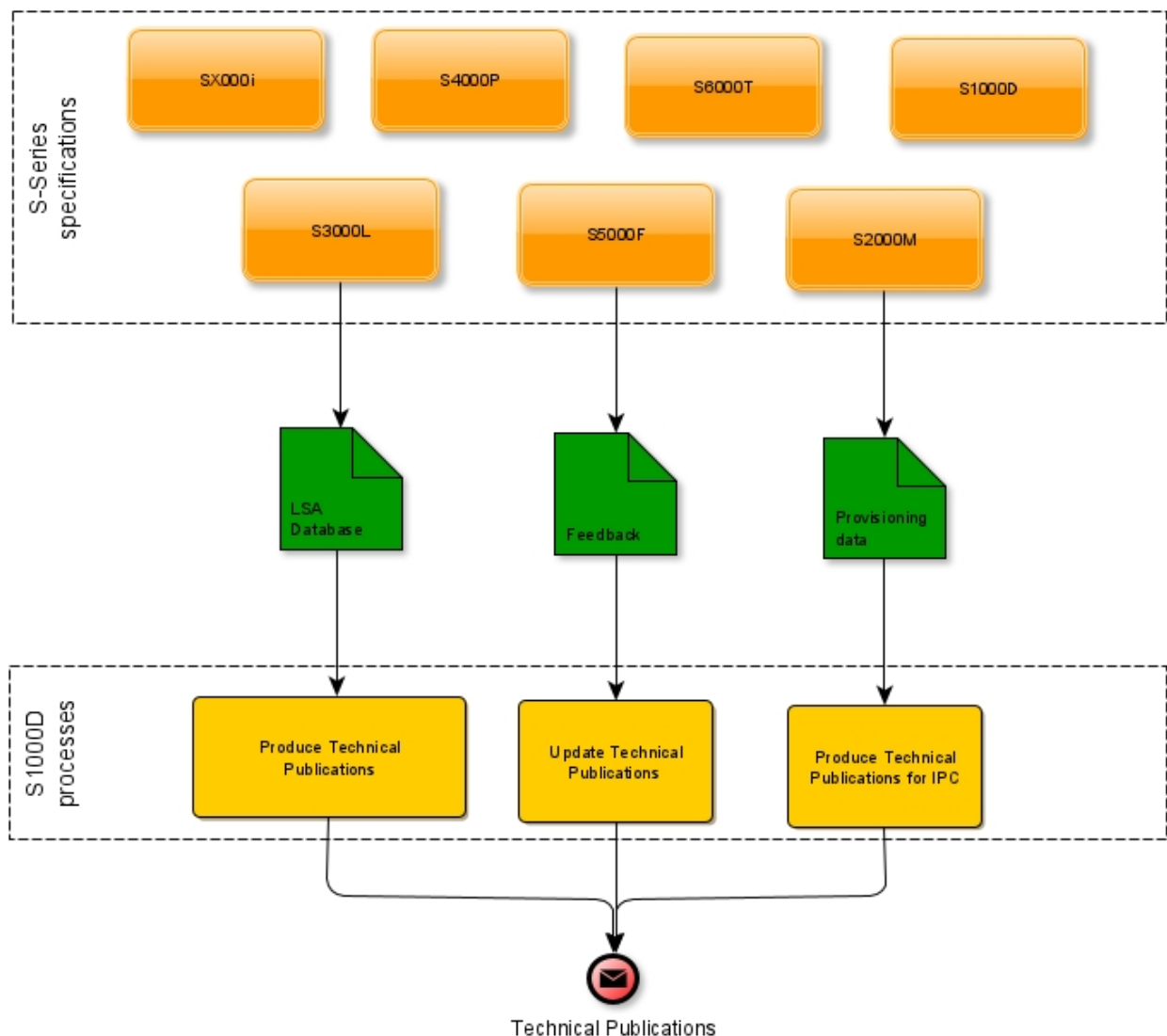
2.1.2.5 Packaging, Handling, Storage and Transportation

The Packaging, Handling, Storage and Transportation (PHST) information generated by this IPS activity identifies the project strategy for safely packaging, handling, storing, and transporting a Product or related material in addition to any special requirements and interfaces with organizations that are responsible for transportation.

This information is stored in S1000D data modules and distributed to final users.

2.1.3 IPS specifications

The interface of S1000D to other S-Series IPS specifications is shown in [Fig 3](#).



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Fig 3 S1000D business process interface with other S-Series IPS specifications

- 2.1.3.1 S2000M
The S2000M interface provides provisioning data and illustrations to produce the IPD/IPC, as a technical publication, defined by the S1000D process.
- The provisioning data generated and stored in accordance with the S2000M process can be translated directly into S1000D data modules, ensuring data consistency and optimization of LCC.
- 2.1.3.2 S3000L
The S3000L interface provides the LSA database, which is used as the single source of information for the production of technical publications related to both preventive and corrective maintenance procedures that can be mapped to S1000D data modules, ensuring data consistency and optimization of LCC.

- 2.1.3.3 S5000F
The interface with S5000F includes the feedback information that is used to update the technical content of the technical publications. Despite there being no direct and specific interface between S5000F and S1000D, feedback can be translated into an S1000D CPF or used in other sources of authorised information used by the technical publications production process.
- 2.1.3.4 S6000T
The interface with S6000T is the data input specification S6000X, which is under development.

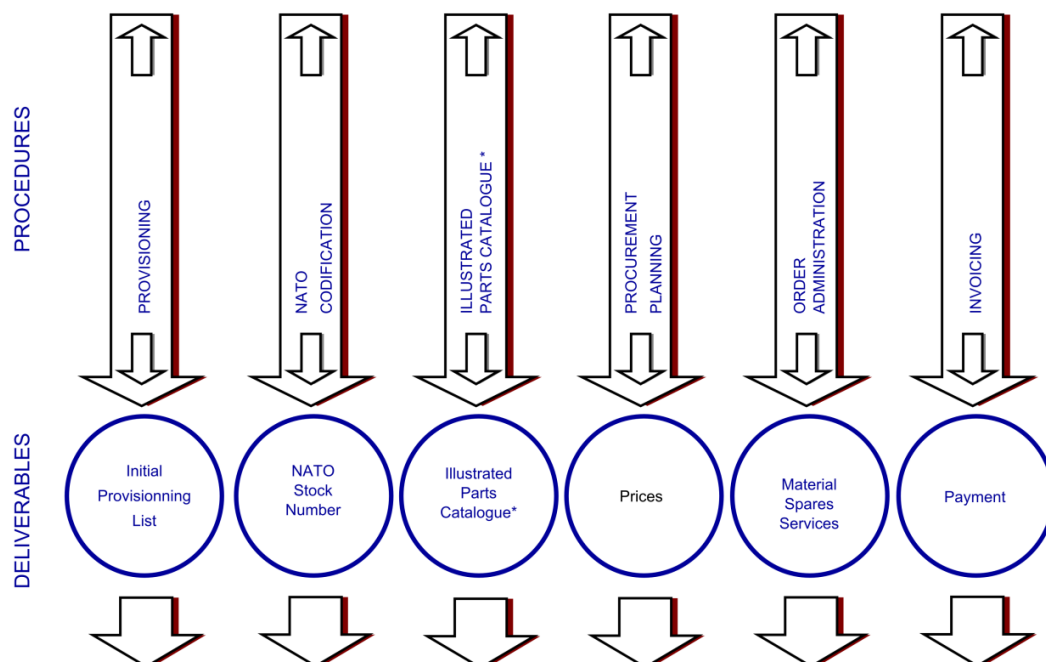
2.2 S2000M

Originally, S2000M defined the materiel management processes and procedures to be used in support of aircraft and aerospace airborne and ground equipment supplied to military customers. S2000M also included the business processes and data requirements applicable to any military Product.

Today, S2000M is designed to address all material management activities in support of military and non-military Products. The procedures describe the interfaces between industry and the customer, which, when based upon contractual agreements, will provide the typical deliverables of support material management, as follows:

- Initial Provisioning Lists (IPL)
- NATO/National codification (the allocation of NATO/National Stock Numbers (NSN) in military projects)
- Illustrated Parts Catalogue (IPC). Refer to S1000D.
- procurement planning (including prices)
- order administration (material spares services)
- invoicing

The contract general terms, relating to the deliverables and procedures of support material management are summarized in [Fig 4](#).



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Fig 4 Deliverables and procedures of support material management

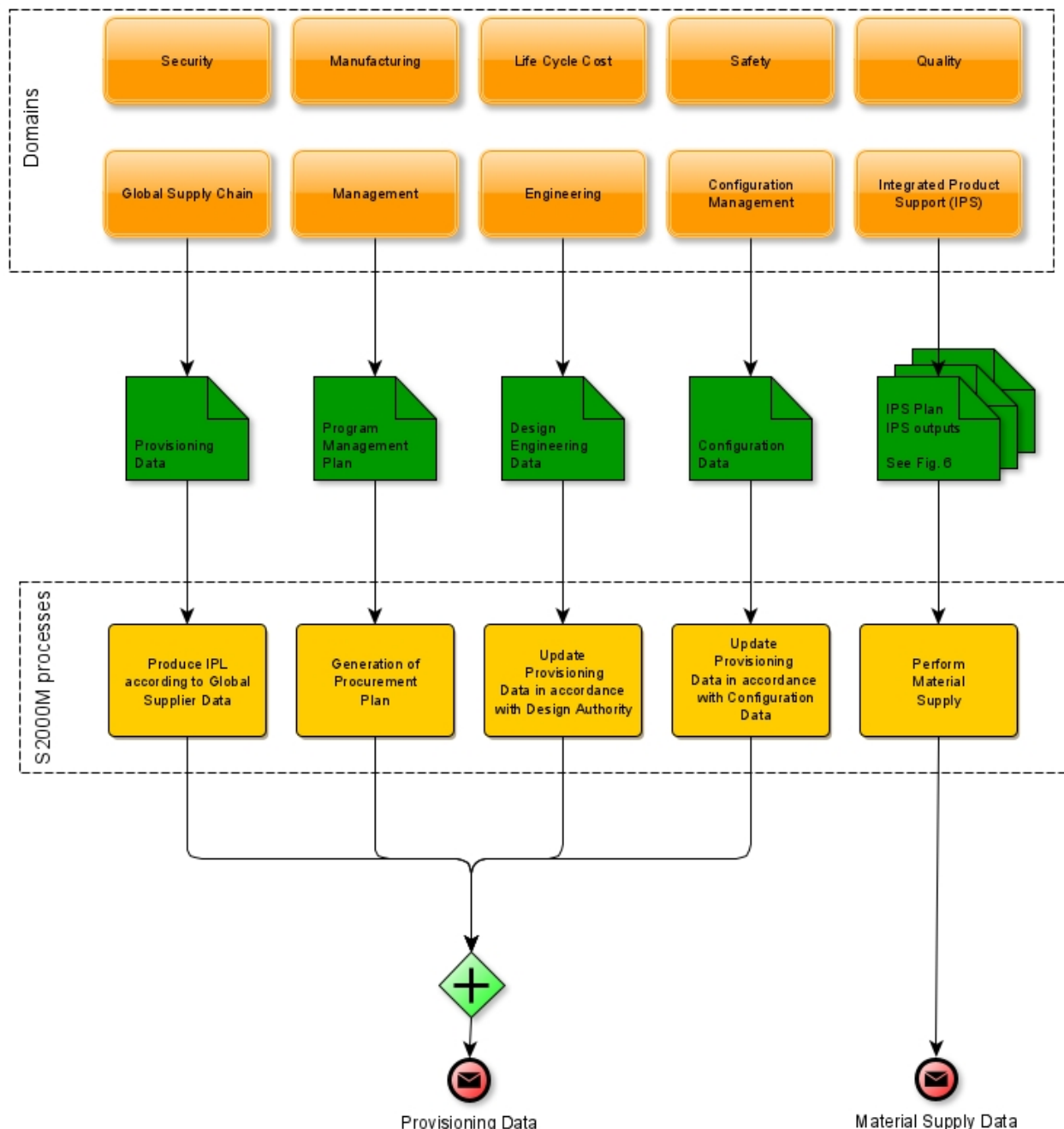
It is intended that S2000M must be the common material support specification used by governments, procurement, support agencies, and industry.

By agreement between customer and industry, S2000M requirements can be supplemented by additional international or national requirements for specific projects.

2.2.1

Domains

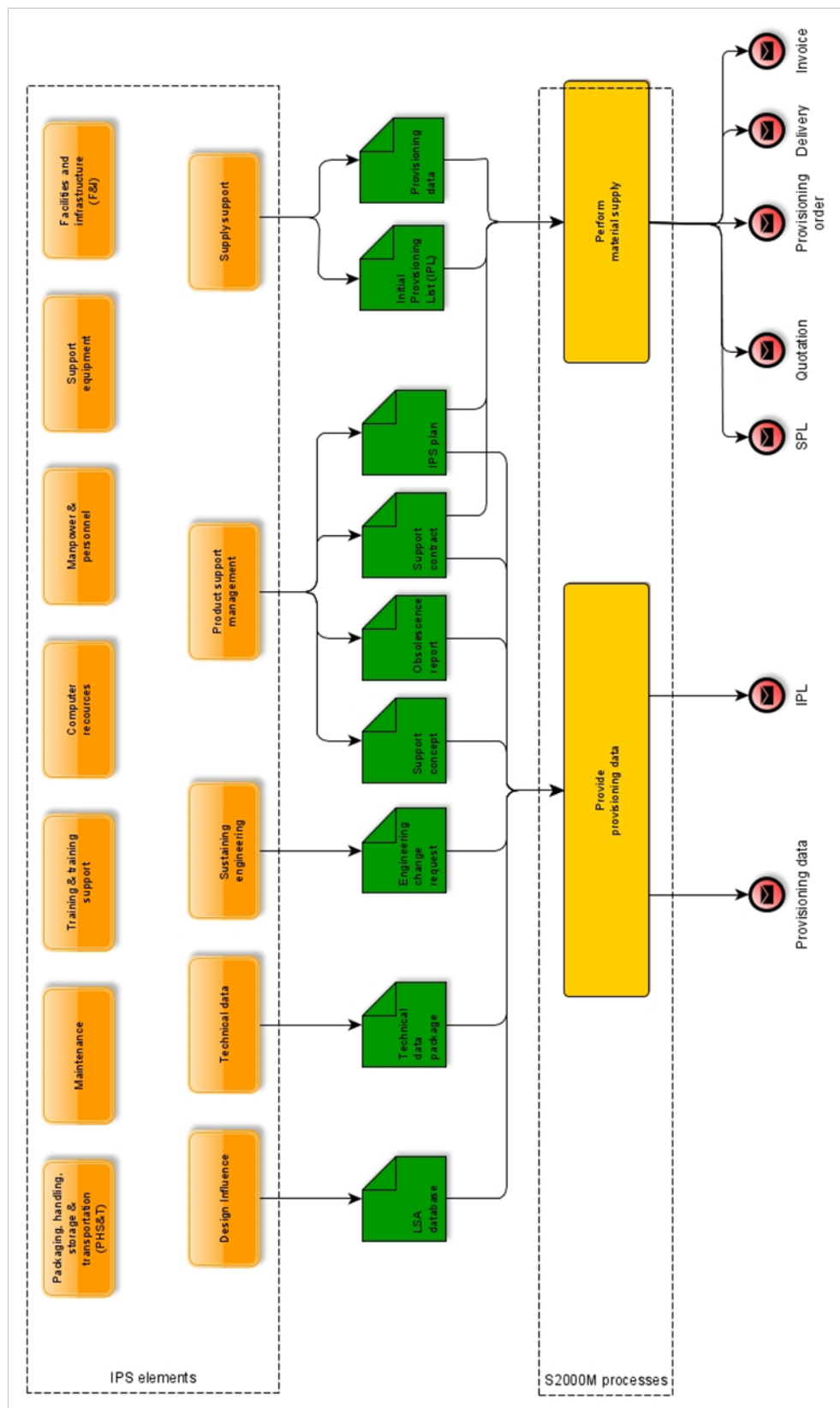
The mapping between S2000M and other domains is shown in [Fig 5](#).



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Fig 5 S2000M business process interface with domains

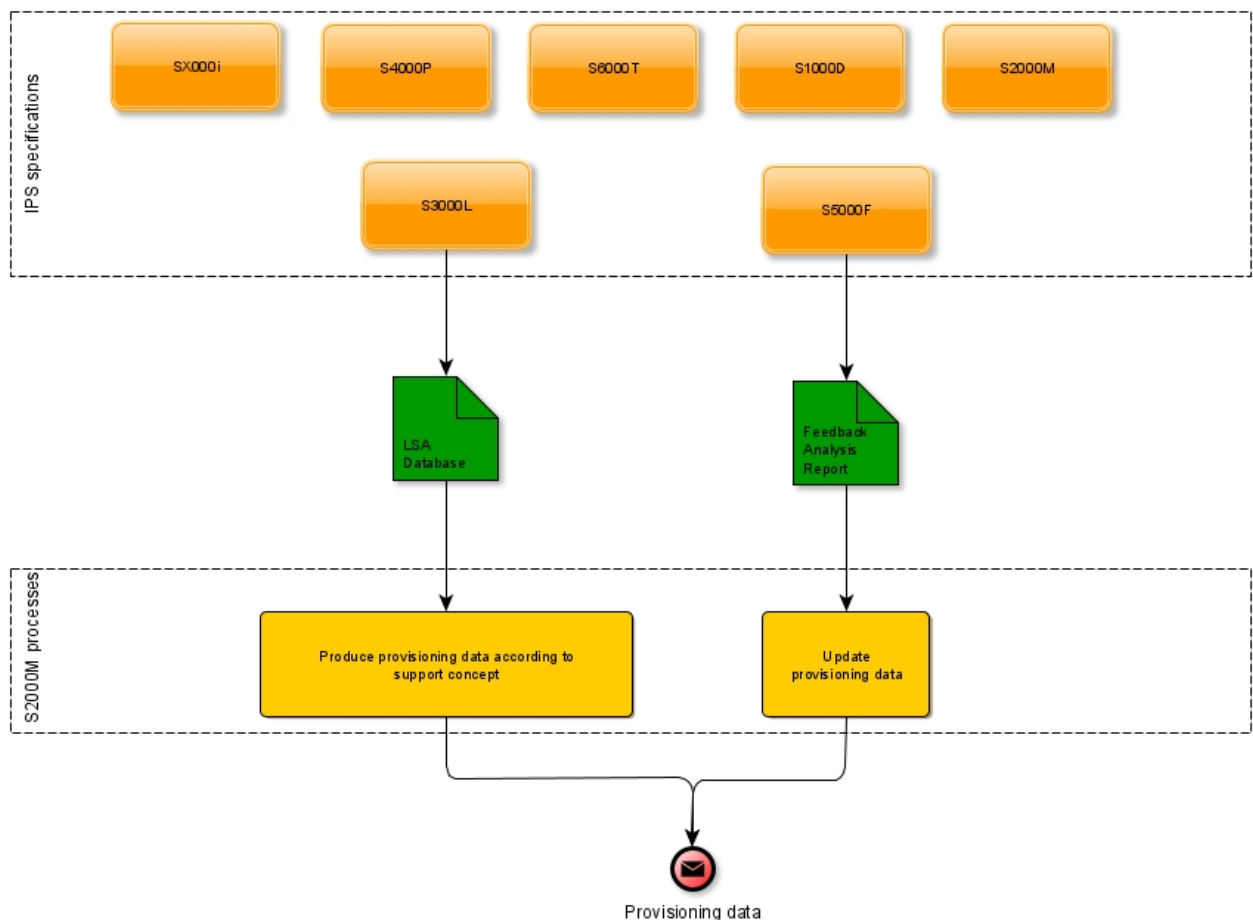
-
- 2.2.1.1 **Product support management**
The IPSP generated by the management domain is used to define the provisioning program plan and associated milestones as defined by the S2000M process.
- This plan includes the schedule for providing provisioning data to meet the entry into service date.
- 2.2.1.2 **Engineering**
The interface between engineering and material management is focused on the review of drawings and/or 3D models, specifications, or any other engineering domain documentation to support the maintenance levels defined by LSA database. Further, this information enables early visibility of spares ranging and scaling requirements to support the planned maintenance philosophy.
- This information is used to create the Product support configuration, and spares breakdown that enable material supply to be carried out.
- 2.2.1.3 **Configuration management**
The configuration data generated by the configuration management domain details the recording, updating and control of information that describes an enterprise's hardware, software and data.
- This interface covers the complete life cycle of the Product and includes the development embodiment and control of all modifications, which can affect the Product support configuration and, therefore, the materiel support requirements, equipment and spares ranges.
- 2.2.1.4 **Global supply chain**
The global supply chain provisioning data contains supplier information related to identification, description, and verification of items, materials, supplies, and services that are been used to generate initial provisioning data for the user.
- This provisioning data is used to perform material supply and is used by S1000D to create the IPD/IPC.
- 2.2.1.5 **IPS domain**
The IPS activity provides a series of outputs that are essential for the preparation of the material management solution.
- 2.2.2 IPS elements**
The interface of S2000M to the IPS elements is shown in [Fig 6](#).



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Fig 6 S2000M business process interface with other IPS elements

- 2.2.2.1 **Design influence**
Design influence activity focuses on selection of material solutions which will support the objectives of cost-effectiveness and optimization within the support strategy.
- The design influence activity is the major source of information to generate the LSA database. Refer to [Para 2.1.2.1](#).
- This information is used to compile all the provisioning data that is necessary for generating initial provisioning information.
- 2.2.2.2 **Product support management**
The Product support management activity details the IPS needs of a specific Product or Service.
- The relevant outputs of the IPS activity which use the provisioning data are the:
- IPSP, which includes detailed information for the planning, implementation and coordination of all the remaining IPS elements
 - support contract
 - support concept
 - obsolescence report
- The IPSP and the support contract provides information that is necessary to perform material supply and its associated outputs:
- spare parts list
 - quotation
 - provisioning order
 - deliveries and invoices
- 2.2.2.3 **Technical data**
The technical data activity provides the technical data package, which includes supplier data and PHST data and are the core data used to define the structure of the breakdown spares, modifications, support equipment, special tools and their applicability.
- Technical data is used to develop the provisioning data and supporting documentation.
- 2.2.2.4 **Sustaining engineering**
The sustaining engineering activity provides the engineering change data necessary to perform provisioning data activities and their associated documentation.
- 2.2.2.5 **Supply support**
The provisioning data generated by the supply support activity, contains information for the identification, description, and verification of items, materials, supplies, and services that are to be purchased and delivered to users.
- The major inputs required to perform the material supply activity are the:
- provisioning data
 - supplier data
 - IPL
- This information generated in accordance with the S2000M process, is the basis for the provision of the spare parts list, quotation, provisioning order, deliveries and invoices to users.
- 2.2.3 IPS specifications**
The interface of S2000M to the other S-Series IPS specifications is shown in [Fig 7](#).



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Fig 7 S2000M business process interface with other S-Series IPS specifications

2.2.3.1 S3000L
S3000L provides database to the S2000M process, which is used as the major source of information through the:

- PHST requirements
- facilities and infrastructures report
- manpower and personnel report
- MTA report
- maintenance concept

2.2.3.2 S5000F
The interface with S5000F is defined through the Product and in-service feedback information, which is used to update the technical content of the provisioning data, Mean Time Between Failure (MTBF), operational data, failure data, repair data etc.

2.3 S3000L

S3000L must not be considered as a standalone specification.

Logistic Support Analysis (LSA) is one of the most important processes of product support. It is the principal tool used to:

- design products relevant to Reliability, Availability, Maintainability, Testability and Safety (RAMTS) and to optimize life cycle costs
- define and develop all required resources to support the Product in its intended use during in-service operation
- establish traceability of content of the IPS end-products back to the justifying analysis results in support engineering during the complete life cycle of the Product or Service.
- define the processes, general requirements and related information exchange governing the performance of LSA during the entire life cycle of complex technical Products and Services
- provide rules for the use of the Product breakdown for support purposes and for the selection of LSA candidate items.
- describe type and methodology for performance of the specified technical/ support analyses.
- provide guidelines on how to process the results of the analysis tasks and on how to achieve a cost-efficient support solution.
- address the interface between LSA and the support engineering functions (eg, reliability, maintainability and testability)
- address the interface between LSA and the IPS elements

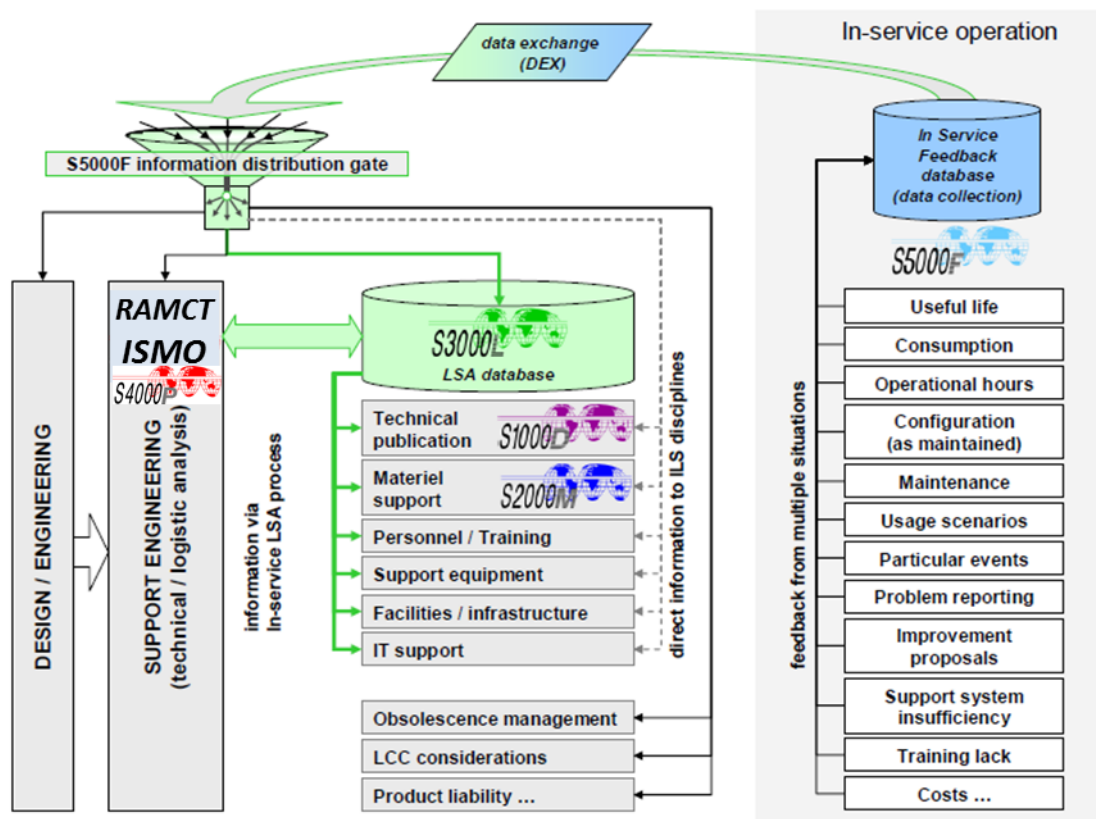
The procedures for performing the technical/support analysis activities (eg, performing a Preventive Maintenance Analysis (PMA) or performing a LORA) are documented and integrated into the LSA process, in accordance with S3000L and S4000P, respectively. These two specifications are closely interrelated. For example, the results of a PMA are documented in the LSA database in the form of Preventive Maintenance Task Requirements (PMTR). Based on the PMTR, S3000L conducts an MTA to develop the actual preventive maintenance task.

This close relationship between the two specifications enable traceability for each preventive maintenance activity, from the in-service phase, where the task is performed, to LSA and then back to the support engineering analysis results.

The same is true for unscheduled maintenance activities (eg, repair after failure or specific operational activities). Justifying events or requirements and the corresponding tasks are documented during the LSA process. Finally, only the complete view of the entire maintenance concept (preventive, unscheduled and operational) guarantees the realization of an optimized and harmonized support concept.

Due to the content of S3000L, which describes the process to define the support system for the operation of technical Products, the feedback from operation to S3000L is also key to assuring the effectiveness of the identified and realized support system.

The entire feedback process showing the position of the S-Series IPS specifications, indicated by their symbols, and the several feedback paths to the different areas of design, support engineering and Product support, is shown in [Fig 8](#).



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Fig 8 In-service data analysis process as an example of S5000F feedback usage

The S-Series IPS specifications guarantee harmonized maintenance and by extension, the major support functions of the Product life cycle.

LSA process is the central support process; the entire IPS process is controlled by the mechanism of LSA. All information concerning functionality and effectiveness of the support system is forwarded to the LSA. All information justifying the maintenance concept is stored in the LSA database. Additionally, relationships are established from LSA to the technical and support analysis activities within the support engineering function (eg, RAMTS).

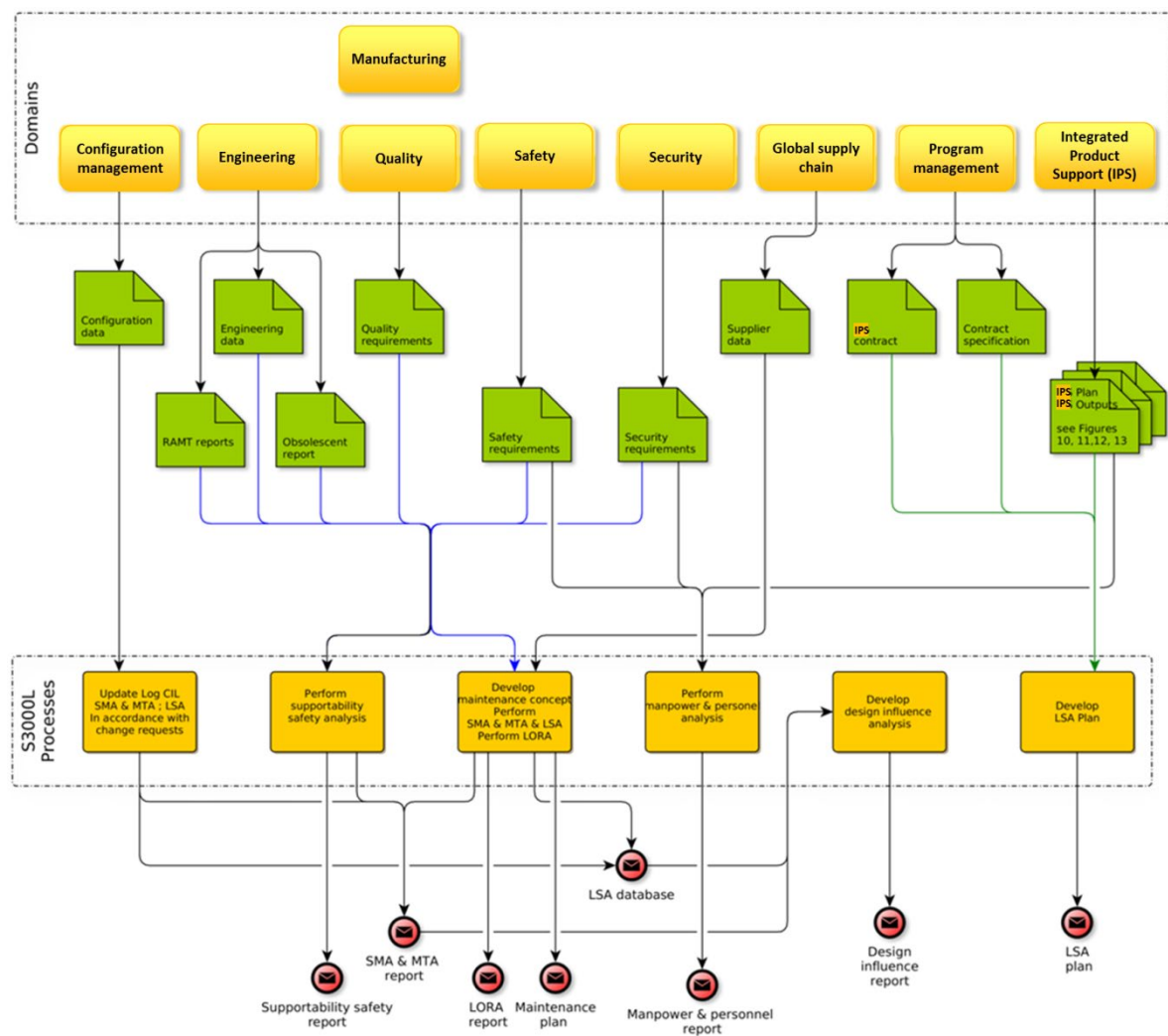
During the entire life cycle of a Product, feedback information is used to improve operability and maintainability. Optimization is an ongoing challenge, especially for complex and long- living Products.

All information, which is directly related to the maintenance activities, is part of the in-service phase of the LSA process. The performance of the support system can be influenced significantly by in-service feedback.

2.3.1

Domains

The mapping of S3000L to specific domains is shown in [Fig 9](#).



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Fig 9 S3000L interfaces with other domains

2.3.1.1 Supplier data

Suppliers are an integral part of the support solution, especially major suppliers within the project, and must be integrated in the IPS process.

The prime contractor, which is responsible for executing the program, should be encouraged to integrate as much of the IPS program with suppliers as is practical, consistent with the suppliers' capability and in line with customer requirements.

The prime contractor conducts IPS procurement reviews at an IPS supplier's conference to evaluate candidate suppliers based on their Product support and supportability program capability. This effort, like a source selection evaluation, surveys suppliers to verify that they are capable of providing the support necessary to satisfy IPSP and project requirements.

The LSA process is tailored according to customer requirements as part of the IPS process for any project. S3000L describes the LSA process, which allows tailoring of LSA to ensure that support requirements from the customer are satisfied.

2.3.1.2 Engineering

- Through integration of supportability into the systems engineering process, we can ensure that the design process includes reliability and maintainability engineering to reinforce

design for support within the IPS program. This objective aligns with the project management objective to: achieve operational availability and readiness thresholds

- Achieve reliability and maintainability thresholds necessary to meet these objectives
- Assign appropriate priorities to supportability requirements in system design trade-offs
- Identify support and associated resources drivers

LSA interfaces with engineering to obtain engineering drawings and/or 3D models to produce maintenance tasks and identify support resources. Specifications and other engineering documents provide RAMTS requirements necessary to ensure that customer requirements are met.

Systems engineering is the application of scientific and engineering resources to:

- Transform the operational need into a system configuration, which meets effectiveness standards
- Integrate related technical parameters and assure compatibility in a manner, which optimizes the system's design
- Integrate the efforts of all engineering aspects into the integrated Product development systems engineering process

2.3.1.3

Configuration Management

Configuration Management (CM) ensures the correct identification and version of the configuration. It controls changes and records the change implementation status of the physical and functional characteristics of the Product.

CM is performed at the lowest level of the Product breakdown. It identifies what is required, designed, produced and supported, and evaluates changes, including effects on technical and operational performance and IPS activities. Normally, it also provides visibility of the configuration through the medium of a Configuration Statement.

The elements of CM include:

- Configuration management planning
- Configuration identification
- Configuration control
- Configuration accounting
- Configuration verification and audit

The interface between CM and LSA provides the implementation and control of the different Product configurations and generation of Product breakdown, at the beginning of the project and throughout the life cycle of the Product. It also provides the implementation of changes, according to design, affecting supportability requirements.

2.3.2

IPS elements

To establish the most effective application and interfaces of LSA, consideration must be given to:

- the numerous LSA interfaces/inputs of the majority of the IPS elements
- the variety of analyses and derived outputs that are impacting the overall IPS functions of the process
- the need to ensure that design engineering is cognizant of the LSA results and reacts to them and vice versa.
- the impact of the LSA outputs on the in-service phase of support and operation of the Product

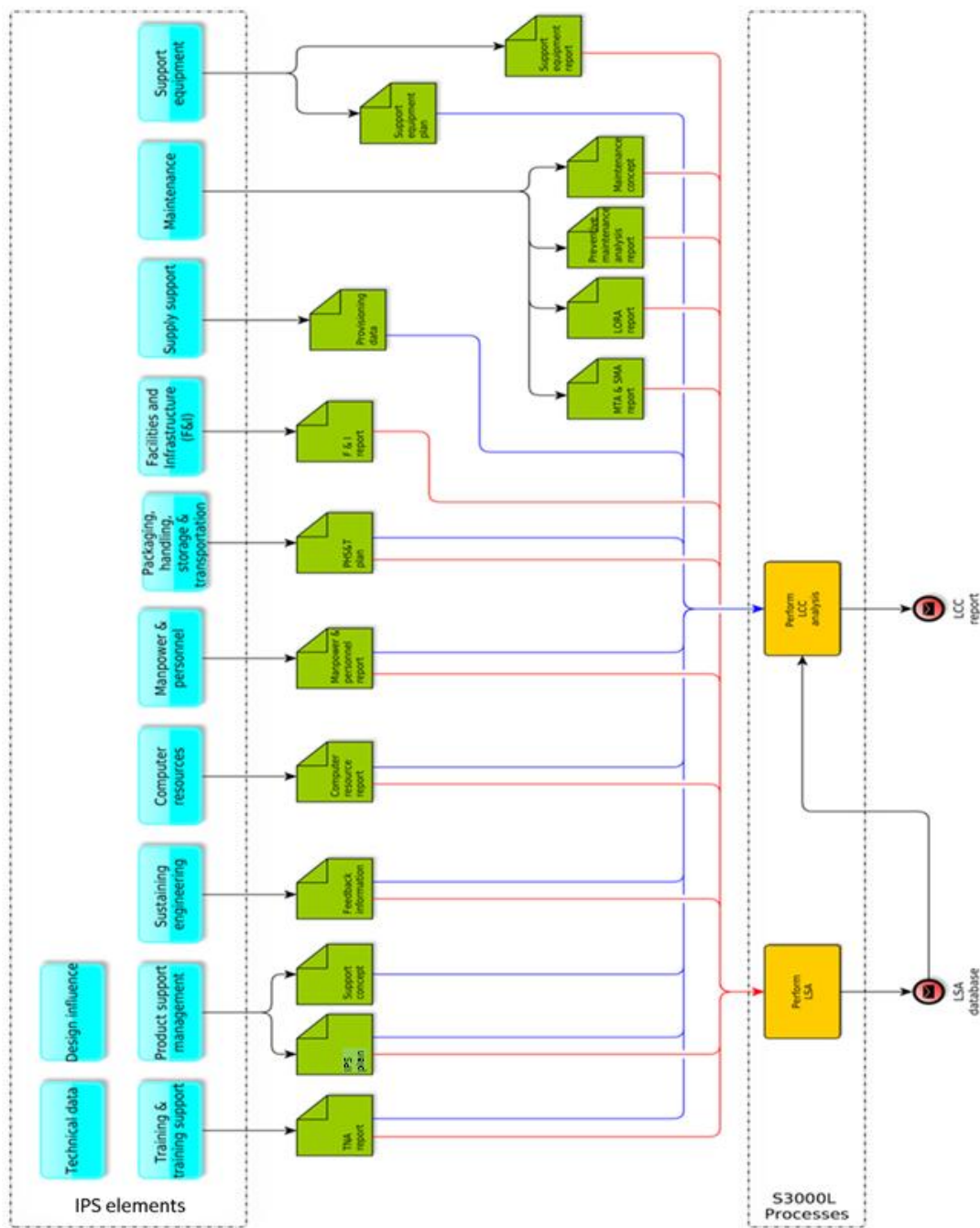
All these considerations were taken into account in the generation of the following charts to describe accurately the most relevant paths and interfaces of the S3000L specification process.

The interfaces between S3000L and other IPS elements describe a complete end-to-end approach in the areas of:

- influence on design (refer to [Para 2.3.2.1](#))
- maintenance (refer to [Para 2.3.2.2](#))
- facilities, and manpower and personnel (refer to [Para 2.3.2.3](#))
- sustaining engineering (refer to [Para 2.3.2.4](#))

2.3.2.1 Influence on design

These are outputs that influence the design with respect to the concept of design for support of a Product in terms of reliability, availability, testability, etc, and to enhance supportability in terms of standardization, interchangeability, human factors, etc, to achieve an optimized, cost-effective support solution. Refer to [Fig 10](#).



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Fig 10 S3000L design influence process interface with other IPS elements

2.3.2.1.1 Design influence

One of the main objectives of LSA is to identify opportunities for influencing the Product or Service design, develop the most cost-effective support concept, and define Product support resource requirements to optimize life cycle cost. Primarily, the focus is put on influence of the Product design, however, it is not possible to isolate it from the iterative work needed for an effective support solution or from requirements on Product support resources.

The opportunity for influencing design to fulfil LSA requirements is at its highest at the beginning of a project, during the conceptual phase. Early design influence can reduce or eliminate the need for later design changes (need for redesign) to make the Product fit for operation and

support. LSA requirements are useful for achieving balance in the Product design between the competing parameters of total system availability and cost-effectiveness.

Consideration must be given to design modifications that affect support analysis activity and IPS functions or support elements Logistics support functions must be triggered in case of changes in the LSA database and where design changes have no connected information.

Experience shows that modifications undertaken in the design and development phase, will have a positive effect on the entire project. Additionally, in later phases of the project, modification management for the IPS products is essential to maintain design integrity for both the customer and the contractor.

Supplier design must be approached in the same manner as the contractor in-house design.

It is important to provide the supplier with specific LSA goals and requirements to influence supplier design before the design efforts commence.

2.3.2.1.2 *Life cycle cost*

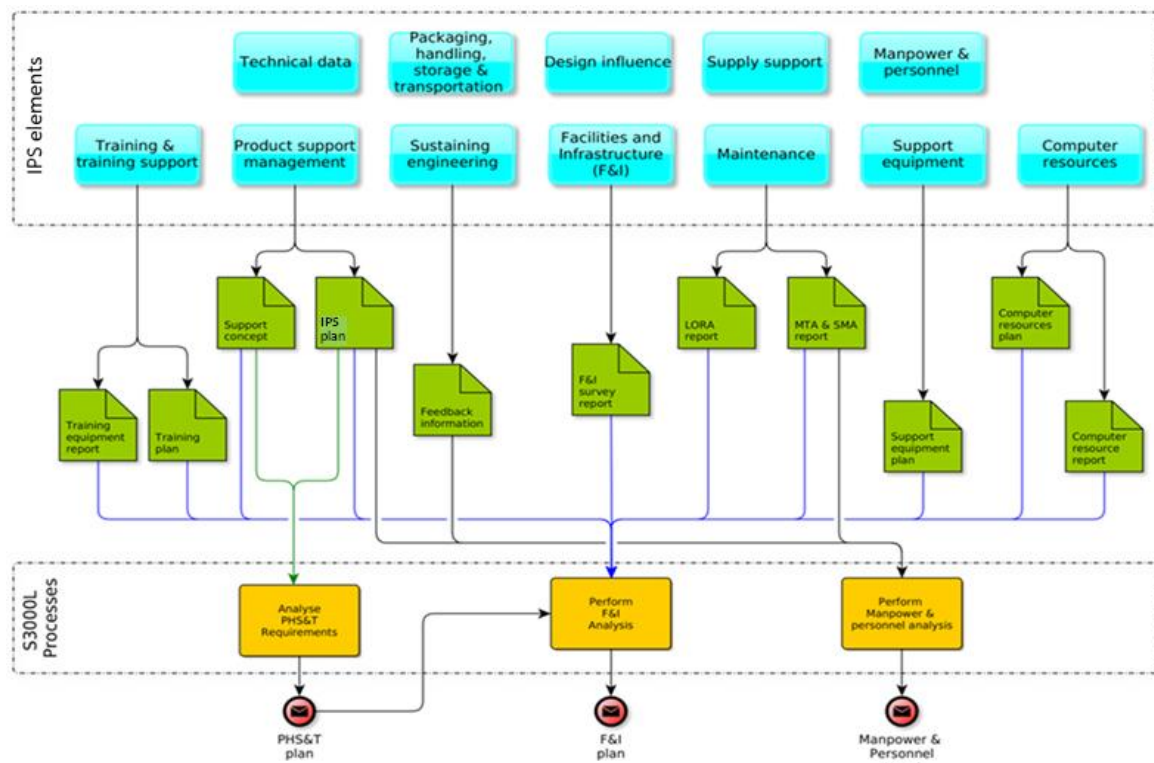
The S3000L analysis determines maintenance baselines and support resources that impact the LCC and consequently, the total cost of ownership.

S3000L processes and methodology (eg, LORA) identify support cost drivers and cost-effective solutions, enabling further analysis to evaluate and select the most effective support solution.

LSA input/output data comparison and analysis enable support resource planners to give timely and effective feedback into the design process, which enables optimization of support at the lowest LCC.

2.3.2.2 Maintenance

Maintenance is the main IPS element with respect to the S3000L process activities. It covers LSA activities that define the required capabilities and resources to support and maintain a Product in its intended use profile during the in-service phase. Refer to [Fig 11](#).



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Fig 11 S3000L maintenance process interface with other IPS elements

2.3.2.2.1 Product support management

The interface with Product support management allows definition and planning of LSA activities. Product support management monitors the performance of LSA activities throughout the project life cycle to ensure LSA data is delivered to satisfy supportability requirements.

The LSA process is the central element of the contractor's IPS program and provides the framework for monitoring and controlling orderly and systematic development, and execution of IPS, including identification of necessary corrective actions/activities, communications, and follow-up procedures.

LSA provides the data required to define and develop Product support requirements. Data generated by performance of LSA activities is documented in the LSA database.

Through the integrated Product development system engineering process, the LSA process is the analytical tool for the determination of supportability requirements for the IPS elements.

Reports are provided to the functional members of the Product support organization and feedback occurs within the integrated Product organization. Support elements are integrated through the LSA process and output reports from the LSA database readily describe their impact on other elements. Using these outputs, the contractor can determine, for example, what effect the selection of a particular item of support equipment will have on maintenance planning, training requirements, technical publications, and supply support. This information enables support element resource planners to make timely and intelligent inputs into the design process, which, in turn, enables optimization of support at the lowest LCC.

2.3.2.2.2 Preventive maintenance

Accurate identification of required preventive maintenance is essential for the operation of a Product. Technical, commercial, operational, legal and environmental factors must be considered. It is a common tendency to minimize scheduled maintenance and to revert to

condition-based maintenance concepts. However, experience shows that some scheduled maintenance cannot be avoided, especially in safety critical areas.

It is essential that PMA is conducted in accordance with S4000P and must be linked to the LSA process. Alternative methods such as or Reliability Centered Maintenance (RCM) analysis can be used instead of S4000P, but the integration with LSA remains essential.

This preventive maintenance, together with corrective maintenance gives a complete view of what is expected of the overall maintenance activities throughout the life cycle of the Product. There are extensive analysis activities that are carried out outside the LSA database (eg, FMECA, or PMA). However, these analyses are documented in the LSA database for traceability. Refer to [Para 2.3](#).

The LSA database not only documents the results from the analysis, providing identification of preventive maintenance activities, but also the results of the corresponding MTA.

The preventive maintenance activities, including the threshold or interval information, is documented for affected LSA candidates within the LSA database using the PMTR. The PMTRs are analyzed in detail for personnel, support equipment, spares, consumables and facilities requirements. The connection between the final LSA tasks and the underlying PMA must be established as effectively as possible to guarantee the consistency of data.

2.3.2.2.3 LORA

LORA is an activity that establishes an optimized maintenance or support concept using technical, commercial, operational, legal and environmental data. LORA is an analysis performed to assist in the establishment of an optimized maintenance solution, based on a support philosophy, agreed to with the customer. This includes the determination of where repairable LSA candidates are removed, replaced, repaired or discarded. Repair decisions must consider both economic and non-economic factors such as costs, reliability values, maintainability/testability constraints or availability goals for the system. The results of the analysis influence maintenance tasks and corresponding task requirements (eg, support equipment, personnel and spare parts). The LORA must be performed on each LSA candidate item to determine the most cost-effective method to restore each item to its fully serviceable condition.

2.3.2.2.4 MTA

MTA describes how to analyze a maintenance task and its support requirements including spare parts and consumables, support equipment, personnel, facilities and task duration. Additional information such as task criticality, training needs, pre- and post-conditions, safety and environmental requirements must also be considered. The maintenance solution comprises the maintenance activities documented within maintenance tasks in the LSA database. Each task for an LSA candidate must be provided with attributes that reflect the maintenance solution. As a minimum, this information must contain:

- whether the maintenance task to be performed scheduled or unscheduled
- for preventive or scheduled tasks: interval or threshold data
- whether the maintenance task to be performed on or off the Product
- the depth of maintenance at which the task must be performed
- the place at which the maintenance tasks will be performed
- special remarks or warnings (eg, when the Product is used under special circumstances, inspection interval must be reduced from, for example, six to three months)
- references to standard repair tasks
- data source information for traceability (eg, identification of LORA report)

2.3.2.2.5 Support equipment

Identification of relevant support and test equipment is a main task within the LSA process. Timely provisioning of required support/test equipment is essential and identification of common or special support/test equipment is important to enable procurement activity to begin.

Each item of support/test equipment that was identified by the LSA must be included in the development or procurement process.

2.3.2.2.6 *Supply support*

Identification of relevant spare parts is a main task within the LSA process. Depending on the maintenance concept, identification of spare parts can differ drastically. For example, in a simple two-level maintenance scenario, complete components will be replaced, and the operator of the Product/system will not perform repair activities. In this case, only a small number of spare parts will be identified. However, additional spare parts (eg, standard parts) required when larger assemblies are replaced must be identified so that they can be procured.

A guiding factor is the breakdown (level of indenture) within the LSA. Theoretically, a breakdown down to the smallest piece part is possible but is impractical and not cost effective.

Therefore, the identification of spare parts within the LSA process will stop at a certain level of breakdown. Typically, the maintenance drivers and the cost drivers will be identified within the LSA process. This information is documented within the requirements of maintenance tasks in the LSA database. A similar process to that described for technical publications must also be established for material support. Depending on progress of the LSA activities, creation of the support products with respect to material support must be triggered by relevant maintenance and cost drivers from the LSA.

LSA does not identify all required spare parts. However, all spare parts identified by an LSA task must be considered within material support.

2.3.2.2.7 *Technical publications*

Generally, technical publications can be considered as:

- technical publications for Product maintenance and repair
- technical publications for Product operation

During the design and development process, the LSA activities are performed. As a result of these analyses and the clarity they generate, the ideal maintenance concept is derived including the required personnel, support equipment and spares and how the task will be executed.

Consequently, the development of technical publications for Product repair and maintenance starts later as the support analysis progresses. As information from the support analyses activities mature, the risk of rework of the technical publications reduces. However, the production of technical publications will have contractual milestones that must be met, which also influences when production begins.

It is recommended that thought is given to establishing a trigger which enables technical documentation production to begin. This process must be harmonized between the Contractor's support engineering and the technical documentation departments.

Each repair or maintenance task identified and documented in the LSA database must have its corresponding technical documentation in the handbooks for Product repair and maintenance.

2.3.2.2.8 *Training*

Training provision must be specially considered. Training needs concerning maintenance activities cannot be identified until complete maintenance task information is available (eg, details of performance, required support equipment, difficulty and criticality, duration, number of working steps, required personnel).

Training Needs Analysis (TNA) is the initial step in establishing training requirements; the TNA can be based on the maintenance tasks documented in the LSA database.

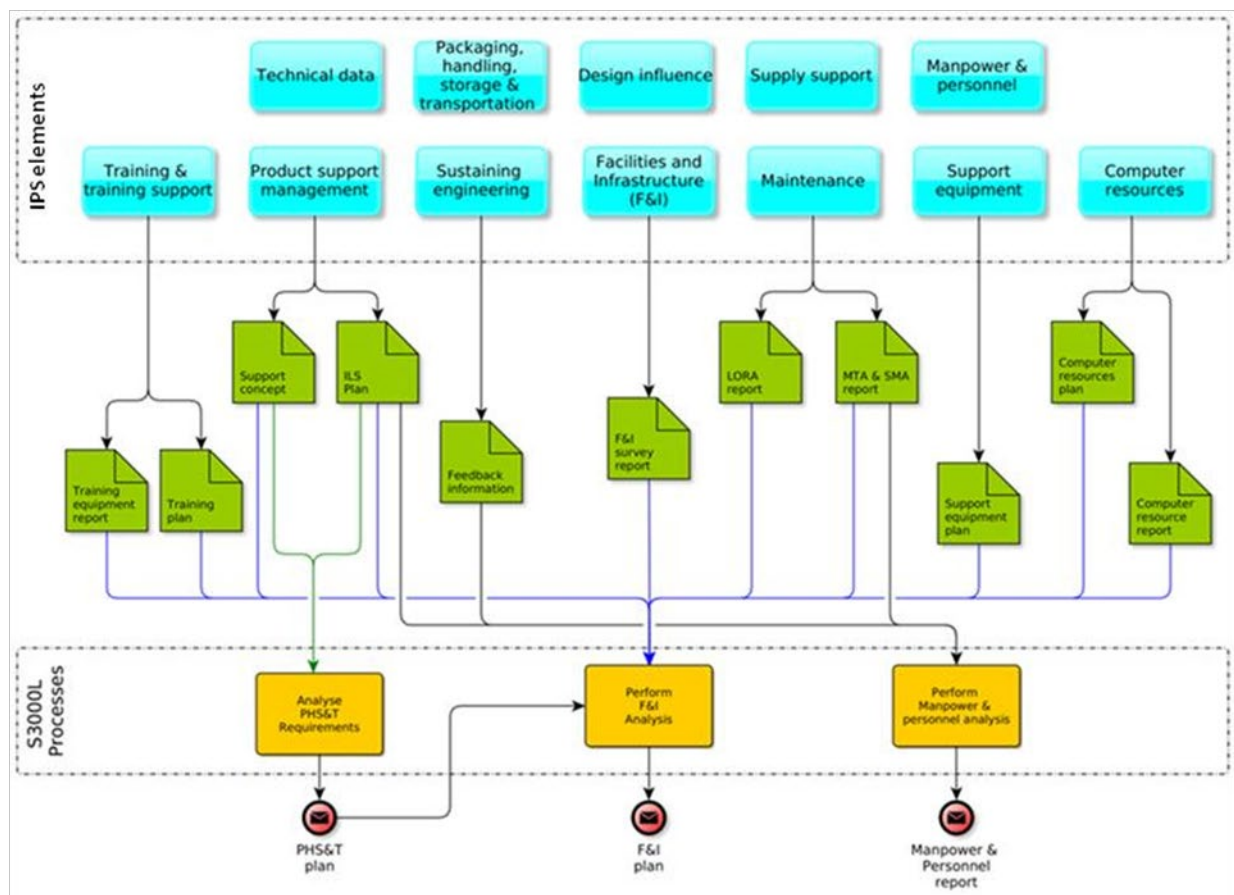
Status information must be sourced to identify the starting point for training activities. Additional information must be sourced from the technical publications to support identification of training needs not addressed in the LSA database and to support creation of training documents in general.

The underpinning process to identify and create training must be agreed to with the customer and be based on the available information in the LSA database and technical publications. Creation of training equipment can be expensive (eg, production of training videos, training rigs, training simulators). Consequently, decisions associated with Training, must be based on reliable information. For the best possible support outcome, it is recommended that training information that is within the LSA database be identified and documented. The LSA database can contain simple markers such as “training required”, skill levels for personnel or more detailed information, if necessary. In addition to these data elements, Information Technology (IT) support is recommended to translate training requirements into queries within the LSA database.

2.3.2.3

Facilities, and manpower and personnel

These are activities which are not directly related to the system analysis but are essential to support the execution of maintenance and operation during the in-service phase of the life cycle of the Product. Refer to [Fig 12](#).



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Fig 12 PHST, facilities, manpower & personnel process interface with other IPS elements

2.3.2.3.1 Facilities and infrastructure

Facilities and infrastructure activities identify, plan, resource, and acquire facilities to enable training, maintenance, and storage to maximize effectiveness of Product operation and support system. Additionally, the activities identify and prepare plans for the acquisition of facilities to enable responsive support for the Product.

This activity consists of establishing permanent and semi-permanent property assets required to support a Product, including studies to define types of facilities or facility improvements,

location, space needs, environmental and security requirements, and equipment. It includes facilities for training, equipment storage, maintenance and supply.

2.3.2.3.2 *Manpower and personnel*

The maintainability and supportability functions of LSA must be closely coordinated to ensure that potential support solutions are within established support thresholds, including the requirements of human factors. Particularly in the area of support, human factors integration and engineering have an influence on operational and maintenance activities.

The documented results of the human factors analysis must be available as early as possible during the project phase. Within the LSA database, the influence of human factors can appear in assorted places. Each modification or proposed design change can require changes in maintenance, which, in turn, require a review of the human factor constraints and limitations.

During the disposal phase, human factors can be of crucial interest because of the potential need for handling material, which can have an impact on human health.

The LSA activity receives input from design and develops a trade-off analysis of each drawing alternative. From the first drafts of drawings, LSA activity analyzes the design, compares support requirements between alternatives, and makes recommendations based on supportability and life cycle cost. This process involves identifying all possible maintenance actions.

Each maintenance action results in a list of resources, required to accomplish each task. These resources include parts, maintenance man-hours, training, support equipment and test equipment information. The specific effects on human factors are the number of maintainers and the human factors related support equipment.

2.3.2.3.3 *PHST*

PHST activities identify, plan, resource, and detail PHST requirements to maximize availability and usability of material, including support items, used for training or mission.

PHST focuses on the unique requirements involved with packaging, handling, storing and transporting not only the major end items of the Product but also spare parts, other classes of supply, infrastructure items, and personnel.

Additionally, PHST resources can require dedicated life cycle support, such as maintenance of re-usable containers or special storage facilities.

2.3.2.3.4 *Computer resources*

Computer resources include computer hardware, network components, network wiring, communication protocols, software packages, data security aspects and standards. The computer resources activities identify, plan, resource, and acquire IT facilities, hardware, software, documentation, manpower and personnel necessary for planning and management of mission critical computer hardware and software systems. The activities coordinate and implement agreements between customer, contractor and suppliers that are necessary to manage technical interfaces, and work performed completing maintenance activities.

Computer programs and software are often part of the technical data that defines the current and future configuration baselines of the Product. From the configuration baselines can be developed safe and effective procedures for Product operation and maintenance.

The interface between other IPS elements and computer resources identifies specific requirements for maintenance and operation computer hardware and software. The interrelation between software and hardware must be clearly defined coupled with explanation of the method of integrating software aspects into the overall LSA process.

LSA identifies computer hardware resources to fulfill supportability requirements.

For software, a clear distinction between the operational/maintenance aspects and actual software modification, must be established. For example, operational aspects can include the

simple act of loading software or required data to an equipment, whereas software modification covers aspects that deal with changes to the source code. Software modification is a design activity and needs to follow the full design process, including potential certification. Typically, software will change more often than hardware, so it is often necessary to identify the necessary computer resources to perform that design activity, especially if the responsibility of this software modification is going to be transferred to another party (eg, a customer).

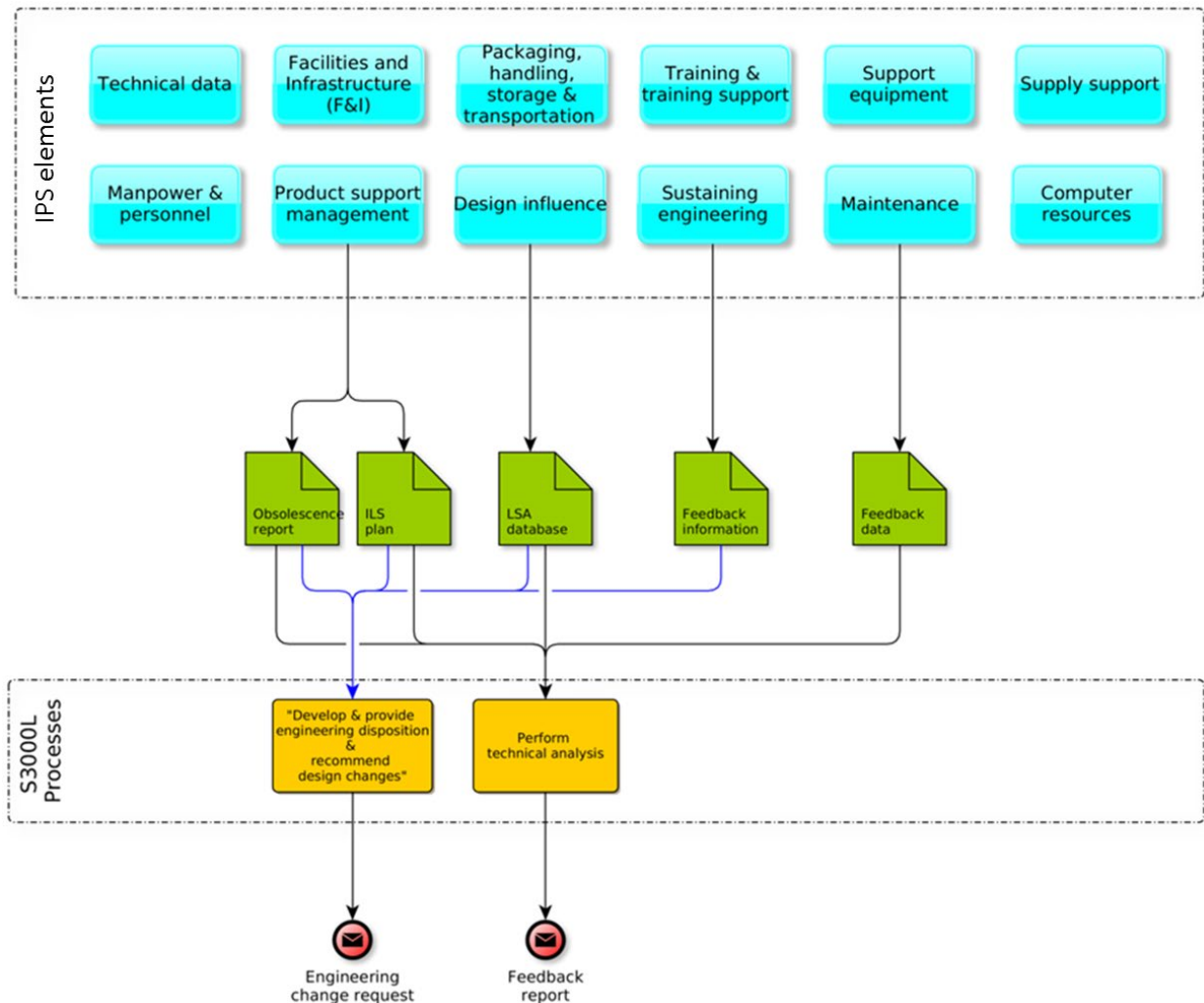
2.3.2.4 Sustaining engineering

This provides feedback information, evaluations, and recommendations to design in the form of engineering changes that address any design shortfalls or that enhance supportability design factors. Refer to [Fig 13](#).

Design influence is the goal of sustaining engineering. It influences those Product characteristics which are vital for enabling the operation of the Product in accordance with the performance and design requirements and reduces LCC.

Primarily, the Product characteristics influenced are RAMTS.

The tools for supportability engineering are the early application of RAMTS activities/programs and the performance of LSA. Sustaining engineering is the enabler between design and development, and IPS.



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Fig 13 S3000L sustaining engineering process interface with other IPS elements

This provides feedback information, evaluations, and recommendations to design in the form of engineering changes that address any design shortfalls or that enhance supportability design factors. Refer to [Fig 13](#).

Design influence is the goal of sustaining engineering. It influences those Product characteristics which are vital for enabling the operation of the Product in accordance with the performance and design requirements and reduces LCC.

Primarily, the Product characteristics influenced are RAMTS.

The tools for supportability engineering are the early application of RAMTS activities/programs and the performance of LSA. Sustaining engineering is the enabler between design and development, and IPS.

2.3.2.4.1 *Feedback information*

The feedback of in-service information happens during the in-service support phase. Feedback enables fleet and support managers, and system manufacturers to perform a thorough analysis of operational and maintenance performance of a Product.

The results of this analysis can be the basis for:

- enhancement of the operational effectiveness
- improvement of the Product by modifications and retrofit activities
- optimization of support requirements and cost

To ensure that the customer's contractual expectations are met, the customer must be involved in the industry interpretations and approaches during the whole LSA process.

Each supportability requirement must be capable of being traced to an operational requirement. If the origin for the supportability requirement is not clear, that requirement must be regarded with suspicion.

The Operational Requirements Document (ORD) is required to identify key performance indicators. Any parameter not identified as a key parameter, must be a candidate for revision when supportability attributes are negatively impacted.

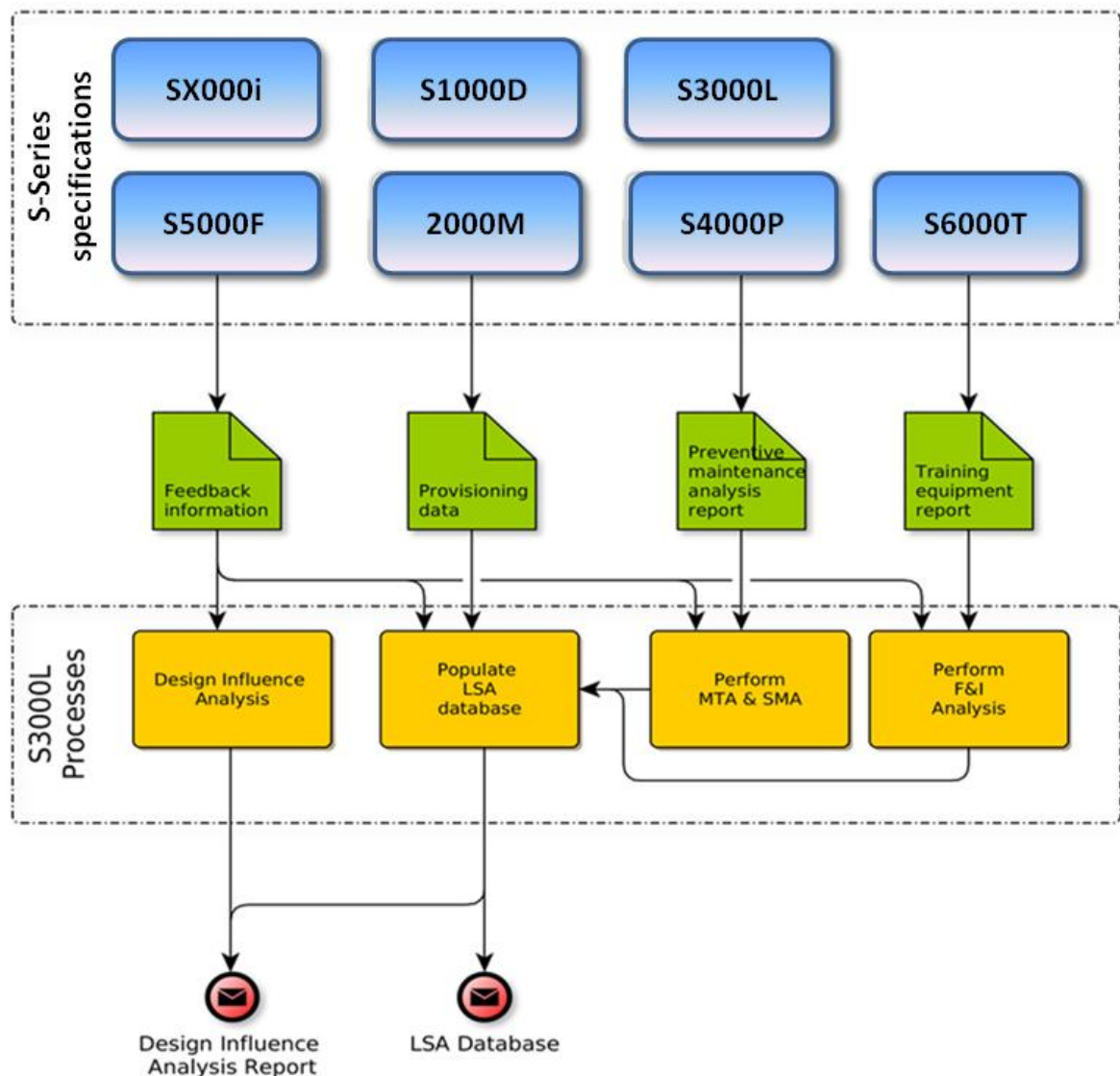
In-service feedback enables optimization of support and must optimize the supportability maintaining operational requirements into the ORD and customer requirements established in the Customer Requirements Document (CRD).

The feedback of in-service data is not only for support analysis purposes. In-service data is also used for fleet planning and management, Product liability and warranty claims, material and stock forecasting and provisioning.

Overall, the aim of in-service data feedback is to increase Product availability, optimize its effectiveness and support resources, reduce of life cycle costs and establish information and data coherency for future contract and projects.

2.3.3 **IPS specifications**

The integration between S3000L and other S-Series IPS specifications is shown in [Fig 14](#).



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Fig 14 S3000L integrates with other S-Series IPS specifications

The individual specifications must not be considered as standalone entities. Of all the S-Series IPS specifications, S3000L plays a central role.

From the S2000M perspective, the interface to S3000L is the provisioning functionality and particularly the provisioning data that enable the process of selecting support items and spares.

S3000L LSA and S4000P SMA are very closely interconnected. Only the common view on unscheduled maintenance and schedule/preventive maintenance provides a holistic picture of maintenance activities.

The LSA tasks derived from the original SMA can be used to document SMA results and the LSA application must link to corresponding SMA documents.

S5000F provides a means for the feedback of in-service data and information collected and prepared for industry to support and improve maintenance and operation of the Product. In-service reality, maintenance concept/tasks and the Product support requirements developed by the S3000L LSA process, must be continuously compared to ensure the identification of required revaluation or adaptation. In-service defined data and specific data elements must be

collected and compared to the existing maintenance situation for permanent optimization of Product support.

The future development of the S6000T process is planned to reflect the core activity of Training and generate the TNA. Part of this analysis must be the identification of Training Equipment requirements which are considered in the S3000L LSA process to perform the F&I analysis, as part of the LSA database.

2.4 S4000P

For a new Product or Product variant, the maintainability of the intended Product design must be assessed by engineering support specialists based on their in-service experience.

PMTRs with intervals and/or redesign requirements must be determined in parallel to the Product design process and must be available to satisfy Product design-freeze milestones, which are the latest dates prior to the Product Critical Design Review (CDR).

S4000P can be applied to all Product types in all domains including any complex technical platform, system, equipment or facility.

The S4000P analysis methodologies allow a structured, traceable and complete determination of PMTR with intervals for a Product, necessary to create and document a Product maintenance program/Operator Maintenance Plan (OMP) prior to entering the Product's in-service phase.

During the in-service phase, S4000P provides an additional process for reviewing the completeness and effectiveness of preventive maintenance tasks from a Product OMP perspective, taking into account in-service experience and current analysis methodologies. That review of the OMP is again fully traceable and applicable for all Products types.

Every S4000P analysis methodology and processes must be precisely tailored for the Product under analysis using processes that are acceptable to regulatory authorities, maintainers, operators, manufacturers and suppliers.

The main purpose of this document is to assist regulatory authorities, and all parties involved in the analysis process, to develop and issue initial PMTR with intervals for new Products, prior entry into service. S4000P analysis methodologies can be applied repeatedly to later Product or system design changes.

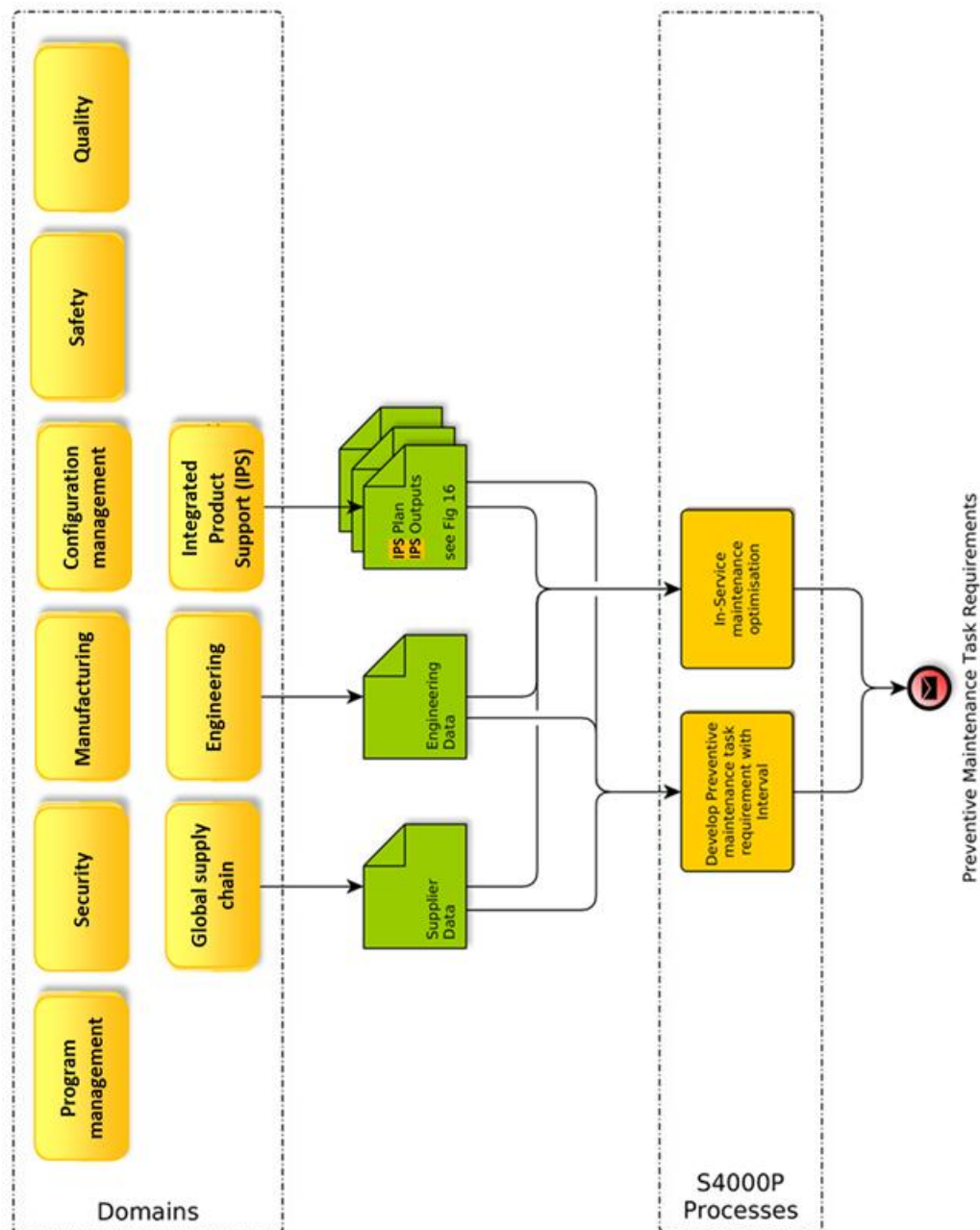
Once developed and authorized the Product OMP tends to be packaged into interval clusters. Thereafter, S4000P In-Service Maintenance Optimization (ISMO) processes can be applied, to continuously improve Product maintenance during its in-service phase.

Every development or improvement of a preventive maintenance task for a Product:

- ensures and maintains Product safety, including safety/emergency systems and/or emergency equipment
- avoids any conflict with legislation and regulation.
- avoids significant impact on environmental integrity (ecological damage) during the Product's mission/operation and/or maintenance
- optimizes mission/operational capability/availability of the Product
- optimizes Product LCC

2.4.1 Domains

The mapping of S4000P to specific domains is shown in [Fig 15](#).



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Fig 15 S4000P business process interface to domains

2.4.1.1

Supplier data

Supplier data consists of:

- supplier technical data package
- in-service data
- certification information

2.4.1.2

Design engineering data

S4000P analysis activities are integrated and require close cooperation with the responsible Product design departments. S4000P evaluations are based on the item's functions, functional failures, functional failure effects and the respective failure causes.

S4000P analysis is very powerful and can result in mandatory design changes. Design effects on maintainability must be identified as early as possible, in order to reduce risks, and to save money and time.

Participation of maintainability engineers in the systems engineering process at the earliest project stages will enhance supportability and optimize the design for availability, effectiveness, and ownership costs.

- 2.4.1.3 Integrated Product support
IPS activity domain provides a series of informative artifacts that are essential for the preparation of preventive maintenance task requirements. These artifacts include the IPS Plan or information originating from the IPS element plans or associated reports.
- 2.4.1.4 Other interfaces for certification purposes
Though not specifically highlighted in the figure, two other specific interfaces can be necessary for certification purposes, in particular for products within highly regulated industries, such as rail, aerospace, air traffic management or nuclear industries:

- certification authorities
- certification maintenance requirement

- 2.4.1.4.1 *Certification authorities*
To ensure effective management and implementation of the scheduled maintenance program for a Product, the organizational project structure must consist of appropriate stakeholders as representatives of the Product.

At a minimum, this must include:

- operators
- design authority organizations
- Original Equipment Manufacturer (OEM)
- regulatory authority/authorities (if required)

Certification of preventive maintenance programs (when required by customer) leads to the preparation of a customized policy and procedures handbook, guidelines, etc, that are agreed to by the customer, authorities and manufacturer. In general, two different certification types exist:

- Civil certification. Using civil certification bodies such as FAA, EASA, Office for Nuclear Regulation, Rail Regulator etc.
- Military certification. Today, military certification tends to follow civil certification where possible, but then develop specific certification requirements for military applications not addressed by civil certification. The customer and manufacturer must work together to scope the certification requirements to prevent any delays in bringing the Product into service. Early engagement to detail the certification requirements and to plan the certification and acceptance process is essential.

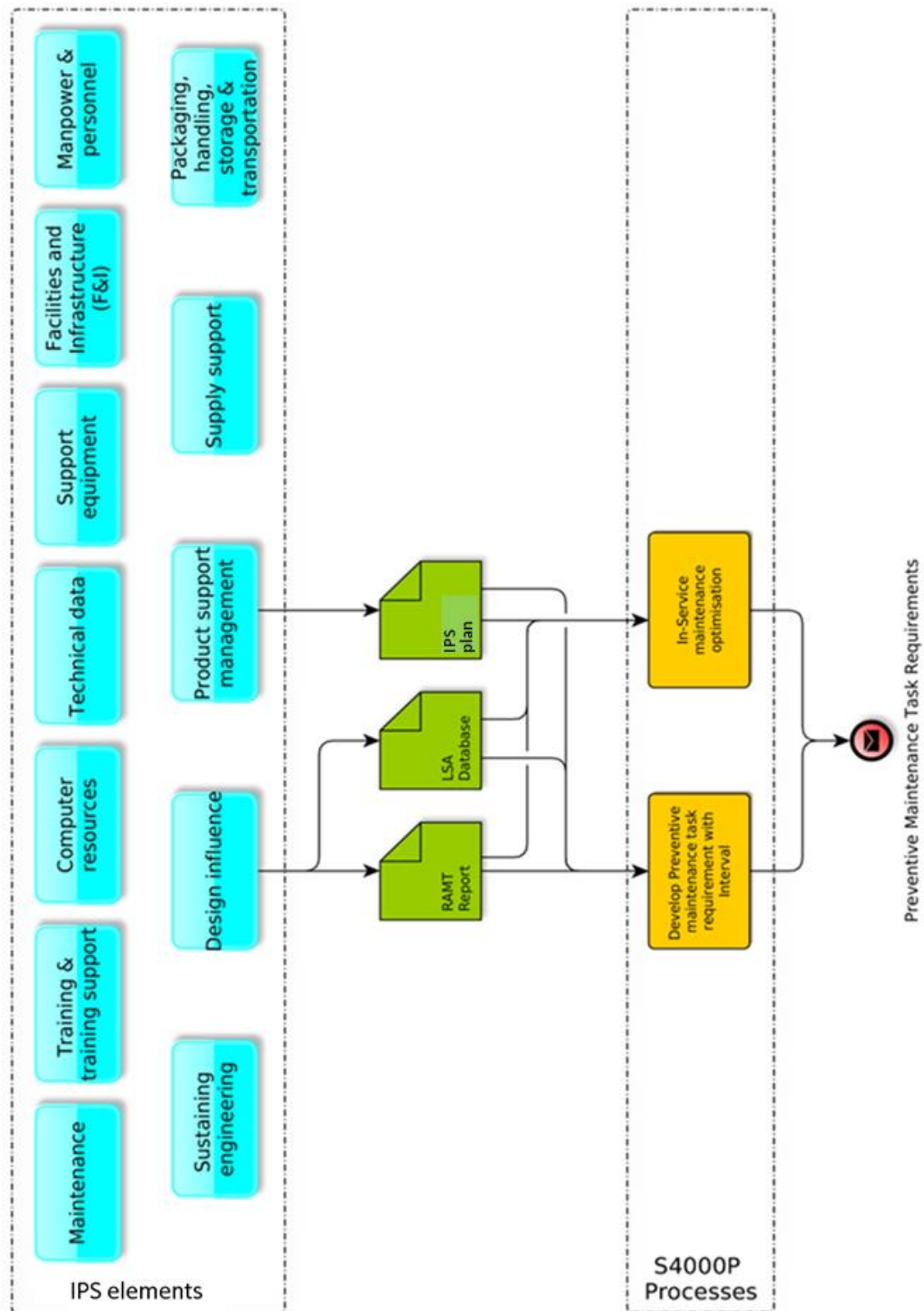
In addition to those tasks and intervals established through the S4000P SMA, preventive maintenance tasks can arise within the certification process.

- 2.4.1.4.2 *Certification maintenance requirement*
A Certification Maintenance Requirement (CMR) is a required periodic task, established during the design certification of the Product as an operating limitation of the Product certificate. A CMR is intended to detect and or to eliminate safety significant latent failures that would, in combination with one or more other specific failures or events, result in a hazardous or catastrophic failure effect.

The process for coordinating S4000P derived tasks with CMRs involves a certification committee.

2.4.2 IPS elements

The interface between S4000P and the other IPS elements is shown in [Fig 16](#).



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Fig 16 S4000P business process interface to other IPS elements

Applicable to: All

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Chap 3

2.4.2.1 Design influence
The IPS activity of design influence provides two outputs to S4000P:

- RAMTS report
- LSA database

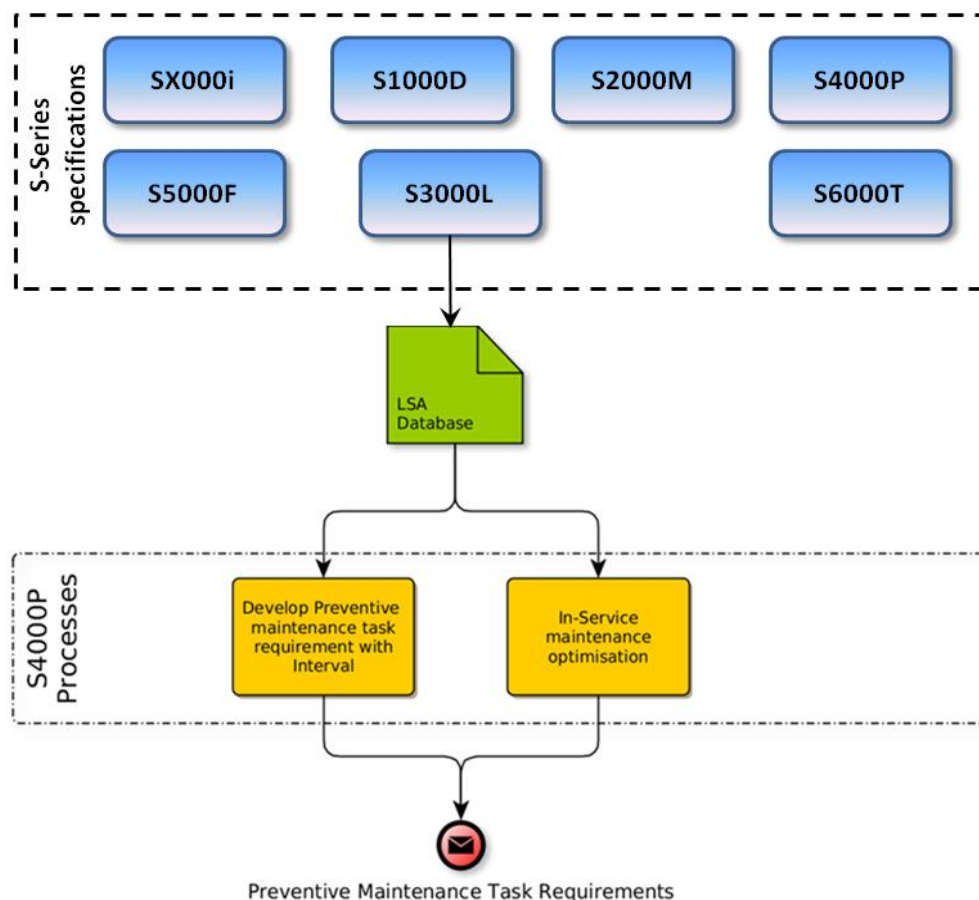
The analysis methodologies in S4000P start with the determination of Analysis Relevant Candidates (ARC) and candidates not being relevant for analysis (non-ARC). To complete the ARC activity, the RAMT report including a system Failure Mode and Effects Analysis (FMEA) is needed as a starting point.

Configuration management deals with functional and physical attributes with its requirements for the Product, design and operational information throughout its life. Before the S4000P analysis can be applied to a Product, the maintenance significant items and structural significant items and components must be identified.

2.4.2.2 Any modification on the Product must be recorded through the configuration management process and can result in a new (partial or total) S4000P analysis. IPS plan
The IPSP is the primary document that details the approach to IPS, tailored to meet the needs of a specific Product or Service. The IPSP must include detailed information for the planning, implementation, and coordination of the IPS elements and their activities, together with an IPS work breakdown structure.

2.4.3 S-Series IPS specifications

The interface of S4000P to the other S-Series IPS specifications is shown in [Fig 17](#).



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Fig 17 S4000P business process interface to other S-Series IPS specifications

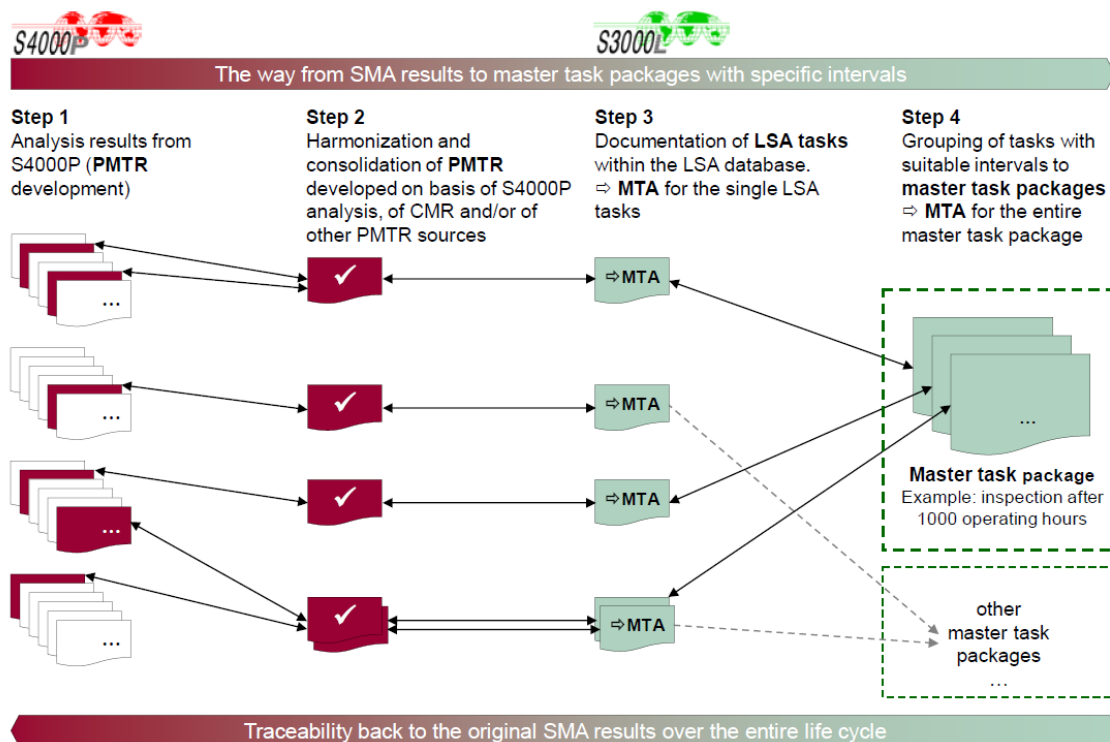
2.4.3.1

S3000L

The LSA database is used as the single source of information for the design and development of support resource requirements. For S4000P purposes, the LSA database must address the latest/final configuration status of the Product. When modifications are embodied during the in-service phase, or if there are Product variants following other build statuses, the initial preventive maintenance tasks and intervals must be reviewed.

The analysis methodologies in S4000P, use selection logic to identify one or more applicable and effective preventive maintenance task types. The remaining maintenance task types for systems, structure and zones must be documented as maintenance significant items or LSA candidates in the LSA database.

Within the LSA database, all PMTR must be allocated to effective task packages with interval values and interval types included so that the total maintenance effort for a Product is optimized. Packaging solutions and rules must be in accordance with S3000L. When the task packages are complete, an MTA must be carried out for each of the final task packages.



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Fig 18 Traceability of preventive maintenance tasks with intervals

Fig 18 shows the complete traceability path from the original PMTR developed in accordance with S4000P, to the point of LSA tasks and the final master task packages for Product Maintenance, Repair and Overhaul (MRO).

The maintenance task packages for Product MRO are the source data for the technical publications. Refer to S1000D.

2.5

S5000F

The scope of S5000F is to feedback information from the in-service operation/operator to the OEM or the maintainer and vice-versa, in addition to feeding such information into the other specifications for product and product support improvement purposes. The main processes in S5000F focus on the in-service data feedback information and the activities that take place during the operational phases of the life cycle of the Product.

The purpose of S5000F is to provide a structured way to handle the information from the operator, maintainer or OEM during the in-service phase.

S5000F is an interface between the customer and the different IPS activities and addresses all unified in-service feedback information, interfaces and domains related to the project's IPS activities and guarantees the integrity of information across the different IPS elements. It also provides an integrated communications path for the contractor and the customer.

The feedback data is automatically transferred, according to the defined schedule, to and from an in-service database. The data exchange process will provide the requested data in XML format.

In-service feedback is one of the most important functions of in-service support. It enables fleet and support managers, and system manufacturers to perform a thorough analysis of operational and maintenance performance of a Product.

The results of this analysis are the basis for:

- enhancement of the maintenance and support concept
- improvement of the Product by modifications and retrofit activities
- sophisticated operational planning

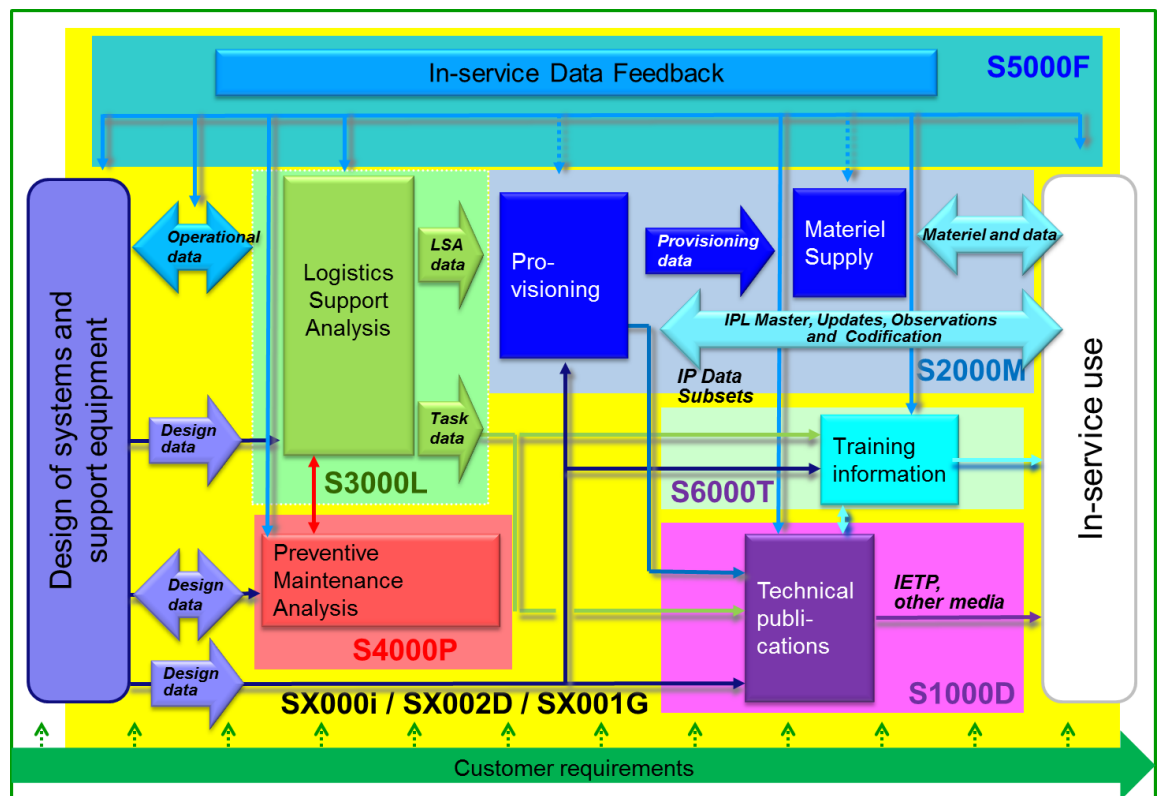
The in-service use data feedback is considered a subset of the IPS.

IPS has overall responsibility for the development of technical information and the support environment that will be used to support a Product throughout its intended life cycle. The disciplines in the context of supportability (eg, technical documentation, spare parts, support equipment, personnel and training) must be harmonized.

The main IPS elements taking advantage of this feedback are:

- design influence
- product support management
- supply support
- support and test equipment
- technical data/technical documentation
- personnel and manpower
- IT/software support
- facilities and infrastructure
- scheduled maintenance/maintenance planning
- PHST
- training and training devices

[Fig 19](#) shows how S5000F exchanges data with the other S-Series IPS specifications. An example of actual usage can be found in [Fig 8](#). It does not manipulate or change the data but provides the raw data to organizations or users of the other specifications who use the data according to their business needs.



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Fig 19 Scope of S5000F: in-service feedback to other S-Series IPS specifications.

2.6

S6000T

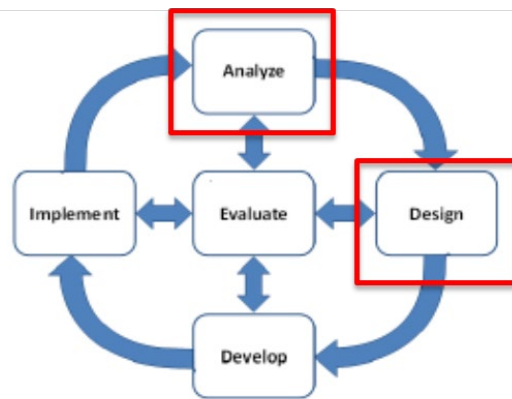
S6000T has adopted the ISD (Instructional System Design) as a reference to identify activities, tasks, input and output data.

ISD is often referred to and closely aligns with the Analysis, Design, Development, Implementation and Evaluation (ADDIE) process, which are the five phases of ISD.

Note

The scope of S6000T Issue 2.0 is limited to the analysis and design parts of the ADDIE process.

[Fig 20](#) shows the iteration between the phases of training.



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Fig 20 Training phases

The purpose of S6000T is to define all levels of requirements and design data necessary to support Product training development.

S6000T also defines the interfaces, interactions and standard data exchanges between S6000T and the S-Series IPS specifications.

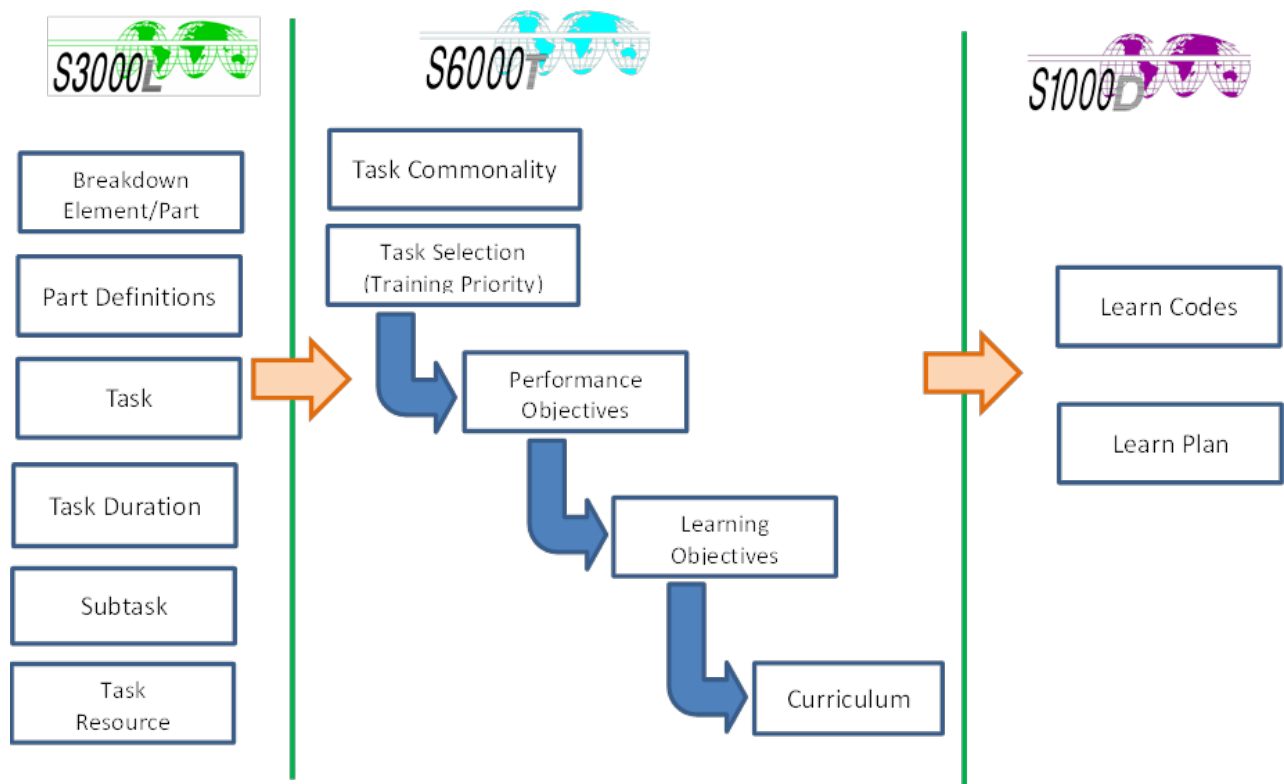
The scope of the activities analysis and design covered by S6000T are:

- analysis:
 - perform training situation analysis
 - perform mission and job analysis
 - identify collective/individual tasks
 - select tasks for training
 - perform training task analysis
 - develop training strategy
- design
 - identify target audience
 - perform learning analysis
 - design learning objectives
 - design assessment strategy
 - develop instructional strategy
 - media selection
 - learning objectives sequencing
 - perform training system alternative analysis
 - identify training system functional requirements
 - design curriculum outline

2.6.1 S-Series IPS specifications

In performing the training development activity, apart from the initial training plan, LSA database outputs (from S3000L), and technical publications (to S1000D), information is gathered from design engineering, the OMP (S3000L), feedback data from operation (S5000F) for training updates, and external equipment suppliers and/or OEM.

[Fig 21](#) shows the interfaces in the process from S3000L outputs to inputs to S1000D learning schemas via S6000T.



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Fig 21 Interfaces of training to other specifications

2.6.2 Training plan

The training plan identifies all training activities to be conducted by contractor, and their procedures for responding to the customer's training requirements. Typically, two phases of training can be identified:

- initial training
- sustainment training

On each phase, three categories of training can take place:

- operator training
- maintenance training
- instructor training

The development of an initial training plan, as a subset of the IPSP, also considers the contract requirements and results of the TNA

including:

- the training curriculum which identifies the number of sessions required to perform initial training of all personnel, by course type
- then, for each type of course:
 - training methods (eg, lectures, hands-on training, On-The-Job Training (OJT), self-study, etc)
 - training materials (eg, instructor guide, student guide, OJT handbook, training aids, etc)

- training support, which must include instructors, facilities (eg, the size and arrangement of classroom), and training equipment (eg, actual equipment, mock-ups simulators, etc)

This document is a living document and can be subject to periodic updating, as required and agreed between customer and industry.

To ensure that the correct training is developed for appropriate use and operation of a product, a TNA must be carried out in accordance with the training requirements mainly derived from the customer requirements and LSA database results. The results from the LSA task data will be the basis for the analysis (ie, maintenance task description, personnel and skill requirements and support equipment requirements).

The TNA is a systematic approach through a process to identify training requirements for a particular system, task, and job. The TNA looks at every aspect of the operational area of the job, and their foundations are:

- design of the Product type and/or variant
- types of operation, support needs and related personnel
- structured and recognized product referencing system (eg, MIL-STD, S-Series IPS specifications, etc)
- the target audience and personnel pre-requisites
- applicable training level and related learning objectives
- the learning theory
- available training methods/technologies
- need to ensure the suitability and efficiency of training solutions
- need to ensure the training solutions' adaptability to change (eg, to Product and technology, and to regulations change)

2.6.3 The instructional specification

The instructional specification will be created based on the outputs of the TNA. An instructional specification details the training and enabling objectives, the condition, and standards that must be achieved, by the specific technician, through the related media. It also defines the technical documents which are required to design the training material for those enabling objectives.

2.6.4 Learning objective

The learning objective is a statement that defines the expected goal of a learning activity in terms of demonstrable knowledge, skill and/or attitude. Normally, it is expressed in terms of condition, behavior and standard.

2.6.5 Training curriculum

The training curriculum is a document which defines a course, or set of courses and their content offered by the training program, containing at least:

- course's training objectives
- course topics
- duration
- material and training aids to be used in the course

2.7 Mapping table overview

The S-Series IPS specifications address many of the activities defined in this specification, but do not map directly one-to-one to the activities defined here. This is due in part to historical reasons, but also because an identical activity can be required for two different major business processes, as defined in the individual specifications. Nonetheless, the different specifications do not overlap, except in a few exceptional cases.

[Fig 22](#) provides a detailed mapping of the different IPS elements and associated activities to the different S-Series IPS specifications. The mapping table cross-references each activity of all IPS

elements with the individual specifications, using a color code to indicate the specification coverage of or relationship to the activity. The purpose of this mapping is to:

- validate the IPS process defined in [Chap 2](#) regarding consistency and completeness
- provide the framework for this chapter
- verify the interfaces between the specifications
- ensure that there are no overlaps between specifications
- identify potential gaps within the IPS process, so that new specifications to cover such gaps can be developed

The codes used in the mapping depicted in [Fig 22](#) are:

- F - Full in-depth coverage.

Full in-depth coverage by a specification means that it describes an activity in detail, explaining how to carry it out to its full extent, and identifies the information that is required to perform it, as well as the detailed data that result from the activity. The characteristic of a full in-depth coverage is that no other specification is required to carry out this activity.

- P - Partial in-depth coverage.

Partial in-depth coverage by a specification means that it describes part of an activity in detail, explaining how to carry it out, and identifies the information that is required to perform it, as well as the data that result from the partial activity. A characteristic of a partial coverage is that it is necessary to refer to another specification to perform all aspects of the activity.

- I - No coverage, but information is supplied by the specification.

The activity in question is not described by the specification, but the specification provides information that is required to perform the activity.

- S - Support.

The activity in question is not described by the specification, nor does it provide information necessary to perform the activity, but the specification provides supporting material that will facilitate carrying out the activity, allowing the exchange of information required for that activity, or supply material required for the activity.

- T - Top-level coverage.

Top-level coverage by a specification means that the activity in question is described at a high level only and placed in context with other activities of the same or other IPS element(s). The input and output information, associated to the activity, is also only described at a high level.

- (Blank) - No coverage.

No coverage means that the specification does not describe how to carry out an activity. In most cases, no coverage by a specification is because the activity is not required by the specification or it is more effective to perform it by using existing internal processes. A typical case are procurement activities. It does not imply that the specification is incomplete.

	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 PH&T Requirements	PH&T Plan		S	P		I		T			
		Execute logistic related operations	Feedback data (operations)					Recommended	I*	to use	T		internal processes
	Maintenance	Develop Maintenance Concept	Maintenance Concept			F	S	I		T			
		Develop Maintenance Plan	Maintenance Plan		S	F	I	I		T			
		Develop preventive maintenance task requirements	PMTR				F	I		T			
		Execute Maintenance Activities	Maintenance Report Feedback data	S	S		Recommended	I	to use	T			internal processes
		Perform Diagnostics, Prognostics and Health Management (DPHM) Analysis	Testability Report					I		T			
		Perform in-service maintenance optimization (ISMO)	In-Service PMTR				F	I		T			
		Perform Level of Repair Analysis	LORA Report				F		I	T			
		Perform Maintenance Task Analysis (MTA)	MTA Report				F		I	T			
		Perform Software Support Analysis (SSA)	SSA report				F		I	T			
		Perform Supportability Safety Analysis	Supportability Safety Analysis Report						I	T			
	Product Support Management	Analyze alternatives	Support Concept Usage Requirements Document (URD) Operational Requirements Document (ORD) Product support requirements		S	P			I		P		
		Develop IPS plan	IPS Plan		S	S			I		F		
		Document Lessons Learned	Lessons Learned database					Recommended	I*	to use	T		internal processes
		Manage Configuration	Allowed configuration As-is configuration Management reports Support Contract	I*	S	P			P		T		S
		Manage contract			S				I		F		
		Manage Fleet	Fleet Performance Report					F		T			
		Manage In-service IPS activities	Management reports (in-service)		S				P		F		
		Perform obsolescence management	Obsolescence Report		S	F			I		T		
	Supply Support	Manage stocks / stores	Inventory reports			I		Recommended	I	to use	T		internal processes
		Manage warranty	Warranty reports			I	P	Extend	P	with	T		internal processes
		Perform Material Supply	Quotation Provisioning Order Delivery Invoice			F			I		T		
		Provide provisioning data	Provisioning data Initial Provisioning List (IPL) Spare Parts List (SPL)			F	I			I	T		S
Technical Management	Computer Resources	Manage Computer Resources for IPS program	IPS program Computer Resources Plan (part of IPS Plan) Technical data exchange document						I		F		
		Perform Computer Resource Analysis	Computer Resources Plan (for Product)			P			I		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		I		T		
		Perform Logistic Support Analysis (LSA)	LSA database		S	F	I	I			T		S
		Perform Support Engineering Analysis	Support Engineering Reports				I	I	I		T		
	Sustaining Engineering	Perform engineering technical analysis	Feedback information				P		I		T		S
		Develop & provide engineering disposition & recommend design changes	Engineering Change Request	S			P	P	I		T		
		Evaluate operational suitability	Operational Suitability Report						I		T		
		Manage disposal	Product disposal file Feedback data (disposal)			I	P		I*		T		
	Technical Data	Develop Technical Data Package	Technical data package			I		Recommended	I	to use	T	internal	S processes
		Produce Technical Publications	Technical publications	F	I	I			I		T		S
	Facilities and Infrastructure	Perform F&I Analysis	F&I Plan				P		I		T		
		Provide Facilities and Infrastructure	F&I F&I Report					Recommended		I	to use	T	internal processes
Infrastructure Management	Manpower & Personnel	Perform Manpower & Personnel Analysis	Manpower & Personnel Report				P		I		T		
	Support Equipment	Analyse Support Equipment Requirements	Support Equipment Plan				P		I		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

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Fig 22 Activity - specification mapping table

3 Applying the S-Series IPS specifications

This chapter provides guidance for the required management activities, tailoring and customizing criteria. It also provides guidance on policy, implementation, and responsibilities for

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Chap 3

application of the S-Series IPS specifications. Significantly, it does not specify the use of specific tools, but establishes the essential information required to initiate, maintain and schedule the IPS activities, throughout the entire Product life cycle, in addition to the resulting deliverables.

Due to the variety of Products and their purpose, application, complexity, quantities, innovation and lifetime and cognizant of the objectives of the stakeholders, the IPS activities need to be customized. Specific Products or Services will not need to use all IPS activities. Therefore, implementation of the S-Series IPS specifications involves the selection or tailoring of a suitable set of IPS activities.

Successful delivery of the IPS objectives requires diligent planning and management. Procedures have been developed, which provide effective planning and management to enable IPS to achieve its goals. There is no standard organizational structure, but there are areas that customer or contractor must use.

3.1 Project objectives and involved stakeholders

The project objectives are to meet contractual requirements in terms of time, cost and quality.

The IPS process contributes to these objectives by ensuring that its goals are met (refer to [Chap 2](#)) in the areas of:

- design for support
- develop support solution
- acquire the support
- provide the support

While a project could be restricted to, for example, the development and production phases of the Product, IPS takes a broader view that exceeds the initial project objectives because it considers the entire life cycle of the Product or Service to develop the support solution in order to optimize supportability and life cycle costs while ensuring that the Product or Service meets the required performance.

There are assorted Stakeholders with specific roles and objectives. Refer to [Chap 2](#). These Stakeholders comprise:

- prime contractors and subcontractors
- OEMs
- suppliers
- customers

Stakeholders can have roles as buyers or sellers, depending on the contractual framework within which they interact. For example, the prime contractor acts as seller for the customer, but as a buyer for the suppliers.

Typical objectives of the seller role are profit, market share increase, and technical capability improvement while meeting customer requirements. However, the customer's objectives are to achieve the lowest life cycle cost while exploiting the Product to the maximum effect.

To reconcile these different views, it is necessary achieve a consensus through a common framework and understanding using the processes detailed in the S-Series IPS specifications. This will facilitate the achievement of an optimal support solution which should satisfy all stakeholders.

3.2 Selecting appropriate S-Series IPS specifications

One aspect that can have an important impact on the overall support of the Product is the selection of the specifications and their issue numbers used to develop/maintain the IPS products. This subject must be addressed at the beginning of a project, as it can have a severe impact later; a specification details how an IPS product is developed often detailing specific IPS

activities, which are tailored for a specification and, to an extent a specific specification issue. Changing the specification for the development of an IPS product mid-program will have a significant impact.

Specification version change can also be a problem if the IT tools have been selected for a specific specification version and cannot support a different version. Since the specification itself will have changed, rework could be required to perform the conversion of the IPS product. Though backwards compatibility of specifications is attempted, it is not always possible, or the specifications would never be able to evolve.

While this is complex enough for one single specification, the issue becomes even more complex when multiple specifications must work together. An appropriate selection of the specifications will ensure proper integration and interoperability, typically in a more cost-effective manner.

Often contractual documents will detail the issue number of a specification to be applied throughout the project. The IPS manager will need to be cognizant of the changes to the specification(s) which happen naturally over time and how these changes can affect the effective delivery of the IPS program.

3.2.1 Stakeholders involved in specification selection

Assorted stakeholders are involved in the specification selection and influence the final decision. The stakeholders include but are not limited to:

- The business function. Usually this refers to an IPS team, which identifies the specification that best suits its business needs.
- The IT group. While, in principle, the IT group does not select the specification for use, it can have an influence in the specification choice. For example, the group can be equipped with a legacy toolset, or a toolset to implement the selected specification does not exist or is still immature.
- The IPS/product support manager. The responsibility for the integration of the different IPS elements lies with the IPS/product support manager. This responsibility extends to ensuring that the specifications that are selected are interoperable and allow for integration of IPS products.
- The Project Manager. It is the PM's responsibility to ensure that the use of specifications does not lead to unjustified costs or excessive risks. This responsibility extends to ensuring that the use of the specifications complies with the project contractual requirements. The PM can also request the use of specific specifications or specification versions to take advantage of other opportunities or position the Product in a specific market.
- The companies involved. Especially on complex programs, a lot of companies can be involved, either as full partners or suppliers, and each has internal best practices and IT tools. Agreement between these stakeholders must also take the volume and frequency of data exchange into account.
- The customer. The customer often selects the specifications used for a Product as part of a contract, or at least is involved in their selection. In the case of a Commercial off the Shelf (COTS) Product or systems selected for a Product developed as COTS, the customer can choose to adopt the specification under which the system was developed or request the usage of a different one. While it can be feasible to adopt a preferred specification, the costs incurred can be prohibitive. The customer represents the voice of the end user.

All these stakeholders have their own interests and priorities, and it can be challenging to achieve a harmonized view, especially when several customers and IPS elements are involved. However, through effective stakeholder management, agreement can be achieved.

3.2.2 Basic criteria for specification selection

The selection of the individual specifications, unless contractually mandated, must consider the following criteria:

- project requirements
- parties involved
- IPS activities on the project
- added value of the specifications
- available tools
- risks and opportunities
- interoperability of specifications and IPS products

3.2.2.1 Project requirements

Project requirements and deliverables impacting the support solution will define the selection of IPS specifications. Customer needs can also dictate the selection.

For example, performing a TNA when the customer does not require any kind of training is an unnecessary expenditure of resource. In this case, S6000T would not be required.

In some cases, only one, or a limited set of specifications is required. For example, a bicycle will require a manual for the end customer, but not necessarily spares, or a maintenance plan. If there is a need for the manual to be in a standard format, S1000D can be selected, but not necessarily any of the other S-Series IPS specifications.

3.2.2.2 Parties involved

The selection of specifications can be dependent upon the need of data exchange between different partners, the capabilities of the different partners and suppliers, and the experience from the contractor and user perspective; the use of one or a combination of specifications can exceed the capability of a small or medium enterprise.

Similarly, a specification could be unusable by one of the project partners, suppliers or end customer because the stakeholder does not have the necessary in-house skills. This is also true if the specification defines a process that the organization has never applied, resulting in additional training and substantial effort. Alternatively, experience with a specific specification (even if it is a different version) can significantly reduce the project risk.

3.2.2.3 IPS activities on the project

A key criterion that is used is the necessity to adapt to the tailoring of the IPS program, (refer to [Chap 8](#)). If some top-level IPS activities are not required, then the associated specifications are not required either.

At the other extreme, in complex projects where a full-scale IPS program is necessary, use of the whole suite of S-Series IPS specifications could be required to implement all IPS elements.

3.2.2.4 Added value of the specifications

A criterion that is often used is the added value that a specification can bring to the business function. This can be as simple as reusing existing tools and processes or adopting a standard to streamline the internal processes or gain a competitive advantage. Additional benefits can include, but are not limited to:

- faster time to market
- easier data exchange and consolidation
- cost reduction in the long term

3.2.2.5 Available tools

Often the availability of tools required to support a specification, drive the selection, without considering the other aspects listed at [Para 3.3.3](#). Thus, the aim to consolidate the information in the existing tools can prevail over other criteria. Though important, availability of tools must not be the main criterion.

- 3.2.2.6 **Risks and opportunities**
The selection of a specification entails some risks to the organization that is adopting and implementing it. However, adopting the specification can provide the organization with new skills and competences that will be required in future projects or by new contracts.
- 3.2.2.7 **Interoperability of specifications and IPS products**
A final critical criterion is the interoperability between the specifications. In principle, interoperable specifications yield better support in terms of higher quality and improved efficiency. If the processes of the adopted specifications are incoherent, and the information exchanged between them is inconsistent, effort spent on standardization is wasted. However, there are situations where such interoperability is not feasible or desirable, (eg, the use of COTS or legacy systems).
- 3.2.3 Selection of the specification versions**
Once the specifications have been selected, it is necessary to select the versions. Though ideally the latest version of a specification must be used, this cannot always be possible because of project or organizational restrictions, existing infrastructure, interoperability issues or even user skills.
- Usually, legacy specification versions are implemented in the producer and user organizations. There is a strong temptation to use the same version, so that all Products are consolidated to the same standard and version. For example, if an organization used S1000D Issue 2.3 for a previous project, it will be reluctant to move to a later version because of the impact.
- Though the basic criteria used for the specification selection also apply here, there are three aspects that have particular importance. These are:
- functionality of a specific version
 - interoperability with the other specifications
 - IT tool compatibility
- 3.2.3.1 **Functionality required by the business function**
This is a critical factor in the selection a version of a specification. If there are legacy applications, but the business function needs a functionality that is required by a later specification version, then the previous version cannot be selected. Alternatively, if the previous version is adequate, then justification of the additional cost and effort to move to a more advanced version can be difficult.
- 3.2.3.2 **Interoperability between the selected specifications**
Though the functionality is important, it is also essential that the selected specification versions can exchange data. As specifications evolve, data and data formats also evolve, and so, versions will not always be as interoperable with each other as they were previously.
- 3.2.3.3 **IT tool compatibility**
Existing IT tools are a factor that must be considered, as these represent a significant investment. As the tools are implemented to support specific version of a specification, supporting a different version is not guaranteed. The cost and time taken to adapt such IT tools can have a significant influence on the decision.
- 3.2.4 Upgrade path for specifications during the project**
Even if there is initially no intent to upgrade the specifications used to develop the IPS products, there can be compelling arguments to do so. Reasons for upgrading include, but are not limited to:
- obsolescence of the specification
 - obsolescence or consolidation of the IT tools
 - modernization or mid-life upgrade of the supported Product

- new customer or major requirements change
- new requirements that the old specification version cannot meet
- requirements harmonization across projects and business domains
- adoption of new or additional specifications

Upgrading starts with the selection of the version(s) of the specification(s) that would be required for the upgrade. The process for this is similar to that at [Para 3.3.3](#).

Once the necessary infrastructure is in place, it is necessary to convert the data to the new version of the specification, but also to review specific business rules that are no longer relevant. Reconciliation of data from two or more specifications if the interfaces between them have been affected can also be necessary. Whilst acknowledging the impact on a project, it is essential to consider that a specification upgrade can:

- require significant effort
- take a long time to implement

A specification update can also imply that:

- acquiring new skills is required
- process changes are required
- organizational changes are required

Usually, this results in an impact on the program that is using the specifications being upgraded, so it is not a decision that must be taken without a proper impact study.

3.3 Scheduling

The purpose of the scheduling process is to define and assure availability of specifications, procedures, resources and data exchange mechanisms, for use by the organization to meet the project needs.

3.3.1 Objectives

The objectives to be achieved by scheduling processes are to:

- proactively manage the completion of project milestones
- provide repeatable/predictable processes, outputs and data flows across the Product life cycle
- enable process improvement across the domains
- enable cost savings through economies of scale for IPS activities by standardization
- enable setup process improvements for new projects
- reflect dynamically changing organization, project scope and specification updates over the Product life cycle

Depending on risk and the situational environment, the scheduling process must be continually monitored and adjusted accordingly.

3.3.2 Activities

3.3.2.1 Establishing the schedule

The scheduling process must start no later than the preparation phase, by identifying sources for scheduling information (eg, activities defined in the support concept, work packages, outputs from IPS elements (refer to [Chap 2](#)) and the selected specifications). Information from the sources extracted and included in an appropriate timeline model that is aligned with the organizational resources, infrastructure and the required inputs and outputs. The established planning schedule must be documented in the IPSP and should be included in the program's master schedule.

The requirements of the selected specifications must be constantly monitored during the Product's life cycle to ensure that all inputs and data exchanges are in place when outputs are required by downstream activities.

The communications criteria for reviewing the planning schedule, during the Product's life cycle, must be determined.

3.3.2.2 Assessing the schedule

Periodic assessments of the project schedule must be carried out to confirm the adequacy and effectiveness of the scheduling process.

3.3.2.3 Improving the schedule

Opportunities to improve the schedule, on a regular basis, based on individual project assessments, individual and organisational feedback, and changes in the specifications, must be identified. Changes in the schedule according to the project guidelines must be documented and communicated. Major changes and decisions which lead to the selection or elimination of specifications must be documented in the IPSP.

Chapter 4

IPS program guidance

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References

Table 1 References

Chap No./Document No.	Title
Chap 3	Use of the S-Series IPS specifications in an IPS program
S1000D	International specification for technical publications using a common source database
S2000M	International specification for material management
S3000L	International procedure specification for Logistics Support Analysis (LSA)

1 Introduction

Integrated Product Support (IPS) considers all elements of the Product life cycle, from the initial idea and conception through disposal. Important items to consider include quality, cost, schedule, user requirements, systems engineering, operations, sustainment, and other domains. IPS also ensures the continuous integration in the entire Product team throughout the Product life cycle.

Concurrent Product development has the potential to introduce more risk into a development program because downstream activities (eg, waterfall) are initiated on the assumption that upstream activities will meet their requirements and changes will be communicated. However, the introduction of a hierarchy of cross-functional Integrated Product Teams (IPT), each developing and delivering a Product, can reduce risks, provide better products faster, and improve team execution IPTs make decisions based on timely input from the members, manage risks as a team, provide better integration and communication between domains, improve

customer involvement, and can shorten the development process, reduce life cycle costs and increase Product availability.

1.1 Purpose

The purpose of an IPS Program is to develop, enable, and execute a sustainment strategy that will deliver optimum operational readiness, consistent with stakeholder requirements, at a best value cost throughout the Product life cycle. The Product must be designed to be supportable and reduce the demand for Product support and the Product support must be effective, efficient, and affordable.

1.2 Scope

This chapter provides the basic steps and key activities to develop, deploy, execute, and sustain an IPS program. It is focused on the specifics of using S-Series IPS specifications including links to the life cycle domains. Due to the variances inherent in each program, the steps and activities described within this chapter require tailoring to meet the specific needs of every program.

2 IPS program

The IPS program identifies, develops, deploys, and sustains the activities required to deliver required operational availability balanced with life cycle affordability. The IPS program is directed toward providing an integrated IPS system and resources for the customer during the acquisition, development, production, fielding, and disposal of a Product.

Programs require coordination and control to ensure that each individual project/IPS element fully meets the requirements of the program of work. It is also critical that costs and timescales are respected. Utilization of a robust IPS program, embedded in an integrated product development team, will ensure the following:

- IPS considerations are included in the Product design on an equal weighting with design, performance and cost
- Program plans are in place to achieve optimum logistic support for the Product at an affordable and ideally minimum life cycle cost
- IPS element plans that provide a coordinated approach are identified and integrated
- the Product will be maintained, and the support infrastructure will be determined by IPS analyses
- Supportability requirements influence design
- The design reflects test data assessment, supportability alternatives and tradeoff evaluations
- The IPS specification requirements are sufficiently detailed
- The IPS resource planning is adjusted
- The IPS thresholds, performance parameters, and metrics (eg, availability and readiness) are met
- The operational environment(s) is (are) accurately considered

The IPS program will:

- Define clear interfaces between IPS elements, project management and affected domains with clearly defined inputs and outputs
- Define clear decision gates between project phases at which clearly defined criteria can be applied to assess project progress to be ready for the next stage
- Define clear responsibilities for the tasks and activities
- Define clear procedures for reviewing progress of non-IPS but related projects
- Enable senior IPS and project managers to be engaged with a project at appropriate points
- Create a continuous process that allows the development of projects to be assessed against the organization's own strategy
- Allow project teams the freedom they need to act between decision gates

2.1 IPS strategy

The IPS program will develop an IPS strategy. The IPS strategy identifies and describes the support approach that the IPS team will follow to meet program objectives across the entire program life cycle. It ensures that system support and life cycle affordability considerations are addressed and documented, identifies expectations of each of the stakeholders, and addresses life cycle sustainment and continuous improvement of Product affordability, reliability, and supportability. The Product support strategy evolves with the maturation of the Product through its various life cycle phases. The development and execution of the IPS strategy will involve all stakeholders including the end users.

The IPS strategy normally includes:

- The method by which the IPS team will develop enable and execute a support program that will deliver optimum operational readiness, consistent with stakeholder requirements, at an affordable, best value cost
- Lower tier strategies for IPS elements and Product specific items, such as supply, maintenance, manpower, technical data, training, facilities, and intellectual property
- Program-specific tailoring requirements, including unique requirements, constraints, statutes, policy, stakeholder preferences, boundary conditions, and funding availability associated with a specific program
- Product support alternatives including options such as organic, contractor, partnership, performance-based support, contractor Product support, life cycle support, non-development items, Commercial Off-The-Shelf (COTS), and Modified-Off-The-Shelf (MOTS)

During the preparation phase, the IPS strategy concentrates on identifying the support concept for the Product, equipment options and estimating of Life Cycle Cost (LCC) to analyze investment decision options. During this phase, together with design phase, the IPS strategy should focus on influencing the design and balancing capability and costs through trade studies which utilize supportability, affordability, and other support-related factors as decision criteria. In later phases, the IPS strategy concentrates on how the support program is performing relative to the performance metrics, identifies corrective actions to ensure metrics are achieved, refines LCC estimates, identifies and establishes the necessary support resources, and ensures alignment across the program.

The IPS strategy must consider the potential cost benefit of collecting performance and feedback data for management purposes even where none was available from the outset.

2.2 IPS concept

The IPS concept (eg, organic, two-level, three-level, contractor, partnering, etc.) must be defined early in the program, and refined throughout the program. The IPS concept must include provisions to:

- Deliver materiel to satisfy highly variable readiness and sustainment needs in a variety of unique and demanding environments
- Meet all supply and maintenance requirements
- Improve readiness
- Establish end-to-end processes focused on outcomes
- Implement current business systems and practices that enable the integration of people, information, and processes
- Address the hardware and its associated software (including commercial off-the-shelf (COTS) software)
- Plan for technology refreshment and maintaining the software after production
- Provide cost effective, total life cycle logistics support

Topics that should be considered in developing the IPS concept include:

- Infrastructure

- In-service data feedback
- Embedded diagnostics/testing and prognostics
- Embedded training and technical/maintenance data
- Serialized Item management supported by automatic identification technology and item unique identification technology
- Reliability centered maintenance/Condition Based Maintenance Plus (CBM+)
- Standard data syntax and semantics
- Iterative technology refreshment
- End-to-end supply chain management system

3 IPS plan

The Integrated Product Support Plan (IPSP) establishes the essential information required to initiate and maintain a through-life IPS program and executes the IPS strategy. The IPSP is a working document for those activities responsible for the planning, executing, monitoring and closing a program's IPS program. The IPSP supports management, business case, development; system integration and testing, fielding and utilization of the Product, with related planning to support a seamless transition between the life cycle phases.

The IPSP addresses and documents the IPS team management plans and guidelines for data gathering and analyses; task management, control, execution; integration and interface of the IPS program tasks with program management, systems engineering and other domains. The IPSP will be integrated and consistent with other program documentation.

The IPSP is a living document and therefore the content will vary depending on the type and phase of any program or project. The IPSP should address:

- The IPS strategy translated into plans for each of the IPS elements
- The maintenance and support concepts
- How the sustainment metrics will be achieved and sustained throughout the life cycle
- How sustainment is addressed as an integral part of the program acquisition strategy and system design process
- The assigned responsibilities and management approach for achieving effective and timely acquisition, Product support, and availability throughout the life cycle including the PM role in planning for and executing sustainment
- The funding required and budgeted by year and appropriation for the main sustainment cost categories including operating and support costs
- The plan for identifying and selecting sources of repair or support
- The sustainment risk areas and mitigation plans
- Product support implementation status

3.1 Integration with existing support concepts

An IPSP can be developed for a single Product and stakeholder or can support multiple configurations of a Product and stakeholder. There can be cases where the IPSP will need to be integrated with existing support concepts. In these cases, trade and feasibility studies help to identify needs for data exchange and integration. Technological opportunities, state-of-the-art support concepts, and the added value of the integration needs to be considered and balanced with the respective costs. Multi-national/cross-organizational aspects should be broadly outlined (especially deviations which need further work to meet specific organizational standards and integrate with specific software and infrastructure, such as interactive technical documentation). Key stakeholders in the support system must be identified and their requirements outlined.

3.2 IPSP content

The IPSP will be structured as follows:

- Executive summary
- Introduction and program overview

- IPS strategy and concept
- IPS requirements, determinations, and performance metrics
- IPS acquisition and business strategy
- IPS management
- Integration across IPS elements and other domains
- IPS element plans
- IPS fielding, deployment, and operations
- IPS program feedback and evolution
- Special interest items and topics

4 IPS management

The IPS organization must be comprised of leaders and technical experts from each of the required IPS elements and focal points designated to interface with Program domains and stakeholders. It must be led by an IPS manager and must be in effect throughout the lifecycle of a Product. The IPS organization must ensure the IPS program is developed, managed, executed, controlled, deployed, and sustained.

4.1 Management

4.1.1 IPS management

The IPS organization will implement the IPS program and associated tasks. To achieve the fully integrated Product support program, the IPS manager and IPS element leaders will interface directly with the other domains, the integrated Product and the senior management team in defining system architecture, software architecture, hardware architecture, visual systems, and testing. The relationship between the different design teams, organizations and IPS elements should be identified, preferably in diagrammatic form to show the responsibilities/reporting routes. The IPS organization will identify roles and responsibilities for each of the IPS element teams, provide procedures for the development, management, execution, and control of the IPS program, and establish methods for effective change and risk management, communication and distribution of deliverables. In addition, it will define:

- The method of demonstrating that an acceptable level of supportability has been achieved
- The master schedule by which delivery of IPS products will be integrated with delivery, operation or removal of the Product
- The method by which supportability risk will be managed

4.1.1.1 Change request management

Change management must be established to control and document changes to the IPS inputs or outputs. A Change Request (CR) must initiate the process and must document the proposed change and the impact (including cost, schedule, and configuration) to the IPS elements and all program domains and stakeholders including vendors/suppliers and users. The CR follows a formal review and approval process. After approval and subsequent release, the CR is budgeted and the contract, work breakdown structure, schedule, drawings, and all impacted systems and documents are updated.

The IPS manager or designee is a voting member of the program change board.

4.1.1.2 Work breakdown structure

The Work Breakdown Structure (WBS) assists IPS managers in planning their IPS program and provides the mechanism for control. It reflects all activities required for the IPS program. The WBS should define the IPS elements required for a Product and identify the responsibilities for the IPS tasks.

4.1.1.3 Organizational breakdown structure

When IPS programs require resources from more than one organization or department, using a project specific Organizational Breakdown Structure (OBS) helps to identify the responsibilities, hierarchy, and interfaces between these organizations. The OBS is independent from the

organizational structure. It can be established between all organizations like project, functional and matrix assignments. It describes the role which is responsible for each activity and identifies the resources available to work the activities and to manage the resource utilization for scheduling purposes.

A combination of WBS and OBS must be used to develop such a graphic representation of the key responsibility roles and will help ensure no duplication of or gap in responsibility occurs.

4.1.1.4 Cost breakdown structure

Cost Breakdown Structure (CBS) is a breakdown of the cost of the various components of the WBS, including all services provided by other organizations. It is used to continuously compare the actual costs with the budget and to integrate them into the cost control system.

4.1.1.5 Integrated schedule

The integrated program schedule details when all IPS deliverables are required and identifies predecessors and successors to understand the impact of upstream and downstream delays on the IPS program.

4.2 IPS team

4.2.1 IPS manager

The IPS manager will be identified who must have responsibility for the development and performance of the IPS program. The IPS manager must:

- Define the IPS vision and objectives. The IPS vision and objectives must be developed in the manner that each member has an ownership.
- Identify all required IPS elements
- Designate leaders for each of the IPS element teams
- Develop the IPSP
- Provide procedures for the development, management, execution, and control of the IPS program
- Establish methods for effective change and risk management, communication and distribution of deliverables
- Train the IPS team. The following recommended topics must be covered:
 - Tailored IPS processes for the project
 - Project (product, IPS and IPS element) description, stakeholders, purpose, mission, organization, schedule, and budget
 - Terminology and nomenclature
 - Access to project products
 - Communications skills
 - IPS project procedures, measures, and reporting
- Establish routine IPS process assessment and a continuous improvement
- Monitor IPS program progress via measures and reports. These measures can include a financial report and technical measures like a maintainability or false detection rate. The selected measures depend on the team's role on the project.

4.2.2 IPS element team leader

The IPS element team leaders must:

- Have the responsibility and authority for the development and execution of their respective IPS element teams and products
- Identify the tasks, roles, responsibilities, and milestones for their IPS element
- Document the products for their IPS element team. The IPS products should be well define
- Staff their IPS element team
- Identify the need for specific competencies, skills, and level of expertise required to execute the requirements assigned to their IPS element team

- Establish the operating environment for their IPS element which supports the IPS program
- Articulate how their individual tasks fit into the IPS project–program tasks
- Document their IPS element strategy and plan in the IPSP
- Document the process, internal and external interfaces (eg, to improve the Product or configuration management) they are using and the key measures (eg, design changes, reliability) to be monitored. The teams must have the mindset of continuous improvement, monitor their own activities, and continually make course corrections along the way.
- Develop a set of measures and reports to monitor its own progress. These measures can include a financial report and technical measures like a maintainability or false detection rate. The selected measures depend on the team's role on the project.
- Sustain and evolve their IPS element team throughout the project. Personnel assignments to a team will vary as each team grows, shrinks, and changes skill mix over the project life cycle. Ensure that technical specialists are available to join the team to help address these specific issues (eg, for failure or prognostics discussions) that arise. Services such as program controls, procurement, finance, legal, and human resources generally IPS the team at a steady, low level of effort, or as required.

5 Integration across IPS elements

The IPS program can include several separate IPS elements. For a simple contract, these can all be addressed within the main IPSP, in practice it is required to develop the element plans detailed below to reduce complexity and divide the IPS program in manageable parts.

5.1 IPS guidance conference

At the start of any program using IPS specifications, it is necessary for the parties to agree how the specifications will be implemented and to define and agree to the variables and options that the IPS specifications provide. These agreements must be recorded in the program's Guidance Conference (GC) Document (GCD). The process used by the involved parties to establish the information included in the GCD is known as the IPS Guidance Conference. To supplement the GCD, the definition of a project interchange specification (data and other deliverables) will be required. The complexity of the program will determine whether this is a stand-alone specification or integrated within the GCD.

The GC must be a central event with participation of management staff and specialists from both the customer and the IPS provider. At this conference, the binding agreements for the performance of the IPS process must be established. Business information and terms must be expressed in clear business rules that are agreed to by the involved parties and updated as required at the corresponding reviews. Refer to [Chap 3](#) for details regarding interfaces and data exchange requirements between the S-Series IPS specifications.

In major and complex programs, it is advised to separate the GC in manageable parts. Traditionally, guidance conferences will be performed for the creation of, but not limited to:

- Technical documentation (refer to S1000D)
- Provisioning data (refer to S2000M)
- Logistic Support Analysis (refer to S3000L)

To ensure best performance of these conferences, it is necessary to have prepared inputs and to have a clear expectation of the results and final agreements. It is strongly recommended to have checklists for the GC preparations and expectations.

Most of essential decisions influencing the IPS effort must be negotiated before the GC. Usually, the preparation of a GC begins while creating an offer. This applies to any IPS significant aspect within the potential contract like statement of work, specification, business rules, deliverables, specified values and performance measures and milestones. This implies a series of investigations that will be carried out prior to the GC (eg, identification of IPS activities considered as mandatory, recommended or voluntary, depending on early strategy judgment and/or the kind of products and equipment to be assessed).

The IPS GC serves as a vehicle to communicate the work that will be carried out in detail, along with the associated rules and time schedules, based on the requirements and further agreements. The IPS GC also clarifies any questions the customer might have regarding the effort. Nevertheless, changes to the IPS work effort, to a certain extent, must be allowed during the IPS GC without the need for changes in the cost of the effort. Considering the iterative nature of IPS activities, customization (tuning) must be possible to be flexible.

5.2 IPS element plans and reports

Each IPS element plan will document the essential information required to initiate and maintain a through-life program for its respective IPS element, which supports the IPS strategy and is integrated with the IPS program. Additionally, all results and status of tasks and actions derived from the IPS element plan must be gathered in the corresponding IPS element report to enable the overview to the changes, developments and upcoming risks during a projects progress. The IPS element reports are also the foundation to inform the stakeholders. To keep this paragraph simple, the following subparagraphs are just explaining the IPS element plan. However, there can always be a corresponding report that documents the achieved level of fulfillment related to the plan.

5.2.1 LSA plan

5.2.1.1 General

Logistic Support Analysis (LSA) is a systematic iterative process that integrates Product design and IPS system requirements and evaluates supportability requirements relative to achieving the specified system/component sustainability and availability requirements. The analyses documentation process is optimized by employing an electronic database. The logistics relevant information consists of the identification, optimization, and traceability of IPS resources.

In general, the LSA Plan (LSAP) can be a part of an overall IPS program plan. For more complex projects it is recommended to have a separate document. Many aspects to be covered must be harmonized and agreed within an LSA GC.

5.2.1.2 LSA program plan - generic example

The LSAP is a crucial output document of the LSA GC. It is organized with general sections and descriptive subsections. These are followed by the appendices. In the general section, the following aspects are covered as a recommended minimum:

- Management structure of the program for both the contractor and customer
- Time schedule of the program and meeting calendar
- Definition of milestones
- Responsibilities and reporting levels
- Change process (eg, categories and levels of authority)
- Risk management
- Work share agreements

5.2.1.3 General requirements

The LSAP describes the strategy for developing the LSA activities during the engineering and manufacturing development phase of the complete program. It identifies and integrates the LSA activities, identifies management responsibilities and activities, and establishes the approach for accomplishing the analysis activities. This plan provides a roadmap of what LSA will be performed and how it will be accomplished. Furthermore, this plan provides an approach to LSA and a basis to measure progress throughout the various phases of the program. The LSA process is iterative and dynamic in nature, therefore this plan will be updated to reflect current program status and planned changes.

This LSAP describes the LSA process and the management structure established to execute this process. It details how the LSA process will be accomplished to satisfy the intended requirements. LSA is an iterative process that usually continues for as long as the item under

analysis is in continuous use. Once the item has been retired, the LSA data can be used as baseline comparison data for future supported items.

The LSAP describes the management, organizations, and procedures required to accomplish program requirements. It includes:

- A description of how the LSA program will be conducted to meet the system and logistic requirements defined in the applicable project documents
- A description, interrelationships, and schedule of procedures to be accomplished by each organizational element concerned in IPS of the LSA program
- A statement of requirements for LSA program participants
- The identification of LSA program monitoring points
- The interface of LSA to system engineering including description of techniques to be employed to ensure that desired LSA is inherent in the Product design
- A schedule with estimated start and completion points for each LSA program activity or task. Schedule relationships with other IPS program requirements and associated system engineering activities must be identified
- A description of the LSA database and WBS
- A description of how problems will be identified, controlled, and reported
- The identification of each LSA task that will be accomplished and how each will be performed
- A description of how LSA activities and data will interface with other IPS and Product-oriented tasks and data. This description will include analysis and data interfaces with the following programs.
- The breakdown structure identification of items upon which LSA will be performed and documented, including software items

5.2.1.4 Functional requirements

This activity identifies the required operations and IPS functions for the Product. The primary inputs are the results of the supportability and supportability-related design factors, and results of the reliability and maintainability programs and analyses. The results of this task form the basis for the IPS system alternatives. Through coordination and interaction with design engineering, maintainability, human engineering and technical manuals, LSA personnel will revise as applicable functional block diagrams identifying subsystem component changes and their functional interface within the subsystem and with associated subsystem components. LSA personnel will then evaluate and identify operations and maintenance functions that are required to implement the maintenance and operational concept for LSA candidates.

5.2.2 RAMCT plan

The Reliability, Availability, Maintainability, Capability and Testability (RAMCT) plan must document exactly what best practices (ie, tasks, methods, tools, analysis, and tests) are required for a particular Product and its systems, as well as clarify customer requirements for RAMCT assessment. Resource determination for manpower and budgets for testing and other tasks is critical for a successful program. In general, the amount of work required for an effective program for complex systems is large. The RAMCT plan is essential for achieving high levels of reliability, testability, maintainability, and the resulting Product availability, and is developed early during system development and refined over the system's life cycle. It specifies not only what the reliability engineer does, but also the tasks performed by other domains and stakeholder like systems engineering. A reliability program plan is approved by top program management, which is responsible for allocation of sufficient resources for its implementation.

A RAMCT plan can also be used to evaluate and improve the availability of a Product by focusing on increasing testability and maintainability and not only on reliability. Improving maintainability is generally easier than improving reliability. Maintainability estimates (eg, Mean Time to Repair (MTTR), Mean Time Between Failure (MTBF), etc) are also generally more accurate. However, when reliability is not under control, more complicated issues can arise, like manpower (eg, maintainers/customer service capability) shortages, spare part availability,

logistic delays, lack of repair facilities, extensive retro-fit and complex configuration management costs, and others. The problem of unreliability can be increased also due to the domino effect of maintenance-induced failures after repairs. Focusing only on maintainability is therefore not enough. If failures are prevented, none of the other issues are of any importance, and therefore reliability is generally regarded as the most important part of availability. Reliability needs to be evaluated and improved related to both availability and the LCC due to cost of spare parts, maintenance man-hours, transport costs, storage cost, part obsolete risks, etc. Testability of the Product must also be addressed in the plan, as this is the link between reliability and maintainability. The maintenance strategy can influence the reliability of a system (eg, by preventive and/or predictive maintenance).

Last but not least, the RAMCT plan is also used to ensure that the product is capable of performing its intended functions and identify the capability shortfalls in case that part(s) of the Product are inoperable or part of the support infrastructure is not available.

5.2.3 Supply support plan

The supply support plan will develop the project specific requirements for material management processes and procedures. Procedures, policies, data and data exchange rules will be required for ranging and scaling, initial provisioning, re-provisioning, together with responsibilities and time scales between contractor and contracting authority. The identification and development of suitable models, and arrangements for financial control and management, also need to be decided and documented.

The plan should cover the assessment, provision and cost of:

- Built in spares
- Initial provisioning
- Testing and tuning spares
- Initial replenishment
- Initial repair program support
- Initial contingency support
- Provisioning data

5.2.4 Technical documentation plan

Procedures leading to the identification of the technical data, its management and configuration control, publication, and time scales must be documented in the technical documentation plan.

5.2.5 Training and additional IPS element plans

As with the IPS plans described previously, the training and/or additional IPS element plans must describe the responding processes and the management structure established to execute these processes. It details how the individual process will be accomplished to satisfy the intended requirements. The tasks are part of an iterative process that usually continues for as long as the item under analysis is in continuous use. Once the item has been retired, the respective data can be used as baseline comparison data for future supported items.

5.3 In-service monitoring of support performance

The IPS manager must consider the need to gather and monitor data comparing the achieved performance against each element of the through life finance during the service life of the Product and corresponding support system. The functionality, reliability, maintainability, and supportability achievements of the Product should be reviewed on a regular basis. This can include running the through-life finance costing model with current in-service performance data.

The IPS manager must consider the need to review the support strategies after an appropriate level of detail using actual use of performance figures and comparing them to predicted values. Possible outcomes can include no change, a warranty claim, modification to the support of the structure, modification to the equipment, overhaul to restore equipment, disposal of the equipment.

6 Audits and reviews

The management will selectively and systematically review all IPS related tasks and data for adequacy, consistency, and compatibility with the requirements of the Product throughout the program. Host design reviews and conduct in-house design reviews to ensure that design program goals and objectives are being achieved. These internal audits, reviews and technical information meetings will ensure accurate IPS data. They will be conducted by the IPS manager and related engineering personnel.

Supportability concerns involving equipment design that arises during meetings, or throughout the overall and continuous design process, will be brought to the attention of the cognizant integrated Product engineers. All design related supportability issues will be documented, including status, as necessary to ensure that a timely and appropriate resolution is obtained.

Formal approval reviews (also known as milestones or decision gates) ensure that new activities are not pursued until the previously scheduled activities, on which new activities depend, are satisfactorily completed. IPS personnel will be aware of supportability and supportability related design issues through direct participation in design reviews and must provide evidence considering their requirements.

IPS data must be monitored, managed and brought under configuration management to ensure that all support data, information and exchange criteria consider the support information requirements are met.

A list of descriptions, and frequencies of the occurrence of reviews should be provided in this section. The stakeholder, responsible for agendas and meeting minutes, should also be included.

It is assumed that during the development phase of a Product, the Product IPS milestones/decision gates that exist are:

- Operational Requirements Document (ORD)
- Usage requirements document (URD)
- System Requirements Document (SRD)
- GCD
- System Requirements Review (SRR)
- Preliminary Design Review (PDR)
- Critical Design Review (CDR)
- Final Acceptance Review (FAR)
- IPS Solution Review (ISR)
- Product Delivery/In-Service Date (ISD)
- In-Service Review (ISR)
- Out of Service Date

[Para 6.1](#) provides a description of the different maturity levels that are associated to these IPS milestones/decision gates.

6.1 IPS Support maturity levels

The Support Maturity Level (SML) concept is a method that can be used by IPS or senior program manager to help identify the maturity level IPS should achieve for each milestone. Achieving the levels will help the management develop the program's Product IPS concept to obtain the best value IPS solution. The SML provide a uniform way to measure and communicate the expected life cycle supportability maturity as well as provide the basis for root cause analysis when risks are identified during program reviews. Achievement of a maturity level is usually determined by means of an audit or review.

These reviews must be held during the major phases of a program's life cycle and the activities and deliverables associated with each phase and start with the development of requirements. A strategy must be developed to fulfill these requirements. These strategies must address each of

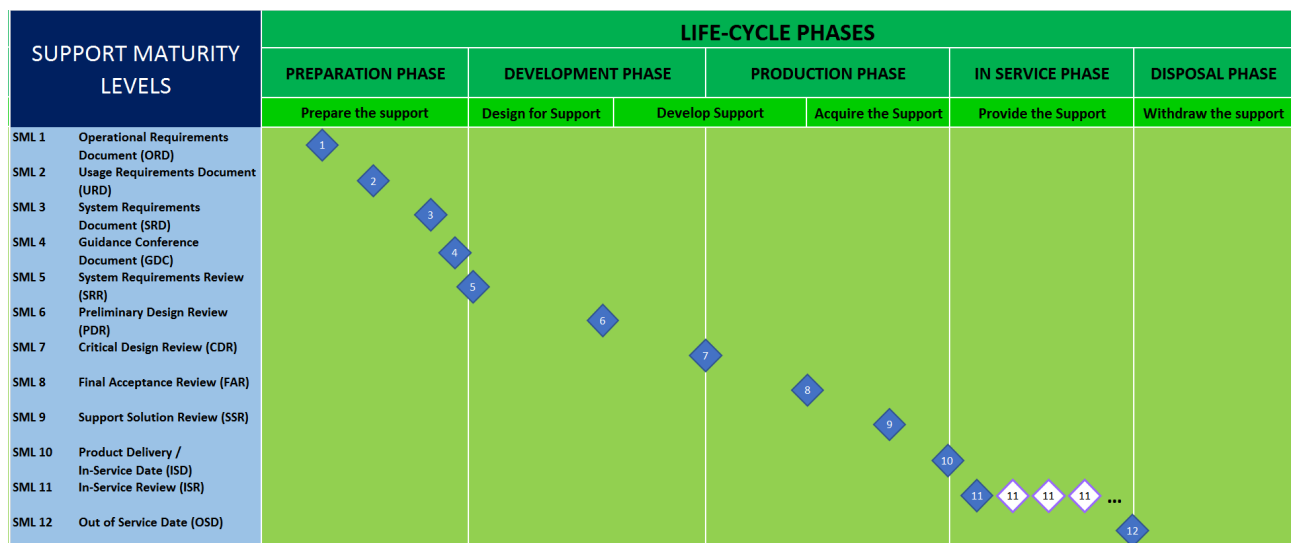
the IPS elements and will change over time. This change over time is represented by the SML, which describe the expected level of maturity and summarize key documents and capabilities of the IPS program at a given point in the life cycle.

Table 2 IPS support maturity levels

SML	Milestone/Decision gate	Definition
1	Operational Requirements Document (ORD)	Operational requirements must be defined in a quantitative and qualitative way. Supportability requirements are developed directly from the operational requirements. Each supportability requirement should be based on an operational requirement, and that relationship should be clearly identified. A checklist for the generation of the ORD can be found at Table 3 .
2	Usage Requirements Document (URD)	To ensure the proper usage of the Product, the customer should consider all the logistic requirements. The logistician can most efficiently influence the supportability and design of a new system during its early stages of development. A checklist for the generation of the URD can be found at Table 4 .
3	System Requirements Document (SRD)	The SRD defines the system requirements that meet user needs. The IPS manager must: – Ensure that the SRD is supported by the IPSP that details the IPS strategy developed by the IPS team in response to the ORD and URD IPS requirements and identifies and justify supportability objectives – Include supportability aspects in the requirements repository which forms the basis of the SRD – Ensure that supportability issues are addressed. The IPS manager will put forward the justification for the inclusion of the supportability requirements statement as one of the key product requirements for the Product or service.
4	Guidance Conference Document (GCD)	The GC must be the central event with participation of management staff and specialists from both the customer and the IPS provider. At this conference, the binding agreements for the performance of the IPS activities must be established. To ensure best performance of this conference, it is necessary to have prepared inputs and to have a clear expectation of the results and final agreements. Through the potential procurement process the Statement Of Work (SOW) is negotiated until final bids can be made. The GCD is an agreed and contractual based agreement of what industry must provide and therefore an essential part of the SOW.

SML	Milestone/Decision gate	Definition
5	System Requirements Review (SRR)	Initial system capabilities and supportability objectives/requirements have been analyzed and allocated to downstream product elements. Initial RAMCT strategy has been formulated and integrated with the system engineering process. The IPSP is updated accordingly. Design features to achieve the product IPS strategy, including diagnostics and prognostics, are incorporated into system performance specifications. The Test, Verification and Evaluation Plan (TVEP) addresses when and how required IPS related design features and key performance indicators/measures will be verified.
6	Preliminary Design Review (PDR)	The PDR demonstrates that the preliminary design meets all Product requirements with acceptable risk and within the cost and schedule constraints and establishes the basis for proceeding with detailed design. It will show that the correct design options have been selected, interfaces have been identified, and verification methods have been described. The IPS provider must address the IPS planning and management of requirements, defining IPS requirements, major cost drivers and risks. Respective evidence must be provided. IPS activities to develop IPS system alternatives and determining the optimum solution using analysis must underpin the evidence with facts.
7	Critical Design Review (CDR)	The CDR demonstrates that the maturity of the design is such that it can proceed with prototyping, assembly, integration and test. IPS element requirements are integrated, finalized and consistent with the approved system design and IPS concept. Validation that the design conforms to IPS requirements. Metrics are predicted based on CDR results and projected to supply chain performance.
8	Final Acceptance Review (FAR)	The FAR demonstrates that the Product IPS planning is completed. The in-service strategy, roles, responsibilities, and partnerships are identified and are ready to be implemented. Design inherent Product IPS capabilities like RAMC-T or technical documentation must be tested and demonstrated to validate the supply chain performance and IPS products. Budget requirements are adjusted based on the design and test results
9	Support Solution Review (SSR)	The SSR demonstrates that the IPS capabilities (including associated support processes and products) are proven in an operational environment.

SML	Milestone/Decision gate	Definition
		For validation purposes it is likely to involve evidence from engineering evaluation and test and demonstration of the IPS system. A Logistic Demonstration (LogDemo) must be carried out which will form part of the TVEP. IPS systems and products must be delivered to the operational site. Key performance indicators must be measured against agreed availability, materiel reliability, ownership cost and other IPS metrics. Needed improvement actions are taken based on performance data.
10	Product Delivery/In-Service Date (ISD)	The ISD is defined as the date at which the IPS system is in place in range and scale to meet and sustain the customers' requirements. The ISD also includes the Product Support date (PSD). IPS systems and services are delivered and fully integrated into the operational environment. IPS in-service products like warehousing and depot maintenance are in place.
11	In-Service Review (ISR)	The ISR should be carried out to verify that the IPS system is working. The Product IPS performance must be regularly measured against metrics and corrective actions should be taken. Product improvement, modifications, upgrades must be planned. The IPS concept is refined leveraging the best value mix of organic and contractor IPS for logistics processes, services and products according to changing environment and customer needs.
12	Out of Service Date	This is the date from which the Product will be de-commissioned according to the disposal plan.



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Fig 1 Overview of IPS maturity levels, milestones and life cycle phases

7 IPS business process

IPS consist of integrated, interacting elements and create an additional benefit throughout their lifecycle for customers and suppliers. Potentials are created by the integration of products and services over the entire lifecycle. IPS represent customized solutions and allow a flexible adaptation to changing requirements of both customers and suppliers by the resulting scope. Physical products and logistic products depend on and influence each other and, therefore, must be developed together as an integrated system. This puts high demands in regard to technical knowledge from different domains, especially in both fields of Product design and support engineering, as well as to the process complexity and organizational complexity. Also, it is necessary to take the interdependencies between products and IPS products into account with concurrent and iterative development processes until contradictions are eliminated and the best solution is reached.

The planning of IPS starts with an acquisition of customer needs and values in the preparation phase. The integration of the customer in the planning and development is a key point for providing IPS products, which in most cases is a customized solution. Apart from customer specific factors (eg, competences, strategies, processes) also external factors like legislation, infrastructure, market, competitors, etc. should be considered.

For the development of physical products as well as IT systems, many methodologies exist which define the development process from abstract to detailed levels. The development and delivery of IPS products are not well specified and detailed process models for IPS development are missing at present.

Consequently, there is the need to:

- Know and document the IPS tasks and deliverables
- Establish consistent processes and interfaces for all involved IPS elements and domains
- Establish easy, traceable and transparent orchestration of the tasks and information needed between all parties and stakeholders
- Enable collaboration across all organization including the roles and rights
- Locate information directly in the tasks where it is generated and only once
- Enable rapid response in case of new requirements

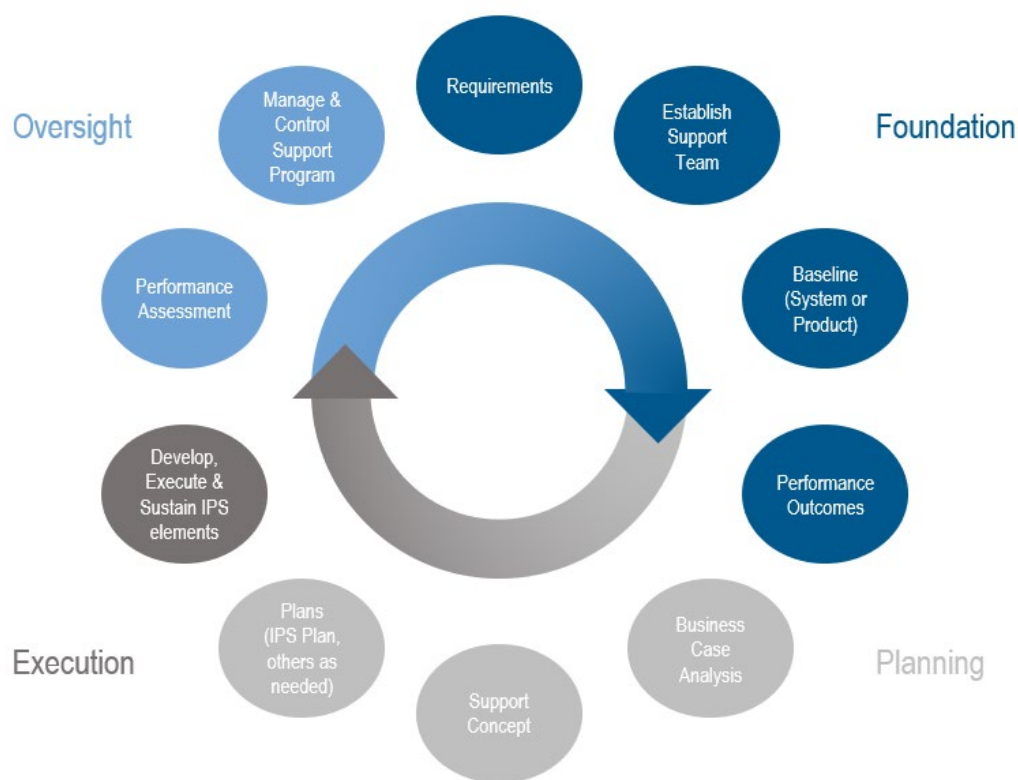
The development, implementation and management of these tasks is called IPS business process management. Although the business process might not be documented separately in

the IPSP, de facto the processes exist. The process should be documented within the GCD and IPS element plans when they are identified in the way the tasks are performed and the data is passed on. However, at a minimum, the IT relevant aspects must be documented within the IT-concept to ensure necessary IT resources and IPS.

8 IPS business implementation model

The Product IPS strategy for a Product changes over the life cycle as it transitions from the fielding analysis over the ISD to a fully fielded and mature system and ultimately to retirement. The customization of, or revision to, the Product IPS adheres to a logical methodology captured in the 10-step IPS business implementation model shown in [Fig 2](#).

This model represents the major activities required to implement, manage, evaluate, and refine Product IPS over the life cycle. It is a continuous, iterative process in which the IPS of a Product is adapted and evolved to optimally IPS the needs and requirements of the operating organization in an effective and affordable manner.



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Fig 2 Twelve-step IPS business implementation model

These can be grouped into four project stages:

- Build the foundation for IPS activities
- Plan the execution for IPS activities
- Execute the IPS activities

8.1 Oversight of the IPS activities

The distinction between the stages is important at this point because they follow one another, and the success of the program depends significantly on the proper and detailed first phase. In the first phase, the necessary foundations are laid to enable the successful planning and implementation of the Product IPS activities in the following stages. The performance results achieved during the execution have an existential impact on the remuneration of the IPS

provider and needs therefore management attention and the opportunity to change Product IPS processes and interfaces.

8.2 Foundation

8.2.1 Manage requirements

The objective of Integrated Product IPS is to develop, enable, and execute an IPS strategy that will deliver the desired outcome (eg, operational readiness, availability, mission success) at an affordable cost.

Requirements for the in-service phase of a Product are often expressed in operational terms. Those requirements must be interpreted, translated and negotiated if/as necessary into IPS objectives that will drive the achievement of those outcomes.

8.2.2 Establish IPS team

The IPS team will develop, implement, and manage the Product IPS over the life cycle. This team is charged with the responsibility to plan, develop, implement, and execute the integrated Product IPS strategy. This includes beside the identification of the required IPS elements and outputs a range of activities including operational mission planning, financial, contracts, legal.

Subject matter experts, training requirements and resources must be considered during the staffing of the IPS team.

8.2.3 Baseline the Product

The definition of the Product baseline is of importance, since it describes the actual state (for example in the form of costs, reliability, availability) of the Product to be considered. A comprehensive and detailed Product baseline helps to:

- Present the identified performance problems
- Provide the foundations for determining the right performance goals
- Identify initial performance improvement measures

The baseline then serves as the basis for the applicable IPS strategy and for the business case analysis. Finally, with the help of the baseline, improvement and optimization approaches in IPS and care of the Product can be identified and provided with an initial cost forecast. The cost forecast represents an important first step in the acceptance or rejection of an IPS strategy.

8.2.4 Performance outcomes

Using the Product IPS baseline, develop a process for identifying critical Product IPS outcomes and how you will measure success. Identify the critical behaviors that must be influenced by the metrics to achieve the Product IPS strategy outcomes.

The starting points for metrics identification are the top-level IPS objectives developed in the first activity. Each Product IPS strategy, as it evolves, must be tailored consistent with the maturity of data and existence of in-place IPS infrastructure and capabilities. The metrics defined as accountable outcomes must be tailored accordingly, with an objective to maintain a close correlation with the achievement of the in-service outcomes.

8.3 Planning

8.3.1 Business case analysis

The Business Case Analysis (BCA) in an IPS program is the most appropriate way of verifying the feasibility of the proposed IPS solution. For this purpose, the BCA should consider all input data relevant for the program (including life cycle costs) and, in order to be able to use the possibility of comparing IPS alternatives, should contain at least two IPS solution options. The solution to be selected should best and most efficiently implement the desired performance goals. The derived results must be able to withstand a later review.

In the BCA, the separately developed products of the IPS requirements are brought together for the first time and will be qualitatively and quantitatively assessed in the context of the future implemented IPS scenario.

8.3.2 **Develop the IPS concept**

The IPS concept describes the optimum level of IPS (ie, system, sub-system, or component level), evaluation of Product IPS strategy considerations related to the 12 IPS elements, supply chain management strategy, workload allocation strategy (including depot maintenance and Public Private Partnership (PPP) considerations), strategies for continuous modernization and improvements and proactively addressing obsolescence issues.

Determine the stakeholder that is providing the IPS at which level and the acquisition method in case of external IPS.

8.3.3 **Plans**

An IPSP specifies the performance requirements between the organizations involved. The IPSP clearly defines:

- Roles, responsibilities, resources on both sides
- The in-service objectives and IPS strategy
- The metrics to be used
- The performance assessment
- Integration, coordination, and interfaces between the IPS functions itself and other domains like system engineering and configuration management
- The reciprocal aspects of Product IPS business relationships

The IPSP must be consistent with related artifacts like contracts, memorandum of understanding and statement of work.

8.4 **Execution**

8.4.1 **Develop, execute, and sustain IPS elements**

Establish the objectives and processes required to deliver the desired results for all IPS activities. The practice of trial-and-error of the concept in small manageable pieces before the roll out for the complete products is best practice.

Execute all activities according to the agreed IPSP.

Establish the measurement of performance indicators and thresholds to have the opportunity of being proactive.

8.5 **Oversight**

8.5.1 **Performance assessment**

Performance assessment includes the continuous, ongoing assessment of Product IPS effectiveness according to the desired outputs. A forecast and variance analysis is performed to enable all parties to assess the actual and long-term performance of the IPS system.

In case of identified issues, perform a root cause analysis. Typically, this starts with the problem description referring to time, financial, availability or performance difficulties compared to the in-service objectives. Identify the potential cause and the related interfaces to understand the relationship between all functionalities.

After understanding the behavior of the IPS system identify potential solutions. Develop an implementation plan and allocate the budget for the change.

8.5.2 **Manage and control IPS program**

Manage and control the IPS program includes documenting updates to the IPSP and program, as well as conducting and implementing recommendations from the performance assessment.

Changes in the IPS program environment which can have an impact on the IPS program have to be tracked and analyzed about their impact. This includes changes of the in-service objectives.

9 IPS for system of systems

A system of systems is often defined as a collection of dedicated products that pool, their resources and capabilities, together to create a new or more complex Product which offers more performance and functionalities. Typical characteristics of these system of system Products are:

- Operational independence of individual Products (eg, spaceship/drone and its ground control station)
- Managerial independence of the Products
- Geographical distribution
- Emergent behavior
- Evolutionary and independent development

The need for system of system framework for IPS must be established. Generally, a system of system framework does not implement special tools, methods, techniques and methods, but IPS generates a new way of thinking to solve major challenges. Typically, the behavior of complex systems must be predicted and no direct link between cause and consequence could be identified. Best practice recommendations are not working in this case.

Consequently, the program managers and engineers (system and IPS) need to overcome the following pitfalls in managing Products IPS for complex products:

- Issues and problems are objective, and they only need to be defined accurately
- There is a direct link between cause and consequence
- A real leader can implement every problem-solving solution
- To understand the system behavior, it is sufficient to take a picture of the current state
- The implementation of a solution solves the issue
- The system behavior is predictable
- The system can be kept under control

IPS for complex Products to handle uncertainty and probability. In addition, the Product IPS organization and IPS products and IT systems must be flexible due to the fact that the Product IPS system must be in line with the needs of the dynamic Product structure. Effective approaches to manage the complex Products from the IPS perspective can include:

- Defining a unifying lexicon and formal modelling language for the program (attempt for standardization)
- Developing effective methods to visualize and communicate between, for example, different IT systems and management cockpits
- Establishing artificial modules which can be easily connected and removed to stabilize the dynamic changes
- Distributed resource management for operation and IPS
- A study of interoperability and data distribution between the individual IPS information systems and the products
- Performing various simulations of the IPS system

10 Interface with other domains

10.1 System engineering

The complexity of Products continues to grow and the elements of a large and complex Product (eg, family of systems/Products) must work as a single entity including support components and services. This feature is increasingly important as their spans increase. Commercial and national organizations want to ensure that their investment in legacy elements of the new Product is protected and that new features added over time will work seamlessly with the legacy

elements to form a unified Product. To achieve this IPS must be addressed from a life cycle perspective and to be considered in all stages of a program and especially as an inherent part of system concept definition and development. The emphasis on addressing logistics in these stages is based on the fact that a significant portion of a system's LCC and availability can be directly linked to the operation and IPS of the Product in the field and that much of this is based on design and management decisions made during early stages of system development. Furthermore, logistics should be approached from a system perspective to include all activities associated with design for supportability, the acquisition and procurement of the elements of IPS.

The following aspects should be considered in order to connect system engineering to the IPS process:

- Provide procedures and requirements for distribution of data, information, trade studies
- Focus on data exchange, integration meetings and workshops

The interaction between IPS and system engineering changes during the lifecycle. These changes must be reflected in the updates of the IPSP.

The relationship between the different teams, organizations and IPS elements should be identified, preferably in diagrammatic form to show the responsibilities/reporting routes.

10.2 Configuration management

Configuration management establishes and maintains control over configuration items (eg, requirements, specifications, documentation, software and material breakdown) throughout the life cycle. There will always be a need to make changes; however, it must be ensured that the change is necessary, that the most cost-effective solution has been proposed and that IPS is part of the process.

It is important to define the data exchange process for changing configuration items even before the first status accounting takes place and items are under formal configuration control. The reason is, that during the reviews system engineering and IPS activities must be harmonized. If, for example, the reliability calculation during the CDR is based on an outdated hardware breakdown, passing the review successfully is not always assured and, therefore, the reliability of all IPS results cannot be guaranteed.

IPS must identify the impact of changes for all 12 IPS elements. Therefore, it is important to define the lowest replaceable item in accordance with the Service Bill of Materials (SBOM) as a configuration item.

Baseline information and interface for configuration management must be provided.

IPS related configuration management must start in the development phase and must be maintained until the phase out of the Product.

10.3 IT concept

An IPS program must identify the IT architecture that can ensure the implementation of the IPS specifications.

Such tools must be selected using a global IT concept and architecture to avoid integration problems. IT is an essential enabler for an efficient business process.

It is recommended that a functional IT architect is present at least at the IPS GC (Refer to [Para 5.1](#)) and, if necessary, at the individual IPS element GC, as it is critical that the IT architect is aware of the business needs, to establish a global IT concept that covers all IPS elements. IT tools used on the IPS program must be documented in the IPSP.

The IT concept must be documented and distributed to all stakeholders so that all IT development and integration is performed in a homogeneous way. This documentation consists of one global architectural document and one or more lower-level detail documents.

The IT concept (including architecture and technical data exchange documents) can be an official delivery and must be considered as being contractual. These documents will contain all technical aspects agreed at the GC and possible ad-hoc additional technical meetings. They will be approved by the parties involved in the project and its modifications must be approved by authorized personnel.

10.3.1 IT architecture document

The IT architecture document outlines the global IT concept and provides the overview of the IT infrastructure, associated stakeholders and IT systems, including but not limited to:

- Parties involved (eg, companies or organizations)
- Points of contact points at each party for IT issues
- IT infrastructure (including firewalls, IP addresses, etc)
- Affected IT tools, databases
- Data exchange process between organizations/IT tools and global data delivery responsibilities
- Data integration responsibilities
- Help desk
- Reporting on exchange issues
- Security requirements (eg, https, encryption, etc)
- Planning/implementation timescales, including testing
- Service level agreements

10.4 Technical data exchange document

In addition to the IT architecture document, one or several technical data exchange documents can be required. Not to be confused with an Interface Control Document (ICD), which is the exchange mechanism between two or more IT systems, the technical data exchange document provides a detailed description of the data exchange between two or more parties, including but not limited to:

- Responsible organizations and contact points 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, encryption)
- Responsible for delivery of each individual data set and delivery frequency
- Exchange mechanisms
- Exact data to be exchanged
- XML schema for project-specific values
- Business rules for data validation
- Service-level agreement, exchange times (if synchronous)

11 Best practices

To set up an IPS organization and run it until the disposal of the Product the following best practices must be applied:

- 1 In the first step the IPS teams for the projects need to be defined. The team performing this task must cover all IPS areas.

- 2 The responsibility and authority for the logistic products must be delegated to IPS managers. Select experienced IPS managers early in the development process and avoid frequent budget changes throughout the life cycle.
- 3 The IPS teams must be staffed. Team members must work well in a team environment, communicate well, and meet their commitments:
 - 3.1 The competency, availability, and fulltime commitment of the core team must be balanced.
 - 3.2 The need for competencies (and those not required) must be planned.
 - 3.3 Issues where experts are needed must be identified.
- 4 The team's operating environment must be realized. How the IPS element directly or indirectly influences other elements and domains must be recognized.
- 5 An initial kick-off meeting must be planned and conducted. It is recommended to hold kick-off meetings for the whole IPS project as well as for each individual IPS team.
- 6 The IPS teams must be trained. Training for the IPS project is a critical element. It is recommended that topics that must be covered and documented in the IPSP are:
 - 6.1 Tailored IPS process for the project.
 - 6.2 Project (ie, Product, IPS and IPS element) description, stakeholders, purpose, mission, organization, schedule, and budget.
 - 6.3 Terminology and nomenclature.
 - 6.4 Access to project products.
 - 6.5 Communications skills.
 - 6.6 IPS project procedures, measures, and reporting.
- 7 Define the IPS vision and objectives. The IPS vision and objectives must be developed in the manner that each member has an ownership. It is recommended to bring in other project members (eg, systems engineering), management, and customers to stress out the vision and objectives of the team.
- 8 Each IPS team must define its job. Once the higher-level IPS project plan has been reviewed, each IPS team must identify the tasks, roles, responsibilities, and milestones of the team and each of the members. Members need to understand how their individual tasks fit into the IPS project/program tasks.
- 9 Routine IPS process assessment and a continuous improvement must be established. Each IPS team must document the process, internal and external interfaces (eg, to improve the product or configuration management) they are using and the key measures (eg, design changes, reliability) to be monitored. The teams must have the mindset of continuous improvement, monitor their own activities, and continually make course corrections along the way.
- 10 IPS progress must be monitored via measures and reports. Each IPS team will have a set of measures and reports to monitor its own progress. These reports and measures must be reviewed by the IPS team, the IPT, if available, and the product management team that coordinates among the other teams. These measures can include a financial report and

technical measures like a maintainability or false detection rate. The selected measures depend on the team's role on the project.

- 11 The team must be sustained and evolved throughout the project. Personnel assignments to a team will vary as each team grows, shrinks, and changes skill mix over the project life cycle. As issues arise, technical specialists must be available to join the team to help address these specific issues (eg, for failure or prognostics discussions). Services, such as program controls, procurement, finance, legal, and human resources, generally support the team at a steady, low level of effort, or as required.
- 12 IPS products must be documented. The IPS products should be well defined. Because of the program structure, the overhead of cross-organizational communication varies and should be reduced. When multiple documents are required, different IPS members with identified backups should be assigned as the responsible author with contributions from others. The IPS management must sustain a documentation of activities in addition to the mission, vision, objectives, deliverables, meeting minutes, decisions, tailored processes, agreements, team project information, and contact information.
- 13 Traditionally development programs are dominated by engineering and production. Therefore, the program will be closed after transition of the Products to the customer. However, the support's main activities of maintaining the Product during its operation starts with this transition and becomes the focal point. With the PSD all IPS conduct follow-up activities, knowledge and IPS products (eg, warehousing, spares tools, technical documentation) and records must be transferred to the in-service program. The IPS team must maintain records because the in-service project will be reengineered at some future time (eg, changing user needs or environment) and all closeout products must be accessible. All IPS logs should be organized the same way, though they can be easily integrated into an overall in-service project report.
- 14 The formal closeout of the IPS development should include lessons learned, recommended changes, and a summary of measures for the IPS team.
- 15 The advantages of a full-time contributor outweigh the work of many part-time team members. Similarly, the loss of a knowledgeable key team member can leave the team floundering. It is important to have people who can work well together and communicate, but team results can suffer without outstanding technical specialists and professionals who can make a difference. Recommended techniques for achieving high performance in an IPS team of a program are:

15.1 Select the staff.

15.2 Establish and maintain positive team interaction dynamics. All stakeholders should know what is expected of IPS and each individual and strive to meet commitments. Anticipate and surface potential problems quickly, both internally and externally. Interactions should be informal but efficient and problems are fixed.

15.3 Generate team commitment and buy-in with team alignment to the vision, objectives, tasks, and schedules.

15.4 Breakdown the job into manageable activities, (eg, those that can be accurately scheduled, assigned, and followed up).

15.5 Delegate and spread out routine administrative tasks among the team. Free up the leader to participate in IPS and technical activities. Give every team member some administrative/managerial experience.

- 16 Schedule frequent team meetings with mandatory attendance for quick information exchanges. Ensure everyone is current. Assign action items with assignee and due date.

12 Detailed checklists

The ORD and the URD are important questionnaires that must be considered even though not all the information is always captured in the data model.

12.1 Creation of an ORD

A complete ORD, a checklist with several questions should be used in the IPS development. A checklist of questions must be answered during the creation of the ORD, taking into account any project specific aspects. Refer to [Table 3](#).

Table 3 Checklist of questions asked by IPS during the ORD creation

ORD questions	Answer/Action
General usage scenario	
Which usage areas or which mission areas are expected?	Describe usage areas
Is the normal usage of the Product the only scenario?	Yes/No? If yes, is there a reason for it? If no, what are the other scenarios?
Are there special usage scenarios, which must be taken into consideration?	Yes/No? If yes, describe special usage scenarios in detail
Is a permanent usage expected?	Yes/No? If yes, describe in detail
Is an out of area usage under rough conditions expected?	Yes/No? If yes, describe in detail
Is there any influence on the environment expected from noise from the usage or the maintenance of the Product?	Yes/No? If yes, describe in detail
Is there any influence on the environment expected by pollution from the usage or the maintenance of the Product?	Yes/No? If yes, describe in detail
Is there any other influence on the environment expected from the usage or the maintenance of the Product?	Yes/No? If yes, describe in detail
Are there any activities necessary to avoid negative influence on the environment such as noise or pollution?	Yes/No? If yes, describe in detail
Are there any problems with the currently used Product concerning performance?	Yes/No? If yes, describe problems
Are there any problems with the currently used Product concerning maintenance?	Yes/No? If yes, describe problems
Are there any problems with the currently used Product concerning supportability?	Yes/No? If yes, describe problems

ORD questions	Answer/Action
Is the Product used in combination with other existing products (generally or only sometimes)?	Yes/No? If yes, describe interaction
Is the usage of the Product dependent on other existing Products?	Yes/No? If yes, describe dependence
Product transportability	
Is the Product itself transportable?	Yes/No? If yes, answer the following questions. If no, ignore them.
How long does it take to prepare the Product for transportation?	Duration
Does transportation require a special conservation and/or packaging?	Yes/No? If yes, describe in detail
Define transportability requirements (ie, mode, type, quantity, distance, duration of transport, transport conditions, etc)	Define the details
Which requirements concerning IPS equipment and personnel exist for the preparation of the Product for transport?	Define the details
What is the maximum accepted time to reset the Product to full capability after transportation?	Define the duration
Which requirements concerning IPS equipment and personnel exist for the rest of the Product to full capability after transportation?	Define the details
What else must be transported (eg, IPS equipment, spares, personnel) for the proper operation of the Product at the destination and what are the requirements for these additional transportation tasks?	Define the details
Deployment of locations and special conditions of every location	
How many operating locations exist?	Number
Is there an international or even an intercontinental distribution of the operational locations?	Yes/No?
What are the distances between the operating locations?	Map, distances
What are the distances between the operating locations and the required industry and/or contractor facilities?	Map, distances
Define the type of each location:	Define the details
- Is the location land based? - Is the location ship based or sea based? - Is the location based in a mountain region? - Is the location a depot with maintenance abilities? - Is the location a home base or an offshore location for the Product? - Is the location a training base equipped with training facilities?	

ORD questions	Answer/Action
Define the special conditions at each location:	Define the details
Are there extreme sandy or dusty conditions?	
Is there a salty atmosphere because of location?	
Are there extreme hot or cold weather conditions?	
Are there other extreme stress conditions at special locations?	
Are there limitations due to special regulations/laws at special locations?	
Are there special storage requirements due to extreme weather conditions at special locations?	
In a wartime scenario, are there special locations that would preclude contractor maintenance (eg, maintenance and repairs in wartime environment cannot easily be performed by contractors)?	Yes/No?
Are there any special situations involving threat that can require a special emergency IPS concept limited to a minimum of intervention?	Yes/No?
Is there sufficient infrastructure available to reach all locations (eg, to guarantee proper supply of spare parts or consumables):	Define the details
– Low payload period	
– Quality and existence of roads	
– Airport (local or international) nearby	
– Connection to railway stations	
– Connection to inland or seaports	
Are there special infrastructural requirements for reaching a location?	Yes/No? If yes, define the details
What are the existing capabilities of each location concerning IPS equipment?	Define the details
What are the existing capabilities of each location concerning facilities and infrastructure?	Define the details
What are the existing capabilities of each location concerning personnel?	Define the details
What are the planned capabilities of each location concerning IPS equipment?	Define the details
What are the planned capabilities of each location concerning facilities and infrastructure?	Define the details
What are the planned capabilities of each location concerning personnel?	Define the details
Will there be plans to establish a repair station at special locations?	Yes/No? Why? Define the details
Will there be plans to establish a supply depot at special locations?	Yes/No? Why? Define the details

ORD questions	Answer/Action
Will there be plans to share abilities between different locations (ie, exchange of IPS equipment or personnel)	Yes/No? Why? Define the details
Product IPS and deployment	
How many support Products are planned per location?	Define the details
What is the deployment of Products per location?	Define the details
Will there be plans to share Products between different locations?	Define the details
Product usage overview	
What will be the normal usage of the Product at every location (key usage)?	Define the details
What is the planned availability of the Product at each operating location?	Define the details
When the Product is used in missions, what are the planned mission success rates for each operating location?	Define the details
Are there any periods of special usage of the Products at a special location?	Define the details
– Low payload period – Temporary peak loads – Temporary storage of the Product – Out of area usage under special or rough conditions – Wartime usage	
In the case of permanent operational conditions, what are the possible down times for maintenance or maintenance windows?	Define the time periods for maintenance
Define additional Product performance parameters in measurable quantifiable terms such as:	Define the values
– Range of usage – Required accuracy – Payload values – Required temperatures	
Required speed	
– Required distances	

ORD questions	Answer/Action
What is the key measurement base of usage per unit of time? Examples are:	Define the values
– Operational hours for general Products	
– Flight hours for airborne Products (aircrafts, helicopters)	
– Kilometers or miles for land-based vehicles	
– Rounds or cycles for periodic processes in a Product	
– Tons for transportation systems	
What operational profile is expected at each location?	Define an operational profile
How many operating hours or missions are planned per day?	as detailed as possible
Are there different typical usage days, define the operating profile for each day type.	
What are the typical operational profiles for longer ranges such as weeks, months or entire years?	
How many operating days/operating hours are expected for a year or for any other basic time period?	Define the values
What is the average duration of each different usage (eg, operation, mission, trip, flight, drive)	Define the values

12.2 Creation of an URD

To IPS the development of a complete URD, a checklist with a number of detailed questions should be used. taking into account any project specific aspects. Refer to [Table 4](#).

Table 4 Checklist of questions asked by IPS the URD creation

URD questions	Answer/Action
Supply concept	
Are central depots expected, and how is the deployment planned?	Define the details
Are depots planned directly at the operational locations?	Yes/No? Why? Define the details
Is a material exchange between different locations expected?	Yes/No? Why? Define the details
Is a selection process for suppliers defined and how is it planned to integrate suppliers into the expected supply concept?	Define the details
Is it possible for a production line to provide spare part IPS (especially at the early stages)?	Yes/No? Why? Define the details

URD questions	Answer/Action
Is an outsourcing concept via an IPS agency expected?	Yes/No? Why? Define the details
What are the limitations for spare part availability and lead times?	Define the details
What distribution systems and IT system will be used for spare part supply?	Define the details
Which concept will be used for initial provisioning?	Define the details
Is it expected to use an optimization or a simulation tool?	
Is the deployment schedule properly supported by the initial delivery of spares?	
Will spare part delivery impact the production schedule?	Yes/No?
Will the industrial base be obligated to provide spares IPS in the out-years for items that remain in the inventory?	Yes/No?
IPS equipment concept	
How can it be ensured that all IPS equipment is available in time?	Define the details
What is the identification and realization process for standard and special IPS equipment?	Define the details
How effectively is automated test equipment being utilized to IPS the Product?	Define the details
What is planned for maintenance and IPS of the IPS equipment itself?	Define the details
Repair and overhaul of IPS equipment	
Calibration of IPS equipment	
Personnel integration	
What are the general requirements and provisions for manpower and personnel?	Define the details
Are the Products operated by the staff of the customer or by staff of the contractor?	Define the details
Should cooperative models be considered?	Yes/No? Why? Define the details
How can it be ensured that the required operator training is verified on time?	Define the details
How can it be ensured that the required maintenance training is verified on time?	Define the details
What training processes should be developed to ensure adequate operational and maintenance IPS at all levels during the entire life of the Product? The possible rapid turn-over of personnel must be considered.	Define the details
Facilities and infrastructure	

URD questions	Answer/Action
Which infrastructure must be available at the required facility (eg, electrical power, hydraulic power, compressed air, special working environment)	Define the details
Are existing facilities at operational locations appropriate to the requirements of a new Product (eg, operational and maintenance facilities)?	Yes/No? Why? Define the details
Can existing facilities at operational locations be adapted to the requirements of a new Product (eg, operational and maintenance facilities)?	Yes/No? Why? Define the details
Is there a realistic time schedule available for the building of required new facilities?	Yes/No? Define the details
Is there a plan to identify and reduce risks caused by the delay of the building of facilities?	Define the details
IT and communication resources	
Which IT architectures exists at every operational location concerning the following aspects: – Network capabilities – Data storage capabilities – Computer capabilities – Communication resources	Define the details
Are the existing IT and communication capabilities appropriate for the new Products to be introduced?	Yes/No? Define the details
Are there risks in connection with future changes in IT or communication architecture concerning the operation of the new Products?	Define the details
Are there concepts for an initial provision with data for required IT systems? Who is the holder of the required data? Are there contractual aspects to be considered? Are there any problems concerning data security requirements?	Define the details
Are there plans for a first installation of required new IT systems and for the appropriate service of IT systems during the life of the Product to be supported?	Yes/No? Why? Define the details
Are there service contracts for hardware and software (ie, planned and existing)? Fast reaction to downtime must be ensured. Upgrade of hardware and software in case of technical progress should be included in the agreements of a service contract.	Yes/No? Why? Define the details

URD questions	Answer/Action
Are different IT systems at different operational locations compatible?	Yes/No? Why? Define the details
Is there a plan to ensure the existence of all required interfaces to other IT systems?	Yes/No? Why? Define the details
New organizational structures	
Will any organizational structures be changed at operational locations and what are the risks of these changes?	Define the details
What structure changing opportunities exist with the introduction of a new Product (eg, reduction of personnel)	Define the details
Schedule consideration	
What are the plans for an appropriate participation of logistic disciplines in all phases of the project?	Define the details
Are the supportability analysts involved in the project in a very early phase of the project so they can influence basic decisions concerning design?	Yes/No? Why? Define the details
Additional aspects	
What additional aspects specific to the project are of high significance for the supportability analysts?	Define the details

Chapter 5

IPS activities for each life cycle phase contract type

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Table 1 References

Chap No./Document No.	Title
Chap 1	Introduction
Chap 2	IPS framework
Chap 12	Comparison of specification terminology
S1000D	International specification for technical publications using a common source database
S2000M	International specification for materiel management

Chap No./Document No.	Title
S3000L	International procedure specification for Logistics Support Analysis (LSA)
S5000F	International specification for in-service feedback

1 Introduction

This chapter is oriented around the major phases of a Product's life cycle and the activities and deliverables associated with each phase.

It starts with the Product and in-service stakeholders developing Product support requirements.

The Integrated Product Support (IPS) manager develops a strategy and plans to fulfill these requirements. These strategies and plans address each of the IPS elements and will change over time, which is represented by the Support Maturity Levels (SML), that describe the expected level of maturity and summarize key milestones, documents and capabilities of the IPS program at a given point in the Product life cycle.

Execution of these plans and strategies result in efforts that vary across the life cycle. Finally, execution of these plans and strategies also result in desired support outcomes.

1.1 Purpose

The purpose of establishing the strategy is to ensure that the execution of each phase's activities result in the desired Product support and support products, acknowledging that efforts to achieve the results vary across the life cycle.

1.2 Scope

This chapter is intended for both customer and contractor project and IPS managers.

The design of an IPS system begins with the identification of customer needs in the early phases and extends through a series of activities and tasks ending with the withdrawal of the Product from operation or actual disposal.

This is an evolutionary top down, life cycle process depending on the specific Product. Guidelines for the activities performed over the life cycle are given, acknowledging that they can vary depending on the Product. The guidelines distinguish between a full Development Item (DI) Product and an existing Commercial Off The Shelf/Modified Off The Shelf (COTS/MOTS) Products.

2 Product life cycle overview

2.1 Product life cycle phases

Every Product has a life cycle, which describes the life of a Product from beginning to end using a functional model with distinct sequential phases. The phases provide an organization with a framework for decision gates and ensure high-level visibility and control of project and technical processes. Decision gates are specific points in the process where the situation is reviewed, and a decision is taken to continue with the process or redo part of the previous work. At each decision gate, progress into the following phase is decided. However, phases usually will overlap due to operational or organizational needs.

For example, for a complex Product with different configurations some configurations could be at a development phase while others are still in Production and others already in-service, which would lead to an overlap of three phases.

As described in [Chap 12](#), there can be many different Product life cycle models, depending on the organization's approach. For the S-Series IPS specifications, five phases are defined and mapped in [Chap 12](#) to other specification models:

- Preparation phase
- Development phase
- Production phase
- In-service phase
- Disposal phase

2.2 Decision gates during the life cycle

The IPS life cycle considers many aspects, including the business case, available budget, technical Product and the in-service support in the customers environment. The systems engineer creates technical solutions that are consistent with the business case and the funding constraints. The IPS engineer creates the generic support solution for the Product and customizes it to the customer's needs, and provides the baseline and variable costs for the in-service support of the Product.

Product and support integrity require that these aspects are balanced and given equal emphasis at all decision gate reviews. Decision gates are often called milestones or reviews but should not be confused with these. Decision gate are approval events in the Product life cycle with entry and exit criteria established for each gate. They ensure that new activities are not started until the previously scheduled tasks, on which new activities depend, are satisfactorily completed such as the creation of technical documentation before the drawing set is under configuration control. These criteria enable decision gates to mitigate the risk for a project by defining clear criteria to proceed.

The criteria that the decision gates address include, but are not limited to the questions:

- Does the project deliverable still satisfy the support requirements?
- Is it affordable?
- Can it be delivered on time, on cost on quality?

To support the IPS management in answering these questions [Chap 4](#) has introduced the concept of SML, which are mapped here to the different Product phases.

The following paragraphs describe which SML belongs to:

- Which life cycle phase
- Which IPS activities provide value to the specific SML
- Which level of detail is recommended for development Products and COTS/MOTS (high, medium, limited, N/A)

3 IPS activities during the product life cycle

[Fig 1](#) provides a global mapping of the different IPS activities to the different life cycle phases.

Element	Activity	Preparation Phase	Development Phase	Production Phase	In Service Phase	Disposal Phase
Computer Resources	Manage Computer Resources for ILS program				evaluation periodically	
	Perform Computer Resource Analysis				evaluation periodically	
	Provide Computer Resources				evaluation periodically	
Design Influence	Perform Reliability, Availability, Maintainability Analysis					
	Perform LSA					
Facilities and Infrastructure	Perform LCC (Affordability) Analysis				Update LCC	
	Perform F&I Analysis					
	Provide Facilities and Infrastructure					
	Develop Maintenance Concept					
Maintenance	Perform Level of Repair Analysis				evaluation periodically	
	Develop Maintenance Plan				evaluation periodically	
	Execute Maintenance Tasks				evaluation periodically	
	Perform Supportability Safety Analysis					
	Develop and continuously improve preventive maintenance					
	Perform Scheduled Maintenance Analysis (MTA)					
	Perform in-service maintenance optimization (ISMO)					
	Perform Diagnostics, Prognostics and Health Management					
	(D&PHM) Analysis					
	Perform Software Maintenance Analysis					
Manpower & Personnel Packaging, Handling, Storage & Transport (PHS&T)	Perform Manpower & Personnel Analysis				evaluation periodically	
	Analyse PHS&T Requirements			PHS&T Devel. & Prod. (Provision)		
Product Support Management	Manage contract				evaluation periodically	
	Capture product support requirement				evaluation periodically	
	Develop ILS plan					
	Manage In-service ILS activities					
	Configuration management					
	Perform obsolescence management					
	Fleet management					
	Lessons learned					
Supply Support	Provide provisioning data					
	Perform Material Supply					
	Manage stocks / stores					
Support Equipment	Manage warranty					
	Analyse Support Equipment Requirements					
Sustaining Engineering	Provide Support Equipment					
	Perform engineering technical analysis					
	Develop & provide engineering disposition & recommend					
	Operational suitability					
Technical Data	Manage Disposal					
	Develop Technical Data Package					
	Produce Technical Publications					
Training and Training Support	Perform Training Need Analysis (TNA)				updated periodically	
	Develop Training Plan					
	Perform Training Development					
	Deploy Training				updated periodically In-Service Training	

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Fig 1 Mapping of IPS activities to the life cycle phases

3.1 IPS activities during the preparation phase

It is at this early period in the life cycle that major decisions are made relative to adopting a specific design and support approach. When insufficient information is available, a research activity can be initiated with the objective of developing new methods/techniques for specific purposes.

The preparation phase begins with some recognition of a need for new or modified technology or capability. Many projects use research activity in the preparation phase to study new ideas, which then mature into the development of a new Product.

IPS practitioners performing these studies often follow new ideas that integrate future technologies and opportunities. One of the major achievements in this very early phase is the identification of a technology that forms a backbone of future supportability performance. The associated IPS strategy, ideas, processes and technologies must be documented in a preliminary support concept. In conjunction with systems engineering, the IPS manager will create early Life Cycle Cost (LCC) predictions, schedule and Product support performance projections.

It is important to assess the potential technological readiness and support maturity level for each identified entity that affects the Product support outcome. Technologies such as prognostics for electronic items, new business models due to service clouds and real time decision making within complex systems are some aspects to be considered.

Effective research studies in the early phase of the Product life cycle, can reduce recalls and rework in later phases.

Developing a conceptual design is the next step in the overall process and is initiated in response to an identified customer need. Starting with the creation of an Operator Requirements Document (ORD), feasibility studies are conducted with the objective of identifying alternative support solutions. Operational requirements for the Product identify the overall allocations of the Product support in terms of locations and schedule. This is followed by the integration of a Usage Requirements Document (URD) in the feasibility studies and respective trade-off studies.

The Product's performance requirements and the support concept are defined, and applicable Technical Performance Measures (TPM) are identified and prioritized. Often, however, the selection of technology applications does have supportability implications and therefore, it is essential that TPMs address critical areas from the IPS perspective. The System Requirements Document (SRD) is prepared to describe the design and support requirements for the Product. It is at this point that the appropriate Performance-Based Support (PBS) (also known as Performance Based Logistics or PBL) factors must be discussed, defined and included in the system requirements.

It is necessary to:

- Identify the alternative feasible design and support approaches that can be pursued to meet the requirements.
- Evaluate the most likely candidates in terms of performance, effectiveness, supportability, and LCC criteria
- Recommend a preferred approach. The objective is to select an overall integrated and holistic approach, which can be sustained for the life of the Product. The number of different alternatives must be narrowed down, as far as possible, to the minimum feasible options that achieve the customer requirements while must being consistent with the availability of resources (ie, personnel, materials, and cost).

Note

The same information can be required for different SMLs because the maturity of such information can be different.

Table 2 Activity level of detail required during the preparation phase

Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
Preparation phase	1	Operational Requirements Document (ORD)	Analyze alternatives	High	High
			Develop IPS plan	High	High
			Develop maintenance concept	High	High
	2	Usage requirements document (URD)	Analyze alternatives	High	High
			Develop IPS plan	High	High
			Develop maintenance concept	High	High
	3	System Requirements Document (SRD)	Analyze alternatives	High	High
			Develop IPS plan	High	High
			Develop maintenance concept	High	High

3.2 IPS activities during the development phase

The transition from the preparation phase to the development phase starts with the IPS Guidance Conference (GC) and related documents such as IPS sub-plans and guidance documents for Logistic Support Analysis (LSA), Interactive Electronic Technical Publications (IETP) and provisioning data. The GC must be the central event with participation of management staff and specialists from both the customer and the support provider. At this conference, the binding agreements for the performance of the IPS activities must be established. To ensure best performance of this conference, it is necessary to have prepared inputs and to have a clear expectation of the results and final agreements. The GCs must be conducted before the functional baseline is described and the system level requirements are broken down into detailed design and support requirements, otherwise the results of the GC can have significant impact on cost and schedule of the Product development and production.

The key aspect at this point is to create an agreement between all IPS element and related domains how to manage and exchange data through the life cycle. Even the in-service phase must be considered because the baseline for the in-service support and related TPM's and feedback data requirements must be established during the development phase. Otherwise, the in-service phase starts without the possibility to check and optimize the operational performance. Clear interfaces and data exchange rules with configuration management and systems engineering should be defined in order to track the continuously changing design, and to easily identify the changes and their impact on IPS.

By defining the requested analysis and activities, the necessary data will be defined usually by means of use cases. The GC must identify the necessary dependencies and actions to be implemented 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 for the complete life cycle. There are best practices that should be conducted at the GC for:

- For technical publication, refer to S1000D
- For GC provisioning data, refer to S2000M

- For GC LSA, refer to S3000L
- For GC feedback data, S5000F

The preliminary Product design must start after the GC with a "functional baseline" described in the SRD prepared during the preparation phase. Preliminary Product design includes the process of:

- The allocation of Product-level requirements downwards to single configuration items
- Functional support assessment
- Preliminary Product design and support assessment
- The accomplishment of trade-off studies and design optimization
- The definition of the allowed configurations in the form of system engineering, Product, and processes, or combinations thereof

The preliminary IPS design process leads to the System Requirements Review (SRR) by performing the following activities:

- Identification of Product-Level support functions, functional support requirements and functional interfaces
- Product-level support functions are high-level activities and are not necessarily associated with a single, physical Product implementation.
- Development of a Product support architecture
- Allocation of IPS-related SRD requirements to configuration items and IPS elements

Initial system capabilities and supportability objectives/requirements have been analyzed and allocated to configuration items or downstream Product elements. Initial support engineering strategy has been formulated and integrated with the system engineering process. The IPS plan is updated accordingly. Design features to achieve the Product support strategy, including diagnostics and prognostics, are incorporated into system performance specifications.

The Test, Verification and Evaluation Plan (TVEP) addresses when and how required IPS related design features and key performance indicators/measures will be verified.

The Preliminary Product Support Assessment (PPSA) leads to the identification of specific support requirements to include equipment, software, people, facilities and infrastructure, training equipment, etc.

Support requirements must be considered as an integral part of the preliminary Product design process. The functional support assessment includes:

- The development of top-level maintenance and support functions:
 - Identification of maintenance activities to the maintenance concept
 - Identification of special support equipment
- The establishment of supportability criteria for design:
 - Accessibility
 - Human factors integration
 - Standardization
 - Transportation
- The accomplishment of trade-off studies:
 - Determine COTS versus modification or development
 - Alternative methods of mounting
 - Alternative methods of prognostics versus redundancy
 - Organic repair versus supplier repair
 - LCCA

- Design optimization and influence:
 - Identification of functional (equipment) failures
 - Identification of reliability critical functions
 - Identification of maintainability critical functions
 - Identification of testability critical functions
- and the LSA

The PPSA demonstrates that the preliminary design meets all Product support requirements with acceptable risk and within the cost and schedule constraints and establishes the basis for proceeding with detailed design. It will show that the correct design options have been selected, interfaces have been identified, and verification methods have been described.

The support provider must address the IPS planning and management of requirements, defining support requirements, major cost drivers and risks. Respective evidence must be provided.

IPS activities to develop support system alternatives and determining the optimum solution using analysis must underpin the evidence with facts. The PPSA can be conducted as a standalone review but it is recommended to embed it in the system engineering Preliminary Design Review (PDR) because within integrated Product teams and development, integrated reviews must also take place.

Detail design and development begins with the configuration derived through the preliminary Product design and evolves through the further development and ends with the Critical Product Support Assessment (CPSA) as an integral part of the Critical Design Review (CDR).

A Product configuration has been defined, a functional analysis has been accomplished, and the requirements for detail design have been included in the appropriate specifications.

The next step is to convert the information provided into the proper mix of hardware, software, people, data, and specific elements of support. The following engineering data are inputs to the various IPS activities performed in this phase:

- Definition of Product breakdown: sub-products, units, assemblies, lower-level equipment parts, software, facilities, and data. As the support infrastructure constitute a major element of the system, it is essential that this area be addressed as an integral part of the design process.
- Preparation of design data: specifications, drawings, databases, electronic data files, trade-off study reports, predictions, analysis reports, etc, describing the Product

The CPSA leads to the forecast of the future operational performance related to availability, cost and sustainability including the detailed demand for equipment, software, people, facilities and infrastructure, training equipment, etc. After the successful CPSA, it is expected that the Product and support system design meet the intended top-level requirements and it is ready for prototyping, testing and production.

Support requirements must be considered as an integral part of the Product design process. The CPSA provides evidence that:

- the Maintainability requirements are met, and the following have been performed:
 - Maintenance Task Analysis (MTA)
 - Level Of Repair Analysis (LORA)
 - Perform Diagnostics, Prognostics and Health Management (DPHM) analysis
 - Preventive Maintenance Task Requirements (PMTR)
 - Software Support Analysis (SSA)
 - Supportability safety analysis the support engineering requirements are met, and the following have been performed:

- Reliability analysis
- Availability analysis
- Testability analysis
- Packing, Handling, Storage and Transportation (PHST) requirements are analyzed and that:
 - Configuration is properly managed
 - Obsolescence management is properly performed
 - Computer resources analysis is properly performed
 - LSA data is stored, distributed and under configuration control
 - Operational suitability is forecasted
 - Facilities and infrastructure requirements determined
 - Manpower and personnel analysis is properly performed
 - Support and training equipment requirements are determined, and systems engineering have been informed

The CDR and its CPSA portion demonstrates that the maturity of the design is such that it can proceed with prototyping, assembly, integration, and test.

IPS element requirements are integrated, finalized and consistent with the approved system design and support concept. Validation that the design conforms to support requirements. Metrics are predicted based on CDR results and projected to supply chain performance.

Table 3 Activity level of detail required during the development phase

Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
Development phase	4	Guidance Conference (GC)	Develop IPS plan	High	High
			Perform LSA	High	High
			Perform LCC (affordability) analysis	High	High
			Provide provisioning data	High	High
			Manage configuration	High	High
			Perform engineering technical analysis	High	High
			Evaluate operational suitability	High	High
			Produce technical publications	High	High
	5	System Requirements Review (SRR)	Develop IPS plan	Update	Limited
			Analyze training equipment requirements	High	Limited

Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
			Analyze support equipment requirements	High	Limited
			Perform support engineering analysis	High	Limited
			Perform computer resources analysis	High	Limited
			Develop maintenance concept	High	Limited
			Analyze handling and usage aspects	High	Limited
	6	Preliminary Design Review (PDR)	Analyze handling and usage aspects	Limited	N/A
			Analyze PHST requirements	limited	N/A
			Develop maintenance concept	Medium	Limited
			Perform MTA	limited	N/A
			Perform SSA	limited	N/A
			Analyze alternatives	Medium	Limited
			Develop IPS plan	Medium	Limited
			Manage configuration	High	Medium
			Perform computer resources analysis	Medium	N/A
			Manage computer resources for IPS program	High	Medium
			Perform LSA	Medium	N/A
			Perform LCC (affordability) analysis	Medium	Limited
			Perform SSA	Medium	N/A
			Perform Facilities	High	Limited

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Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
			and Infrastructure (F&I) analysis		
			Analyze support equipment requirements	medium	N/A
			Develop training plan	high	Medium
	7	Critical design Review	Analyze handling and usage aspects	High	Medium
			Analyze PHST requirements	High	Medium
			Develop maintenance concept	Limited	Limited
			Develop maintenance plan	Medium	Medium
			Perform DPHM analysis	High	Medium
			Perform LORA	High	Medium
			Perform MTA	High	Limited
			Develop PMTR	High	Medium
			Perform SSA	High	Medium
			Perform supportability safety analysis	High	High
			Analyze alternatives	Limited	Limited
			Develop IPS plan	Limited	Limited
			Manage configuration	High	High
			Manage in-service IPS activities	Medium	Medium
			Perform obsolescence management	High	Medium
			Perform computer resources analysis	High	Medium
			Manage computer resources for IPS	Medium	Medium

Applicable to: All

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Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
			program		
			Perform LSA	High	Limited
			Perform support engineering analysis	High	Limited
			Perform LCC (affordability) analysis	High	High
			Evaluate operational suitability	Medium	Medium
			Develop Technical Data Package (TDP)	Limited	Limited
			Perform F&I analysis	High	Medium
			Perform manpower and personnel analysis	High	N/A
			Analyze support equipment requirements	High	Limited
			Analyze training equipment requirements	High	N/A
			Develop training plan	limited	Limited
			Perform training need analysis (TNA)	High	Limited

3.3 IPS activities during the production phase

The production phase is where the Product is manufactured. Product modifications can be required to resolve production or qualification problems, to reduce production costs, or to enhance Product capabilities. Any of these can influence Product requirements and can require reverification or revalidation. All such changes require IPS assessment before they are approved.

Following the CDR the testing and verification and validation activities start. The planning for these activities must take place early to ensure that adequate facilities and other resources are available when needed.

The next step is to verify the theoretical analyses provided at CDR with physical models of the Product and/or major Product components, such as engineering laboratory models, service test

models, mock-ups. Deviations in maintenance tasks will be observed and integrated, duration of the maintenance activities are measured, failure reporting and corrective action processes are in place. All results are stored in the LSA database and forwarded to the subsequent IPS activities, such as produce technical documentation or TNA. All IPS Products must be created and available at the factory acceptance test at the manufacturers site.

The Final Acceptance Review (FAR) is usually carried out jointly by the manufacturer and the contractor or their authorized representative. The IPS review portion includes the following activities:

- The IPS Products such as the IETP, training equipment, support equipment, etc, are checked for availability and completeness. The bases of the assessment are the specifications and guidance documents and, if applicable, other changes agreed upon after the conclusion of the contract (amendment request) if these have become part of the contract.
- In addition, the test (eg, reliability qualification) and observation results documented by the supplier are used. In addition, a (reduced) functional test takes place. This can include but is not limited to:
 - Does the failure code, in the BIT/BITE demonstration, lead to the correct maintenance action?
 - Is the time period for maintenance, in the maintainability demonstration, in accordance with that defined by LSA?
 - Is the support equipment compatible?
 - Is the IETP procedure correct?
 - Is the Illustrated Parts Catalog/Illustrated Parts Data (IPC/IPD) content in line with configuration management?

Whether the documented results can also be reproduced at the place of Production is also confirmed.

The FAR demonstrates that the Product support planning is completed. The in-service strategy, roles, responsibilities, and partnerships are identified and are ready to be implemented.

Design inherent Product support capabilities such as RAMCT or technical documentation must be tested and demonstrated to validate the supply chain performance and IPS Products.

Budget requirements are adjusted based on the design and test results.

For a Product that is customized to the operator's special environment, a fielding analysis must be conducted. The results of the fielding analysis can lead to Product modification and can require reverification or revalidation. The planning stage for this analysis is critical to any major Product and begins with an accurate, detailed site survey of the user's existing facilities, offices, and IT infrastructure. This is important because every branch and warehouse is unique, even in the most carefully planned organizations. Square footage, distribution, cabling, and hardware can all vary from location to location and can change over time.

In parallel to the manufacturing of the Product, it is necessary to acquire and then provide the necessary support products on a sustaining basis. Acquisition comprises the provisioning, procurement, and/or manufacture of spare/repair parts, special test and support equipment, technical data, computer resources, etc. Material flow requirements include the packaging, handling, transportation, and distribution of Product components designated for operational use, along with those items required in support of maintenance activities in the field. Customer service refers to the initial installation and checkout of the system at the user site, sustaining on-site maintenance support and training (ie, field services often provided by the manufacturer), Product evaluation and supportability assessment, and the incorporation of system modifications, as required.

The Support Solution Review (SSR) is used to conduct operational readiness of a Product or service. SSR is a common type of non-functional testing in the customer's environment. This

type of testing focuses on the operational readiness of the system to be supported, and/or to become an integral part of the operator's environment. The SSR is performed at the operator's site and can last up to several months for large defense projects.

The SSR demonstrates that the support capabilities (including associated support processes and products) are proven in an operational environment.

For validation purposes, evidence from engineering evaluation and test is often involved with the demonstration of the support system. A Logistic Demonstration (LogDemo) must be carried out which will form part of the TVEP. IPS support systems and products must be delivered to the operational site. Key performance indicators must be measured against agreed availability, materiel reliability, ownership cost and other IPS metrics. Needed improvement actions are taken based on performance data.

Subsequently, the Product is transitioned to the operator.

Table 4 Activity level of detail required during the production phase

Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
Production phase	8	Final Acceptance Review (FAR)	Analyze handling and usage aspects	High	Limited
			Analyze PHST requirements	High	limited
			Develop maintenance concept	Limited	limited
			Develop maintenance plan	High	Medium
			Perform DPHM analysis	High	Limited
			Perform LORA	High	Medium
			Perform MTA	High	Medium
			Develop PMTR	High	Medium
			Perform SSA	High	Medium
			Perform supportability safety analysis	High	High
			Analyze alternatives	Limited	Limited
			Develop IPS plan	Limited	Limited
			Document lessons learned	Medium	Limited
			Manage configuration	High	High
			Manage contract	Medium	Medium
			Manage fleet	High	Limited
			Manage in-service	High	Medium

Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
			IPS activities		
			Perform obsolescence management	High	Medium
			Provide provisioning data	High	High
			Perform computer resources analysis	High	Limited
			Provide computer resources	High	High
			Manage computer resources for IPS program	Limited	Limited
			Perform LSA	High	Limited
			Perform support engineering analysis	High	Limited
			Perform LCC (affordability) analysis	High	Medium
			Perform engineering technical analysis	High	Limited
			Evaluate operational suitability	Medium	Medium
			Manage disposal	High	High
			Develop TDP	Medium	Medium
			Produce technical publications	High	High
			Perform F&I analysis	Limited	Limited
			Perform manpower and personnel analysis	High	Limited
			Analyze support equipment requirements	High	Medium
			Provide support equipment	High	Medium
			Analyze training equipment requirements	Medium	Limited
			Develop training plan	Medium	Limited

Applicable to: All

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Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
			Perform TNA	Limited	Limited
			Perform training development	High	High
			Provide training equipment	High	High
Production phase	9	Support Solution Review (SSR)	Execute logistic related operations	Limited	Limited
			Develop maintenance plan	Medium	Limited
			Execute maintenance activities	Limited	Limited
			Perform DPHM analysis	Medium	Limited
			Analyze alternatives	Limited	Limited
			Develop IPS plan	Limited	Limited
			Document lessons learned	High	High
			Manage configuration	Medium	Limited
			Manage contract	Medium	Medium
			Manage fleet	High	Limited
			Manage in-service IPS activities	High	Medium
			Perform obsolescence management	Limited	Limited
			Provide provisioning data	High	High
			Perform material supply	Limited	Limited
			Provide computer resources	High	High
			Manage computer resources for IPS program	Limited	Limited
			Develop and provide engineering disposition and recommend design changes	Limited	Limited

Applicable to: All

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Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
			Evaluate operational suitability	High	High
			Produce technical publications	High	High
			Provide facilities and infrastructure	High	High
			Provide support equipment	High	High
			Deploy training	High	High
			Provide training equipment	High	High

3.4 IPS activities during the in-service phase

The in-service phase starts after the delivery and installation of the first Product. Up to this milestone, the focus was on design for support/design the support in line with the Product support requirements. From this point in the Product's life cycle, the support activities include:

- Establish and sustain service functions such as training for operators and maintainers, as well as technical support
- Establish and sustain Product maintenance and support functions
- Establish sustainment engineering support to assist periodic upgrades/modifications
- Establish and sustain supply support functions including initial warehousing, delivery, and demand management
- Sustain and upgrade the technical publications

This decision gate is often a contractual milestone. It is when everything is ready to support the first delivered Product and is called In-Service Date (ISD). The validated support system is in place with the necessary scale to support the Product. All activities for planning and conducting this milestone belong to the in-service phase.

The designated operational sites and activation dates are specified in the IPS plan, which includes:

- The identification of operational sites, locations, and activation dates
- The identification of Products delivered to each site
- The requirements and procedures to install the Product. This can include establishing maintenance shops, checkout of test equipment and initial supply support capabilities
- The duration and extent of Product support services provided after Product activation

During the in-service phase the requirements for Product support must be updated due to operational changes, technical upgrades, or failing support performance. Both influence the support system. For example, the ERP-software of the operator is replaced when it becomes obsolete, all interfaces need to be adjusted and opportunities can be realized to optimize the support performance.

The Product support performance must be regularly measured against metrics and corrective actions taken. Product improvement, modifications and upgrades must be planned.

The support concept is refined using the best mix of organic and contractor support for support processes, services and products, according to changing environment and customer needs.

Therefore, the Product support capability must be assessed on a regular basis. This assessment is called In-Service Review (ISR). It should be carried out to verify that the support system is working.

The assessment of the support performance and effectiveness requires an amount of feedback data. Typical management questions are:

- What is the true performance?
- Are the specified requirements met?
- Is the system cost-effective?
- Are all customer expectations met for the remainder of the Product's life cycle?

This feedback has two purposes:

- Provision of ongoing data for evaluation of the performance of Maintenance, reliability, spare availability and so on. The IPS manager need to know exactly how the support system is performing.
- Collection of historical data that are applicable for the development of new Products

Typical metrics concerning the evaluations are:

- Equipment arrival rates
- Active maintenance times
- Equipment turnaround times
- Operational availability
- Achieved reliability
- Obsolete items
- Inventory turnover

Table 5 Activity level of detail required during the in-service phase

Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
In-service phase	10	Product Delivery/In-Service Date (ISD)	Execute logistic related operations	High	High
			Execute maintenance activities	High	High
			Develop IPS plan	Limited	Limited
			Document lessons learned	High	High
			Manage configuration	High	High
			Manage contract	High	High
			Manage fleet	High	High
			Manage in-service IPS activities	High	High
			Perform	High	High

Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
			obsolescence management		
			Perform material supply	High	High
			Manage stocks/stores	High	High
			Manage warranty	High	High
			Provide computer resources	High	High
			Manage computer resources for IPS program	High	High
			Perform LSA	Limited	Limited
			Perform engineering technical analysis	Limited	Limited
			Develop and provide engineering disposition and recommend design changes	Limited	Limited
			Evaluate operational suitability	High	High
			Manage disposal	Limited	Limited
			Provide facilities and infrastructure	High	High
			Provide support equipment	High	High
			Deploy training	High	High
	11	In-Service Review (ISR)	Execute support related operations	High	High
			Execute maintenance activities	High	High
			Perform In-Service Maintenance Optimization (ISMO)	Medium	medium
			Develop IPS plan	Limited	Limited

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Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
			Document lessons learned	Limited	Limited
			Manage configuration	High	High
			Manage contract	High	High
			Manage fleet	High	High
			Manage in-service IPS activities	High	High
			Perform obsolescence management	High	High
			Perform material supply	High	High
			Manage stocks/stores	High	High
			Manage warranty	Medium	Medium
			Provide computer resources	Limited	Limited
			Manage computer resources for IPS program	Limited	Limited
			Perform LSA	Medium	medium
			Perform engineering technical analysis	High	High
			Develop and provide engineering disposition and recommend design changes	High	High
			Evaluate operational suitability	High	High
			Manage disposal	Limited	Limited
			Provide FI	Limited	Limited
			Provide support equipment	Limited	Limited
			Deploy training	Limited	Limited

Applicable to: All

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3.5 IPS activities during the disposal phase

The disposal phase starts after the in-service phase when a product is no longer operational and needs to be decommissioned. From this point in the Product's life cycle, about the term support, means the finalization of support and disposing of the Product and support infrastructure in a safe and environmentally responsible manner.

This includes, but is not limited to:

- Disassembly of the product into manageable components
- Repair of components that can be reused or resold
- Convert, upgrade, or modify components and support items that can be reused
- Dispose unusable components and materials iaw environmental regulations
- Decommission unused FI iaw applicable laws

Table 6 Activity level of detail required during the disposal phase

Life cycle phase	SML	Milestone/Decision gate	Activity	Level of detail for	
				DI	COTS
Disposal phase	12	Out of Service Date (OSD)	Manage disposal	High	High

Chapter 6

Support system effectiveness

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Table 1 References

Chap No./Document No.	Title
Chap 1	Introduction to the specification

1 Introduction

Desired performance characteristics of a Product are articulated as Product requirements. Metrics are derived from these Product requirements to drive outcomes that serve as the primary indicator of Product performance. Support system performance measures the degree to which a Product's support program has achieved or demonstrated the ability to achieve its

objectives under the expected conditions. Metrics which calculate the effectiveness of a support system must be designed so that required outcomes can be tracked, measured, assessed, and validated and support the ability to develop action plans to bring deficient performance outcomes to within acceptable margins. Typically, both threshold and objective metrics are defined and the difference between the two is used as trade-off space during the Product design.

1.1 Objective

This chapter provides guidance for the identification and application of metrics related to a Product's support system and includes a non-exhaustive list of metrics for selective adoption based upon the needs and specific objectives of the program.

1.2 Scope

The target audience for this SX000i support systems effectiveness is Project Managers (PM), IPS managers, and IPS element managers. It applies to all types of Products for the entire Product life cycle starting with the preparation phase and concluding with the final disposal phase (for exclusions, refer to [Chap 1](#)). Application of metrics can occur at any point during the Product life cycle.

2 Support system effectiveness

2.1 Metrics

Product design requirements are established based upon many factors including strategic plans, technical performance needs, operational environment, perceived threats, and funding profiles. These requirements and constraints can change as the Product matures, conditions shift, technology advances, strategic needs evolve, and other situations occur ultimately leading to changes in the way in which the Product performance is measured. Thus, a goal when designing the support system is to ensure systems, tools, and collection methods provide flexibility to implement different metrics throughout the Product lifecycle to achieve desired performance outcomes. Additionally, data and information availability as well as collection tools and methods to obtain that data and information drive the ability to develop and calculate metrics that accurately reflect the health of the support system itself. Therefore, during the early design phase of the Product, metrics which might be utilized throughout the Product life cycle must be identified and provisions made for developing and acquiring the right data and adopting robust collection tools in order to calculate those metrics. Support system metrics must be acknowledged by the Product manager and budgeted accordingly in order to develop, field, and sustain the support program which can achieve Product performance requirements.

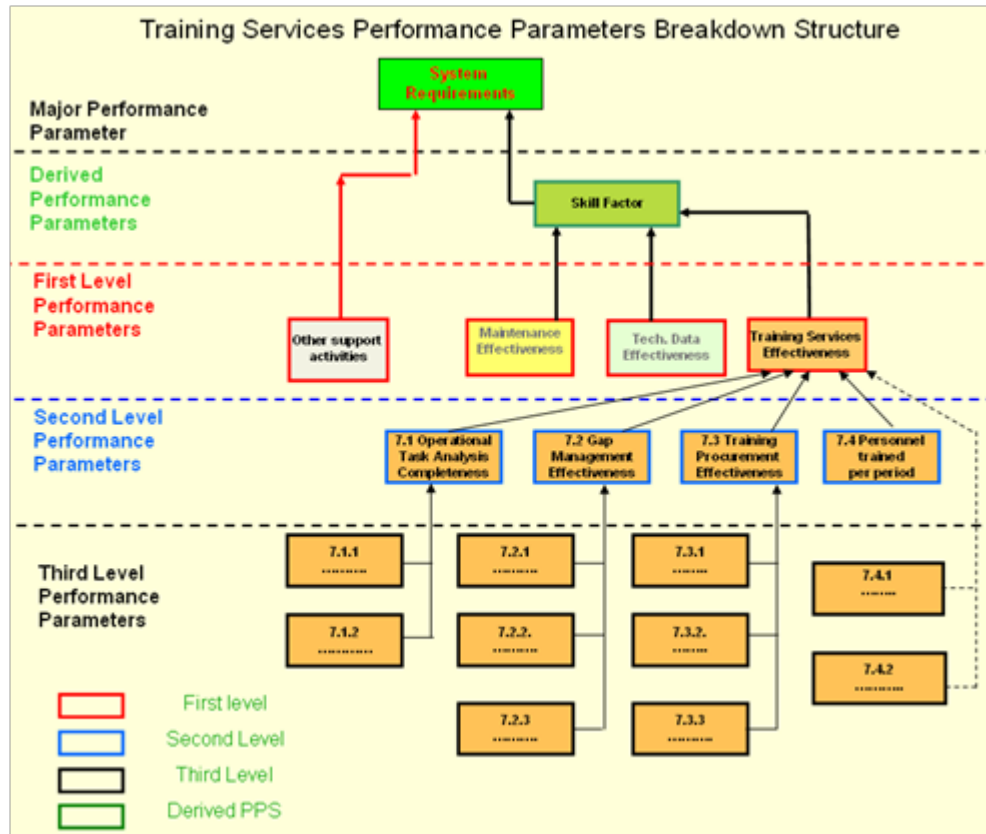
Product design requirements are classified into levels of priority. Primary, or key, objectives which must be met by the Product design are typically referred to as Key Performance Parameters (KPP). The KPP most often designated for a support program is availability. This metric consists of two components, which can be invoked together or individually as the KPP:

- Material Availability (A_M)
- Operational Availability (A_O)

Secondary, or supporting, objectives are designated as Key System Attributes (KSA). KSAs are desired performance outcomes which should be achieved but do not have as much importance in the Product and support system design as KPPs. Material Reliability (R_M) and Operation and Support Cost (O&S) are typically used as KSAs for the support program. While the majority of a program's metrics should be objective and data driven, there can be instances where subjective evaluation of the Product's performance is more appropriate.

Top-level metrics must be established that align Product domains strategies, including the support system strategy, and must communicate a shared understanding of expectations in order to achieve primary program requirements. The IPS manager should then allocate requirements to each tier of the support program and to each IPS element team to achieve the over-arching program requirements and performance outcomes. [Fig 1](#) provides an example of

how requirements are allocated to the appropriate support system tiers. IPS managers must ensure that the scope of responsibility for a metric falls within the responsibility, authority, and accountability of the team to which it is assigned. Lower tier metrics can provide invaluable information in determining root causes of poor performance, thus isolating weaknesses in the support program, and determining where additional resources or help is needed in order to achieve Product performance goals. During the initial phases of a program, estimated or predicted performance data can be used to calculate metrics but that data is replaced with actual performance data as the Product matures and performs in an operational environment.



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Fig 1 Requirements allocation to support system tiers

2.2 Support system metrics

A description of metrics that can be used to measure the performance of a support system is provided at [Table 2](#). The metrics are categorized into seven categories (refer to [Para 2.3](#)), and their association to the twelve IPS elements is given at [Table 3](#).

2.3 Support system categories

2.3.1 Affordability

The affordability category has 4 associated metrics. These are:

- Cost Effectiveness (CE)
- Life Cycle Cost (LCC)
- Operating and Support (O&S) Cost
- Ownership Cost (OC)

2.3.2 Availability/Readiness

The availability/readiness category has 18 associated metrics. These are:

- Achieved Availability (A_A)

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- Down Time (T_d)
- Inherent Availability (A_i)
- Maintenance Facility Availability (A_F)
- Material Availability (A_M)
- Mission Capable (MC)
- Not-Mission Capable Maintenance (NMCM)
- Not-Mission Capable (NMC)
- Not-Mission Capable Supply (NMCS)
- Operational Availability (A_o)
- Overall Equipment Effectiveness (OEE)
- Partial Mission Capable (PMC)
- Partial Mission Capable Maintenance (PMCM)
- Partial Mission Capable Supply (PMCS)
- Personnel Availability (A_P)
- Sortie Generation Rate (SGR)
- Spares Availability (A_s)
- Support Equipment Availability (A_{SE})

2.3.3 Maintainability:

The maintainability category has 24 associated metrics. These are:

- Administrative Delay Time (ADT)
- Ambiguity Group
- Cannot Duplicate (CND) Rate/False Alarm Rate /No Fault Found (NFF) Rate
- Fault Isolation (FI)
- Logistics Delay Time (LDT)
- Maintenance Down Time (MDT)
- Maintenance Ratio (MR)
- Maximum Time to Repair (MaxTTR)
- Mean Active Maintenance Down Time (MAMDT)
- Mean Corrective Maintenance Time (MCMT)
- Mean Down Time (MDT)
- Mean Preventative Maintenance Time (Mpt)
- Mean Time Between Maintenance (MTBM)
- Mean Time Between Maintenance Actions (MTBMA)
- Mean Time Between Maintenance - Scheduled (MTBMS)
- Mean Time Between Maintenance - Unscheduled (MTBMU)
- Mean Time Between Preventative Maintenance (MTBPM)
- Mean Time To Repair (MTTR)
- Planned Maintenance Percentage (PMP)
- Preventative Maintenance Effectiveness
- Preventive Maintenance Compliance
- Scheduled Maintenance Time (Depot, Phase, Periodic)
- Turn Around Time (TAT)
- Unscheduled Maintenance Time

2.3.4 Reliability

The reliability category has 8 associated metrics. These are:

- Inherent reliability (R_i)
- Materiel Reliability (R_M)
- Mean Time Between Abort (MTBA)
- Mean Time Between Failure (MTBF)
- Mean Time Between Mission Critical Failure (MTBMCF)
- Mean Time to Failure (MTTF)

- Mission Reliability (R_{Mission})
- Reliability

2.3.5 Supply:

The supply category has 8 associated metrics. These are:

- Customer Wait Time (CWT)
- Materiel Readiness
- Order Cycle Time (OCT)
- Fill Rate
- Backorder Rate
- Response Time Effectiveness
- Stock Level
- Supply Effectiveness

2.3.6 Supportability

The supportability category has 1 associated metric. It is:

- Mean Logistics Delay Time (MLDT)

2.3.7 Transportation:

The transportation category has 1 associated metric. It is:

- Transportation/Shipping Time

2.3.8 Training:

The training category has 1 associated metric. It is:

- Training Effectiveness

2.4 Product life cycle metrics

A Product's support system should be designed concurrently with the Product and in consideration of the Product's Operational Requirements. The Systems Engineering Plan (SEP) identifies requirements and technical performance measures for all program Product domains at the start of the program to ensure that requirements across the various IPTs are synchronized and are monitored in relation to design. The design trade study process should include supportability as an evaluation factor and a supportability impact assessment must be performed for every design decision. The Test and Evaluation Master Plan will include methods to track support system performance to evaluate initial support system metrics and ensure that support system products such as training and technical publications meet program requirements. Adjustments to the Product design to enhance supportability are often less costly to implement prior to Critical Design Review (CDR) than after the Product has been delivered.

2.5 Performance objectives

As the Product enters into service, actual performance data is tracked and used to determine appropriate adjustments that should be made to achieve required Product performance outcomes. Changes to various contributors of the metric under analysis including the support system, design, data collection, or processes, could be necessary.

Recurring review of metrics is required in order to identify if the Product is achieving support system performance objectives, understand the behaviors of the contributors to the metrics, and adjust the IPS strategy as the Product's data and capability mature. As the Product passes through the various life cycle phases, some metrics can become obsolete while others can become more relevant. Using metrics which do not provide value to the execution of the support program should be discontinued, and the focus should shift to key actionable metrics. The metrics used to measure the support system should be continuously evaluated to confirm that they are actually measuring the appropriate contributing performance characteristics to achieve



desired performance outcomes. A metric that repeatedly indicates a high level of performance while the overall system is not meeting the desired performance objective, signals that the metric is not necessarily contributing to the higher-level metric.

The right support system metrics, applied, tracked, analyzed, and refined properly, will have a significant impact on achieving the supportability and life cycle cost objectives of a Product.

Table 2 Product support management - Metrics calculations

Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
2	Achieved Availability (A _A)	Operations (Availability/Readiness)	Probability that an item will operate satisfactorily at a given point in time when used under stated conditions in an ideal support environment (ie, that personnel, tools, spares, etc, are instantaneously available), including active preventive and corrective maintenance downtime and excluding logistics time and waiting or administrative downtime.	$A_A = MTBM / (MTBM + MMT)$ where: MTBM = Mean Time Between Maintenance MMT = Mean Maintenance Time	A _A
2	Achieved Availability (A _A)	Operations (Availability/Readiness)	Probability that an item will operate satisfactorily at a given point in time when used under stated conditions in an ideal support environment (ie, that personnel, tools, spares, etc, are instantaneously available), including active preventive and corrective maintenance downtime and excluding logistics time and waiting or administrative downtime.	$A_A = OT / (OT + TPM + TCM)$ where: OT = Operating Time TPM = Total preventative Maintenance Time TCM = Total Corrective Maintenance Time	A _A
3	Administrative Delay Time (ADT)	Maintainability	Time associated with processes or tasks not directly involved in repair activities, (ie, processing requests, non-availability of tools, equipment, or facilities, and delays dues to establishment of higher priorities)	$ADT = SUM (time\ to\ perform\ administrative\ tasks\ associated\ with\ a\ repair)$	ADT
3	Ambiguity Group	Maintainability	A set of items at the same level of indenture having properties such that BIT can determine that at least one of the sets is faulty, but is unable to determine which particular one to be used as a metric, the maximum number of items within an Ambiguity Group or maximum number of Ambiguity Groups needs to be established.	$AG_n \leq AG_{max}$ where: n = number of Ambiguity Groups identified max = maximum number of Ambiguity Groups desired	AG
3	Backorder Rate	Supply	An order for a good or service that cannot be filled at the current time due to a lack of available supply. The item could be not held in the company's available inventory but could still be in production, or the company could need to still manufacture more of the product.	$BOR = (Number\ of\ undeliverable\ order / Total\ number\ if\ orders) * 100$	

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
3	Cannot Duplicate (CND) Rate/False Alarm Rate /No Fault Found (NFF) Rate	Maintainability	A reported failure which cannot be replicated in the repair shop and is therefore unable to be restored to service.	$CND\ Rate = NFF\ Rate = \frac{\text{Number of Items with undetectable issues during attempted repair}}{\text{Total number of Items submitted for repair.}}$	CND Rate / NFF Rate
3	Cost Effectiveness	Financial (Affordability/ Cost)	Economic analysis that compares the relative costs and outcomes (effects) of different courses of action.	To be added during next SX000i update	CE
3	Customer Wait Time (CWT)	Supply	Total elapsed time between the submission of a customer order and the receipt of that order.	$CWT = t_{receipt} - t_{ordered}$ where: t = time	CWT
3	Down Time (T_d)	Operations (Availability/ Readiness)	Total of all the different contributions that compromise operations	$T_d = T_m ((MTTR + MLDT + MAMDT)/MTBF)$ where: T_m = Mission Duration, MTTR = Mean Time To Repair, MLDT = Mean Logistics Delay Time, MAMDT = Mean Active Maintenance Down Time, MTBF = Mean Time Between Failure	T_d
3	Fill Rate	Supply	Percentage of time that an order was filled with on-hand inventory.	$FR = \frac{\text{Number of orders shipped in full}}{\text{Number of orders placed}} * 100$	
2	Inherent Availability (A_i)	Operations (Availability/ Readiness)	Probability that an item will operate satisfactorily at a given point in time when used under stated conditions in an ideal support environment, including corrective maintenance downtime and excluding logistics time, waiting or administrative downtime, and preventive maintenance downtime.	$A_i = \frac{MTBF}{(MTBF + MTTR)}$ where: MTBF = Mean Time Between Failure MTTR = Mean Time To Repair	A_i

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
2	Inherent Reliability (R_i)	Reliability	Measure of the overall "robustness" of a system or piece of equipment. Upper limit to the reliability and availability that can be achieved.	$R_i = MTTF / (MTTF + MTTR)$ where: MTTF = Mean Time To Failure MTTR = Mean Time To Repair	R_i
1	Life Cycle Cost (LCC)	Financial (Affordability/ Cost)	Direct and indirect costs of a program over its entire life cycle including research and development costs, investment costs, operating and support costs, and disposal costs.	$LCC = \text{initial (projected) capital costs} + \text{projected life-time operating costs} + \text{projected life-time maintenance costs} + \text{projected capital rehabilitation costs} + \text{projected disposal costs} - \text{projected residual value}$ $LCC = \text{flyaway cost} + \text{weapon System cost} + \text{procurement cost} + \text{program acquisition cost}$	LCC
1	Life Cycle Cost (LCC) (alternate calculation)	Financial (Affordability/ Cost)	Direct and indirect costs of a program over its entire life cycle including research and development costs, investment costs, operating and support costs, and disposal costs.	$LCC = \text{flyaway cost} + \text{weapon System cost} + \text{procurement cost} + \text{program acquisition cost}$	LCC
3	Logistics Delay Time (LDT)	Maintainability	All non-administrative maintenance delays involved in repair actions, including transportation, time to obtain spares, time to get trained personnel to repair, etc	$LDT = \text{SUM (time to perform non-administrative tasks associated with a repair)}$	LDT
3	Maintenance Down Time (MDT)	Maintainability	Amount of time that a system is not operational due to required maintenance work. The average down time for maintenance actions, including MTTR, LDT, and ADT	$MDT = \text{Total system non-operational time for maintenance} / \text{Total system operational time}$	MDT
2	Maintenance Facility Availability (A_F)	Operations (Availability/ Readiness)	Probability that a facility be will ready and have the resources needed to perform required tasks. Influences the additional wait time for a maintenance (preventive or corrective) action. Facilities have a maximum capacity.	$A_F = \text{Amount of time Facility is available with required resources} / \text{Total Time Facility is open for maintenance}$	A_F
3	Maintenance Ratio (MR)	Maintainability	Total maintenance manpower burden required to maintain an item, including corrective and scheduled maintenance.	$MxR = \text{Cumulative number of manhours of maintenance expended in direct labor during a given period of the life units} / \text{Cumulative number of end item life units during the same period}$	MR

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
1	Materiel Availability (A_M)	Operations (Availability/Readiness)	Percentage of the total inventory of a system operationally capable, based on materiel condition, of performing an assigned mission.	$A_M = \text{Number of Operational End Items} / \text{Total Population of End Items Acquired}$	A_M
2	Materiel Reliability (R_M)	Reliability	The probability that the system will perform without failure over a specific interval.	$R_M = \text{Actual operating hours} / \text{Number of failures during a specific interval} = \text{MTBF}$	R_M
2	Materiel Readiness	Supply	Ability of the supply chain to support weapon systems in undertaking and sustaining their assigned missions at planned peacetime and wartime utilization rates.	$MR = (\text{Possessed} - \text{Deadlined}) / \text{Authorized}$ where: Possessed = Total number of items on hand Deadlined = Total number of items on hand that are Non-Mission Capable Authorized = Total number of items required	MR
3	Maximum Time to Repair (MaxTTR)	Maintainability	Maximum time required to complete a specified percentage of all maintenance actions.	$M_{max\ ct} = t_{max} = x\%$ where: t_{max} = time limit x = % of maintenance action which must be completed within tmax	MaxTTR
3	Mean Active Maintenance Time (M_{ct})	Maintainability	Average elapsed time needed to perform maintenance (preventive and corrective), excluding logistics and administrative delays. Time includes only actual repair time associated with a repair person performing maintenance steps (ie, Localization, Isolation, Disassembly Interchange, Reassembly, Alignment and Checkout).	To be added during next SX000i update	M_{ct}
3	Mean Active Maintenance Down Time (MAMDT)	Maintainability	Average amount of time while the system is not 100% operational because of diagnostic testing that requires down time.	To be added during next SX000i update	MAMDT

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
3	Mean Corrective Maintenance Time (MCMT)	Maintainability	Time from when a repair starts until operations are restored, including repair time, testing period, and return to the normal operating condition.	$MCMT = MTTR$	MCMT
3	Mean Down Time (MDT)	Maintainability	Average Total Downtime required to restore an asset to full operational capability, including actual repair time, fault detection, fault isolation, removal and replacement of failed components, verification, and all delay times. Measures effectiveness of supply chain & support infrastructure (eg, customer wait time, logistics response time, retrograde time)	$MDT = \text{Total Down Time for All Failures} / \text{Total Number of Failures}$	MDT
3	Mean Down Time for Training (MDTT)	MDTT	Average downtime per maintenance action due to lack of training	$MDTT = \text{Total time unable to perform maintenance due to training deficiency} / \text{Total system maintenance time}$	MDTT
3	Mean Logistics Delay Time (MLDT)	Supportability	Cumulative time required by all logistics processes to support the requisite repair, including Depot Repair Turn Around Time, Administrative Delay Time, Supply Response Time, and Customer Wait Time. Referred to as Support System Effectiveness Measure.	$MLDT = MSRT + MADT + MDTT$ where: MSRT = Mean Supply Response Time MADT = Mean Administrative Delay Time MOADT = Mean Outside Assistance Delay Time	MLDT
3	Mean Maintenance Time	Maintainability	Measure of maintainability taking into account maintenance policy. The sum of preventive and corrective maintenance times, divided by the sum of scheduled and unscheduled maintenance events, during a stated period of time	$MMT = (t_{PM} + t_{CM}) / SUM (\text{scheduled} + \text{unscheduled maintenance events during a period of time})$ where: t = time PM = preventive maintenance CM = corrective maintenance	MMT

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
3	Mean Preventative Maintenance Time (M _{pt})	Maintainability	Average of the maintenance cycle times for individual preventative maintenance actions of a system, including periodic inspection, calibration, scheduled replacement, etc.	To be added during next SX000i update	M _{pt}
3	Mean Time Between Aborts (MTBA)	Reliability	Average time between events that result in the loss or degradation of an essential function(s) that renders the system unable to enter service or causes immediate removal from service, deadlines the platform, or makes it non-mission capable.	<i>MTBA = Total operating time of the system / Total number of System Abort failures that have occurred during the performance measurement/test period</i>	MTBA
3	Mean Time Between Failure (MTBF)	Reliability	Average time between system failures under specified conditions. This calculation assumes a normal failure distribution where in reality failure distributions tends to be Weibull or exponential. There are other more complex methods to calculate MTBF.	<i>MTBF= Total operational time / Total number of failures during operating period</i>	MTBF
3	Mean Time Between Maintenance (MTBM)	Maintainability	Average time between maintenance activities under specified conditions, including preventative and corrective actions.	<i>MTBM = (1/MTBF + 1/MTBM_{ND} + 1/MTBPM) – 1</i> where: MTBF = Mean Time Between Failure MTBM _{ND} = Mean Time Between Maintenance No Defect MTBPM = Mean Time Between Maintenance Preventative Maintenance	MTBM
3	Mean Time Between Maintenance Actions (MTBMA)	Maintainability	Mean of the distribution of the time intervals between actions or groups of actions required to restore an item to, or maintain it in, a specified condition, having both technical and operational characteristics. Technical parameters reflect the technical reliability and Operational parameters reflect operational reliability and maintainability characteristics.	<i>MTBMA = (1/MTBF + 1/MTBM_{Induced} + 1/MTBM_{ND} + 1/MTBPM) – 1</i> where: MTBF = Mean Time Between Failure MTBM _{Induced} = Mean Time Between Maintenance Induced MTBM _{ND} = Mean Time Between Maintenance No Defects MTBPM = Mean Time Between Maintenance Preventative Maintenance	MTBMA

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
3	Mean Time Between Maintenance - Scheduled (MTBMs)	Maintainability	Average time (ie, operating hours, flight hours) between scheduled maintenance activities (ie: oil change, inspections, overhauls, etc).	$MTBMs = Uptime / (Number\ of\ Scheduled\ Maintenance)$	MTBMs
3	Mean Time Between Maintenance - Unscheduled (MTBM _U)	Maintainability	Average time (ie, operating hours, flight hours) between unscheduled maintenance activities to restore a system to fully operational condition, including confirmation that no fault exists (a No Defect maintenance action).	$MTBM_U = Uptime / (Number\ of\ unscheduled\ Maintenance)$	MTBM _U
3	Mean Time Between Mission Critical Failure (MTBMCF)	Reliability	Average time between failures that are determined to be critical by the customer.	$MTBMCF = Total\ operational\ time / Total\ number\ of\ Mission\ Critical\ failures\ during\ operating\ period$	MTBMCF
3	Mean Time Between Preventative Maintenance (MTBPM)	Maintainability	Mean of the distribution of intervals, measured in hours, rounds, etc, between preventive maintenance actions and one of the four categories of maintenance events contributing to the Mean Time Between Maintenance Actions (MTBMA).	$MTBPM = (AOR * ConFac) / (N \sum_{i=1} TF_i)$ where: i = Preventive maintenance action TF _i = Task frequency of the "i" preventive maintenance action, N = Total number of preventive maintenance actions charged against the LCN/ALC item under analysis, AOR = Annual operating requirement ConFac = Conversion factor for the LCN/ALC item under analysis	MTBPM
3	Mean Time to Failure (MTTF)	Reliability	Length of time that a non-repairable item is expected to operate until it fails.	$MTTF = Total\ hours\ of\ operation\ of\ all\ units / Total\ number\ of\ units$	MTTF
3	Mean Time To Repair (MTTR)	Maintainability	Time from when a repair starts until operations are restored, including repair time, testing period, and return to the normal operating condition.	$MTTR = SUM\ of\ downtime\ periods / total\ number\ of\ repairs;$ $MTTR = Total\ Maintenance\ Time / Number\ of\ Repairs$	MTTR

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
3	Mean Time To Repair (MTTR) (alternate calculation)	Maintainability	Time from when a repair starts until operations are restored, including repair time, testing period, and return to the normal operating condition.	$MTTR = \text{Total Maintenance Time} / \text{Number of Repairs}$	MTTR
2	Mission Capable (MC)	Operations (Availability/ Readiness)	Material condition of an aircraft indicating it can perform at least one and potentially all of its designated missions. Mission-capable is further defined as the sum of full mission-capable and partial mission-capable.	$MC = \text{Hours system is capable of performing its mission} / \text{Unit possessed hours} = FMC + PMC$ where: FMC = Full Mission Capable PMC = Partial Mission Capable	MC
3	Mission Reliability (R_{mission})	Reliability	Ability of an item to perform its required function for the duration of a specified mission profile, defined as the probability that the system will not fail to complete the mission, considering all possible redundant modes of operation.	To be added during next SX000i update	(R_{mission})
3	Not-Mission Capable (NMC)	Operations (Availability/ Readiness)	Percentage of time that a materiel condition exists, indicating that systems and equipment are not capable of performing any of their assigned missions because of maintenance requirements (NMCM) or a maintenance work stoppage due to a supply shortage (NMCS).	$NMC = NMCM + NMCS$ where: NMCM = Not-Mission Capable Maintenance NMCS = Not-Mission Capable Supply	NMC
3	Not-Mission Capable Maintenance (NMCM)	Operations (Availability/ Readiness)	Material condition indicating that systems and equipment are not capable of performing any of their assigned missions because of maintenance requirement.	To be added during next SX000i update	NMCM
3	Not-Mission Capable Supply (NMCS)	Operations (Availability/ Readiness)	Material condition indicating that systems and equipment are not capable of performing any of their assigned missions because of maintenance work stoppage due to a supply shortage. Portrays how well the supply chain supports the materiel needs of weapon systems or groups of weapon systems.	To be added during next SX000i update	NMCS

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
1	Operating and Support (O&S) Cost	Financial (Affordability/ Cost)	Sustainment costs incurred from the initial system deployment through the end of system operations, including costs directly and indirectly attributable to the system such as Unit Operations, Maintenance, Manpower, Facilities, Sustaining Support, and Continuing System Improvement costs.	<i>O&S Cost = cost of: (Continuing System Improvements + Depot Maintenance + Energy (Fuel, Electricity, etc) + Equipment + General Training and Education + Hardware Modifications or Modernization + Indirect Support + Installation Support + Intermediate Maintenance + Maintaining + Maintenance + Manpower + Modifying Operating + Operating Equipment Replacement + Operating Materiel + Operations Manpower + Organizational Maintenance and Support + Personnel Support + Program Management + Software Maintenance and Modifications + Supplies + Supplying + Support Equipment Replacement + Support Services + Sustaining Engineering + Sustaining Support + System Specific Training + Temporary Duty Training Munitions and Expendable Stores + Unit Operations+ Unit-Level Maintenance Manpower)</i>	O&S
1	Operational Availability (A _o)	Operations (Availability/ Readiness)	(1) Percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission. (2) Probability that a system or component is performing its required function at a given point in time or over a stated period of time.	$A_o = Uptime^*/(Uptime^* + Downtime^*)$ Note * entire system	A _o
1	Operational Availability (A _o) (<i>alternate calculation</i>)	Operations (Availability/ Readiness)	(1) Percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission. (2) Probability that a system or component is performing its required function at a given point in time or over a stated period of time.	$A_o = (MTBF)/(MTBF + MDT)$ where: MTBF = Mean Time Between Failure MDT = Mean Downtime	A _o
1	Operational Availability (A _o) (<i>alternate calculation</i>)	Operations (Availability/ Readiness)	(1) Percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission. (2) Probability that a system or component is performing its required function at a given point in time or over a stated period of time.	$A_o = MTBM/(MTBM + MMT) + MTTS$ where: MTBF = Mean Time Between Failure MMT = Mean Maintenance Time MTTS = Mean Time To Support	A _o

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
1	Operational Availability (A_o) (alternate calculation)	Operations (Availability/Readiness)	(1) Percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission. (2) Probability that a system or component is performing its required function at a given point in time or over a stated period of time.	$A_o = MTBF / (MTBF + MTTR + MLDT)$ where: MTBF = Mean Time Between Failure MTTR = Mean Time To Repair MLDT = Mean Logistics Delay Time	A_o
1	Operational Availability (A_o) (alternate calculation)	Operations (Availability/Readiness)	(1) Percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission. (2) Probability that a system or component is performing its required function at a given point in time or over a stated period of time.	$A_o = A_oD + A_oFI + A_oL + A_oC$ where: A_oD = Diagnostic down time = (Total Time) / (Total Time + Diagnostic Down Time) A_oFI = Fault isolation down time = (Total Time) / (Total Time + Fault Isolation Down Time) A_oL = Logistics delay down time = (Total Time) / (Total Time + Logistics Down Time) A_oC = Corrective maintenance down time = (Total Time) / (Total Time + Corrective Down Time)	A_o
1	Operational Availability (A_o) (alternate calculation)	Operations (Availability/Readiness)	Percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission	$A_o = (OT + ST) / (OT + ST + TPM + TCM + ALDT)$ where: OT = Operating Time ST = Standby Time TPM = Total preventative Maintenance Time TCM = Total Corrective Maintenance Time ALDT = Administrative and Logistics Delay Time	A_o

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
3	Order Cycle Time (OCT)	Supply	Average time required to fulfill an order demonstrating the speed at which demand can be satisfied.	$OCT = \Sigma(Delivery\ Date - Order\ Date) / n$ where: Delivery Date = The date/time the order was delivered and accepted by the customer Order Date = The date/time the order was submitted by the customer n = Total number of orders or order lines delivered	OCT
3	Overall Equipment Effectiveness (OEE)	Operations (Availability/Readiness)	Measure of the productivity of a piece of equipment which identifies how effective an organization's maintenance processes are based on factors like equipment quality, performance, and availability. When OEE is 100%, the system is producing no defects, as fast as possible, and with no stops.	$OEE = Availability \times Performance \times Quality$ where: Availability = Operating time/Planned production time Performance = Ideal cycle time/(Operating time/Total pieces) Quality = Good pieces/Total pieces	OEE
1	Ownership Cost (OC)	Financial (Affordability/Cost)	Total cost of acquiring and owning or converting an item of material, piece of equipment, or service and post-ownership cost, including the disposal of hazardous and other manufacturing waste.	$OC = O\&S\ Costs + Disposal\ Costs$	OC
3	Partial Mission Capable (PMC)	Operations (Availability/Readiness)	Material condition of a system indicating that it can perform at least one but not all of its missions.	$PMC = PMCM + PMCS$ where: PMCM = Partial Mission Capable Maintenance PMCS = Partial Mission Capable Supply	PMC
3	Partial Mission Capable Maintenance (PMCM)	Operations (Availability/Readiness)	Material condition of an aircraft or training device indicating that it can perform at least one but not all of its missions because of maintenance requirements existing on the inoperable subsystem(s).	To be added during next SX000i update	PMCM

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
3	Partial Mission Capable Supply (PMCS)	Operations (Availability/Readiness)	Material condition of an aircraft or training device indicating it can perform at least one but not all of its missions because maintenance required to clear the discrepancy cannot continue due to a supply shortage.	To be added during next SX000i update	PMCS
2	Personnel Availability (A_P)	Operations (Availability/Readiness)	Probability that trained personnel are on-hand and ready to perform required tasks. Influences the additional wait time for a maintenance (preventive or corrective) action. Unavailability can be caused by the number of people required, the quality of the training received and the ability for repair.	$A_P = (\text{Amount of time trained personnel are available} / \text{Total amount of time needed to perform required tasks})$	A_P
3	Planned Maintenance Percentage (PMP)	Maintainability	Amount of maintenance work planned to be done on a particular asset versus amount of time to repair it because it unexpectedly broke down.	$PMP = (\# \text{ of planned maintenance time} / \# \text{ of total maintenance hours}) \times 100$ Note Planned maintenance hours = scheduled maintenance hours	PMP
3	Preventative Maintenance Effectiveness	Maintainability	Indicates the degree to which the scheduled maintenance tasks are at the correct frequency.	$Mx \text{ Effectiveness} = \text{Number of planned maintenance hours that adhere to schedule} / \text{Total maintenance labor hours}$	
3	Preventive Maintenance Compliance	Maintainability	Percentage of the preventive work scheduled and completed in a set time.	$PMC = (\text{Maintenance Scheduled} / \text{Maintenance Completed}) \times 100$	PMC
2	Reliability (R)	Reliability	Probability that the system will perform without failure over a specific interval, under specified conditions.	$R_{(t)} = e^{-\lambda t} = e^{-t/\theta}$ where: t = time λ = failure rate $\theta = 1$ λ = total time/number of failures	$R_{(t)}$

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
3	Response Time Effectiveness	Supply	Average time and percentage of time the weapon system materiel orders are filled within each echelon of the supply chain.	To be added during next SX000i update	
3	Scheduled Maintenance Time (Depot, Phase, Periodic)	Maintainability	Preventive maintenance performed at prescribed points in the item's life.	To be added during next SX000i update	
3	Sortie Generation Rate (SGR)	Operations (Availability/ Readiness)	Number of missions that a given unit can support in a given time.	$SGR = (T / (FT + TAT + MT))_{\tau} * 100$ where: T = period of time FT = Flight Time TAT = Turn Around Time MT = Maintenance Time	SGR
2	Spares Availability	Operations (Availability/ Readiness)	Probability that the number of on-hand spare units is not less than the number of failed units (ie, the probability of no stock-out). Influences the spares supply delay, which is the time required from the point of identifying the need for a part until that part is in the hands of the maintenance technicians. Unavailability can be caused by the lack of spares in stock.	$A_s = Uptime^* / (Uptime^* + Downtime^*)$ Note * of either single spare or all spares required	A _s
3	Stock Level	Supply	Quantity of supplies or materiel authorized or directed to be held in anticipation of future demands.	To be added during next SX000i update	
3	Supply Effectiveness	Supply	How well the demands of the various groups and organizations that are concerned with Supply activities, including customers, partners, suppliers and vendors, are being met.	$Supply\ Effectiveness = ave\ (time\ to\ source + design + make + deliver)$	

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Lvl	Metric	Category	Description	Calculation (suggested)	Acronym
2	Support Equipment Availability (A _{SE})	Operations (Availability/Readiness)	Duration of time that a particular piece of equipment is able to perform its intended task. Synonymous with "Uptime". Influences the additional wait time for a maintenance (preventive or corrective) action. Unavailability can be caused by waiting for access to the item, insufficient quantities of support equipment, calibration or failure of the support equipment.	$A_{SE} = \text{Uptime}^*/(\text{Uptime}^* + \text{Downtime}^*)$ Note * of either single item or entire suite of support equipment	A _{SE}
3	Training Effectiveness	Training	An evaluation of the quality of the training, the level to which training enhanced the employee's skill, knowledge, and behavior, and the time it took to train to the desired level of proficiency.	<i>Various multi-faceted models including Kirkpatrick's Four Level Approach, Kaufman's Five Level of Evaluation, CIRO (Context, Input, Reaction, Outcome) Approach, and the Five Level Return on Investment Framework</i>	
3	Transportation /Shipping Time	PHS&T	Time either to transport a product for maintenance or to ship an item from a storage location.	To be added during next SX000i update	
3	Turn Around Time (TAT)	Maintainability	The length of time between arriving at a point and being ready to depart from that point, including loading, unloading, re-fueling, and re-arming, where appropriate, of vehicles, aircraft, and ships	<i>TAT = Total time of all actions required to ready platform for departure after landing.</i>	TAT
3	Unscheduled Maintenance Time	Maintainability	Corrective maintenance required by item conditions.	To be added during next SX000i update	

Level (Lvl):

Level 1 = Performance attribute critical to a program's success as cost, schedule, and performance. Often designated as a Key Performance Indicator (KPP)

Level 2 = Performance attribute of a system considered important to achieving a balanced solution/approach to a system, but not critical enough to be designated as a Level 1 metric. Often designated as a Key System Attribute (KSA)

Level 3 = Performance attribute that demonstrates how effectively the Product is achieving performance requirements.

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Lvl	Metric	Category	Description	Calculation
1	Material Availability (A_M)	Operations (Availability /Readiness)	Percentage of the total inventory of a system operationally capable, based on materiel condition, of performing an assigned mission.	$A_M = \frac{\text{Number of Operational End Items}}{\text{Total Population}}$
1	Operational Availability (A_O)	Operations (Availability /Readiness)	Percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission	$A_O = \frac{\text{Uptime*}}{(\text{Uptime*} + \text{Downtime*})}$ Note * entire system
1	Operational Availability (A_O) (<i>alternate calculation</i>)	Operations (Availability /Readiness)	Percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission	$A_O = \frac{(OT+ST)}{(OT+ST+TPM+TCM+ALDT)}$ Note OT = Operating Time ST = Standby Time TPM = Total preventative Maintenance Time TCM = Total Corrective Maintenance Time ALDT = Administrative and Logistics Delay Time
2	Operating and Support (O&S) Cost	Financial (Affordability /Cost)	Sustainment costs incurred from the initial system deployment through the end of system operations, including costs directly and indirectly attributable to the system such as Unit Operations, Maintenance, Manpower, Facilities, Sustaining Support, and Continuing System Improvement costs.	$\text{O\&S Cost} = \text{Continuing System Improvements} + \text{Depot Maintenance} + \text{Energy (Fuel, Electricity, etc) Equipment} + \text{General Training and Education} + \text{Hardware Modifications or Modernization} + \text{Indirect Support} + \text{Installation Support} + \text{Intermediate Maintenance} + \text{Maintaining} + \text{Maintenance} + \text{Manpower} + \text{Modifying Operating} + \text{Operating Equipment Replacement} + \text{Operating Materiel} + \text{Operations Manpower} + \text{Organizational Maintenance and Support} + \text{Personnel Support} + \text{Program Management} + \text{Software Maintenance and Modifications} + \text{Supplies} + \text{Supplying} + \text{Support Equipment Replacement} + \text{Support Services} + \text{Sustaining Engineering} + \text{Sustaining Support} + \text{System Specific Training} + \text{Temporary Duty Training Munitions and Expendable Stores} + \text{Unit Operations} + \text{Unit Level Maintenance Manpower}$
2	Reliability	Reliability	Probability that the system will perform without failure over a specific interval, under specified conditions.	$\text{Failure Rate} = \frac{1}{(MTBF)}$

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Lvl	Metric	Category	Description	Calculation
3	Mission Reliability	Reliability	The measure of the ability of an item to perform its required function for the duration of a specified mission profile, defined as the probability that the system will not fail to complete the mission, considering all possible redundant modes of operation.	Under review
	Planned Maintenance Percentage	Maintainability	Amount of maintenance work planned to be done on a particular asset versus amount of time to repair it because it unexpectedly broke down.	$PPC = \left(\frac{\text{Scheduled maintenance time}}{\text{Total maintenance hours}} \right) 100$ Note <i>Scheduled maintenance time</i> is total maintenance hours
	Spares Availability	Operations (Availability /Readiness)	Probability that the number of on-hand spare units is not less than the number of failed units (ie, the probability of no stock-out). Influences the spares supply delay, which is the time required from the point of identifying the need for a part until that part is in the hands of the maintenance technicians. Unavailability can be caused by the lack of spares in stock.	$A_S = \frac{Uptime*}{(Uptime* + Downtime*)}$ Note * of either single spare or all spares required
	Support Equipment Availability	Operations (Availability /Readiness)	Duration of time that a particular piece of equipment is able to perform its intended task. Synonymous with "Uptime". Influences the additional wait time for a maintenance (preventive or corrective) action. Unavailability can be caused by waiting for access to the item, insufficient quantities of support equipment, calibration or failure of the support equipment.	$A_{SE} = \frac{Uptime*}{(Uptime* + Downtime*)}$ Note * of either single item or entire suite of support equipment
	Personnel Availability	Operations (Availability /Readiness)	Probability that trained personnel are on-hand and ready to perform required tasks. Influences the additional wait time for a maintenance (preventive or corrective) action. Unavailability can be caused by the number of people required, the quality of the training received and the ability for repair.	$A_P = \frac{\text{Amount of time trained personnel are available}}{\text{(Total amount of time needed to perform required tasks)}}$

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Lvl	Metric	Category	Description	Calculation
	Maintenance Facility Availability	Operations (Availability /Readiness)	Probability that a facility be will ready and have the resources needed to perform required tasks. Influences the additional wait time for a maintenance (preventive or corrective) action. Facilities have a maximum capacity.	$A_F = \frac{\text{Amount of time Facility is available with required resources}}{\text{(Total Time Facility is open for maintenance)}}$
	Transportation /Shipping Time	PHST	Time either to transport a Product for maintenance or to ship an item from a storage location.	<i>Transportation Time = t_{ship}</i> Note "t" is time
	Cost Effectiveness	Financial (Affordability /Cost)	Economic analysis that compares the relative costs and outcomes (effects) of different courses of action.	$\text{Cost Effectiveness} = \frac{\text{Total Cost}}{\text{Outcome}}$
	Preventative Maintenance Effectiveness	Financial (Affordability /Cost)	Indicates the degree to which the scheduled maintenance tasks are at the correct frequency.	$\text{Mx Effectiveness} = \frac{\text{Number of planned maintenance hours that adhere to schedule}}{\text{Total maintenance labor hours}}$
	Overall Equipment Effectiveness	Operations (Availability /Readiness)	Measure of the productivity of a piece of equipment which identifies how effective an organization's maintenance processes are based on factors like equipment quality, performance, and availability. When OEE is 100%, the system is producing no defects, as fast as possible, and with no stops.	$OEE = \text{Availability} \times \text{Performance} \times \text{Quality}$
	Materiel Readiness	Supply	Ability of the supply chain to support weapon systems in undertaking and sustaining their assigned missions at planned peacetime and wartime utilization rates.	$MR = \frac{(\text{Possessed} - \text{Deadlined})}{(\text{Authorized})}$ Note Possessed =Total number of items on hand Deadlined = Total number of items on hand that are Non-Mission Capable Authorized = Total number of items required

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Lvl	Metric	Category	Description	Calculation
	Supply effectiveness	Supply	How well the demands of the various groups and organizations that are concerned with Supply activities, including customers, partners, suppliers and vendors, are being met.	$\text{Supply Effectiveness} = \frac{(\text{time to source, design, make, and deliver})n}{n}$ Note n = Number of items being delivered
	Training Effectiveness	Training	An evaluation of the quality of the training, the level to which training enhanced the employee's skill, knowledge, and behavior, and the time it took to train to the desired level of proficiency.	Various multi-faceted models including Kirkpatrick's Four Level Approach, Kaufman's Five Level of Evaluation, CIRO (Context, Input, Reaction, Outcome) Approach, and the Five Level Return on Investment Framework
	Mission Capable Rate	Operations (Availability /Readiness)	Material condition of a system indicating it can perform at least one and potentially all of its designated missions.	$MC = \frac{MC \text{ hours}}{\text{Unit posessed hours}}$
	Partial Mission Capable Rate	Operations (Availability /Readiness)	Material condition of a system indicating that it can perform at least one but not all of its missions.	$PMC = \left(\frac{\text{Maintenance Scheduled}}{\text{Maintenance Completed}} \right) 100$
	Non-Mission Capable Rate	Operations (Availability /Readiness)	The percentage of time that a materiel condition exists, indicating that systems and equipment are not capable of performing any of their assigned missions because of maintenance requirements (NMCM) or a maintenance work stoppage due to a supply shortage (NMCS).	$NMC = NMCM + NMCS$
	Non-Mission Capable Maintenance	Operations (Availability /Readiness)	Material condition indicating that systems and equipment are not capable of performing any of their assigned missions because of maintenance requirement.	Under review
	Non-Mission Capable Supply	Operations (Availability /Readiness)	Portrays how well the supply chain supports the materiel needs of weapon systems or groups of weapon systems.	Under review
	Mean Time Between Failure	Reliability	Measures the amount of time that elapses between one breakdown to the next during normal operations	$MTBF = \frac{\text{Total operational time}}{\text{Total number of failures}}$

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Lvl	Metric	Category	Description	Calculation
	Mean Time Between Mission Critical Failure	Reliability	Measures the average time between failures that are determined to be critical by the customer.	Under review
	Mean Time Between Unscheduled Maintenance	Reliability	The time (ie, operating hours, flight hours) between unscheduled maintenance actions to restore a system to fully operational condition, including confirmation that no fault exists (a No Defect maintenance action)	$MTBM_u = \frac{Uptime}{Number\ of\ Unscheduled\ Maintenance}$
	Mean Time to Failure	Reliability	Length of time that a non-repairable item is expected to operate until it fails.	$MTTF = \frac{Total\ hours\ of\ operation}{Total\ number\ of\ units}$
	Customer Wait Time (CWT)	Supply	Total elapsed time between the submission of a customer order and the receipt of that order.	$CWT = t_{receipt} - t_{ordered}$ Note "t" is time
	Response Time Effectiveness	Supply	The average time and percentage of time the weapon system materiel orders are filled within each echelon of the supply chain.	Under review
	Life Cycle Cost	Financial (Affordability /Cost)	Direct and indirect costs of a program over its entire life cycle including research and development costs, investment costs, operating and support costs, and disposal costs.	$LCC = (initial\ (projected)\ capital\ costs + projected\ lifetime\ operating\ costs + projected\ lifetime\ maintenance\ costs + projected\ capital\ rehabilitation\ costs + projected\ disposal\ costs) - projected\ residual\ value$ $LCC = flyaway\ cost + weapon\ system\ costs + procurement\ costs + program\ acquisition\ costs$
	Ownership Cost	Financial (Affordability /Cost)	Total cost of acquiring and owning or converting an item of material, piece of equipment, or service and post-ownership cost, including the disposal of hazardous and other manufacturing waste.	$Ownership\ Costs = O\&S\ Costs + Disposasl\ Costs$

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Lvl	Metric	Category	Description	Calculation
	Inherent reliability	Reliability	Measure of the overall "robustness" of a system or piece of equipment. Upper limit to the reliability and availability that can be achieved.	$\text{Inherent Reliability} = \frac{MTTF}{(MTTF + MTTR)}$ Note MTTF = Mean Time To Failure MTTR = Mean Time To Repair
3	Mean Down Time	Maintainability	Average Total Downtime required to restore an asset to full operational capabilities; Measures effectiveness of supply chain & support infrastructure (eg, customer wait time, logistics response time, retrograde time)	$MDT = \frac{\text{Total Down Time for All Failures}}{\text{Total Number of Failures}}$
	Mean Time Between Maintenance	Maintainability	Measures the average time between all maintenance actions including preventative and repair actions.	Under review
	Mean Time To Repair	Maintainability	Measures the time from when a repair starts until operations are restored, including repair time, testing period, and return to the normal operating condition.	$MTTR = \frac{\text{Sum of Downtime Periods}}{\text{Total Number of Repairs}}$ $MTTR = \frac{\text{Total Maintenance Time}}{\text{Number of Repairs}}$
	Preventive Maintenance Compliance	Maintainability	Percentage of the preventive work scheduled and completed in a set time.	Under review

Table 3 Metrics applied to IPS elements

Metric	Product Support Management	Design Influence	Sustaining Engineering	Supply Support	Maintenance	PHST	Technical Data	Support Equipment	Training and Training Support	Manpower and Personnel	Facilities and Infrastructure	Computer Resources
Achieved Availability (A_A)	X	X					X	X	X	X		
Administrative Delay Time (ADT)	X		X	X	X	X	X	X	X	X		
Ambiguity Group	X		X		X			X				
Backorder Rate	X			X								
Cannot Duplicate (CND) Rate/False Alarm Rate /No Fault Found (NFF) Rate	X	X	X		X			X	X	X		
Cost Effectiveness	X	X										
Customer Wait Time (CWT)	X	X		X		X						
Down Time (T_d)	X				X			X	X	X		
Fill Rate	X			X								
Inherent Availability (A_i)	X	X					X	X	X	X		
Inherent Reliability (R_i)	X	X	X		X		X	X	X	X		
Life Cycle Cost (LCC)	X	X	X	X	X	X	X	X	X	X	X	X
Logistics Delay Time (LDT)	X		X	X	X	X	X	X	X	X	X	X
Maintenance Down Time (MDT)	X	X	X		X		X	X	X	X		
Maintenance Facility Availability (A_F)	X	X			X						X	

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Metric	Product Support Management	Design Influence	Sustaining Engineering	Supply Support	Maintenance	PHST	Technical Data	Support Equipment	Training and Training Support	Manpower and Personnel	Facilities and Infrastructure	Computer Resources
Maintenance Ratio (MR)	X	X	X		X		X	X	X	X		
Materiel Availability (A_M)	X	X			X							
Materiel Reliability (R_M)	X	X	X					X				
Materiel Readiness	X	X		X								
Maximum Time to Repair ($M_{max\ ct}$)	X	X	X		X		X	X	X	X		
Mean Active Maintenance Time (Mct)	X	X	X		X		X	X	X	X		
Mean Active Maintenance Down Time (MAMDT)	X	X	X		X		X	X	X	X		
Mean Corrective Maintenance Time (MCMT)	X	X	X		X		X	X	X	X		
Mean Down Time (MDT)	X	X	X		X		X	X	X	X		
Mean Down Time for Training (MDTT)	X								X			
Mean Logistics Delay Time (MLDT)	X				X		X	X	X	X		
Mean Maintenance Time	X	X	X		X		X	X	X	X		
Mean Preventative Maintenance Time (M_{pt})	X	X	X		X		X	X	X	X		
Mean Time Between Aborts (MTBA)	X	X	X									
Mean Time Between Failure (MTBF)	X	X	X					X				
Mean Time Between Maintenance (MTBM)	X	X	X		X		X					
Mean Time Between Maintenance Actions (MTBMA)	X	X	X		X		X					

Applicable to: All

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Chap 6

Metric	Product Support Management	Design Influence	Sustaining Engineering	Supply Support	Maintenance	PHST	Technical Data	Support Equipment	Training and Training Support	Manpower and Personnel	Facilities and Infrastructure	Computer Resources
Mean Time Between Maintenance - Scheduled (MTBMS)	X	X	X		X		X					
Mean Time Between Maintenance - Unscheduled (MTBM _U)	X	X	X		X		X					
Mean Time Between Mission Critical Failure (MTBMCF)	X	X	X									
Mean Time Between Preventative Maintenance (MTBPM)	X	X	X		X		X					
Mean Time to Failure (MTTF)	X	X	X									
Mean Time To Repair (MTTR)	X	X	X		X		X	X	X	X		
Mission Capable (MC)	X	X		X	X							
Mission Reliability (R _{mission})	X	X	X									
Not-Mission Capable (NMC)	X	X		X	X				X	X		
Not-Mission Capable Maintenance (NMCM)	X	X			X				X	X		
Not-Mission Capable Supply (NMCS)	X	X		X	X							
Operating and Support (O&S) Cost	X	X	X	X	X	X	X	X	X	X	X	X
Operational Availability (A _o)	X	X	X	X	X	X	X	X	X	X		
Order Cycle Time (OCT)	X			X								
Overall Equipment Effectiveness (OEE)	X	X	X	X	X			X				
Ownership Cost (OC)	X	X	X	X	X	X	X	X	X	X	X	X
Partial Mission Capable (PMC)	X	X		X	X			X	X	X		
Partial Mission Capable Maintenance (PMCM)	X	X			X			X	X	X		
Partial Mission Capable Supply (PMCS)	X	X		X	X							

Applicable to: All

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Chap 6

Metric	Product Support Management	Design Influence	Sustaining Engineering	Supply Support	Maintenance	PHST	Technical Data	Support Equipment	Training and Training Support	Manpower and Personnel	Facilities and Infrastructure	Computer Resources
Personnel Availability (A_P)	X	X			X				X	X		
Planned Maintenance Percentage (PMP)	X	X	X		X		X	X	X	X		
Preventative Maintenance Effectiveness	X	X						X				
Preventive Maintenance Compliance	X		X		X		X	X	X	X	X	
Reliability (R)	X	X	X									
Response Time Effectiveness	X	X		X								
Scheduled Maintenance Time (Depot, Phase, Periodic)	X	X	X		X		X	X	X	X		
Sortie Generation Rate (SGR)	X	X			X			X	X	X		
Spares Availability	X	X		X	X							
Stock Level	X			X								
Supply Effectiveness	X	X		X		X						
Support Equipment Availability (A_{SE})	X	X			X			X				X
Training Effectiveness	X						X					
Transportation/Shipping Time	X	X				X						
Turn Around Time (TAT)	X	X	X		X		X	X	X	X		
Unscheduled Maintenance Time	X	X	X	X	X		X	X	X	X		X

Applicable to: All

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End of data module

Chap 6

Chapter 7

Data management

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Chap No./Document No.	Title
Chap 4	IPS program guidance
S4000P	International specification for developing and continuously improving preventive maintenance
S5000F	International specification for in-service data feedback
SX005G	S-Series IPS specifications XML schema implementation guidance
DEF STAN 00-600	Integrated Logistic Support
GEIA 0007	Logistics Product Data
IEC 60300-3-12	Dependability Management. Part 3-12, Application guide. Integrated logistic support
MIL-HDBK-502	Acquisition logistics
MIL-STD-1388	Logistics support analysis

1 General

As a result of the increasing influence of Information Technology (IT) on management, development, production and in-service support in the past decades, the Integrated Product Support (IPS) of complex technical systems became a more computer driven aspect during the life-cycle of a product. Therefore, if someone wants to set up an IPS program, the spectrum of necessary considerations is no longer limited to procedural challenges (who does what, when, where, under what conditions and constraints). There are also data related actions, which must be carefully defined, executed and monitored to enable project success.

Importantly, this explains why the S-Series IPS specifications consist of both - process descriptions of IPS activities and the data models to enable their appropriate mapping on IT systems.

Consequently, the IPS manager is required to balance two complex dimensions: processes and data. While the previous chapters have described aspects of the process, this chapter will present an approach to manage the data dimension of IPS.

The objectives of data management as part of an IPS program are:

- automation, to avoid manual effort during data transfer to minimize data failures and to accelerate the application of the business processes (eg, maintenance)
- standardization, to minimize the efforts of costs, time and personnel by establishing common interface and common data exchange procedures between contractor (including partners and subcontractors) and customer
- data quality, to enable completeness, timeliness, traceability and consistency of exchanged data
- contractual matters, such as clear definitions (eg, contents, data types, transmission protocols) of the information (data elements, data structures), which must be delivered by the contractor and customer. Based on the definitions in the data exchange requirements document with its data element list one can accurately identify which IPS activities must be implemented within the IPS program to generate the contracted data.

Previously, most projects employed data managers, but their role was usually limited to the control of the exchanged deliverable documents with suppliers and customers. Data, in this historical context, was limited to physical (paper) documents.

With the arrival of advanced computing systems and data exchange, this approach is no longer sufficient. While there is still the need for the control of documents, it becomes increasingly important to control the data within the IT systems, as well as the exchange between them. Organizations can no longer afford to have data silos, but require integration between their different IT systems, not only to streamline their operations but also to acquire greater information insight through the application of technologies such as big data and data analytics.

Similarly, contractors, their suppliers and their customers are increasingly integrated as a result of exchanging data between their respective IT systems. This adds an additional layer of complexity to the internal and external integration problem where different organizations control the various systems and tools, which need to be integrated

The S-Series IPS specifications have established a set of integrated interoperable data models, with a common core, which enables a standard method of exchanging information. This is a necessary (but not sufficient) condition for effective data management. Guidelines regarding on how to address this problem are provided in this chapter

1.1 Distinction of data categories

The term data within this chapter is focused on information, which is transferred, applied and stored by IT (network devices, computers, databases and software). Furthermore, data in the context of IPS activities and business processes must be distinguished and defined within the categories of master data, transaction data and metadata.

1.1.1 Master data

Master data describe the characteristics (eg, length, weight, dangerous goods mark) of objects such as materials, infrastructures, technical structures or maintenance measures. They are used to define decision points during a workflow inside a business process. Master data rarely changes its value during the Product life cycle. One way to create master data is the application of the IPS activities.

1.1.2 Transaction data

The inputs and outputs of software supported business processes are transaction data (eg, orders, reports, accounting vouchers or warehousing receipts). Transaction data describe the state of an object (eg, the location or the operational readiness of an aircraft) at a specific moment in time. Transaction data can change every time a business process is applied to the Product. The exchange of transaction data between customer and contractor will be necessary when parts of the business processes of the customer must be executed by the contractor (eg, higher maintenance levels are performed by contractor and lower level maintenance is performed by the customer). The transaction data must be synchronized between the IT systems of the involved parties to enable a consistent view on the state of the product.

1.1.3 Metadata

Metadata are structured data, that describe and provide information about other data (eg, data values). Metadata contain the semantics (ie, the meaning and content of a code, which forms data), the syntax (allowed combinations, operations and structures)) and the data model (showing the relationship between data, ie, the data architecture).

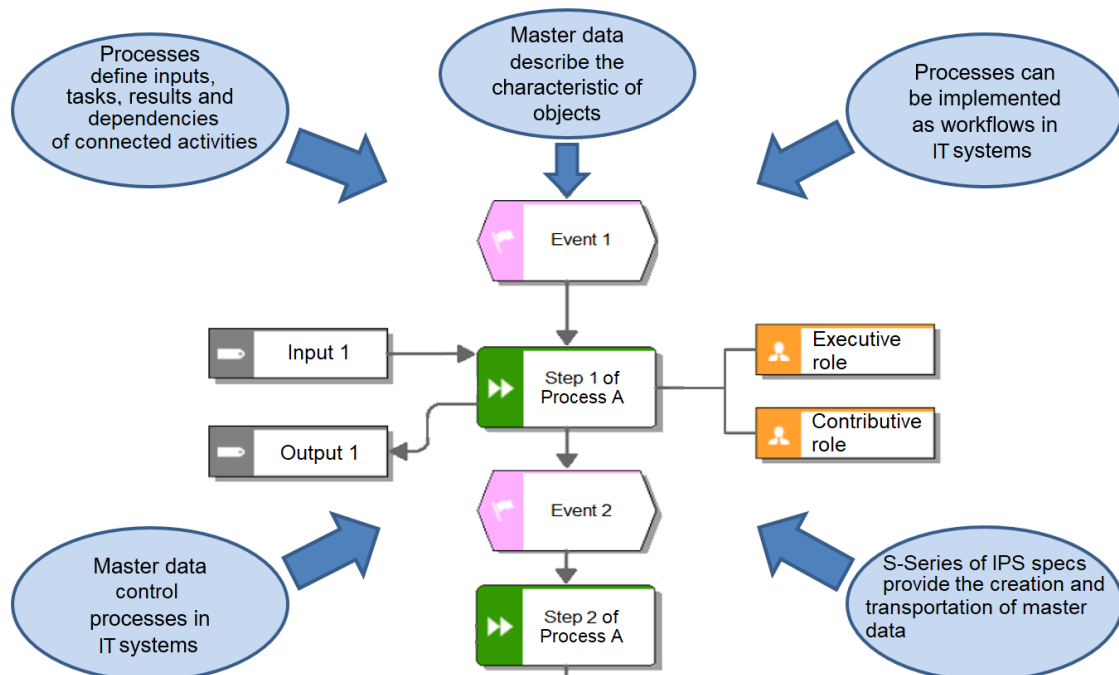
Metadata can either be embedded within the same structure as the data values itself or stored externally in a separate structure (eg, XML schema definition files).

1.2 Processes and the connection to data

Generally, processes define who must do what, when, under what conditions, what inputs are needed and what output will be generated within a chain of connected, interdependent activities. The roles and responsibilities to perform these activities are also important parts of the process model.

The (master) data generated by the contractor by performing the IPS activities/IPS processes are the foundation to control the business processes (eg, material management, maintenance, transportation), which are applied by the customer to use the product.

Business processes are organizational workflows, which are implemented with software (eg, ERP Systems).

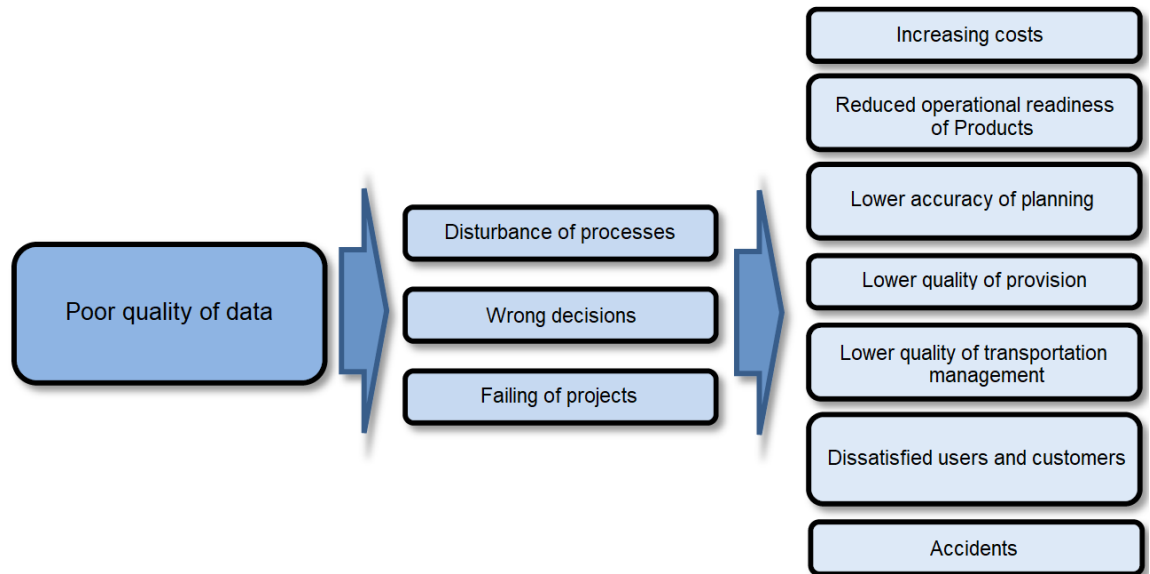


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Fig 1 Connection of processes and data

2 Data quality

Data quality covers all requirements, which an organization and its IT systems expect surrounding the characteristics of data. The quality of the data, which are transferred between the parties of a project, is the essential key to enable the project success. Data is the foundation of information and control the decision-making and workflow in a business environment, which is automated by IT. Potential impacts of poor data quality are shown in [Fig 2](#).



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Fig 2 Possible impacts of poor data quality

2.1 Common data quality requirements

The following are criteria for data quality:

- structural correctness (data package format, data type, value range, naming convention)
- timeliness of data availability (data must be integrated in the ERP before the in-service Phase of the Product, which is controlled by the ERP)
- completeness of data (data must have all the necessary information associated to it)
- traceability of the data (the required data elements must be derived from the business processes, which shall be applied to the Product)
- consistency of data (avoiding of contradictory values)
- redundancy-free data to ensure explicitness
- exactness of data values
- accessibility of the data
- editability of the data
- validity of new data versions (eg, caused by changes during the life cycle)

2.2 Measures to support data quality

To support data quality in a Project, it is highly recommended to apply the following tasks:

- establish and enable a Data Governance Office for the project
- use standards (eg, the data models of the S-Series IPS specifications)
- automate data transfer (ie, eliminate manual activities to minimize errors and to accelerate the data transfer speed for achieving timeliness)
- define, contract and monitor mandatory data quality requirements

- define and establish a common data interface to connect the ERP of the Product using party with the IT systems of the contractors/supporters

Before implementing any measures of data quality support, an organization must carefully evaluate the efforts/costs of the measures related to the benefit, which can be reached by applying them. In this context, a detailed cost/benefit analysis must take place, to group all contracted data elements in the categories, which show the consequences, if the data element is faulty.

These categories are:

- total process prevention (faulty data elements of this category are totally stopping a business process and causing the biggest harm/costs)
- partial process prevention
- process inhibition (unwanted delays during the execution of process steps)
- information deficit (eg, faulty data elements just causing a lack of information, but do no harm to the business process - just the ease of process analyzing activities is reduced)

Based on the grouping in the categories above and the estimated probability of occurrence, it is possible to decide, on which data elements to focus the data quality effort. Specific reports of the data quality can be agreed, so that the adequacy of the data quality monitoring is ensured. Specifically, it is important to ensure that the data quality report is used to continuously improve data quality at the data source and to correct potentially faulty source data. Refer to [Para 4.2.13](#).

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 all data, which is collected and prepared for exchange, is complete and accurate. The later quality controls are introduced in the processes, the higher the impact will be due to a lack of data quality.

The implementation of SX000i should be accompanied by business rules that provide the means to validate the received data.

For example, a business rule can be implemented 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 cleansing and cross-referencing of data should be performed in accordance with organization standard practices. It is recommended that a record be 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. S5000F provides a mapping of the use cases to the classes that these use cases require. It is recommended that this mapping is used so that all data being exchanged are always complete and within context, so that it will comply with a specific business scenario.

The responsibility for providing high quality data always lies on the party generating/providing such data and checks should be performed before the data is exchanged. It is recommended that both parties establish a data quality group (ie, Data Governance Office), 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.

2.3

Causes of low data quality

Poor data quality (or inadequacy of the data) is often due to five reasons:

- 1 The data is incomplete, (ie, 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
- 2 The data is noisy, (ie, 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 (eg, human or computer errors)
 - data transmission problems

Examples:

- age=-10
 - name="Jones", LastName="Mike"
 - manufacturing date="31/12/999"
- 3 The data is inconsistent, (ie, 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 S-Series 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"
- 4 The data is out of context, (ie, 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.
- 5 The data is outdated due to changes in the design of the Product IPS processes need to run again quickly and data shall be replaced by newest version:
 - configuration control mechanisms are not sufficiently implemented.

- change & version control works not properly.

3 Data management process

As described in the previous paragraphs, data are the key to an automated support and control of Products by IT systems (eg, ERP). Therefore, any IPS project, which needs to introduce complex technical systems with a long-term in-service phase, must integrate an appropriate data management process to be successful. All the following aspects should be considered in an IPS-specific data management process, which can (or not) be fully or partially integrated with other data management processes at organizational or project level.

3.1 Organizational aspects

The organizational dimension of data management can be covered by establishing expert data teams, comprising:

- data governance officers with focus on data quality regulations, and administration of the metadata management system
- data object analysts with focus on correction of inconsistent data, detection of systematic data errors and maintenance of the data objects description (type, value range, definition) with the transformation rules (mapping) in metadata management systems
- data security supervisors, to ensure compliance with security classifications, and the management of data access
- data owners, who are the source of the data provided and in charge of the provision and update of the data values

3.2 Process aspects

The collection and connection of requirements on data, to answer the questions about what information is needed to be able to execute the different IPS business processes of the customer, such as:

- material management (eg, warehousing, stocktaking measures, dispatching of material, disposal measures)
- manufacturing and maintenance (eg, control of product repair or configuration information)
- traffic & transportation (eg, product conditions and preparations for transport, planning of redeployment, processing of transports)

3.3 Software support aspects

A crucial aspect of an appropriate data management process is the choosing and using of adequate software tools to support the data related efforts of the Project parties, like:

- data management support software (eg, data quality monitoring tools),
- interfaces between contractor and customers ERP systems,
- global IT security, including enforcement of data security and export control,
- metadata management systems with data transformation rules and data structure descriptions

3.4 Minimal approach of a data management process

The data management process is usually organization or project-specific and closely integrated with the internal business process, hence, it is too complicated to define a detailed global process. Nevertheless, data management activities should address as a minimum the following eight aspects:

- 1 Define contents of master and transaction data, derived from the requirements of the operating business processes. These data must be considered in the guidance conference and in the contract.

- 2 Define methods, technologies and standards to transfer the data between contractor and customer and integrate this in the contract.
- 3 Define data quality rules and apply these rules to the data delivery of the contractor and to the customer's ERP by using a data quality monitoring tool.
- 4 Ensure that all data quality rules are applied by the business process users of the organization by training, handouts, supervision.
- 5 Establish an automatic data exchange between contractor and customer, based on contracted standards and specifications.
- 6 Ensure proper data integration between contractor, suppliers and partners before and after the data exchange with the customer takes place.
- 7 Analyze and correct inconsistent data and record the corrections measures.
- 8 Send feedback to the project team, if systematic data errors are discovered, which are caused by contractor's data delivery. Check whether the contract has been provided with wrong data requirements or the contractor made a mistake.

3.5 Metadata management

It is important when selecting/designing IPS data exchanges that an appropriate meta data schema is also developed to ensure that the information can be used effectively throughout the life cycle by different systems and for different purposes. These facts lead to the need to establish an effective metadata management within the data management of a project or on an organizational level. The entity with the responsibility for metadata management is the data governance office of the project/organization. To enable appropriate IT support, a metadata management system must be applied to administer and monitor all the business objects described by data models, syntax and semantics, which are involved in a project and the data element mapping with the transformation rules between them.

The following subparagraphs explain the

3.5.1 Meta-model considerations

There are several different aspects and methods of approach to metadata management. IPS standards typically contain several meta-models:

- activity
- process
- logical data
- physical data

If a complex family of standards is used concurrently, a meta-model will need to be defined to harmonize structure, semantics and constraints of the interacting models. The complexity of the models within individual standards can vary dramatically, with simple data catalogue appearing in IEC 60300-3-12 vs a comprehensive UML model in the S-Series IPS specifications suite. The integration/interoperation solution can use the process model of one standard to populate the data structures specified in a different standard (eg, MIL-HDBK-502 processes populating a SAE GEIA-0007 database, which has to be integrated in an S-Series IPS specifications centric overarching system).

Note that this additional meta-model that is required when using a set of non-interoperable standards also implies higher costs, higher IT-system complexity and is more likely to lead to incomplete or inconsistent data. The fact that this situation is sometimes unavoidable (eg, when integrating legacy data in a system of systems) implies that additional safeguards should be put in place to avoid such data issues.

3.5.2 Data integration/mapping architecture

An architecture will need to be developed to allow multiple data sources from multiple actors to be used (eg, integration of data from suppliers and partners and/or between contractor and customer). The interoperational approach can take several routes depending on the business processes to be supported.

3.5.2.1 Decentralized system Peer-to-peer data integration

Distributed data integration is realized with no unique, central global schema.

This approach favors immediate access to the data by all parties, at the expense of more complex assurance of data quality.

3.5.2.2 Centralized data integration

A global schema is mapped to the different data sources, which can be heterogeneous, distributed and autonomous.

This approach allows for the best assurance of data quality, at the expense of immediate availability of the data.

To achieve a single view of the IT based product support, a definition of the integrated logic data model is required to connect data from multiple systems and the business rules that will be applied. The S-Series IPS specification common data model (trfer to SX002D) facilitates centralized data integration and is likely to be the preferred approach.

The data architecture should facilitate:

- minimization of the number of standards in use
- minimization of the number of supporting systems in use
- identification of the minimum number of exchanges between systems
- provision of a mechanism for specifying business rules surrounding information exchanges
- provision of a mechanism for specifying business rules constraining the use of standards
- the development of a metadata model of the information to be shared
- the development of a data model for the interoperation of standards

3.5.2.3 Hybrid system integration

A mixture of the two previous systems takes place, typically with the contractor performing a central integration of the data of its suppliers and partners, developing a peer-to-peer architecture with the customer.

In this solution, a multi-step approach is required, where the centralized data integration is performed separately, and only the consolidated results are then shared in the peer-to-peer network.

The hybrid system integration is usually performed when contractual, legal or security constraints do not allow all data sources or participants to access the peer-to-peer network or one of the parties is responsible for the totality of the data of some of the peers (eg, integration of supplier data). There is usually a firewall between both integration systems, so that no unwanted crossover can take place.

Hybrid integration systems are typically more complex and expensive but have the benefit that it is easier to ensure data quality on the side of the main actors while still maintaining a reasonable immediacy on the availability of data.

3.5.3 Management of multiple or non-interoperable data standards

The use of multiple or incompatible data standards is something that should be avoided as much as possible because there is a high risk of data inconsistency and ensures problems with data exchange and data integration.

There are several causes that can lead to this problem:

- migration of a legacy program to new baseline specifications
- update of a legacy product using modern equipment
- use of COTS products based on a different data standard
- integration of heterogeneous information with different data standards for a system of systems

Basically, there are two approaches to handle these situations, either migration or cohabitation of the different data standards. Migration is the ideal case, but, in some cases, is not always be possible. A metadata management system must be implemented to be able to handle the different standards within a project.

3.5.4 Migration of standards

Migration is performed by adopting one single baseline data standard, based on one or several interoperable specifications. An example of migration could be the migration of data in S3000L Issue 1.0 to Issue 2.0, to become interoperable with SX000i, S5000F or S4000P Issue 2.0, or migrate MIL-STD-1388 information to S3000L. The approach for this migration can be either a linear or a concurrent adoption:

3.5.4.1 Linear adoption

The IPS program adopts one standard to deliver the necessary IPS products and migrates to a different standard at some point in the life cycle. This can occur for a variety of reasons, including technological and business changes (eg, the suite of S-Series IPS specifications matures and the additional functionality, which is delivered, supports a cost reduction business case; or from a business perspective as the prime contract changes to a supplier that uses a particular toolset).

3.5.4.2 Concurrent adoption

The IPS program has multiple delivering standards which can be used for one Product at the same time. This can occur because different suppliers produce different subsystems, or a new subsystem is being incorporated into an existing legacy program.

3.5.5 Concurrent application of multiple data standards

The concurrent application of multiple data standards is the least preferred option as it increases the complexity of the data exchanges, requires data conversions and is more prone to errors and data inconsistencies. At the very least, concurrent implementation of multiple data standards will lead to much higher costs.

However, there can be good reasons that make this concurrent implementation necessary, such as a prohibitive cost for migrating existing systems, existing contractual arrangements that do not allow for this migration (eg, because of shared data between different projects), legacy systems that cannot be changed, unavailable skills, multiple involved companies with heterogeneous systems or other similar causes.

Should such concurrent application be unavoidable, then the following solutions should be considered:

- middleware solution for data exchange.
- common data model and common repository

The latter solution provides the greatest capability, as ultimately it is a pseudo-migration of the data, even if the original data sources remain in a legacy format. As such, it can be exploited, compared and analyzed holistically and used as a single source of truth at program level.

Nonetheless, there can be limitations that make this integrated solution unfeasible, in which case a middleware solution could enable at least a partial integration.

Note

This is the least desirable solution, as we have to add a greater problem of data synchronization between different actors to the already complicated aspect of data conversion.

3.5.6 Types of data sets**3.5.6.1 Static data sets**

Static data in the context of an IPS data exchange is data that is by agreement set to fixed values for the duration of the project. IPS projects can have many partner organizations, over a long period, which use a range of processes and toolsets to provide the required outputs.

Certain analysis techniques and the tools used to support the execution of them are sensitive to the initial data values used. All partners in the execution of the analysis must use common values and maintain the use of them over time.

A master assumptions list of static values for the project often needs to be established to avoid undesirable behavior from complex interactions between the different partners.

3.5.6.2 Dynamic data sets

Dynamic data sets are those that vary over the time scale of the project.

3.5.6.3 Reference data sets

The S-Series IPS specification data models are generic in nature and the allowed number of data elements need to be tailored to meet the project's requirements. The data set used for this purpose is known as reference data. Reference data can be divided into two basic types:

- Generic reference, which is data derived from sources that are relevant to many projects and use cases, such as international standards for country and currency codes.
- Project specific reference data, which is relevant only to the project and includes such things as the constraints imposed by the implementing toolset.

Consideration must be given to the selection of reference data when non-S-Series IPS specification standards are used. The activities are closely related to the constraints of the implementing toolset and any legacy standards, which are used.

3.5.7 Data mapping

In general, data mapping is required in the case of using multiple non-interoperable data standards, yet there are exceptions. Though the S-Series IPS specifications are interoperable, and therefore harmonized to each other, it is not always possible to use the same data standards, mainly in case of systems of systems, where legacy products have been involved with different standards.

Data conversion is an expensive business and should be avoided as much as possible, especially for data that is continuously updated and converted from one format into another. In some cases, it could be cheaper to convert legacy data to the agreed standard rather than perform the continuous conversion, including the development and maintenance of the associated interfaces and conversion tools. Even so, the conversion will still require the mapping of the data.

3.5.7.1 Data mapping considerations

Generally, rules will need to be developed that constrain the exchange to the maximum allowable by all participating standards. Typically, this results in the most restrictive standard dominating the exchange rules.

The mapping between standards can take several forms depending on the number and types of standards used. The following options can be encountered:

- one to one

- one to many
- many to many
- many to one

Explicit knowledge of the data models of each standard will be required to specify the business rules.

Additionally, it is sometimes necessary to complement existing data with context information that does not exist in legacy systems but is required for the integrated data set. This context information could be static (eg, the project identifier) or calculated. In extreme cases, this context information could be required to be compiled manually. This process is often called data augmentation.

3.5.7.2 Data mapping rules considerations

The rules that will need to be developed will often be unique to a particular project's requirements. All IPS standards are designed to be tailored. It is very difficult to specify a generic set of data exchange requirements and associated mapping rules even between two standards.

Commonly used types of rules are:

- substitution rules
- splitting and consolidation rules
- business logic rules
- data augmentation rules
- constraint rules

3.5.7.3 Substitution rules

A value in one table standard /system to be represented as a different value in another standard but has the same semantic meaning. For example, both "c" and "cm" being used as measurement base of centimeters, but one can be implemented as a character data type and the other as string data type. Depending on the underlying systems in use a rule that truncates the string "cm" to a character "c" will be required when transferring data in one direction and, in the reverse direction, a different rule that substitutes "cm" for "c".

3.5.7.4 Splitting and consolidation rules

The atomicity of data in one standard/system often does not match that in another system/standard, even though it is the same basic information. Early IPS standards required the narrative of maintenance tasks to be split into blocks of limited size, connected with sequencing codes. Current IPS standards don't have such limitations, and in such cases, rules for splitting and combining along with the generation of the sequencing codes can be required.

3.5.7.5 Business logic rules

Some standard data models require that specific combinations of data fields are populated. Rules can be required that ensure the correct sequence of population before the declaration of a record in a receiving system.

3.5.7.6 Data augmentation rules

Where all the desired data is not available in the originating system default values, there is sometimes a need for fields in the receiving system to be specified.

3.5.7.7 Constraint rules

Constraint rules are rules that limit the range of values allowed in the fields to less than those natively allowed by the standards.

Example

Consider a widely used legacy IPS LSA standard, such as MIL-STD-1388-2B.

MIL-STD-1388-2B and its derivatives have a primary identifier the Logistic Control Number (LCN) which is Data Element Description (DED) 199, and specified in a physical data model field format as "18 X L -"

The field format is a specification for the length, type, positional justification and decimal placement of the data element field. Where, in this instance, "18" indicates the maximum field length of 18 characters, "X" specifies that characters of the data entry are upper case, alphabetical, numerical, special or any combination thereof, "L" indicates that the LCN is left justified and "-" indicates that there is no decimal placement on this field.

An additional data element code, named the Alternate Logistic Control Number (ALC), allows to identify variants of the LCN.

Contrast this with the ASD suite equivalent specification: S3000L has just a primary identifier "*breakdownElementIdentifier*" for the equivalent data structure, which has no limitations on size. In addition, S3000L can have multiple identifiers associated to a "*breakdownElement*", so that it is possible to identify the same item using part numbers, internal engineering codes, a NATO (or National) Stock Number (NSN) or any other identifier at the same time.

The legacy specification is a highly restrictive physical data model specification developed to facilitate implementation via early 1980s computing technology. The current state of the art specification is a logical representation of the equivalent functionality, without the constraints. It is therefore possible to transfer the LCN/ALC identifier from MIL-STD-1388-2B to S3000L, but it is impossible to feed back all potential S3000L identifiers to MIL-STD-1388-2B, as this latter cannot accommodate such information.

To allow interoperability between an S3000L based system and a legacy MIL-STD-1388-2B system if a bidirectional exchange is required, a business rule will need to be imposed that constrains the S3000L system "*breakdownElementIdentifier*" string to the 18 alphanumeric and special characters of the LCN and the three characters of the ALC.

Note

This would only apply to the common identifier between both specifications.

Thus, you could create a rule that one of the S3000L identifiers is equal to LCN+ALC and the corresponding *identifierClassifier* is set to "LCN", so that it indicates that the identifier corresponds to MIL-STD-1388-2B. The mapping would use only this single identifier, ignoring the rest of potential S3000L identifiers, and would use the MIL-STD-1388-2B restrictions.

Generally, rules will need to be developed that constrain the exchange to the maximum allowable by all participating standards. This typically results in the most restrictive standard dominating the exchange rules.

4 Data contracting and setup

During the Guidance Conference (GC), the main data exchange agreements/framework and a technical data exchange document defining the detailed exchange parameters should be established. Both the GC and the technical data exchange document must be detailed in the contract.

The data contracting must be part of a global IPS GC as required by SX000i, which ideally takes place after the GCs of the individual IPS elements that are affected by this data exchange, to ensure that their data management requirements are properly covered.

Common practice on large contracts will be to undertake a single, all-encompassing GC in order to use time more effectively and to avoid the need for repeated conferences. If necessary, once the basic principles have been agreed at the GC, it could be necessary to establish specific technical meetings or workshops for further refining of the details. Refer to [Para 4.3](#).

4.1

Transition from a request for proposal to the guidance conference

Most essential decisions influencing the IPS effort must be negotiated before the GC. Usually, the IPS process begins while creating an offer and will be similar to the final version contained in the corresponding contract. This applies to any IPS significant aspect within the contract (eg, related Statement of Work) as well as for 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 IPS activities considered as mandatory, recommended or voluntary, depending on early strategy judgment and/or the kind of systems and equipment to be assessed).

The GC serves as a vehicle to communicate the work that will be carried out in detail, along with the associated rules and time schedules, based on the contractual requirements and further agreements. The GC also clarifies any questions the customer has regarding the effort. Nevertheless, changes to the IPS work effort, to a certain extent, must be allowed during the GC without the need of contract changes and changes in the cost of the effort. Considering the iterative nature of IPS activities, customization (tuning) must be possible to enable flexibility.

4.1.1

Checklist of documents to prepare a data contracting GC

[Table 2](#) provides an overview of required information to prepare an IPS data contracting GC.

Table 2 Required input documents for data contracting GC

Type of document	Content	Responsible for creation
General usage aspects	Strategic aspects of the intended use of data deliveries	Customer
Contractual documents	Contractual decisions, which can influence the data delivery process, must be available at the data contracting GC and must be considered.	Customer and Contractor
Data exchange requirements document	Details of customer requirements regarding the transfer/exchange of data between the parties	Customer
Data Element List (DEL)-DRAFT	A list of mandatory data elements, which are required to run and control the business processes of customers ERP system during the in-service phase of the Product use. This list should be an appendix to the preliminary GCD	Customer
IPS Plan-DRAFT	Management plan for the IPS program	Customer and Contractor
Guidance Conference Document (GCD)-DRAFT	Implementation rules for the IPS program	Customer and Contractor

4.2

Guidance conference

It is recommended that a GC with all parties affected by SX000i data exchange in attendance, be held. During the GC, it is necessary to specify the requirements of the technical information infrastructure and the data transfer protocol required to support the exchange of information. The contractor must update the technical data exchange document and provide it as a deliverable in the proposal response. This document must be reviewed and updated at the GC and on a periodic basis, be a formal contractual deliverable, and agreed to, and signed by, both parties involved in the exchange of data.

Aspects that must be discussed at the GC and must be part of the technical data exchange document are:

- agreement on implementation timescales
- definition of the organizational aspects
- definition of the exchange mechanism
- confirmation of the data delivery responsibilities
- definition of data security and access
- definition of the data exchange frequency
- refinement of the agreed data exchange
- removal of unused valid values and define project specific values and data
- identification of the XML schema for project specific values
- definition of master data sources
- definition of specific Business Rules
- definition of data analysis guidelines
- the data quality and data feedback reporting
- Agreement on the integration/conversion rules (if applicable)
- any other aspect that can require agreement regarding the data exchange

4.2.1 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 date for the exchange system to be in place, it is necessary to test it before going live, and an agreement is required between both contract parties about when such testing will be performed, as both will have to commit resources for this purpose.

4.2.2 Define organizational aspects

It is necessary to identify on both sides the organizational elements that are involved in the exchange, including technical focal points for IT problems or data quality issues (eg, a problem management team), so that potential problems can be solved quickly.

4.2.3 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 SX000i data is exchanged by means of files (eg, if using FTP). This allows for automatic validation and processing of the files by the receiver.

SX000i does not require a specific naming convention. It is recommended to use the guidelines outlined in SX005G.

Example

- SX000i_2-0_ipsdataset_contract1_001-02.xml

Where:

- "SX000i_2-0_ipsdataset" indicates the specification and its version indicates the use case for which data is sent
- "contract1" indicates the contract for which the data is sent
- "001" indicates the message sequence
- "02" indicates that it has been re-sent twice (eg, due to transmission errors)

4.2.4 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 have not been covered. In this case, the guidance conference must ensure that all data exchanges have a responsible person assigned for such data delivery, including the responsibility for data quality. It is recommended that the data exchanges are reviewed and if necessary reassigned. The responsibility for defining master data should also be established at the guidance conference. Usually, master data (ie, data elements, value range, structure, dependencies and metadata) are given by the ERP system of the customer, who wants to run his business processes by using the data delivery of his contractor. The contractor creates the master data during the IPS activities. Normally, the data models of the S-Series IPS specifications are used to transfer the master data from contractor to customer. On the customer side, a data transformation must take place, by using the metadata management system. That means, the information of relevant data elements was taken from the S-Series IPS specs data stream, transformed by using the transformation rules and stored in the mapped data fields of customer's ERP.

4.2.5 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 with data from other customers or a physical or functional segregation is required, must be also defined.

Part of the data access agreements can include read/write permissions by individual organizations. If not already contractually established, these agreements can also cover the intellectual property of the created data, and the processed data (ie, analysis results).

Significantly, data feedback from the in-service activities (transaction data) of military customers to contractors can become a challenge because of information restrictions. The contractor needs the transaction data to maintain or optimize the product or to refine the IPS measures but the analysis of these data can also give information about missions (location, time), operational readiness of the fleet and other aspects of strategic indicators of the military strength, which is a crucial issue of military security and highly classified. The challenge is to give enough feedback to enable the contractor to fulfill his assignment without violating the military security restrictions on information.

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).

One way of reducing the sensitivity of the information is implementing anonymization rules. For example, the contractor does not need to know that a Product has been operating at a specific site; he basically needs to know that it has operated under desert conditions, as this will impact the maintenance of the Product.

4.2.6 Define the data exchange frequency

Usually, this frequency will 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.

4.2.7 Refine the agreed data exchange

The scope of the data to be exchanged is defined during the guidance conference. 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 scope of the data to be exchanged will have to be modified or reduced by mutual agreement.

4.2.8 Remove unused valid values and 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 which is used for the data transfer between the originator and the receiver. The standard SX000i allowed values, supplemented by the project-specific values, are commonly referred to as reference data. Typically, reference data (eg, country codes, units of measure or project codes) do not change over the lifetime of a project, though 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 SX000i database. If it is determined that a code is necessary across multiple projects, then a change request should be submitted to the responsible S-Series IPS specification steering committee (eg, via the SX000i website).

Similarly, there can be a need for a specific project data set that is not covered in the standard SX000i data elements set. SX000i provides the means to include project-specific data, but it is necessary to define such data, as well as its data types.

4.2.9 Identify the XML schema for project specific values.

Identify project or product-specific codes that must be exchanged in addition to the SX000i-predefined codes, derived from the XML schema.

4.2.10 Define master data and primary data sources

It is essential to define standard business objects, which need to be referred across the project and across all involved systems (eg, organizations, locations). This information, commonly called master data, must be managed by a single entity, in order to ensure data consistency. These master data tends to change over the lifetime of a project (eg, if the product was optimized), so the guidance conference needs to nominate a single entity which is responsible for the maintenance of the master data, and the process to update the master data to ensure that all the involved parties 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 (eg, if legacy systems are involved). 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 (eg, inconsistency of information).

4.2.11 Define specific business rules

SX000i provides a mechanism for data exchange. However, it does not 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 an NSN, have a specific part number range or adhere to a project-specific codification.

4.2.12 Define data analysis guidelines

If data analysis is required (eg, to monitor project specific key performance indicators), the rules for the analysis must be agreed, including potential analysis extensions, such as root cause analysis, for anomalies detected during the analysis.

4.2.13 Data quality reporting

A specific reporting of the data quality itself can be agreed, so that the adequacy of the data is ensured. Specifically, it is important to ensure that this data quality report is used to continuously improve data quality at the data source systems when systematic data quality problems are detected, and to correct potentially faulty source data.

Note

This data quality reporting can also be performed by using SX000i constructs. An example of data quality reporting is shown in [Fig 3](#). SX000i does not mandate any specific data feedback report.

Typically, the entity responsible for the data quality (eg, the Data Governance Office) is the producer of such data quality reports. However, it is recommended that a 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 achieved. Furthermore, 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, be established between all the involved parties.

4.2.14 Agree integration/conversion rules (if applicable)

When using heterogeneous specifications or complex contract arrangements, it can be necessary to define project-level rules about how the data integration will be performed, as well as any conversion rules that need to be implemented. Refer to [Para 3.5.2](#) and [Para 3.5.7](#).

Data quality report		
Project: XYZ manufacturing robot line	Product: Hi-tech Rob-32	Reported by: Robot-X Associates
Reporting date: 2016-09-01	Reporting period: 2016-08	Days: 31
Messages received 3765	Messages rejected: 23	Messages repeated: 11
Total data transfer: 1.7 Gbytes	Average message size: 459 Kbytes	Average messages/day: 121.5
Message rejection rate: 0.61%	Message repetition rate: 0.16%	Transfer availability: 99.97%
Total data objects: 647581	Average data objects/message: 172	Non-predefined info files: 134
Messages rejected (By Id): 334, 476, 544, 545, 612, 752, 753, 1033, 1489, 2131, 2541, 2917, 3002, 3047, 2541 Causes for message rejection: - Wrong sender/wrong recipient: 544, 545 - Invalid export control information: 753 - Invalid XML schema: 334, 2131, 2541, 3002 - Not SX000i 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	CRITICAL (security, export control): 753, 2131
Data quality errors: Average data object errors: 2.6% Dubious data object information: 0.7% Critical violations: 0.05% Business rule violations: 1026 Average business rule violations: 0.16% Master data violations: 1720 Average master data violations: 2.54% Reference data violations: 955 Average reference data violations: 0.15% Top 5 BR violations: BR32, BR17, BR52, BR78, BR5 Top 5 MASTERDATA violations: Contract, Organization, Mission Definition, Facility, Fleet Top 5 REFDATA violations: unit, limitationType, securityClass, zoneElementType, amountCurrency Refer to Annex for detailed data quality report.		

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Fig 3 Example top-level data quality report

4.3 Supplementary technical meetings

It can be necessary to have supplementary 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 minuted, all agreements must be documented, and such agreements must be included in the technical data exchange document.

Where contract amendments are being discussed most organizations will insist on the inclusion of a commercial specialist in the meeting.

4.4 Technical data exchange document

The technical data exchange document is a critical agreement that compiles all technical information required to set up a data exchange between two or more parties.

Note

The technical data exchange document should not 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/problem management
- reporting on exchange issues
- IT-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 (eg, including changes agreed at the guidance conference and any additional technical meetings)
- XML schema definitions for project-specific data elements
- business rules for data validation
- service-level agreement (SLA) (eg, data quality requirements, exchange times (if synchronized). Best practices and templates for SLA can be found within the IT-Infrastructure Library (ITIL) standards.

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, which are involved in the exchange and its modifications must be properly approved by authorized personnel.

5 Additional considerations

5.1 Systems of systems considerations

In a system of systems situation, there is a possibility that individual systems will have been developed using a range of different IPS standards and supporting information system technologies over a considerable period.

The total IPS footprint can be held across a range of systems in both customer and prime and sub-contractor systems, each built to a different standard.

This situation gives rise to challenges at both the process and data levels if the IPS aim of producing a single integrated view of the Product support considerations is to be achieved.

It is desirable that information shall have the capability of being seamlessly exchanged between all required IPS activities to allow processes to be performed more effectively, concurrently, or iteratively as appropriate.

5.2 Data migration considerations

IPS programmes are rarely a green field site and there is often a comparator system used as a baseline in modelling techniques employed in the early stages of new projects. Typically reference data from the comparator project will need to be migrated into the tools used for the current project.

Care must be taken to undertake any necessary analysis and design activities prior to moving the data as it will need to be integrated into the new system

Where the integration model allows a single system, the basic activities consist of:

- extract, (ie, read and extract all data sources within the integration space)
- transform, (ie, aggregate, rearrange and consolidate the extracted data using a defined set of business rules)
- load, (ie, transfer converted data into the destination system)

Care must be taken to ensure that any necessary transform activities are undertaken as the context of the comparator project can be different to the current system of interest.

5.3 Interoperation management

5.3.1 IPS workflow

In a multi-standard situation, the processes within the individual standards could have been developed with no knowledge of each other. An overall workflow, integrating the individual standards at a process level must be developed. This also applies for systems of systems, even if using the same standards, as the internal business processes used for each individual product can differ.

5.3.2 Change triggers

Rules must be developed that identify when activities in one standard trigger requirements for the application of another standard.

5.3.3 Version control

Rules must be developed to determine the primacy of information within the system and how to define the master version.

5.4 Semantic considerations

Most of the IPS standards use similar but not identical terminology. To achieve seamless process and data integration the meaning of terms used will need to be scrutinized to ensure that disparate parts of the IPS process, which can be conducted in different organizations, are coherent.

Analysis should be conducted to ensure subtle differences in the meaning of terms does not impact on the interoperability of standards.

For example, Costing data typically uses terms such as Whole Life Cost (WLC), Through Life Costs (TLC), Life Cycle Costs (LCC). These are used promiscuously throughout IPS documentation and must be put on sound ontological foundation to effect proper use of multiple standards. In some circumstances, TLC and LCC are synonymous, in others they are distinctly different, depending on the suite of standards used.

Chapter 8

Tailoring and contracting against SX000i

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Chap No./Document No.	Title
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Chap 2	IPS framework
Chap 3	Use of the S-Series specifications in an IPS program
Chap 5	IPS activities for each life cycle phase contract type
Chap 9	IPS program data model
S3000L	International procedure specification for Logistics Support Analysis (LSA)
SX005G	S-Series IPS specifications XML schema implementation guidance

1 Introduction

Guidance on tailoring the Integrated Product Support (IPS) activities and inputs required for a specific project and to contract for an Integrated Product Support IPS program is provided in order to satisfy specific business requirements. The processes and specifications interface and relate with other life cycle domains, IPS elements and IPS activities throughout the life cycle of a Product and provides a contractual framework that can be invoked between two or more parties are explained.

1.1 Objective

This objective is to identify the key steps in effectively implementing SX000i. A set of suitable IPS activities that enable a standards-based communication and information/data exchange among involved stakeholders to achieve the main IPS objectives is provided.

1.2 Scope

The scope applies to a variety of support efforts, from informal agreements to formal contracts throughout the entire Product life cycle, from the preparation phase to the final disposal phase. Refer to [Chap 1](#).

The focus is on S-Series IPS specifications including links to the life cycle domains.

2 Tailoring for the use of the S-Series IPS specifications

Tailoring is fundamental to the cost-effective application of IPS on a project. It is the process of identifying the range and depth of IPS activities that are carried out, and depends on the scope, size, complexity, life cycle phase and contractual arrangements of a project. Tailoring to meet project requirements must be carried out during the early stages of the project life cycle with the development of the IPS strategies. As the project matures, adjustments are made, including application of specifications that were not originally deemed necessary but can provide value as the Product becomes operational. Any changes to the use of specifications must be documented.

2.1 Factors affecting tailoring

Tailoring applies to all the IPS elements. All elements of the support program must be considered in order to achieve performance objectives that are cost effective throughout the project lifecycle. Effort must be concentrated on the areas where most benefit can be achieved.

The major factors to be considered are outlined in [Table 2](#).

Table 2 Main factors to be considered for tailoring

Factor	Description
IPS activities	The activities needed to optimize the IPS disciplines and related elements for the program.
Outputs	The information, deliverables and plans required to define and meet the support requirements.
Inputs	The information required to support the analysis.
Resources	The resources available to perform the IPS activities required by the project, in terms of cost, time, and manpower.

Considerations which must be addressed in the tailoring process include:

- Type of program (national or multinational program)
- Nature of project (civil or military project)

- Phase of the project (preparation phase, development phase, production phase, in service phase, and disposal phase)
- Type of project (new item, modified item, existing item, leased item)
- Cost limitations
- Schedule constraints
- Time, financial, and resources availability
- Amount of design freedom involved
- Impact on other IPS activities
- Impact on data exchange and IT systems
- Desired tasks that are non-standard
- Data availability and relevancy
- Work already completed on the project
- Past experience and historical data on comparable projects
- Estimated return on investment
- Contract agreement

2.2 Tailoring procedure

The purpose of performing tailoring of an IPS program is to:

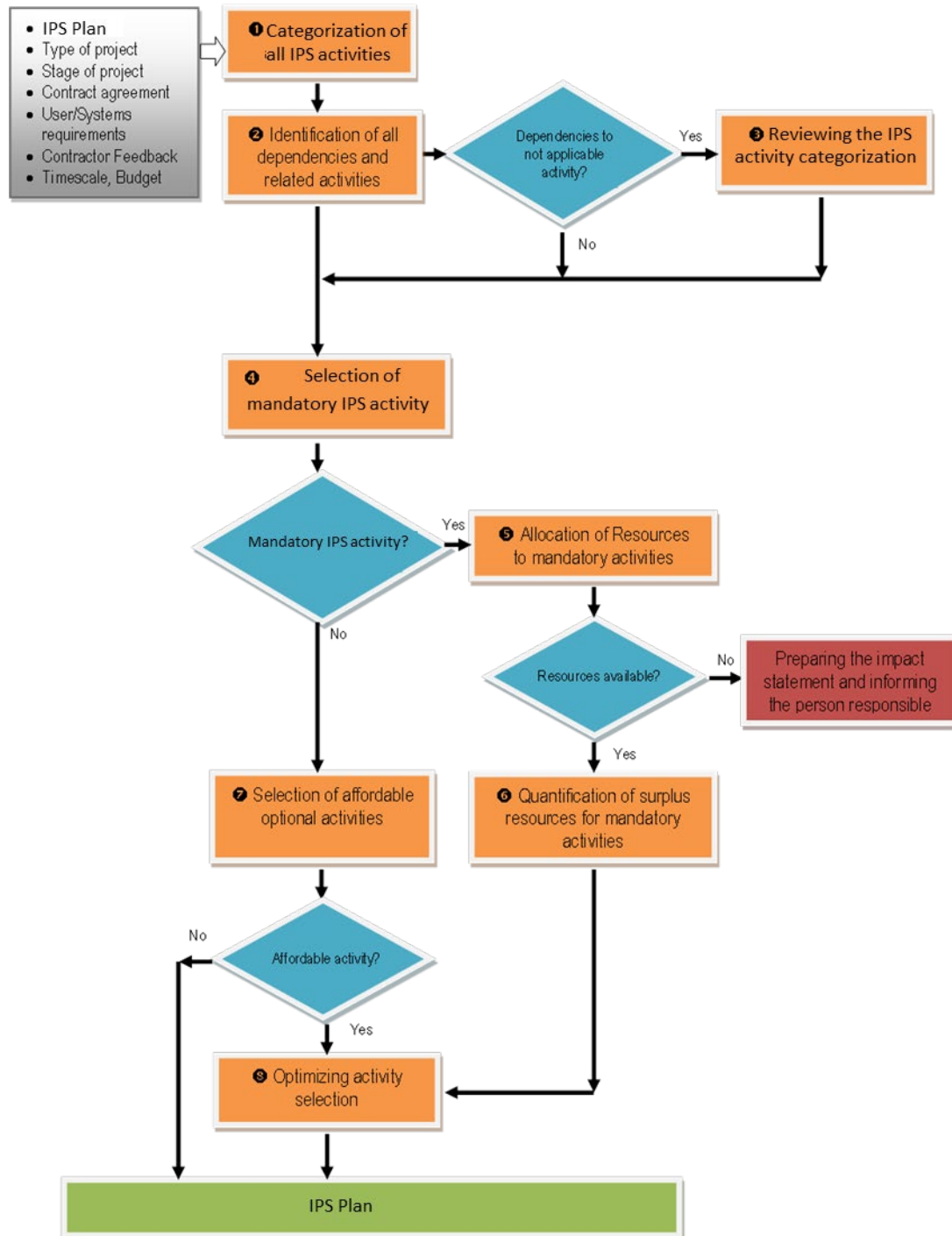
- Identify project mandatory and optional IPS activities and associated IPS specifications and processes
- Determine activity costs to execute mandatory activities
- Identify and cost additional IPS activities in terms of added value against cost
- Manage project acceptance of tailored IPS activities and overall IPS program
- Identify necessary information and data elements
- Establish project specific specification business rules

Tailoring is an iterative process comprised of eight primary steps. [Fig 1](#) describes the top-level activities that occur during the tailoring process. While a program will undergo several instances of tailoring during its life, the agency procuring the initial program provides the most significant amount of tailoring by translating the capability gap identified by the operational user into tangible requirements in the Program System Specification and Statement of Work which then defines the appropriate Program Integrated Support Program.

During Step 1 of the Tailoring Process, the procuring agency will determine the mandatory requirements for the support program (ie: the aircraft must have a turnaround time of 20 minutes from time of landing until ready for launch). Mandatory IPS requirements can encompass a wide range of features including physical characteristics, repair considerations (two level maintenance, Contractor Logistics Support), schedule or financial restrictions, and operational and user constraints. Any mandatory requirements not met by the proposal response will render it non-compliant. Optional requirements may also be identified which can provide additional desired capability but are not critical in fielding the program. An example of an optional requirement could be the desire for no new support equipment to be developed when fielding the program. Lastly, those IPS activities and elements which are not identified in the System Specification or Statement of Work are considered “not applicable”. The IPS plan documents the support program defined by the meeting all the mandatory requirements and viable optional requirements.

Step 2 of the tailoring process identifies the IPS activities and subsequent inputs, outputs, and dependencies required to achieve the support program identified in the IPS Plan by selecting the main activities for each required IPS element detailed [Chap 2](#) Paras 5 - 7. Additional tailoring is accomplished when the procuring agency determines contractual deliverables by selecting specific outputs generated by completing the IPS activities defined in [Chap 2](#).

Step 3 through Step 7 of the tailoring process further refine the support program resulting in an optimized support program and project specific IPS Plan during Step 8.



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Fig 1 Main IPS tailoring procedure

The individual steps of the tailoring procedure are:

- 1 Categorization of IPS activities. In accordance with the project constraints and IPS requirements, all activities on the IPS plan will be categorized as:
 - Mandatory
 - Optional

- Not Applicable

Note

The IPS plan details all IPS activities and therefore includes the preparation of concepts, plans and reports, the acquisition of all data, all analyses and the modification of data bases related to the IPS program.

- ② Identification of all dependencies and related activities. The IPS activities identified as mandatory and optional activities from the IPS plan will be examined and their dependent and related activities will be shown, where relevant against WBS activities.
- ③ Reviewing the IPS activity categorization. Where dependencies to activities identified as Not Applicable are shown, the activity categorization must be reviewed. The tailoring task can then recognize the implications of not performing an activity.
- ④ Selection of mandatory IPS activity. Selection of all the activities, detailed in the IPS plan, which are mandatory IPS activities for the project, under the project IPS constraints.

Note

All stakeholders must be identified, and a subjective assessment made of the impact of other project activities (eg, design and production) on the IPS scope of activities.

- ⑤ Allocation of resources to mandatory activities. The estimated resources required to perform the IPS activity will be identified and compared with available resources. The balance of available resources will be quantified and used as a constraint for the optional activities. All IPS plan activities categorized as not applicable must be archived along with reasons and mitigating comments and justifications.
- ⑥ Quantification of surplus resources for mandatory activities. The balance of available resources will be quantified and used as a constraint for the optional activities.
- ⑦ Selection of affordable optional activities. The estimated resources required to perform the further consideration activities will be identified. The cost of carrying out each optional activity must be compared to the available surplus resources.

Note 1

The possible benefits of undertaking each activity, in comparison with the required and available resources and the allocated priority levels will be evaluated

Note 2

The stakeholders will consider the final selection of affordable activities previously categorized as optional.

- ⑧ Optimizing IPS activity selection. The IPS plan will have been updated at all stages of the tailoring procedure, consolidating all IPS activity information. The output will be a project specific IPS plan.

3 Contracting against SX000i

While every contract is different due to differing contractual environments, applicable laws, and varying project requirements, the contracting process for SX000i is predicated on determining the key IPS activities (use cases) to be performed in order to specify contract deliverables and defining the Data Model framework for the project by developing a technical data exchange document.

3.1 Contracting procedure

The contracting procedure is defined as:

- Identify guidance documents
- Identify the support program requirements
- Tailor the requirements
- Determine the support program activities
- Develop the technical data exchange document

3.1.1 Identify guidance documents

Prior to start a program, it is necessary to define the basic rules and principles under which this program must be run. For this purpose, it is necessary to select a set of basic guidance documents that will establish such rules and principles.

Examples for such guidance documents are national procurement guidelines, the compliance with specific environmental control laws and quality assurance standards, and formatting and data exchange requirements.

When identifying the guidance documents, the project must:

- Identify project and acquisition specific laws, policy, procedures, instructions, and standards that will be invoked
- Consider the requirements for national, international, military service specific, procuring agency, and company regulations and guidance

The result of this exercise is a list of applicable program documents that must be invoked on a contract.

3.1.2 Identify the support program requirements:

The program requirements needed to define the Support program, are:

- Program management interface: Integrated Master Plan (IMP), Integrated Master Schedule (IMS), Work Breakdown Structure (WBS), Organizational Breakdown Structure (OBS), responsibility assignment matrix, support program milestones
- Key Performance Parameters (KPPs), Key System Attributes (KSAs), metrics related to the support program which are defined in the program system specification
- Verification methods for KPPs, KSAs, and metrics
- Operational concept
- Supportability and sustainment approach
- Maintenance concept
- Trade studies
- IPS elements required and specific requirements from each IPS element needed to achieve the support plan.
- Deliverables for each identified IPS element such as IPS plan, Product support analysis plan, training plan, facilities plan, IT plan, etc, as well as their delivery dates and potential validation against customer requirements. Refer to [Chap 3](#) and [Chap 5](#).
- Meeting plan, including guidance conferences.

3.1.3 Tailor the requirements

The tailoring of the requirements in [Para 3.1.2](#) to specific Program scope and phase must be in accordance with the procedure defined in [Para 2.2](#).

3.1.4 Determine the required support program data

The data required to carry out a support program are identified as follows:

- Determine the necessary support program activities for each program phase. Refer to [Chap 5](#).
- Identify one or several use cases for each required activity. These use cases consist of the information that is required to perform an activity or part of an activity and could potentially have different delivery rates. Thus, the use case consists of all data/information sets, Units of Functionality (UoF), classes and data elements that are necessary for this purpose. For each individual use case, it is also identifying the required data deliveries. The delivery intervals can be in real time, on a daily, monthly or quarterly basis, or as required (when the information changes).
- Document each use case in the appropriate program document (IMP, IMS, WBS, etc)
 - The definition of a use case is performed as follows:

- Identify the UoF(s) that provides the necessary information to perform the activity
 - Within each UoF identify the classes that provide the necessary data including the intermediate classes that provide the required relationships between the data
 - Create a table which identifies the class name and the activity(ies) for which it is required. Alternately, utilize the technical data exchange document, defined in [Para 3.1.5](#), to document this step.
 - For each class, identify which of the optional attributes/data elements are (not) required
- Identify legacy data, required to migrate to new specification formats
 - Ensure the inputs (data/information/items) to the Product support activities are developed or obtained as part of this contract
 - Create a means of providing the output from those activities for which the procuring agency requires a deliverable or artifact, such as using a Contract Deliverable Requirements List (CDRL) or deliverable report. The format, frequency, delivery method, number of copies, and delivery address should be specified.

An example of a use case for the IPS activity “Manage contract” is “Provide Statement of Work”, and this would in principle include the WBS document and all data required in UoFs “SX000i UoF Work Breakdown” and “SX000i UoF Work Breakdown Context”, to be updated with every contract change or as required. Refer to [Chap 9](#).

3.1.5 Develop the technical data exchange document

Specify the requirements of the technical information infrastructure and protocol required to support the exchange of information. The contractor must update this document and provide it as a deliverable in the proposal response. This document must be reviewed and updated at the guidance conference and on a periodic basis, be a formal contractual deliverable, and agreed to, and signed by, both parties involved in the exchange of data. This document must:

- **Define the exchange mechanism:** Identify whether the exchange will be “push” or “pull”, synchronous or asynchronous, via File Transfer Protocol (FTP), http, web services or other, and if each exchange will be the entire data set or only a modified or updated data set. In this latter case, it is also necessary to define how updates/deletions will be performed. Refer to SX005G.
- **Confirm the data delivery responsibilities:** Identify the organization with responsibility for ensuring top level and master level data exchanges. Identify lower level data exchanges or state that the lower level exchanges will be determined at the guidance conference. It is recommended that lower level data exchanges are defined at the use case level.
- **Define data security and access:** The security classification of the data, the security requirements of the network, and the encryption mechanisms or requirements, must be stated. The contract must identify restrictions on the access to the data, whether the data can be combined with data of other customers, and if physical or functional segregation of the data is required.
- **Define data exchange frequency:** The frequency of data exchanged must be established for each activity. Any restrictions on data exchanges, such as time period during which data exchanges can occur due to infrastructure or security constraints, must be identified.
- **Remove unused valid values and define project specific values and data:** Not all valid values defined as part of the SX000i classifications might be applicable in the context of a specific project (eg, a status of “immersed” for an aircraft). These valid values must be removed from the valid values XML files and the agreement of their removal documented, to ensure that there are no misunderstandings on this topic. Similarly, project specific values and data, such as special data classification or security requirements, must be identified and included in the project specific values XML files. Standard allowed values, supplemented by project specific values, are commonly referred to as reference data. Reference data includes information such as country codes, unit of measure, and project codes. Project specific values and data that are not in the standard data element set must include a definition of the data element and its data type.

- **Identify the XML schema for project specific values:** Identify project or product-specific codes that must be exchanged in addition to the SX000i-predefined codes.
- **Define master data sources:** It is necessary to define standard business objects that need to be referred to across the project and across all involved systems (eg, organization, locations, etc). The information, commonly referred to as master data, needs to be managed by a single entity to ensure data consistency. The technical data exchange document will identify the owning entity that is responsible for the maintenance of the master data and the process to update the master data whenever changes are approved throughout the life cycle of the project. The technical data exchange document will identify the primary source of data in cases where data can come from various sources or systems.
- **Define specific business rules:** Business rules for execution of the project must be determined. The technical data exchange document will identify an initial set of rules which will be refined during the contracting process, including contract negotiations, and finalized during guidance conferences and other meetings after contract award.
- **Define data analysis guidelines:** The technical data exchange document will identify guidelines on how to conduct and assess any data analysis which is required
- **Determine data quality and data feedback reporting:** The level of data quality and feedback reports to ensure data quality is at the right level should be specified. The feedback reports should serve as a mechanism to continuously improve data quality, detect data quality issues, and rectify incorrect source data.
- **Identify other unique aspects:** Ensure that any requirement/need associated to the data exchange is properly documented.

It can be necessary to develop a similar technical data exchange document for each individual S-Series specification (eg, S3000L), in order to cater for their peculiarities (eg, valid values not covered by SX000i, specification business rules, different data exchange frequency, etc.). Should this occur, then the common information must be included in the SX000i document, with one annex for each individual specification, documenting the peculiarities for that particular specification. This will ensure consistency across all data exchanges and avoid data duplication.

Chapter 9

IPS program data model

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References

Table 1 References

Chap No./Document No.	Title
Chap 10	IPS program data elements
SX001G	Glossary for the S-Series ILS specifications
SX002D	Common data model for the S-Series IPS specifications
SX004G	UML model reader's guide
SX000H	Harmonized Suite of the S-Series Integrated Product Support (IPS) Specifications

1

General

1.1

Introduction

This chapter defines a coherent data model for the data that can be exchanged purpose of managing an IPS program as defined in [Chap 4](#). It covers all information that is expected to be exchanged between the different stakeholders of a program during all life cycle phases, as well

as the program management information that needs to be shared across the different IPS elements.

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>). It is beyond the scope of this document to provide a description of UML. Please refer to SX004G for guidance on how to read the SX000i UML data model.

An alphabetic list of all classes, attributes, valid values and valid value libraries used in the UML data model can be found in [Chap 10](#), IPS program data elements.

The data model itself is based on the Common Data Model (CDM) defined in SX002D.

1.2 Purpose

The purpose of this chapter is to define a coherent data model for the data that can be exchanged as part of the IPS program by its related business processes. It provides a list of all units of functionalities, the classes that they define, as well as their attributes and relationships.

1.3 Scope

The scope of the data model includes all data related to the management of an IPS program throughout the whole product lifecycle.

1.4 Out of scope

The data model does not cover all data required to perform all IPS program management activities; it simply covers the information that is likely to be exchanged between different IPS actors. Thus, any implementation of the data model into a software package that aims to cover all or at least a sub-set of IPS program management 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 CDM that has been defined in SX002D, so as to ensure the interoperability of SX000i with the other S-Series specifications. It has also considered for its development the existing specification data models. Issue 2.1 of SX000i is therefore fully compatible with the 2021 block release of the S-Series of IPS specifications. Refer to SX000H.

For details on how the interoperability between the specifications will be maintained, please refer to [Chap 1](#).

2 Model overview

The SX000i data model has been defined using the Unified Modeling Language (UML). It consists of two major segments:

- A segment that is common to other IPS S-Series specifications and is part of the CDM.
- A segment that is specific to SX000i.

The CDM is a model that does not belong to any specific IPS S-Series specification, because it covers all elements that are used by 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 IPS S-Series 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 IPS S-Series specifications.

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 SX000i to those *base* classes.

The following CDM UoFs are included without changes:

- CDM UoF Document
- CDM UoF Location
- CDM UoF Product Usage Context
- CDM UoF Product Usage Phase
- CDM UoF Resource Specification

The UoFs that are extensions and/or subsets of the CDM are listed in [Table 2](#).

Table 2 UoFs extending and/or reducing the CDM

UoF Name	Extension/subset of CDM UoF
SX000i UoF Applicability Statement	CDM UoF Applicability Statement
SX000i UoF Capability Definition	SX000i UoF Capability Definition
SX000i UoF Change Request	CDM UoF Design Change Request
SX000i UoF Digital File	CDM UoF Digital File
SX000i UoF Environment Definition	CDM UoF Environment Definition
SX000i UoF Facility	CDM UoF Facility
SX000i UoF Mission Definition	CDM UoF Mission Definition
SX000i UoF Product SX000i UoF Project	CDM UoF Product and Project
SX000i UoF Performance Parameter,	CDM UoF Performance Parameter,
SX000i UoF Person Competences and Labor Rates	CDM UoF Competence Definition
SX000i Project-specific attributes	S-Series Base Object Definition 2.0
SX000i UoF Remark	CDM UoF Remark
SX000i UoF Security Classification	CDM UoF Security Classification
SX000i UoF Message SX000i UoF IPS Program Message Content	CDM UoF Message

A few isolated classes from the CDM are also used in order to provide a “hook” to other specifications, without their whole UoF being listed. These classes are listed in [Chap 10](#).

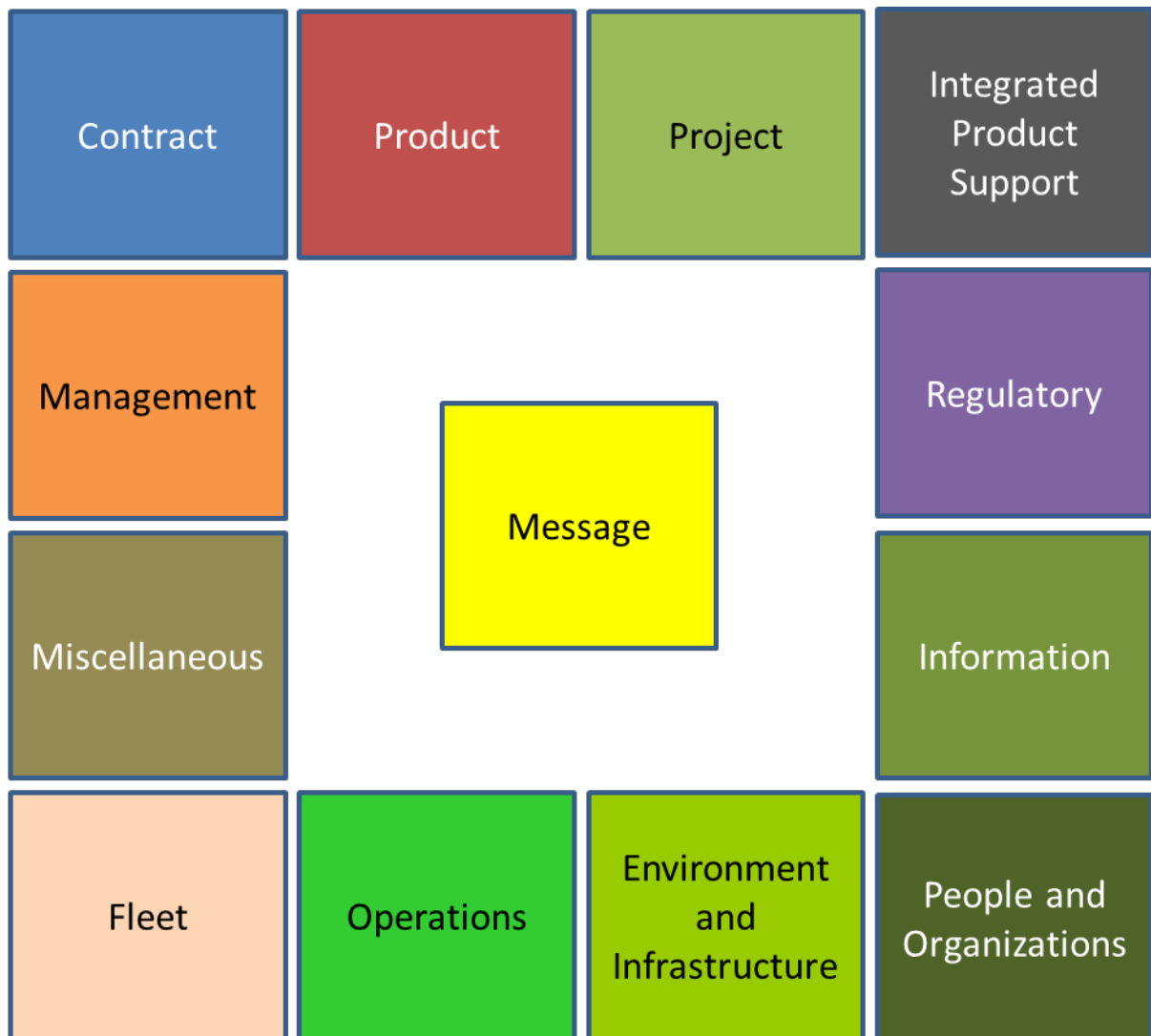
3 UoF grouping

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 ([Para 4](#)), and the business-related UoFs ([Para 5](#)).

Given the great number of business UoFs included in SX000i, 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 as described in [Para. 5](#).

Note

This grouping is for referencing purposes only and does not affect the data model itself.



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Fig 1 UoF domains

Note

The structuring of the IPS data XML message is however organized around these domains. Refer to [Para 5.6](#).

3.1 «Domain» SX000i Contract

The Contract Domain is a grouping within the data model that covers all the information associated to contract-related aspects. This domain includes the following UoFs:

- SX000i UoF Data Set Definition (refer to [Para 5.15](#))
- SX000i UoF Deliverable Items (refer to [Para 5.16](#))
- SX000i UoF Contract Breakdown (refer to [Para 5.13](#))
- SX000i UoF Service (refer to [Para 5.61](#))
- SX000i UoF Work Breakdown (refer to [Para 5.67](#))

3.2 «Domain» SX000i Environment and Infrastructure

The 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:

- CDM Resource Specification (refer to [Para 5.5](#))
- «FunctionalArea» SX000i Infrastructure. The Infrastructure functional area combines all information related to the infrastructure. This functional area includes the following UoFs:
 - SX000i UoF Infrastructure (refer to [Para 5.31](#))
 - SX000i UoF Infrastructure Availability (refer to [Para 5.31](#))
- SX000i UoF Environment Definition (refer to [Para 5.23](#))
- SX000i UoF Facility (refer to [Para 5.27](#))
- «FunctionalArea» SX000i Location Information groups all information related to Locations.
 - SX000i UoF Location Definition (refer to [Para 5.31](#))
 - CDM UoF Location (refer to [Para 5.6](#))

3.3 «Domain» SX000i Fleet

The Fleet domain is a grouping within the data model that covers all the information associated to groups of Products or ProductVariants that operate together as a Fleet. This domain includes the following UoFs:

- SX000i UoF Fleet Definition (refer to [Para 5.24](#))
- SX000i UoF Fleet Environment (refer to [Para 5.25](#))

3.4 «Domain» SX000i Information

The 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:

- SX000i UoF Comment (refer to [Para 5.12](#))
- «FunctionalArea» SX000i Document. The Document functional area allows to combine all the information related to documents. This functional area includes the following UoFs:
 - CDM UoF Document (refer to [Para 5.1](#))
 - SX000i UoF Document (refer to [Para 5.18](#))
- SX000i UoF Remark (refer to [Para 5.58](#))

3.5 «Domain» SX000i Integrated Product Support

The Integrated Product Support domain that groups all the concept UoFs that are associated to the definition of an Integrated Product Support (IPS) concept. This domain includes the following UoFs:

- SX000i UoF IPS Concept Definition (refer to [Para 5.28](#))
- SX000i UoF Support Elements (refer to [Para 5.67](#))

- SX000i UoF Supported Item (refer to [Para 5.68](#))
- SX000i UoF IT Concept (refer to [Para 5.33](#))
- SX000i UoF Maintenance Concept (refer to [Para 5.325.53](#))
- SX000i UoF Operational Concept (refer to [Para 5.53](#))
- SX000i UoF Provisioning Concept (refer to [Para 5.53](#))
- SX000i UoF Training Concept (refer to [Para 5.65](#))

3.6 «Domain» SX000i Management

The Management domain is a grouping within the data model that covers all the information associated related to the IPS management.

This domain includes the following UoFs and functional groups:

- SX000i UoF Action tracking (refer to [Para 5.11](#))
- «FunctionalArea» SX000i Budget and Cost. The Budget and Cost functional is a grouping of the data model that compiles together all the information required for cost and budgeting purposes. This functional area includes the following UoFs:
 - SX000i UoF Budget (refer to [Para 5.13](#))
 - SX000i UoF Cost Breakdown (refer to [Para 5.18](#))
- SX000i UoF Change Request (refer to [Para 5.11](#))
- SX000i UoF Organizational Breakdown Structure (refer to [Para 5.47](#))
- «FunctionalArea» SX000i Reporting. The Reporting functional area is a data model grouping compiling all the information associated to reporting aspects. This functional area includes the following UoFs:
 - SX000i UoF Report (refer to [Para 5.55](#))
 - SX000i UoF Reportable Activity (refer to [Para 5.56](#))
 - SX000i UoF Reportable Metric (refer to [Para 5.57](#))
- SX000i UoF Planning (refer to [Para 5.47](#))
- SX000i UoF Risk Management (refer to [Para 5.59](#))
- SX000i UoF Meeting (refer to [Para 5.33](#))

3.7 «Domain» SX000i Message

The 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:

- SX000i UoF Digital File (refer to [Para 5.17](#))
- SX000i UoF Message (refer to [Para 5.38](#))
- SX000i UoF IPS Program Message Content (refer to [Para 5.6](#))

3.8 «Domain» SX000i Miscellaneous

The 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:

- SX000i UoF Applicability Statement (refer to [Para 5.12](#))
- SX000i UoF Capability Definition (refer to [Para 5.10](#))
- SX000i UoF Expression Evaluation (refer to [Para 5.22](#))
- SX000i UoF Limitation (refer to [Para 5.30](#))
- SX000i UoF Performance Parameter (refer to [Para 5.45](#))
- SX000i UoF Requirement (refer to [Para 5.58](#))

3.9 «Domain» SX000i Operations

The Operations domain is a grouping within the data model that compiles all information required to plan or execute operations. This domain includes the following UoFs:

- SX000i UoF Operational Scenario Definition (refer to [Para 5.44](#))
- SX000i UoF Mission Definition (refer to [Para 5.35](#))
- SX000i UoF Operating Location (refer to [Para 5.41](#))
- SX000i UoF Operational Roles (refer to [Para 5.39](#))
- SX000i UoF Operator (refer to [Para 5.41](#))
- SX000i UoF Operating Base (refer to [Para 5.36](#))

3.10 «Domain» SX000i People and Organizations

The 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:

- SX000i UoF Organization Location (refer to [Para 5.42](#))
- SX000i UoF Party (refer to [Para 5.44](#))
- SX000i UoF Person Competences and Labor Rates (refer to [Para 5.46](#))
- SX000i UoF Staffing (refer to [Para 5.62](#))
- SX000i UoF Type of Person (refer to [Para 5.66](#))

3.11 «Domain» SX000i Product

The Product domain is a grouping within the data model that compiles all the different UoFs related to the Product. This domain includes the following UoFs:

- SX000i UoF Product (refer to [Para 5.50](#))
- CDM UoF Product Usage Context (refer to [Para 5.3](#))
- CDM UoF Product Usage Phase (refer to [Para 5.4](#))

3.12 «Domain» SX000i Project

The Project Domain is a grouping within the data model that compiles all the information related to a Project. This domain includes the following UoFs:

- SX000i UoF Project (refer to [Para 5.54](#))
- SX000i UoF Project Requirements (refer to [Para 5.51](#))
- SX000i UoF Project Milestones (refer to [Para 5.52](#))

3.13 «Domain» SX000i Regulatory

The 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 area:

- «FunctionalArea» SX000i 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:
 - SX000i UoF Export Control License (refer to [Para 5.20](#))
 - SX000i UoF Export Control Requirement (refer to [Para 5.21](#))
- SX000i UoF Policies and Regulations (refer to [Para 5.48](#))
- SX000i UoF Security Classification (refer to [Para 5.60](#))

4 Special UoFs

This paragraph covers the extensions to the CDM that are not strictly related to the business-specific data model. This includes the <<primitives>> and <<compoundAttributes>> being used, the extensions to CDM classes and the definition of project-specific attributes.

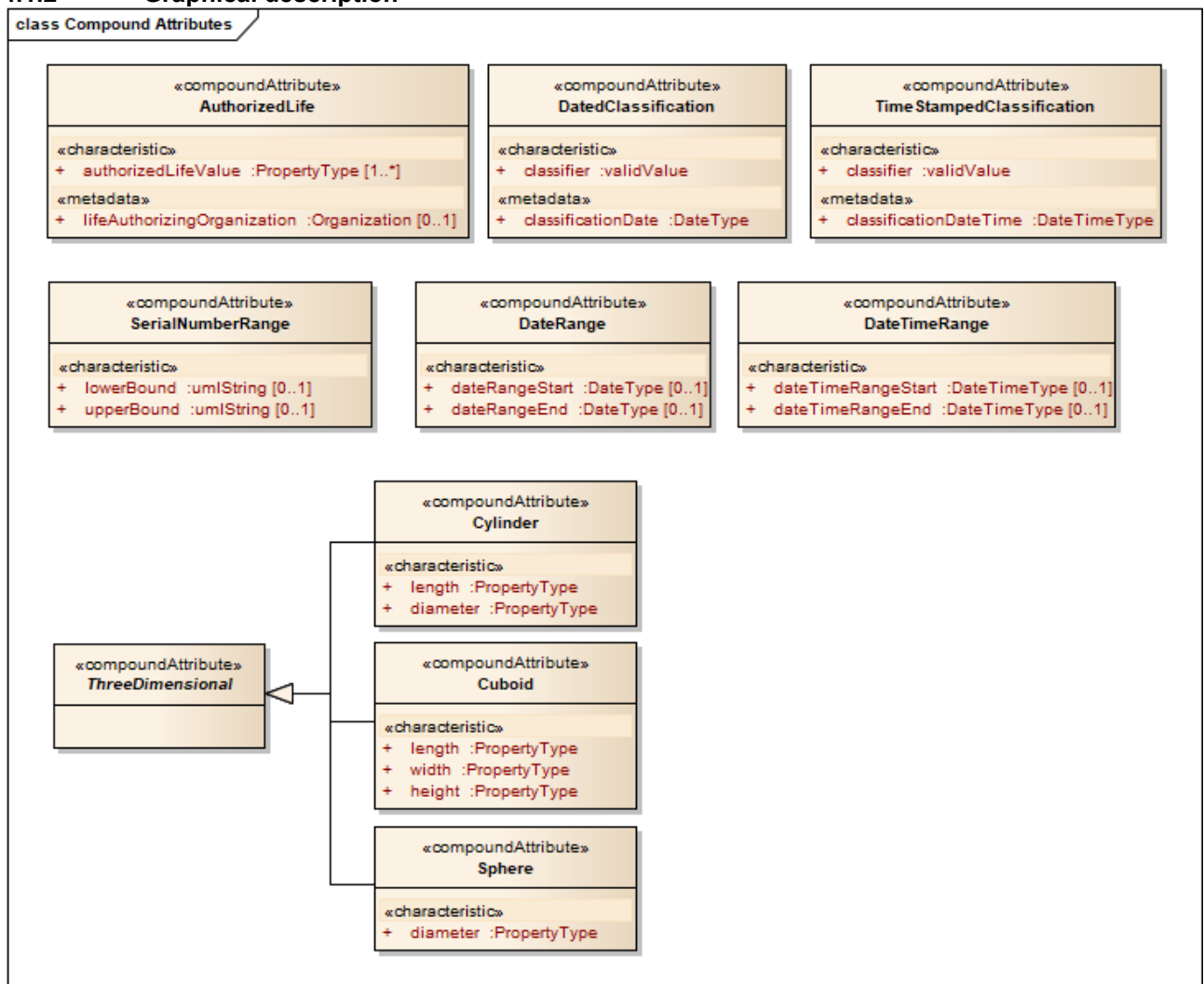
For easy understanding, all compound attributes (including the global S-Series compound attributes) have been included. For the S-Series primitives, refer to SX002D.

4.1 S-Series Compound Attributes

4.1.1 Description

S-Series compound attributes defines data types made up from combinations of attributes. A compound attribute establishes a pattern that in addition to the S-Series primitives can be used to determine the type of values that individual attributes in the S-Series IPS specifications data models can have.

4.1.2 Graphical description



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Fig 2 Compound Attributes

4.1.3 Class definition

4.1.3.1 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.

4.1.3.1.1 Attribute(s)

This class has the following attributes:

- [authorizedLifeValue](#), one or many
- [lifeAuthorizingOrganization](#), zero or one

4.1.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.1.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

- [ProjectSpecificAttributeValue](#). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.1.3.2 Cuboid

[Cuboid](#) represents a three-dimensional object where all its faces are rectangles and all angles are right angles.

4.1.3.2.1 Attribute(s)

This class has the following attributes:

- [length](#)
- [width](#)
- [height](#)

4.1.3.2.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.1.3.2.3 Selects

This class is a member of the following <<select>> interfaces:

- [ProjectSpecificAttributeValue](#) (inherited from [ThreeDimensional](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.1.3.3 Cylinder

[Cylinder](#) represents a three-dimensional object with straight parallel sides and a circular section.

4.1.3.3.1 Attribute(s)

This class has the following attributes:

- [length](#)

- diameter

4.1.3.3.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.1.3.3.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [ProjectSpecificAttributeValue](#) (inherited from [ThreeDimensional](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.1.3.4 *DatedClassification*

[DatedClassification](#) is a <<compoundAttribute>> that represents a classification in conjunction with its recording date.

4.1.3.4.1 *Attribute(s)*

This class has the following attributes:

- classifier
- classificationDate

4.1.3.4.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.1.3.4.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [ProjectSpecificAttributeValue](#). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.1.3.5 *DateRange*

[DateRange](#) is a <<compoundAttribute>> that identifies an interval of dates.

Note

The range pattern can be open-ended.

4.1.3.5.1 *Attribute(s)*

This class has the following attributes:

- dateRangeStart, zero or one
- dateRangeEnd, zero or one

4.1.3.5.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.1.3.5.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [ProjectSpecificAttributeValue](#). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.1.3.6 *DateTimeRange*

[DateTimeRange](#) is a <<compoundAttribute>> that identifies an interval of date and times.

4.1.3.6.1 *Attribute(s)*

This class has the following attributes:

- `dateTimeRangeStart`, zero or one
- `dateTimeRangeEnd`, zero or one

4.1.3.6.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.1.3.6.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [ProjectSpecificAttributeValue](#). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.1.3.7 *SerialNumberRange*

[SerialNumberRange](#) is a <<compoundAttribute>> that identifies an interval of serialized items.

Note

The range pattern can be open-ended.

4.1.3.7.1 *Attribute(s)*

This class has the following attributes:

- `lowerBound`, zero or one
- `upperBound`, zero or one

4.1.3.7.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.1.3.7.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [ProjectSpecificAttributeValue](#). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.1.3.8 *Sphere*

[Sphere](#) represents a three-dimensional object where every point on its surface is equidistant from its center.

4.1.3.8.1 *Attribute(s)*

This class has the following attributes:

- diameter

4.1.3.8.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.1.3.8.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [ProjectSpecificAttributeValue](#) (inherited from [ThreeDimensional](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.1.3.9 *ThreeDimensional*

[ThreeDimensional](#) is a <<compoundAttribute>> that represents spatial magnitudes.

4.1.3.9.1 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.1.3.9.2 *Selects*

This class is a member of the following <<select>> interfaces:

- [ProjectSpecificAttributeValue](#). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.1.3.10 *TimeStampedClassification*

[TimeStampedClassification](#) is <<compoundAttribute>> that represents a classification in conjunction with its recording time stamp.

4.1.3.10.1 *Attribute(s)*

This class has the following attributes:

- classifier
- classificationDateTime

4.1.3.10.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.1.3.10.3 *Selects*

This class is a member of the following <<select>> interfaces:

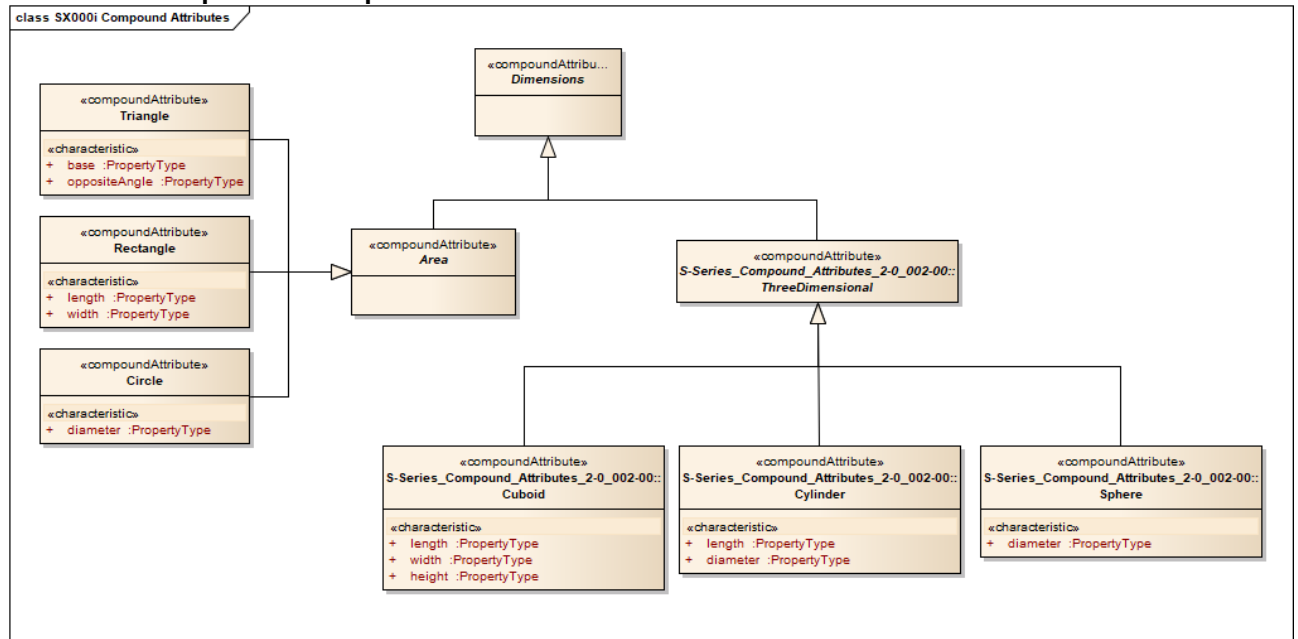
- [ProjectSpecificAttributeValue](#). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.2 **SX000i Compound Attributes**

4.2.1 **Description**

Compound Attributes UoF defines reusable data patterns which are used for declaring data types for class attributes in the SX000i specification.

4.2.2 Graphical description



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Fig 3 SX000i Compound Attributes

4.2.3 Class definition

4.2.3.1 Area

Area is a <<class>> that represents the extent or measurement of a surface.

4.2.3.1.1 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.2.3.1.2 Selects

This class is a member of the following <<select>> interfaces:

- [ProjectSpecificAttributeValue](#). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.2.3.2 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).

4.2.3.2.1 Attribute(s)

This class has the following attributes:

- diameter

4.2.3.2.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.2.3.2.3 Selects

This class is a member of the following <<select>> interfaces:

Applicable to: All

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- [ProjectSpecificAttributeValue](#) (inherited from [Area](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.2.3.3 Dimensions

[Dimensions](#) is a <<compoundAttribute>> that represents a set of values that define the measurable extent of a particular kind for a specific item.

Example(s)

- area
- volume

4.2.3.4 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.

4.2.3.4.1 *Attribute(s)*

This class has the following attributes:

- length
- width

4.2.3.4.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.2.3.4.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [ProjectSpecificAttributeValue](#) (inherited from [Area](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.2.3.5 Triangle

[Triangle](#) is a <<class>> representing a geometrical plane figure with three straight sides and three angles.

4.2.3.5.1 *Attribute(s)*

This class has the following attributes:

- base
- oppositeAngle

4.2.3.5.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#). Refer to SX000i UoF Comment, [Para 5.16](#)
- [RemarkItem](#). Refer to SX000i UoF Remark, [Para 5.58](#)

4.2.3.5.3 *Selects*

This class is a member of the following <<select>> interfaces:

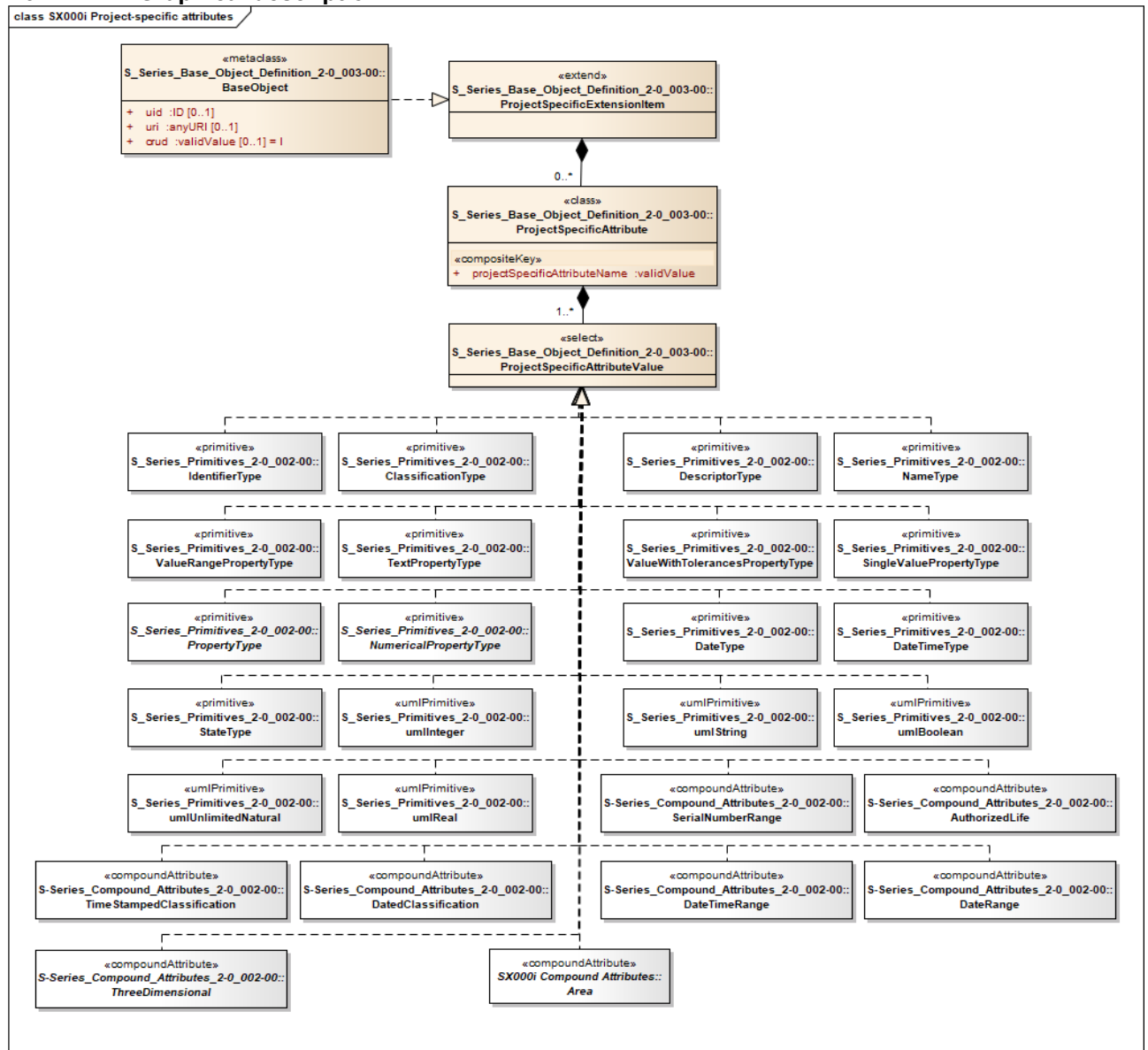
- [ProjectSpecificAttributeValue](#) (inherited from [Area](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)

4.3 SX000i Project-specific attributes

4.3.1 Description

Project-specific attributes allows to extend existing classes with additional attributes that are not always considered as part of the base model but are required for a specific project.

4.3.2 Graphical description



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Fig 4 SX000i Project-specific attributes

4.3.3 Class definition

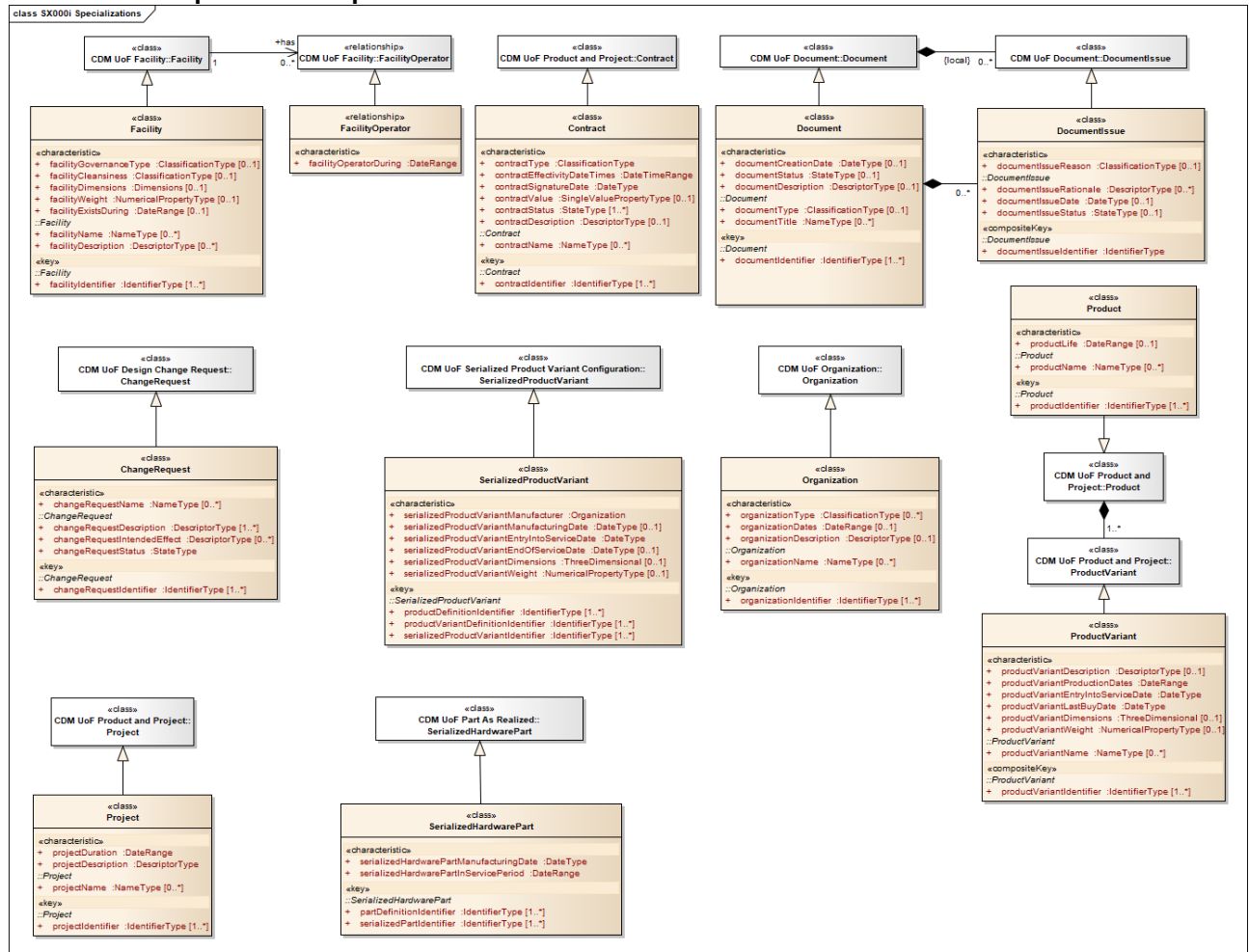
Refer to SX002D.

4.4 SX000i Specializations

4.4.1 Description

SX000i specializations provides the specializations of classes from other S-Series IPS specifications (mainly SX002D) for the purpose of SX000i.

4.4.2 Graphical description



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Fig 5 SX000i Specializations

4.4.3 Class definition

4.4.3.1 ChangeRequest

ChangeRequest is a <<class>> that represents a formal proposal for a modification to a configuration item upon a given baseline.

4.4.3.1.1 Attribute(s)

This class has the following attributes:

- changeRequestIdentifier, one or many
- changeRequestDescription, one or many
- changeRequestIntendedEffect, zero, one or many
- changeRequestStatus
- changeRequestName, zero, one or many

4.4.3.1.2 Associations

This class has the following associations:

- A directed association, to one or many objects of type **ChangeRequestTarget**
- A directed association, to zero, one or many objects of type **ChangeRequestRationale**

Applicable to: All

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- A directed association, to object(s) from classes that are members of [Party](#)

4.4.3.1.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

4.4.3.1.4 *Selects*

This class is a member of the following <<select>> interfaces:

- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)

4.4.3.2 *Contract*

[Contract](#) is a <<class>> that represents a binding agreement between two or more parties

Example(s)

- leasing contract
- procurement contract
- service contract
- subcontract

4.4.3.2.1 *Attribute(s)*

This class has the following attributes:

- `contractIdentifier`, one or many
- `contractName`, zero, one or many
- `contractType`
- `contractEffectivityDateTimes`
- `contractSignatureDate`
- `contractValue`, zero or one
- `contractStatus`, one or many
- `contractDescription`, zero or one

4.4.3.2.2 *Associations*

This class has the following associations:

- A directed association, to zero, one or many objects of type [ContractRelationship](#)

4.4.3.2.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)

- [BudgetingItem](#). Refer to SX000i UoF Budget, [Para 5.13](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [ContractingRequirement](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [OrganizationalBreakdownStructure](#). Refer to SX000i UoF Organizational Breakdown Structure, [Para 5.47](#)
- [PerformanceParameterItem](#). Refer to SX000i UoF Performance Parameter, [Para 5.45](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [ReportableMetricItem](#). Refer to SX000i UoF Reportable Metric, [Para 5.61](#)
- [RiskContextItem](#). Refer to SX000i UoF Risk Management, [Para 5.63](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

4.4.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActionContextItem](#). Refer to SX000i UoF Action tracking, [Para 5.11](#)
- [ActualDeliverableItem](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ChangeRequestTargetItem](#). Refer to CDM UoF Design Change Request,
- [ClassInstanceAssertItem](#) (inherited from [Contract](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [Contract](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractReference](#). Refer to SX000i UoF Contract Breakdown, [Para 5.17](#)
- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [MeetingContextItem](#). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessageContextItem](#) (inherited from [Contract](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)

4.4.3.3 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.

Example(s)

- drawing
- manual
- report

4.4.3.3.1 Attribute(s)

This class has the following attributes:

- `documentIdentifier`, one or many
- `documentType`, zero or one
- `documentTitle`, zero, one or many
- `documentCreationDate`, zero or one
- `documentStatus`, zero or one
- `documentDescription`, zero or one

4.4.3.3.2 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DataItemDescriptionDocument](#). Refer to SX000i UoF Data Set Definition, [Para 5.19](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentCharacteristicItem](#). Refer to SX000i UoF Document, [Para 5.22](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

4.4.3.3.3 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ChangeRequestRationaleItem](#). Refer to CDM UoF Design Change Request, [Para 5.17](#)
- [DigitalFileReferencedItem](#) (inherited from [Document](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentItem](#) (inherited from [Document](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ExportControlledItem](#). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [SupportElementItem](#). Refer to SX000i UoF Support Elements, [Para 5.67](#)

4.4.3.4 DocumentIssue

[DocumentIssue](#) is a <<class>> that represents a specific release of a [Document](#)

4.4.3.4.1 *Attribute(s)*

This class has the following attributes:

- documentIssueIdentifier
- documentIssueRationale, zero, one or many
- documentIssueDate, zero or one
- documentIssueStatus, zero or one
- documentIssueReason, zero or one

4.4.3.4.2 *Associations*

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [Document](#)
- An aggregate association, zero, one or many, to one related object of type [ExportControlRegulation](#)
- An aggregate association, zero, one or many, to one related object of type [ExternalDocument](#)
- An aggregate association, zero, one or many, to one related object of type [PoliciesAndRegulations](#)
- An aggregate association, zero, one or many, to one related object of type [Report](#)

4.4.3.4.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DataItemDescriptionDocument](#). Refer to SX000i UoF Data Set Definition, [Para 5.19](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentCharacteristicItem](#). Refer to SX000i UoF Document, [Para 5.22](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

4.4.3.4.4 *Selects*

This class is a member of the following <<select>> interfaces:

- [DigitalFileReferencedItem](#) (inherited from [DocumentIssue](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentItem](#) (inherited from [DocumentIssue](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ExportControlledItem](#). Refer to SX000i UoF Export Control License, [Para 5.24](#)

4.4.3.5 Facility

Facility is a <<class>> that represents a physically limited infrastructure which exists, or is intended to be built or installed, and is established to serve a particular purpose.

4.4.3.5.1 Attribute(s)

This class has the following attributes:

- facilityIdentifier, one or many
- facilityName, zero, one or many
- facilityDescription, zero, one or many
- facilityGovernanceType, zero or one
- facilityCleansiness, zero or one
- facilityDimensions, zero or one
- facilityWeight, zero or one
- facilityExistsDuring, zero or one

4.4.3.5.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [FacilityEquipment](#)
- A directed association, to zero, one or many objects of type [FacilityLocation](#)
- A directed association, to zero, one or many objects of type [FacilityOwner](#)
- A directed association, to zero, one or many objects of type [FacilityRelationship](#)

4.4.3.5.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to SX000i UoF Environment Definition, [Para 5.23](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition,
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [InfrastructureItem](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)

- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [StaffingItem](#). Refer to SX000i UoF Staffing, [Para 5.66](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

4.4.3.5.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [InfrastructureNode](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [MeetingContextItem](#). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessageContextItem](#). Refer to SX000i UoF Message, [Para 5.38](#)
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [SupplyRequiringItem](#). Refer to SX000i UoF Provisioning Concept, [Para 5.57](#)
- [SupportElementItem](#). Refer to SX000i UoF Support Elements, [Para 5.67](#)
- [TaskLocationItem](#) (inherited from [Facility](#)). Refer to CDM UoF [Task](#) Usage,

4.4.3.6 FacilityOperator

[FacilityOperator](#) is a <<relationship>> that identifies the party responsible for running the [Facility](#)

Example(s)

- The [FacilityOperator](#) has leased the [Facility](#) from the [FacilityOwner](#).

4.4.3.6.1 Attribute(s)

This class has the following attributes:

- [facilityOperatorDuring](#)

4.4.3.6.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [FacilityOperatorItem](#)

4.4.3.6.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)

4.4.3.7 *Organization*

[Organization](#) is a <<class>> that represents an administrative structure with a particular purpose belonging to a legal entity.

Example(s)

- company
- Government department
- International agency

4.4.3.7.1 *Attribute(s)*

This class has the following attributes:

- `organizationIdentifier`, one or many
- `organizationName`, zero, one or many
- `organizationType`, zero, one or many
- `organizationDates`, zero or one
- `organizationDescription`, zero or one

4.4.3.7.2 *Associations*

This class has the following associations:

- A directed association, to zero, one or many objects of type [OrganizationLocation](#)

4.4.3.7.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [BudgetingItem](#). Refer to SX000i UoF Budget, [Para 5.13](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [OrganizationalBreakdownStructure](#). Refer to SX000i UoF Organizational Breakdown Structure, [Para 5.47](#)
- [PartyItem](#). Refer to SX000i UoF Party, [Para 5.48](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityAssignmentParty](#). Refer to SX000i UoF Security Classification, [Para 5.64](#)

- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [StaffingItem](#). Refer to SX000i UoF Staffing, [Para 5.66](#)

4.4.3.7.4 Selects

This class is a member of the following <<select>> interfaces:

- [ClassInstanceAssertItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractDeliverableToBeDeliveredTo](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [FacilityOperatorItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Facility, [Para 5.27](#)
- [LegalParty](#) (inherited from [Organization](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [MeetingContextItem](#). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessagePartyItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [MissionDefinitionPartyItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [Party](#). Refer to SX000i UoF Party, [Para 5.48](#)
- [ProvisioningSource](#). Refer to SX000i UoF Provisioning Concept, [Para 5.57](#)
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [TaskLocationItem](#) (inherited from [Organization](#)). Refer to CDM UoF [Task](#) Usage,

4.4.3.8 Product

[Product](#) is <<class>> that represents a family of items which share the same underlying design purpose.

Example(s)

- Aegis Class Destroyer
- Airbus A340
- Ford Fusion
- iPhone 7
- Pegasus engine
- Stryker

4.4.3.8.1 Attribute(s)

This class has the following attributes:

- `productIdentifier`, one or many
- `productName`, zero, one or many
- `productLife`, zero or one

4.4.3.8.2 Implementations

This class implements the following <<extend>> interfaces:

- [AnalysisCandidateItem](#). Refer to CDM UoF Analysis Candidate Item,
- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [BreakdownItem](#). Refer to CDM UoF [Breakdown](#) Structure in SX002D
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DecisionTreeAnalysisItem](#). Refer to CDM UoF Decision Tree Template Definition,
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition,
- [InServiceOptimizationAnalysisItem](#). Refer to CDM UoF In [Service](#) Optimization Analysis,
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalItem](#). Refer to SX000i UoF Operator, [Para 5.45](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PerformanceParameterItem](#). Refer to SX000i UoF Performance Parameter, [Para 5.45](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProductUsagePhaseItem](#). Refer to CDM UoF Product Usage Phase, [Para 5.8](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

4.4.3.8.3 Selects

This class is a member of the following <<select>> interfaces:

- [ChangeRequestTargetItem](#) (inherited from [Product](#)). Refer to CDM UoF Design Change Request,
- [ClassInstanceAssertItem](#) (inherited from [Product](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [Product](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Product](#)). Refer to SX000i UoF Product, [Para 5.53](#)

- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [CostEntryItem](#) (inherited from [Product](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Product](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [InfrastructureRequiringItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureRequiringItem](#) (inherited from [Product](#)). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [MeetingContextItem](#). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessageContextItem](#) (inherited from [Product](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [OperationsApprovalItem](#). Refer to SX000i UoF Operator, [Para 5.45](#)
- [ProjectItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)
- [ReportContextItem](#) (inherited from [Product](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Product](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SerializedAssertItem](#) (inherited from [Product](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [SerializedAssertItem](#) (inherited from [Product](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [SubjectOfPoliciesAndRegulations](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)

4.4.3.9 **ProductVariant**
[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.

Example(s)

- Boeing 787-800 versus 787-900
- Ford Fusion S versus SE versus SEL

4.4.3.9.1 *Attribute(s)*

This class has the following attributes:

- `productVariantIdentifier`, one or many
- `productVariantName`, zero, one or many
- `productVariantDescription`, zero or one
- `productVariantProductionDates`
- `productVariantEntryIntoServiceDate`
- `productVariantLastBuyDate`
- `productVariantDimensions`, zero or one
- `productVariantWeight`, zero or one

4.4.3.9.2 *Associations*

This class has the following associations:

- A directed association, to zero, one or many objects of type [ExpectedProductVariantOperatingBase](#)

4.4.3.9.3 Implementations

This class implements the following <<extend>> interfaces:

- [AnalysisCandidateItem](#). Refer to CDM UoF Analysis Candidate Item,
- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [BreakdownItem](#). Refer to CDM UoF [Breakdown](#) Structure in SX002D
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DecisionTreeAnalysisItem](#). Refer to CDM UoF Decision Tree Template Definition,
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition,
- [InfrastructureItem](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [InServiceOptimizationAnalysisItem](#). Refer to CDM UoF In [Service](#) Optimization Analysis,
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalItem](#). Refer to SX000i UoF Operator, [Para 5.45](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PerformanceParameterItem](#). Refer to SX000i UoF Performance Parameter, [Para 5.45](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProductUsagePhaseItem](#). Refer to CDM UoF Product Usage Phase, [Para 5.8](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [ReportableMetricItem](#). Refer to SX000i UoF Reportable Metric, [Para 5.61](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

4.4.3.9.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)

- [ChangeRequestTargetItem](#) (inherited from [ProductVariant](#)). Refer to CDM UoF Design Change Request,
- [ClassInstanceAssertItem](#) (inherited from [ProductVariant](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [ProductVariant](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [ProductVariant](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [ProductVariant](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [InfrastructureNode](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [InfrastructureRequiringItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [MeetingContextItem](#). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessageContextItem](#) (inherited from [ProductVariant](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [OperationsApprovalItem](#). Refer to SX000i UoF Operator, [Para 5.45](#)
- [ProjectItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SerializedAssertItem](#) (inherited from [ProductVariant](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [SerializedAssertItem](#) (inherited from [ProductVariant](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [SubjectOfPoliciesAndRegulations](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)

4.4.3.10 **Project**
[Project](#) is a <<class>> that represents the overall set of IPS activities defined for a [Product](#).

Note

[Project](#) is often referred to as an IPS program.

4.4.3.10.1 **Attribute(s)**
This class has the following attributes:

- `projectIdentifier`, one or many
- `projectName`, zero, one or many
- `projectDuration`
- `projectDescription`

4.4.3.10.2 **Associations**
This class has the following associations:

- A directed association, to zero, one or many objects of type [ProjectContract](#)
- A directed association, to zero, one or many objects of type [ProjectRelationship](#)
- A directed association, to zero, one or many objects of type [ProjectRequirement](#)
- A directed association, to object(s) from classes that are members of [ProjectItem](#)

4.4.3.10.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [BudgetingItem](#). Refer to SX000i UoF Budget, [Para 5.13](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DecisionTreeAnalysisItem](#). Refer to CDM UoF Decision Tree Template Definition,
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InServiceOptimizationAnalysisItem](#). Refer to CDM UoF In Service Optimization Analysis,
- [OrganizationalBreakdownStructure](#). Refer to SX000i UoF Organizational Breakdown Structure, [Para 5.47](#)
- [PerformanceParameterItem](#). Refer to SX000i UoF Performance Parameter, [Para 5.45](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [ReportableMetricItem](#). Refer to SX000i UoF Reportable Metric, [Para 5.61](#)
- [RiskContextItem](#). Refer to SX000i UoF Risk Management, [Para 5.63](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

4.4.3.10.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActionContextItem](#). Refer to SX000i UoF Action tracking, [Para 5.11](#)
- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [InfrastructureRequiringItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [MeetingContextItem](#). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessageContextItem](#) (inherited from [Project](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)
- [ReportContextItem](#) (inherited from [Project](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)

4.4.3.11 SerializedHardwarePart

[SerializedHardwarePart](#) is <<class>> that represent an actual physical part which can be identified as an individual.

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.

Note

A [SerializedHardwarePart](#) can evolve due to modifications. The actual build standard at a given moment is defined through the relationship [SerializedPartDesignAssociation](#).

4.4.3.11.1 Attribute(s)

This class has the following attributes:

- [partDefinitionIdentifier](#), one or many
- [serializedPartIdentifier](#), one or many
- [serializedHardwarePartManufacturingDate](#)
- [serializedHardwarePartInServicePeriod](#)

4.4.3.11.2 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureItem](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [MeasurementPointItem](#). Refer to CDM UoF Measurement Point,
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

4.4.3.11.3 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [SerializedHardwarePart](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [SerializedHardwarePart](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)

- [DigitalFileReferencedItem](#) (inherited from [SerializedHardwarePart](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [InfrastructureNode](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [MessageContextItem](#). Refer to SX000i UoF Message, [Para 5.38](#)
- [RealizedPart](#) (inherited from [SerializedHardwarePart](#)). Refer to CDM UoF Serialized [Product](#) Variant Configuration,
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)
- [SupportElementItem](#). Refer to SX000i UoF Support Elements, [Para 5.67](#)

4.4.3.12 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](#).

4.4.3.12.1 Attribute(s)

This class has the following attributes:

- [productDefinitionIdentifier](#), one or many
- [productVariantDefinitionIdentifier](#), one or many
- [serializedProductVariantIdentifier](#), one or many
- [serializedProductVariantManufacturer](#)
- [serializedProductVariantManufacturingDate](#), zero or one
- [serializedProductVariantEntryIntoServiceDate](#)
- [serializedProductVariantEndOfServiceDate](#), zero or one
- [serializedProductVariantDimensions](#), zero or one
- [serializedProductVariantWeight](#), zero or one

4.4.3.12.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [SerializedProductVariantInFleet](#)
- A directed association, to zero, one or many objects of type [SerializedProductVariantOperatingBase](#)
- A directed association, to zero, one or many objects of type [SerializedProductVariantOperator](#)

4.4.3.12.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [BreakdownItem](#). Refer to CDM UoF [Breakdown](#) Structure in SX002D
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)

- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureItem](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MeasurementPointItem](#). Refer to CDM UoF Measurement Point,
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [ReportableMetricItem](#). Refer to SX000i UoF Reportable Metric, [Para 5.61](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

4.4.3.12.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [SerializedProductVariant](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [SerializedProductVariant](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [SerializedProductVariant](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [InfrastructureNode](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [InfrastructureRequiringItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [MessageContextItem](#). Refer to SX000i UoF Message, [Para 5.38](#)
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)

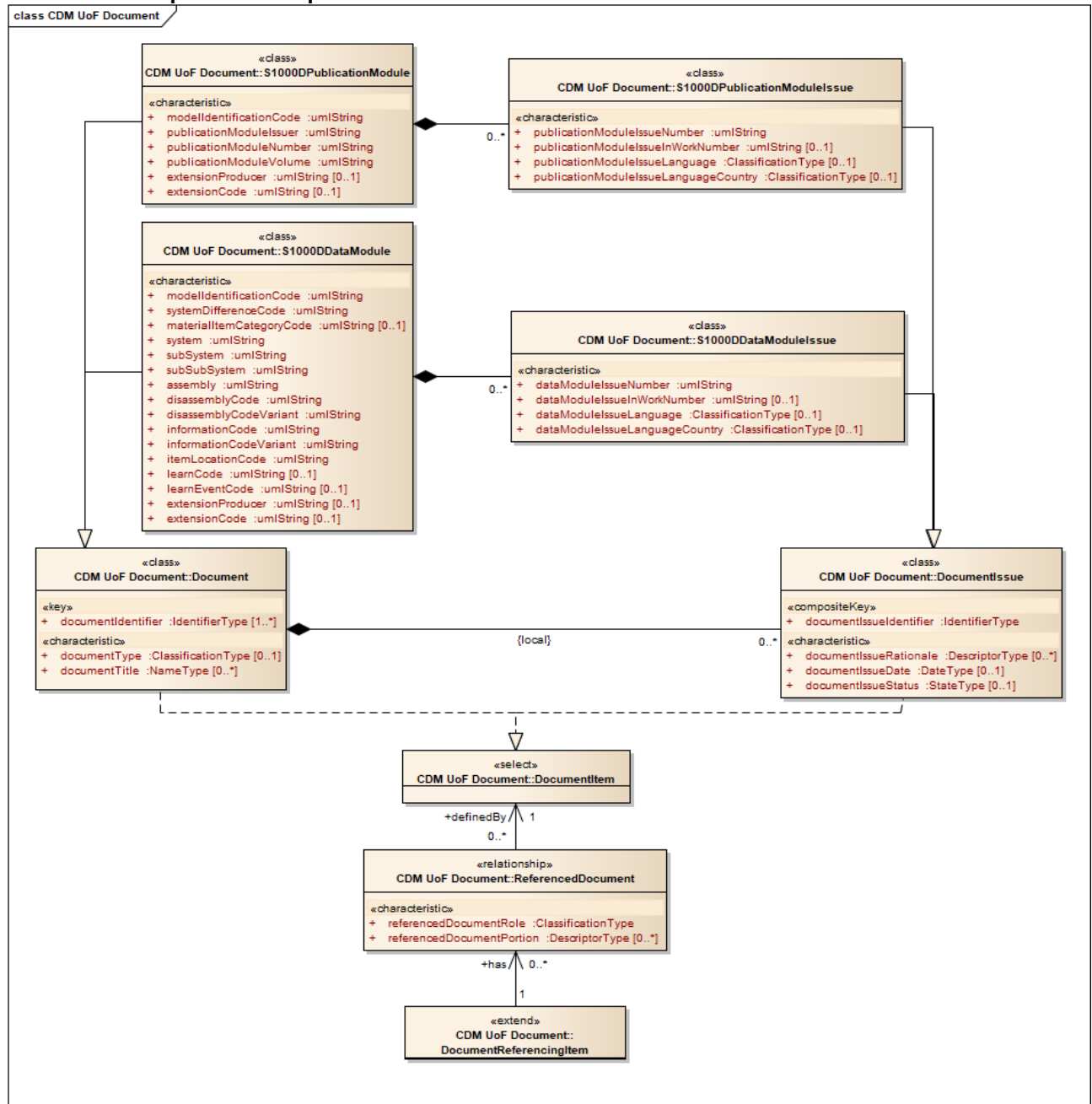
5 Data model units of functionality

5.1 CDM UoF Document

5.1.1 Description

The Document UoF provides the capability to identify a physical document or a digital file and their associated metadata.

5.1.2 Graphical description



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Fig 6 CDM UoF Document

5.1.3 Class definition

5.1.3.1 Document

Document is a <<class>> that represents a compiled set of information that serves a purpose.

5.1.3.1.1 Attribute(s)

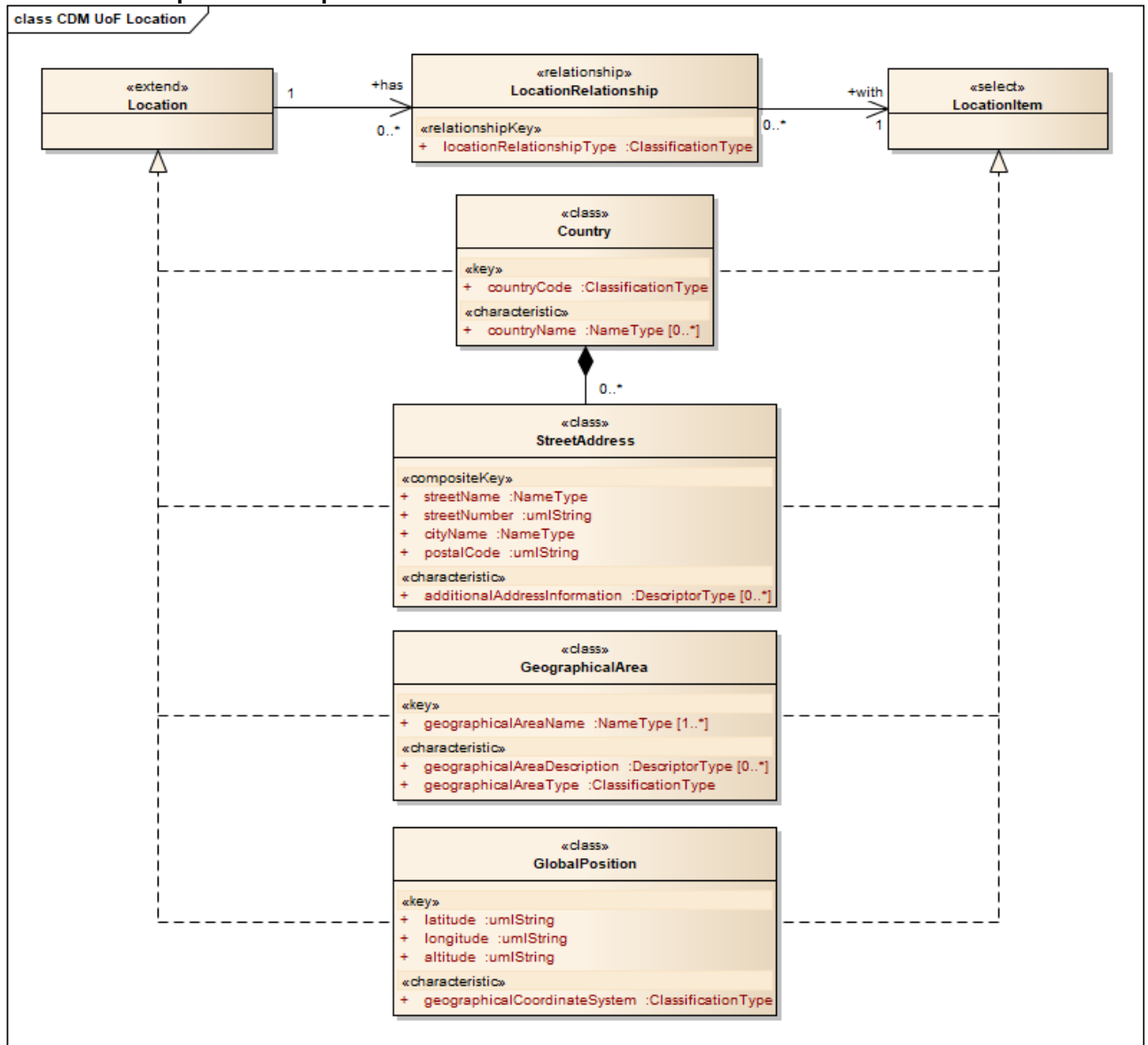
This class has the following attributes:

- documentIdentifier, one or many
- documentType, zero or one

-
- documentTitle, zero, one or many
- 5.1.3.2 DocumentIssue
[DocumentIssue](#) is a <<class>> that represents a specific release of a [Document](#)
- 5.1.3.2.1 *Attribute(s)*
This class has the following attributes:
- documentIssueIdentifier
 - documentIssueDate, zero or one
- 5.1.3.3 DocumentItem
[DocumentItem](#) is a <<select>> interface that identifies items which can be selected as [Document](#).
- 5.1.3.4 DocumentReferencingItem
[DocumentReferencingItem](#) is an <<extend>> interface that provides its associated data model to those classes that implement it.
- 5.1.3.5 ReferencedDocument
[ReferencedDocument](#) is a <<relationship>> where one [DocumentReferencingItem](#) relates to a [DocumentItem](#).
- 5.1.3.5.1 *Attribute(s)*
This class has the following attributes:
- referencedDocumentRole
 - referencedDocumentPortion, zero, one or many
- 5.1.3.6 S1000DDataModule
[S1000DDataModule](#) is a [Document](#) that identifies a document written in accordance with an S1000D schema.
- 5.1.3.6.1 *Attribute(s)*
This class has the following attributes:
- modelIdentificationCode
 - systemDifferenceCode
 - materialItemCategoryCode, zero or one
 - system
 - subSystem
 - subSubSystem
 - assembly
 - disassemblyCode
 - disassemblyCodeVariant
 - informationCode
 - informationCodeVariant
 - itemLocationCode
 - learnCode, zero or one
 - learnEventCode, zero or one
 - extensionProducer, zero or one
 - extensionCode, zero or one

- 5.1.3.7 S1000DDataModuleIssue
S1000DDataModuleIssue is a *DocumentIssue* that identifies a specific issue of a data module produced in accordance with S1000D.
- 5.1.3.7.1 *Attribute(s)*
This class has the following attributes:
- dataModuleIssueNumber
 - dataModuleIssueInWorkNumber, zero or one
 - dataModuleIssueLanguage, zero or one
 - dataModuleIssueLanguageCountry, zero or one
- 5.1.3.8 S1000DPublicationModule
S1000DPublicationModule is a *Document* that identifies a publication published in accordance with S1000D
- 5.1.3.8.1 *Attribute(s)*
This class has the following attributes:
- modelIdentificationCode
 - publicationModuleIssuer
 - publicationModuleNumber
 - publicationModuleVolume
 - extensionProducer, zero or one
 - extensionCode, zero or one
- 5.1.3.9 S1000DPublicationModuleIssue
S1000DPublicationModuleIssue is a *DocumentIssue* that identifies a specific issue of a publication module published in accordance with S1000D.
- 5.1.3.9.1 *Attribute(s)*
This class has the following attributes:
- publicationModuleIssueNumber
 - publicationModuleIssueInWorkNumber, zero or one
 - publicationModuleIssueLanguage, zero or one
 - publicationModuleIssueLanguageCountry, zero or one
- 5.2 CDM UoF Location**
- 5.2.1 Description**
The Location UoF provides the capability to define a geographic location.

5.2.2 Graphical description



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Fig 7 CDM UoF Location

5.2.3 Class definition

5.2.3.1 Country

Country is a self-governing political entity, occupying a particular territory.

5.2.3.1.1 Attribute(s)

This class has the following attributes:

- countryCode
- countryName, zero, one or many

5.2.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition, [Location](#). Refer to CDM UoF Location, [Para 5.6](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.2.3.1.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [LocationItem](#). Refer to CDM [Location](#),

5.2.3.2 *GeographicalArea*

[GeographicalArea](#) is a <<class>> that represents a particular extent of space.

5.2.3.2.1 *Attribute(s)*

This class has the following attributes:

- [geographicalAreaName](#), one or many
- [geographicalAreaDescription](#), zero, one or many
- [geographicalAreaType](#)

5.2.3.2.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to SX000i UoF Environment Definition, [Para 5.23](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition, [Location](#). Refer to CDM UoF Location, [Para 5.6](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.2.3.2.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [ClassInstanceAssertItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [LocationItem](#). Refer to CDM [Location](#),
- [OperatingLocation](#). Refer to SX000i UoF Operating Location, [Para 5.41](#)

5.2.3.3 *GlobalPosition*

[GlobalPosition](#) is a <<class>> that identifies a point in space by a set of coordinates.

5.2.3.3.1 *Attribute(s)*

This class has the following attributes:

- latitude
- longitude
- altitude
- geographicalCoordinateSystem

5.2.3.3.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to SX000i UoF Environment Definition, [Para 5.23](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition,
- [Location](#). Refer to CDM UoF Location, [Para 5.6](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.2.3.3.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [LocationItem](#). Refer to CDM [Location](#),
- [OperatingLocation](#). Refer to SX000i UoF Operating Location, [Para 5.41](#)

5.2.3.4 *Location*

[Location](#) is an <<extend>> interface that provides its associated data model to those classes that implement it.

5.2.3.4.1 *Class members*

This <<extend>> interface includes the following class members:

- [Country](#)
- [GeographicalArea](#)
- [GlobalPosition](#)
- [StreetAddress](#)

5.2.3.4.2 *Associations*

This class has the following associations:

- A directed association, to zero, one or many objects of type [LocationRelationship](#)
- A directed association, zero, one or many, to one object of type [LocationDefinitionRevision](#)

5.2.3.5 *LocationItem*

[LocationItem](#) is a <<select>> interface that identifies items which can be selected to provide the definition of a geographic location.

5.2.3.5.1 Class members

This <<select>> interface includes the following class members:

- [Country](#)
- [GeographicalArea](#)
- [GlobalPosition](#)
- [StreetAddress](#)

5.2.3.6 LocationRelationship

[LocationRelationship](#) is a <<relationship>> where one [LocationItem](#) relates to another [LocationItem](#)

5.2.3.6.1 Attribute(s)

This class has the following attributes:

- [locationRelationshipType](#)

5.2.3.6.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [LocationItem](#)

5.2.3.7 StreetAddress

[StreetAddress](#) is a <<class> that represents a locatable position along a road.

5.2.3.7.1 Attribute(s)

This class has the following attributes:

- [streetName](#)
- [streetNumber](#)
- [cityName](#)
- [postalCode](#)
- [additionalAddressInformation](#), zero, one or many

5.2.3.7.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [Country](#)

5.2.3.7.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to SX000i UoF Environment Definition, [Para 5.23](#)
- [Location](#). Refer to CDM UoF Location, [Para 5.6](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.2.3.7.4 Selects

This class is a member of the following <<select>> interfaces:

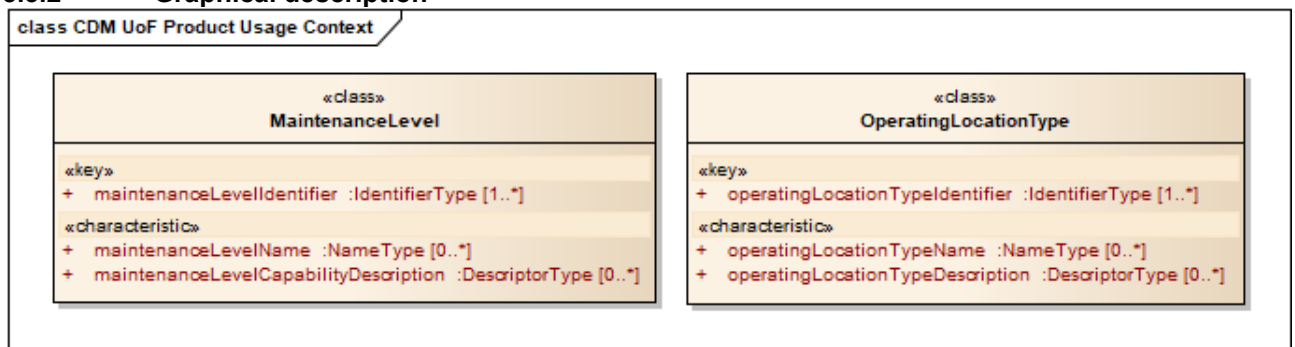
- [ContractDeliverableToBeDeliveredTo](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [LocationItem](#). Refer to CDM [Location](#),
- [OperatingLocation](#). Refer to SX000i UoF Operating Location, [Para 5.41](#)

5.3 CDM UoF Product Usage Context

5.3.1 Description

The Product Usage Context UoF defines the context in which the defined product(s) and product variant(s) will be operated and maintained.

5.3.2 Graphical description



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Fig 8 CDM UoF Product Usage Context

Fig 1 CDM UoF Product Usage Context

5.3.3 Class definition

5.3.3.1 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](#) can be established either by a single organization or be distributed between a set of organizations.

5.3.3.1.1 Attribute(s)

This class has the following attributes:

- maintenanceLevelIdentifier, one or many
- maintenanceLevelName, zero, one or many
- maintenanceLevelCapabilityDescription, zero, one or many

5.3.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)

- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition,
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.3.3.1.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [ClassInstanceAssertItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [TaskLocationItem](#). Refer to CDM UoF [Task](#) Usage,

5.3.3.2 *OperatingLocationType*

[OperatingLocationType](#) is a <<class>> that represents the definition of the nature of the environment in which a product will be operated.

5.3.3.2.1 *Attribute(s)*

This class has the following attributes:

- `operatingLocationTypeIdentifier`, one or many
- `operatingLocationTypeName`, zero, one or many
- `operatingLocationTypeDescription`, zero, one or many

5.3.3.2.2 *Implementations*

This class implements the following <<extend>> interfaces:

- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition,
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.3.3.2.3 *Selects*

This class is a member of the following <<select>> interfaces:

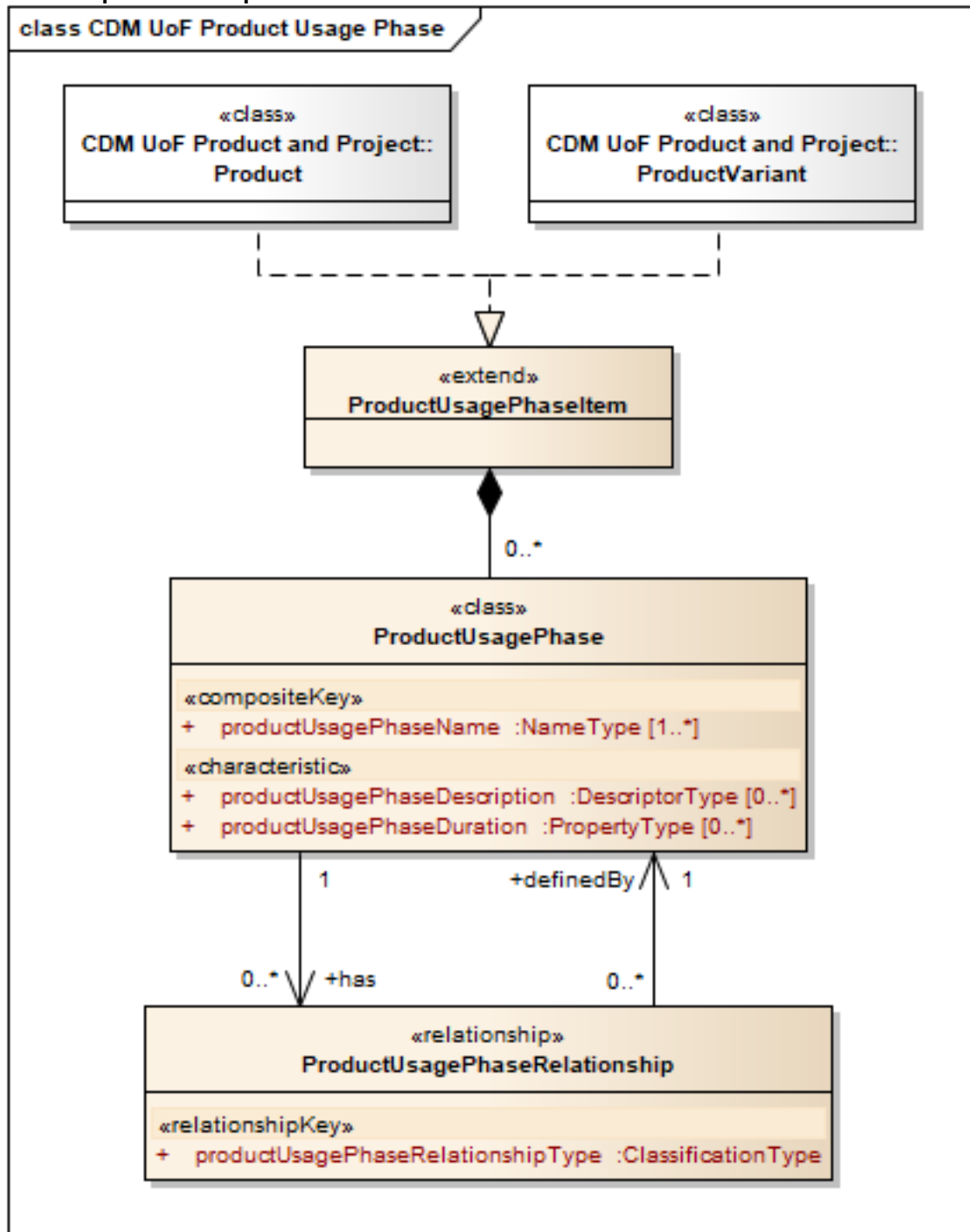
- [ClassInstanceAssertItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [OperatingLocation](#). Refer to SX000i UoF Operating Location, [Para 5.41](#)
- [TaskLocationItem](#). Refer to CDM UoF [Task](#) Usage,

5.4 CDM UoF Product Usage Phase

5.4.1 *Description*

[Product](#) Usage Phase UoF provides the capability to define segments of the [Product](#) usage that have different usage characteristics.

5.4.2 Graphical description



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Fig 9 CDM UoF Product Usage Phase

5.4.3 Class definition

5.4.3.1 ProductUsagePhase

ProductUsagePhase is a <<class>> that represents a distinct period of time during which a **ProductUsagePhaseItem** is in an operational state which has specific characteristics that need special considerations.

Example(s)

- Emersion, surface and dock for a submarine.
- Preflight, postflight, cruise, taxiing for an aircraft.

5.4.3.1.1 *Attribute(s)*

This class has the following attributes:

- productUsagePhaseName, one or many
- productUsagePhaseDescription, zero, one or many
- productUsagePhaseDuration, zero, one or many

5.4.3.1.2 *Associations*

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [ProductUsagePhaseItem](#)
- A directed association, to zero, one or many objects of type [ProductUsagePhaseRelationship](#)

5.4.3.1.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.4.3.2 *ProductUsagePhaseItem*

[ProductUsagePhaseItem](#) is an <<extend>> interface that provides its associated data model to those classes that implement it.

5.4.3.2.1 *Class members*

This <<extend>> interface includes the following class members:

- [Product](#)
- [ProductVariant](#)

5.4.3.3 *ProductUsagePhaseRelationship*

[ProductUsagePhaseRelationship](#) is a <<relationship>> where one [ProductUsagePhase](#) relates to another [ProductUsagePhase](#).

5.4.3.3.1 *Attribute(s)*

This class has the following attributes:

- productUsagePhaseRelationshipType

5.4.3.3.2 *Associations*

This class has the following associations:

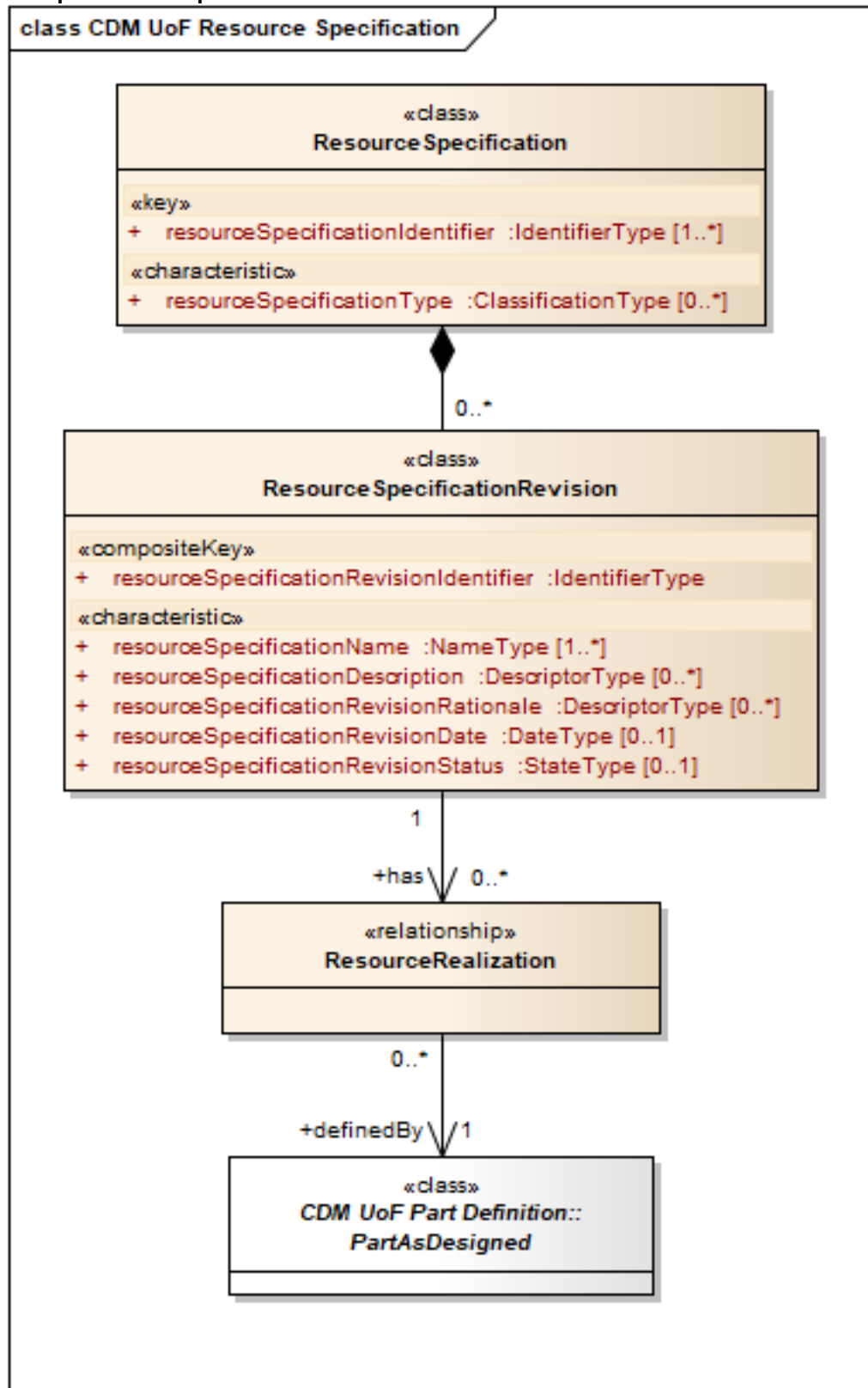
- A directed association, zero, one or many, to one object of type [ProductUsagePhase](#)

5.5 CDM UoF Resource Specification

5.5.1 *Description*

The Resource Specification UoF provides the capability to define generic definitions of resources needed without having to define its actual realization.

5.5.2 Graphical description



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Fig 10 CDM UoF Resource Specification

5.5.3 Class definition

5.5.3.1 ResourceRealization

[ResourceRealization](#) is a <<relationship>> where a [ResourceSpecification](#) relates to an instance of [PartAsDesigned](#) that fulfills the resource specification.

5.5.3.1.1 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [AllowedProductConfigurationHardwarePartAsDesigned](#)
- A directed association, zero, one or many, to one object of type [HardwarePartAsDesigned](#)
- A directed association, zero, one or many, to one object of type [PartAsDesigned](#)

5.5.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)

5.5.3.2 ResourceSpecification

[ResourceSpecification](#) is a <<class>> that defines a resource by its characteristics.

Note

Resource specification allows for more generic resource definitions ie, a task/subtask does not need to be changed due to eg, customer specific resource preferences.

5.5.3.2.1 Attribute(s)

This class has the following attributes:

- `resourceSpecificationIdentifier`, one or many
- `resourceSpecificationType`, zero, one or many

5.5.3.2.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition,
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.5.3.2.3 Selects

This class is a member of the following <<select>> interfaces:

- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)

- [TaskResourceDefinitionItem](#). Refer to CDM UoF [Task](#) Resource,

5.5.3.3 ResourceSpecificationRevision

[ResourceSpecificationRevision](#) is a <<class>> representing an iteration applied to a [ResourceSpecification](#).

5.5.3.3.1 Attribute(s)

This class has the following attributes:

- [resourceSpecificationRevisionIdentifier](#)
- [resourceSpecificationName](#), one or many
- [resourceSpecificationDescription](#), zero, one or many
- [resourceSpecificationRevisionRationale](#), zero, one or many
- [resourceSpecificationRevisionDate](#), zero or one
- [resourceSpecificationRevisionStatus](#), zero or one

5.5.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [ResourceSpecification](#)
- A directed association, to zero, one or many objects of type [ResourceRealization](#)

5.5.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.5.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

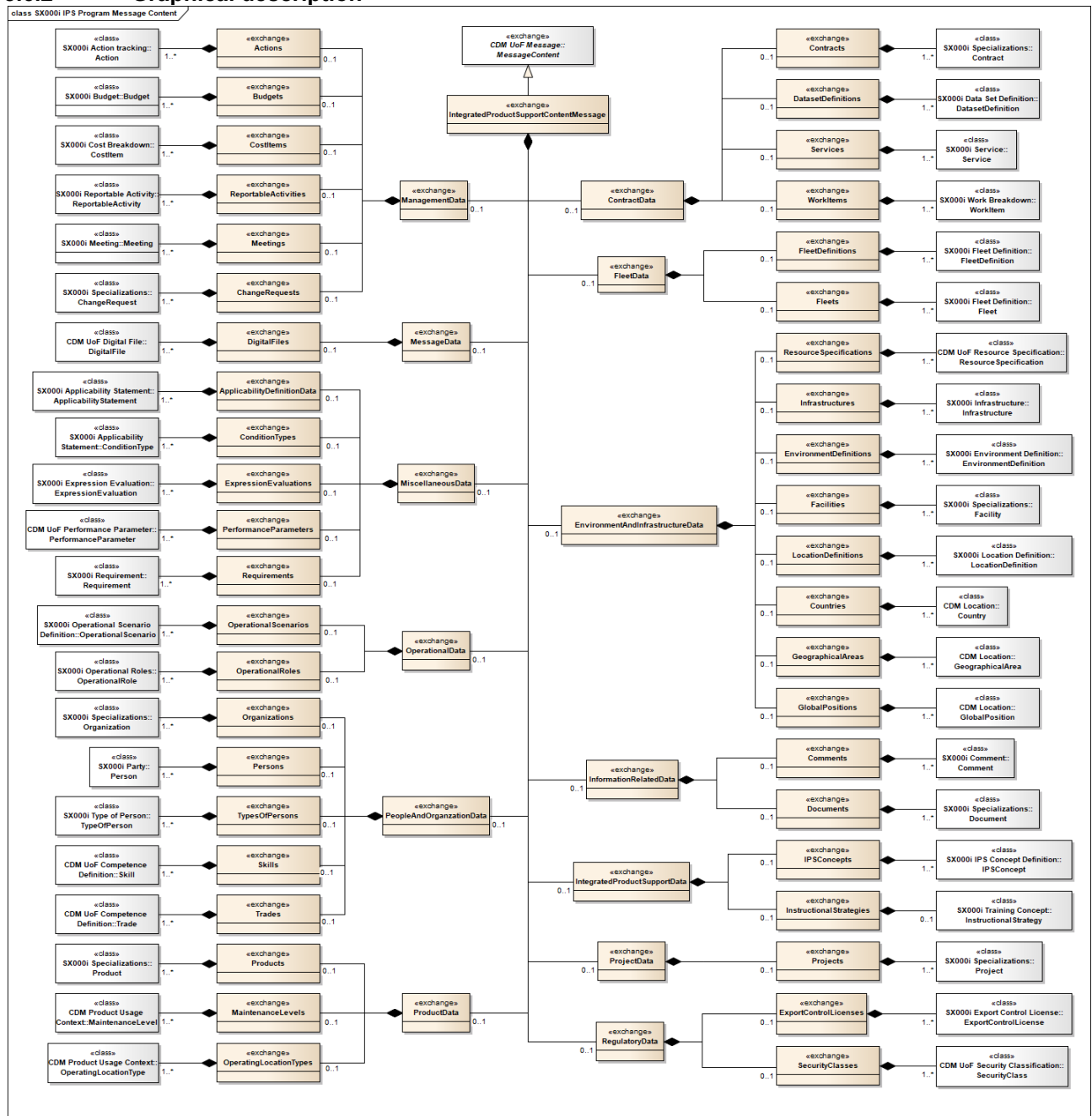
- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)

5.6 SX000i UoF IPS Program Message Content

5.6.1 Description

The IPS Program Message Content UoF defines the collection of information that can be exchanged as part of an Integrated Product Support (IPS) Program in the context of the S-Series IPS specifications.

5.6.2 Graphical description



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Fig 11 SX000i IPS Program Message Content

5.6.3 Class definition

5.6.3.1 Actions

[Actions](#) is a wrapper element that contains all instances of [Action](#) that are in scope for a data exchange.

5.6.3.2 ApplicabilityDefinitionData

[ApplicabilityDefinitionData](#) is a wrapper element that contains all instances of [ApplicabilityStatement](#) that are in scope for a data exchange.

Applicable to: All

SX000i-A-09-00-0000-00A-040A-A

Chap 9

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- 5.6.3.3 **Budgets**
Budgets is a wrapper element that contains all instances of **Budget** that are in scope for a data exchange.
- 5.6.3.4 **ChangeRequests**
ChangeRequests is a wrapper element that contains all instances of **ChangeRequest** that are in scope for a data exchange.
- 5.6.3.5 **Comments**
Comments is a wrapper element that contains all instances of **Comment** that are in scope for a data exchange.
- 5.6.3.6 **ConditionTypes**
ConditionTypes is a wrapper element that contains all instances of **ConditionType** that are in scope for a data exchange.
- 5.6.3.7 **ContractData**
ContractData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the primary data used in, and resulting from, the contracting activities.
- 5.6.3.8 **Contracts**
Contracts is a wrapper element that contains all instances of **Contract** that are in scope for a data exchange.
- 5.6.3.9 **CostItems**
CostItems is a wrapper element that contains all instances of **CostItem** that are in scope for a data exchange.
- 5.6.3.10 **Countries**
Countries is a wrapper element that contains all instances of **Country** that are in scope for a data exchange.
- 5.6.3.11 **DatasetDefinitions**
DatasetDefinitions is a wrapper element that contains all instances of **DatasetDefinition** that are in scope for a data exchange.
- 5.6.3.12 **DigitalFiles**
DigitalFiles is a wrapper element that contains all instances of **DigitalFile** that are in scope for a data exchange.
- 5.6.3.13 **Documents**
Documents is a wrapper element that contains all instances of **Document** that are in scope for a data exchange.
- 5.6.3.14 **EnvironmentAndInfrastructureData**
EnvironmentAndInfrastructureData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that include the data related to the IPS Environment and used **Infrastructure**.
- 5.6.3.15 **EnvironmentDefinitions**
EnvironmentDefinitions is a wrapper element that contains all instances of **EnvironmentDefinition** that are in scope for a data exchange.
- 5.6.3.16 **ExportControlLicenses**
ExportControlLicenses is a wrapper element that contains all instances of **ExportControlLicense** that are in scope for a data exchange.
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- 5.6.3.17 **ExpressionEvaluations**
ExpressionEvaluations is a wrapper element that contains all instances of **ExpressionEvaluation** that are in scope for a data exchange.
- 5.6.3.18 **Facilities**
Facilities is a wrapper element that contains all instances of **Facility** that are in scope for a data exchange.
- 5.6.3.19 **FleetData**
FleetData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the primary data used in, and resulting from, the fleet-related activities and information.
- 5.6.3.20 **FleetDefinitions**
FleetDefinitions is a wrapper element that contains all instances of **FleetDefinition** that are in scope for a data exchange.
- 5.6.3.21 **Fleets**
Fleets is a wrapper element that contains all instances of **Fleet** that are in scope for a data exchange.
- 5.6.3.22 **GeographicalAreas**
GeographicalAreas is a wrapper element that contains all instances of **GeographicalArea** that are in scope for a data exchange.
- 5.6.3.23 **GlobalPositions**
GlobalPositions is a wrapper element that contains all instances of **GlobalPosition** that are in scope for a data exchange.
- 5.6.3.24 **InformationRelatedData**
InformationRelatedData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the primary data used in, and resulting from, the exchange of information.
- 5.6.3.25 **Infrastructures**
Infrastructures is a wrapper element that contains all instances of **Infrastructure** that are in scope for a data exchange.
- 5.6.3.26 **InstructionalStrategies**
InstructionalStrategies is a wrapper element that contains all instances of **InstructionalStrategy** that are in scope for a data exchange.
- 5.6.3.27 **IntegratedProductSupportContentMessage**
IntegratedProductSupportContentMessage is an <<exchange>> that represents a data set allowing to send all integrated product support (IPS) program information.
- 5.6.3.27.1 **Associations**
This class has the following associations:
- An aggregate association, to one related object of type **Message**
- 5.6.3.28 **IntegratedProductSupportData**
IntegratedProductSupportData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the primary data used in, and resulting from, the definition of IPS concepts and strategies.
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- 5.6.3.29 **IPSConcepts**
IPSConcepts is a wrapper element that contains all instances of **IPSCOncept** that are in scope for a data exchange.
- 5.6.3.30 **LocationDefinitions**
LocationDefinitions is a wrapper element that contains all instances of **LocationDefinition** that are in scope for a data exchange.
- 5.6.3.31 **MaintenanceLevels**
MaintenanceLevels is a wrapper element that contains all instances of **MaintenanceLevel** that are in scope for a data exchange.
- 5.6.3.32 **ManagementData**
ManagementData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the primary data used in, and resulting from, the IPS management-related activities and information.
- 5.6.3.33 **Meetings**
Meetings is a wrapper element that contains all instances of **Meeting** that are in scope for a data exchange.
- 5.6.3.34 **MessageData**
MessageData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the message-specific data.
- 5.6.3.35 **MiscellaneousData**
MiscellaneousData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the primary data used for miscellaneous purposes.
- 5.6.3.36 **OperatingLocationTypes**
OperatingLocationTypes is a wrapper element that contains all instances of **OperatingLocationType** that are in scope for a data exchange.
- 5.6.3.37 **OperationalData**
OperationalData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the primary data used in, and resulting from, the operations-related activities and information.
- 5.6.3.38 **OperationalRoles**
OperationalRoles is a wrapper element that contains all instances of **OperationalRole** that are in scope for a data exchange.
- 5.6.3.39 **OperationalScenarios**
OperationalScenarios is a wrapper element that contains all instances of **OperationalScenario** that are in scope for a data exchange.
- 5.6.3.40 **Organizations**
Organizations is a wrapper element that contains all instances of **Organization** that are in scope for a data exchange.

-
- 5.6.3.41 **PeopleAndOrganizationData**
PeopleAndOrganizationData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the primary data used in relationship with people and organizations.
- 5.6.3.42 **PerformanceParameters**
PerformanceParameters is a wrapper element that contains all instances of **PerformanceParameter** that are in scope for a data exchange.
- 5.6.3.43 **Persons**
Persons is a wrapper element that contains all instances of **Person** that are in scope for a data exchange.
- 5.6.3.44 **ProductData**
ProductData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the primary data used in, and resulting from, the product-related activities and information.
- 5.6.3.45 **Products**
Products is a wrapper element that contains all instances of **Product** that are in scope for a data exchange.
- 5.6.3.46 **ProjectData**
ProjectData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the primary data used in, and resulting from, the project-related activities and information.
- 5.6.3.47 **Projects**
Projects is a wrapper element that contains all instances of **Project** that are in scope for a data exchange.
- 5.6.3.48 **RegulatoryData**
RegulatoryData is a subset of the **IntegratedProductSupportContentMessage** dataset <<exchange>> that includes the primary data used in, and resulting from, the application of different laws and regulations.
- 5.6.3.49 **ReportableActivities**
ReportableActivities is a wrapper element that contains all instances of **ReportableActivity** that are in scope for a data exchange.
- 5.6.3.50 **Requirements**
Requirements is a wrapper element that contains all instances of **Requirement** that are in scope for a data exchange.
- 5.6.3.51 **ResourceSpecifications**
ResourceSpecifications is a wrapper element that contains all instances of **ResourceSpecification** that are in scope for a data exchange.
- 5.6.3.52 **SecurityClasses**
SecurityClasses is a wrapper element that contains all instances of **SecurityClass** that are in scope for a data exchange.

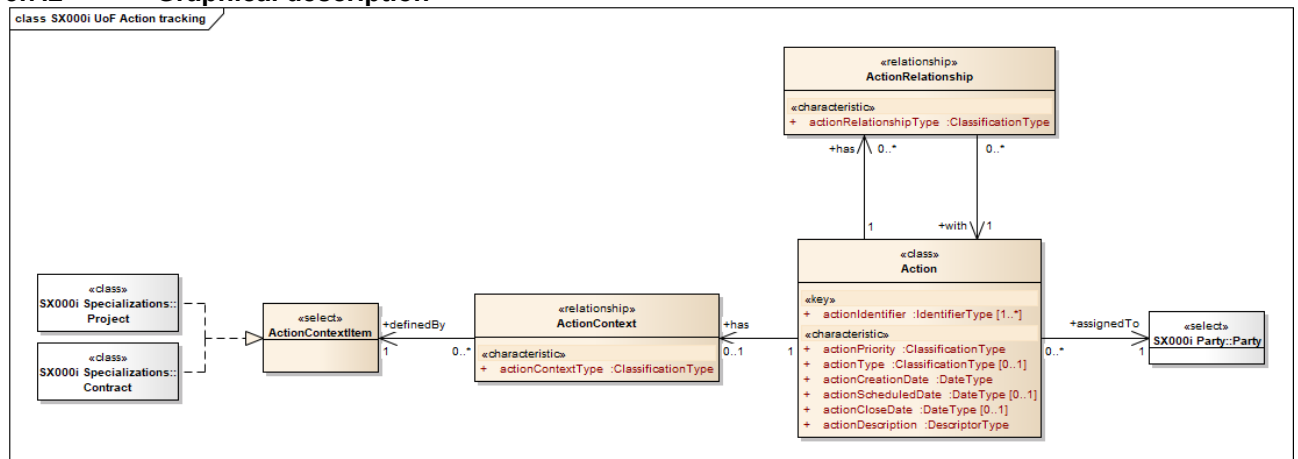
- 5.6.3.53 **Services**
Services is a wrapper element that contains all instances of **Service** that are in scope for a data exchange.
- 5.6.3.54 **Skills**
Skills is a wrapper element that contains all instances of **Skill** that are in scope for a data exchange.
- 5.6.3.55 **Trades**
Trades is a wrapper element that contains all instances of **Trade** that are in scope for a data exchange.
- 5.6.3.56 **TypesOfPersons**
TypesOfPersons is a wrapper element that contains all instances of **TypeOfPerson** that are in scope for a data exchange.
- 5.6.3.57 **WorkItems**
WorkItems is a wrapper element that contains all instances of **WorkItem** that are in scope for a data exchange.

5.7 SX000i UoF Action tracking

5.7.1 Description

The Action tracking UoF provides the capability to define and track the status of actions.

5.7.2 Graphical description



ICN-B6865-SX000i09004-001-01

Fig 12 SX000i UoF Action tracking

5.7.3 Class definition

5.7.3.1 Action

Action is a fact or process of doing something for the purpose of achieving an aim.

5.7.3.1.1 Attribute(s)

This class has the following attributes:

- actionIdentifier, one or many
- actionPriority
- actionType, zero or one
- actionCreationDate
- actionScheduledDate, zero or one
- actionCloseDate, zero or one
- actionDescription

5.7.3.1.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type [Meeting](#)
- A directed association, to zero or one objects of type [ActionContext](#)
- A directed association, to zero, one or many objects of type [ActionRelationship](#)
- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.7.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.7.3.2 ActionContext

[ActionContext](#) is a <<relationship>> that allows the association the context of an [Action](#).

5.7.3.2.1 Attribute(s)

This class has the following attributes:

- `actionContextType`

5.7.3.2.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [ActionContextItem](#)

5.7.3.3 ActionContextItem

[ActionContextItem](#) is a <<select>> interface that enables the selection of the context of an action.

5.7.3.3.1 Class members

This <<select>> interface includes the following class members:

- [Contract](#)
- [Project](#)

5.7.3.4 ActionRelationship

[ActionRelationship](#) is a <<relationship>> that associates different actions.

5.7.3.4.1 Attribute(s)

This class has the following attributes:

- `actionRelationshipType`

5.7.3.4.2 Associations

This class has the following associations:

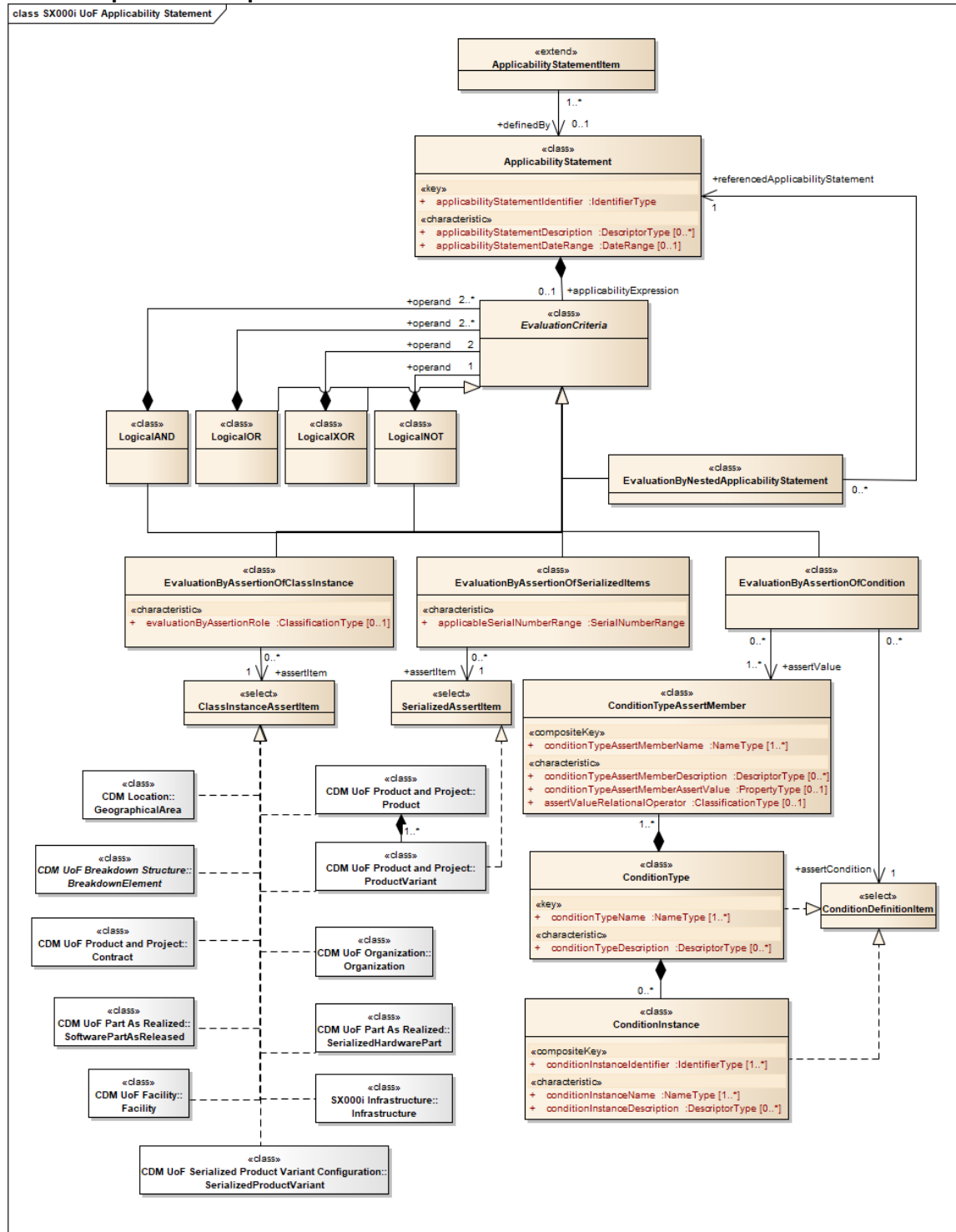
- A directed association, zero, one or many, to one object of type [Action](#)

5.8 SX000i UoF Applicability Statement

5.8.1 Description

The Applicability Statement UoF provides the capability to define the situation or situations under which related items are valid.

5.8.2 Graphical description



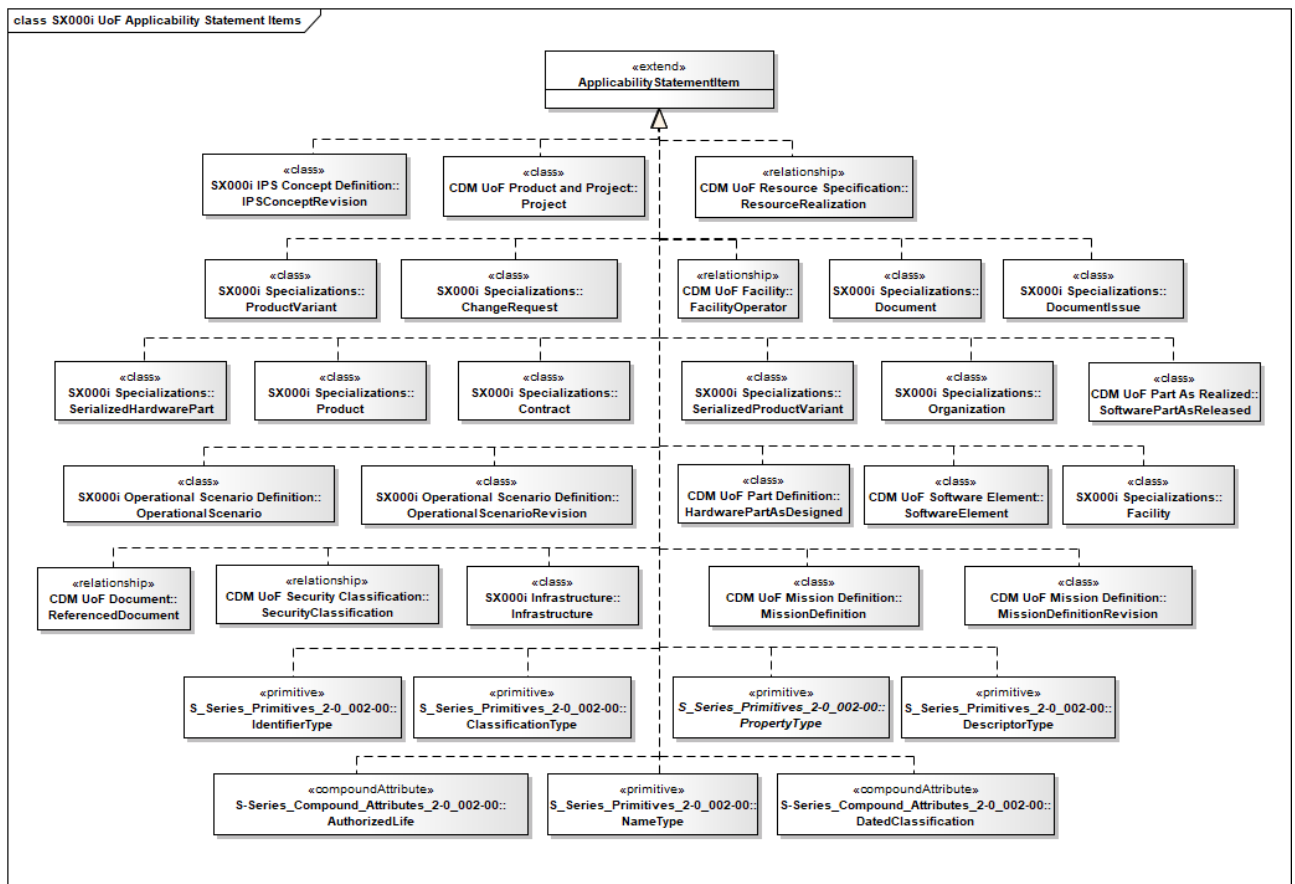
ICN-B6865-SX000I09005-001-01

Fig 13 SX000i UoF Applicability Statement

Applicable to: All

SX000i-A-09-00-0000-00A-040A-A

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Fig 14 SX000i UoF Applicability Statement Items

5.8.3 Class definition

5.8.3.1 ApplicabilityStatement

[ApplicabilityStatement](#) is a <<class>> that defines the situation or situations under which related items are valid.

5.8.3.1.1 Attribute(s)

This class has the following attributes:

- applicabilityStatementIdentifier
- applicabilityStatementDescription, zero, one or many
- applicabilityStatementDateRange, zero or one

5.8.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.2 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](#).

5.8.3.2.1 Class members

This <<extend>> interface includes the following class members:

- [AllowedProductConfigurationHardwarePartAsDesigned](#)
- [AuthorizedLife](#)
- [ChangeRequest](#)
- [ClassificationType](#)
- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)
- [Contract](#)
- [DatedClassification](#)
- [DescriptorType](#)
- [Document](#)
- [DocumentIssue](#)
- [ExportControlRegulation](#)
- [ExternalDocument](#)
- [Facility](#)
- [FacilityOperator](#)
- [Fleet](#)
- [HardwarePartAsDesigned](#)
- [IdentifierType](#)
- [Infrastructure](#)
- [IPSConceptRevision](#)
- [ITConceptRevision](#)
- [MaintenanceConceptRevision](#)
- [MaintenanceFacility](#)
- [MissionDefinition](#)
- [MissionDefinitionRevision](#)
- [MRONetwork](#)
- [NameType](#)
- [NumericalPropertyType](#)
- [OperatingBase](#)
- [OperationalConceptRevision](#)
- [OperationalScenario](#)
- [OperationalScenarioRevision](#)
- [OperatorOrganization](#)
- [Organization](#)
- [OtherFacility](#)
- [PoliciesAndRegulations](#)
- [Port](#)
- [PowerGrid](#)
- [Product](#)
- [ProductVariant](#)

- Project
- PropertyType
- ProvisioningConceptRevision
- ReferencedDocument
- Report
- Requirement
- ResourceRealization
- SecurityClassification
- SerializedHardwarePart
- SerializedProductVariant
- Service
- SingleValuePropertyType
- SoftwareElement
- SoftwarePartAsReleased
- TextPropertyType
- TrainingConceptRevision
- TrainingFacility
- TransportNetwork
- ValueRangePropertyType
- ValueWithTolerancesPropertyType
- Warehouse

5.8.3.2.2 *Associations*

This class has the following associations:

- A directed association, one or many, to zero or one objects of type [ApplicabilityStatement](#)

5.8.3.3 *ClassInstanceAssertItem*

[ClassInstanceAssertItem](#) is a <<select>> interface that identifies classes from which an instance can be used as the [EvaluationByAssertionOfClassInstance](#) assert item

5.8.3.3.1 *Class members*

This <<select>> interface includes the following class members:

- BreakdownElement
- CloudInfrastructure
- CommunicationsNetwork
- ComputerNetwork
- Contract
- Facility
- GeographicalArea
- Infrastructure
- MaintenanceFacility
- MRONetwork
- OperatingBase
- OperatorOrganization
- Organization
- OtherFacility
- Port

- [PowerGrid](#)
- [Product](#)
- [ProductVariant](#)
- [SerializedHardwarePart](#)
- [SerializedProductVariant](#)
- [SoftwareElement](#)
- [SoftwarePartAsReleased](#)
- [TrainingFacility](#)
- [TransportNetwork](#)
- [Warehouse](#)

5.8.3.4 [ConditionDefinitionItem](#)
[ConditionDefinitionItem](#) is a <<select>> interface that identifies classes from which an instance can be used as the [EvaluationByAssertionOfCondition](#) assert condition.

5.8.3.4.1 *Class members*
This <<select>> interface includes the following class members:

- [ConditionInstance](#)
- [ConditionType](#)

5.8.3.5 [ConditionInstance](#)
[ConditionInstance](#) is a <<class>> that defines an individual concept or object having the characteristics of a generic [ConditionType](#).

Example(s)

- Uniquely identified [Service](#) Bulletin

5.8.3.5.1 *Attribute(s)*
This class has the following attributes:

- [conditionInstanceIdIdentifier](#), one or many
- [conditionInstanceName](#), one or many
- [conditionInstanceDescription](#), zero, one or many

5.8.3.5.2 *Associations*
This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [ConditionType](#)

5.8.3.5.3 *Implementations*
This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.5.4 *Selects*
This class is a member of the following <<select>> interfaces:

-
- [ConditionDefinitionItem](#). Refer to SX000i Applicability Statement,
- 5.8.3.6 **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.
- Example(s)**
- Environmental conditions
- 5.8.3.6.1 **Attribute(s)**
This class has the following attributes:
- `conditionTypeName`, one or many
 - `conditionTypeDescription`, zero, one or many
- 5.8.3.6.2 **Implementations**
This class implements the following <<extend>> interfaces:
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
 - [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
 - [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
 - [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- 5.8.3.6.3 **Selects**
This class is a member of the following <<select>> interfaces:
- [ConditionDefinitionItem](#). Refer to SX000i Applicability Statement,
- 5.8.3.7 **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.
- 5.8.3.7.1 **Attribute(s)**
This class has the following attributes:
- `conditionTypeAssertMemberName`, one or many
 - `conditionTypeAssertMemberDescription`, zero, one or many
 - `conditionTypeAssertMemberAssertValue`, zero or one
 - `assertValueRelationalOperator`, zero or one
- 5.8.3.7.2 **Associations**
This class has the following associations:
- An aggregate association, one or many, to one related object of type [ConditionType](#)
- 5.8.3.7.3 **Implementations**
This class implements the following <<extend>> interfaces:
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
 - [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
-

- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.8 [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.

5.8.3.8.1 *Attribute(s)*

This class has the following attributes:

- [evaluationByAssertionRole](#), zero or one

5.8.3.8.2 *Associations*

This class has the following associations:

- An aggregate association ,[applicabilityExpression](#), zero or one, to one related object of type [ApplicabilityStatement](#)
- An aggregate association ,[evaluationExpression](#), zero or one, to one related object of type [ExpressionEvaluation](#)
- An aggregate association, [operand](#), to one related object of type [LogicalNOT](#)
- An aggregate association, [operand](#), two, to one related object of type [LogicalXOR](#)
- An aggregate association, [operand](#), two or many, to one related object of type [LogicalAND](#)
- An aggregate association, [operand](#), two or many, to one related object of type [LogicalOR](#)
- A directed association, zero, one or many, to object(s) from classes that are members of [ClassInstanceAssertItem](#)

5.8.3.8.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.9 [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.

5.8.3.9.1 *Associations*

This class has the following associations:

- An aggregate association ,[applicabilityExpression](#), zero or one, to one related object of type [ApplicabilityStatement](#)
- An aggregate association ,[evaluationExpression](#), zero or one, to one related object of type [ExpressionEvaluation](#)
- An aggregate association, [operand](#), to one related object of type [LogicalNOT](#)
- An aggregate association, [operand](#), two, to one related object of type [LogicalXOR](#)

- An aggregate association, operand, two or many, to one related object of type [LogicalAND](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalOR](#)
- A directed association, zero, one or many, to one or many objects of type [ConditionTypeAssertMember](#)
- A directed association, zero, one or many, to object(s) from classes that are members of [ConditionDefinitionItem](#)

5.8.3.9.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.10 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 FALSE.

5.8.3.10.1 Attribute(s)

This class has the following attributes:

- applicableSerialNumberRange

5.8.3.10.2 Associations

This class has the following associations:

- An aggregate association ,applicabilityExpression, zero or one, to one related object of type [ApplicabilityStatement](#)
- An aggregate association ,evaluationExpression, zero or one, to one related object of type [ExpressionEvaluation](#)
- An aggregate association, operand, to one related object of type [LogicalNOT](#)
- An aggregate association, operand, two, to one related object of type [LogicalXOR](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalAND](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalOR](#)
- A directed association, zero, one or many, to object(s) from classes that are members of [SerializedAssertItem](#)

5.8.3.10.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)

- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.11 **EvaluationByNestedApplicabilityStatement**
[EvaluationByNestedApplicabilityStatement](#) is an [EvaluationCriteria](#) that enables an [ApplicabilityStatement](#) to be reused as part of this [EvaluationCriteria](#).

Note

This class enables the definition of nested applicability statements.

5.8.3.11.1 **Associations**

This class has the following associations:

- An aggregate association ,applicabilityExpression, zero or one, to one related object of type [ApplicabilityStatement](#)
- An aggregate association ,evaluationExpression, zero or one, to one related object of type [ExpressionEvaluation](#)
- An aggregate association, operand, to one related object of type [LogicalNOT](#)
- An aggregate association, operand, two, to one related object of type [LogicalXOR](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalAND](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalOR](#)
- A directed association, zero, one or many, to one object of type [ApplicabilityStatement](#)

5.8.3.11.2 **Implementations**

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.12 **EvaluationCriteria**
[EvaluationCriteria](#) is a <<class>> that defines conditions that can be mapped to a Boolean expression which can be evaluated to be either TRUE or FALSE.

5.8.3.12.1 **Associations**

This class has the following associations:

- An aggregate association ,applicabilityExpression, zero or one, to one related object of type [ApplicabilityStatement](#)
- An aggregate association ,evaluationExpression, zero or one, to one related object of type [ExpressionEvaluation](#)
- An aggregate association, operand, to one related object of type [LogicalNOT](#)
- An aggregate association, operand, two, to one related object of type [LogicalXOR](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalAND](#)

- An aggregate association, operand, two or many, to one related object of type [LogicalOR](#)

5.8.3.12.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.13 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.

5.8.3.13.1 Associations

This class has the following associations:

- An aggregate association ,applicabilityExpression, zero or one, to one related object of type [ApplicabilityStatement](#)
- An aggregate association ,evaluationExpression, zero or one, to one related object of type [ExpressionEvaluation](#)
- An aggregate association, operand, to one related object of type [LogicalNOT](#)
- An aggregate association, operand, two, to one related object of type [LogicalXOR](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalAND](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalOR](#)

5.8.3.13.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.14 LogicalNOT

[LogicalNOT](#) is an [EvaluationCriteria](#) that defines a Boolean operation where the result from its associated [EvaluationCriteria](#) must be FALSE for the result to be TRUE, otherwise the result is FALSE.

5.8.3.14.1 Associations

This class has the following associations:

- An aggregate association ,applicabilityExpression, zero or one, to one related object of type [ApplicabilityStatement](#)

- An aggregate association ,evaluationExpression, zero or one, to one related object of type [ExpressionEvaluation](#)
- An aggregate association, operand, to one related object of type [LogicalNOT](#)
- An aggregate association, operand, two, to one related object of type [LogicalXOR](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalAND](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalOR](#)

5.8.3.14.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.15 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.

5.8.3.15.1 Associations

This class has the following associations:

- An aggregate association ,applicabilityExpression, zero or one, to one related object of type [ApplicabilityStatement](#)
- An aggregate association ,evaluationExpression, zero or one, to one related object of type [ExpressionEvaluation](#)
- An aggregate association, operand, to one related object of type [LogicalNOT](#)
- An aggregate association, operand, two, to one related object of type [LogicalXOR](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalAND](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalOR](#)

5.8.3.15.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.16 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.

5.8.3.16.1 Associations

This class has the following associations:

- An aggregate association ,applicabilityExpression, zero or one, to one related object of type [ApplicabilityStatement](#)
- An aggregate association ,evaluationExpression, zero or one, to one related object of type [ExpressionEvaluation](#)
- An aggregate association, operand, to one related object of type [LogicalNOT](#)
- An aggregate association, operand, two, to one related object of type [LogicalXOR](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalAND](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalOR](#)

5.8.3.16.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.8.3.17 SerializedAssertItem

[SerializedAssertItem](#) is a <<select>> interface that identifies classes from which an instance can be used as the [EvaluationByAssertionOfSerializedItems](#) assert item

5.8.3.17.1 Class members

This <<select>> interface includes the following class members:

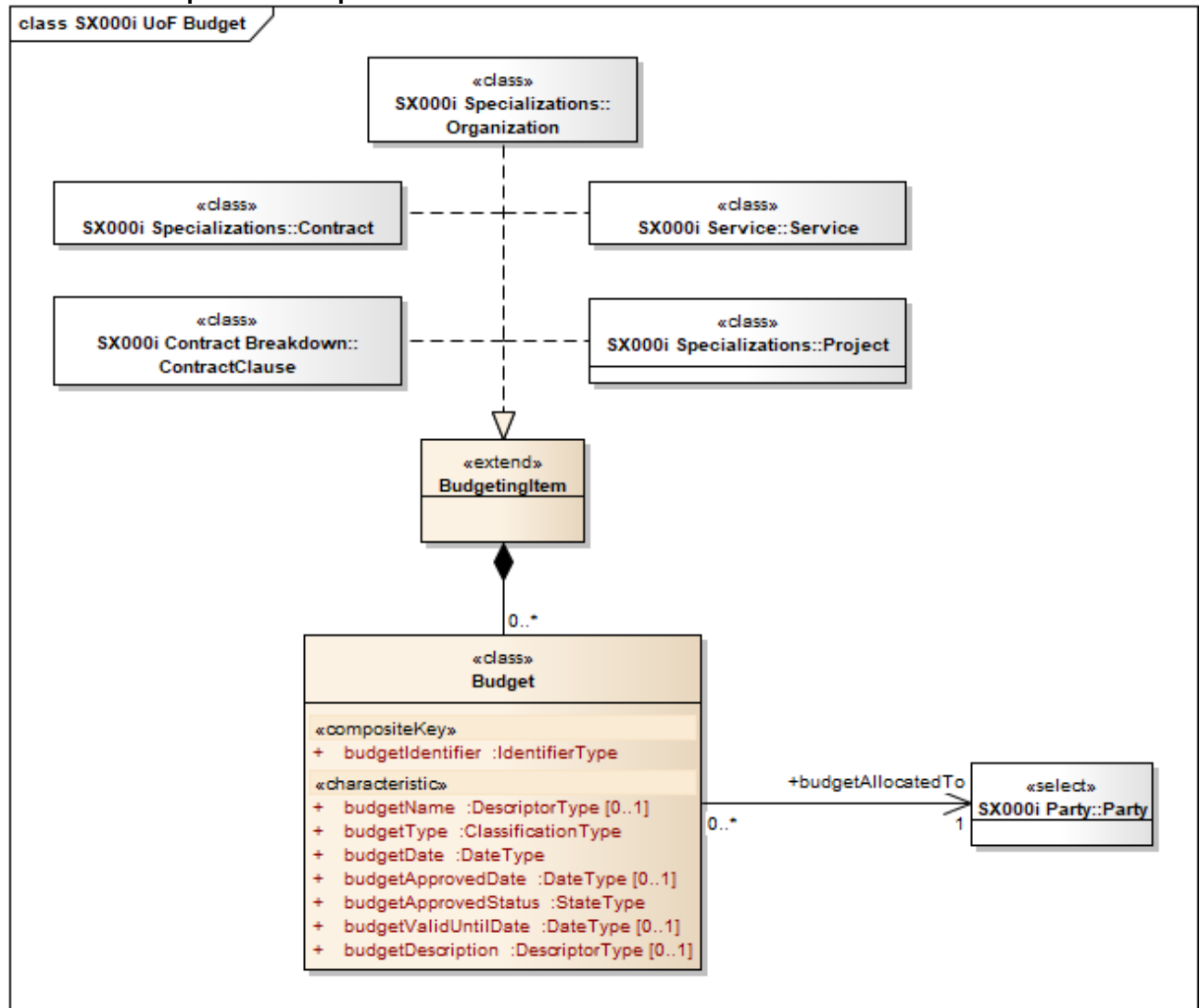
- [Product](#)
- [ProductVariant](#)

5.9 SX000i UoF Budget

5.9.1 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.

5.9.2 Graphical description



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Fig 15 SX000i UoF Budget

5.9.3 Class definition

5.9.3.1 Budget

Budget is a <<class>> representing a cost proposal to perform a specific service or provide a certain item.

5.9.3.1.1 Attribute(s)

This class has the following attributes:

- budgetIdentifier
- budgetName, zero or one
- budgetType
- budgetDate
- budgetApprovedDate, zero or one
- budgetApprovedStatus
- budgetValidUntilDate, zero or one
- budgetDescription, zero or one

5.9.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [BudgetingItem](#)
- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.9.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.9.3.2 BudgetingItem

[BudgetingItem](#) is an <<extend>> interface that enables the association of [Budgets](#) to specific items.

5.9.3.2.1 Class members

This <<extend>> interface includes the following class members:

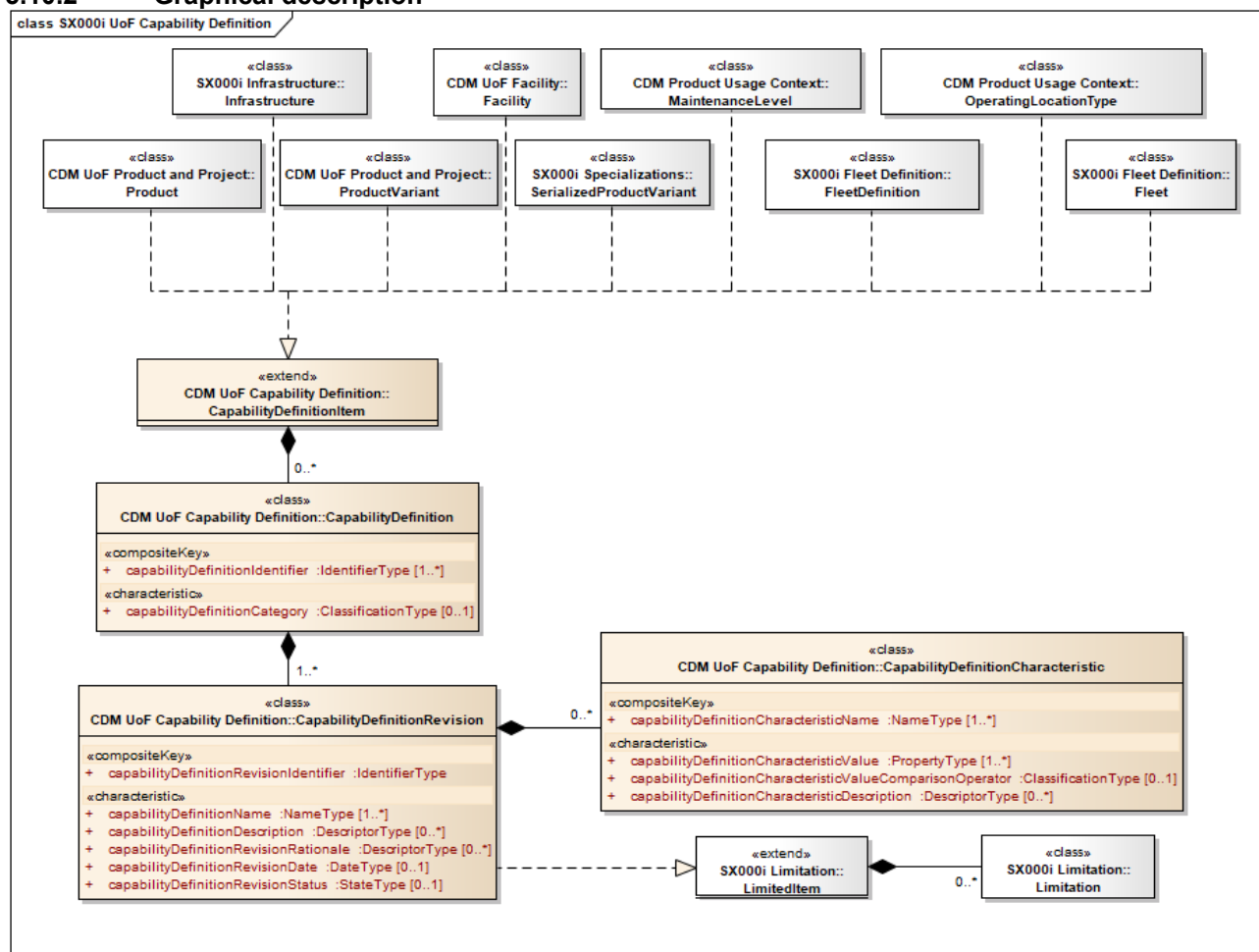
- [Contract](#)
- [ContractClause](#)
- [OperatorOrganization](#)
- [Organization](#)
- [Project](#)
- [Service](#)
- [ServiceLevelAgreementClause](#)

5.10 SX000i UoF Capability Definition

5.10.1 Description

Capability Definition UoF provides the possibility to define a Capability that can be associated to existing items and identify potential limitations to that Capability.

5.10.2 Graphical description



ICN-B6865-SX000I09007-001-01

Fig 16 SX000i UoF Capability Definition

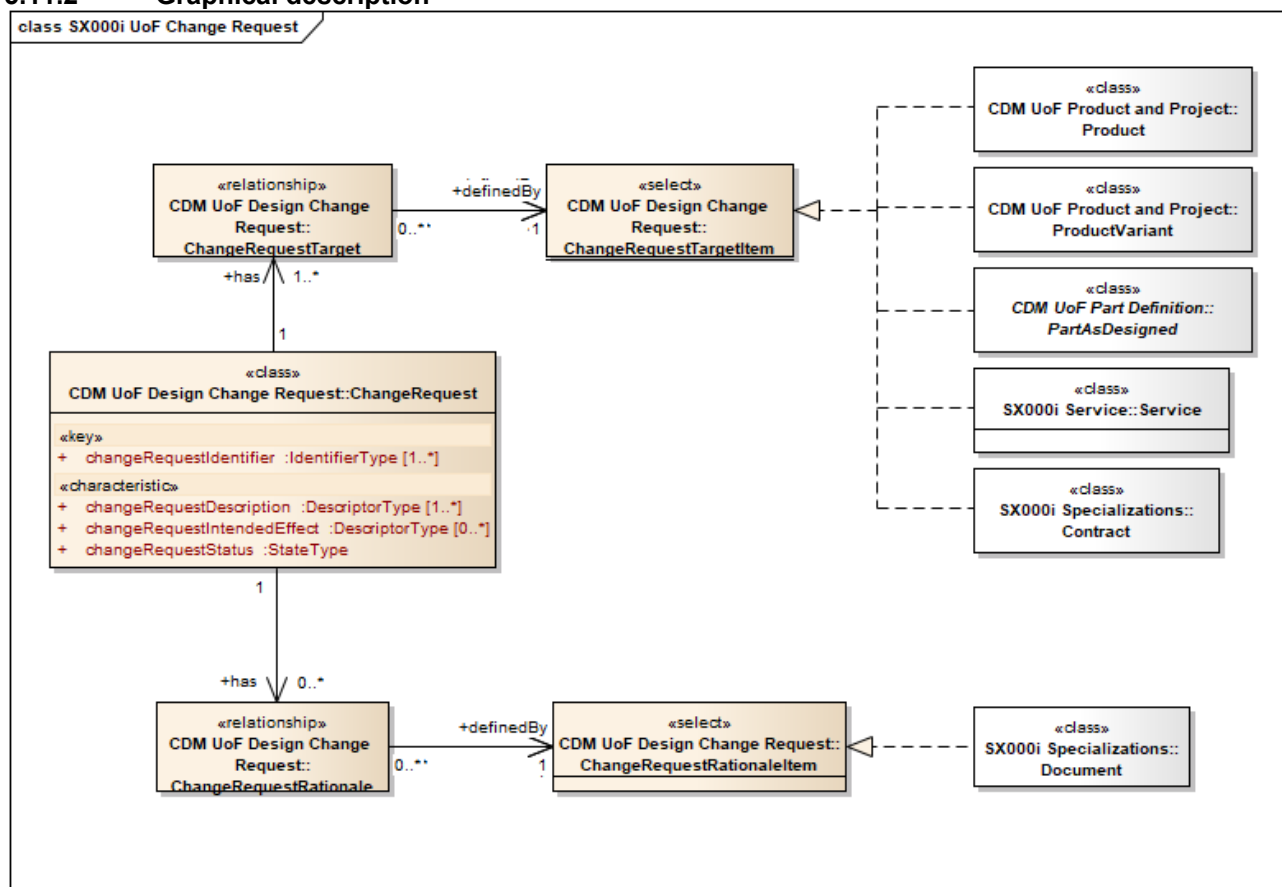
5.10.3 Class definition

5.11 SX000i UoF Change Request

5.11.1 Description

The Change Request UoF provides the capability to identify proposed changes against items, including the rationale for this change.

5.11.2 Graphical description



ICN-B6865-SX000i09078-001-01

Fig 17 SX000i UoF Change Request

5.11.3 Class definition

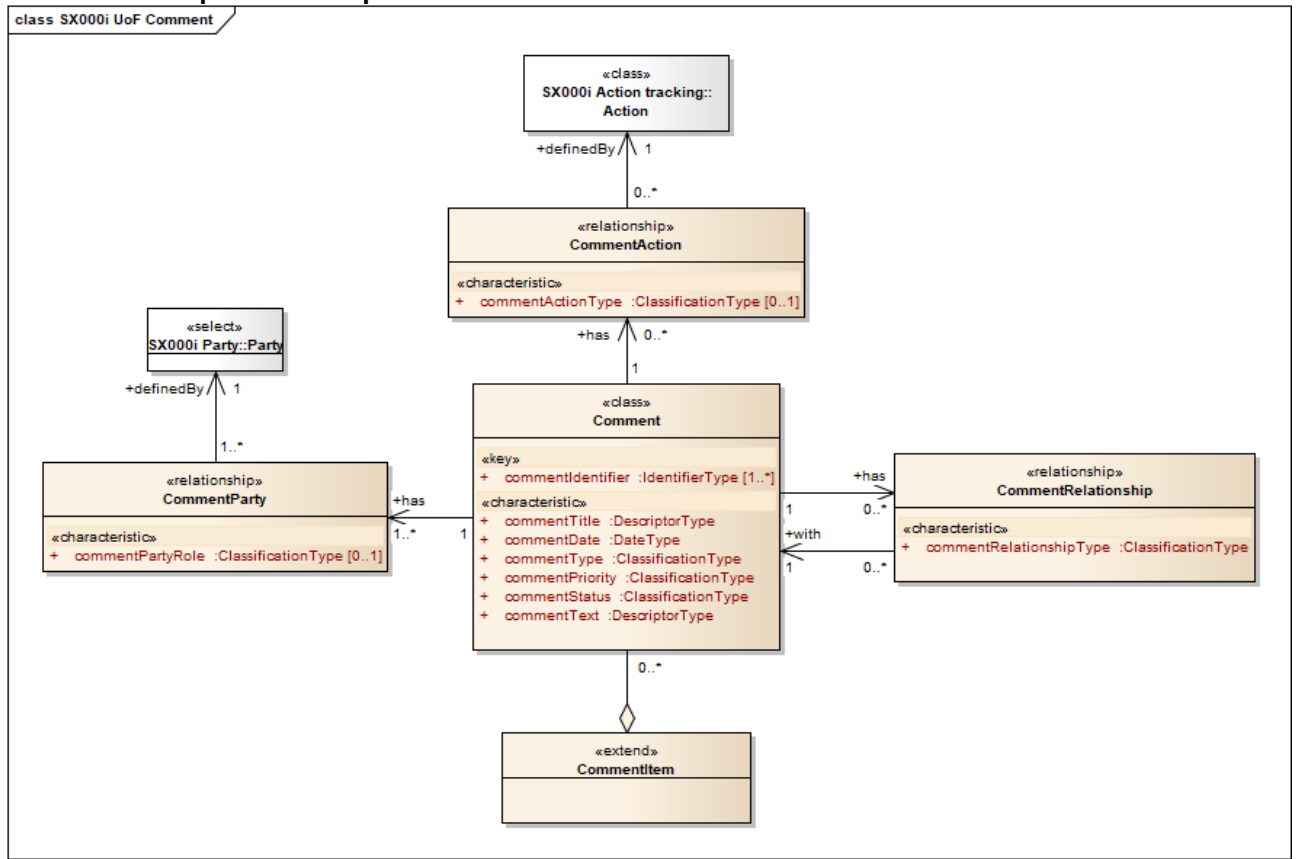
Refer to SX002D.

5.12 SX000i UoF Comment

5.12.1 Description

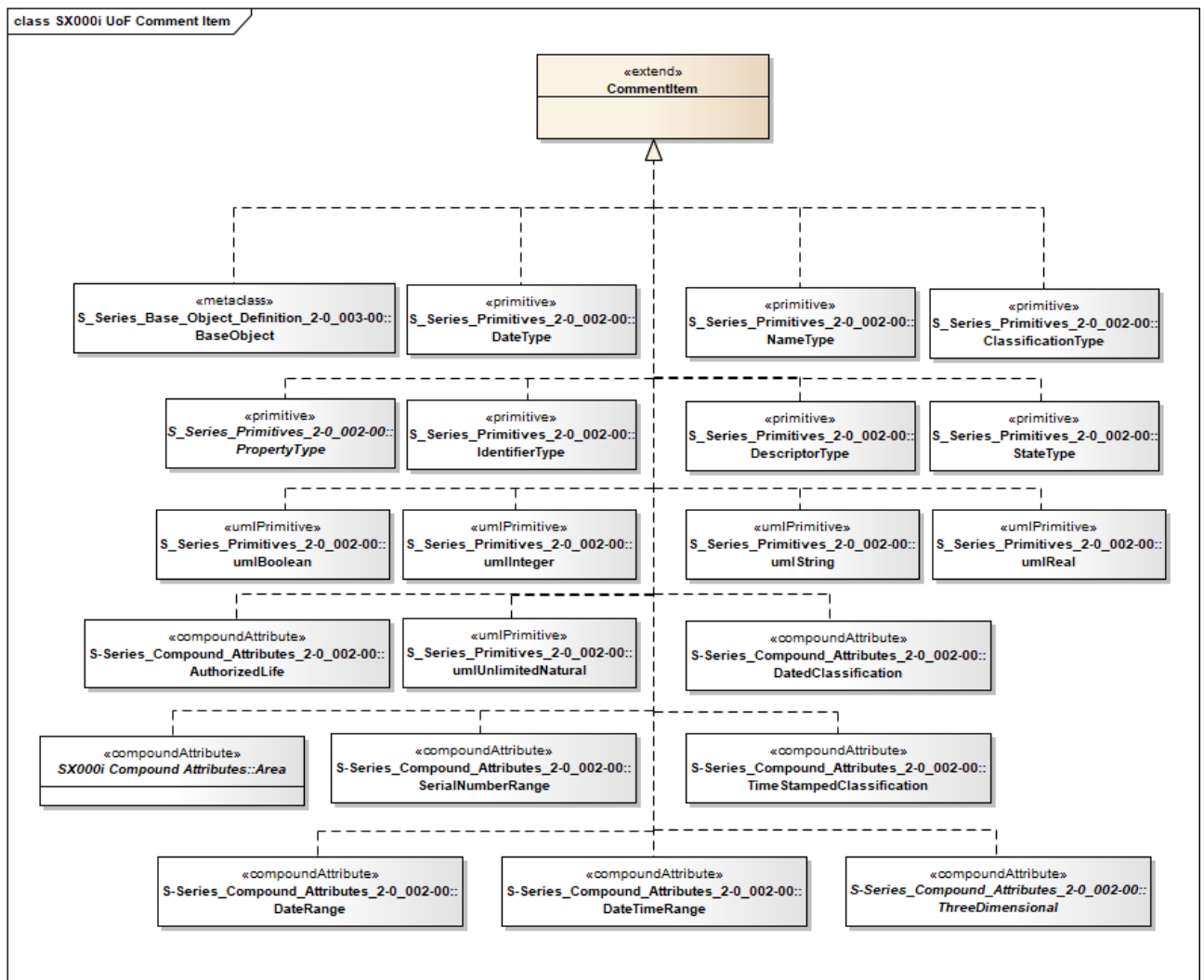
The Comment UoF defines the capability to provide comments on any feedback class.

5.12.2 Graphical description



ICN-B6865-SX000I09008-001-01

Fig 18 SX000i UoF Comment



ICN-B6865-SX000I09066-001-01

Fig 19 SX000i UoF Comment Item

5.12.3 Class definition

5.12.3.1 Comment

Comment is a textual statement about a related item that deals with an issue associated to that item that needs to be addressed.

5.12.3.1.1 Attribute(s)

This class has the following attributes:

- commentIdentifier, one or many
- commentTitle
- commentDate
- commentType
- commentPriority
- commentStatus
- commentText

5.12.3.1.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type [CommentItem](#)
- A directed association, to one or many objects of type [CommentParty](#)
- A directed association, to zero, one or many objects of type [CommentAction](#). A [Comment](#) can relate to zero, one or many [Actions](#) (via the [CommentAction](#) <<irelationship>>)
- A directed association, to zero, one or many objects of type [CommentRelationship](#). Each [Comment](#) can relate to zero, one or many [Comments](#) (via dhe [CommentRelationship](#) <<relationship>> class

5.12.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.12.3.2 CommentAction

[CommentAction](#) is a <<relationship>> that allows the association a [Comment](#) to one or several [Actions](#) performed in response to the [Comment](#).

5.12.3.2.1 Attribute(s)

This class has the following attributes:

- `commentActionType`, zero or one

5.12.3.2.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [Action](#)

5.12.3.3 CommentItem

[CommentItem](#) is an <<extend>> interface allowing to establish an association between an item and the comments that are associated to it.

5.12.3.3.1 Class members

This <<extend>> interface includes the following class members:

- [Action](#)
- [AllowedProductConfigurationByConfigurationIdentifier](#)
- [AllowedProductConfigurationHardwarePartAsDesigned](#)
- [ApplicabilityStatement](#)
- [Area](#)
- [AuthorizedLife](#)
- [BreakdownElement](#)
- [Budget](#)
- [CapabilityDefinition](#)
- [CapabilityDefinitionCharacteristic](#)
- [CapabilityDefinitionRevision](#)

- ChangeRequest
- Circle
- ClassificationType
- CloudInfrastructure
- Comment
- CommunicationsNetwork
- ComputerNetwork
- ConditionInstance
- ConditionType
- ConditionTypeAssertMember
- Contract
- ContractClause
- ContractClauseRelationship
- ContractDeliverable
- CostBreakdown
- CostBreakdownRevision
- CostEntry
- CostItem
- Country
- CourseDefinition
- Cuboid
- Cylinder
- DataElement
- DatasetDefinition
- DatedClassification
- DateRange
- DateTimeRange
- DateTimeType
- DateType
- DescriptorType
- DigitalFile
- Document
- DocumentIssue
- EnvironmentDefinition
- EnvironmentDefinitionCharacteristic
- EnvironmentDefinitionRevision
- EvaluationByAssertionOfClassInstance
- EvaluationByAssertionOfCondition
- EvaluationByAssertionOfSerializedItems
- EvaluationByNestedApplicabilityStatement
- EvaluationByNestedExpression
- EvaluationCriteria
- ExportControlLicense
- ExportControlRegulation
- ExpressionEvaluation
- ExternalDocument
- Facility
- Fleet

- FleetDefinition
- GeographicalArea
- GlobalPosition
- HardwarePartAsDesigned
- IdentifierType
- Infrastructure
- InfrastructureRevision
- InstructionalStrategy
- InstructionalStrategyRevision
- IPSConcept
- IPSConceptRevision
- ITArchitectureNode
- ITConcept
- ITConceptRevision
- ItemPlanning
- Limitation
- LocationDefinition
- LocationDefinitionRevision
- LogicalAND
- LogicalNOT
- LogicalOR
- LogicalXOR
- MaintenanceConcept
- MaintenanceConceptRevision
- MaintenanceFacility
- MaintenanceLevel
- Meeting
- MeetingAgreement
- Message
- Milestone
- MissionDefinition
- MissionDefinitionRevision
- MRONetwork
- NameType
- NumericalPropertyType
- OperatingBase
- OperatingLocationType
- OperationalConcept
- OperationalConceptRevision
- OperationalRole
- OperationalScenario
- OperationalScenarioRevision
- OperatorOrganization
- OperatorPerson
- Organization
- OrganizationalBreakdownStructureRevision
- OtherFacility
- PartAsDesigned

- PerformanceParameter
- PerformanceParameterRevision
- Person
- PoliciesAndRegulations
- Pool
- Port
- PowerGrid
- Product
- ProductUsagePhase
- ProductVariant
- Project
- ProjectSpecificAttribute
- PropertyType
- ProvisioningConcept
- ProvisioningConceptRevision
- Rectangle
- Report
- ReportableActivity
- ReportableMetric
- Requirement
- ResourceSpecification
- ResourceSpecificationRevision
- Risk
- RiskMitigationPlan
- S1000DDataModule
- S1000DDataModuleIssue
- S1000DPublicationModule
- S1000DPublicationModuleIssue
- SecurityClass
- SerializedHardwarePart
- SerializedProductVariant
- SerialNumberRange
- Service
- ServiceLevelAgreementClause
- SingleValuePropertyType
- Skill
- SkillLevel
- SoftwareElement
- SoftwarePartAsReleased
- Sphere
- StateType
- StreetAddress
- TextPropertyType
- ThreeDimensional
- TimeStampedClassification
- Trade
- TrainingConcept
- TrainingConceptRevision

- TrainingFacility
- TransportNetwork
- Triangle
- TypeOfPerson
- umlBoolean
- umlInteger
- umlReal
- umlString
- umlUnlimitedNatural
- ValueRangePropertyType
- ValueWithTolerancesPropertyType
- Warehouse
- WorkBreakdown
- WorkBreakdownRevision
- WorkItem

5.12.3.4 **CommentParty**
CommentParty is a <<relationship>> defining the association between a **Comment** and a **Party**.

Example(s)

- **Comment** raised by organization XYZ.

5.12.3.4.1 **Attribute(s)**
This class has the following attributes:

- commentPartyRole, zero or one

5.12.3.4.2 **Associations**
This class has the following associations:

- A directed association, one or many, to object(s) from classes that are members of **Party**

5.12.3.5 **CommentRelationship**
CommentRelationship is a <<relationship>> that defines the association between two different **Comments**.

5.12.3.5.1 **Attribute(s)**
This class has the following attributes:

- commentRelationshipType

5.12.3.5.2 **Associations**
This class has the following associations:

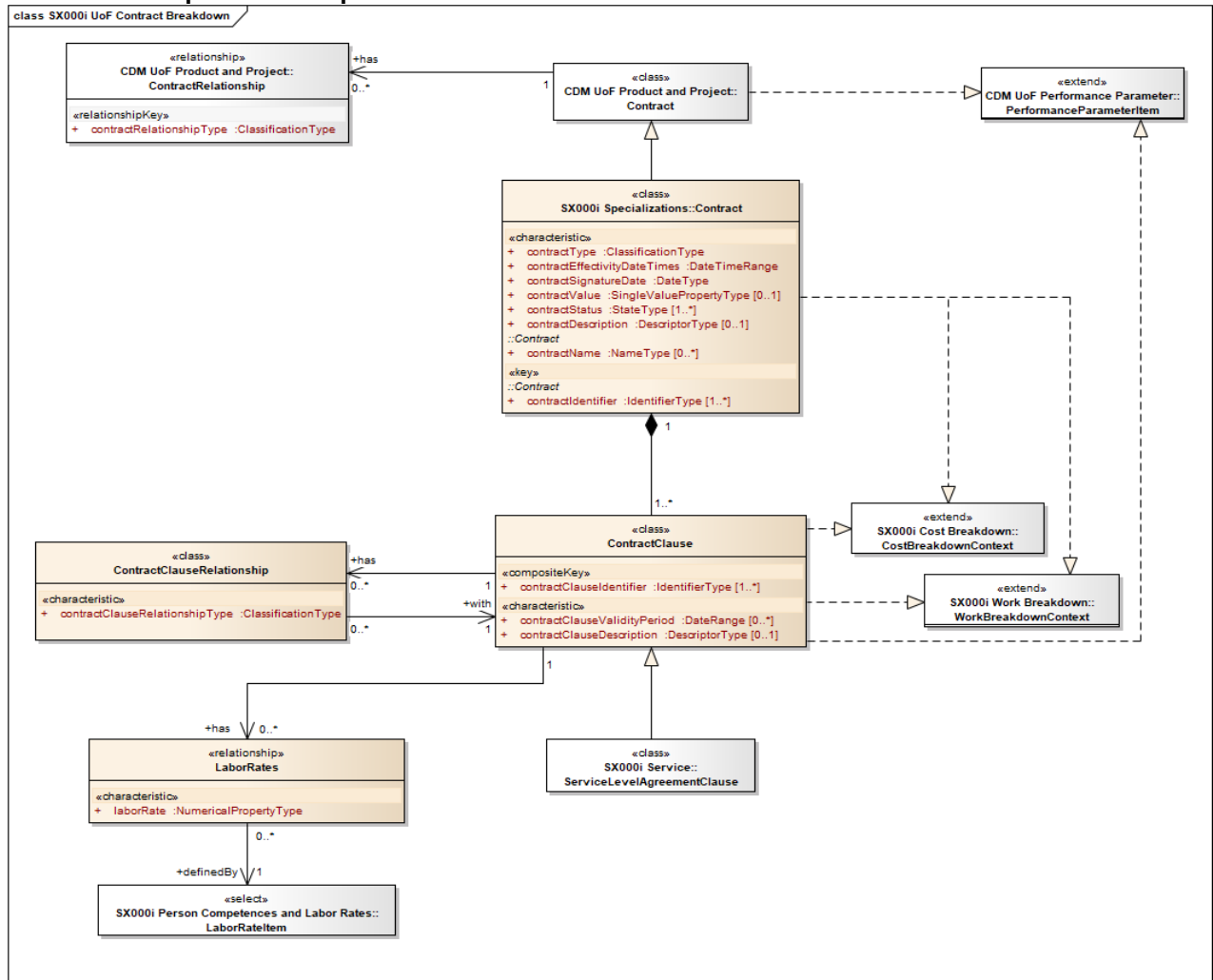
- A directed association, zero, one or many, to one object of type **Comment**

5.13 **SX000i UoF Contract Breakdown**

5.13.1 **Description**

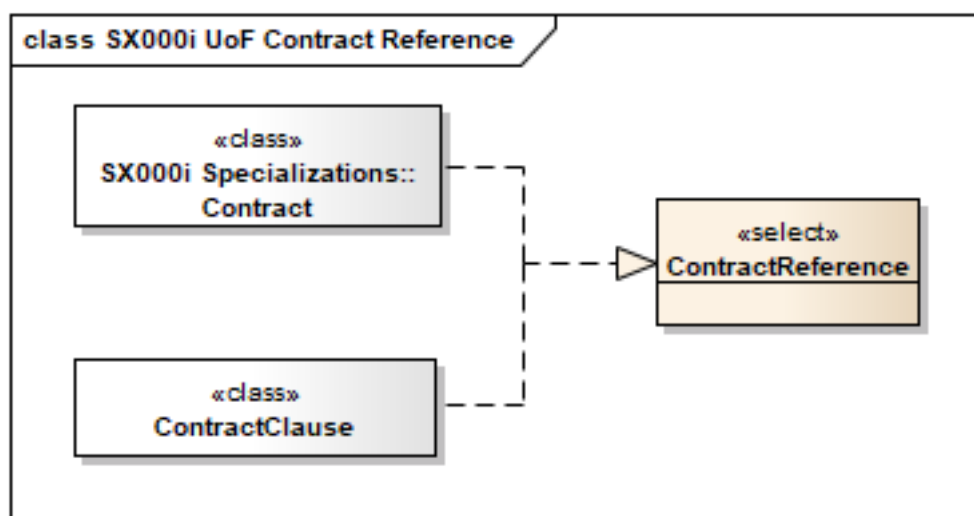
The Contract Breakdown UoF provides the capability to define the breakdown for a **Contract**.

5.13.2 Graphical description



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Fig 20 SX000i UoF Contract Breakdown



ICN-B6865-SX000I09067-001-01

Fig 21 SX000i UoF Contract Reference

5.13.3 Class definition

5.13.3.1 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.

5.13.3.1.1 Attribute(s)

This class has the following attributes:

- [contractClauseIdentifier](#), one or many
- [contractClauseValidityPeriod](#), zero, one or many
- [contractClauseDescription](#), zero or one

5.13.3.1.2 Associations

This class has the following associations:

- An aggregate association, one or many, to one related object of type [Contract](#)
- A directed association, to zero, one or many objects of type [ContractClauseRelationship](#)
- A directed association, to zero, one or many objects of type [LaborRates](#)

5.13.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [BudgetingItem](#). Refer to SX000i UoF Budget, [Para 5.13](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [ContractingRequirement](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [PerformanceParameterItem](#). Refer to SX000i UoF Performance Parameter, [Para 5.45](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.13.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- [ContractReference](#). Refer to SX000i [Contract Breakdown](#),

5.13.3.2 ContractClauseRelationship

[ContractClauseRelationship](#) is a <<relationship>> that associates different [ContractClauses](#).

5.13.3.2.1 *Attribute(s)*

This class has the following attributes:

- `contractClauseRelationshipType`

5.13.3.2.2 *Associations*

This class has the following associations:

- A directed association, zero, one or many, to one object of type [ContractClause](#)
- A directed association, zero, one or many, to one object of type [ServiceLevelAgreementClause](#)

5.13.3.2.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.13.3.3 *ContractReference*

[ContractReference](#) is a <<select>> interface that enables the referencing of a contract or contract clause.

5.13.3.3.1 *Class members*

This <<select>> interface includes the following class members:

- [Contract](#)
- [ContractClause](#)
- [ServiceLevelAgreementClause](#)

5.13.3.4 *LaborRates*

[LaborRates](#) is a <<relationship>> that assigns labor rates to different skills, skill levels and trades.

5.13.3.4.1 *Attribute(s)*

This class has the following attributes:

- `laborRate`

5.13.3.4.2 *Associations*

This class has the following associations:

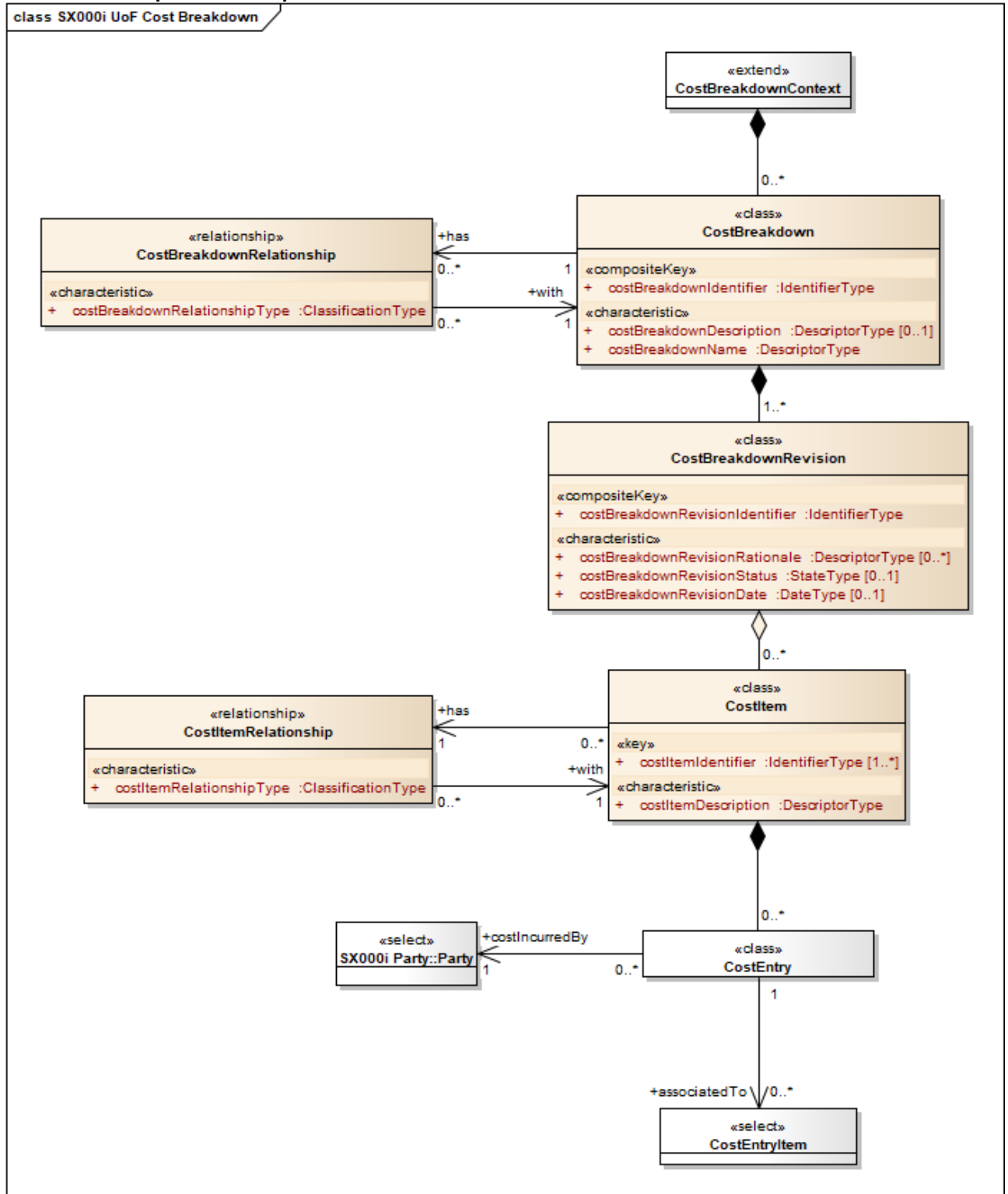
- A directed association, zero, one or many, to object(s) from classes that are members of [LaborRateItem](#)

5.14 **SX000i UoF Cost Breakdown**

5.14.1 **Description**

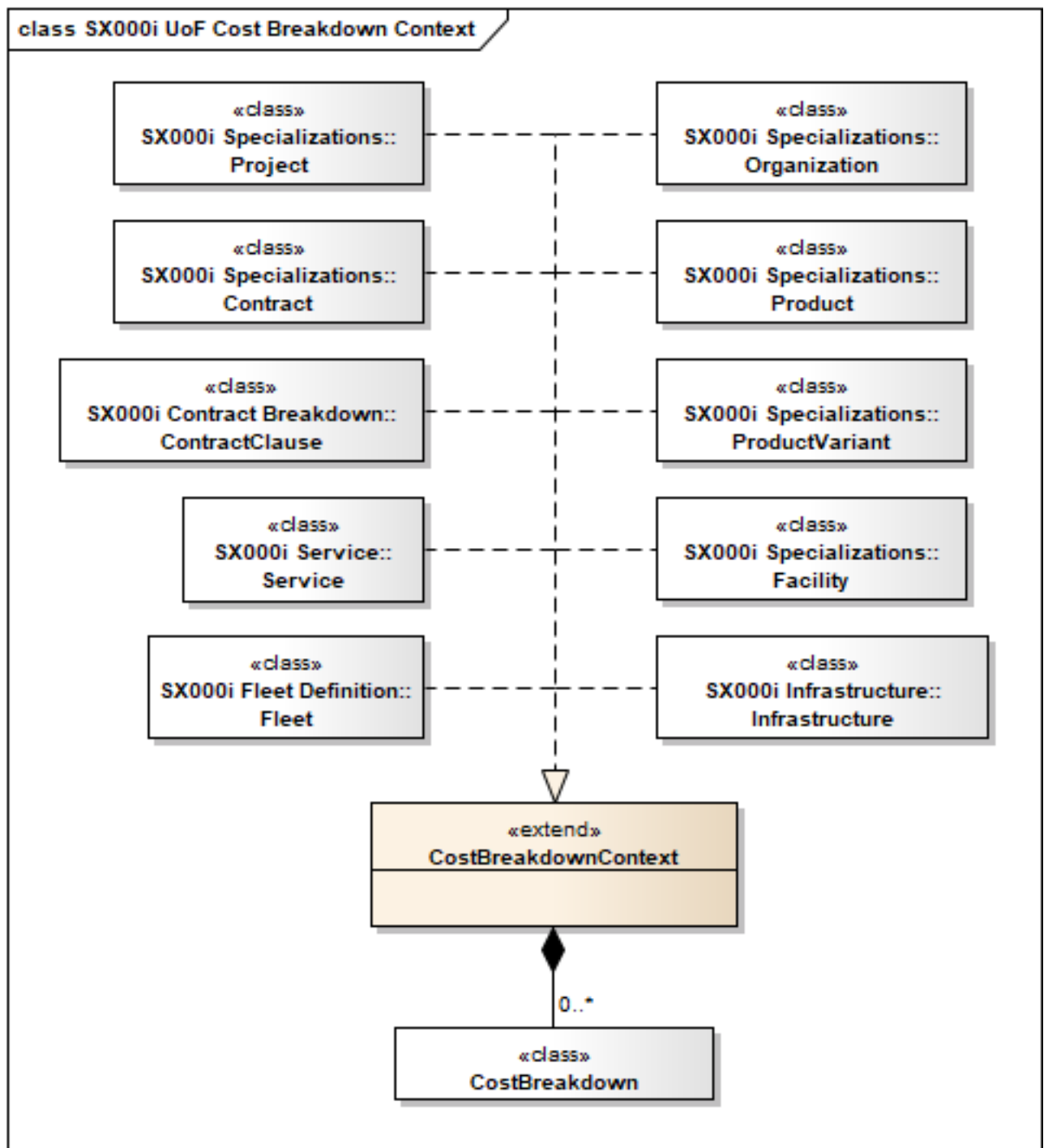
The Cost Breakdown UoF provides the capability to define a cost breakdown structure (CBS).

5.14.2 Graphical description



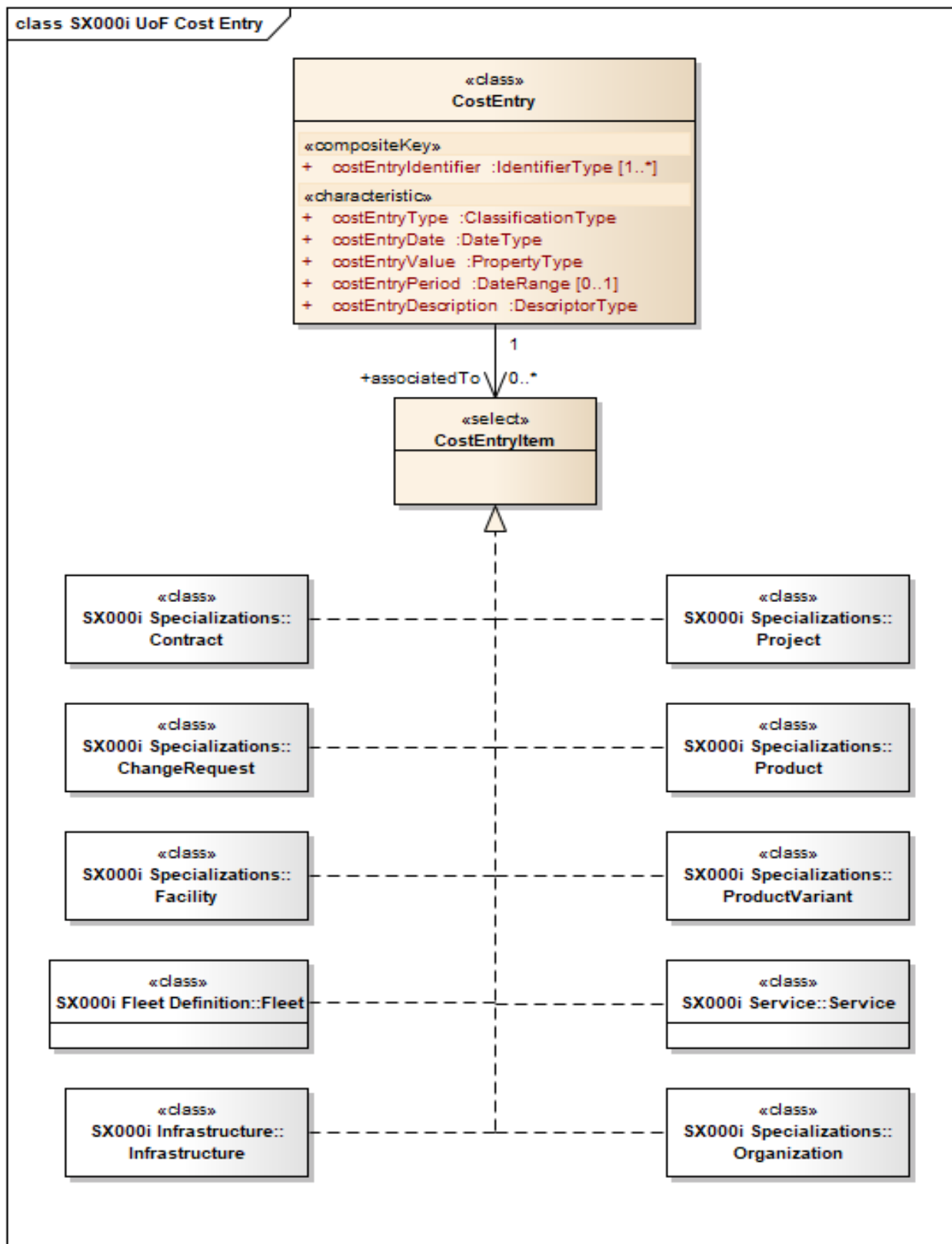
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Fig 22 SX000i UoF Cost Breakdown



ICN-B6865-SX000I09068-001-01

Fig 23 SX000i UoF Cost Breakdown Context



ICN-B6865-SX000I09069-001-01

Fig 24 SX000i UoF Cost Entry

5.14.3 Class definition

5.14.3.1 CostBreakdown

[CostBreakdown](#) is a <<class>> used to group all the different cost concepts associated to a particular purpose.

5.14.3.1.1 Attribute(s)

This class has the following attributes:

- [costBreakdownIdentifier](#)
- [costBreakdownDescription](#), zero or one
- [costBreakdownName](#)

5.14.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [CostBreakdownContext](#)
- A directed association, to zero, one or many objects of type [CostBreakdownRelationship](#)

5.14.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.14.3.2 CostBreakdownContext

[CostBreakdownContext](#) is an <<extend>> interface that enables the assignment of a [CostBreakdown](#) to an item.

5.14.3.2.1 Class members

This <<extend>> interface includes the following class members:

- [BreakdownElement](#)
- [Budget](#)
- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)
- [Contract](#)
- [ContractClause](#)
- [Facility](#)
- [Fleet](#)
- [Infrastructure](#)
- [MaintenanceFacility](#)
- [MRONetwork](#)
- [OperatingBase](#)
- [OperatorOrganization](#)
- [Organization](#)
- [OtherFacility](#)

- Port
- PowerGrid
- Product
- ProductVariant
- Project
- Project
- SerializedHardwarePart
- SerializedProductVariant
- Service
- ServiceLevelAgreementClause
- SoftwareElement
- TrainingFacility
- TransportNetwork
- Warehouse

5.14.3.3 **CostBreakdownRelationship**
[CostBreakdownRelationship](#) is a <<relationship>> that defines associations between two different CostBreakdowns.

5.14.3.3.1 **Attribute(s)**
 This class has the following attributes:

- costBreakdownRelationshipType

5.14.3.3.2 **Associations**
 This class has the following associations:

- A directed association, zero, one or many, to one object of type [CostBreakdown](#)

5.14.3.4 **CostBreakdownRevision**
[CostBreakdownRevision](#) is an iteration that is applied to a [CostItem](#).

5.14.3.4.1 **Attribute(s)**
 This class has the following attributes:

- costBreakdownRevisionIdentifier
- costBreakdownRevisionRationale, zero, one or many
- costBreakdownRevisionStatus, zero or one
- costBreakdownRevisionDate, zero or one

5.14.3.4.2 **Associations**
 This class has the following associations:

- An aggregate association, one or many, to one related object of type [CostBreakdown](#)

5.14.3.4.3 **Implementations**
 This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.14.3.5 CostEntry

[CostEntry](#) is an individual expense made at a specific date for a specific amount that needs to be recorded for accounting purposes.

5.14.3.5.1 Attribute(s)

This class has the following attributes:

- [costEntryIdentifier](#), one or many
- [costEntryType](#)
- [costEntryDate](#)
- [costEntryValue](#)
- [costEntryPeriod](#), zero or one
- [costEntryDescription](#)

5.14.3.5.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [CostItem](#)
- A directed association, to object(s) from classes that are members of [CostEntryItem](#)
- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.14.3.5.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.14.3.5.4 Selects

This class is a member of the following <<select>> interfaces:

- [ReportableItem](#). Refer to SX000i UoF Report, [Para 5.59](#)

5.14.3.6 CostEntryItem

A [CostEntryItem](#) is a <<select>> interface that associates a [CostEntry](#) to the item whose cost must be incurred.

5.14.3.6.1 Class members

This <<select>> interface includes the following class members:

- [ChangeRequest](#)
- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)
- [Contract](#)
- [Facility](#)
- [Fleet](#)
- [Infrastructure](#)

- MaintenanceFacility
- MRONetwork
- OperatingBase
- OperatorOrganization
- OperatorPerson
- Organization
- OtherFacility
- Person
- Port
- PowerGrid
- Product
- Product
- ProductVariant
- Project
- ReportableActivity
- SerializedHardwarePart
- SerializedProductVariant
- Service
- TrainingFacility
- TransportNetwork
- Warehouse

5.14.3.7 CostItem

[CostItem](#) is a <<class>> representing a generic concept to group individual expenses for accounting or program management purposes.

Note

A same [CostItem](#) can be associated to several instances of [CostBreakdownRevision](#).

5.14.3.7.1 Attribute(s)

This class has the following attributes:

- costItemIdentifier, one or many
- costItemDescription

5.14.3.7.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type [CostBreakdownRevision](#)
- A directed association, zero, one or many, to one object of type [CostItemRelationship](#)

5.14.3.7.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.14.3.8 **CostItemRelationship**
[CostItemRelationship](#) is a <<relationship>> that establishes the association between two different instances of [CostItem](#).

5.14.3.8.1 **Attribute(s)**
This class has the following attributes:

- `costItemRelationshipType`

5.14.3.8.2 **Associations**
This class has the following associations:

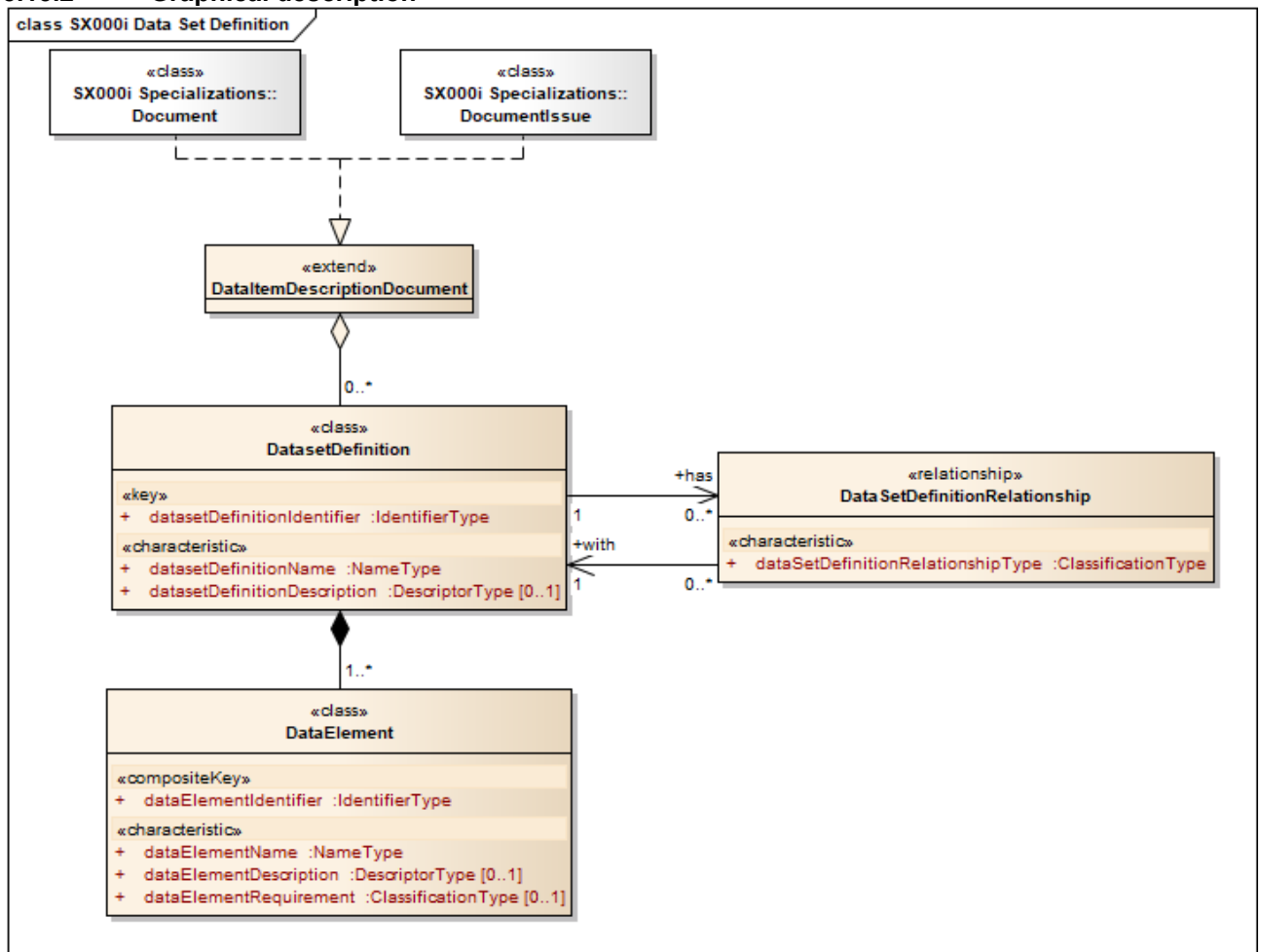
- A directed association, zero, one or many, to one object of type [CostItem](#)

5.15 SX000i UoF Data Set Definition

5.15.1 Description

The Data Set Definition UoF provides the capability to define data sets that must be delivered as part of a [Contract](#).

5.15.2 Graphical description



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Fig 25 SX000i Data Set Definition

5.15.3 Class definition

5.15.3.1 DataElement

[DataElement](#) is a <<class>> representing the smallest named item of data that conveys meaningful information or condenses a lengthy description into a short code.

5.15.3.1.1 Attribute(s)

This class has the following attributes:

- dataElementIdentifier
- dataElementName
- dataElementDescription, zero or one
- dataElementRequirement, zero or one

5.15.3.1.2 Associations

This class has the following associations:

- An aggregate association, one or many, to one related object of type [DatasetDefinition](#)

5.15.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.15.3.2 DataItemDescriptionDocument

[DataItemDescriptionDocument](#) is a <<select>> interface that allows to associate one or several instances of [DatasetDefinition](#) to a document requiring this data. This type of document is usually referred to as Data Item Description (DID).

5.15.3.2.1 Class members

This <<extend>> interface includes the following class members:

- [Document](#)
- [DocumentIssue](#)
- [ExportControlRegulation](#)
- [ExternalDocument](#)
- [PoliciesAndRegulations](#)
- [Report](#)

Note

There is a clear distinction between the [DatasetDefinition](#) (which is a set of data) and the document requiring it, which can identify further details such as contractual caveats associated to such data set definition(s).

5.15.3.3 DatasetDefinition

[DatasetDefinition](#) is a <<class>> defining a group of data elements that have to be provided together, usually as part of a contractual deliverable.

5.15.3.3.1 Attribute(s)

This class has the following attributes:

- datasetDefinitionIdentifier
- datasetDefinitionName
- datasetDefinitionDescription, zero or one

5.15.3.3.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type [DataItemDescriptionDocument](#)
- A directed association, to zero, one or many objects of type [DataSetDefinitionRelationship](#)

5.15.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.15.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [SubjectOfPoliciesAndRegulations](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)

5.15.3.4 DataSetDefinitionRelationship

[DataSetDefinitionRelationship](#) is a <<relationship>> that associates two different [DataSetDefinitions](#).

5.15.3.4.1 Attribute(s)

This class has the following attributes:

- datasetDefinitionRelationshipType

5.15.3.4.2 Associations

This class has the following associations:

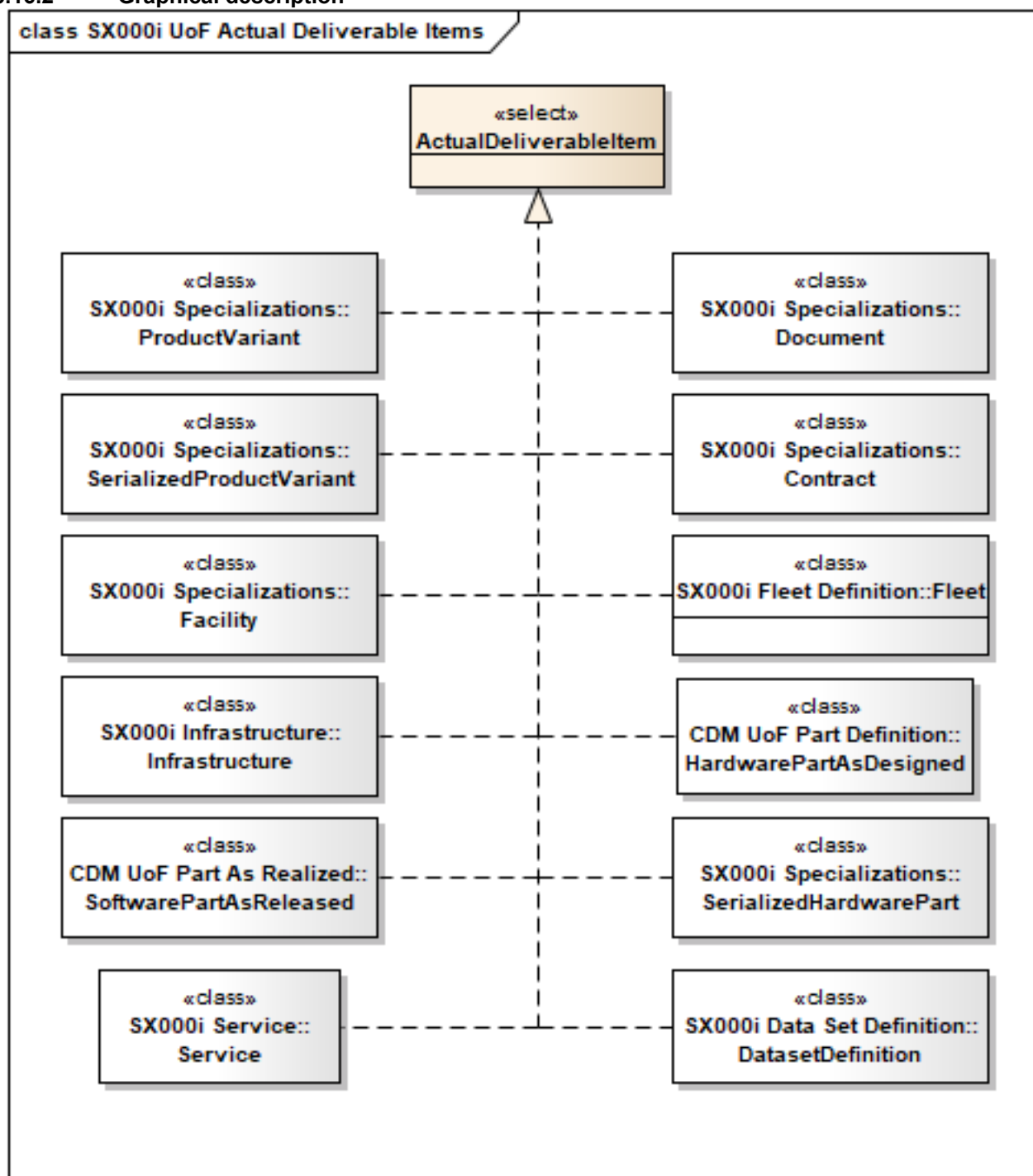
- A directed association, zero, one or many, to one object of type [DatasetDefinition](#)

5.16 SX000i UoF Deliverable Items

5.16.1 Description

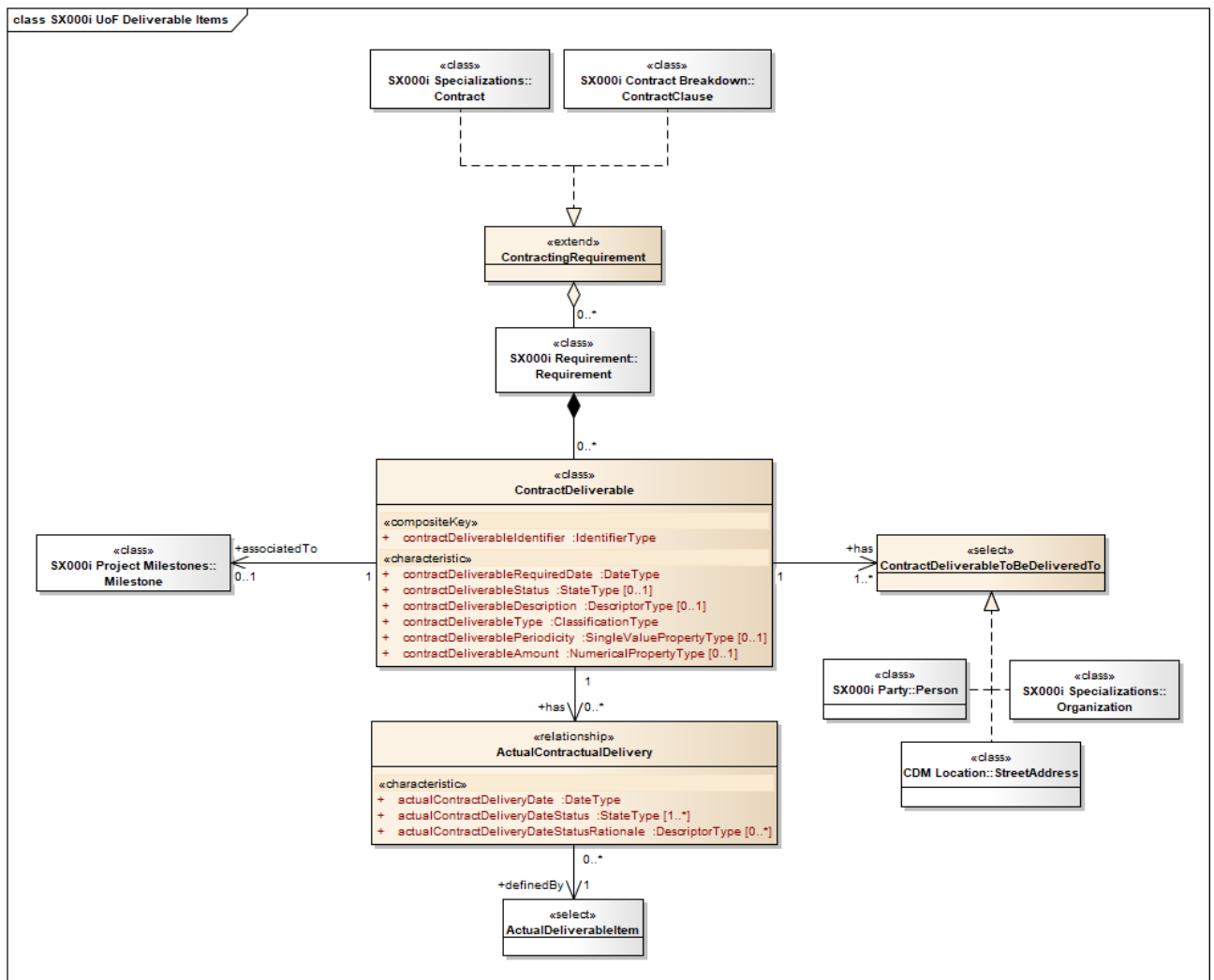
The Deliverable Items UoF provides the capability to define the items to be delivered as part of the contract and track their actual delivery.

5.16.2 Graphical description



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Fig 26 SX000i UoF Actual Deliverable Items



ICN-B6865-SX000I09012-001-01

Fig 27 SX000i UoF Deliverable Items

5.16.3 Class definition

5.16.3.1 ActualContractualDelivery

[ActualContractualDelivery](#) is a <<relationship>> that associates an actual delivery to a [ContractDeliverable](#)

5.16.3.1.1 Attribute(s)

This class has the following attributes:

- actualContractDeliveryDate
- actualContractDeliveryDateStatus, one or many
- actualContractDeliveryDateStatusRationale, zero, one or many

5.16.3.1.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [ActualDeliverableItem](#)

5.16.3.2 ActualDeliverableItem

`ActualDeliverableItem` is a <<select>> interface that enables the association of an actual deliverable item to a `ContractDeliverable` by means of the `ActualContractualDelivery` <<relationship>>.

5.16.3.2.1 Class members

This <<select>> interface includes the following class members:

- `AllowedProductConfigurationHardwarePartAsDesigned`
- `CloudInfrastructure`
- `CommunicationsNetwork`
- `ComputerNetwork`
- `Contract`
- `DatasetDefinition`
- `Document`
- `ExportControlRegulation`
- `ExternalDocument`
- `Facility`
- `Fleet`
- `HardwarePartAsDesigned`
- `Infrastructure`
- `MaintenanceFacility`
- `MRONetwork`
- `OperatingBase`
- `OtherFacility`
- `PoliciesAndRegulations`
- `Port`
- `PowerGrid`
- `ProductVariant`
- `Report`
- `SerializedHardwarePart`
- `SerializedProductVariant`
- `Service`
- `SoftwarePartAsReleased`
- `TrainingFacility`
- `TransportNetwork`
- `Warehouse`

5.16.3.3 ContractDeliverable

`ContractDeliverable` is a <<class>> representing a tangible item that must be provided as a result of a contract.

5.16.3.3.1 Attribute(s)

This class has the following attributes:

- `contractDeliverableIdentifier`
- `contractDeliverableRequiredDate`
- `contractDeliverableStatus`, zero or one
- `contractDeliverableDescription`, zero or one
- `contractDeliverableType`
- `contractDeliverablePeriodicity`, zero or one

- contractDeliverableAmount, zero or one

5.16.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [Requirement](#)
- A directed association, to zero or one objects of type [Milestone](#)
- A directed association, to zero, one or many objects of type [ActualContractualDelivery](#)
- A directed association, to object(s) from classes that are members of [ContractDeliverableToBeDeliveredTo](#)

5.16.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.16.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- [RequirementTargetItem](#). Refer to SX000i UoF Requirement, [Para 5.62](#)

5.16.3.4 ContractDeliverableToBeDeliveredTo

[ContractDeliverableToBeDeliveredTo](#) is a <<select>> interface that defines where or to whom a [ContractDeliverable](#) must be delivered.

5.16.3.4.1 Class members

This <<select>> interface includes the following class members:

- [OperatorOrganization](#)
- [OperatorPerson](#)
- [Organization](#)
- [Person](#)
- [StreetAddress](#)

5.16.3.5 ContractingRequirement

[ContractingRequirement](#) is an <<extend>> interface that enables the association of a [Requirement](#) to contractual terms.

5.16.3.5.1 Class members

This <<extend>> interface includes the following class members:

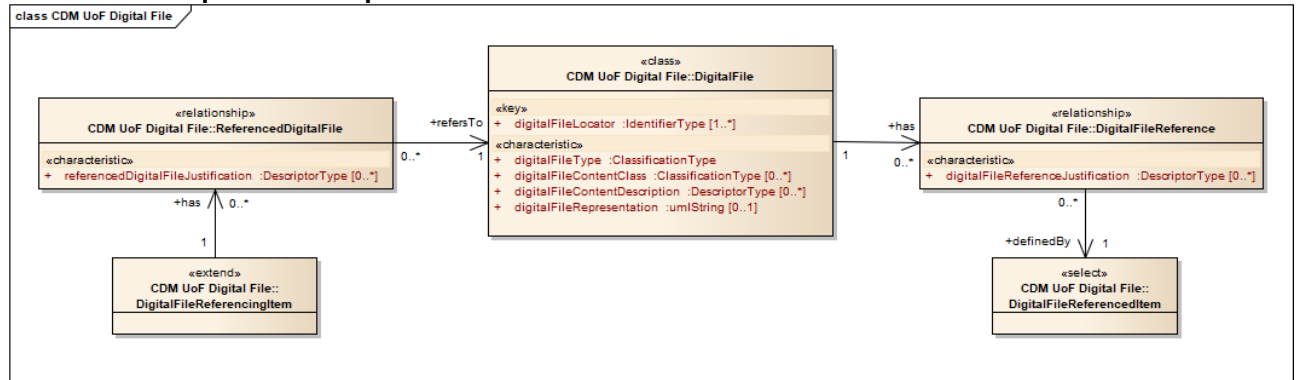
- [Contract](#)
- [ContractClause](#)
- [ServiceLevelAgreementClause](#)

5.17 SX000i UoF Digital File

5.17.1 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.

5.17.2 Graphical description



ICN-B6865-SX002D0030-001-01

Fig 28 SX000i UoF Digital File

5.17.3 Class definition

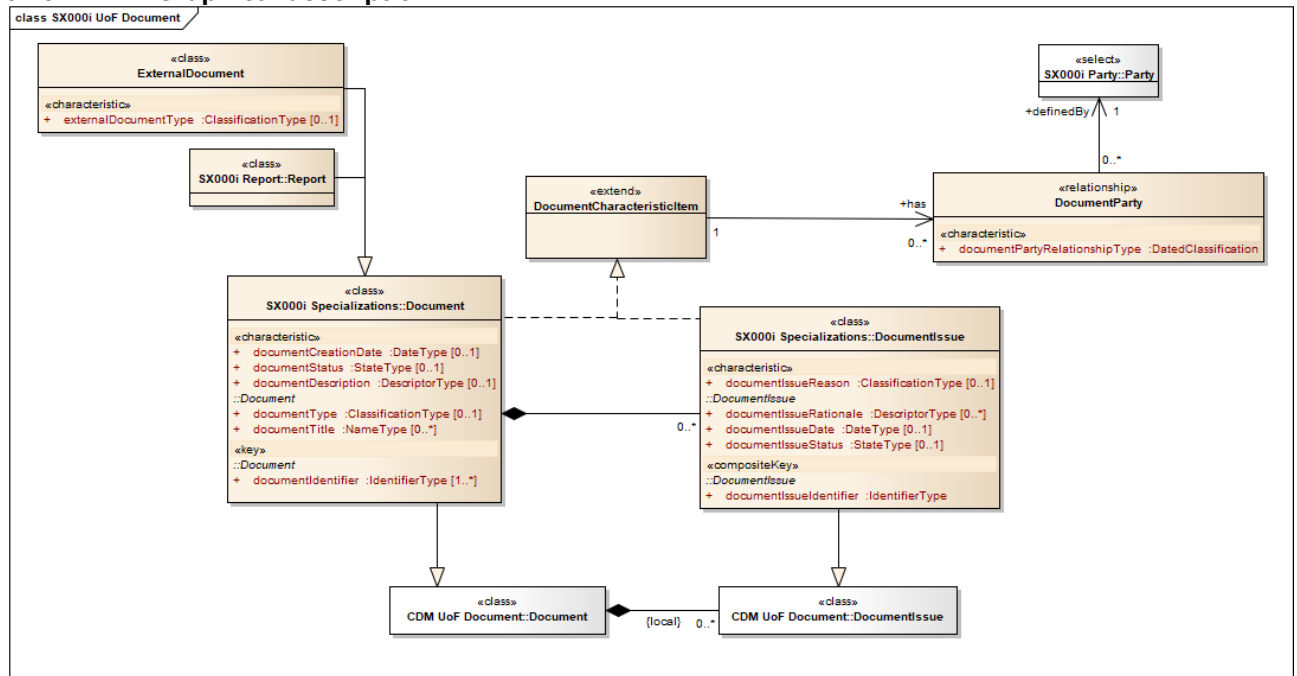
Refer to SX002D.

5.18 SX000i UoF Document

5.18.1 Description

The Document UoF extends the CDM Document UoF to define the types of documents and the relationships that such documents typically establish.

5.18.2 Graphical description



ICN-B6865-SX000I09014-001-01

Fig 29 SX000i UoF Document

5.18.3 Class definition

5.18.3.1 DocumentCharacteristicItem

[DocumentCharacteristicItem](#) is an <<extend>> interface that provides the capability to associate additional relationships to [Documents](#) and [DocumentIssues](#)..

5.18.3.1.1 Class members

This <<extend>> interface includes the following class members:

- [Document](#)
- [DocumentIssue](#)
- [ExportControlRegulation](#)
- [ExternalDocument](#)
- [PoliciesAndRegulations](#)
- [Report](#)

5.18.3.1.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [DocumentParty](#)

5.18.3.2 DocumentParty

[DocumentParty](#) is a <<relationship>> class that defines the association of a document with a specific [Party](#).

Example(s)

- approved by
- prepared by
- reported to

5.18.3.2.1 Attribute(s)

This class has the following attributes:

- `documentPartyRelationshipType`

5.18.3.2.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.18.3.3 ExternalDocument

[ExternalDocument](#) is a specialization of class [Document](#), and represents all documents that do not have a specialized class.

5.18.3.3.1 Attribute(s)

This class has the following attributes:

- `documentIdentifier` (inherited from [Document](#)), one or many
- `documentCreationDate` (inherited from [Document](#)), zero or one
- `documentType` (inherited from [Document](#)), zero or one
- `documentStatus` (inherited from [Document](#)), zero or one
- `documentDescription` (inherited from [Document](#)), zero or one
- `documentTitle` (inherited from [Document](#)), zero, one or many
- `externalDocumentType`, zero or one

5.18.3.3.2 Implementations

This class implements the following <<extend>> interfaces:

Applicable to: All

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- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DataItemDescriptionDocument](#). Refer to SX000i UoF Data Set Definition, [Para 5.19](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentCharacteristicItem](#). Refer to SX000i UoF Document, [Para 5.22](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.18.3.3.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Document](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ChangeRequestRationaleItem](#) (inherited from [Document](#)). Refer to CDM UoF Design Change Request,
- [DigitalFileReferencedItem](#) (inherited from [Document](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentItem](#) (inherited from [Document](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ExportControlledItem](#) (inherited from [Document](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [SupportElementItem](#) (inherited from [Document](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.18.3.4 SCORMContentPackage

[SCORMContentPackage](#) is a specialization of class [Document](#) and represents a SCORM content package.

5.18.3.4.1 *Attribute(s)*

This class has the following attributes:

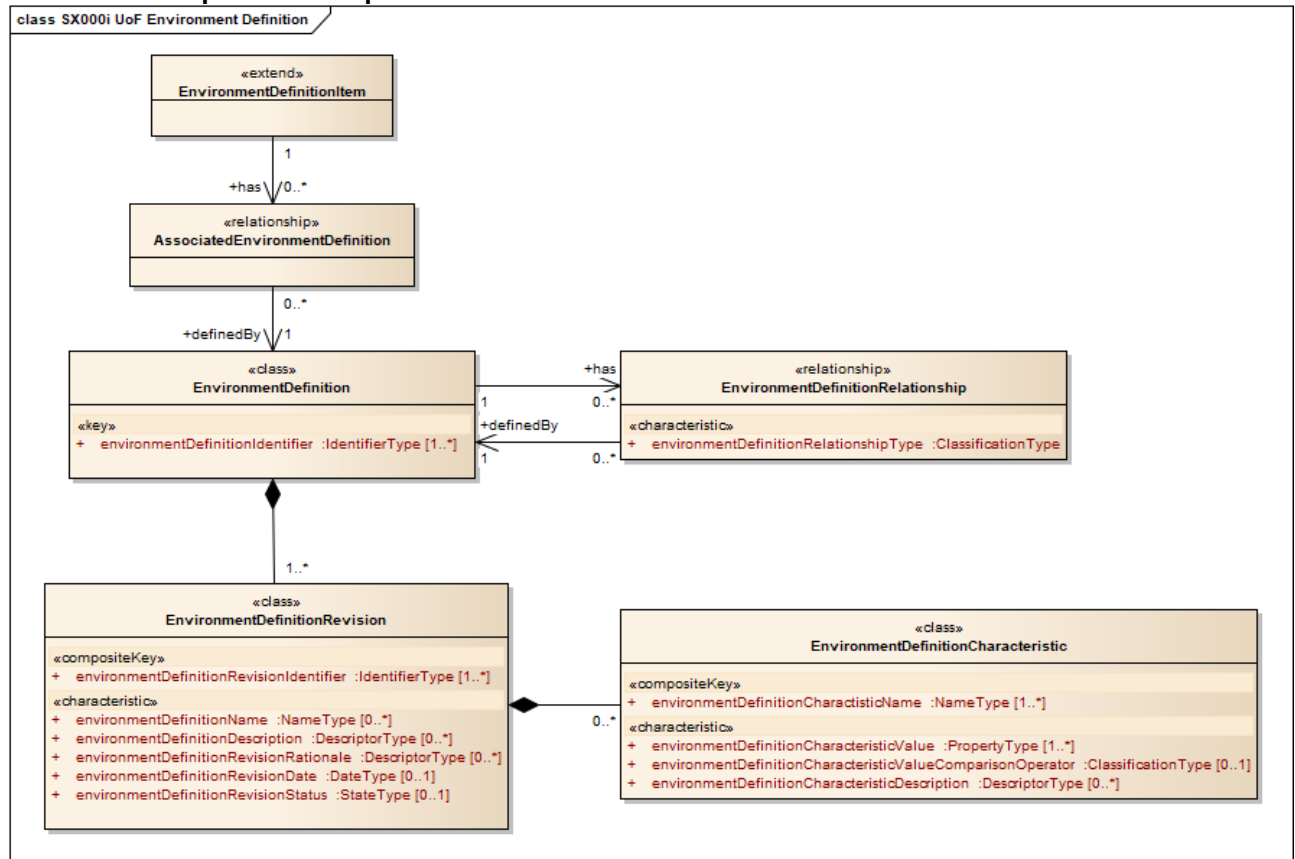
- `documentIdentifier` (inherited from [Document](#)), one or many
- `documentCreationDate` (inherited from [Document](#)), zero or one
- `documentStatus` (inherited from [Document](#)), zero or one
- `documentType` (inherited from [Document](#)), zero or one
- `documentTitle` (inherited from [Document](#)), zero, one or many
- `documentDescription` (inherited from [Document](#)), zero or one

5.19 SX000i UoF Environment Definition

5.19.1 Description

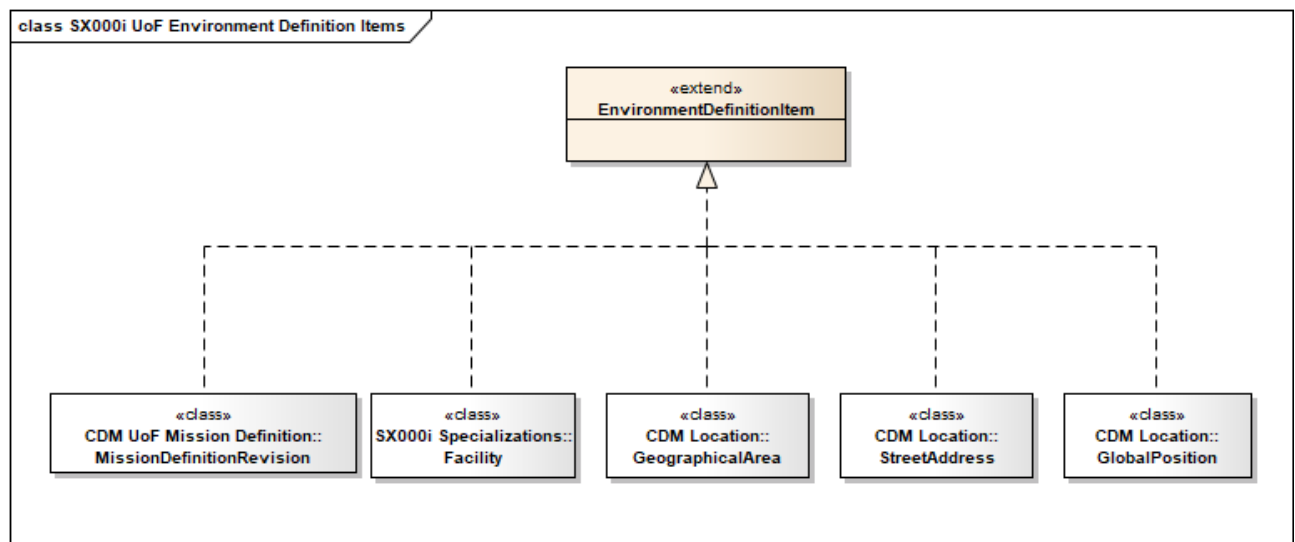
The Environment Definition UoF provides the capability to define a generic Environment.

5.19.2 Graphical description



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Fig 30 SX000i UoF Environment Definition



ICN-B6865-SX000I09071-001-01

Fig 31 SX000i UoF Environment Definition Items

5.19.3 Class definition

5.19.3.1 AssociatedEnvironmentDefinition

[AssociatedEnvironmentDefinition](#) is a <<relationship>> that associates an [EnvironmentDefinition](#) to an item.

Applicable to: All

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5.19.3.1.1 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [EnvironmentDefinition](#)

5.19.3.2 EnvironmentDefinition

[EnvironmentDefinition](#) is a class that represents the environment in which the [Product](#) operation or maintenance takes place.

5.19.3.2.1 Attribute(s)

This class has the following attributes:

- `environmentDefinitionIdentifier`, one or many

5.19.3.2.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type [Facility](#)
- A composition association, zero, one or manychild objects of type [MaintenanceFacility](#)
- A composition association, zero, one or manychild objects of type [OperatingBase](#)
- A composition association, zero, one or manychild objects of type [OtherFacility](#)
- A composition association, zero, one or manychild objects of type [TrainingFacility](#)
- A composition association, zero, one or manychild objects of type [Warehouse](#)
- A directed association, to zero, one or many objects of type [EnvironmentDefinitionRelationship](#)

5.19.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.19.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)

5.19.3.3 EnvironmentDefinitionCharacteristic

[EnvironmentDefinitionCharacteristic](#) is a <<class>> that represents a measurable or observable characteristic for a circumstance, object, event or condition that is significant to the [EnvironmentDefinition](#).

5.19.3.3.1 Attribute(s)

This class has the following attributes:

- `environmentDefinitionCharacteristicName`, one or many
- `environmentDefinitionCharacteristicValue`, one or many

- environmentDefinitionCharacteristicValueComparisonOperator, zero or one
- environmentDefinitionCharacteristicDescription, zero, one or many

5.19.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [EnvironmentDefinitionRevision](#)

5.19.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.19.3.4 EnvironmentDefinitionItem

[EnvironmentDefinitionItem](#) is an <<extend>> interface that enables the association of [EnvironmentDefinitions](#) to the items implementing such interface.

5.19.3.4.1 Class members

This <<extend>> interface includes the following class members:

- [Facility](#)
- [GeographicalArea](#)
- [GlobalPosition](#)
- [MaintenanceFacility](#)
- [MissionDefinitionRevision](#)
- [OperatingBase](#)
- [OtherFacility](#)
- [StreetAddress](#)
- [TrainingFacility](#)
- [Warehouse](#)

5.19.3.4.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [AssociatedEnvironmentDefinition](#)

5.19.3.5 EnvironmentDefinitionRelationship

[EnvironmentDefinitionRelationship](#) is a <<relationship>> that associates two different Environments to be defined.

5.19.3.5.1 Attribute(s)

This class has the following attributes:

- environmentDefinitionRelationshipType

5.19.3.5.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [EnvironmentDefinition](#)

5.19.3.6 EnvironmentDefinitionRevision

[EnvironmentDefinitionRevision](#) is a <<class>> representing an iteration applied to an Environment.

5.19.3.6.1 Attribute(s)

This class has the following attributes:

- `environmentDefinitionRevisionIdentifier`, one or many
- `environmentDefinitionName`, zero, one or many
- `environmentDefinitionDescription`, zero, one or many
- `environmentDefinitionRevisionRationale`, zero, one or many
- `environmentDefinitionRevisionDate`, zero or one
- `environmentDefinitionRevisionStatus`, zero or one

5.19.3.6.2 Associations

This class has the following associations:

- An aggregate association, one or many, to one related object of type [EnvironmentDefinition](#)
- A directed association, to zero, one or many objects of type [EnvironmentDefinitionImpact](#)

5.19.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

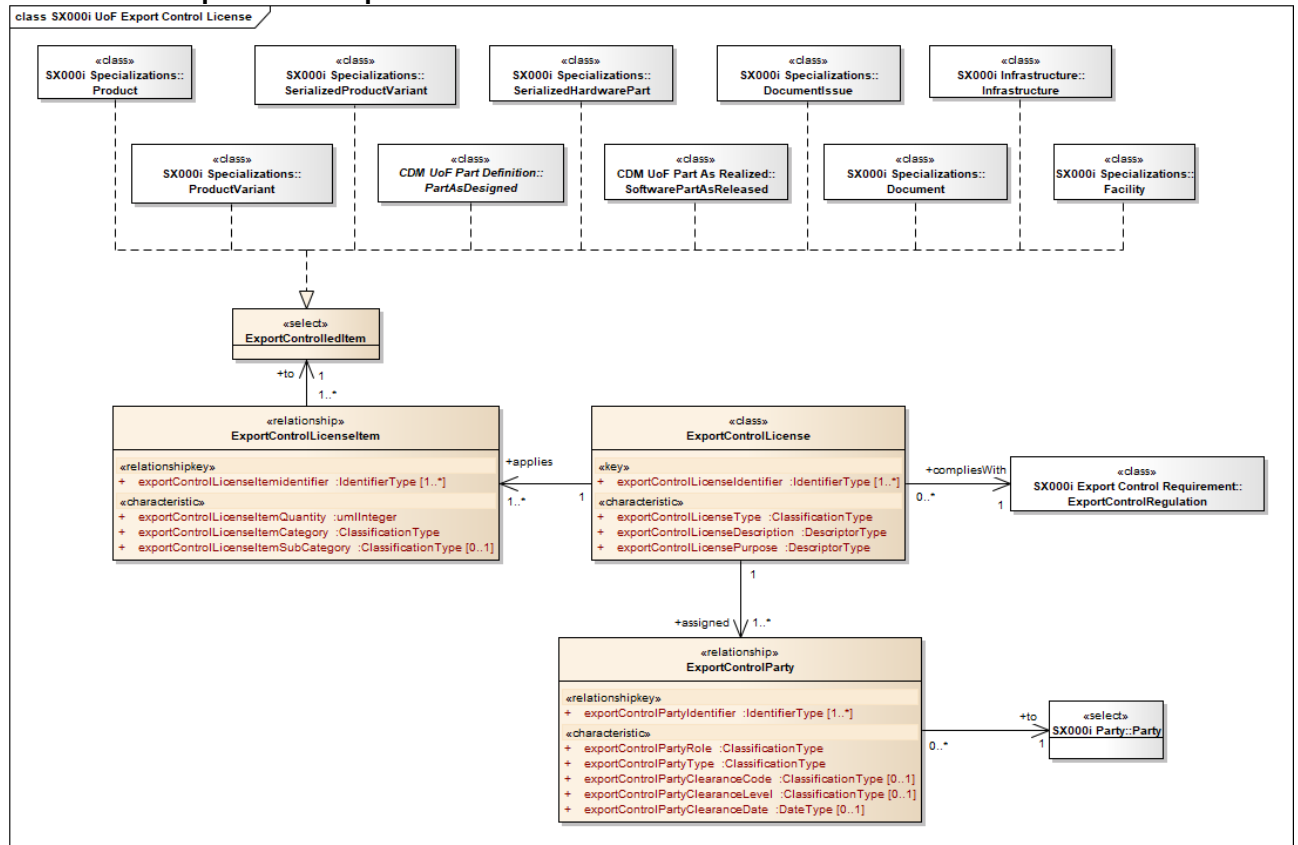
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.20 SX000i UoF Export Control License

5.20.1 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.

5.20.2 Graphical description



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Fig 32 SX000i UoF Export Control License

5.20.3 Class definition

5.20.3.1 ExportControlledItem

ExportControlledItem is a <<select>> interface that defines the items that can be subject to export control.

5.20.3.1.1 Class members

This <<select>> interface includes the following class members:

- AllowedProductConfigurationHardwarePartAsDesigned
- CloudInfrastructure
- CommunicationsNetwork
- ComputerNetwork
- Document
- DocumentIssue
- ExportControlRegulation
- ExternalDocument
- Facility
- HardwarePartAsDesigned
- Infrastructure
- MaintenanceFacility
- MRONetwork
- OperatingBase
- OtherFacility

Applicable to: All

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- [PartAsDesigned](#)
- [PoliciesAndRegulations](#)
- [Port](#)
- [PowerGrid](#)
- [Product](#)
- [ProductVariant](#)
- [Report](#)
- [SerializedHardwarePart](#)
- [SerializedProductVariant](#)
- [SoftwarePartAsReleased](#)
- [TrainingFacility](#)
- [TransportNetwork](#)
- [Warehouse](#)

5.20.3.2 ExportControlLicense

[ExportControlLicense](#) is a <<class>> representing an authorization to one or more parties to export item(s) under the terms of an [ExportControlRegulation](#).

5.20.3.2.1 Attribute(s)

This class has the following attributes:

- [exportControlLicenseIdentifier](#), one or many
- [exportControlLicenseType](#)
- [exportControlLicenseDescription](#)
- [exportControlLicensePurpose](#)

5.20.3.2.2 Associations

This class has the following associations:

- A directed association, to one or many objects of type [ExportControlLicenseItem](#)
- A directed association, to one or many objects of type [ExportControlParty](#)
- A directed association, zero, one or many, to one object of type [ExportControlRegulation](#)

5.20.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.20.3.3 ExportControlLicenseItem

[ExportControlLicenseItem](#) is a <<relationship>> that associates an [ExportControlLicense](#) to the export-controlled items to which this license applies.

5.20.3.3.1 Attribute(s)

This class has the following attributes:

Applicable to: All

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- exportControlLicenseItemIdentifier, one or many
- exportControlLicenseItemQuantity
- exportControlLicenseItemCategory
- exportControlLicenseItemSubCategory, zero or one

5.20.3.3.2 Associations

This class has the following associations:

- A directed association, one or many, to object(s) from classes that are members of [ExportControlledItem](#)

5.20.3.4 ExportControlParty

[ExportControlParty](#) is a <<relationship>> that associates an [ExportControlLicense](#) to the parties to which it applies or that control it.

5.20.3.4.1 Attribute(s)

This class has the following attributes:

- exportControlPartyIdentifier, one or many
- exportControlPartyRole
- exportControlPartyType
- exportControlPartyClearanceCode, zero or one
- exportControlPartyClearanceLevel, zero or one
- exportControlPartyClearanceDate, zero or one

5.20.3.4.2 Associations

This class has the following associations:

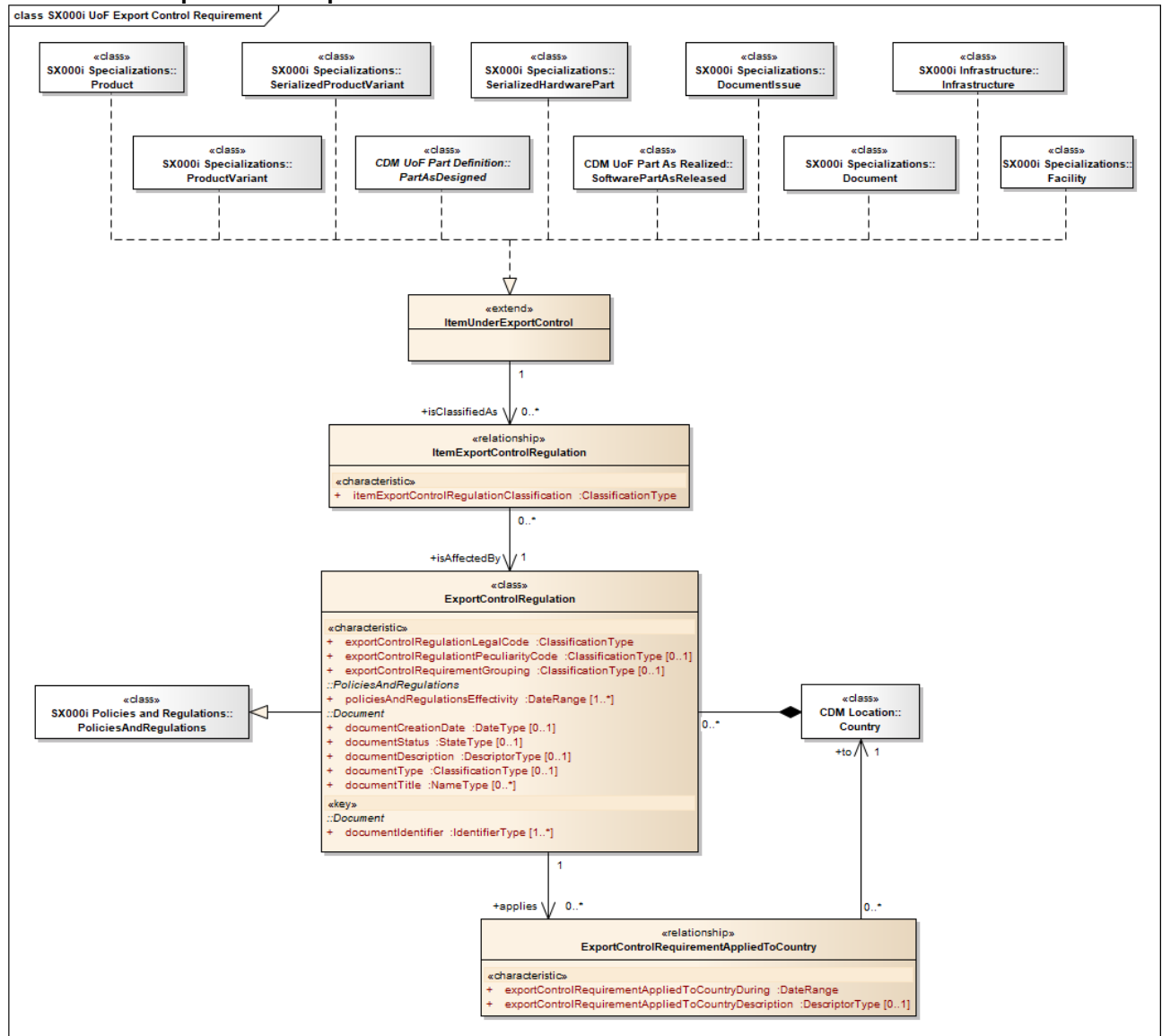
- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.21 SX000i UoF Export Control Requirement

5.21.1 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.

5.21.2 Graphical description



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Fig 33 SX000i UoF Export Control Requirement

5.21.3 Class definition

5.21.3.1 ExportControlRegulation

[ExportControlRegulation](#) is a legal document that defines export control restrictions to one or several items or item categories.

5.21.3.1.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from [Document](#)), one or many
- documentCreationDate (inherited from [Document](#)), zero or one
- policiesAndRegulationsEffectivity (inherited from [PoliciesAndRegulations](#)), one or many
- documentStatus (inherited from [Document](#)), zero or one
- documentType (inherited from [Document](#)), zero or one

- documentTitle (inherited from [Document](#)), zero, one or many
- documentDescription (inherited from [Document](#)), zero or one
- exportControlRegulationLegalCode
- exportControlRegulationPeculiarityCode, zero or one
- exportControlRequirementGrouping, zero or one

5.21.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [Country](#)
- A directed association, to zero, one or many objects of type [ExportControlRequirementAppliedToCountry](#)

5.21.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DataItemDescriptionDocument](#). Refer to SX000i UoF Data Set Definition, [Para 5.19](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentCharacteristicItem](#). Refer to SX000i UoF Document, [Para 5.22](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.21.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Document](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ChangeRequestRationaleItem](#) (inherited from [Document](#)). Refer to CDM UoF Design Change Request,
- [DigitalFileReferencedItem](#) (inherited from [Document](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentItem](#) (inherited from [Document](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ExportControlledItem](#) (inherited from [Document](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [SupportElementItem](#) (inherited from [Document](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)

- 5.21.3.2 **ExportControlRequirementAppliedToCountry**
[ExportControlRequirementAppliedToCountry](#) is a <<relationship>> that defines to which countries an [ExportControlRegulation](#) is applied.
- 5.21.3.2.1 **Attribute(s)**
This class has the following attributes:
- [exportControlRequirementAppliedToCountryDuring](#)
 - [exportControlRequirementAppliedToCountryDescription](#), zero or one
- 5.21.3.2.2 **Associations**
This class has the following associations:
- A directed association, zero, one or many, to one object of type [Country](#)
- 5.21.3.3 **ItemExportControlRegulation**
[ItemExportControlRegulation](#) is a <<relationship>> that associates an [ItemUnderExportControl](#) with the [ExportControlRegulation](#) that governs its export,
- 5.21.3.3.1 **Attribute(s)**
This class has the following attributes:
- [itemExportControlRegulationClassification](#)
- 5.21.3.3.2 **Associations**
This class has the following associations:
- A directed association, zero, one or many, to one object of type [ExportControlRegulation](#)
- 5.21.3.4 **ItemUnderExportControl**
[ItemUnderExportControl](#) is an <<extend>> interface that enables to define which items are subject to export control rules.
- 5.21.3.4.1 **Class members**
This <<extend>> interface includes the following class members:
- [AllowedProductConfigurationHardwarePartAsDesigned](#)
 - [CloudInfrastructure](#)
 - [CommunicationsNetwork](#)
 - [ComputerNetwork](#)
 - [Document](#)
 - [DocumentIssue](#)
 - [DocumentIssue](#)
 - [ExportControlRegulation](#)
 - [ExternalDocument](#)
 - [Facility](#)
 - [HardwarePartAsDesigned](#)
 - [Infrastructure](#)
 - [MaintenanceFacility](#)
 - [MRONetwork](#)
 - [OperatingBase](#)
 - [OtherFacility](#)

- PartAsDesigned
- PoliciesAndRegulations
- Port
- PowerGrid
- Product
- ProductVariant
- Report
- S1000DDataModuleIssue
- S1000DPublicationModuleIssue
- SerializedHardwarePart
- SerializedProductVariant
- SoftwarePartAsReleased
- TrainingFacility
- TransportNetwork
- Warehouse

5.21.3.4.2 Associations

This class has the following associations:

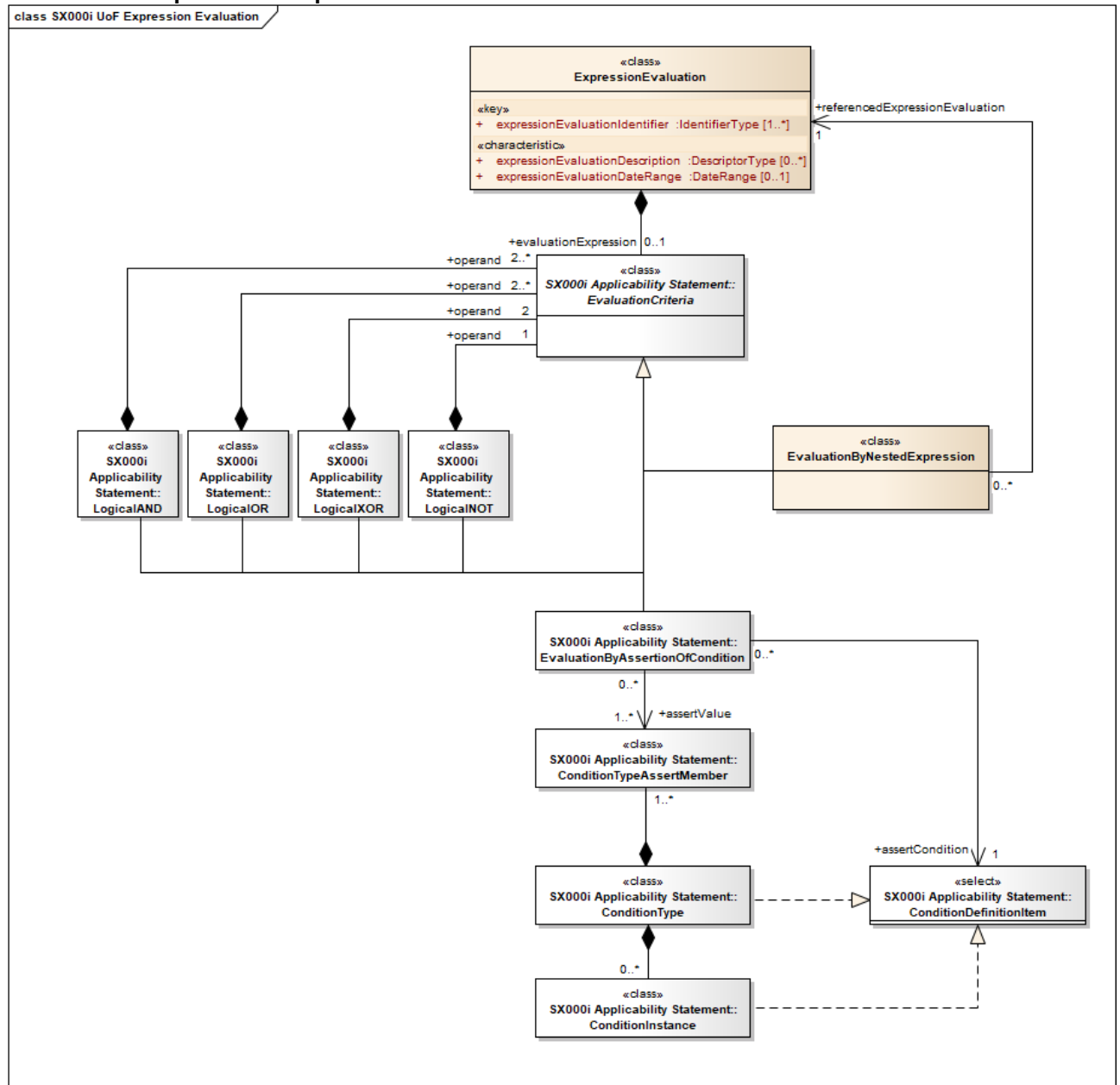
- A directed association, to zero, one or many objects of type
[ItemExportControlRegulation](#)

5.22 SX000i UoF Expression Evaluation

5.22.1 Description

Expression Evaluation UoF provides the capability to define complex expressions or conditions.

5.22.2 Graphical description



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Fig 34 SX000i UoF Expression Evaluation

5.22.3 Class definition

5.22.3.1 EvaluationByNestedExpression

[EvaluationByNestedExpression](#) is an [EvaluationCriteria](#) that defines a Boolean expression between additional [EvaluationCriteria](#) that can be evaluated to either TRUE or FALSE.

5.22.3.1.1 Associations

This class has the following associations:

- An aggregate association ,applicabilityExpression, zero or one, to one related object of type [ApplicabilityStatement](#)

- An aggregate association ,evaluationExpression, zero or one, to one related object of type [ExpressionEvaluation](#)
- An aggregate association, operand, to one related object of type [LogicalNOT](#)
- An aggregate association, operand, two, to one related object of type [LogicalXOR](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalAND](#)
- An aggregate association, operand, two or many, to one related object of type [LogicalOR](#)
- A directed association, zero, one or many, to one object of type [ExpressionEvaluation](#)

5.22.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.22.3.2 ExpressionEvaluation

[ExpressionEvaluation](#) is a Boolean expression that can be evaluated to be either TRUE or FALSE.

5.22.3.2.1 Attribute(s)

This class has the following attributes:

- expressionEvaluationIdentifier, one or many
- expressionEvaluationDescription, zero, one or many
- expressionEvaluationDateRange, zero or one

5.22.3.2.2 Associations

This class has the following associations:

- A composition association ,serviceLevelAgreementExpression, zero or onechild objects of type [ServiceLevelAgreementClause](#)

5.22.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

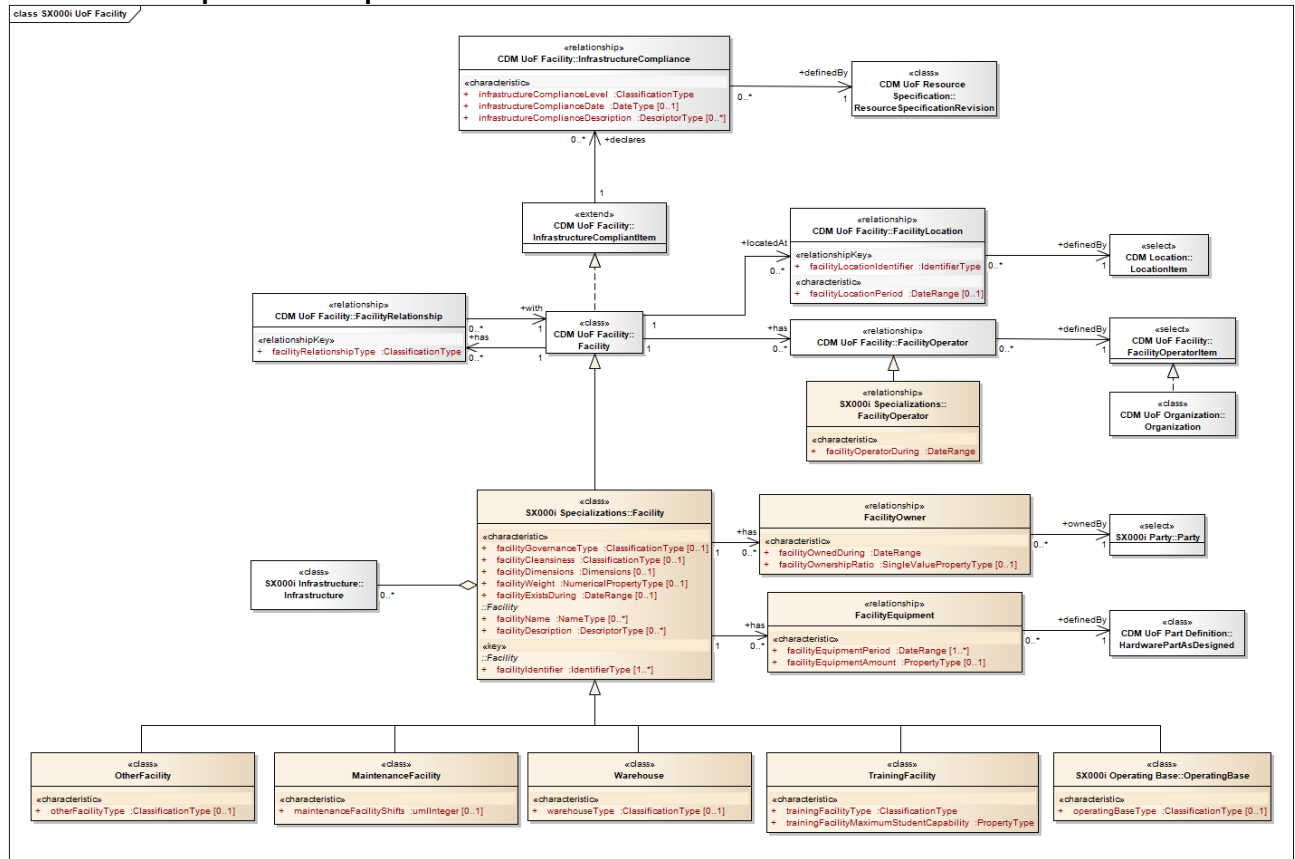
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.23 SX000i UoF Facility

5.23.1 Description

The Facility UoF defines the basic information related to a [Facility](#).

5.23.2 Graphical description



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Fig 35 SX000i UoF Facility

5.23.3 Class definition

5.23.3.1 FacilityEquipment

FacilityEquipment is a <<relationship>> allowing the definition of the equipment that a **Facility** has is planned to have at a specific period of time.

5.23.3.1.1 Attribute(s)

This class has the following attributes:

- facilityEquipmentPeriod, one or many
- facilityEquipmentAmount, zero or one

5.23.3.1.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type **AllowedProductConfigurationHardwarePartAsDesigned**
- A directed association, zero, one or many, to one object of type **HardwarePartAsDesigned**

5.23.3.2 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.

5.23.3.2.1 Attribute(s)

This class has the following attributes:

Applicable to: All

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- facilityOwnedDuring
- facilityOwnershipRatio, zero or one

5.23.3.2.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.23.3.3 MaintenanceFacility

[MaintenanceFacility](#) is a [Facility](#) that is mainly established to carry out [Product](#) maintenance.

5.23.3.3.1 Attribute(s)

This class has the following attributes:

- facilityIdentifier (inherited from [Facility](#)), one or many
- facilityGovernanceType (inherited from [Facility](#)), zero or one
- facilityCleansiness (inherited from [Facility](#)), zero or one
- facilityName (inherited from [Facility](#)), zero, one or many
- facilityDimensions (inherited from [Facility](#)), zero or one
- facilityDescription (inherited from [Facility](#)), zero, one or many
- facilityWeight (inherited from [Facility](#)), zero or one
- facilityExistsDuring (inherited from [Facility](#)), zero or one
- maintenanceFacilityShifts, zero or one

5.23.3.3.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [FacilityEquipment](#)
- A directed association, to zero, one or many objects of type [FacilityLocation](#)
- A directed association, to zero, one or many objects of type [FacilityOwner](#)
- A directed association, to zero, one or many objects of type [FacilityRelationship](#)
- A directed association, to zero, one or many objects of type [MaintenanceFacilityLevel](#)

5.23.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to SX000i UoF Environment Definition, [Para 5.23](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition,

- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [InfrastructureItem](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [StaffingItem](#). Refer to SX000i UoF Staffing, [Para 5.66](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.23.3.3.4 **Selects**

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [InfrastructureNode](#) (inherited from [Facility](#)). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [MeetingContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessageContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [ReportContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Facility](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)

- [SupplyRequiringItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Provisioning Concept, [Para 5.57](#)
- [SupportElementItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)
- [TaskLocationItem](#) (inherited from [Facility](#)). Refer to CDM UoF [Task](#) Usage,

5.23.3.4 OtherFacility

[OtherFacility](#) is a generic [Facility](#) that has no specific classification.

5.23.3.4.1 Attribute(s)

This class has the following attributes:

- [facilityIdentifier](#) (inherited from [Facility](#)), one or many
- [facilityGovernanceType](#) (inherited from [Facility](#)), zero or one
- [facilityName](#) (inherited from [Facility](#)), zero, one or many
- [facilityCleansiness](#) (inherited from [Facility](#)), zero or one
- [facilityDimensions](#) (inherited from [Facility](#)), zero or one
- [facilityDescription](#) (inherited from [Facility](#)), zero, one or many
- [facilityWeight](#) (inherited from [Facility](#)), zero or one
- [facilityExistsDuring](#) (inherited from [Facility](#)), zero or one
- [otherFacilityType](#), zero or one

5.23.3.4.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [FacilityEquipment](#)
- A directed association, to zero, one or many objects of type [FacilityLocation](#)
- A directed association, to zero, one or many objects of type [FacilityOwner](#)
- A directed association, to zero, one or many objects of type [FacilityRelationship](#)

5.23.3.4.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to SX000i UoF Environment Definition, [Para 5.23](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition,
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [InfrastructureItem](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)

- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [StaffingItem](#). Refer to SX000i UoF Staffing, [Para 5.66](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.23.3.4.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [InfrastructureNode](#) (inherited from [Facility](#)). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [MeetingContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessageContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [ReportContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Facility](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [SupplyRequiringItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Provisioning Concept, [Para 5.57](#)
- [SupportElementItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)
- [TaskLocationItem](#) (inherited from [Facility](#)). Refer to CDM UoF [Task](#) Usage,

5.23.3.5 TrainingFacility

[TrainingFacility](#) is a [Facility](#) that is mainly used to provide training.

Example(s)

- Full-flight simulator building
- Training center

5.23.3.5.1 Attribute(s)

This class has the following attributes:

- [facilityIdentifier](#) (inherited from [Facility](#)), one or many
- [facilityGovernanceType](#) (inherited from [Facility](#)), zero or one
- [facilityName](#) (inherited from [Facility](#)), zero, one or many
- [facilityCleansiness](#) (inherited from [Facility](#)), zero or one
- [facilityDescription](#) (inherited from [Facility](#)), zero, one or many
- [facilityDimensions](#) (inherited from [Facility](#)), zero or one
- [facilityWeight](#) (inherited from [Facility](#)), zero or one
- [facilityExistsDuring](#) (inherited from [Facility](#)), zero or one
- [trainingFacilityType](#)
- [trainingFacilityMaximumStudentCapability](#)

5.23.3.5.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [FacilityEquipment](#)
- A directed association, to zero, one or many objects of type [FacilityLocation](#)
- A directed association, to zero, one or many objects of type [FacilityOwner](#)
- A directed association, to zero, one or many objects of type [FacilityRelationship](#)

5.23.3.5.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to SX000i UoF Environment Definition, [Para 5.23](#)
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [InfrastructureItem](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)

- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [StaffingItem](#). Refer to SX000i UoF Staffing, [Para 5.66](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.23.3.5.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [InfrastructureNode](#) (inherited from [Facility](#)). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [MeetingContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessageContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [ReportContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Facility](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [SupplyRequiringItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Provisioning Concept, [Para 5.57](#)
- [SupportElementItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)
- [TaskLocationItem](#) (inherited from [Facility](#)). Refer to CDM UoF [Task](#) Usage,

5.23.3.6 Warehouse

[Warehouse](#) is a [Facility](#) used to store parts.

5.23.3.6.1 *Attribute(s)*

This class has the following attributes:

- facilityIdentifier (inherited from [Facility](#)), one or many
- facilityGovernanceType (inherited from [Facility](#)), zero or one
- facilityName (inherited from [Facility](#)), zero, one or many
- facilityCleansiness (inherited from [Facility](#)), zero or one
- facilityDescription (inherited from [Facility](#)), zero, one or many
- facilityDimensions (inherited from [Facility](#)), zero or one
- facilityWeight (inherited from [Facility](#)), zero or one
- facilityExistsDuring (inherited from [Facility](#)), zero or one
- warehouseType, zero or one

5.23.3.6.2 *Associations*

This class has the following associations:

- A directed association, to zero, one or many objects of type [FacilityEquipment](#)
- A directed association, to zero, one or many objects of type [FacilityLocation](#)
- A directed association, to zero, one or many objects of type [FacilityOwner](#)
- A directed association, to zero, one or many objects of type [FacilityRelationship](#)

5.23.3.6.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to SX000i UoF Environment Definition, [Para 5.23](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition,
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [InfrastructureItem](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)

- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [StaffingItem](#). Refer to SX000i UoF Staffing, [Para 5.66](#)
- [SupplySource](#). Refer to SX000i UoF Provisioning Concept, [Para 5.57](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.23.3.6.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [InfrastructureNode](#) (inherited from [Facility](#)). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [MeetingContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessageContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [ProvisioningSource](#). Refer to SX000i UoF Provisioning Concept, [Para 5.57](#)
- [ReportContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Facility](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [SupplyRequiringItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Provisioning Concept, [Para 5.57](#)
- [SupportElementItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)
- [TaskLocationItem](#) (inherited from [Facility](#)). Refer to CDM UoF [Task](#) Usage,

5.24

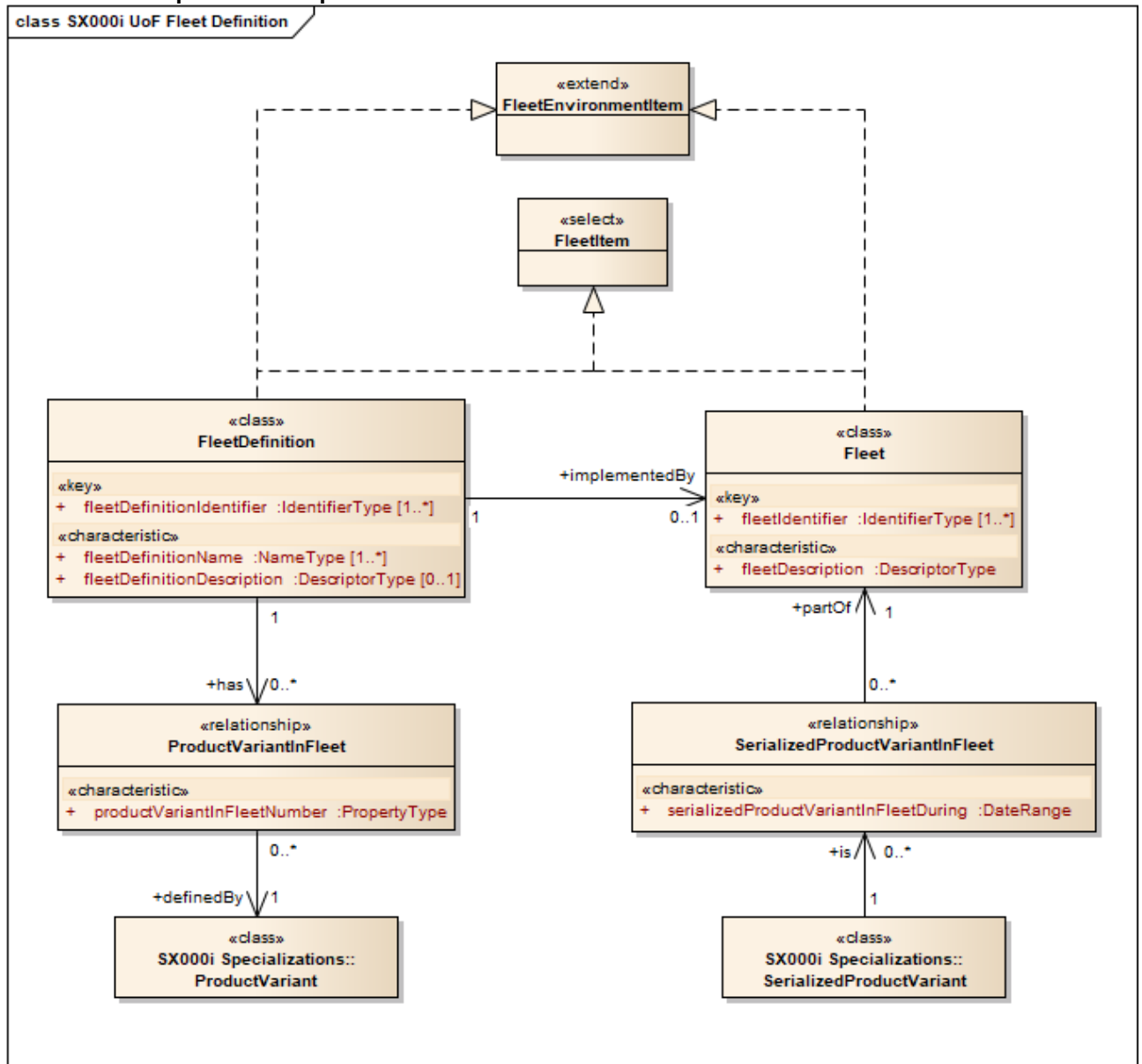
SX000i UoF Fleet Definition

5.24.1

Description

The Fleet Definition UoF defines the basic information of a set of *<i>ProductVariants</i>* that are expected to operate together and the actual*<i> </i><i>SerializedProductVariants </i>*that operate together to form a fleet.

5.24.2 Graphical description



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Fig 36 SX000i UoF Fleet Definition

5.24.3 Class definition

5.24.3.1 Fleet

Fleet is a <<class>> representing 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.

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
- warships of several countries performing joint exercises

5.24.3.1.1 Attribute(s)

This class has the following attributes:

- `fleetIdentifier`, one or many
- `fleetDescription`

5.24.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [FleetEnvironmentItem](#). Refer to SX000i UoF Fleet Definition, [Para 5.28](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.24.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ContractItem](#). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [FleetItem](#). Refer to SX000i [Fleet](#) Definition,
- [MissionDefinitionPartyItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)

5.24.3.2 FleetDefinition

[FleetDefinition](#) is a <<class>> representing a planned group of SerializedProductVariants that will operate together as a [Fleet](#).

Note

It is possible to have a mixed fleet with multiple product variants from multiple Products.

5.24.3.2.1 Attribute(s)

This class has the following attributes:

- [fleetDefinitionIdentifier](#), one or many
- [fleetDefinitionName](#), one or many
- [fleetDefinitionDescription](#), zero or one

5.24.3.2.2 Associations

This class has the following associations:

- A directed association, to zero or one objects of type [Fleet](#)
- A directed association, to zero, one or many objects of type [ProductVariantInFleet](#)

5.24.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [FleetEnvironmentItem](#). Refer to SX000i UoF Fleet Definition, [Para 5.28](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.24.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [FleetItem](#). Refer to SX000i [Fleet](#) Definition,
- [MissionDefinitionPartyItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)

5.24.3.3 FleetEnvironmentItem

[FleetEnvironmentItem](#) an <<extend>> interface that provides its associated data model to those classes that implement it.

5.24.3.3.1 Class members

This <<extend>> interface includes the following class members:

- Fleet
- FleetDefinition

5.24.3.3.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type FleetBasedAt
- A directed association, to zero, one or many objects of type FleetOperatedBy
- A directed association, to zero, one or many objects of type FleetOperatesAtLocation
- A directed association, to zero, one or many objects of type FleetRelationship

5.24.3.4 FleetItem

FleetItem is a <<select>> interface that identifies items which can be selected to identify a Fleet.

5.24.3.4.1 Class members

This <<select>> interface includes the following class members:

- Fleet
- FleetDefinition

5.24.3.5 ProductVariantInFleet

ProductVariantInFleet is a <<relationship>> that defines the product variants that are expected to be associated to a FleetDefinition.

5.24.3.5.1 Attribute(s)

This class has the following attributes:

- productVariantInFleetNumber

5.24.3.5.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type ProductVariant

5.24.3.6 SerializedProductVariantInFleet

SerializedProductVariantInFleet is a <<relationship>> that defines the association between a SerializedProductVariant and the Fleet to which it belongs.

5.24.3.6.1 Attribute(s)

This class has the following attributes:

- serializedProductVariantInFleetDuring

5.24.3.6.2 Associations

This class has the following associations:

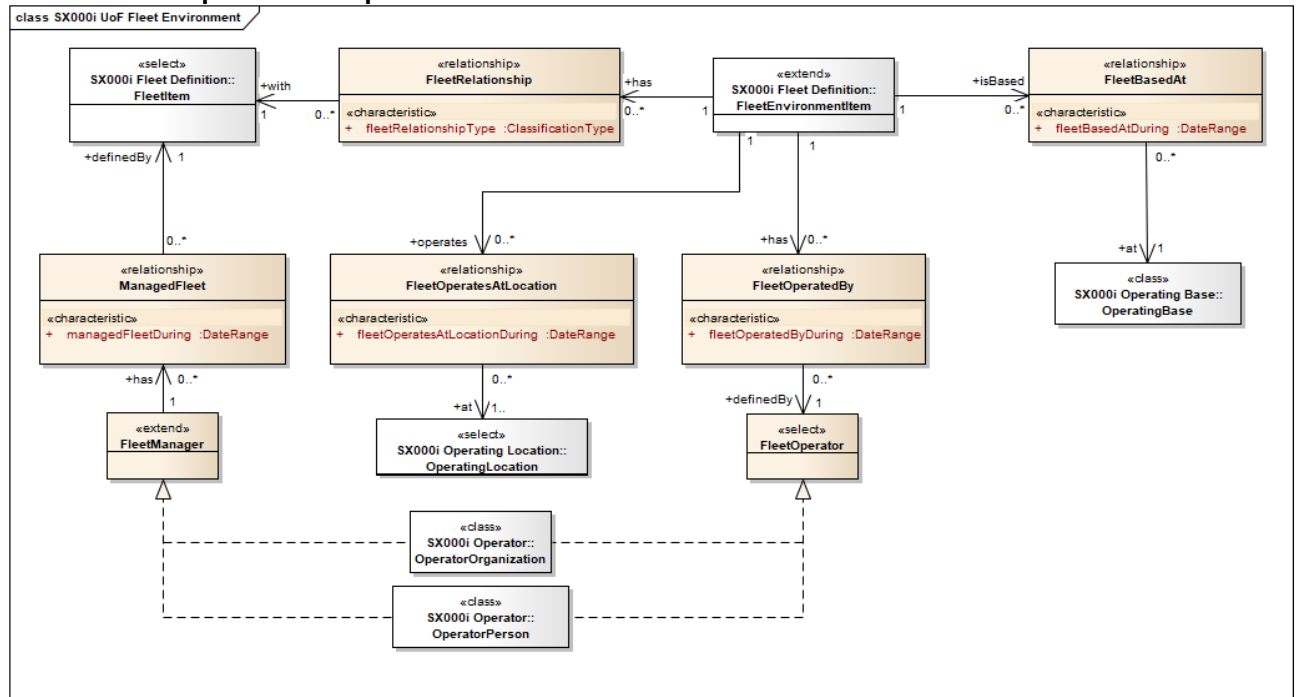
- A directed association, zero, one or many, to one object of type Fleet

5.25 SX000i UoF Fleet Environment

5.25.1 Description

The Fleet Environment UoF provides the capability to define the context and environment in which a Fleet operates.

5.25.2 Graphical description



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Fig 37 SX000i UoF Fleet Environment

5.25.3 Class definition

5.25.3.1 FleetBasedAt

FleetBasedAt is a <<relationship>> that indicates the location at which as **Fleet** is based at a specific point in time.

5.25.3.1.1 Attribute(s)

This class has the following attributes:

- fleetBasedAtDuring

5.25.3.1.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type **OperatingBase**

5.25.3.2 FleetManager

FleetManager is an <<extend>> interface that enables the assignment of capabilities to the **OperatorOrganization** or **OperatorPerson** that manages a **Fleet**.

5.25.3.2.1 Class members

This <<extend>> interface includes the following class members:

- **OperatorOrganization**
- **OperatorPerson**

5.25.3.2.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type **ManagedFleet**

-
- 5.25.3.3 **FleetOperatedBy**
FleetOperatedBy is <<relationship>> that assigns an **Operator** to a **Fleet** during a specific period of time.
- 5.25.3.3.1 **Attribute(s)**
This class has the following attributes:
- fleetOperatedByDuring
- 5.25.3.3.2 **Associations**
This class has the following associations:
- A directed association, zero, one or many, to object(s) from classes that are members of **FleetOperator**
- 5.25.3.4 **FleetOperatesAtLocation**
FleetOperatesAtLocation is a <<relationship>> that indicates the location at which as **Fleet** operates at a specific point in time.
- 5.25.3.4.1 **Attribute(s)**
This class has the following attributes:
- fleetOperatesAtLocationDuring
- 5.25.3.4.2 **Associations**
This class has the following associations:
- A directed association, zero, one or many, to object(s) from classes that are members of **OperatingLocation**
- 5.25.3.5 **FleetOperator**
FleetOperator is a <<select>> interface that enables the identification of the operator of a **Fleet**.
- 5.25.3.5.1 **Class members**
This <<select>> interface includes the following class members:
- **OperatorOrganization**
 - **OperatorPerson**
- 5.25.3.6 **FleetRelationship**
FleetRelationship is a <<relationship>> that indicates how two **Fleets** are related with each other.
- 5.25.3.6.1 **Attribute(s)**
This class has the following attributes:
- fleetRelationshipType
- 5.25.3.6.2 **Associations**
This class has the following associations:
- A directed association, zero, one or many, to object(s) from classes that are members of **FleetItem**
- 5.25.3.7 **ManagedFleet**
ManagedFleet is a <<relationship>> that associates a **FleetManager** to the **Fleet** that it manages during a specific period of time.

This class has the following attributes:

5.26.3 Class definition

5.26.3.1 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.

5.26.3.1.1 Attribute(s)

This class has the following attributes:

- [infrastructureIdentifier](#) (inherited from [Infrastructure](#)), one or many
- [infrastructureName](#) (inherited from [Infrastructure](#)), zero, one or many
- [infrastructureDescription](#) (inherited from [Infrastructure](#))

5.26.3.1.2 Associations

This class has the following associations:

- A composition association, zero, one or many child objects of type [Facility](#)
- A directed association, to zero, one or many objects of type [InfrastructureParty](#)
- A directed association, to zero, one or many objects of type [InfrastructureRelationship](#)

5.26.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.26.3.1.4 *Selects*

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [ITInfrastructure](#). Refer to SX000i UoF IT Concept, [Para 5.33](#)
- [ReportContextItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [SupportElementItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.26.3.2 *CommunicationsNetwork*

[CommunicationsNetwork](#) is an [Infrastructure](#) that represents a number of machines, computers and communication lines that allow the communication between different parties or machines.

5.26.3.2.1 *Attribute(s)*

This class has the following attributes:

- [infrastructureIdentifier](#) (inherited from [Infrastructure](#)), one or many
- [infrastructureName](#) (inherited from [Infrastructure](#)), zero, one or many
- [infrastructureDescription](#) (inherited from [Infrastructure](#))

5.26.3.2.2 *Associations*

This class has the following associations:

- A composition association, zero, one or many child objects of type [Facility](#)
- A directed association, to zero, one or many objects of type [InfrastructureParty](#)
- A directed association, to zero, one or many objects of type [InfrastructureRelationship](#)

5.26.3.2.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)

- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.26.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [ITInfrastructure](#). Refer to SX000i UoF IT Concept, [Para 5.33](#)
- [ReportContextItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)

- [SupportElementItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.26.3.3 ComputerNetwork

[ComputerNetwork](#) is an [Infrastructure](#) that represents a number of interconnected computers, irrespectively of their location.

5.26.3.3.1 Attribute(s)

This class has the following attributes:

- [infrastructureIdentifier](#) (inherited from [Infrastructure](#)), one or many
- [infrastructureName](#) (inherited from [Infrastructure](#)), zero, one or many
- [infrastructureDescription](#) (inherited from [Infrastructure](#))

5.26.3.3.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type [Facility](#)
- A directed association, to zero, one or many objects of type [InfrastructureParty](#)
- A directed association, to zero, one or many objects of type [InfrastructureRelationship](#)

5.26.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.26.3.3.4 *Selects*

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [ITInfrastructure](#). Refer to SX000i UoF IT Concept, [Para 5.33](#)
- [ReportContextItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [SupportElementItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.26.3.4 *Infrastructure*

[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.

Example(s)

- airport
- bus service
- railroad
- roads
- set of buildings

5.26.3.4.1 *Attribute(s)*

This class has the following attributes:

- `infrastructureIdentifier`, one or many
- `infrastructureName`, zero, one or many
- `infrastructureDescription`

5.26.3.4.2 *Associations*

This class has the following associations:

- A composition association, zero, one or manychild objects of type [Facility](#)

- A composition association, zero, one or manychild objects of type [MaintenanceFacility](#)
- A composition association, zero, one or manychild objects of type [OperatingBase](#)
- A composition association, zero, one or manychild objects of type [OtherFacility](#)
- A composition association, zero, one or manychild objects of type [TrainingFacility](#)
- A composition association, zero, one or manychild objects of type [Warehouse](#)
- A directed association, to zero, one or many objects of type [InfrastructureParty](#)
- A directed association, to zero, one or many objects of type [InfrastructureRelationship](#)

5.26.3.4.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.26.3.4.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#). Refer to SX000i UoF Product, [Para 5.53](#)

- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [SupportElementItem](#). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.26.3.5 InfrastructureItem

[InfrastructureItem](#) is an <<extend>> interface that enables the association of additional capabilities to items that can belong to an [Infrastructure](#).

5.26.3.5.1 Class members

This <<extend>> interface includes the following class members:

- [AllowedProductConfigurationHardwarePartAsDesigned](#)
- [Facility](#)
- [HardwarePartAsDesigned](#)
- [MaintenanceFacility](#)
- [OperatingBase](#)
- [OtherFacility](#)
- [ProductVariant](#)
- [SerializedHardwarePart](#)
- [SerializedProductVariant](#)
- [SoftwareElement](#)
- [SoftwarePartAsReleased](#)
- [TrainingFacility](#)
- [Warehouse](#)

5.26.3.5.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [InfrastructureNodeAtLocation](#)

5.26.3.6 InfrastructureNode

[InfrastructureNode](#) is a <<class>> representing one item that forms part of an [Infrastructure](#).

5.26.3.6.1 Class members

This <<select>> interface includes the following class members:

- [AllowedProductConfigurationHardwarePartAsDesigned](#)
- [Facility](#)
- [HardwarePartAsDesigned](#)
- [InfrastructureRevision](#)
- [MaintenanceFacility](#)
- [OperatingBase](#)
- [OtherFacility](#)
- [ProductVariant](#)
- [ProvisioningConceptRevision](#)

- SerializedHardwarePart
- SerializedProductVariant
- SoftwareElement
- SoftwarePartAsReleased
- TrainingFacility
- Warehouse

5.26.3.6.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type [InfrastructureRevision](#)

5.26.3.7 InfrastructureNodeAtLocation

[InfrastructureNodeAtLocation](#) is a <<relationship>> that defines the [Location](#) at which an [InfrastructureNode](#) is located.

5.26.3.7.1 Attribute(s)

This class has the following attributes:

- infrastructureNodeLocatedAtDuring, zero, one or many

5.26.3.7.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [LocationItem](#)

5.26.3.8 InfrastructureParty

[InfrastructureParty](#) is a <<relationship>> that associates a [Party](#) to an [Infrastructure](#).

5.26.3.8.1 Attribute(s)

This class has the following attributes:

- infrastructurePartyRole
- infrastructurePartyRoleDuring

5.26.3.8.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.26.3.9 InfrastructureRelationship

[InfrastructureRelationship](#) is a <<relationship>> that defines how two [Infrastructures](#) are related with each other.

5.26.3.9.1 Attribute(s)

This class has the following attributes:

- infrastructureRelationshipType

5.26.3.9.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [CloudInfrastructure](#)

- A directed association, zero, one or many, to one object of type [CommunicationsNetwork](#)
- A directed association, zero, one or many, to one object of type [ComputerNetwork](#)
- A directed association, zero, one or many, to one object of type [Infrastructure](#)
- A directed association, zero, one or many, to one object of type [MRONetwork](#)
- A directed association, zero, one or many, to one object of type [Port](#)
- A directed association, zero, one or many, to one object of type [PowerGrid](#)
- A directed association, zero, one or many, to one object of type [TransportNetwork](#)

5.26.3.10 InfrastructureRevision

[InfrastructureRevision](#) is a <<class>> representing an iteration applied to an [Infrastructure](#).

5.26.3.10.1 Attribute(s)

This class has the following attributes:

- [infrastructureRevisionIdentifier](#), one or many
- [infrastructureRevisionRationale](#), zero, one or many
- [infrastructureRevisionDate](#), zero or one
- [infrastructureRevisionStatus](#), zero or one
- [infrastructureRevisionValidity](#), zero, one or many

5.26.3.10.2 Associations

This class has the following associations:

- An aggregate association, one or many, to one related object of type [CloudInfrastructure](#)
- An aggregate association, one or many, to one related object of type [CommunicationsNetwork](#)
- An aggregate association, one or many, to one related object of type [ComputerNetwork](#)
- An aggregate association, one or many, to one related object of type [Infrastructure](#)
- An aggregate association, one or many, to one related object of type [MRONetwork](#)
- An aggregate association, one or many, to one related object of type [Port](#)
- An aggregate association, one or many, to one related object of type [PowerGrid](#)
- An aggregate association, one or many, to one related object of type [TransportNetwork](#)

5.26.3.10.3 Implementations

This class implements the following <<extend>> interfaces:

- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.26.3.10.4 Selects

This class is a member of the following <<select>> interfaces:

- [InfrastructureNode](#). Refer to SX000i [Infrastructure](#),

5.26.3.11 MRONetwork

[MRONetwork](#) is an [Infrastructure](#) consisting of Maintenance, Repair and Overhaul (MRO) facilities.

Note

The different facilities do not need to be in a same location, but can be spread world-wide.

Example(s)

- aircraft overhaul center
- equipment repair shop
- shipyard

5.26.3.11.1 Attribute(s)

This class has the following attributes:

- [infrastructureIdentifier](#) (inherited from [Infrastructure](#)), one or many
- [infrastructureName](#) (inherited from [Infrastructure](#)), zero, one or many
- [infrastructureDescription](#) (inherited from [Infrastructure](#))

5.26.3.11.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type [Facility](#)
- A directed association, to zero, one or many objects of type [InfrastructureParty](#)
- A directed association, to zero, one or many objects of type [InfrastructureRelationship](#)

5.26.3.11.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)

- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.26.3.11.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [ReportContextItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [SupportElementItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.26.3.12 Port

[Port](#) is an infrastructure used for the docking of ships.

5.26.3.12.1 Attribute(s)

This class has the following attributes:

- [infrastructureIdentifier](#) (inherited from [Infrastructure](#)), one or many
- [infrastructureName](#) (inherited from [Infrastructure](#)), zero, one or many
- [infrastructureDescription](#) (inherited from [Infrastructure](#))

5.26.3.12.2 Associations

This class has the following associations:

- A composition association, zero, one or many child objects of type [Facility](#)
- A directed association, to zero, one or many objects of type [InfrastructureParty](#)

- A directed association, to zero, one or many objects of type [InfrastructureRelationship](#)

5.26.3.12.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.26.3.12.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)

- [ReportContextItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [SupportElementItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.26.3.13 PowerGrid

[PowerGrid](#) is an [Infrastructure](#) used to generate, transport and distribute power.

5.26.3.13.1 Attribute(s)

This class has the following attributes:

- [infrastructureIdentifier](#) (inherited from [Infrastructure](#)), one or many
- [infrastructureName](#) (inherited from [Infrastructure](#)), zero, one or many
- [infrastructureDescription](#) (inherited from [Infrastructure](#))

5.26.3.13.2 Associations

This class has the following associations:

- A composition association, zero, one or many child objects of type [Facility](#)
- A directed association, to zero, one or many objects of type [InfrastructureParty](#)
- A directed association, to zero, one or many objects of type [InfrastructureRelationship](#)

5.26.3.13.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)

- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.26.3.13.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [ReportContextItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [SupportElementItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.26.3.14 TransportNetwork

[TransportNetwork](#) is an [Infrastructure](#) used to transport items.

Example(s)

- Airline
- Railroad

5.26.3.14.1 Attribute(s)

This class has the following attributes:

- [infrastructureIdentifier](#) (inherited from [Infrastructure](#)), one or many
- [infrastructureName](#) (inherited from [Infrastructure](#)), zero, one or many
- [infrastructureDescription](#) (inherited from [Infrastructure](#))

5.26.3.14.2 Associations

This class has the following associations:

- A composition association, zero, one or many child objects of type [Facility](#)
- A directed association, to zero, one or many objects of type [InfrastructureParty](#)
- A directed association, to zero, one or many objects of type [InfrastructureRelationship](#)

5.26.3.14.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.26.3.14.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [ReportContextItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Report, [Para 5.59](#)

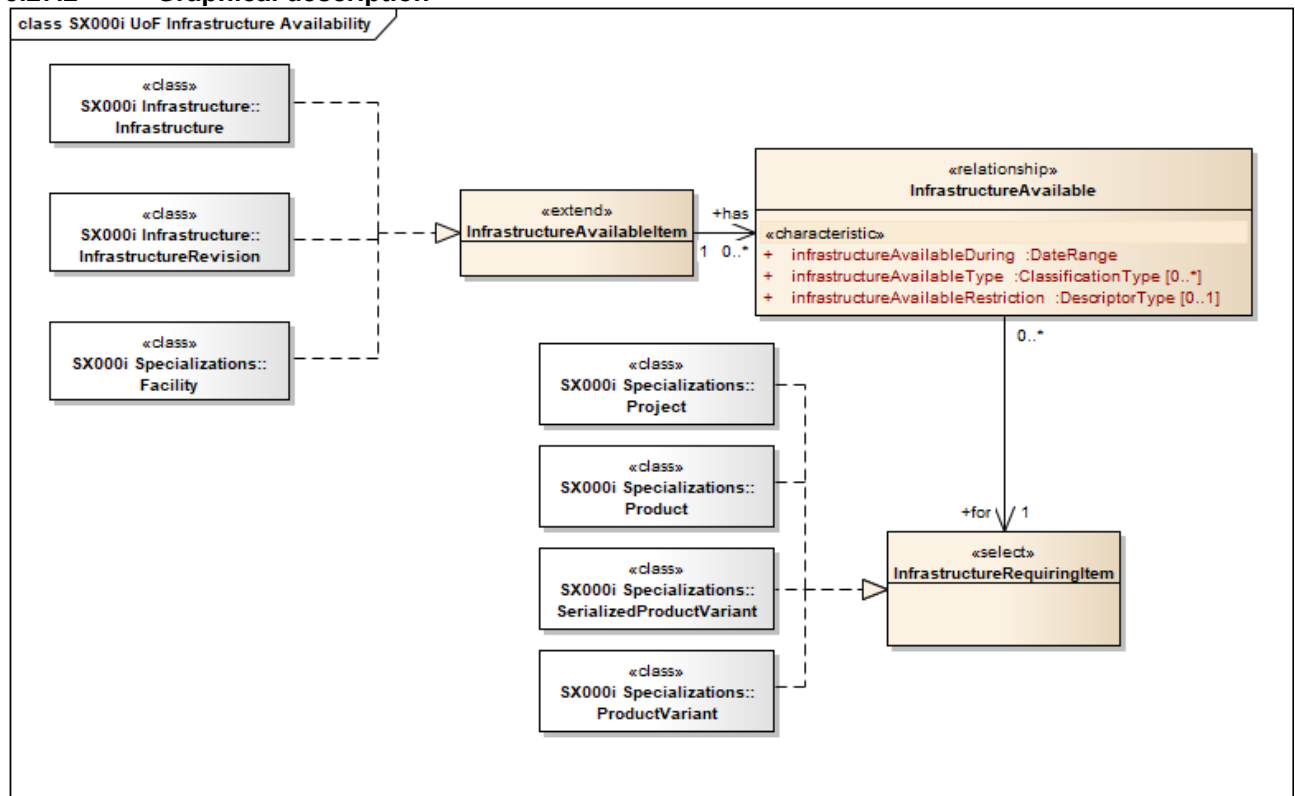
- [RequirementTargetItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [SupportElementItem](#) (inherited from [Infrastructure](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.27 SX000i UoF Infrastructure Availability

5.27.1 Description

The Infrastructure Availability UoF allows to document what [Products](#) or [Services](#) can use a specific [Infrastructure](#).

5.27.2 Graphical description



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Fig 39 SX000i UoF Infrastructure Availability

5.27.3 Class definition

5.27.3.1 InfrastructureAvailable

[InfrastructureAvailable](#) is a <<relationship>> that provides the capability of associating an [Infrastructure](#) to items that can use it.

5.27.3.1.1 Attribute(s)

This class has the following attributes:

- infrastructureAvailableDuring
- infrastructureAvailableType, zero, one or many
- infrastructureAvailableRestriction, zero or one

5.27.3.1.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [InfrastructureRequiringItem](#)

5.27.3.2 [InfrastructureAvailableItem](#)
[InfrastructureAvailableItem](#) is an <<extend>> interface that enables the definition of infrastructure items that are available for infrastructure requiring items.

5.27.3.2.1 *Class members*

This <<extend>> interface includes the following class members:

- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)
- [Facility](#)
- [Infrastructure](#)
- [InfrastructureRevision](#)
- [MaintenanceFacility](#)
- [MRONetwork](#)
- [OperatingBase](#)
- [OtherFacility](#)
- [Port](#)
- [PowerGrid](#)
- [TrainingFacility](#)
- [TransportNetwork](#)
- [Warehouse](#)

5.27.3.2.2 *Associations*

This class has the following associations:

- A directed association, to zero, one or many objects of type [InfrastructureAvailable](#)

5.27.3.3 [InfrastructureRequiringItem](#)
[InfrastructureRequiringItem](#) is a <<select>> interface that defines items requiring an [Infrastructure](#).

5.27.3.3.1 *Class members*

This <<select>> interface includes the following class members:

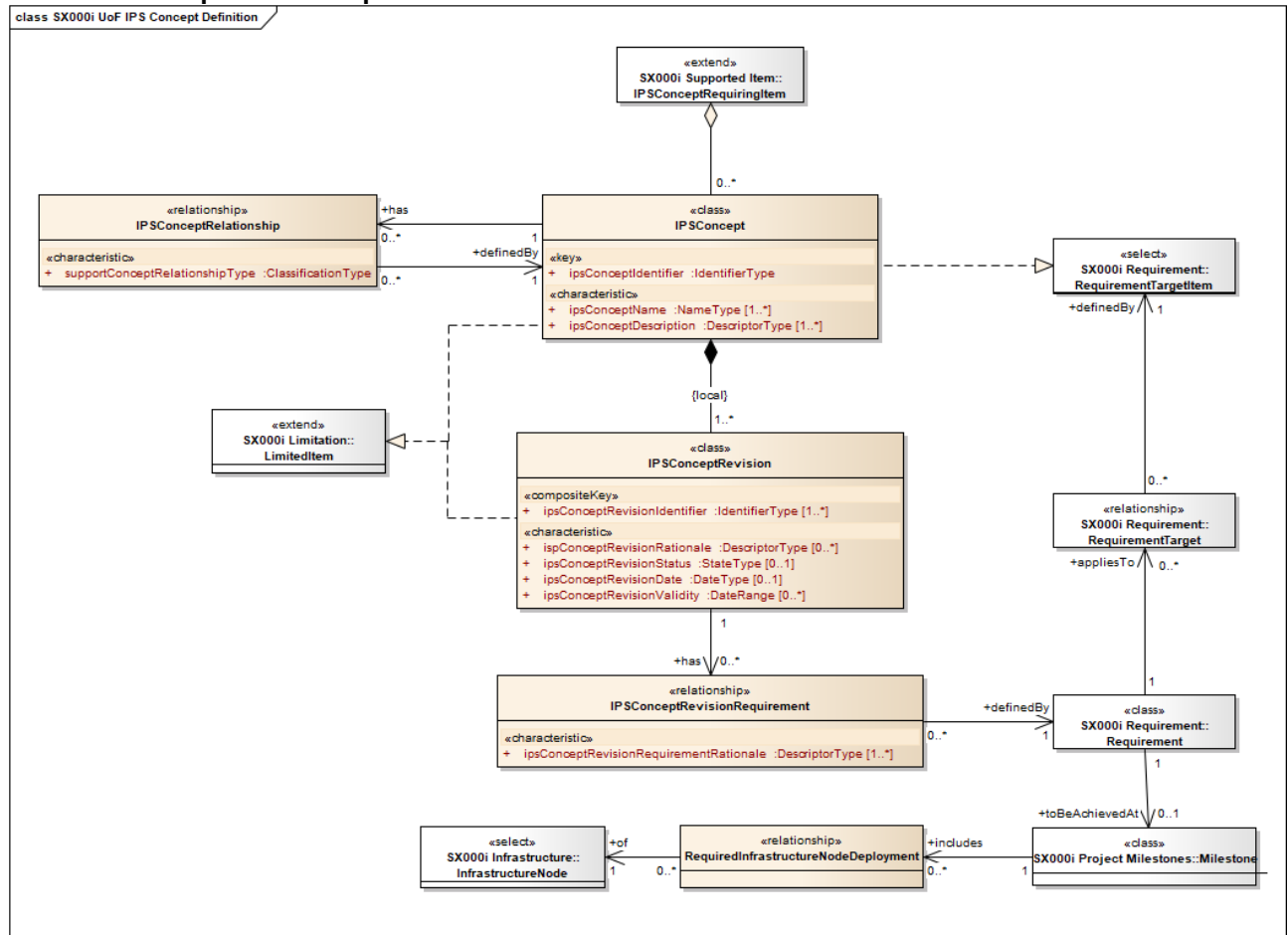
- [Product](#)
- [Product](#)
- [ProductVariant](#)
- [Project](#)
- [SerializedProductVariant](#)
- [Service](#)

5.28 SX000i UoF IPS Concept Definition

5.28.1 Description

The IPS Concept Definition UoF provides the basic capability to define an operational or support concept in the context of an integrated product support.

5.28.2 Graphical description



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Fig 40 SX000i UoF IPS Concept Definition

5.28.3 Class definition

5.28.3.1 IPSConcept

IPSConcept is a <<class>> representing the definition of an Integrated Product Support (IPS) concept.

5.28.3.1.1 *Attribute(s)*

This class has the following attributes:

- `ipsConceptIdentifier`
- `ipsConceptName`, one or many
- `ipsConceptDescription`, one or many

5.28.3.1.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type `IPSConceptRequiringItem`
- A directed association, to zero, one or many objects of type `IPSConceptRelationship`

5.28.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

Applicable to: All

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- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.28.3.1.4 *Selects*

This class is a member of the following <<select>> interfaces:

- [RequirementTargetItem](#). Refer to SX000i UoF Requirement, [Para 5.62](#)

5.28.3.2 IPSConceptRelationship

[IPSConceptRelationship](#) is a <<relationship>> that associates two different instances of [IPSConcept](#).

5.28.3.2.1 *Attribute(s)*

This class has the following attributes:

- [supportConceptRelationshipType](#)

5.28.3.2.2 *Associations*

This class has the following associations:

- A directed association, zero, one or many, to one object of type [IPSConcept](#)
- A directed association, zero, one or many, to one object of type [ITConcept](#)
- A directed association, zero, one or many, to one object of type [MaintenanceConcept](#)
- A directed association, zero, one or many, to one object of type [OperationalConcept](#)
- A directed association, zero, one or many, to one object of type [ProvisioningConcept](#)
- A directed association, zero, one or many, to one object of type [TrainingConcept](#)

5.28.3.3 IPSConceptRevision

[IPSConceptRevision](#) is a <<class>> representing an iteration applied to an [IPSConcept](#).

5.28.3.3.1 *Attribute(s)*

This class has the following attributes:

- [ipsConceptRevisionIdentifier](#), one or many
- [ispConceptRevisionRationale](#), zero, one or many
- [ipsConceptRevisionStatus](#), zero or one
- [ipsConceptRevisionDate](#), zero or one
- [ipsConceptRevisionValidity](#), zero, one or many

5.28.3.3.2 *Associations*

This class has the following associations:

- An aggregate association, one or many, to one related object of type [IPSConcept](#)
- A directed association, to zero, one or many objects of type [IPSConceptRevisionRequirement](#)

5.28.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.28.3.4 IPSConceptRevisionRequirement

[IPSConceptRevisionRequirement](#) is a <<relationship>> that defines a [Requirement](#) that is required in order to enable an [IPSConceptRevision](#).

5.28.3.4.1 Attribute(s)

This class has the following attributes:

- [ipsConceptRevisionRequirementRationale](#), one or many

5.28.3.4.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [Requirement](#)

5.28.3.5 RequiredInfrastructureNodeDeployment

[RequiredInfrastructureNodeDeployment](#) is a <<relationship>> that associates an [Infrastructure](#) node to the location where it must be deployed.

5.28.3.5.1 Associations

This class has the following associations:

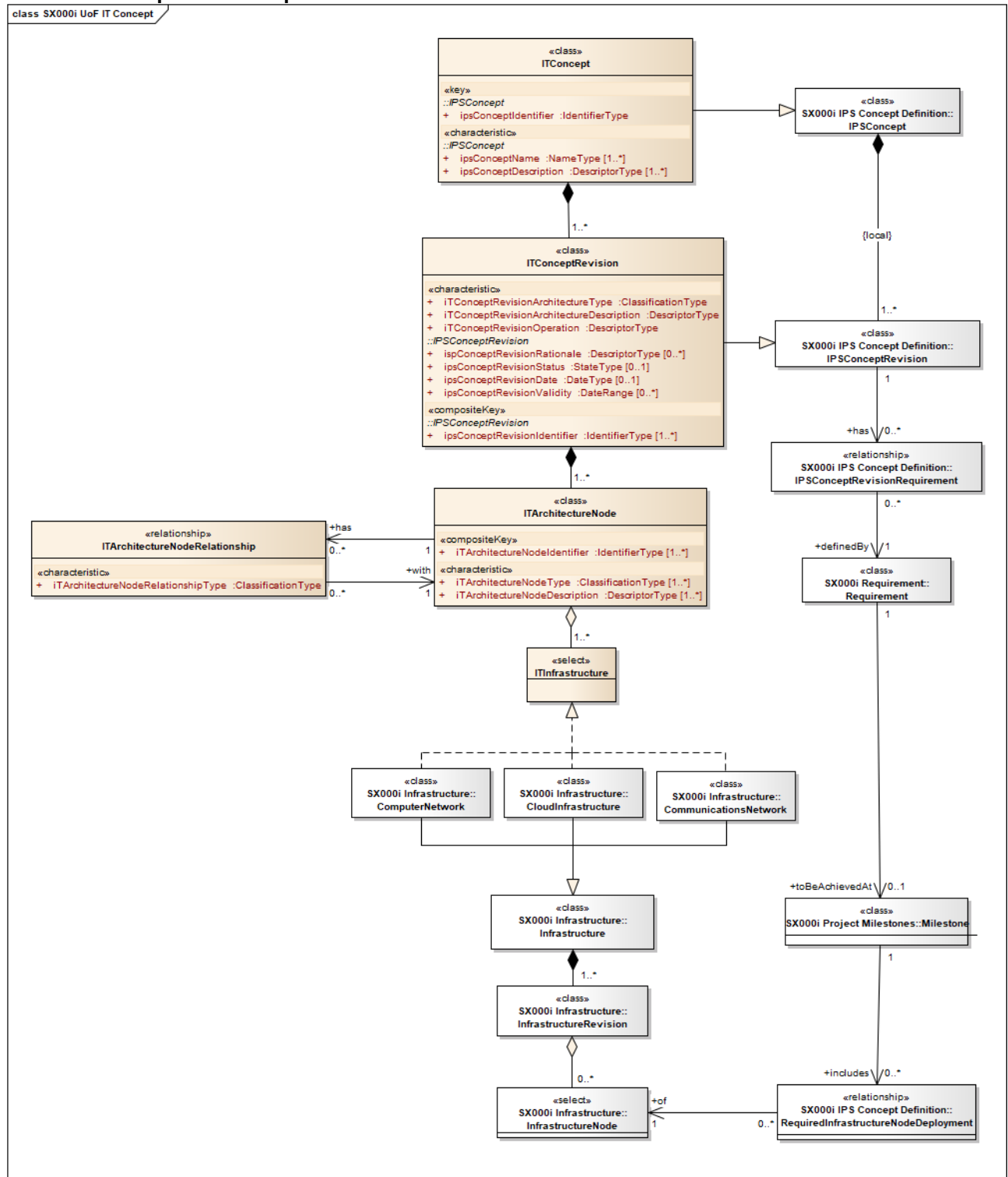
- A directed association, zero, one or many, to object(s) from classes that are members of [InfrastructureNode](#)

5.29 SX000i UoF IT Concept

5.29.1 Description

IT Concept UoF provides the capability to define how and where IT Systems will be deployed and for what purpose.

5.29.2 Graphical description



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Fig 41 SX000i UoF IT Concept

5.29.3 Class definition

5.29.3.1 ITArchitectureNode

[ITArchitectureNode](#) is a <<class>> representing a functional or physical block in the information technology [ITConceptRevision](#) architecture.

5.29.3.1.1 Attribute(s)

This class has the following attributes:

- [iTArchitectureNodeIdentifier](#), one or many
- [iTArchitectureNodeType](#), one or many
- [iTArchitectureNodeDescription](#), one or many

5.29.3.1.2 Associations

This class has the following associations:

- An aggregate association, one or many, to one related object of type [ITConceptRevision](#)
- A directed association, to zero, one or many objects of type [ITArchitectureNodeRelationship](#)

5.29.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.29.3.2 ITArchitectureNodeRelationship

[ITArchitectureNodeRelationship](#) is a <<relationship>> that associates two different instances of [ITArchitectureNode](#).

5.29.3.2.1 Attribute(s)

This class has the following attributes:

- [iTArchitectureNodeRelationshipType](#)

5.29.3.2.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [ITArchitectureNode](#)

5.29.3.3 ITConcept

[ITConcept](#) is a specialized [IPSConcept](#) intended to describe how the IT will be set up as part of the overall support.

5.29.3.3.1 Attribute(s)

This class has the following attributes:

- [ipsConceptIdentifier](#) (inherited from [IPSConcept](#))
- [ipsConceptName](#) (inherited from [IPSConcept](#)), one or many
- [ipsConceptDescription](#) (inherited from [IPSConcept](#)), one or many

5.29.3.3.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type [IPSConceptRequiringItem](#)
- A directed association, to zero, one or many objects of type [IPSConceptRelationship](#)

5.29.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.29.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- [RequirementTargetItem](#) (inherited from [IPSConcept](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)

5.29.3.4 ITConceptRevision

[ITConceptRevision](#) is a <<class>> representing an iteration applied to the definition of an [ITConcept](#).

5.29.3.4.1 Attribute(s)

This class has the following attributes:

- [ipsConceptRevisionIdentifier](#) (inherited from [IPSConceptRevision](#)), one or many
- [ispConceptRevisionRationale](#) (inherited from [IPSConceptRevision](#)), zero, one or many
- [ipsConceptRevisionStatus](#) (inherited from [IPSConceptRevision](#)), zero or one
- [ipsConceptRevisionDate](#) (inherited from [IPSConceptRevision](#)), zero or one
- [ipsConceptRevisionValidity](#) (inherited from [IPSConceptRevision](#)), zero, one or many
- [iTConceptRevisionArchitectureType](#)
- [iTConceptRevisionArchitectureDescription](#)
- [iTConceptRevisionOperation](#)

5.29.3.4.2 Associations

This class has the following associations:

- An aggregate association, one or many, to one related object of type [ITConcept](#)
- A directed association, to zero, one or many objects of type [IPSConceptRevisionRequirement](#)

5.29.3.4.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.29.3.5 ITInfrastructure

[ITInfrastructure](#) is an [Infrastructure](#) designed for Information Technology (IT) purposes.

5.29.3.5.1 Class members

This <<select>> interface includes the following class members:

- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)

5.29.3.5.2 Associations

This class has the following associations:

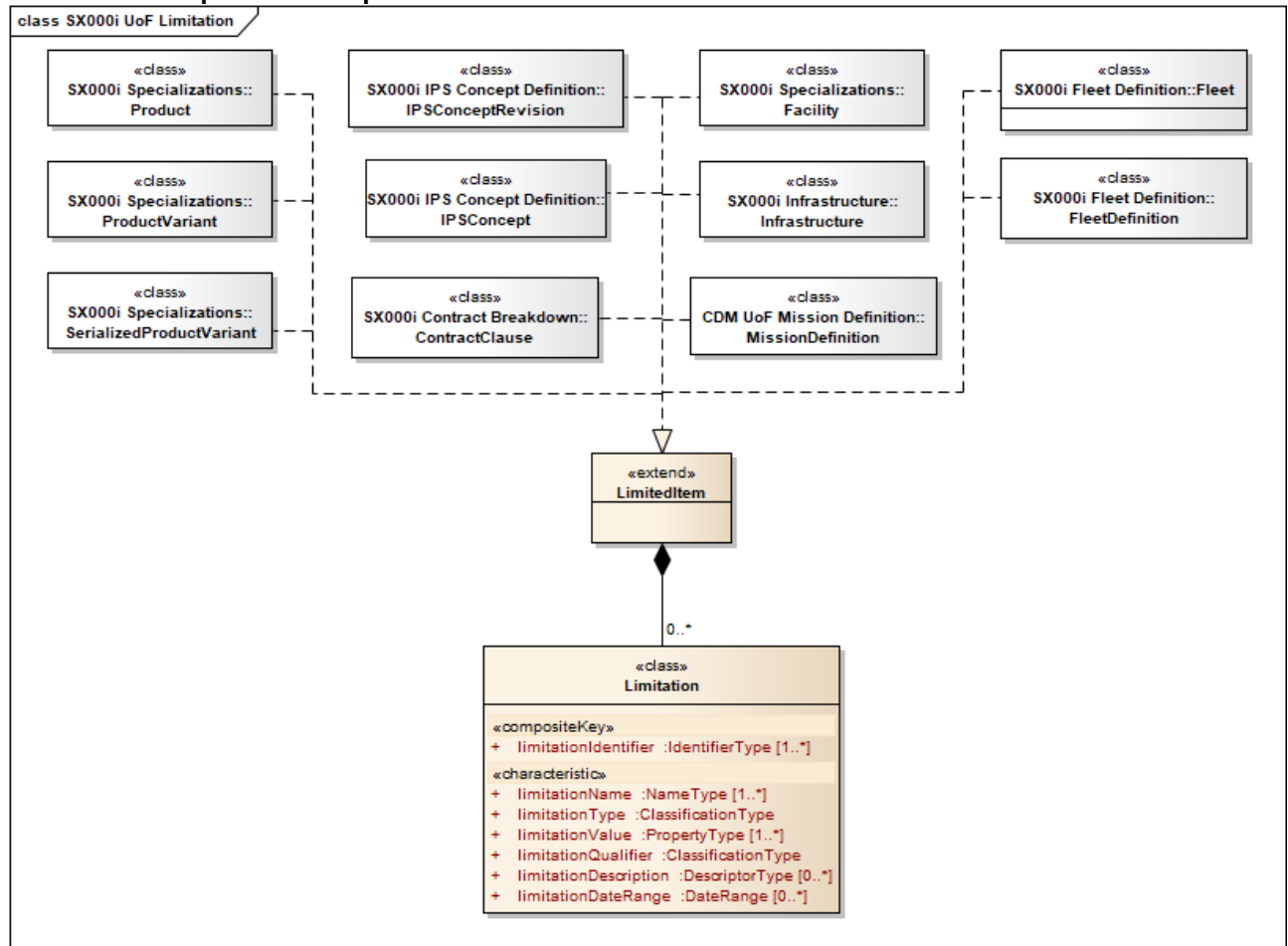
- A composition association, one or manychild objects of type [ITArchitectureNode](#)

5.30 SX000i UoF Limitation

5.30.1 Description

[Limitation](#) UoF provides the capability to define limitations or restrictions to the capability or features of different items or concepts.

5.30.2 Graphical description



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Fig 42 SX000i UoF Limitation

5.30.3 Class definition

5.30.3.1 Limitation

Limitation is the definition of a reduced capability or restriction that applies to an item.

5.30.3.1.1 Attribute(s)

This class has the following attributes:

- limitationIdentifier, one or many
- limitationName, one or many
- limitationType
- limitationValue, one or many
- limitationQualifier
- limitationDescription, zero, one or many
- limitationDateRange, zero, one or many

5.30.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type **LimitedItem**

5.30.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.30.3.2 LimitedItem

[LimitedItem](#) is a <<select>> interface representing the items that can have one or more Limitations associated to them.

5.30.3.2.1 Class members

This <<extend>> interface includes the following class members:

- [CapabilityDefinitionRevision](#)
- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)
- [ContractClause](#)
- [Facility](#)
- [Fleet](#)
- [FleetDefinition](#)
- [Infrastructure](#)
- [IPSConcept](#)
- [IPSConceptRevision](#)
- [ITConcept](#)
- [ITConceptRevision](#)
- [MaintenanceConcept](#)
- [MaintenanceConceptRevision](#)
- [MaintenanceFacility](#)
- [MissionDefinition](#)
- [MRONetwork](#)
- [OperatingBase](#)
- [OperationalConcept](#)
- [OperationalConceptRevision](#)
- [OtherFacility](#)
- [Port](#)
- [PowerGrid](#)
- [Product](#)
- [ProductVariant](#)
- [ProvisioningConcept](#)
- [ProvisioningConceptRevision](#)
- [SerializedProductVariant](#)
- [ServiceLevelAgreementClause](#)
- [TrainingConcept](#)
- [TrainingConceptRevision](#)
- [TrainingFacility](#)

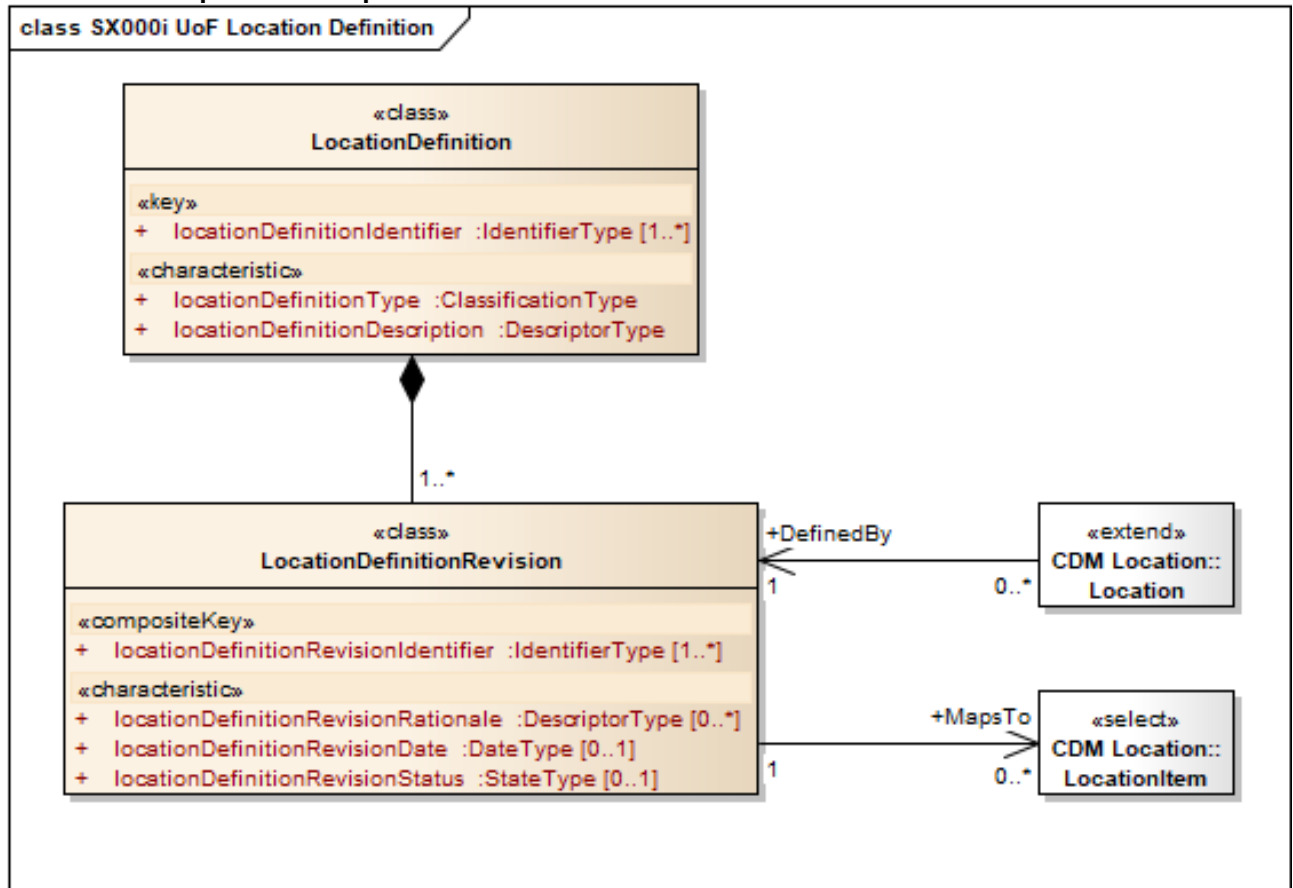
- [TransportNetwork](#)
- [Warehouse](#)

5.31 SX000i UoF Location Definition

5.31.1 Description

The Location Definition UoF provides the capability to specify an abstract location of an item that can later be mapped to an actual location.

5.31.2 Graphical description



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Fig 43 SX000i UoF Location Definition

5.31.3 Class definition

5.31.3.1 LocationDefinition

[LocationDefinition](#) is a <<class>> that defines a particular place or position.

5.31.3.1.1 Attribute(s)

This class has the following attributes:

- [locationDefinitionIdentifier](#), one or many
- [locationDefinitionType](#)
- [locationDefinitionDescription](#)

5.31.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)

Applicable to: All

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- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.31.3.2 LocationDefinitionRevision

[LocationDefinitionRevision](#) is a <<class>> representing an iteration applied to a [LocationDefinition](#).

5.31.3.2.1 Attribute(s)

This class has the following attributes:

- [locationDefinitionRevisionIdentifier](#), one or many
- [locationDefinitionRevisionRationale](#), zero, one or many
- [locationDefinitionRevisionDate](#), zero or one
- [locationDefinitionRevisionStatus](#), zero or one

5.31.3.2.2 Associations

This class has the following associations:

- An aggregate association, one or many, to one related object of type [LocationDefinition](#)
- A directed association, to object(s) from classes that are members of [LocationItem](#)

5.31.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.31.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

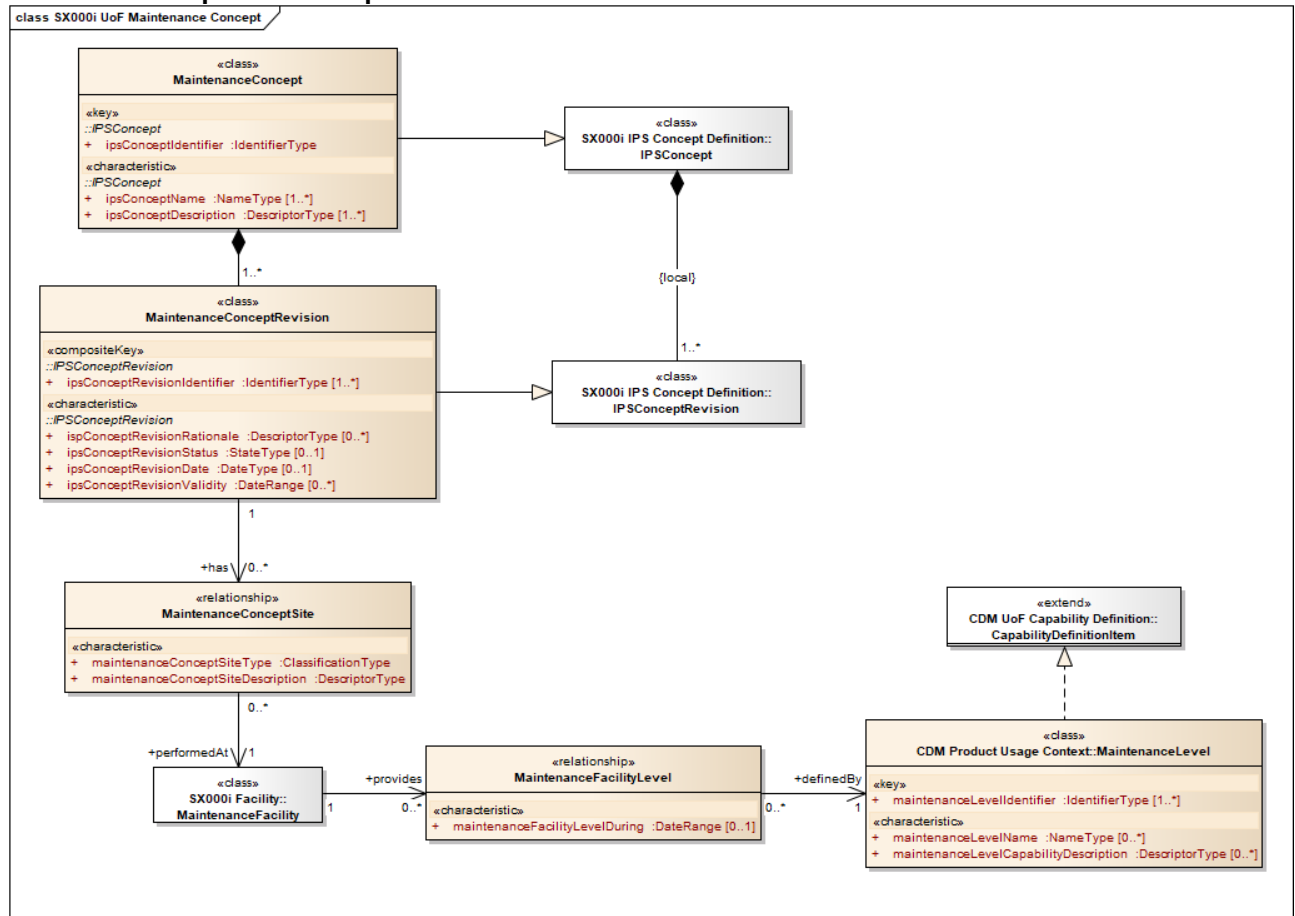
- [OperatingLocation](#). Refer to SX000i UoF Operating Location, [Para 5.41](#)

5.32 SX000i UoF Maintenance Concept

5.32.1 Description

The Maintenance Concept UoF provides the capability to define how and where maintenance will be performed on the supported products.

5.32.2 Graphical description



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Fig 44 SX000i UoF Maintenance Concept

5.32.3 Class definition

class id	class definition
5.32.3.1	MaintenanceConcept

`MaintenanceConcept` is a specialized `IPSConcept` intended to describe how maintenance will be set up and performed as part of the overall support.

5.32.3.1.1 *Attribute(s)*

This class has the following attributes:

- `ipsConceptIdentifier` (inherited from `IPSConcept`)
- `ipsConceptName` (inherited from `IPSConcept`), one or many
- `ipsConceptDescription` (inherited from `IPSConcept`), one or many

5.32.3.1.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type `IPSConceptRequiringItem`
- A directed association, to zero, one or many objects of type `IPSConceptRelationship`

5.32.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.32.3.1.4 *Selects*

This class is a member of the following <<select>> interfaces:

- [RequirementTargetItem](#) (inherited from [IPSConcept](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)

5.32.3.2 MaintenanceConceptRevision

[MaintenanceConceptRevision](#) is a <<class>> representing an iteration applied to a [MaintenanceConcept](#).

5.32.3.2.1 *Attribute(s)*

This class has the following attributes:

- [ipsConceptRevisionIdentifier](#) (inherited from [IPSConceptRevision](#)), one or many
- [ispConceptRevisionRationale](#) (inherited from [IPSConceptRevision](#)), zero, one or many
- [ipsConceptRevisionStatus](#) (inherited from [IPSConceptRevision](#)), zero or one
- [ipsConceptRevisionDate](#) (inherited from [IPSConceptRevision](#)), zero or one
- [ipsConceptRevisionValidity](#) (inherited from [IPSConceptRevision](#)), zero, one or many

5.32.3.2.2 *Associations*

This class has the following associations:

- An aggregate association, one or many, to one related object of type [MaintenanceConcept](#)
- A directed association, to zero, one or many objects of type [IPSConceptRevisionRequirement](#)
- A directed association, to zero, one or many objects of type [MaintenanceConceptSite](#)

5.32.3.2.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)

- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.32.3.3 MaintenanceConceptSite

[MaintenanceConceptSite](#) is a <<relationship>> that defines the facilities where maintenance is going to be carried out as part of a [MaintenanceConceptRevision](#).

5.32.3.3.1 Attribute(s)

This class has the following attributes:

- maintenanceConceptSiteType
- maintenanceConceptSiteDescription

5.32.3.3.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [MaintenanceFacility](#)

5.32.3.4 MaintenanceFacilityLevel

[MaintenanceFacilityLevel](#) is a <<relationship>> that associates a [MaintenanceLevel](#) to a [MaintenanceFacility](#)

5.32.3.4.1 Attribute(s)

This class has the following attributes:

- maintenanceFacilityLevelDuring, zero or one

5.32.3.4.2 Associations

This class has the following associations:

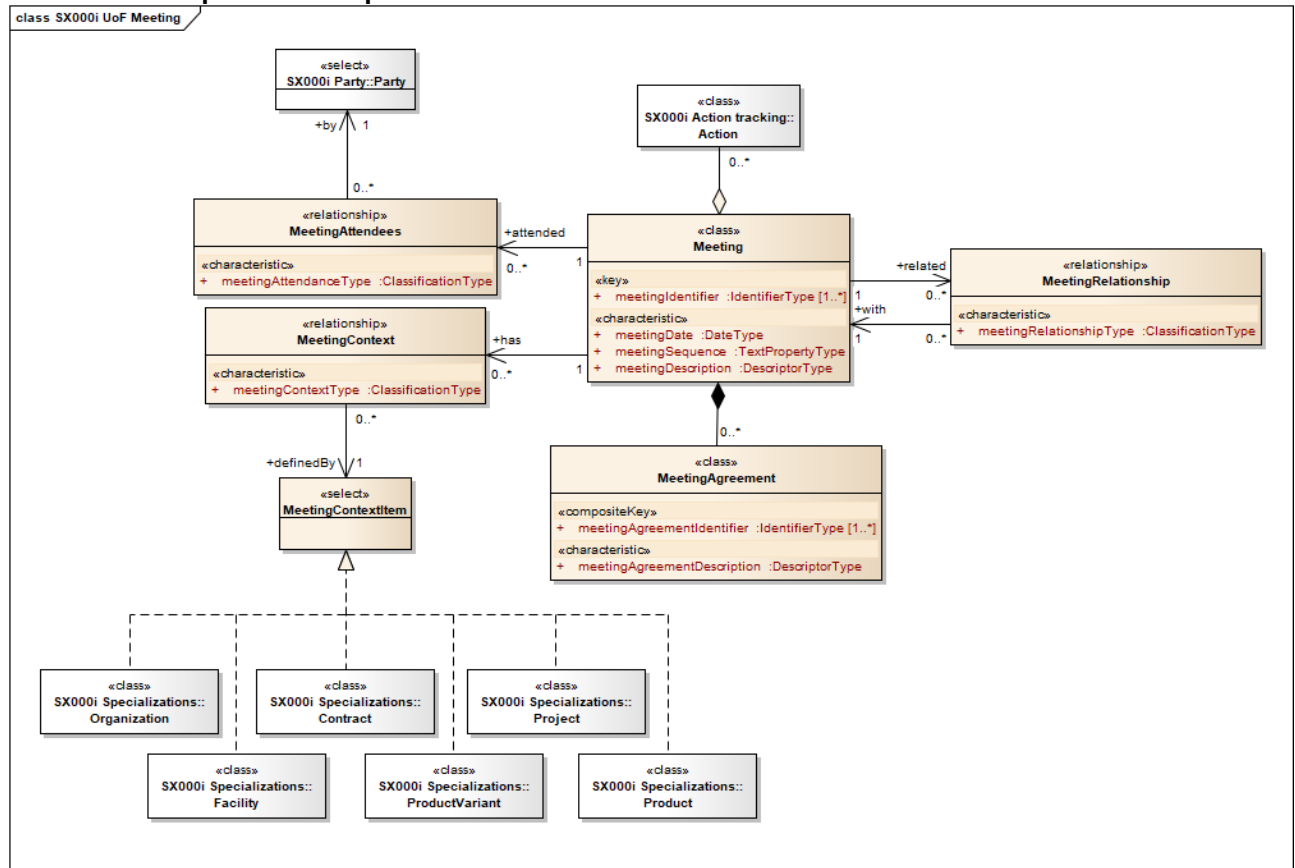
- A directed association, zero, one or many, to one object of type [MaintenanceLevel](#)

5.33 SX000i UoF Meeting

5.33.1 Description

The Meeting UoF provides the capability to document meetings, as well as associated actions and agreements in the context of an IPS program.

5.33.2 Graphical description



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Fig 45 SX000i UoF Meeting

5.33.3 Class definition

5.33.3.1 Meeting

Meeting is a class representing a formal encounter taking place to address a common purpose.

5.33.3.1.1 *Attribute(s)*

This class has the following attributes:

- meetingIdentifier, one or many
- meetingDate
- meetingSequence
- meetingDescription

5.33.3.1.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type `MeetingAttendees`
- A directed association, to zero, one or many objects of type `MeetingContext`
- A directed association, to zero, one or many objects of type `MeetingRelationship`

5.33.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

Applicable to: All

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- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.33.3.2 MeetingAgreement

[MeetingAgreement](#) is a formal decision taken during a [Meeting](#).

5.33.3.2.1 Attribute(s)

This class has the following attributes:

- `meetingAgreementIdentifier`, one or many
- `meetingAgreementDescription`

5.33.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [Meeting](#)

5.33.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.33.3.3 MeetingAttendees

[MeetingAttendees](#) is a <<relationship>> that documents the Parties that attended a [Meeting](#).

5.33.3.3.1 Attribute(s)

This class has the following attributes:

- `meetingAttendanceType`

5.33.3.3.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.33.3.4 MeetingContext

[MeetingContext](#) is a <<select>> interface that identifies items which can be selected as the context for a [Meeting](#).

5.33.3.4.1 Attribute(s)

This class has the following attributes:

- `meetingContextType`

5.33.3.4.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [MeetingContextItem](#)

5.33.3.5 MeetingContextItem

[MeetingContextItem](#) is a <<select>> interface that enables the definition of the context of a [Meeting](#).

5.33.3.5.1 Class members

This <<select>> interface includes the following class members:

- [Contract](#)
- [Facility](#)
- [MaintenanceFacility](#)
- [OperatingBase](#)
- [OperatorOrganization](#)
- [Organization](#)
- [OtherFacility](#)
- [Product](#)
- [ProductVariant](#)
- [Project](#)
- [TrainingFacility](#)
- [Warehouse](#)

5.33.3.6 MeetingRelationship

[MeetingRelationship](#) is a <<relationship>> that defines the associations that exist between different [Meetings](#).

5.33.3.6.1 Attribute(s)

This class has the following attributes:

- [meetingRelationshipType](#)

5.33.3.6.2 Associations

This class has the following associations:

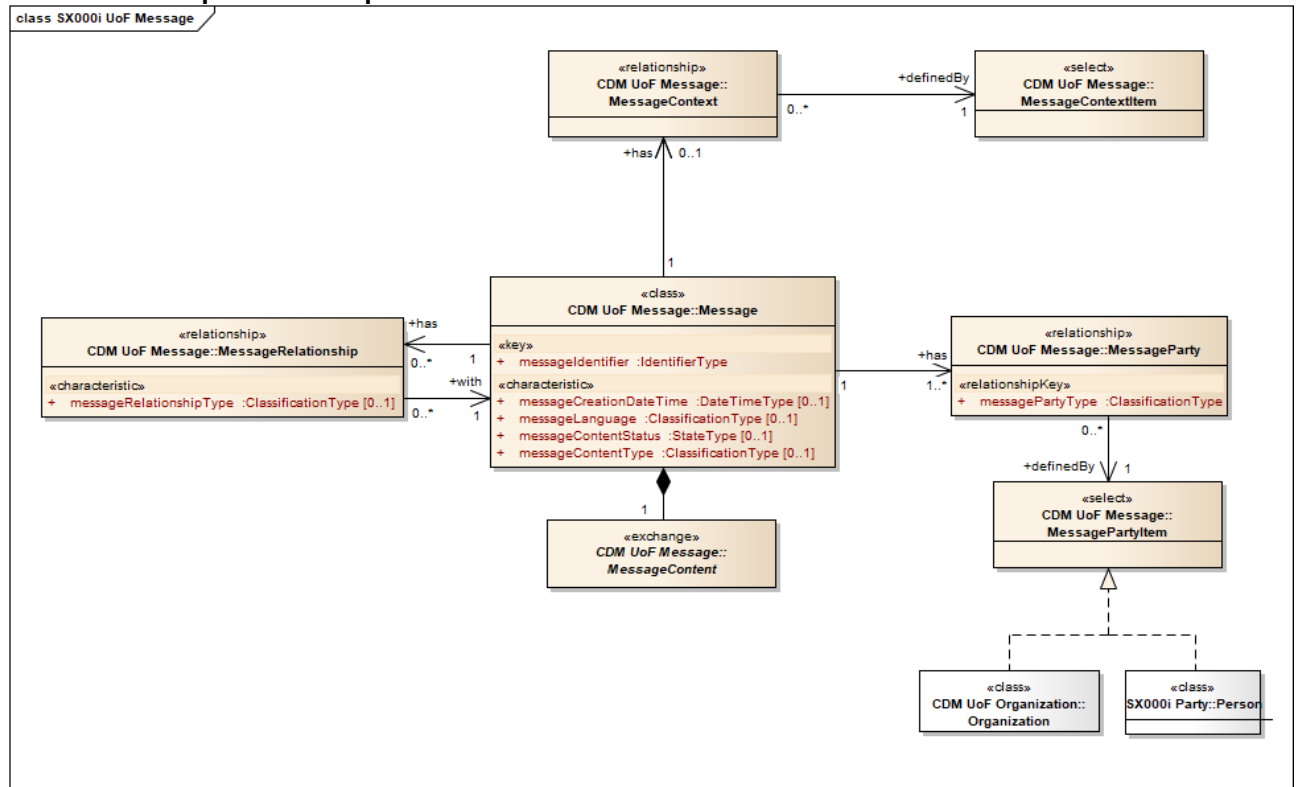
- A directed association, zero, one or many, to one object of type [Meeting](#)

5.34 SX000i UoF Message

5.34.1 Description

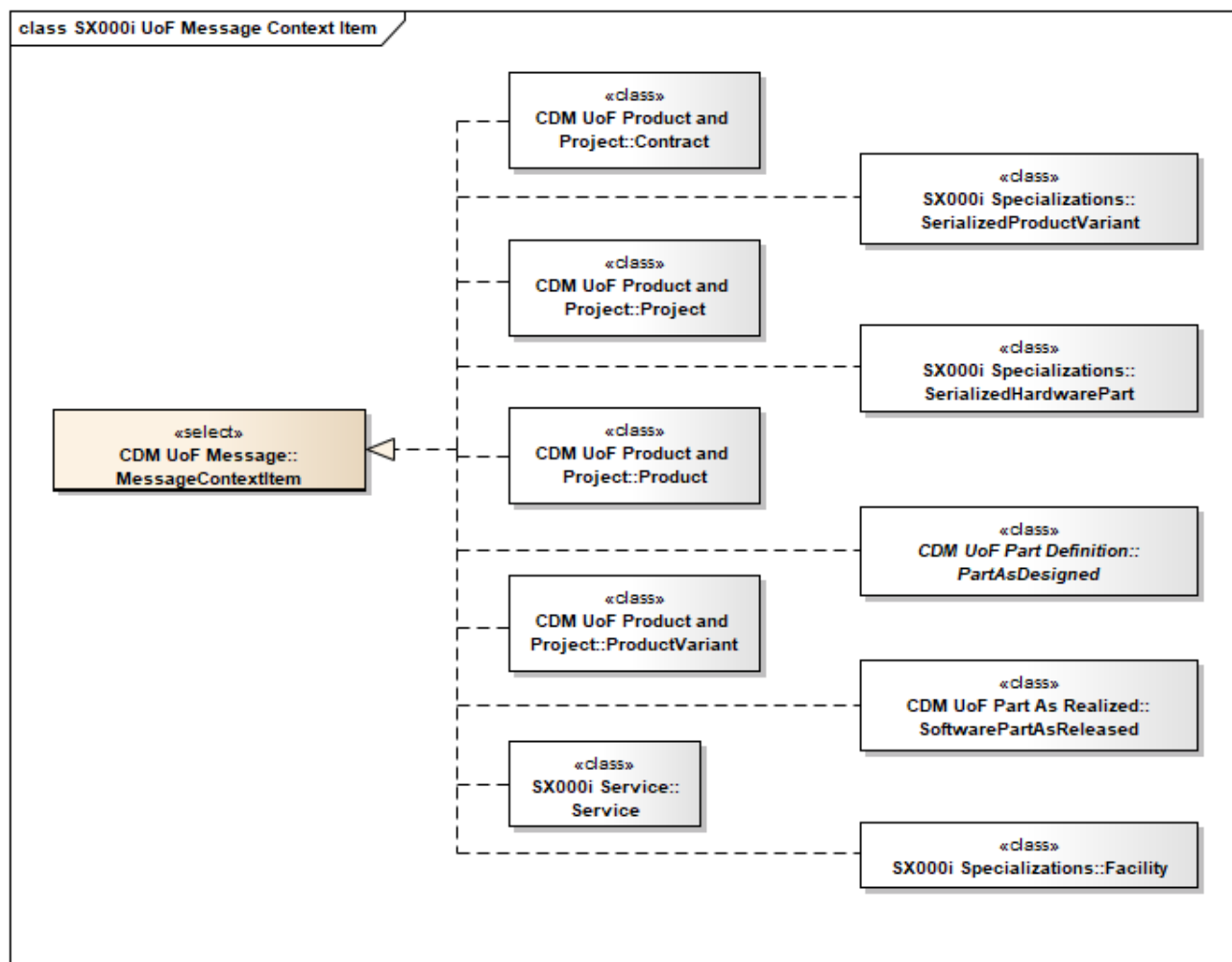
The Message UoF provides the capability of defining a wrapper for all S-Series Specifications data exchanges.

5.34.2 Graphical description



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Fig 46 SX000i UoF Message



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Fig 47 SX000i UoF Message Context Item

5.34.3 Class definition

5.35 SX000i UoF Mission Definition

5.35.1 Description

The Mission Definition UoF supports the definitions of operational scenarios to be carried out by a [Product](#).

5.35.2 Graphical description

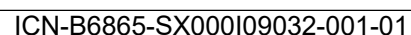
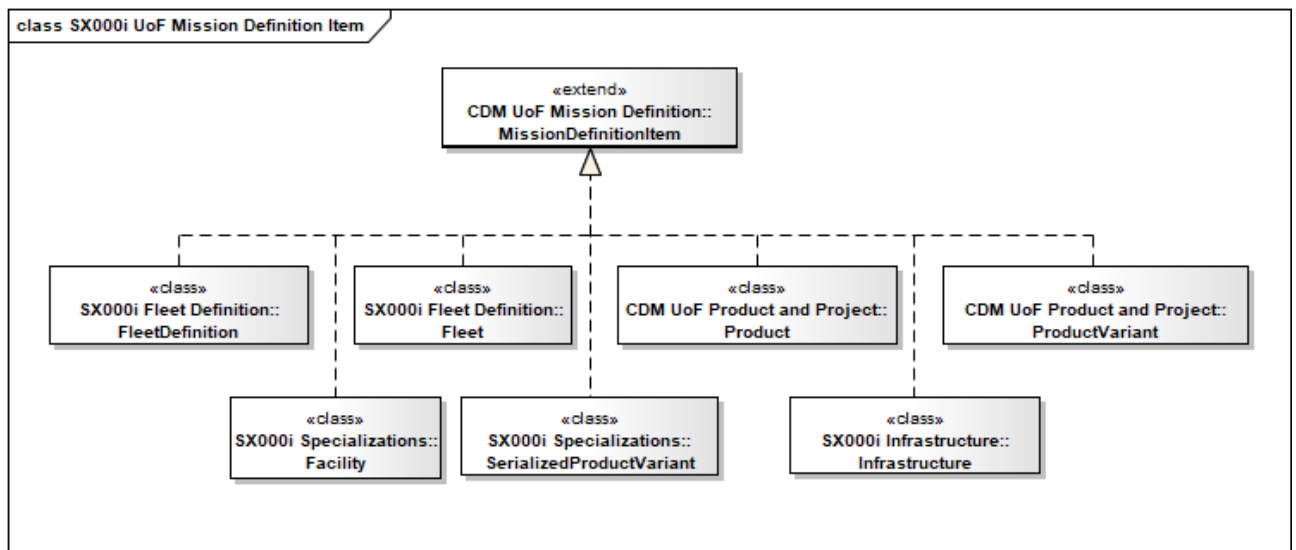
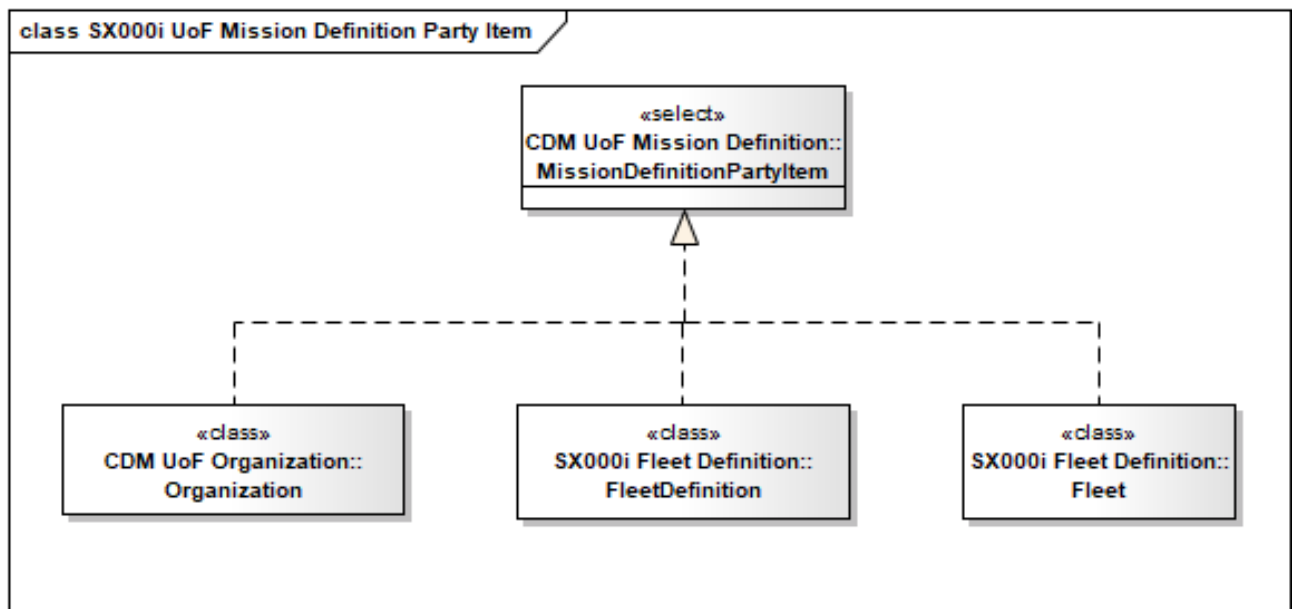


Fig 48 SX000i UoF Mission Definition



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Fig 49 SX000i UoF Mission Definition Item



ICN-B6865-SX000I09074-001-01

Fig 50 SX000i UoF Mission Definition Party Item

5.35.3 Class definition

5.35.3.1 MissionDefinitionRequirement

[MissionDefinitionRequirement](#) is a <<relationship>> that associates [Requirements](#) to a [MissionDefinitionRevision](#).

5.35.3.1.1 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [Requirement](#)

5.35.3.2 MissionDefinitionRevisionLocation

[MissionDefinitionRevisionLocation](#) is a <<relationship>> allowing to associate a [MissionDefinitionRevision](#) to the location when it is performed.

Applicable to: All

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5.35.3.2.1 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [OperatingLocation](#)

5.35.3.3 OperationalRoleMission

[OperationalRoleMission](#) is a <<relationship>> that defines the Missions that an [OperationalRole](#) can perform.

5.35.3.3.1 Associations

This class has the following associations:

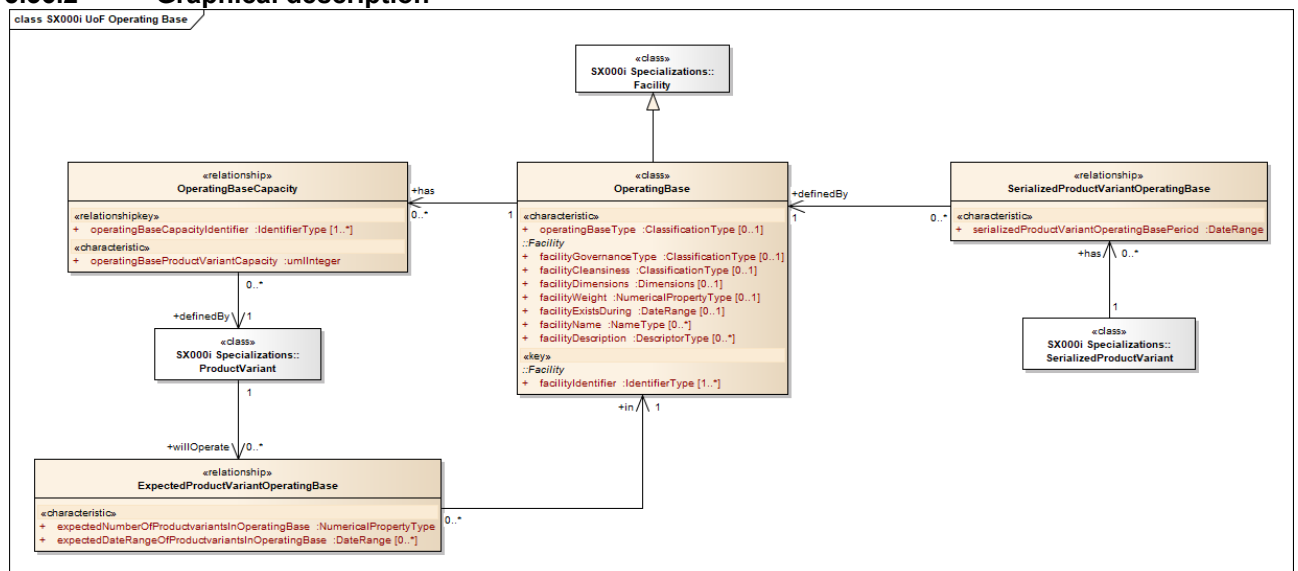
- A directed association, zero, one or many, to one object of type [MissionDefinitionRevision](#)

5.36 SX000i UoF Operating Base

5.36.1 Description

The Operating Base UoF provides the necessary information associated to an [OperatingBase](#).

5.36.2 Graphical description



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Fig 51 SX000i UoF Operating Base

5.36.3 Class definition

5.36.3.1 ExpectedProductVariantOperatingBase

[ExpectedProductVariantOperatingBase](#) is a <<relationship>> that defines the [OperatingBase\(s\)](#) where a [ProductVariant](#) will operate.

5.36.3.1.1 Attribute(s)

This class has the following attributes:

- `expectedNumberOfProductvariantsInOperatingBase`
- `expectedDateRangeOfProductvariantsInOperatingBase`, zero, one or many

5.36.3.1.2 Associations

This class has the following associations:

Applicable to: All

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- A directed association, zero, one or many, to one object of type [OperatingBase](#)

5.36.3.2 OperatingBase

[OperatingBase](#) is a permanent or semi-permanent [Facility](#) that is mainly established for providing support for operations.

Example(s)

- airfield
- garage
- harbor

5.36.3.2.1 Attribute(s)

This class has the following attributes:

- facilityIdentifier (inherited from [Facility](#)), one or many
- facilityGovernanceType (inherited from [Facility](#)), zero or one
- facilityCleansiness (inherited from [Facility](#)), zero or one
- facilityName (inherited from [Facility](#)), zero, one or many
- facilityDimensions (inherited from [Facility](#)), zero or one
- facilityDescription (inherited from [Facility](#)), zero, one or many
- facilityWeight (inherited from [Facility](#)), zero or one
- facilityExistsDuring (inherited from [Facility](#)), zero or one
- operatingBaseType, zero or one

5.36.3.2.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [FacilityEquipment](#)
- A directed association, to zero, one or many objects of type [FacilityLocation](#)
- A directed association, to zero, one or many objects of type [FacilityOwner](#)
- A directed association, to zero, one or many objects of type [FacilityRelationship](#)
- A directed association, to zero, one or many objects of type [OperatingBaseCapacity](#). An [OperatingBase](#) can be associated with zero, one or many [ProductVariants](#) (via the [OperatingBaseCapacity](#) <<relationship>> that can operate there

5.36.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CapabilityDefinitionItem](#). Refer to SX000i UoF Capability Definition, [Para 5.10](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [EnvironmentDefinitionItem](#). Refer to SX000i UoF Environment Definition, [Para 5.23](#)
- [EnvironmentDefinitionItem](#). Refer to CDM UoF Environment Definition,

- [InfrastructureAvailableItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [InfrastructureItem](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [IPSConceptRequiringItem](#). Refer to SX000i UoF Supported Item, [Para 5.68](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [MissionDefinitionItem](#). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [OperationalScenarioItem](#). Refer to SX000i UoF Operational Scenario Definition, [Para 5.44](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectImpactedItem](#). Refer to SX000i UoF Project, [Para 5.54](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [StaffingItem](#). Refer to SX000i UoF Staffing, [Para 5.66](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.36.3.2.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ExportControlledItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [InfrastructureNode](#) (inherited from [Facility](#)). Refer to SX000i UoF Infrastructure, [Para 5.30](#)
- [MeetingContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessageContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [OperatingLocation](#). Refer to SX000i UoF Operating Location, [Para 5.41](#)
- [ReportContextItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Facility](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)

- [SupplyRequiringItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Provisioning Concept, [Para 5.57](#)
- [SupportElementItem](#) (inherited from [Facility](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)
- [TaskLocationItem](#) (inherited from [Facility](#)). Refer to CDM UoF [Task](#) Usage,

5.36.3.3 OperatingBaseCapacity

[OperatingBaseCapacity](#) is a <<relationship>> that identifies the capacity of an [OperatingBase](#) to allow the operation of a specific [ProductVariant](#).

Example(s)

- 2 buses
- 8 cars

5.36.3.3.1 Attribute(s)

This class has the following attributes:

- `operatingBaseCapacityIdentifier`, one or many
- `operatingBaseProductVariantCapacity`

5.36.3.3.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [ProductVariant](#)

5.36.3.4 SerializedProductVariantOperatingBase

[SerializedProductVariantOperatingBase](#) is a <<relationship>> that establishes in which [OperatingBase](#) a [SerializedProductVariant](#) has been operating during a specific period of time.

5.36.3.4.1 Attribute(s)

This class has the following attributes:

- `serializedProductVariantOperatingBasePeriod`

5.36.3.4.2 Associations

This class has the following associations:

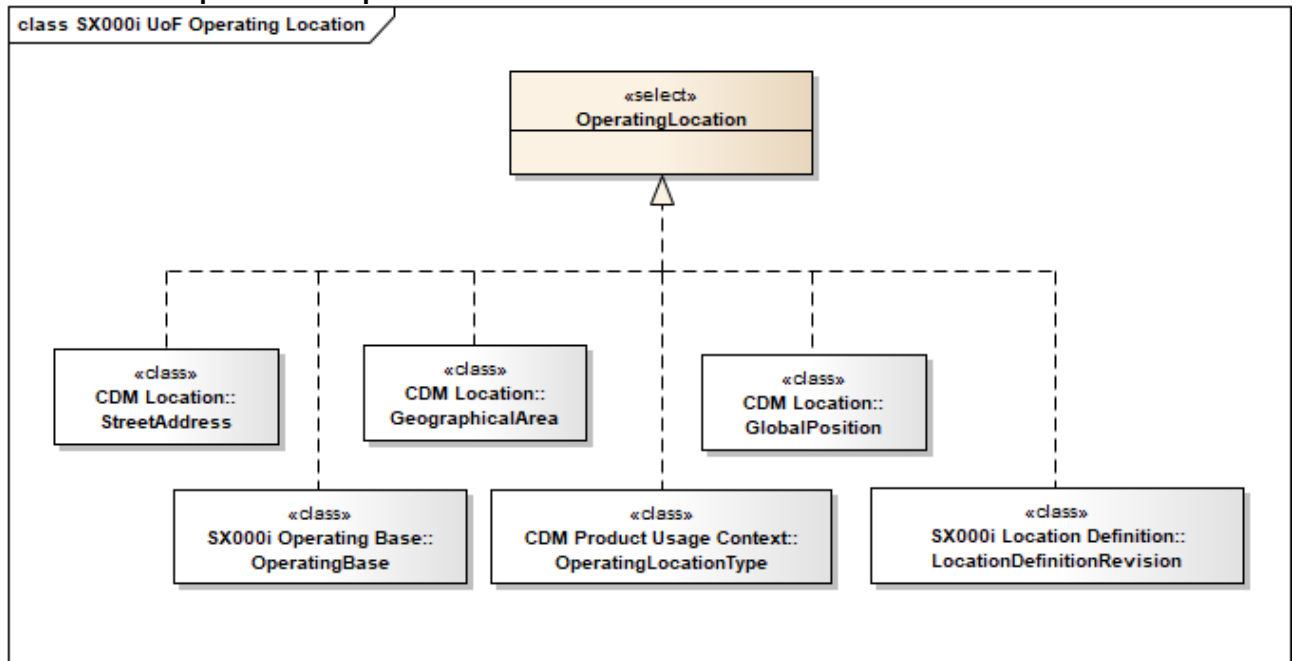
- A directed association, zero, one or many, to one object of type [OperatingBase](#)

5.37 SX000i UoF Operating Location

5.37.1 Description

Operating [Location](#) UoF provides the capability to define where the [Product](#) operation will be performed.

5.37.2 Graphical description



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Fig 52 SX000i UoF Operating Location

5.37.3 Class definition

5.37.3.1 OperatingLocation

[OperatingLocation](#) is a <<select>> interface that allows the selection of the locations where a [Product](#) can operate.

5.37.3.1.1 Class members

This <<select>> interface includes the following class members:

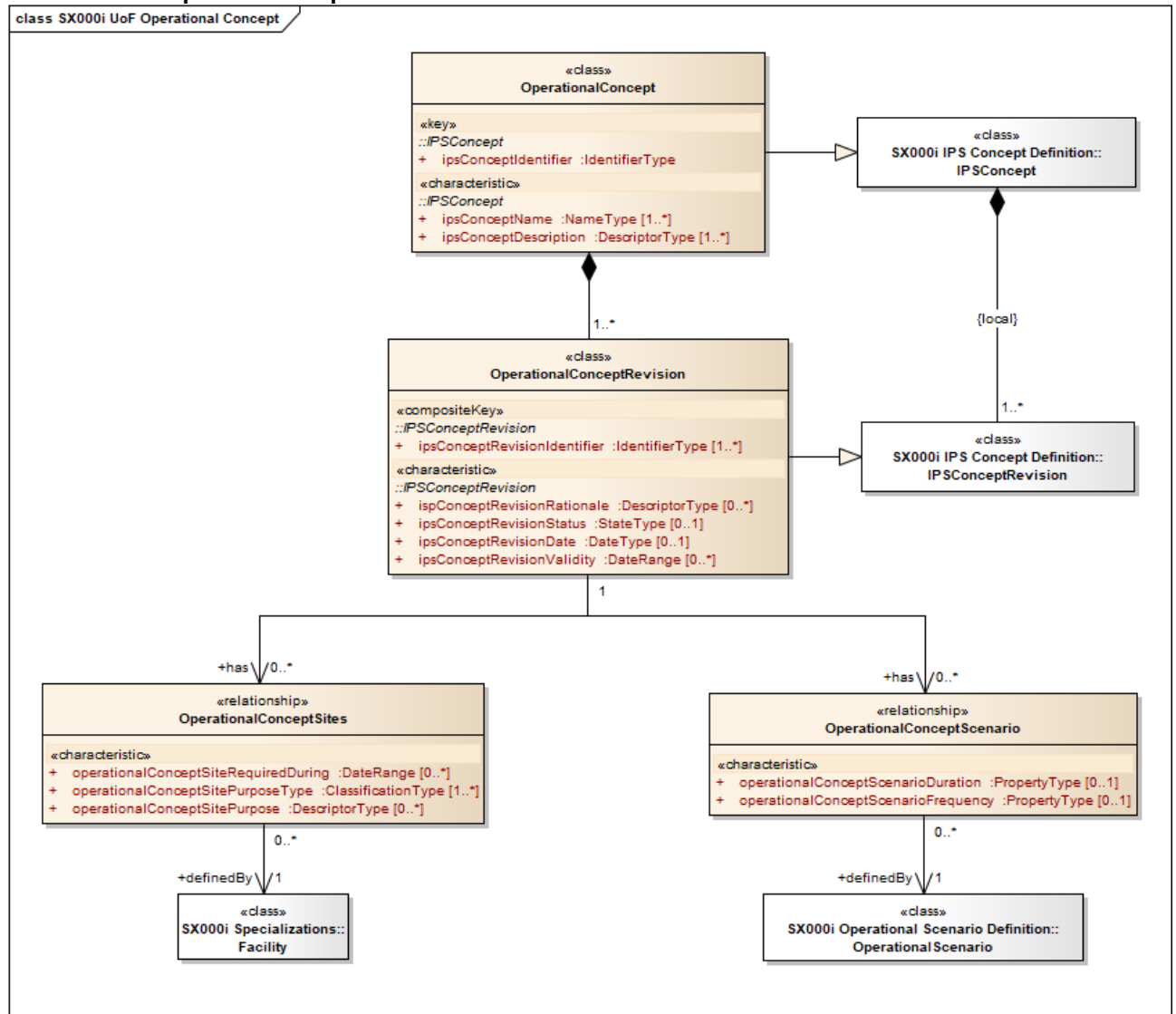
- [GeographicalArea](#)
- [GlobalPosition](#)
- [LocationDefinitionRevision](#)
- [OperatingBase](#)
- [OperatingLocationType](#)
- [StreetAddress](#)

5.38 SX000i UoF Operational Concept

5.38.1 Description

The Operational Concept UoF provides the capability to define the scenarios for the operation of the [Product](#) and where such operation will take place.

5.38.2 Graphical description



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Fig 53 SX000i UoF Operational Concept

5.38.3 Class definition

5.38.3.1 OperationalConcept

OperationalConcept is a specialized **IPConcept** intended to describe how the **Product** operation will be set up and performed as part of the overall IPS concept.

5.38.3.1.1 Attribute(s)

This class has the following attributes:

- ipsConceptIdentifier (inherited from **IPConcept**)
- ipsConceptName (inherited from **IPConcept**), one or many
- ipsConceptDescription (inherited from **IPConcept**), one or many

5.38.3.1.2 Associations

This class has the following associations:

- A composition association, zero, one or many child objects of type [IPSConceptRequiringItem](#)
- A directed association, to zero, one or many objects of type [IPSConceptRelationship](#)

5.38.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.38.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- [RequirementTargetItem](#) (inherited from [IPSConcept](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)

5.38.3.2 OperationalConceptRevision

[OperationalConceptRevision](#) is a <<class>> representing an iteration applied to an [OperationalConcept](#).

5.38.3.2.1 Attribute(s)

This class has the following attributes:

- [ipsConceptRevisionIdentifier](#) (inherited from [IPSConceptRevision](#)), one or many
- [ispConceptRevisionRationale](#) (inherited from [IPSConceptRevision](#)), zero, one or many
- [ipsConceptRevisionStatus](#) (inherited from [IPSConceptRevision](#)), zero or one
- [ipsConceptRevisionDate](#) (inherited from [IPSConceptRevision](#)), zero or one
- [ipsConceptRevisionValidity](#) (inherited from [IPSConceptRevision](#)), zero, one or many

5.38.3.2.2 Associations

This class has the following associations:

- An aggregate association, one or many, to one related object of type [OperationalConcept](#)
- A directed association, to zero, one or many objects of type [IPSConceptRevisionRequirement](#)
- A directed association, to zero, one or many objects of type [OperationalConceptScenario](#)
- A directed association, to zero, one or many objects of type [OperationalConceptSites](#)

5.38.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.38.3.3 OperationalConceptScenario

[OperationalConceptScenario](#) is a <<relationship>> that associates operational scenarios to an [OperationalConceptRevision](#).

5.38.3.3.1 Attribute(s)

This class has the following attributes:

- [operationalConceptScenarioDuration](#), zero or one
- [operationalConceptScenarioFrequency](#), zero or one

5.38.3.3.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [OperationalScenario](#)

5.38.3.4 OperationalConceptSites

[OperationalConceptSites](#) is a <<relationship>> that defines the sites where operation is going to be carried out during a specific period of time.

5.38.3.4.1 Attribute(s)

This class has the following attributes:

- [operationalConceptSiteRequiredDuring](#), zero, one or many
- [operationalConceptSitePurposeType](#), one or many
- [operationalConceptSitePurpose](#), zero, one or many

5.38.3.4.2 Associations

This class has the following associations:

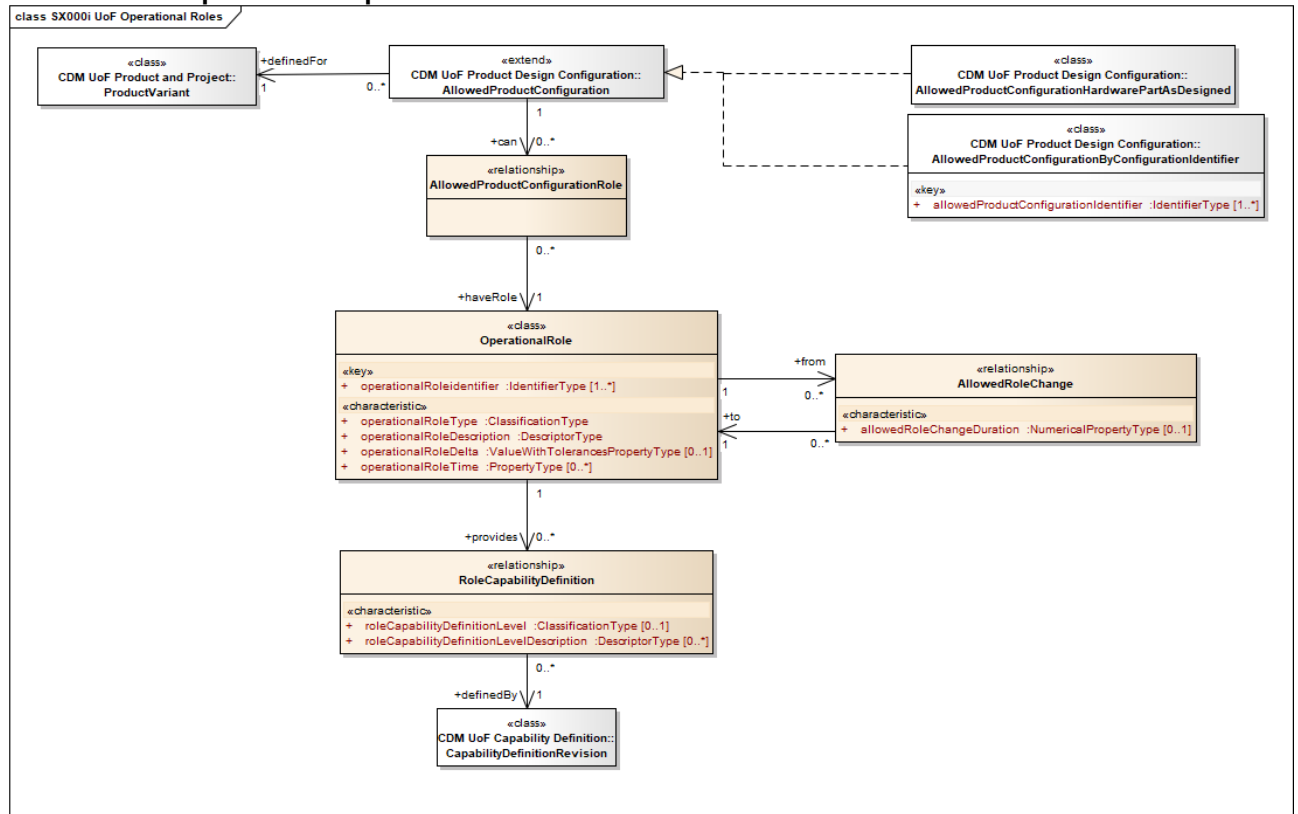
- A directed association, zero, one or many, to one object of type [Facility](#)
- A directed association, zero, one or many, to one object of type [MaintenanceFacility](#)
- A directed association, zero, one or many, to one object of type [OperatingBase](#)
- A directed association, zero, one or many, to one object of type [OtherFacility](#)
- A directed association, zero, one or many, to one object of type [TrainingFacility](#)
- A directed association, zero, one or many, to one object of type [Warehouse](#)

5.39 SX000i UoF Operational Roles

5.39.1 Description

The Operational Roles UoF allows to associate an [OperationalRole](#) to the Capabilities that such a role can have.

5.39.2 Graphical description



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Fig 54 SX000i UoF Operational Roles

5.39.3 Class definition

5.39.3.1 AllowedProductConfigurationRole

[AllowedProductConfigurationRole](#) is a <<relationship>> that defines what [OperationalRoles](#) can be performed by a specific [AllowedProductConfiguration](#).

5.39.3.1.1 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [OperationalRole](#)

5.39.3.2 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.

5.39.3.2.1 Attribute(s)

This class has the following attributes:

- `allowedRoleChangeDuration`, zero or one

5.39.3.2.2 Associations

This class has the following associations:

Applicable to: All

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- A directed association, zero, one or many, to one object of type [OperationalRole](#)

5.39.3.3 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.

5.39.3.3.1 Attribute(s)

This class has the following attributes:

- operationalRoleIdentifier, one or many
- operationalRoleType
- operationalRoleDescription
- operationalRoleDelta, zero or one
- operationalRoleTime, zero, one or many

5.39.3.3.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [AllowedRoleChange](#)
- A directed association, to zero, one or many objects of type [OperationalRoleMission](#)
- A directed association, to zero, one or many objects of type [RoleCapabilityDefinition](#)

5.39.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.39.3.4 RoleCapabilityDefinition

[RoleCapabilityDefinition](#) is a <<relationship>> that defines which [Product](#) capabilities are provided by a specific [OperationalRole](#).

5.39.3.4.1 Attribute(s)

This class has the following attributes:

- roleCapabilityDefinitionLevel, zero or one
- roleCapabilityDefinitionLevelDescription, zero, one or many

5.39.3.4.2 Associations

This class has the following associations:

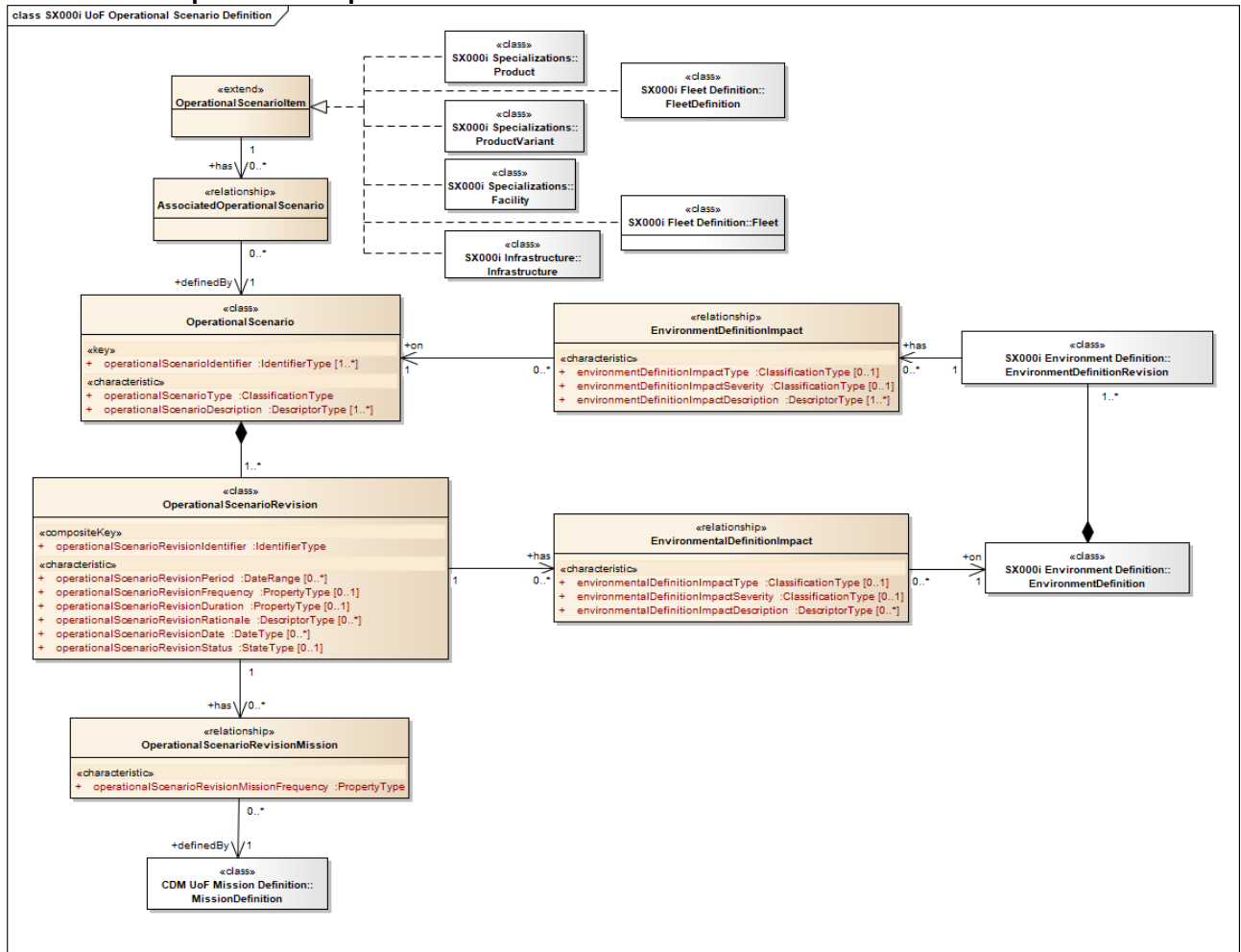
- A directed association, zero, one or many, to one object of type [CapabilityDefinitionRevision](#)

5.40 SX000i UoF Operational Scenario Definition

5.40.1 Description

The Operational Scenario Definition UoF provides the capability to define the context and environment in which operations take place and the missions that are performed under such scenario.

5.40.2 Graphical description



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Fig 55 SX000i UoF Operational Scenario Definition

5.40.3 Class definition

5.40.3.1 AssociatedOperationalScenario

[AssociatedOperationalScenario](#) is a <<relationship>> that associates an [OperationalScenario](#) to an Item.

5.40.3.1.1 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [OperationalScenario](#)

5.40.3.2 EnvironmentalDefinitionImpact

[EnvironmentalDefinitionImpact](#) is a <<relationship>> defining the expected impact of an [EnvironmentDefinitionRevision](#) on an Environment as defined by an [EnvironmentDefinition](#).

5.40.3.2.1 Attribute(s)

This class has the following attributes:

- `environmentalDefinitionImpactType`, zero or one
- `environmentalDefinitionImpactSeverity`, zero or one

Applicable to: All

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- environmentalDefinitionImpactDescription, zero, one or many

5.40.3.2.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [EnvironmentDefinition](#)

5.40.3.3 EnvironmentDefinitionImpact

[EnvironmentDefinitionImpact](#) is a <<relationship>> defining the impact of an [EnvironmentDefinitionRevision](#) on an [OperationalScenario](#).

5.40.3.3.1 Attribute(s)

This class has the following attributes:

- environmentDefinitionImpactType, zero or one
- environmentDefinitionImpactSeverity, zero or one
- environmentDefinitionImpactDescription, one or many

5.40.3.3.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [OperationalScenario](#)

5.40.3.4 OperationalScenario

[OperationalScenario](#) represents the defining information of a period during which an item operates as planned.

5.40.3.4.1 Attribute(s)

This class has the following attributes:

- operationalScenarioIdentifier, one or many
- operationalScenarioType
- operationalScenarioDescription, one or many

5.40.3.4.2 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.40.3.4.3 Selects

This class is a member of the following <<select>> interfaces:

- [RequirementTargetItem](#). Refer to SX000i UoF Requirement, [Para 5.62](#)

5.40.3.5 OperationalScenarioItem

[OperationalScenarioItem](#) is an <<exchange>> interface representing items that can have operational scenarios associated to them.

5.40.3.5.1 Class members

This <<extend>> interface includes the following class members:

- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)
- [Facility](#)
- [Fleet](#)
- [FleetDefinition](#)
- [Infrastructure](#)
- [MaintenanceFacility](#)
- [MRONetwork](#)
- [OperatingBase](#)
- [OtherFacility](#)
- [Port](#)
- [PowerGrid](#)
- [Product](#)
- [ProductVariant](#)
- [TrainingFacility](#)
- [TransportNetwork](#)
- [Warehouse](#)

5.40.3.5.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [AssociatedOperationalScenario](#)

5.40.3.6 OperationalScenarioRevision

[OperationalScenarioRevision](#) is a <<class>> representing an iteration applied to the definition of an [OperationalScenario](#).

5.40.3.6.1 Attribute(s)

This class has the following attributes:

- [operationalScenarioRevisionIdentifier](#)
- [operationalScenarioRevisionPeriod](#), zero, one or many
- [operationalScenarioRevisionFrequency](#), zero or one
- [operationalScenarioRevisionDuration](#), zero or one
- [operationalScenarioRevisionRationale](#), zero, one or many
- [operationalScenarioRevisionDate](#), zero, one or many
- [operationalScenarioRevisionStatus](#), zero or one

5.40.3.6.2 Associations

This class has the following associations:

- An aggregate association, one or many, to one related object of type [OperationalScenario](#)
- A directed association, to zero, one or many objects of type [EnvironmentalDefinitionImpact](#)
- A directed association, to zero, one or many objects of type [OperationalScenarioRevisionMission](#)

5.40.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.40.3.7 OperationalScenarioRevisionMission

[OperationalScenarioRevisionMission](#) is a <<relationship>> that associates a [MissionDefinition](#) to an [OperationalScenario](#).

5.40.3.7.1 Attribute(s)

This class has the following attributes:

- [operationalScenarioRevisionMissionFrequency](#)

5.40.3.7.2 Associations

This class has the following associations:

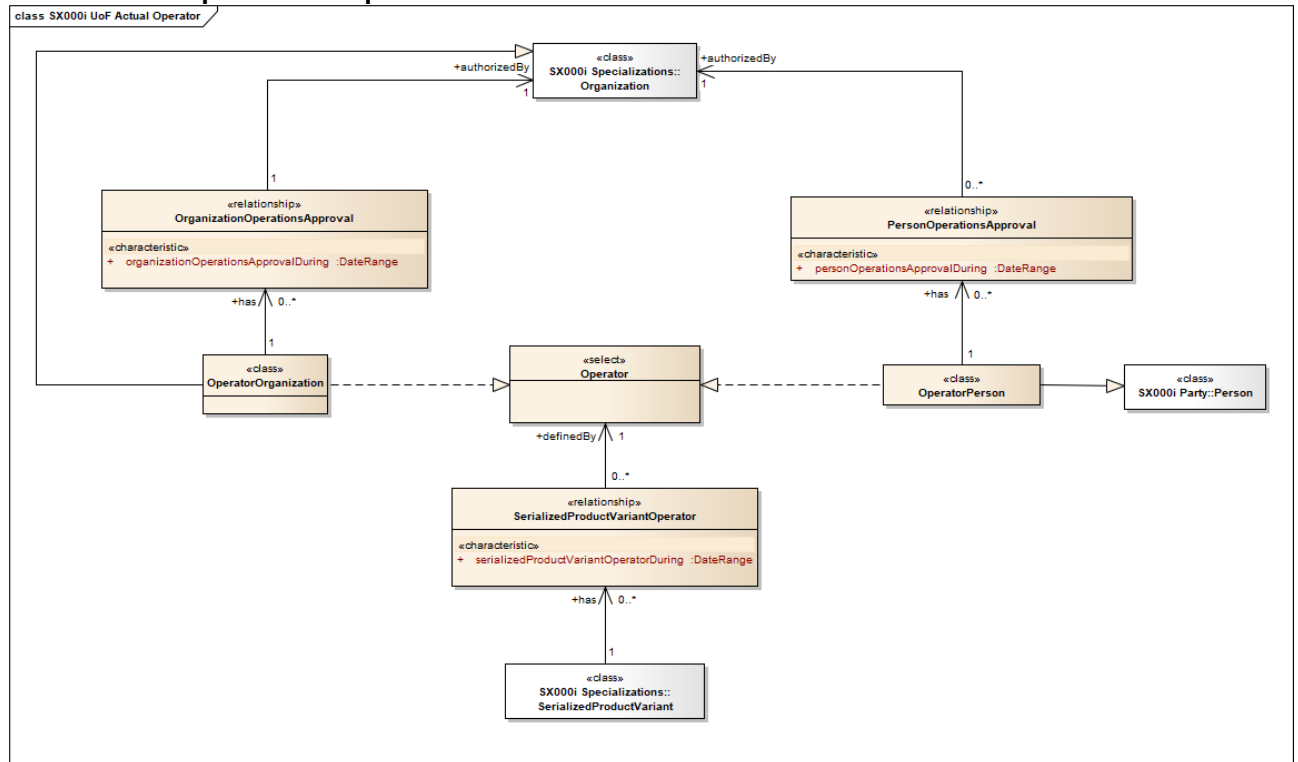
- A directed association, zero, one or many, to one object of type [MissionDefinition](#)

5.41 SX000i UoF Operator

5.41.1 Description

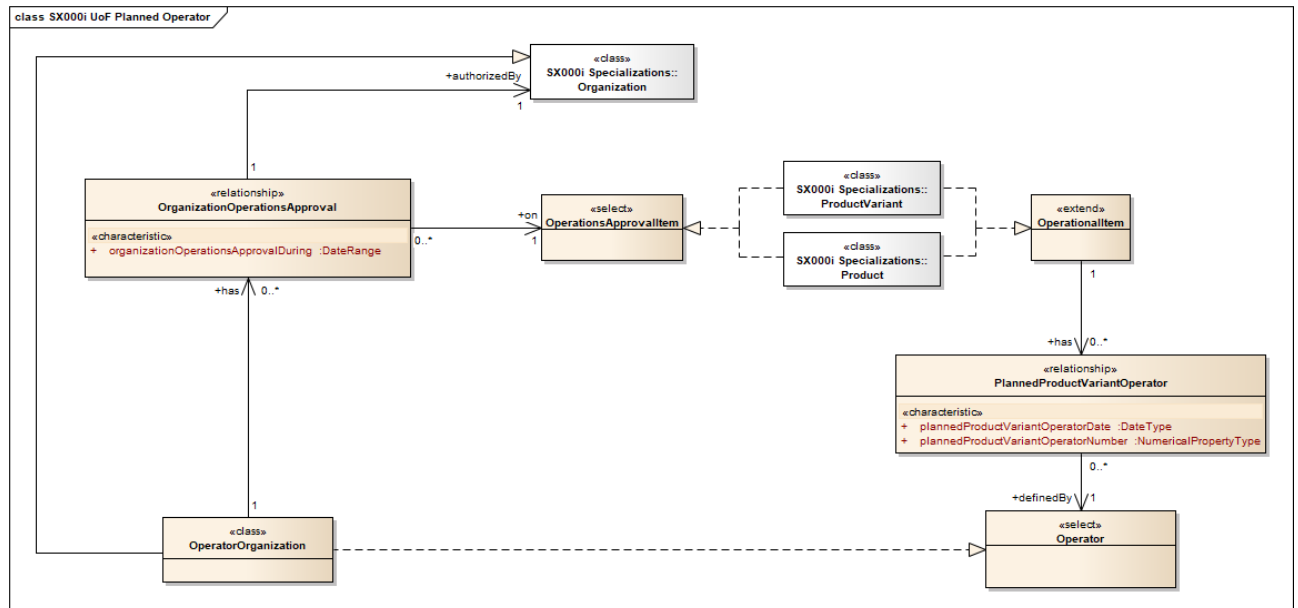
[Operator](#) UoF provides the capability to specify which organizations operate a [SerializedProductVariant](#) and which parties are authorized to operate a [ProductVariant](#).

5.41.2 Graphical description



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Fig 56 SX000i UoF Actual Operator



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Fig 57 SX000i UoF Planned Operator

5.41.3 Class definition

5.41.3.1 OperationalItem

OperationalItem is an <<extend>> interface that provides its associated data model to those classes that implement it.

5.41.3.1.1 Class members

This <<extend>> interface includes the following class members:

- [Product](#)
- [ProductVariant](#)

5.41.3.1.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [PlannedProductVariantOperator](#)

5.41.3.2 OperationsApprovalItem

[OperationsApprovalItem](#) is a <<select>> interface representing an item for which an operational approval has been provided.

5.41.3.2.1 Class members

This <<select>> interface includes the following class members:

- [Product](#)
- [ProductVariant](#)

5.41.3.3 Operator

[Operator](#) is a <<select>> interface that represents the entities that operate one or several [SerializedProductVariants](#).

5.41.3.3.1 Class members

This <<select>> interface includes the following class members:

- [OperatorOrganization](#)
- [OperatorPerson](#)

5.41.3.4 OperatorOrganization

[OperatorOrganization](#) is an [Organization](#) that operates one or several [SerializedProductVariants](#).

5.41.3.4.1 Attribute(s)

This class has the following attributes:

- [organizationIdentifier](#) (inherited from [Organization](#)), one or many
- [organizationType](#) (inherited from [Organization](#)), zero, one or many
- [organizationName](#) (inherited from [Organization](#)), zero, one or many
- [organizationDates](#) (inherited from [Organization](#)), zero or one
- [organizationDescription](#) (inherited from [Organization](#)), zero or one

5.41.3.4.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [OrganizationLocation](#)
- A directed association, to zero, one or many objects of type [OrganizationOperationsApproval](#)

5.41.3.4.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [BudgetingItem](#). Refer to SX000i UoF Budget, [Para 5.13](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [FleetManager](#). Refer to SX000i UoF Fleet Environment, [Para 5.29](#)
- [OrganizationalBreakdownStructure](#). Refer to SX000i UoF Organizational Breakdown Structure, [Para 5.47](#)
- [PartyItem](#). Refer to SX000i UoF Party, [Para 5.48](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityAssignmentParty](#). Refer to SX000i UoF Security Classification, [Para 5.64](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [StaffingItem](#). Refer to SX000i UoF Staffing, [Para 5.66](#)

5.41.3.4.4 Selects

This class is a member of the following <<select>> interfaces:

- [ClassInstanceAssertItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ClassInstanceAssertItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ContractDeliverableToBeDeliveredTo](#) (inherited from [Organization](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [CostEntryItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [FacilityOperatorItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Facility, [Para 5.27](#)
- [FleetOperator](#). Refer to SX000i UoF Fleet Environment, [Para 5.29](#)
- [LegalParty](#) (inherited from [Organization](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [MeetingContextItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Meeting, [Para 5.37](#)
- [MessagePartyItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [MissionDefinitionPartyItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Mission Definition, [Para 5.35](#)
- [Operator](#). Refer to SX000i UoF Operator, [Para 5.41](#)
- [Party](#) (inherited from [Organization](#)). Refer to SX000i UoF Party, [Para 5.48](#)
- [ProvisioningSource](#) (inherited from [Organization](#)). Refer to SX000i UoF Provisioning Concept, [Para 5.57](#)

- [ReportContextItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Report, [Para 5.59](#)
- [RequirementTargetItem](#) (inherited from [Organization](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)
- [SubjectOfPoliciesAndRegulations](#) (inherited from [Organization](#)). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [TaskLocationItem](#) (inherited from [Organization](#)). Refer to CDM UoF [Task Usage](#),

5.41.3.5 OperatorPerson

[OperatorPerson](#) is a [Person](#) that operates one or several ProductVariants.

Example(s)

- drone pilot
- truck driver

5.41.3.5.1 Attribute(s)

This class has the following attributes:

- [personIdentifier](#) (inherited from [Person](#)), one or many
- [personName](#) (inherited from [Person](#)), zero, one or many
- [personMiddleName](#) (inherited from [Person](#)), zero, one or many
- [personFamilyName](#) (inherited from [Person](#)), zero, one or many
- [personPrefixTitle](#) (inherited from [Person](#)), zero, one or many
- [personSuffixTitle](#) (inherited from [Person](#)), zero, one or many
- [personDates](#) (inherited from [Person](#)), zero or one

5.41.3.5.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [PersonGroup](#)
- A directed association, to zero, one or many objects of type [PersonOperationsApproval](#)

5.41.3.5.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CompetenceAssignmentItem](#). Refer to SX000i UoF Person Competences and Labor Rates, [Para 5.50](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [FleetManager](#). Refer to SX000i UoF Fleet Environment, [Para 5.29](#)
- [PartyItem](#). Refer to SX000i UoF Party, [Para 5.48](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.41.3.5.4 Selects

This class is a member of the following <<select>> interfaces:

- [ContractDeliverableToBeDeliveredTo](#) (inherited from [Person](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)

- [CostEntryItem](#) (inherited from [Person](#)). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [FleetOperator](#). Refer to SX000i UoF Fleet Environment, [Para 5.29](#)
- [LegalParty](#) (inherited from [Person](#)). Refer to SX000i UoF Product, [Para 5.53](#)
- [MessagePartyItem](#) (inherited from [Person](#)). Refer to SX000i UoF Message, [Para 5.38](#)
- [Operator](#). Refer to SX000i UoF [Operator](#), [Para 5.41](#)
- [Party](#) (inherited from [Person](#)). Refer to SX000i UoF Party, [Para 5.48](#)

5.41.3.6 **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.

Example(s)

- Municipal authorization to operate a bus line.

5.41.3.6.1 **Attribute(s)**

This class has the following attributes:

- [organizationOperationsApprovalDuring](#)

5.41.3.6.2 **Associations**

This class has the following associations:

- A directed association, to one object of type [OperatorOrganization](#)
- A directed association, to one object of type [Organization](#)
- A directed association, zero, one or many, to object(s) from classes that are members of [OperationsApprovalItem](#)

5.41.3.7 **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.

Example(s)

- driver's license
- mariner license
- pilot type certificate

5.41.3.7.1 **Attribute(s)**

This class has the following attributes:

- [personOperationsApprovalDuring](#)

5.41.3.7.2 **Associations**

This class has the following associations:

- A directed association, zero, one or many, to one object of type [OperatorOrganization](#)
- A directed association, zero, one or many, to one object of type [Organization](#)
- A directed association, zero, one or many, to one object of type [ProductVariant](#)

5.41.3.8 **PlannedProductVariantOperator**

[PlannedProductVariantOperator](#) is a <<relationship>> that documents the [Operator\(s\)](#) that are planned to operate a specific [Product](#) or [ProductVariant](#).

5.41.3.8.1 *Attribute(s)*

This class has the following attributes:

- plannedProductVariantOperatorDate
- plannedProductVariantOperatorNumber

5.41.3.8.2 *Associations*

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [Operator](#)

5.41.3.9 SerializedProductVariantOperator

[SerializedProductVariantOperator](#) is a <<relationship>> defining the operation of a [SerializedProductVariant](#) during a specific period of time.

5.41.3.9.1 *Attribute(s)*

This class has the following attributes:

- serializedProductVariantOperatorDuring

5.41.3.9.2 *Associations*

This class has the following associations:

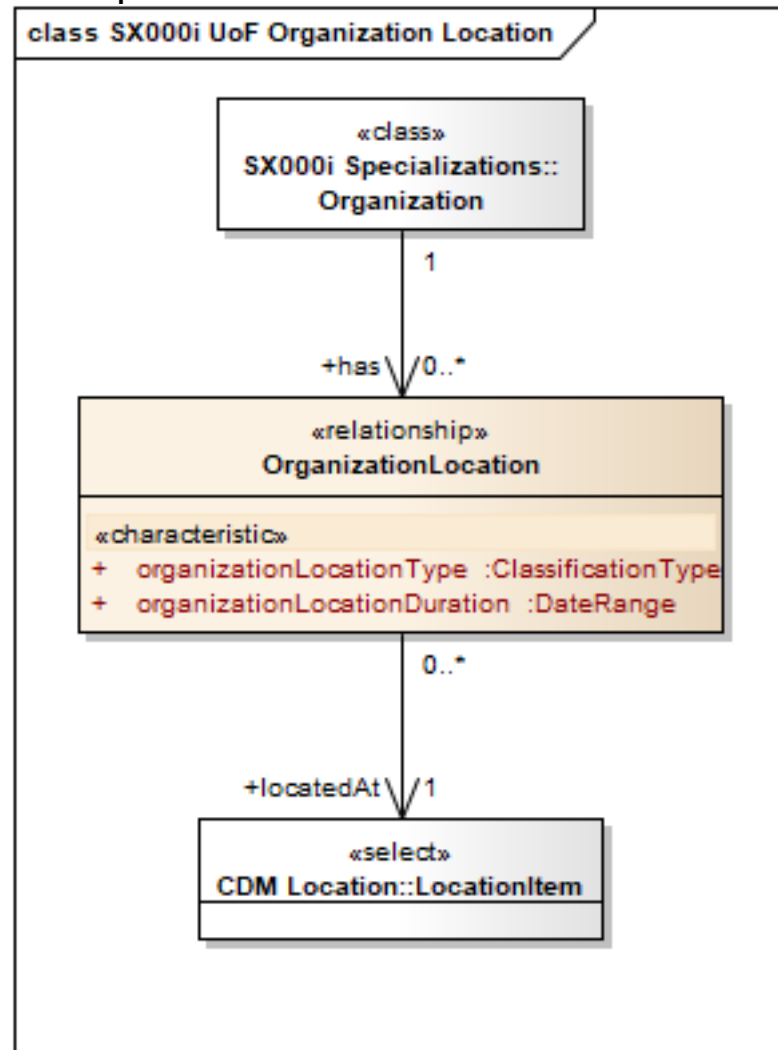
- A directed association, zero, one or many, to object(s) from classes that are members of [Operator](#)

5.42 SX000i UoF Organization Location

5.42.1 Description

The Organization Location UoF provides the capability to define where an organization is located.

5.42.2 Graphical description



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Fig 58 SX000i UoF Organization Location

5.42.3 Class definition

5.42.3.1 OrganizationLocation

[OrganizationLocation](#) is a <<relationship>> that defines the [Location](#) where an [Organization](#) is based.

5.42.3.1.1 Attribute(s)

This class has the following attributes:

- organizationLocationType
- organizationLocationDuration

5.42.3.1.2 Associations

This class has the following associations:

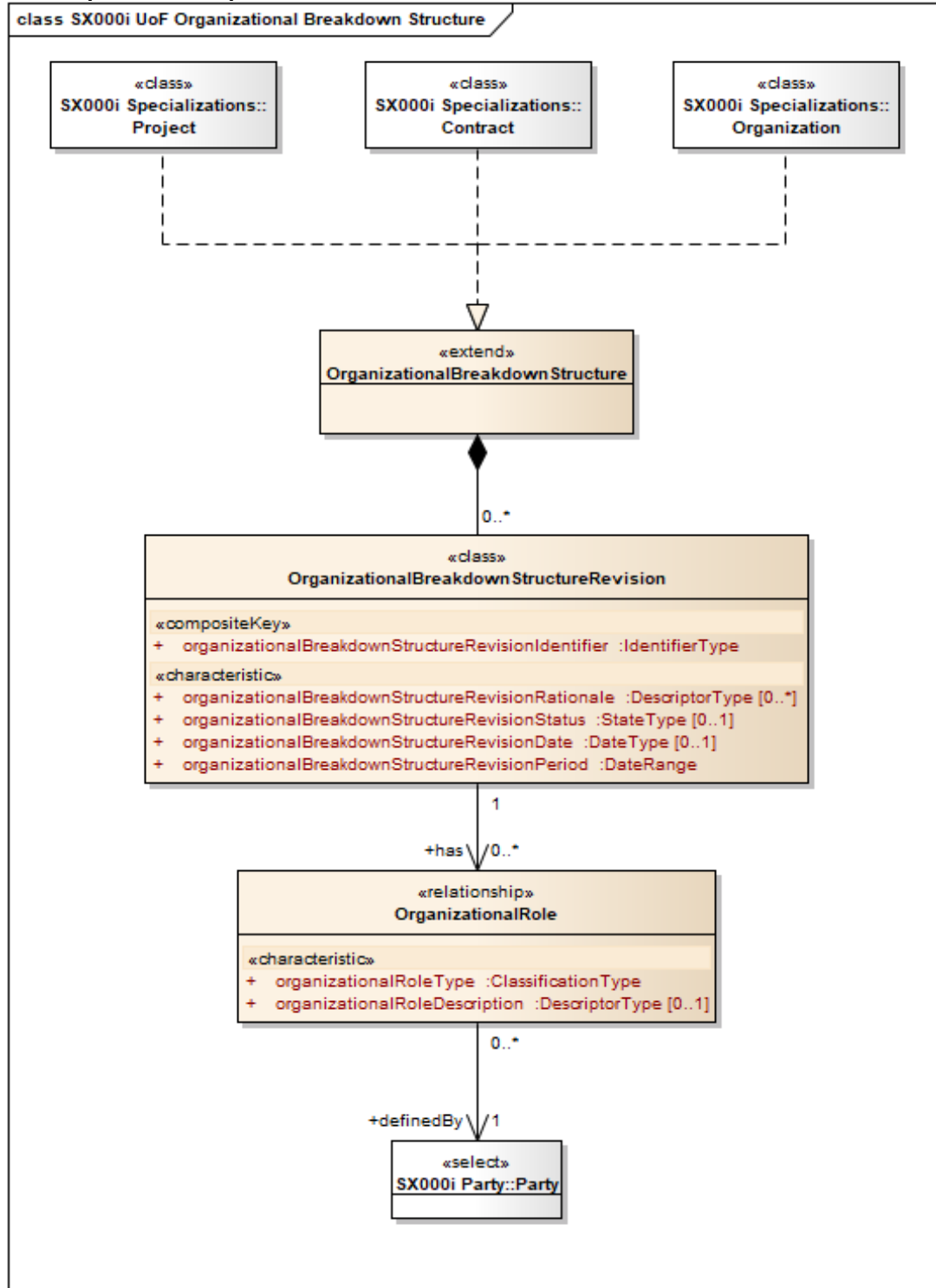
- A directed association, zero, one or many, to object(s) from classes that are members of [LocationItem](#)

5.43 SX000i UoF Organizational Breakdown Structure

5.43.1 Description

The Organizational Breakdown Structure UoF allows to define the organization that is established specifically for a project or contract.

5.43.2 Graphical description



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Fig 59 SX000i UoF Organizational Breakdown Structure

5.43.3 Class definition

5.43.3.1 OrganizationalBreakdownStructure

[OrganizationalBreakdownStructure](#) is an <<extend>> interface that enables the association of an organizational structure to a [Project](#) or [Contract](#).

5.43.3.1.1 Class members

This <<extend>> interface includes the following class members:

- [Contract](#)
- [OperatorOrganization](#)
- [Organization](#)
- [Project](#)

5.43.3.2 OrganizationalBreakdownStructureRevision

[OrganizationalBreakdownStructureRevision](#) is a <<class>> that represents a specific revision of an organizational breakdown structure.

5.43.3.2.1 Attribute(s)

This class has the following attributes:

- `organizationalBreakdownStructureRevisionIdentifier`
- `organizationalBreakdownStructureRevisionRationale`, zero, one or many
- `organizationalBreakdownStructureRevisionStatus`, zero or one
- `organizationalBreakdownStructureRevisionDate`, zero or one
- `organizationalBreakdownStructureRevisionPeriod`

5.43.3.2.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [OrganizationalBreakdownStructure](#)
- A directed association, to zero, one or many objects of type [OrganizationalRole](#)

5.43.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.43.3.3 OrganizationalRole

[OrganizationalRole](#) is a <<relationship>> that defines the role that a [Party](#) performs within a project or contract-specific organizational structure.

5.43.3.3.1 Attribute(s)

This class has the following attributes:

- `organizationalRoleType`
- `organizationalRoleDescription`, zero or one

5.43.3.3.2 Associations

This class has the following associations:

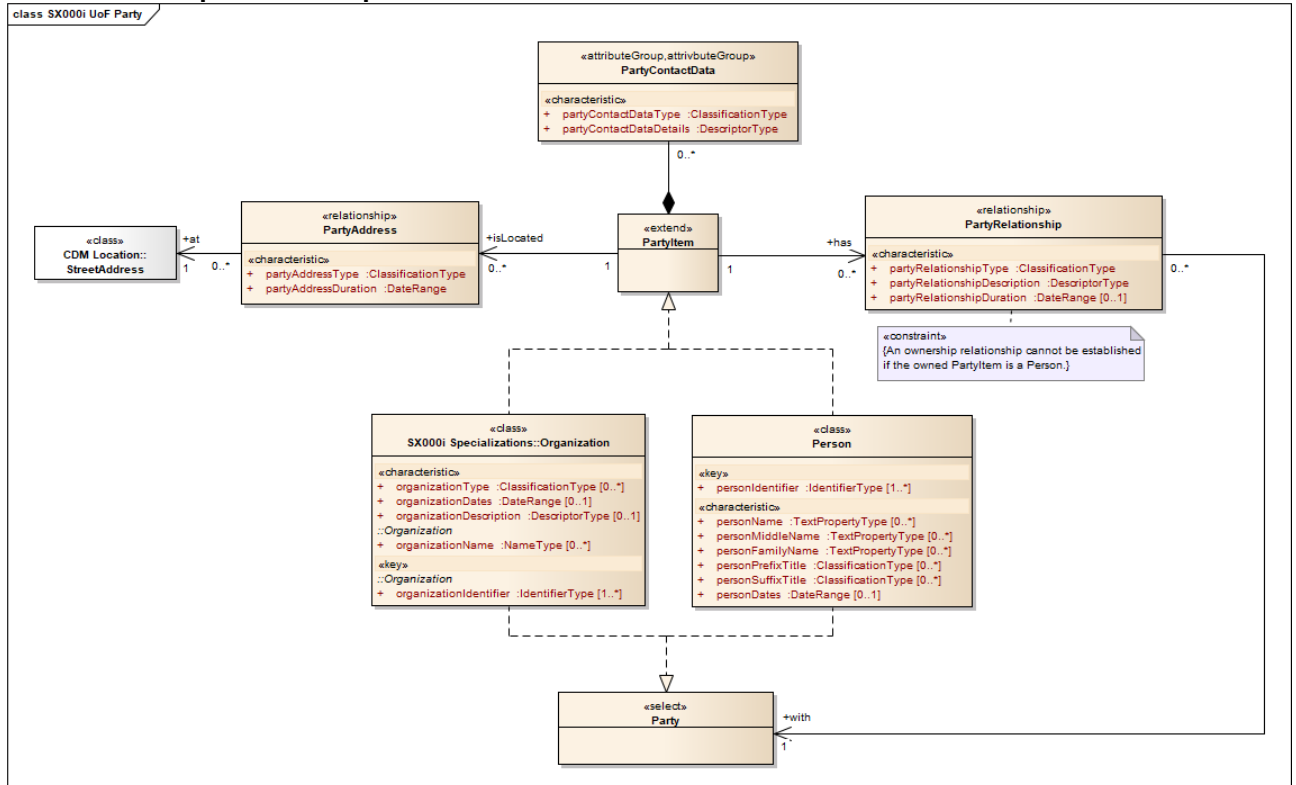
- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.44 SX000i UoF Party

5.44.1 Description

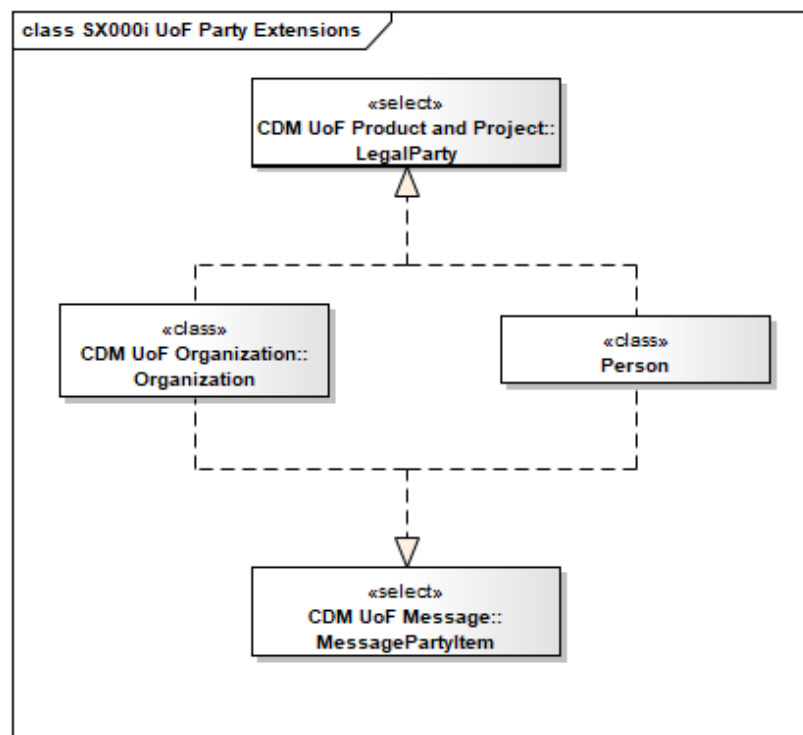
[Party](#) UoF describes the generic interface used for the establishment of relations with different parties (organizations or people).

5.44.2 Graphical description



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Fig 60 SX000i UoF Party



ICN-B6865-SX000I09077-001-01

Fig 61 SX000i UoF Party Extensions

5.44.3 Class definition

5.44.3.1 Party

Party is a <<select>> interface representing an entity that is capable of signing a contract or carrying out actions by itself without being instructed to do so.

5.44.3.1.1 Class members

This <<select>> interface includes the following class members:

- `OperatorOrganization`
- `OperatorPerson`
- `Organization`
- `Person`

Example(s)

- organization
- person

5.44.3.2 PartyAddress

PartyAddress is a <<relationship>> that defines the association between a **Party** and an Address.

5.44.3.2.1 Attribute(s)

This class has the following attributes:

- `partyAddressType`
- `partyAddressDuration`

5.44.3.2.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [StreetAddress](#)

5.44.3.3 PartyContactData

[PartyContactData](#) is an <<attributeGroup>> that provides the contact details for a [Party](#).

5.44.3.3.1 Attribute(s)

This class has the following attributes:

- partyContactDataType
- partyContactDataDetails

5.44.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [PartyItem](#)

5.44.3.4 PartyItem

[PartyItem](#) is an <<extend>> interface that enables the association of additional capabilities to [Organizations](#) and [Persons](#).

5.44.3.4.1 Class members

This <<extend>> interface includes the following class members:

- [OperatorOrganization](#)
- [OperatorPerson](#)
- [Organization](#)
- [Person](#)

5.44.3.4.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [PartyAddress](#). A [PartyItem](#) can be associated zero, one or many times to an Address (via the [PartyAddress](#) <<relationship>>)
- A directed association, to zero, one or many objects of type [PartyRelationship](#)

5.44.3.5 PartyRelationship

[PartyRelationship](#) is a <<relationship>> existing between two parties (organizations or people).

5.44.3.5.1 Attribute(s)

This class has the following attributes:

- partyRelationshipType
- partyRelationshipDescription
- partyRelationshipDuration, zero or one

5.44.3.5.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.44.3.6 Person

[Person](#) is a living human being.

5.44.3.6.1 *Attribute(s)*

This class has the following attributes:

- `personIdentifier`, one or many
- `personName`, zero, one or many
- `personMiddleName`, zero, one or many
- `personFamilyName`, zero, one or many
- `personPrefixTitle`, zero, one or many
- `personSuffixTitle`, zero, one or many
- `personDates`, zero or one

5.44.3.6.2 *Associations*

This class has the following associations:

- A directed association, to zero, one or many objects of type [PersonGroup](#)

5.44.3.6.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CompetenceAssignmentItem](#). Refer to SX000i UoF Person Competences and Labor Rates, [Para 5.50](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [PartyItem](#). Refer to SX000i UoF Party, [Para 5.48](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.44.3.6.4 *Selects*

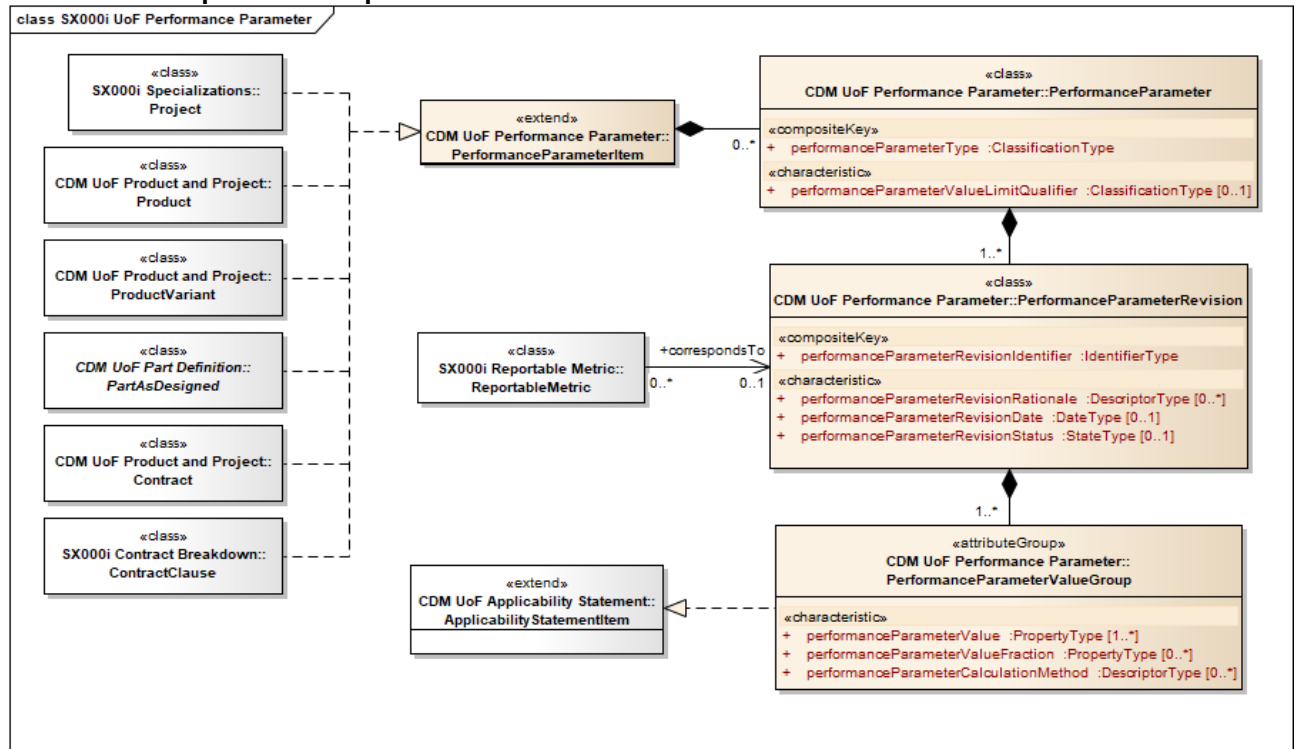
This class is a member of the following <<select>> interfaces:

- [ContractDeliverableToBeDeliveredTo](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [LegalParty](#). Refer to SX000i UoF Product, [Para 5.53](#)
- [MessagePartyItem](#). Refer to SX000i UoF Message, [Para 5.38](#)
- [Party](#). Refer to SX000i [Party](#),

5.45 **SX000i UoF Performance Parameter**

5.45.1 **Description**

5.45.2 Graphical description



ICN-B6865-SX000I090081-001-01

Fig 62 SX000i UoF Performance Parameter

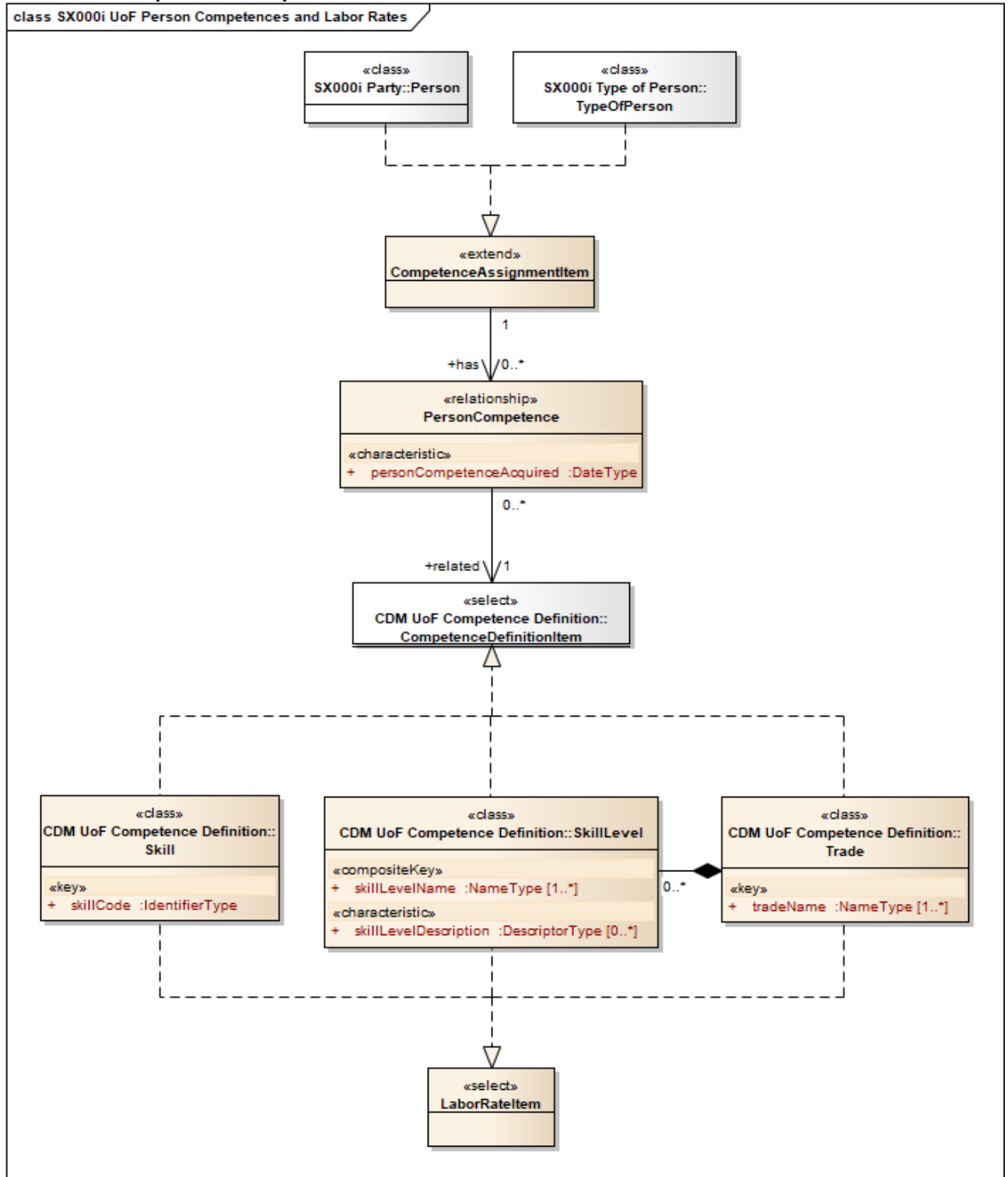
5.45.3 Class definition

5.46 SX000i UoF Person Competences and Labor Rates

5.46.1 Description

The Person Competences and Labor Rates UoF supports the definition of abilities, craft, profession, proficiency and labor rates.

5.46.2 Graphical description



ICN-B6865-SX000I09042-001-01

Fig 63 SX000i UoF Person Competences and Labor Rates

5.46.3 Class definition**5.46.3.1 CompetenceAssignmentItem**

[CompetenceAssignmentItem](#) is an <<extend>> interface that enables the assignment of a competence to an item.

5.46.3.1.1 Class members

This <<extend>> interface includes the following class members:

- [OperatorPerson](#)
- [Person](#)
- [TypeOfPerson](#)

5.46.3.1.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [PersonCompetence](#). A person can have zero, one or many competences associated to it (via the [PersonCompetence](#) <<relationship>>)

5.46.3.2 LaborRateItem

[LaborRateItem](#) is a <<select>> interface that enables the association of a labor rate to a skilled labor.

5.46.3.2.1 Class members

This <<select>> interface includes the following class members:

- [Skill](#)
- [SkillLevel](#)
- [Trade](#)

5.46.3.3 PersonCompetence

[PersonCompetence](#) is a <<relationship>> that defines the competences that a [Person](#) has acquired.

5.46.3.3.1 Attribute(s)

This class has the following attributes:

- `personCompetenceAcquired`

5.46.3.3.2 Associations

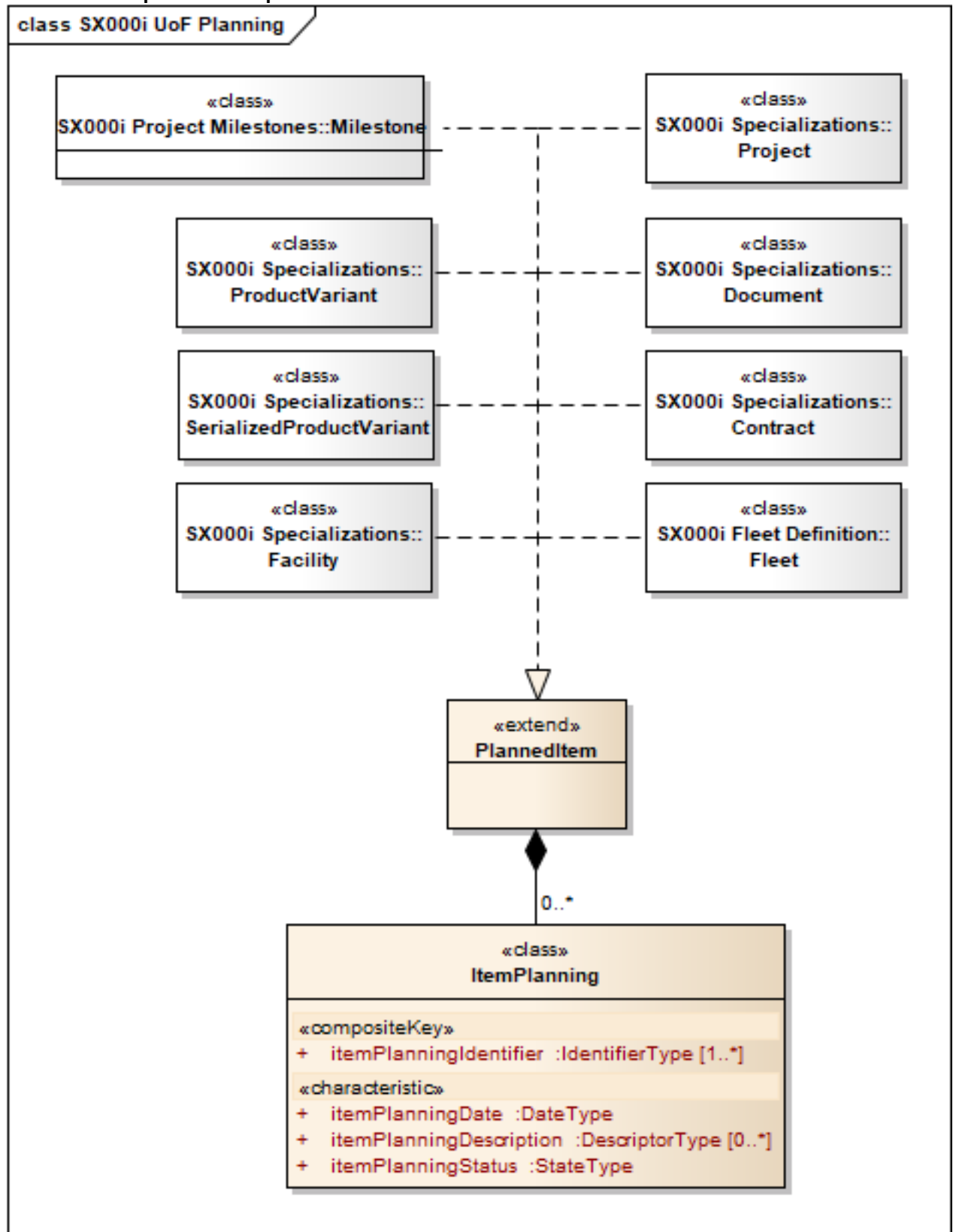
This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [CompetenceDefinitionItem](#)

5.47 SX000i UoF Planning**5.47.1 Description**

The Planning UoF allows to associate a Planning to an item.

5.47.2 Graphical description



ICN-B6865-SX000I09043-001-01

Fig 64 SX000i UoF Planning

5.47.3 Class definition

5.47.3.1 ItemPlanning

[ItemPlanning](#) is a <<class>> that represents the planned schedule of an item.

5.47.3.1.1 Attribute(s)

This class has the following attributes:

- [itemPlanningIdentifier](#), one or many
- [itemPlanningDate](#)
- [itemPlanningDescription](#), zero, one or many
- [itemPlanningStatus](#)

5.47.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [PlannedItem](#)

5.47.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.47.3.2 PlannedItem

[PlannedItem](#) is a <<extend>> interface that represents an item for which a planning is made.

5.47.3.2.1 Class members

This <<extend>> interface includes the following class members:

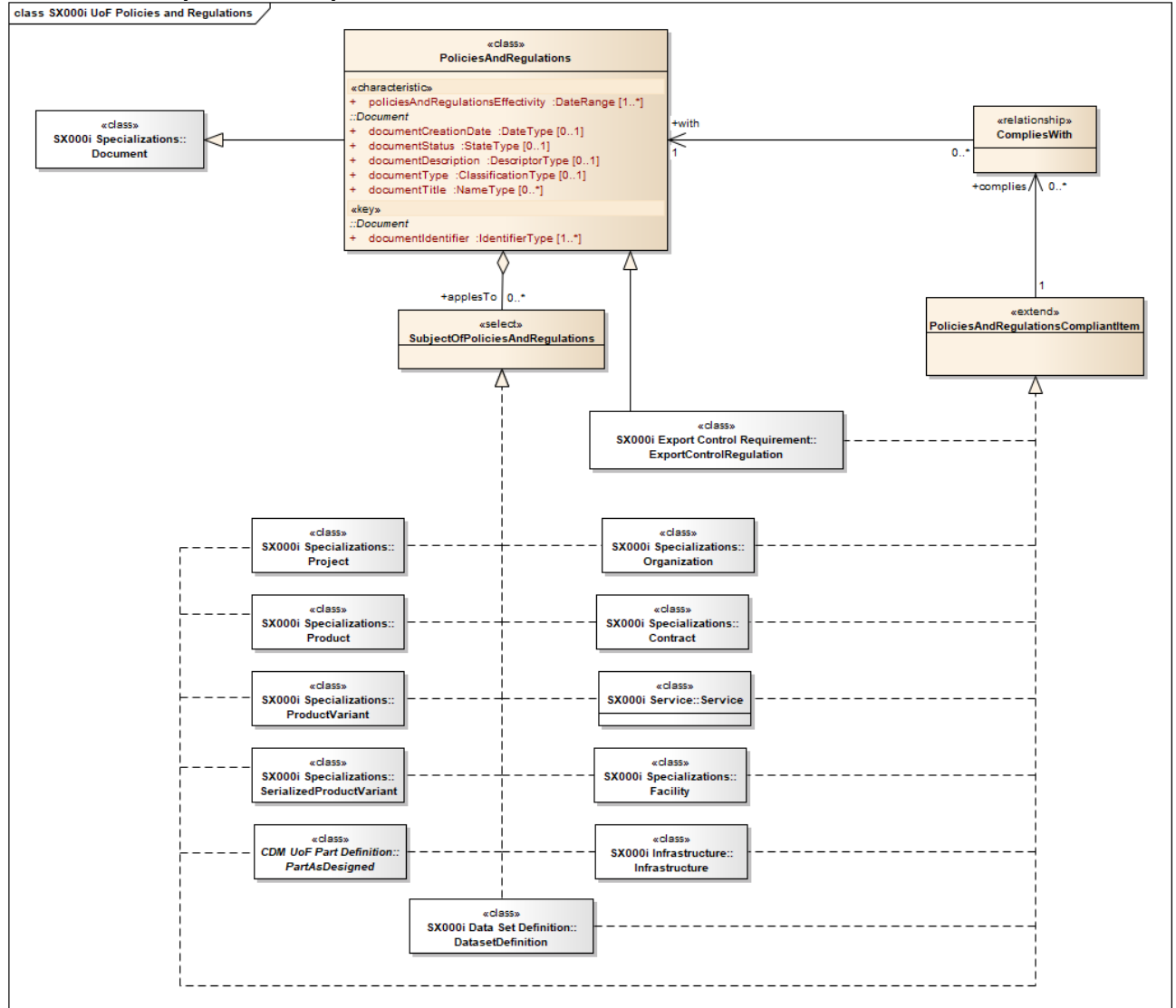
- [Contract](#)
- [Document](#)
- [ExportControlRegulation](#)
- [ExternalDocument](#)
- [Facility](#)
- [Fleet](#)
- [MaintenanceFacility](#)
- [Milestone](#)
- [OperatingBase](#)
- [OtherFacility](#)
- [PoliciesAndRegulations](#)
- [ProductVariant](#)
- [Project](#)
- [Report](#)
- [SerializedProductVariant](#)
- [TrainingFacility](#)
- [Warehouse](#)

5.48 SX000i UoF Policies and Regulations

5.48.1 Description

Policies and Regulations UoF provides the capability to associate policies and regulations to specific items.

5.48.2 Graphical description



ICN-B6865-SX000I09044-001-01

Fig 65 SX000i UoF Policies and Regulations

5.48.3 Class definition

5.48.3.1 CompliesWith

CompliesWith is a <<relationship>> that associates an item with the **PoliciesAndRegulations** with which it complies.

5.48.3.1.1 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type **ExportControlRegulation**

- A directed association, zero, one or many, to one object of type [PoliciesAndRegulations](#)

5.48.3.2 PoliciesAndRegulations

[PoliciesAndRegulations](#) is a [Document](#) that defines mandatory practices for a [Project](#), [Product](#), [Contract](#), [Service](#) or major item requiring specific guidelines.

5.48.3.2.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from [Document](#)), one or many
- documentCreationDate (inherited from [Document](#)), zero or one
- documentType (inherited from [Document](#)), zero or one
- documentStatus (inherited from [Document](#)), zero or one
- documentTitle (inherited from [Document](#)), zero, one or many
- documentDescription (inherited from [Document](#)), zero or one
- policiesAndRegulationsEffectivity, one or many

5.48.3.2.2 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DataItemDescriptionDocument](#). Refer to SX000i UoF Data Set Definition, [Para 5.19](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentCharacteristicItem](#). Refer to SX000i UoF Document, [Para 5.22](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.48.3.2.3 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Document](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ChangeRequestRationaleItem](#) (inherited from [Document](#)). Refer to CDM UoF Design Change Request,
- [DigitalFileReferencedItem](#) (inherited from [Document](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentItem](#) (inherited from [Document](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ExportControlledItem](#) (inherited from [Document](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)

- [SupportElementItem](#) (inherited from [Document](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.48.3.3 PoliciesAndRegulationsCompliantItem

[PoliciesAndRegulationsCompliantItem](#) is an <<extend>> interface that enables the association of an item to the [PoliciesAndRegulations](#) with which it complies

5.48.3.3.1 Class members

This <<extend>> interface includes the following class members:

- [AllowedProductConfigurationHardwarePartAsDesigned](#)
- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)
- [Contract](#)
- [DatasetDefinition](#)
- [ExportControlRegulation](#)
- [Facility](#)
- [HardwarePartAsDesigned](#)
- [Infrastructure](#)
- [MaintenanceFacility](#)
- [MRONetwork](#)
- [OperatingBase](#)
- [OperatorOrganization](#)
- [Organization](#)
- [OtherFacility](#)
- [PartAsDesigned](#)
- [Port](#)
- [PowerGrid](#)
- [Product](#)
- [ProductVariant](#)
- [Project](#)
- [SerializedProductVariant](#)
- [Service](#)
- [TrainingFacility](#)
- [TransportNetwork](#)
- [Warehouse](#)

5.48.3.3.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [CompliesWith](#)

5.48.3.4 SubjectOfPoliciesAndRegulations

[SubjectOfPoliciesAndRegulations](#) is a <<select>> interface that enables the association of policies and regulations to the items to which they apply.

5.48.3.4.1 Class members

This <<select>> interface includes the following class members:

- [AllowedProductConfigurationHardwarePartAsDesigned](#)

- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)
- [Contract](#)
- [DatasetDefinition](#)
- [Facility](#)
- [HardwarePartAsDesigned](#)
- [Infrastructure](#)
- [MaintenanceFacility](#)
- [MRONetwork](#)
- [OperatingBase](#)
- [OperatorOrganization](#)
- [Organization](#)
- [OtherFacility](#)
- [PartAsDesigned](#)
- [Port](#)
- [PowerGrid](#)
- [Product](#)
- [ProductVariant](#)
- [Project](#)
- [SerializedProductVariant](#)
- [Service](#)
- [TrainingFacility](#)
- [TransportNetwork](#)
- [Warehouse](#)

5.48.3.4.2 *Associations*

This class has the following associations:

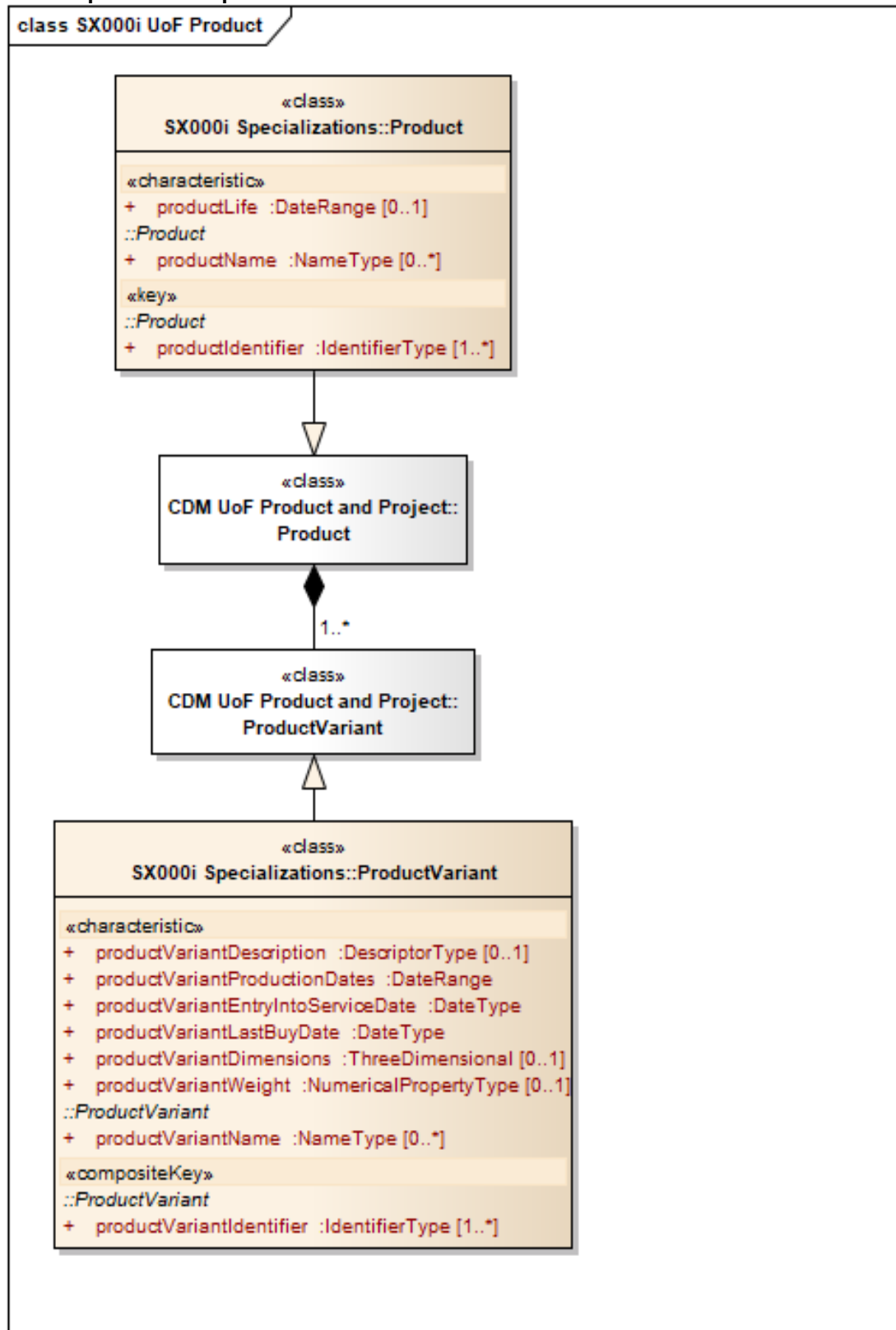
- A composition association ,applesTo, zero, one or manychild objects of type [ExportControlRegulation](#)
- A composition association ,applesTo, zero, one or manychild objects of type [PoliciesAndRegulations](#)

5.49 **SX000i UoF Product**

5.49.1 **Description**

The Product UoF defines the product(s) which are in focus for the IPS program.

5.49.2 Graphical description



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Fig 66 SX000i UoF Product

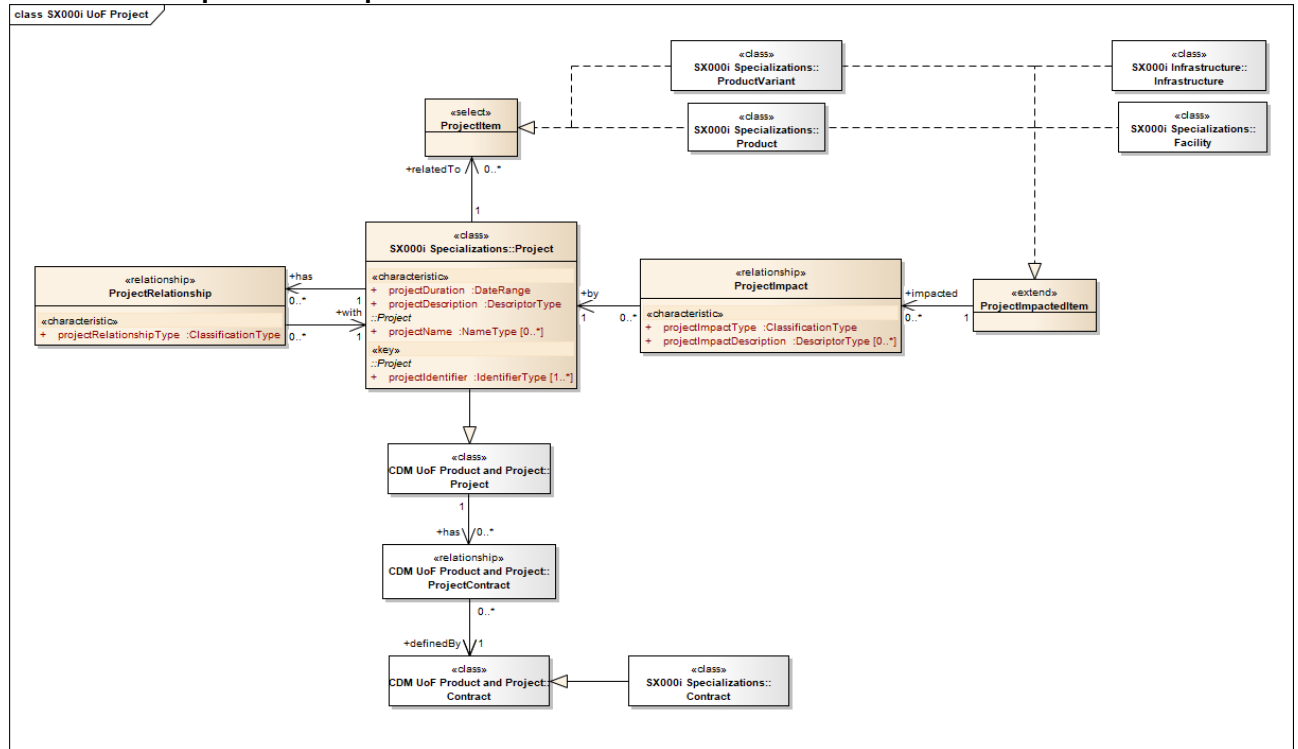
5.49.3 Class definition

5.50 SX000i UoF Project

5.50.1 Description

The Project UoF provides the capability to define a [Project](#) structure, associated contracts and identify items identified by a [Project](#).

5.50.2 Graphical description



ICN-B6865-SX000I09047-001-01

Fig 67 SX000i UoF Project

5.50.3 Class definition

5.50.3.1 ProjectImpact

[ProjectImpact](#) is a <<relationship>> that associates an item with the [Projects](#) that have an impact on it.

5.50.3.1.1 Attribute(s)

This class has the following attributes:

- projectImpactType
- projectImpactDescription, zero, one or many

5.50.3.1.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [Project](#)

5.50.3.2 ProjectImpactedItem

[ProjectImpactedItem](#) is an <<extend>> document that enables the association of an item to the projects that affect it.

5.50.3.2.1 Class members

This <<extend>> interface includes the following class members:

Applicable to: All

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- CloudInfrastructure
- CommunicationsNetwork
- ComputerNetwork
- Facility
- Infrastructure
- MaintenanceFacility
- MRONetwork
- OperatingBase
- OtherFacility
- Port
- PowerGrid
- Product
- ProductVariant
- TrainingFacility
- TransportNetwork
- Warehouse

5.50.3.2.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [ProjectImpact](#)

5.50.3.3 ProjectItem

[ProjectItem](#) is a <<select>> interface that enables the association of a project to the item(s) to which it is related.

5.50.3.3.1 Class members

This <<select>> interface includes the following class members:

- [Product](#)
- [ProductVariant](#)

5.50.3.4 ProjectRelationship

[ProjectRelationship](#) is a <<relationship>> that defines an association between two different [Projects](#).

5.50.3.4.1 Attribute(s)

This class has the following attributes:

- projectRelationshipType

5.50.3.4.2 Associations

This class has the following associations:

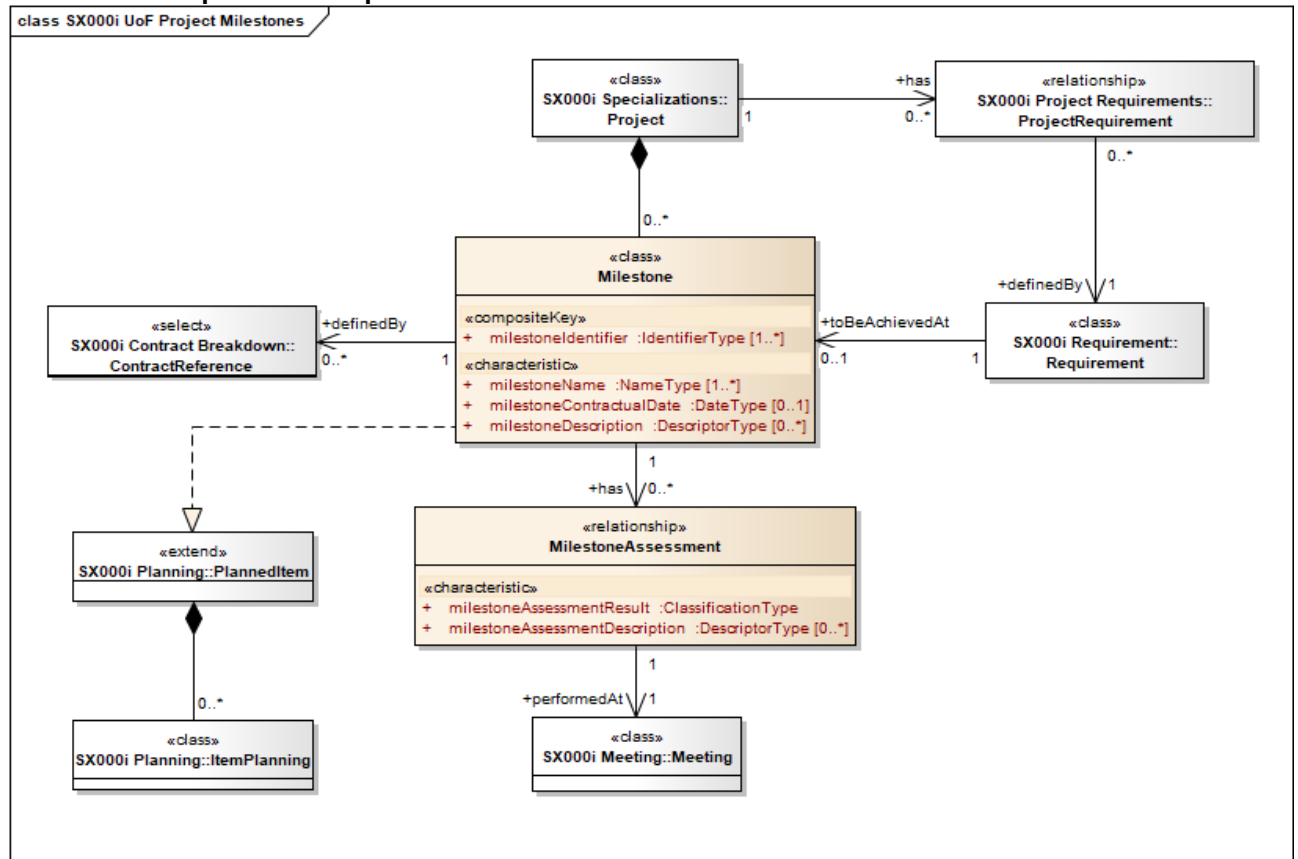
- A directed association, zero, one or many, to one object of type [Project](#)

5.51 SX000i UoF Project Milestones

5.51.1 Description

The Project Milestones UoF provides the capability of defining project milestones and the means of tracking the achievement of such milestones.

5.51.2 Graphical description



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Fig 68 SX000i UoF Project Mileston

5.51.3 Class definition

5.51.3.1 Milestone

Milestone is a situation at a specific moment in time when a certain objective is achieved.

5.51.3.1.1 Attribute(s)

This class has the following attributes:

- milestoneIdentifier, one or many
- milestoneName, one or many
- milestoneContractualDate, zero or one
- milestoneDescription, zero, one or many

5.51.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type **Project**
- A directed association, to zero, one or many objects of type **MilestoneAssessment**
- A directed association, to zero, one or many objects of type **RequiredInfrastructureNodeDeployment**
- A directed association, to object(s) from classes that are members of **ContractReference**

5.51.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.51.3.2 **MilestoneAssessment**
[MilestoneAssessment](#) is a <<relationship>> that documents the assessment that was performed to confirm achievement of a [Milestone](#).

5.51.3.2.1 **Attribute(s)**
This class has the following attributes:

- [milestoneAssessmentResult](#)
- [milestoneAssessmentDescription](#), zero, one or many

5.51.3.2.2 **Associations**
This class has the following associations:

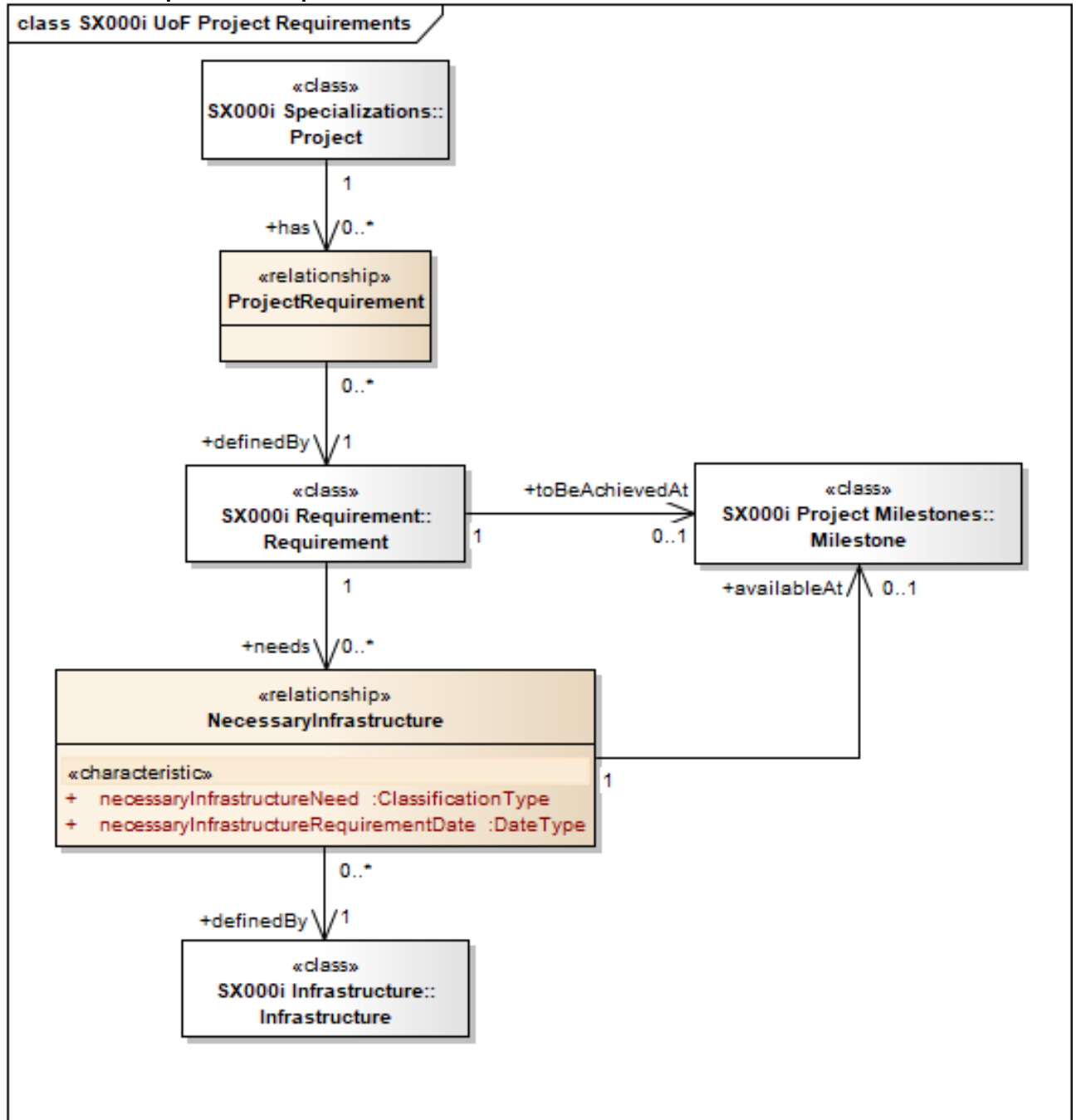
- A directed association, to one object of type [Meeting](#)

5.52 **SX000i UoF Project Requirements**

5.52.1 **Description**

The Project Requirements UoF provides the capability of associating requirements to a [Project](#) and define necessary project infrastructure and the milestones at which this infrastructure must be available.

5.52.2 Graphical description



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Fig 69 SX000i UoF Project Requirements

5.52.3 Class definition

5.52.3.1 NecessaryInfrastructure

NecessaryInfrastructure is a <<relationship>> that defines the infrastructure that is required to fulfill a specific **Requirement**.

5.52.3.1.1 Attribute(s)

This class has the following attributes:

- necessaryInfrastructureNeed

Applicable to: All

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- necessaryInfrastructureRequirementDate

5.52.3.1.2 Associations

This class has the following associations:

- A directed association, to zero or one objects of type [Milestone](#)
- A directed association, zero, one or many, to one object of type [CloudInfrastructure](#)
- A directed association, zero, one or many, to one object of type [CommunicationsNetwork](#)
- A directed association, zero, one or many, to one object of type [ComputerNetwork](#)
- A directed association, zero, one or many, to one object of type [Infrastructure](#)
- A directed association, zero, one or many, to one object of type [MRONetwork](#)
- A directed association, zero, one or many, to one object of type [Port](#)
- A directed association, zero, one or many, to one object of type [PowerGrid](#)
- A directed association, zero, one or many, to one object of type [TransportNetwork](#)

5.52.3.2 ProjectRequirement

[ProjectRequirement](#) is a <<relationship>> that associates a [Requirement](#) to a [Project](#).

5.52.3.2.1 Associations

This class has the following associations:

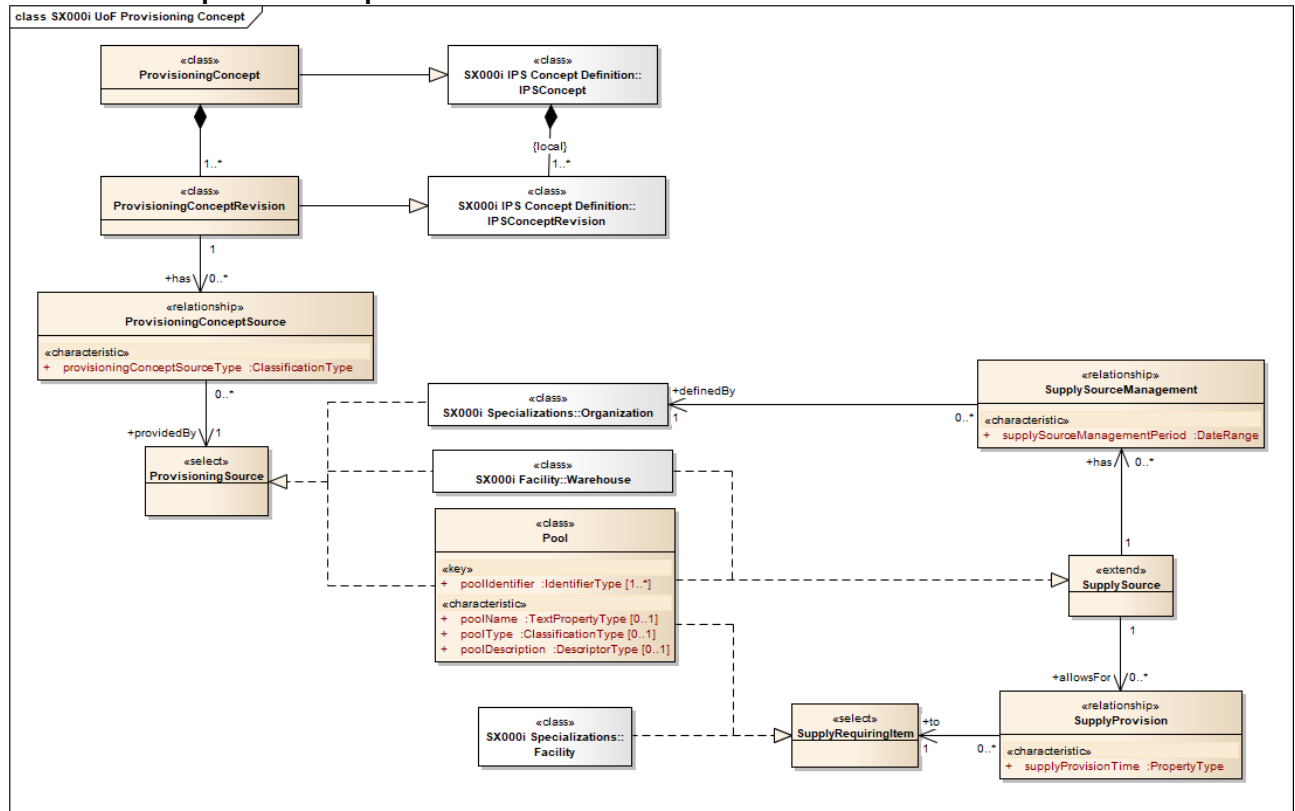
- A directed association, zero, one or many, to one object of type [Requirement](#)

5.53 SX000i UoF Provisioning Concept

5.53.1 Description

The Provisioning Concept UoF provides the capability to define the sources for the provisioning of items and who will provide the supplies to whom.

5.53.2 Graphical description



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Fig 70 SX000i UoF Provisioning Concept

5.53.3 Class definition

5.53.3.1 Pool

Pool is a set of parts that are managed as a functional group and that is shared by different Parties.

5.53.3.1.1 *Attribute(s)*

This class has the following attributes:

- poolIdentifier, one or many
- poolName, zero or one
- poolType, zero or one
- poolDescription, zero or one

5.53.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [SupplySource](#). Refer to SX000i UoF Provisioning Concept, [Para 5.57](#)

5.53.3.1.3 *Selects*

This class is a member of the following <<select>> interfaces:

- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [ProvisioningSource](#). Refer to SX000i Provisioning Concept,
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)
- [SupplyRequiringItem](#). Refer to SX000i Provisioning Concept,

5.53.3.2 *ProvisioningConcept*

[ProvisioningConcept](#) is a specialized [IPSConcept](#) intended to describe how the provisioning will be performed in the context of a global [IPSConcept](#).

5.53.3.2.1 *Attribute(s)*

This class has the following attributes:

- [ipsConceptIdentifier](#) (inherited from [IPSConcept](#))
- [provisioningConceptIdentifier](#)
- [ipsConceptName](#) (inherited from [IPSConcept](#)), one or many
- [ipsConceptDescription](#) (inherited from [IPSConcept](#)), one or many
- [provisioningConceptName](#)
- [provisioningConceptDescription](#)

5.53.3.2.2 *Associations*

This class has the following associations:

- A composition association, zero, one or manychild objects of type [IPSConceptRequiringItem](#)
- A directed association, to zero, one or many objects of type [IPSConceptRelationship](#)

5.53.3.2.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.53.3.2.4 *Selects*

This class is a member of the following <<select>> interfaces:

- [RequirementTargetItem](#) (inherited from [IPSConcept](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)

5.53.3.3 *ProvisioningConceptRevision*

[ProvisioningConceptRevision](#) is a <<class>> representing an iteration applied to a [ProvisioningConcept](#).

5.53.3.3.1 *Attribute(s)*

This class has the following attributes:

- `ipsConceptRevisionIdentifier` (inherited from [IPSConceptRevision](#)), one or many
- `maintenanceConceptRevisionIdentifier`, one or many
- `ispConceptRevisionRationale` (inherited from [IPSConceptRevision](#)), zero, one or many
- `ipsConceptRevisionStatus` (inherited from [IPSConceptRevision](#)), zero or one
- `ipsConceptRevisionDate` (inherited from [IPSConceptRevision](#)), zero or one
- `ipsConceptRevisionValidity` (inherited from [IPSConceptRevision](#)), zero, one or many
- `maintenanceConceptRevisionRationale`, zero, one or many
- `maintenanceConceptRevisionStatus`, zero or one
- `maintenanceConceptRevisionDate`, zero or one
- `maintenanceConceptRevisionValidity`, zero, one or many

5.53.3.3.2 *Associations*

This class has the following associations:

- An aggregate association, one or many, to one related object of type [ProvisioningConcept](#)
- A directed association, to zero, one or many objects of type [IPSConceptRevisionRequirement](#)
- A directed association, to zero, one or many objects of type [ProvisioningConceptSource](#)

5.53.3.3.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.53.3.3.4 *Selects*

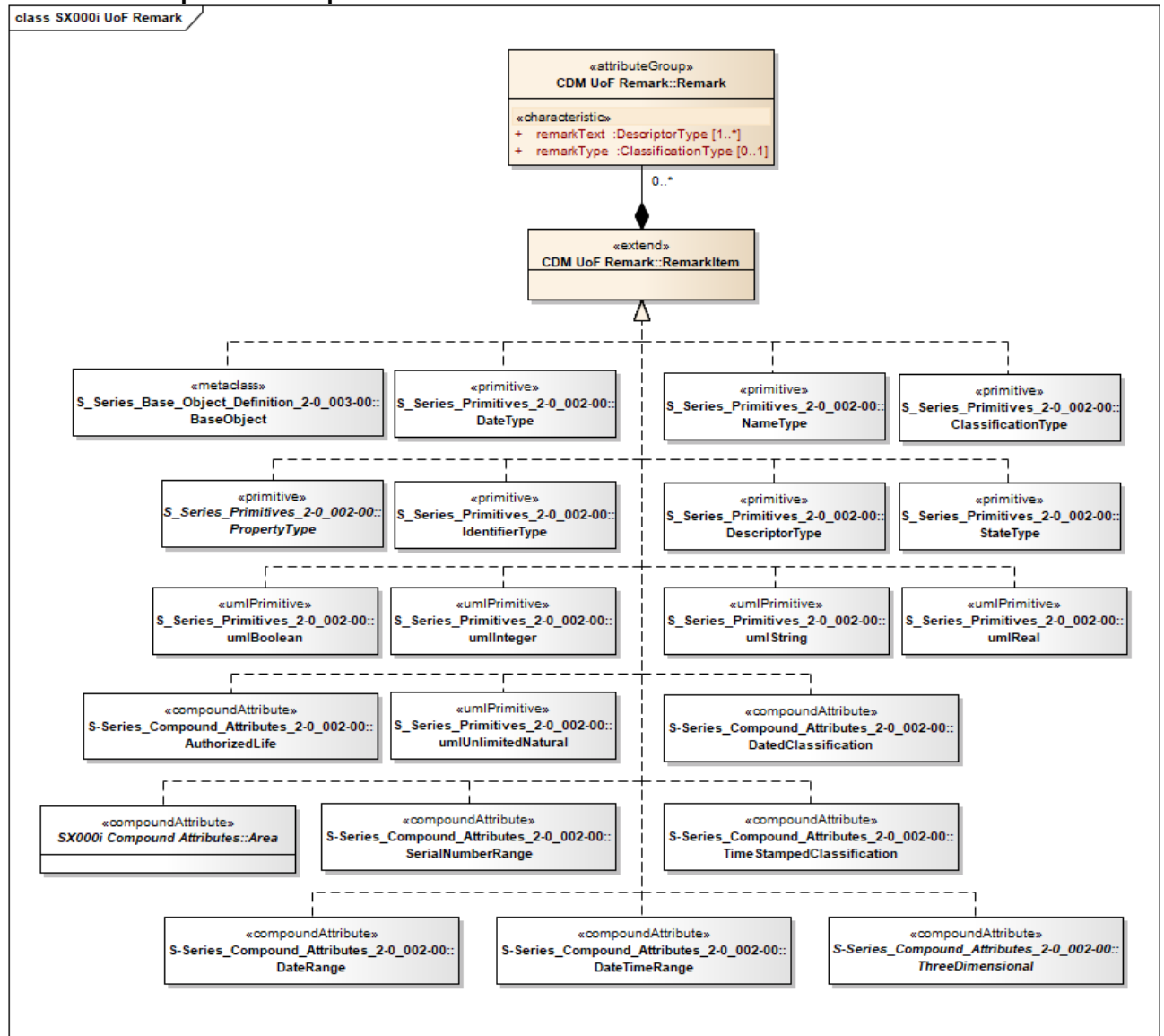
This class is a member of the following <<select>> interfaces:

- [InfrastructureNode](#). Refer to SX000i UoF Infrastructure, [Para 5.30](#)

-
- 5.53.3.4 **ProvisioningConceptSource**
ProvisioningConceptSource is a <<relationship>> that associates a **ProvisioningConceptRevision** with a provisioning source.
- 5.53.3.4.1 **Attribute(s)**
This class has the following attributes:
- provisioningConceptSourceType
- 5.53.3.4.2 **Associations**
This class has the following associations:
- A directed association, zero, one or many, to object(s) from classes that are members of **ProvisioningSource**
- 5.53.3.5 **ProvisioningSource**
ProvisioningSource is a <<select>> interface that enables the definition of the sources from which items can be ordered.
- 5.53.3.5.1 **Class members**
This <<select>> interface includes the following class members:
- **OperatorOrganization**
 - **Organization**
 - **Pool**
 - **Warehouse**
- 5.53.3.6 **SupplyProvision**
SupplyProvision is a <<relationship>> that defines which supply source supplies a required item to the entity requiring it.
- 5.53.3.6.1 **Attribute(s)**
This class has the following attributes:
- supplyProvisionTime
- 5.53.3.6.2 **Associations**
This class has the following associations:
- A directed association, zero, one or many, to object(s) from classes that are members of **SupplyRequiringItem**
- 5.53.3.7 **SupplyRequiringItem**
SupplyRequiringItem is a <<select>> interface that enables the definition of the items that can require the physical delivery of a supply.
- 5.53.3.7.1 **Class members**
This <<select>> interface includes the following class members:
- **Facility**
 - **MaintenanceFacility**
 - **OperatingBase**
 - **OtherFacility**
 - **Pool**
 - **TrainingFacility**
 - **Warehouse**

- 5.53.3.8 **SupplySource**
SupplySource is an <<extend>>interface that enables the definition of the management or items requiring supplies by the provisioning sources that can actually perform the physical supply.
- 5.53.3.8.1 **Class members**
This <<extend>> interface includes the following class members:
- **Pool**
 - **Warehouse**
- 5.53.3.8.2 **Associations**
This class has the following associations:
- A directed association, to zero, one or many objects of type **SupplyProvision**
 - A directed association, to zero, one or many objects of type **SupplySourceManagement**
- 5.53.3.9 **SupplySourceManagement**
SupplySourceManagement is a <<relationship>> that defines the **Organization** that is managing or is planned to manage a supply source.
- 5.53.3.9.1 **Attribute(s)**
This class has the following attributes:
- **supplySourceManagementPeriod**
- 5.53.3.9.2 **Associations**
This class has the following associations:
- A directed association, zero, one or many, to one object of type **OperatorOrganization**
 - A directed association, zero, one or many, to one object of type **Organization**
- 5.54 SX000i UoF Remark**
- 5.54.1 Description**
The Remark UoF provides the capability to attach a comment, observation, or any text to an object of interest.

5.54.2 Graphical description



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Fig 71 SX000i UoF Remark

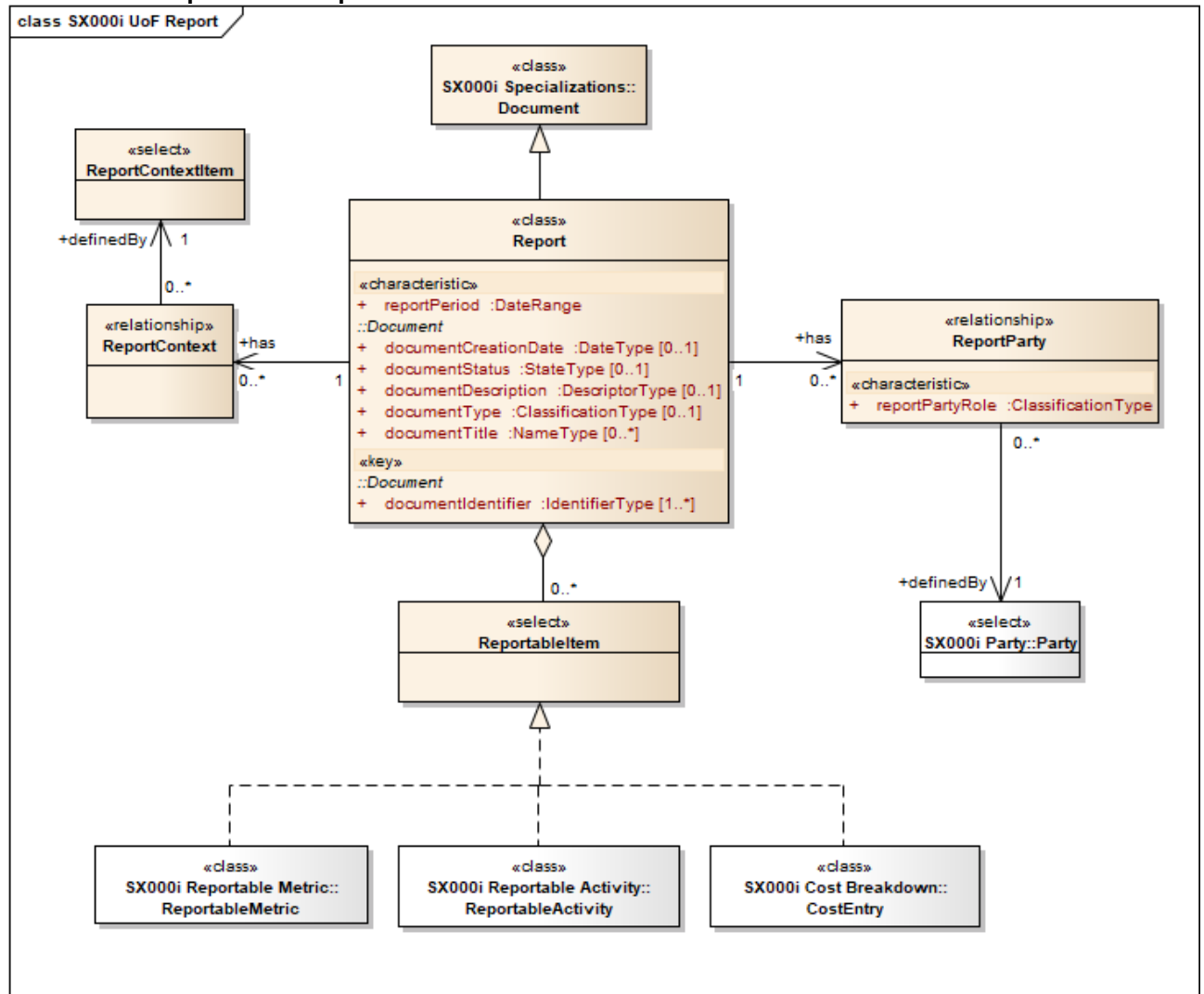
5.54.3 Class definition

5.55 SX000i UoF Report

5.55.1 Description

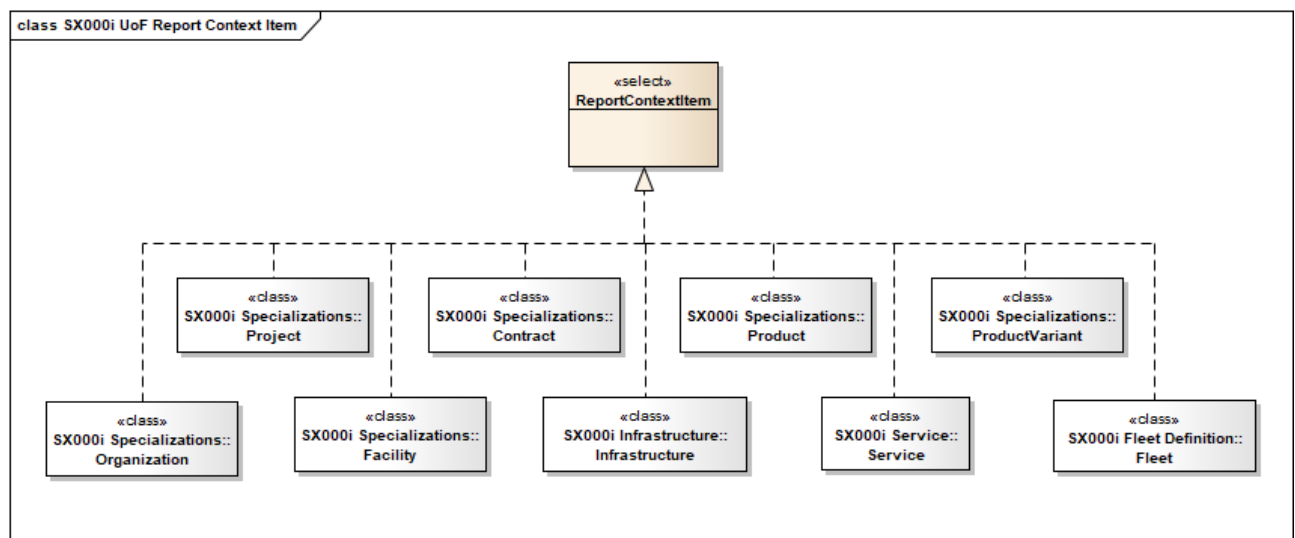
The Report UoF permits to deliver formal information between parties, usually as part of a contractual requirement.

5.55.2 Graphical description



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Fig 72 SX000i UoF Report



ICN-B6865-SX000I090078-001-01

Fig 73 SX000i UoF Report Context Item

5.55.3 Class definition

5.55.3.1 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.

Example(s)

- cost report
- progress report
- technical report

5.55.3.1.1 Attribute(s)

This class has the following attributes:

- documentIdentifier (inherited from **Document**), one or many
- documentCreationDate (inherited from **Document**), zero or one
- documentType (inherited from **Document**), zero or one
- documentStatus (inherited from **Document**), zero or one
- documentTitle (inherited from **Document**), zero, one or many
- documentDescription (inherited from **Document**), zero or one
- reportPeriod

5.55.3.1.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type **ReportContext**
- A directed association, to zero, one or many objects of type **ReportParty**

5.55.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DataItemDescriptionDocument](#). Refer to SX000i UoF Data Set Definition, [Para 5.19](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentCharacteristicItem](#). Refer to SX000i UoF Document, [Para 5.22](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ItemUnderExportControl](#). Refer to SX000i UoF Export Control Requirement, [Para 5.25](#)
- [PlannedItem](#). Refer to SX000i UoF Planning, [Para 5.51](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.55.3.1.4 *Selects*

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#) (inherited from [Document](#)). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ChangeRequestRationaleItem](#) (inherited from [Document](#)). Refer to CDM UoF Design Change Request,
- [DigitalFileReferencedItem](#) (inherited from [Document](#)). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentItem](#) (inherited from [Document](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ExportControlledItem](#) (inherited from [Document](#)). Refer to SX000i UoF Export Control License, [Para 5.24](#)
- [SupportElementItem](#) (inherited from [Document](#)). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.55.3.2 *ReportableItem*

[ReportableItem](#) is a <<select>> interface representing everything that is worth reporting.

5.55.3.2.1 *Class members*

This <<select>> interface includes the following class members:

- [CostEntry](#)
- [ReportableActivity](#)
- [ReportableMetric](#)

Example(s)

- incurred cost
- maintenance activity
- operational event

5.55.3.2.2 *Associations*

This class has the following associations:

- A composition association, zero, one or manychild objects of type [Report](#)

-
- 5.55.3.3 **ReportContext**
ReportContext is a <<relationship>> that associates a **Report** to its context.
- 5.55.3.3.1 **Associations**
This class has the following associations:
- A directed association, zero, one or many, to object(s) from classes that are members of **ReportContextItem**
- 5.55.3.4 **ReportContextItem**
ReportContextItem is a <<select>> interface that allows to indicate on which items a **Report** provides information.
- 5.55.3.4.1 **Class members**
This <<select>> interface includes the following class members:
- **CloudInfrastructure**
 - **CommunicationsNetwork**
 - **ComputerNetwork**
 - **Contract**
 - **Facility**
 - **Fleet**
 - **Infrastructure**
 - **MaintenanceFacility**
 - **MRONetwork**
 - **OperatingBase**
 - **OperatorOrganization**
 - **Organization**
 - **OtherFacility**
 - **Pool**
 - **Port**
 - **PowerGrid**
 - **Product**
 - **Product**
 - **ProductVariant**
 - **Project**
 - **Project**
 - **SerializedHardwarePart**
 - **SerializedProductVariant**
 - **Service**
 - **TrainingFacility**
 - **TransportNetwork**
 - **Warehouse**
- 5.55.3.5 **ReportParty**
ReportParty is a <<relationship>> that associates a **Report** to a **Party**.
- 5.55.3.5.1 **Attribute(s)**
This class has the following attributes:
- **reportPartyRole**

5.55.3.5.2 Associations

This class has the following associations:

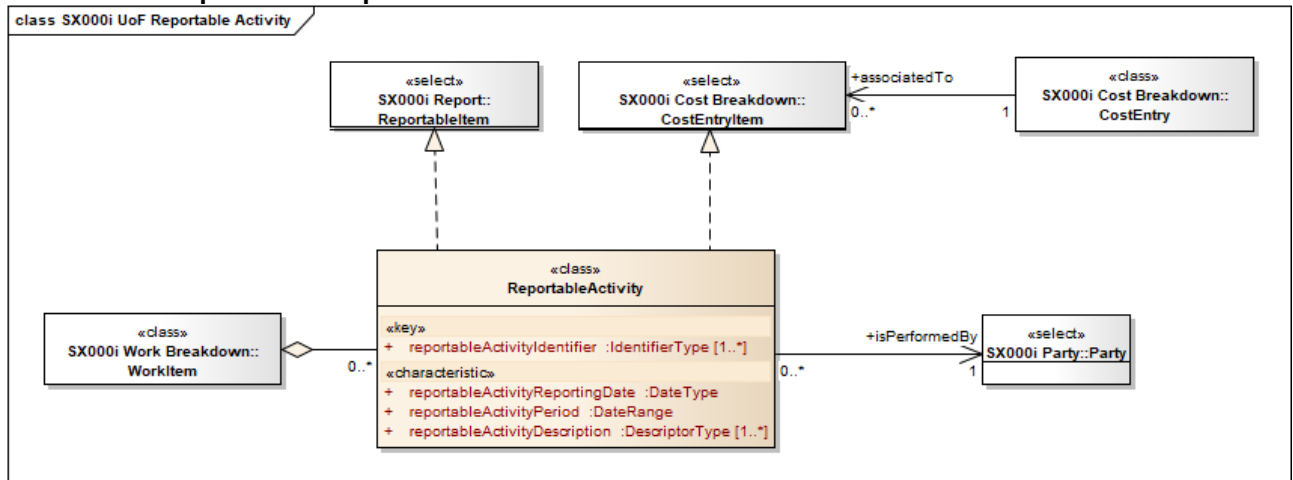
- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.56 SX000i UoF Reportable Activity

5.56.1 Description

The Reportable Activity UoF provides the main relationships of a ReportableActivity and derived classes.

5.56.2 Graphical description



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Fig 74 SX000i UoF Reportable Activity

5.56.3 Class definition

5.56.3.1 ReportableActivity

[ReportableActivity](#) is an activity that is part of work item that is deemed to be of sufficient importance as to be reported.

Example(s)

- maintenance action

5.56.3.1.1 Attribute(s)

This class has the following attributes:

- `reportableActivityIdentifier`, one or many
- `reportableActivityReportingDate`
- `reportableActivityPeriod`
- `reportableActivityDescription`, one or many

5.56.3.1.2 Associations

This class has the following associations:

- A composition association, zero, one or many child objects of type [WorkItem](#)
- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.56.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.56.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

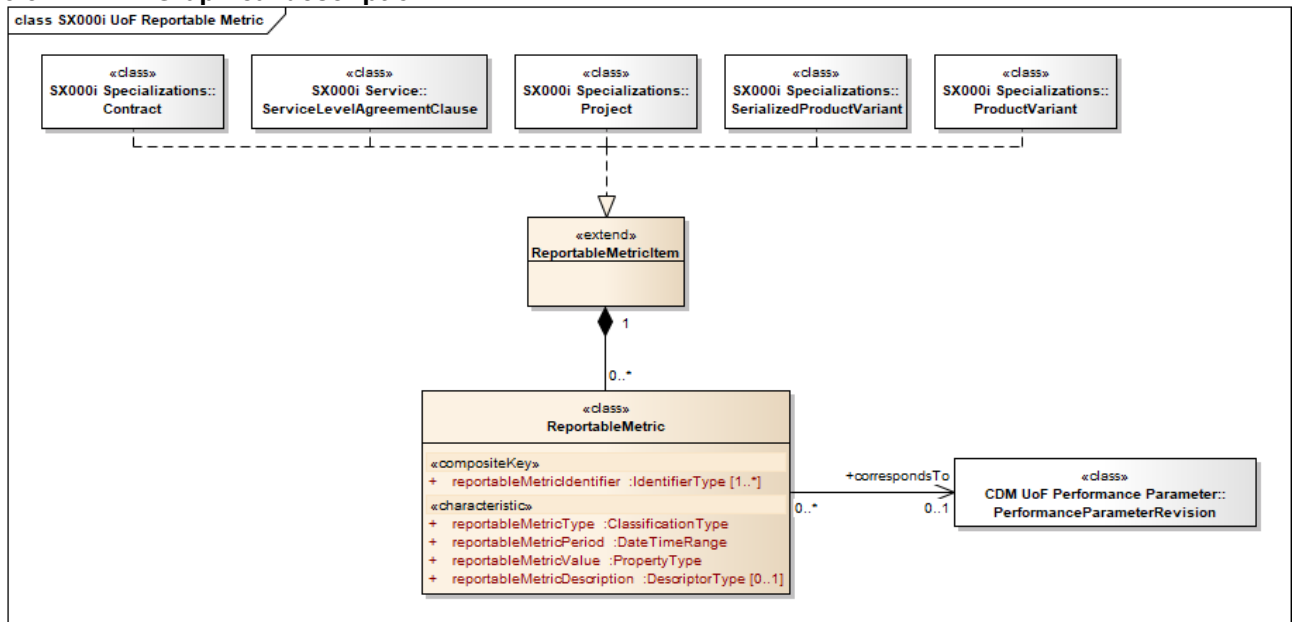
- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [ReportableItem](#). Refer to SX000i UoF Report, [Para 5.59](#)

5.57 SX000i UoF Reportable Metric

5.57.1 Description

The Reportable Metric UoF defines the measurement to be performed on an item.

5.57.2 Graphical description



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Fig 75 SX000i UoF Reportable Metric

5.57.3 Class definition

5.57.3.1 ReportableMetric

[ReportableMetric](#) is a measure of a specific characteristic that can evolve over time and is reported periodically for program or contract management purposes.

5.57.3.1.1 Attribute(s)

This class has the following attributes:

- `reportableMetricIdentifier`, one or many
- `reportableMetricType`
- `reportableMetricPeriod`
- `reportableMetricValue`
- `reportableMetricDescription`, zero or one

5.57.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [ReportableMetricItem](#)
- A directed association, zero, one or many, to zero or one objects of type [PerformanceParameterRevision](#)

5.57.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.57.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- [ReportableItem](#). Refer to SX000i UoF Report, [Para 5.59](#)

5.57.3.2 ReportableMetricItem

[ReportableMetricItem](#) is an <<extend>> interface that enables the assignment of instances of [ReportableMetric](#) to different items.

5.57.3.2.1 Class members

This <<extend>> interface includes the following class members:

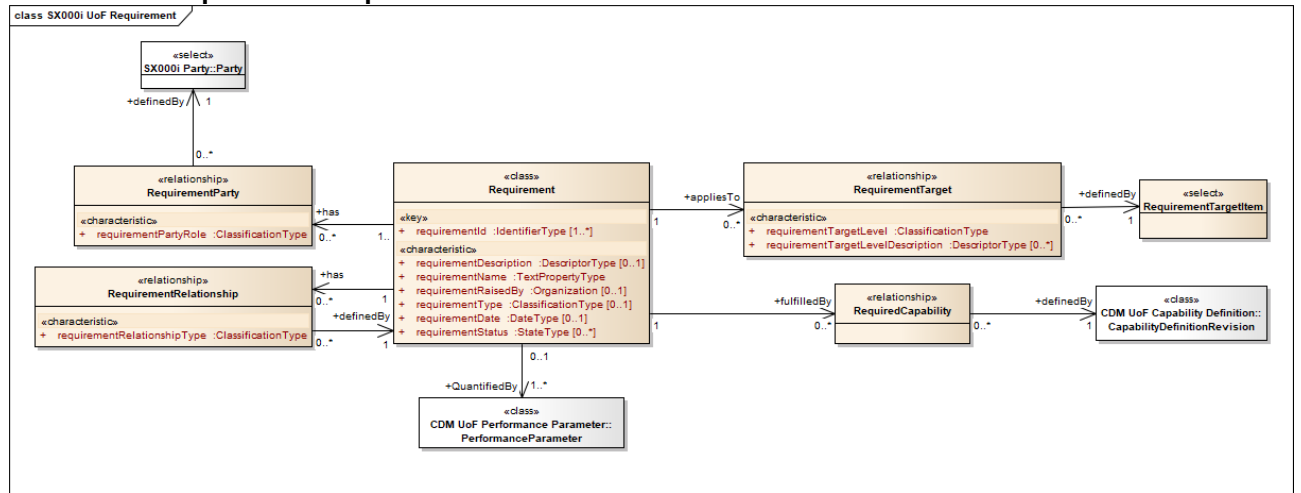
- [Contract](#)
- [ProductVariant](#)
- [Project](#)
- [SerializedProductVariant](#)
- [ServiceLevelAgreementClause](#)

5.58 SX000i UoF Requirement

5.58.1 Description

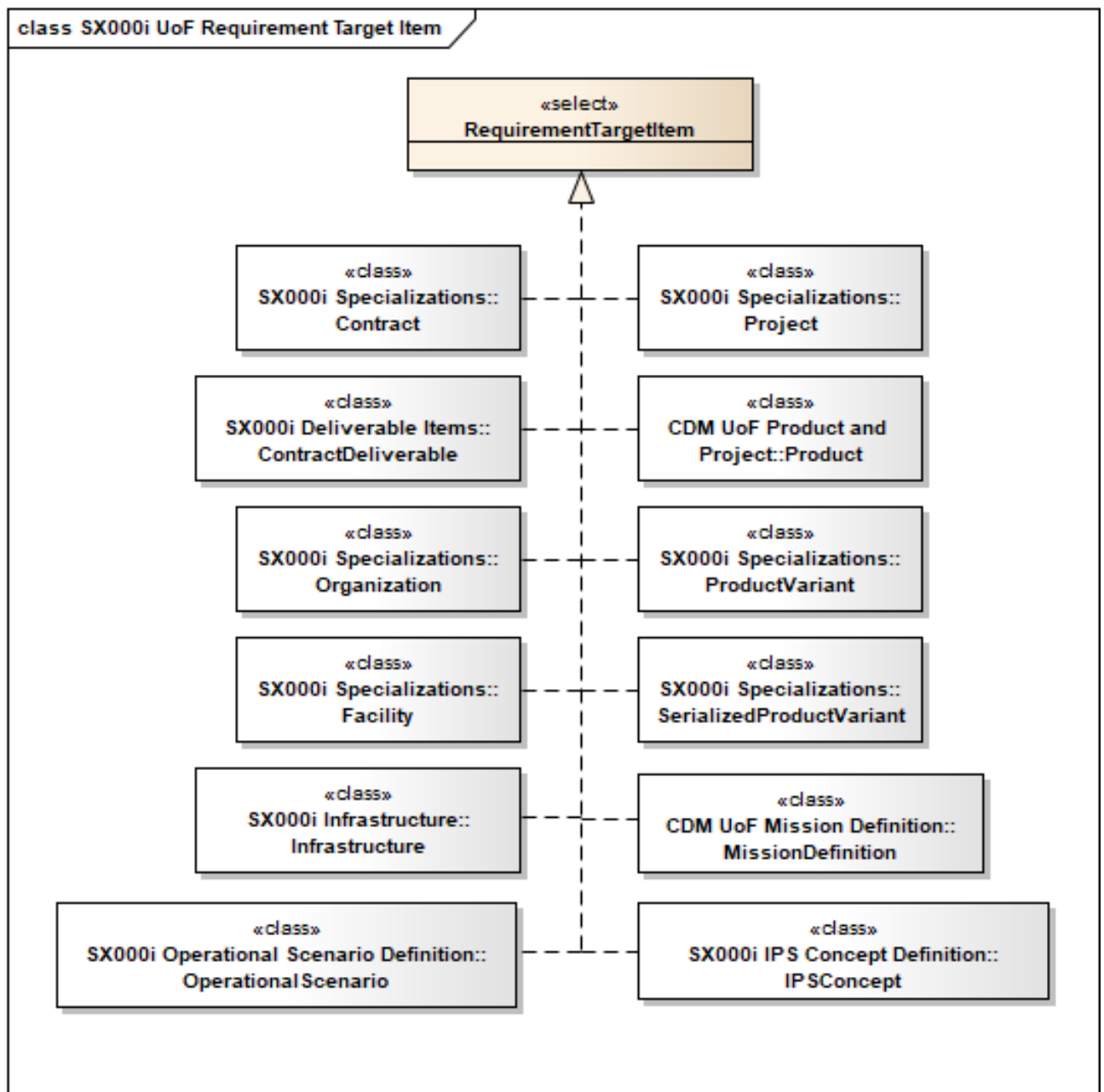
[Requirement](#) UoF provides the capability to specify statements of needs that require implementation.

5.58.2 Graphical description



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Fig 76 SX000i UoF Requirement



ICN-B6865-SX000I090079-001-01

Fig 77 SX000i UoF Requirement Target Item

5.58.3 Class definition

5.58.3.1 RequiredCapability

[RequiredCapability](#) is a <<relationship>> that associates one or several required capabilities to a requirement.

5.58.3.1.1 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [CapabilityDefinitionRevision](#)

5.58.3.2 Requirement

[Requirement](#) is a documented need that must be implemented.

5.58.3.2.1 Attribute(s)

This class has the following attributes:

- requirementId, one or many
- requirementDescription, zero or one
- requirementName
- requirementRaisedBy, zero or one
- requirementType, zero or one
- requirementDate, zero or one
- requirementStatus, zero, one or many

5.58.3.2.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type [ContractingRequirement](#)
- A directed association, to zero or one objects of type [Milestone](#)
- A directed association, to zero, one or many objects of type [NecessaryInfrastructure](#)
- A directed association, to zero, one or many objects of type [RequiredCapability](#)
- A directed association, to zero, one or many objects of type [RequirementParty](#)
- A directed association, to zero, one or many objects of type [RequirementRelationship](#)
- A directed association, to zero, one or many objects of type [RequirementTarget](#)
- A directed association, zero or one, to one or many objects of type [PerformanceParameter](#)

5.58.3.2.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.58.3.3 RequirementParty

[RequirementParty](#) is a <<relationship>> that associates a [Requirement](#) with a [Party](#).

5.58.3.3.1 Attribute(s)

This class has the following attributes:

- requirementPartyRole

5.58.3.3.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.58.3.4 RequirementRelationship

[RequirementRelationship](#) is a <<relationship>> that defines the association between two [Requirements](#).

5.58.3.4.1 Attribute(s)

This class has the following attributes:

- [requirementRelationshipType](#)

5.58.3.4.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [Requirement](#)

5.58.3.5 RequirementTarget

[RequirementTarget](#) is a <<relationship>> that associates a [Requirement](#) with the item to which the [Requirement](#) applies.

5.58.3.5.1 Attribute(s)

This class has the following attributes:

- [requirementTargetLevel](#)
- [requirementTargetLevelDescription](#), zero, one or many

5.58.3.5.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of [RequirementTargetItem](#)

5.58.3.6 RequirementTargetItem

[RequirementTargetItem](#) is a <<select>> interface that enables the selection of the item to which a [Requirement](#) applies.

5.58.3.6.1 Class members

This <<select>> interface includes the following class members:

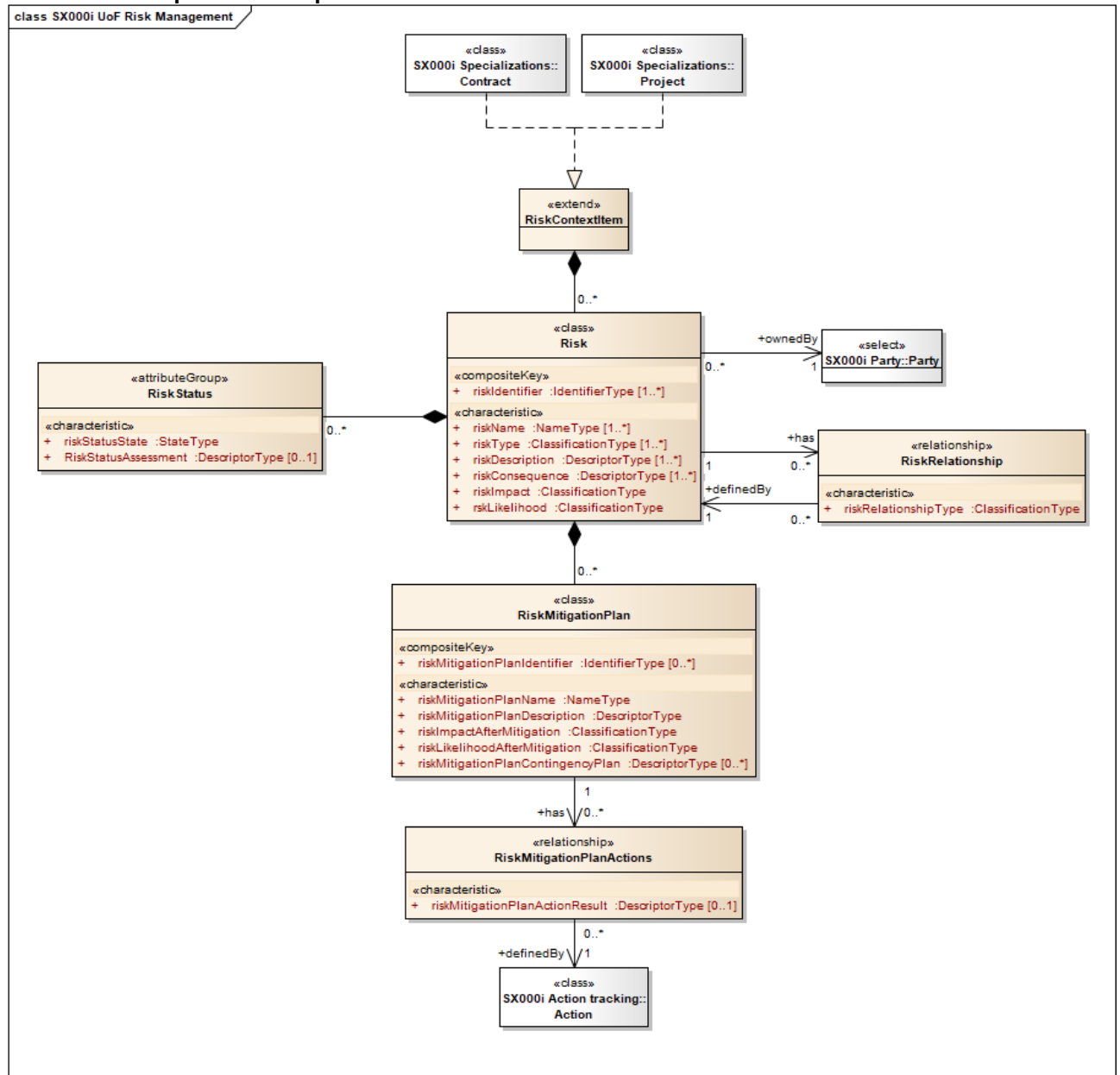
- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)
- [Contract](#)
- [ContractDeliverable](#)
- [Facility](#)
- [Infrastructure](#)
- [IPSConcept](#)
- [ITConcept](#)
- [MaintenanceConcept](#)
- [MaintenanceFacility](#)
- [MissionDefinition](#)
- [MRONetwork](#)

- OperatingBase
- OperationalConcept
- OperationalScenario
- OperatorOrganization
- Organization
- OtherFacility
- Port
- PowerGrid
- Product
- ProductVariant
- Project
- ProvisioningConcept
- SerializedProductVariant
- TrainingConcept
- TrainingFacility
- TransportNetwork
- Warehouse

5.59**SX000i UoF Risk Management****5.59.1****Description**

The Risk Management UoF enables the definition of risks, monitor their status and identify actions to mitigate such risks.

5.59.2 Graphical description



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Fig 78 SX000i UoF Risk Management

5.59.3 Class definition

5.59.3.1 Risk

Risk is a potential happening or event that implies delay, cost overrun or non-compliance with technical requirements.

5.59.3.1.1 Attribute(s)

This class has the following attributes:

- riskIdentifier, one or many
- riskName, one or many
- riskType, one or many
- riskDescription, one or many

Applicable to: All

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- riskConsequence, one or many
- riskImpact
- riskLikelihood

5.59.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [RiskContextItem](#)
- A directed association, to zero, one or many objects of type [RiskRelationship](#)
- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.59.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.59.3.2 RiskContextItem

[RiskContextItem](#) is an <<extend>> interface that enables the definition of the context in which a [Risk](#) is identified.

5.59.3.2.1 Class members

This <<extend>> interface includes the following class members:

- [Contract](#)
- [Project](#)

5.59.3.3 RiskMitigationPlan

[RiskMitigationPlan](#) is a set of [Actions](#) defined in advance to as to reduce the impact or likelihood of an expected [Risk](#).

5.59.3.3.1 Attribute(s)

This class has the following attributes:

- riskMitigationPlanIdentifier, zero, one or many
- riskMitigationPlanName
- riskMitigationPlanDescription
- riskImpactAfterMitigation
- riskLikelihoodAfterMitigation
- riskMitigationPlanContingencyPlan, zero, one or many

5.59.3.3.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [Risk](#)
- A directed association, to zero, one or many objects of type [RiskMitigationPlanActions](#)

5.59.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.59.3.4 RiskMitigationPlanActions

[RiskMitigationPlanActions](#) is a <<relationship>> that associates [Actions](#) to a [RiskMitigationPlan](#).

5.59.3.4.1 Attribute(s)

This class has the following attributes:

- `riskMitigationPlanActionResult`, zero or one

5.59.3.4.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [Action](#)

5.59.3.5 RiskRelationship

[RiskRelationship](#) is a <<relationship>> that associates two different Risks.

5.59.3.5.1 Attribute(s)

This class has the following attributes:

- `riskRelationshipType`

5.59.3.5.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [Risk](#)

5.59.3.6 RiskStatus

[RiskStatus](#) is an <<attributeGroup>> representing the status of a [Risk](#) at a specific moment in time.

5.59.3.6.1 Attribute(s)

This class has the following attributes:

- `riskStatusState`
- `RiskStatusAssessment`, zero or one

5.59.3.6.2 Associations

This class has the following associations:

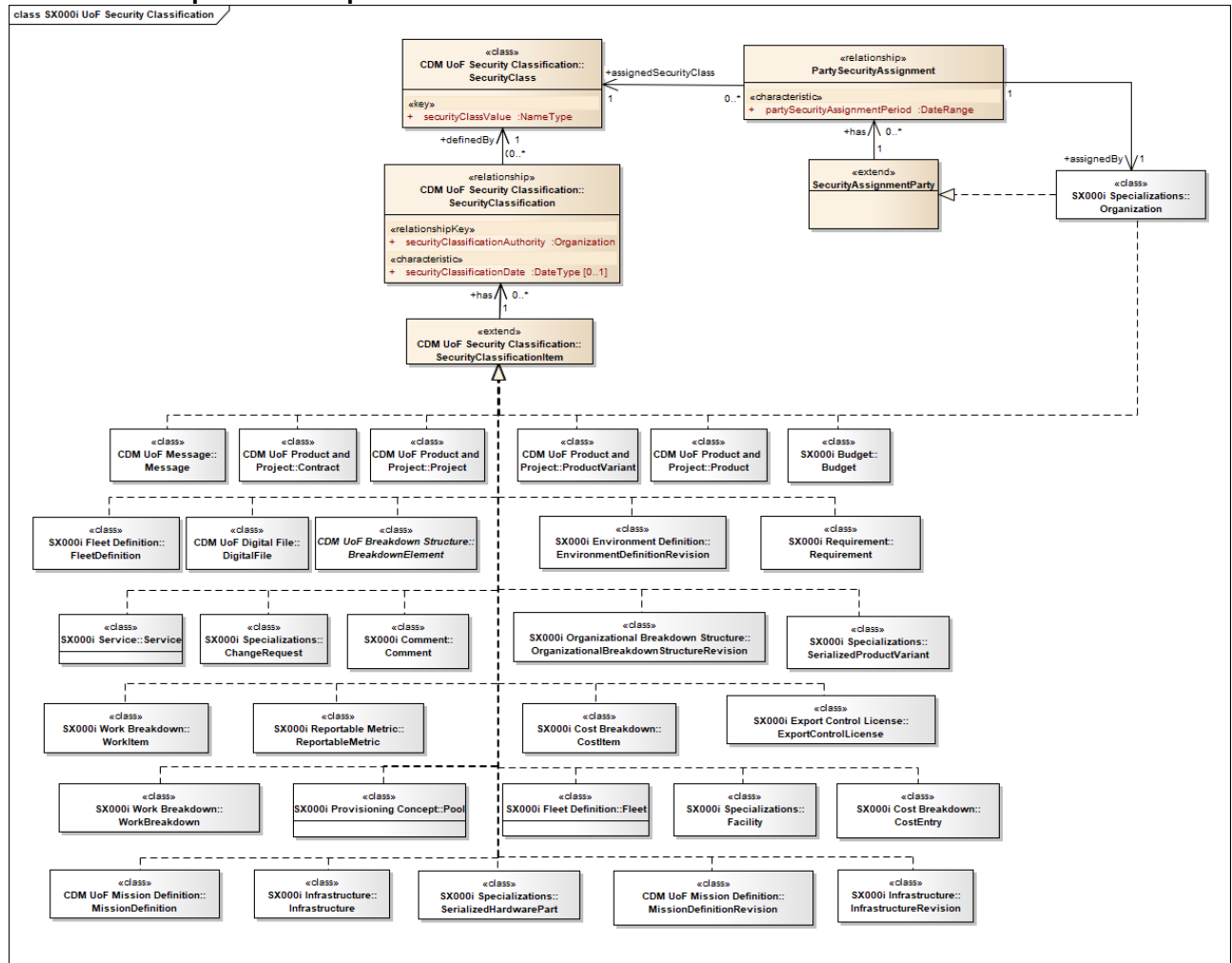
- An aggregate association, zero, one or many, to one related object of type [Risk](#)

5.60 SX000i UoF Security Classification

5.60.1 Description

Security Classification UoF provides the capability to assign security classifications to objects that need special handling for protection against unauthorized access or distribution.

5.60.2 Graphical description



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Fig 79 SX000i UoF Security Classification

5.60.3 Class definition

5.60.3.1 PartySecurityAssignment

PartySecurityAssignment is a <<relationship>> that establishes the security clearance of a **Party** during a certain period of time.

5.60.3.1.1 Attribute(s)

This class has the following attributes:

- partySecurityAssignmentPeriod

5.60.3.1.2 Associations

This class has the following associations:

- A directed association, to one object of type **OperatorOrganization**
- A directed association, to one object of type **Organization**
- A directed association, zero, one or many, to one object of type **SecurityClass**

5.60.3.2 SecurityAssignmentParty

SecurityAssignmentParty is an <<extend>> interface that enables the assignment of Security clearances to specific Parties.

Applicable to: All

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5.60.3.2.1 Class members

This <<extend>> interface includes the following class members:

- [OperatorOrganization](#)
- [Organization](#)

5.60.3.2.2 Associations

This class has the following associations:

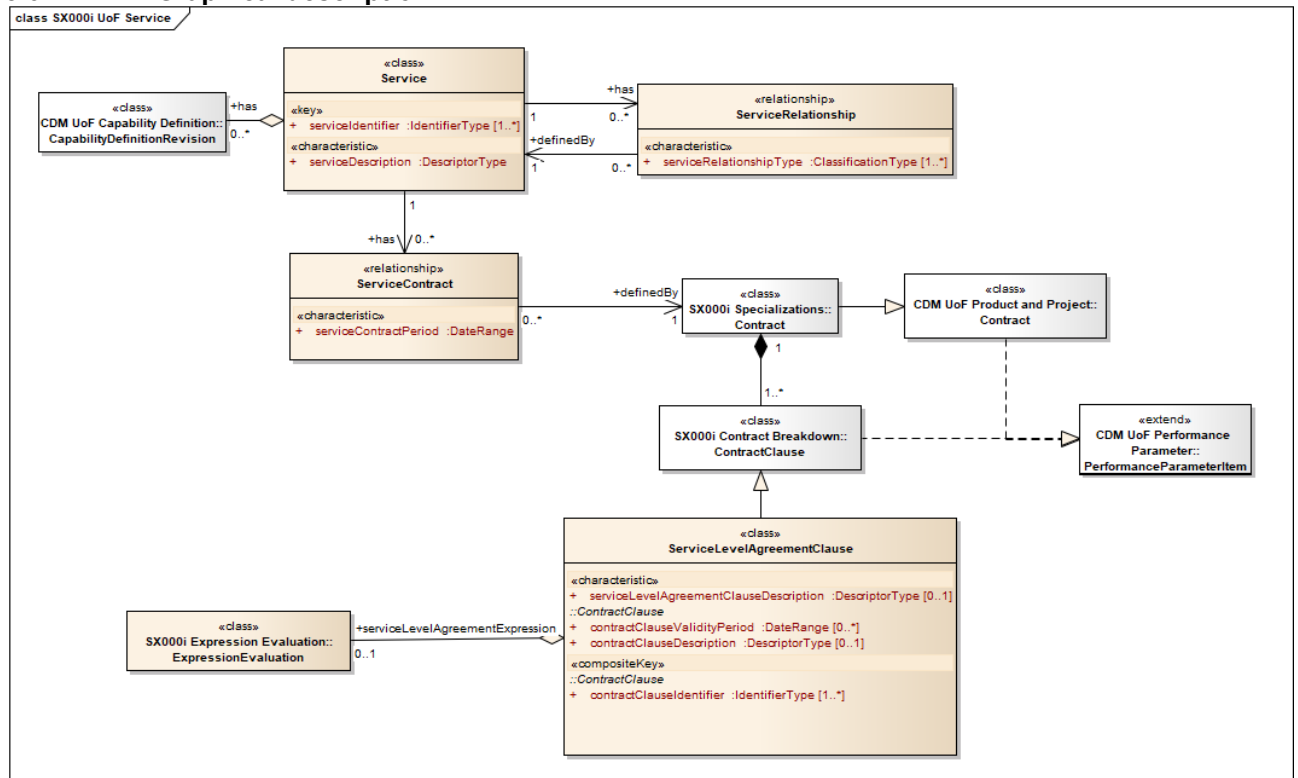
- A directed association, to zero, one or many objects of type [PartySecurityAssignment](#)

5.61 SX000i UoF Service

5.61.1 Description

The [Service Contract](#) Management UoF permits the [Service](#) reporting to be mapped to the [Service](#) Level Agreement (SLA) clauses to ensure compliance with the contractual SLAs.

5.61.2 Graphical description



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Fig 80 SX000i UoF Service

5.61.3 Class definition

5.61.3.1 Service

[Service](#) is a contract where technical or intellectual work is performed but no delivery of goods takes place.

5.61.3.1.1 Attribute(s)

This class has the following attributes:

- `serviceIdentifier`, one or many
- `serviceDescription`

Applicable to: All

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5.61.3.1.2 Associations

This class has the following associations:

- A directed association, to zero, one or many objects of type [ServiceContract](#). A [Service](#) can be associates with zero, one or many [Contracts](#) (through the [ServiceContract](#) <<relationship>>)
- A directed association, to zero, one or many objects of type [ServiceRelationship](#)

5.61.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [BudgetingItem](#). Refer to SX000i UoF Budget, [Para 5.13](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in [SX002D](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencingItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [PoliciesAndRegulationsCompliantItem](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.61.3.1.4 Selects

This class is a member of the following <<select>> interfaces:

- [ActualDeliverableItem](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [ChangeRequestTargetItem](#). Refer to CDM UoF Design Change Request,
- [ContractItem](#). Refer to SX000i UoF Product, [Para 5.53](#)
- [CostEntryItem](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DigitalFileReferencedItem](#). Refer to SX000i UoF Digital File, [Para 5.17](#)
- [InfrastructureRequiringItem](#). Refer to SX000i UoF Infrastructure Availability, [Para 5.31](#)
- [MessageContextItem](#). Refer to SX000i UoF Message, [Para 5.38](#)
- [ReportContextItem](#). Refer to SX000i UoF Report, [Para 5.59](#)
- [SubjectOfPoliciesAndRegulations](#). Refer to SX000i UoF Policies and Regulations, [Para 5.52](#)

5.61.3.2 ServiceContract

[ServiceContract](#) is a <<relationship>> that allows a service being provided to be associated to a specific contract.

5.61.3.2.1 Attribute(s)

This class has the following attributes:

- serviceContractPeriod

5.61.3.2.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [Contract](#)

5.61.3.3 ServiceLevelAgreementClause

[ServiceLevelAgreementClause](#) is a contractual clause related to a service that determines the level of service to be provided.

5.61.3.3.1 Attribute(s)

This class has the following attributes:

- `contractClauseIdentifier` (inherited from [ContractClause](#)), one or many
- `contractClauseValidityPeriod` (inherited from [ContractClause](#)), zero, one or many
- `contractClauseDescription` (inherited from [ContractClause](#)), zero or one
- `serviceLevelAgreementClauseDescription`, zero or one

5.61.3.3.2 Associations

This class has the following associations:

- An aggregate association, one or many, to one related object of type [Contract](#)
- A directed association, to zero, one or many objects of type [ContractClauseRelationship](#)
- A directed association, to zero, one or many objects of type [LaborRates](#)

5.61.3.3.3 Implementations

This class implements the following <<extend>> interfaces:

- [BudgetingItem](#). Refer to SX000i UoF Budget, [Para 5.13](#)
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [ContractingRequirement](#). Refer to SX000i UoF Deliverable Items, [Para 5.20](#)
- [CostBreakdownContext](#). Refer to SX000i UoF Cost Breakdown, [Para 5.18](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [PerformanceParameterItem](#). Refer to SX000i UoF Performance Parameter, [Para 5.45](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [ReportableMetricItem](#). Refer to SX000i UoF Reportable Metric, [Para 5.61](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.61.3.3.4 Selects

This class is a member of the following <<select>> interfaces:

- [ContractReference](#) (inherited from [ContractClause](#)). Refer to SX000i UoF Contract Breakdown, [Para 5.17](#)

5.61.3.4 ServiceRelationship

[ServiceRelationship](#) is a <<relationship>> that associates two [Services](#).

5.61.3.4.1 Attribute(s)

This class has the following attributes:

- serviceRelationshipType, one or many

5.61.3.4.2 Associations

This class has the following associations:

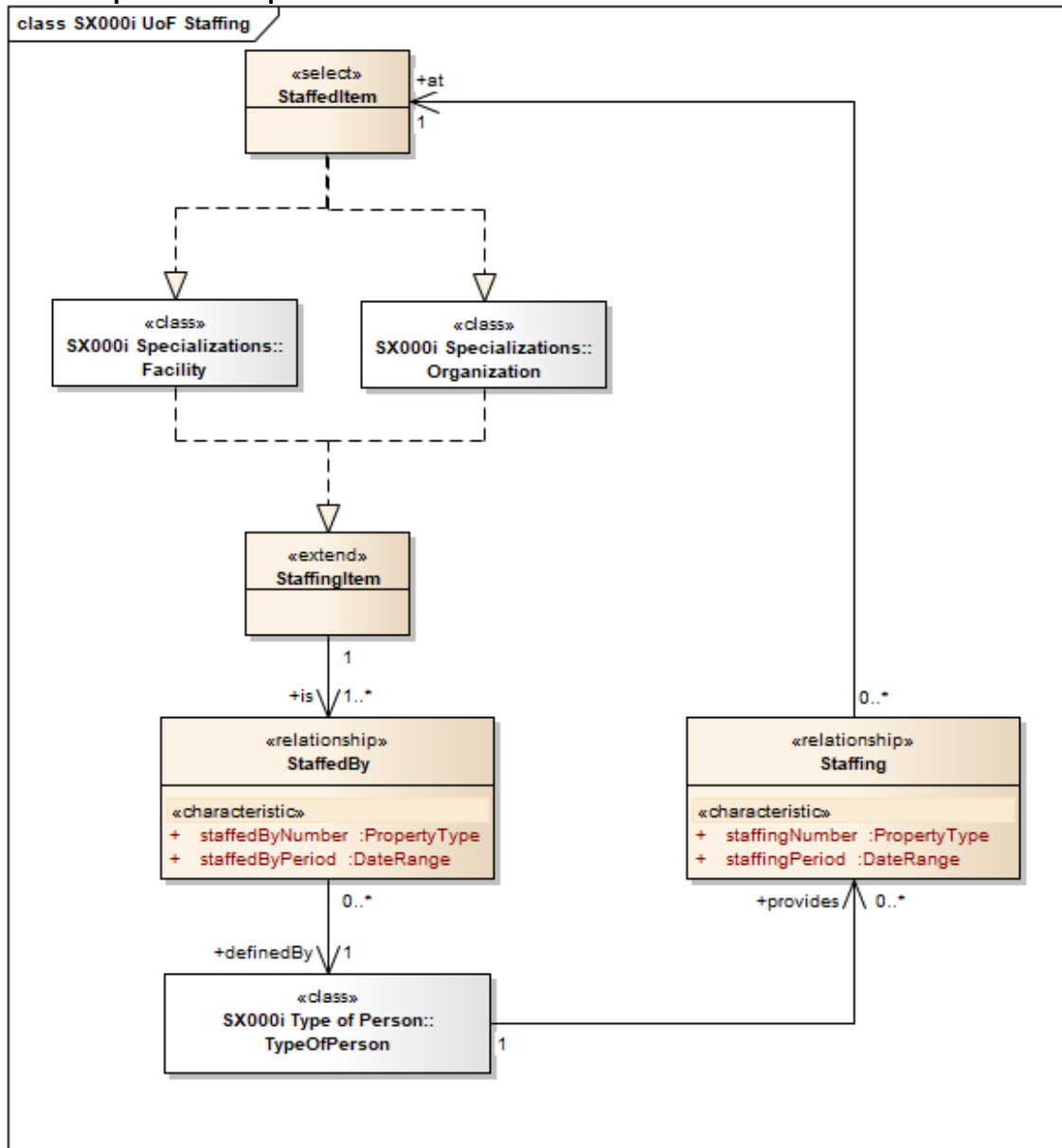
- A directed association, zero, one or many, to one object of type [Service](#)

5.62 SX000i UoF Staffing

5.62.1 Description

The Staffing UoF enables the definition of items requiring staffing and detail the staffing required by such items.

5.62.2 Graphical description



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Fig 81 SX000i UoF Staffing

5.62.3 Class definition**5.62.3.1 StaffedBy**

StaffedBy is a <<relationship>> that defines the current or expected number of persons of a specific profile (**TypeOfPerson**) working on an entity during a specified period of time.

5.62.3.1.1 Attribute(s)

This class has the following attributes:

- staffedByNumber
- staffedByPeriod

5.62.3.1.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type **TypeOfPerson**

5.62.3.2 StaffedItem

StaffedItem is a <<select>> interface that represents Items to which staff can be assigned.

5.62.3.3 Staffing

Staffing is a <<relationship>> that associates a **TypeOfPerson** with the Entity that it staffs or will staff.

5.62.3.3.1 Attribute(s)

This class has the following attributes:

- staffingNumber
- staffingPeriod

5.62.3.3.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to object(s) from classes that are members of **StaffedItem**

5.62.3.4 StaffingItem

StaffingItem is an <<extend>> interface that represents all items that can have staff associated to them.

5.62.3.4.1 Class members

This <<extend>> interface includes the following class members:

- Facility
- MaintenanceFacility
- OperatingBase
- OperatorOrganization
- Organization
- OtherFacility
- TrainingFacility
- Warehouse

5.62.3.4.2 Associations

This class has the following associations:

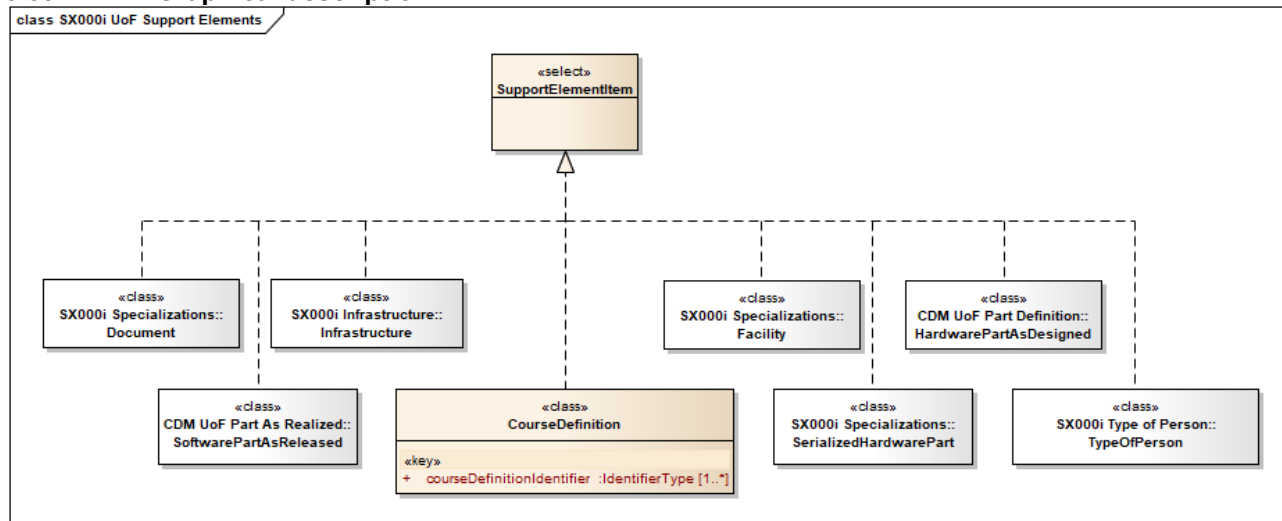
- A directed association, to one or many objects of type **StaffedBy**

5.63 SX000i UoF Support Elements

5.63.1 Description

The Support Elements UoF provides the capability to define the resources that can be used for support purposes.

5.63.2 Graphical description



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Fig 82 SX000i UoF Support Elements

5.63.3 Class definition

5.63.3.1 CourseDefinition

CourseDefinition is a <<class>> defining a combination of course elements with the objective that a trainee will acquire knowledge, skills and attitude to meet performance requirements for a particular aspect of a job or duty.

5.63.3.1.1 Attribute(s)

This class has the following attributes:

- `courseDefinitionIdentifier`, one or many

5.63.3.1.2 Implementations

This class implements the following <<extend>> interfaces:

- **CommentItem** (inherited from **BaseObject**). Refer to SX000i UoF Comment, [Para 5.16](#)
- **DocumentReferencingItem** (inherited from **BaseObject**). Refer to CDM UoF Document, [Para 5.5](#)
- **ProjectSpecificExtensionItem** (inherited from **BaseObject**). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- **RemarkItem** (inherited from **BaseObject**). Refer to SX000i UoF Remark, [Para 5.58](#)

5.63.3.1.3 Selects

This class is a member of the following <<select>> interfaces:

- **SupportElementItem**. Refer to SX000i Support Elements,

5.63.3.2 SupportElementItem

SupportElementItem is a <<select>> interface that represents an item required to support a **Product**.

5.63.3.2.1 Class members

This <<select>> interface includes the following class members:

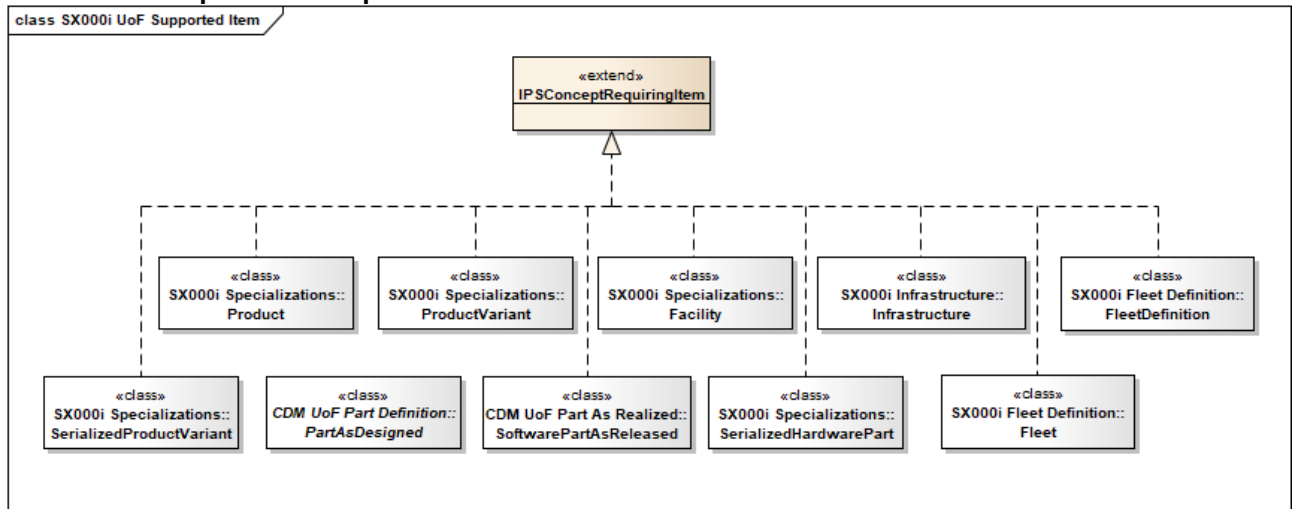
- AllowedProductConfigurationHardwarePartAsDesigned
- CloudInfrastructure
- CommunicationsNetwork
- ComputerNetwork
- CourseDefinition
- Document
- ExportControlRegulation
- ExternalDocument
- Facility
- HardwarePartAsDesigned
- Infrastructure
- MaintenanceFacility
- MRONetwork
- OperatingBase
- OtherFacility
- PoliciesAndRegulations
- Port
- PowerGrid
- Report
- SerializedHardwarePart
- SoftwarePartAsReleased
- TrainingFacility
- TransportNetwork
- TypeOfPerson
- Warehouse

5.64 SX000i UoF Supported Item

5.64.1 Description

The Supported Item UoF provides the capability to define the items that can require support and for which an IPS Concept can be required.

5.64.2 Graphical description



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Fig 83 SX000i UoF Supported Item

5.64.3 Class definition

5.64.3.1 IPSConceptRequiringItem

[IPSConceptRequiringItem](#) is an <<extend>> interface that enables the association of IPS concepts to one or more items requiring IPS.

5.64.3.1.1 Class members

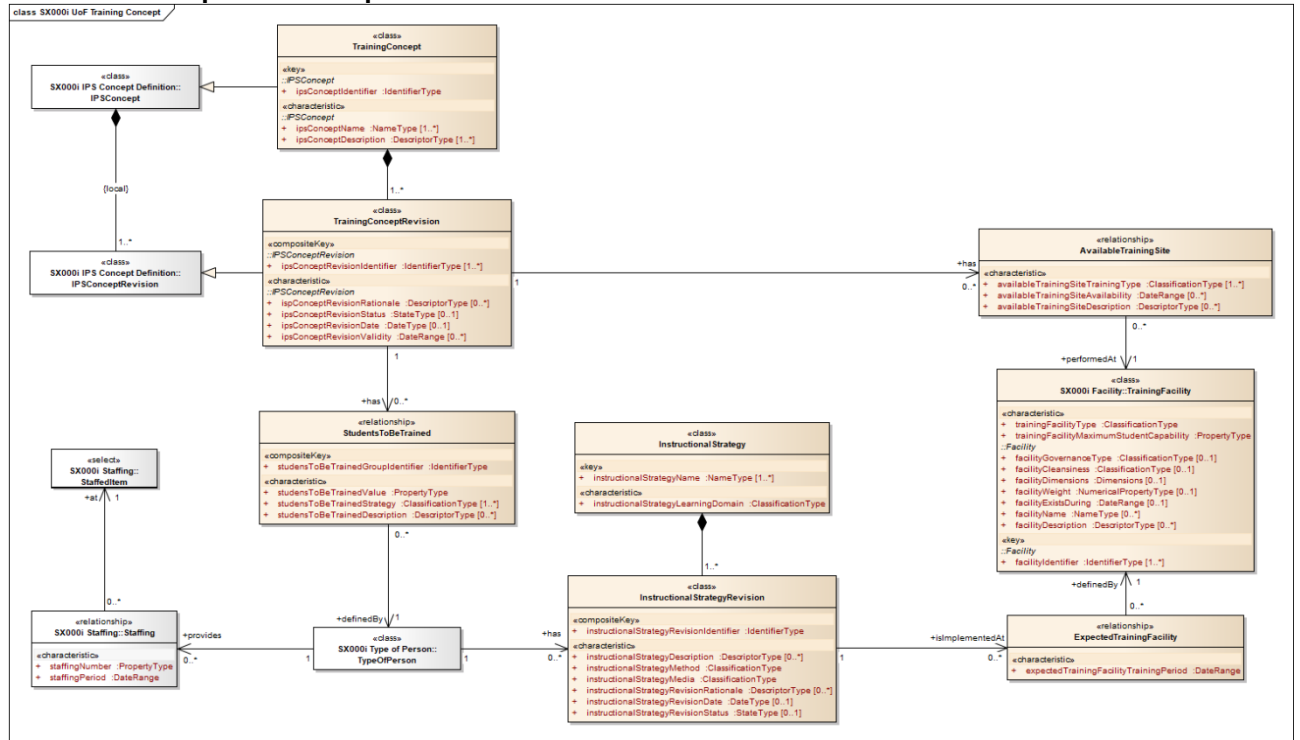
This <<extend>> interface includes the following class members:

- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)
- [Facility](#)
- [Fleet](#)
- [FleetDefinition](#)
- [Infrastructure](#)
- [MaintenanceFacility](#)
- [MRONetwork](#)
- [OperatingBase](#)
- [OtherFacility](#)
- [Port](#)
- [PowerGrid](#)
- [Product](#)
- [ProductVariant](#)
- [SerializedHardwarePart](#)
- [SerializedProductVariant](#)
- [SoftwarePartAsReleased](#)
- [TrainingFacility](#)
- [TransportNetwork](#)
- [Warehouse](#)

SX000i UoF Training Concept Description

The Training Concept UoF provides the capability to define the number and types of students to be trained and where such training could potentially take place.

Graphical description



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Fig 84 SX000i UoF Training Concept

Class definition

AvailableTrainingSite

AvailableTrainingSite is a <<relationship>> that defines the available TrainingSite8s) for a specific TrainingConceptRevision.

Attribute(s)

This class has the following attributes:

- availableTrainingSiteTrainingType, one or many
- availableTrainingSiteAvailability, zero, one or many
- availableTrainingSiteDescription, zero, one or many

Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type `TrainingFacility`

ExpectedTrainingFacility

ExpectedTrainingFacility is a <<relationship>> that allows to associate an **InstructionalStrategyRevision** to the **TrainingFacility** where the training is expected to take place.

Attribute(s)

This class has the following attributes:

Applicable to: All

SX000j-A-09-00-0000-00A-040A-A

- expectedTrainingFacilityTrainingPeriod

5.65.3.2.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [TrainingFacility](#)

5.65.3.3 InstructionalStrategy

[InstructionalStrategy](#) is a <<class>> representing techniques used to support the acquisition of new knowledge, skills and attitudes.

5.65.3.3.1 Attribute(s)

This class has the following attributes:

- instructionalStrategyName, one or many
- instructionalStrategyLearningDomain

5.65.3.3.2 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.65.3.4 InstructionalStrategyRevision

[InstructionalStrategyRevision](#) is a <<class>> representing an iteration applied to an instructional strategy.

5.65.3.4.1 Attribute(s)

This class has the following attributes:

- instructionalStrategyRevisionIdentifier
- instructionalStrategyDescription, zero, one or many
- instructionalStrategyMethod
- instructionalStrategyMedia
- instructionalStrategyRevisionRationale, zero, one or many
- instructionalStrategyRevisionDate, zero or one
- instructionalStrategyRevisionStatus, zero or one

5.65.3.4.2 Associations

This class has the following associations:

- An aggregate association, one or many, to one related object of type [InstructionalStrategy](#)
- A directed association, to zero, one or many objects of type [ExpectedTrainingFacility](#)

5.65.3.4.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)

- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.65.3.5 StudentsToBeTrained

[StudentsToBeTrained](#) is a <<relationships>> that defines the number of students to be trained for a specific [TypeOfPerson](#) in the context of a [TrainingConceptRevision](#).

5.65.3.5.1 Attribute(s)

This class has the following attributes:

- [studensToBeTrainedGroupIdentifier](#)
- [studensToBeTrainedValue](#)
- [studensToBeTrainedStrategy](#), one or many
- [studensToBeTrainedDescription](#), zero, one or many

5.65.3.5.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [TypeOfPerson](#)

5.65.3.6 TrainingConcept

[TrainingConcept](#) is a specialized [IPSConcept](#) intended to describe how the training will be performed in the context of a global [IPSConcept](#).

5.65.3.6.1 Attribute(s)

This class has the following attributes:

- [ipsConceptIdentifier](#) (inherited from [IPSConcept](#))
- [ipsConceptName](#) (inherited from [IPSConcept](#)), one or many
- [ipsConceptDescription](#) (inherited from [IPSConcept](#)), one or many

5.65.3.6.2 Associations

This class has the following associations:

- A composition association, zero, one or manychild objects of type [IPSConceptRequiringItem](#)
- A directed association, to zero, one or many objects of type [IPSConceptRelationship](#)

5.65.3.6.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.65.3.6.4 *Selects*

This class is a member of the following <<select>> interfaces:

- [RequirementTargetItem](#) (inherited from [IPSConcept](#)). Refer to SX000i UoF Requirement, [Para 5.62](#)

5.65.3.7 *TrainingConceptRevision*

[TrainingConceptRevision](#) is a <<class>> representing an iteration applied to a [TrainingConcept](#)

5.65.3.7.1 *Attribute(s)*

This class has the following attributes:

- [ipsConceptRevisionIdentifier](#) (inherited from [IPSConceptRevision](#)), one or many
- [ispConceptRevisionRationale](#) (inherited from [IPSConceptRevision](#)), zero, one or many
- [ipsConceptRevisionStatus](#) (inherited from [IPSConceptRevision](#)), zero or one
- [ipsConceptRevisionDate](#) (inherited from [IPSConceptRevision](#)), zero or one
- [ipsConceptRevisionValidity](#) (inherited from [IPSConceptRevision](#)), zero, one or many

5.65.3.7.2 *Associations*

This class has the following associations:

- An aggregate association, one or many, to one related object of type [TrainingConcept](#)
- A directed association, to zero, one or many objects of type [AvailableTrainingSite](#)
- A directed association, to zero, one or many objects of type [IPSConceptRevisionRequirement](#)
- A directed association, to zero, one or many objects of type [StudentsToBeTrained](#)

5.65.3.7.3 *Implementations*

This class implements the following <<extend>> interfaces:

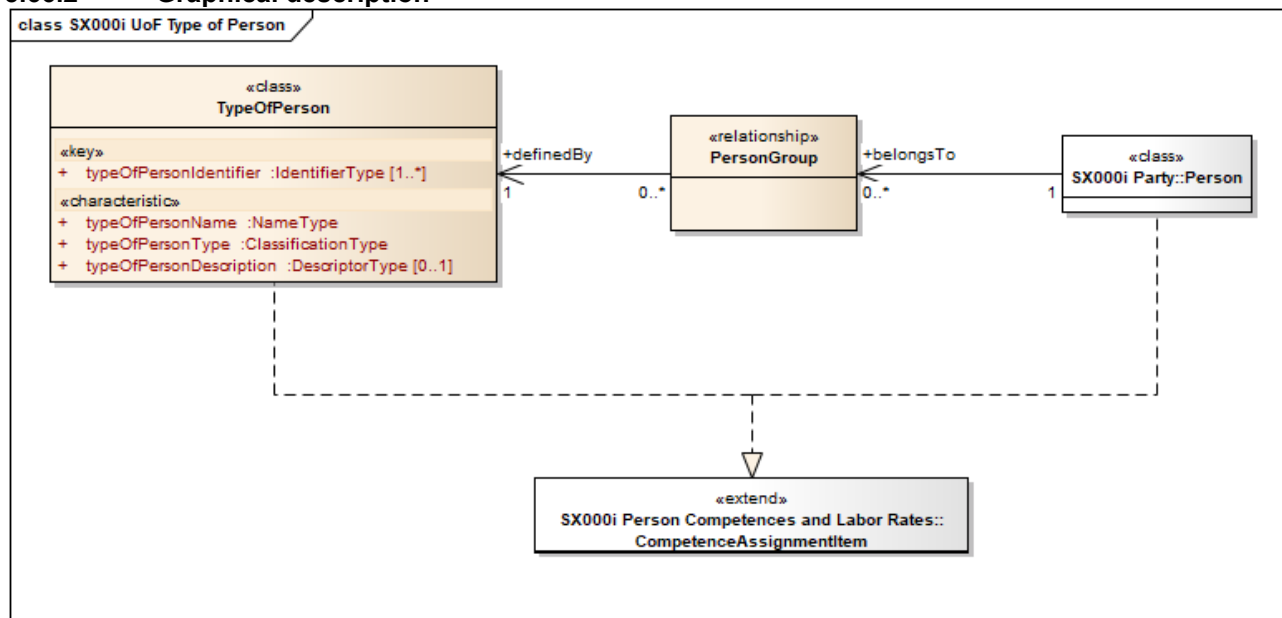
- [ApplicabilityStatementItem](#). Refer to SX000i UoF Applicability Statement, [Para 5.12](#)
- [ChangeControlledItem](#). Refer to CDM UoF Change Information in SX002D
- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [InfrastructureCompliantItem](#). Refer to SX000i UoF Facility, [Para 5.27](#)
- [LimitedItem](#). Refer to SX000i UoF Limitation, [Para 5.34](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)
- [WorkBreakdownContext](#). Refer to SX000i UoF Work Breakdown, [Para 5.71](#)

5.66 SX000i UoF Type of Person

5.66.1 Description

Type Of **Person** UoF provides information about the shared characteristics that can be associated to a group of **Persons**.

5.66.2 Graphical description



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Fig 85 SX000i UoF Type of Person

5.66.3 Class definition

5.66.3.1 PersonGroup

PersonGroup is a <<relationship>> that associates a **Person** to different types of persons.

5.66.3.1.1 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type **TypeOfPerson**

5.66.3.2 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.

Example(s)

- class 3 welder
- electronics engineer
- helicopter pilot
- mechanical technician
- paratrooper
- typical passenger
- truck driver

5.66.3.2.1 *Attribute(s)*

This class has the following attributes:

- `typeOfPersonIdentifier`, one or many
- `typeOfPersonName`
- `typeOfPersonType`
- `typeOfPersonDescription`, zero or one

5.66.3.2.2 *Associations*

This class has the following associations:

- A directed association, to zero, one or many objects of type [InstructionalStrategyRevision](#)
- A directed association, to zero, one or many objects of type [Staffing](#)

5.66.3.2.3 *Implementations*

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [CompetenceAssignmentItem](#). Refer to SX000i UoF Person Competences and Labor Rates, [Para 5.50](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.66.3.2.4 *Selects*

This class is a member of the following <<select>> interfaces:

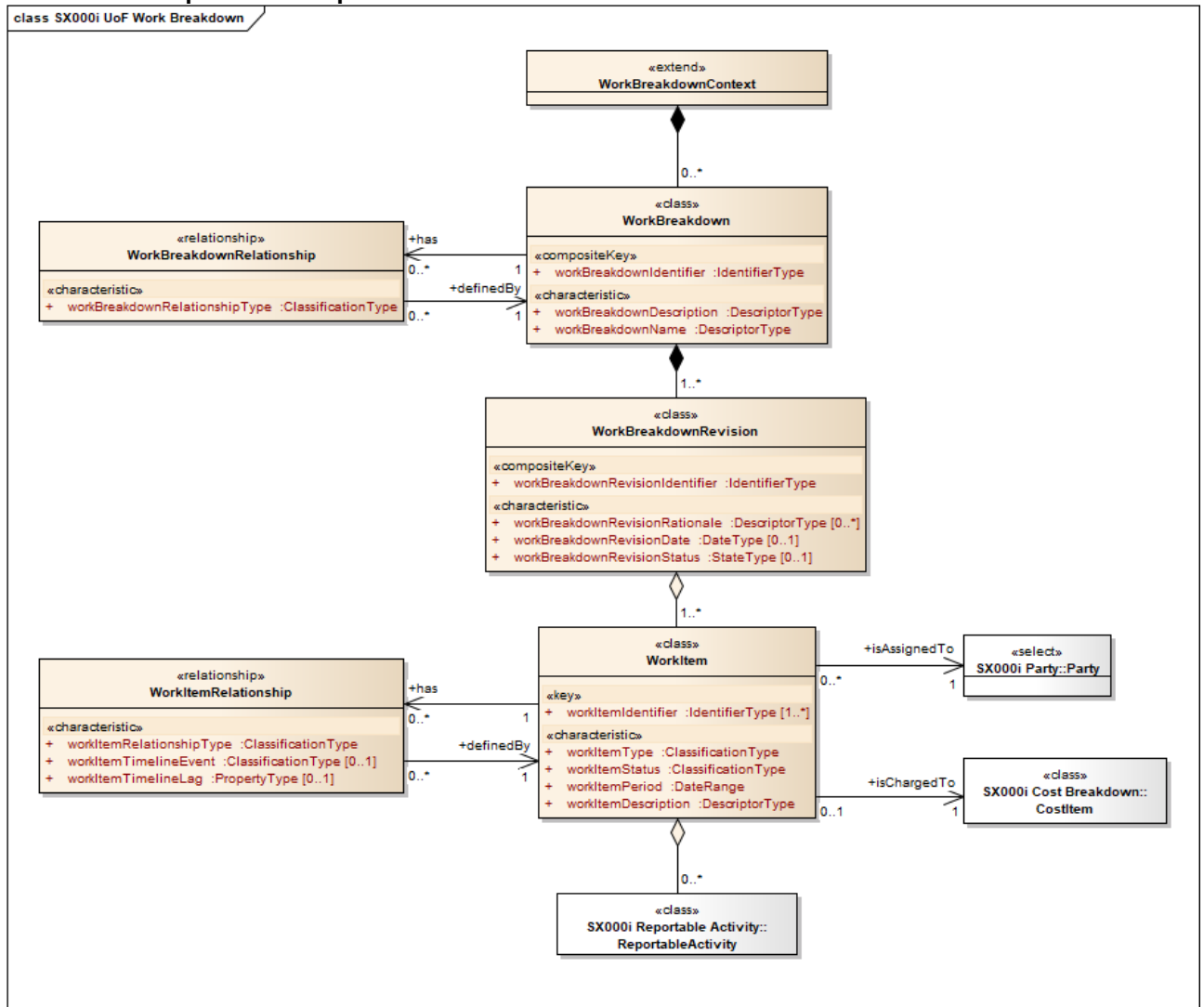
- [SupportElementItem](#). Refer to SX000i UoF Support Elements, [Para 5.67](#)

5.67 **SX000i UoF Work Breakdown**

5.67.1 **Description**

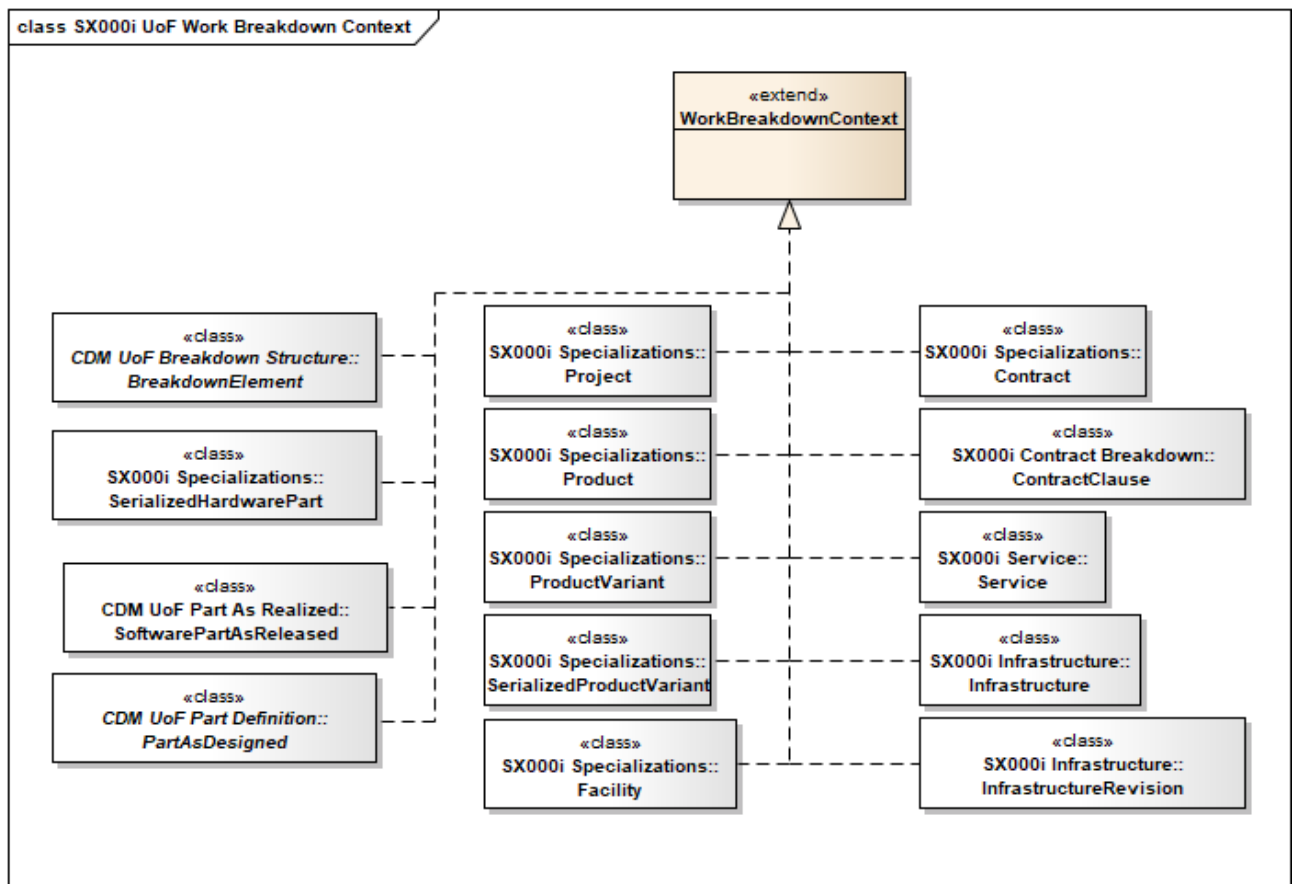
The Work Breakdown UoF provides the capability to define a Work [Breakdown](#) Structure (WBS).

5.67.2 Graphical description



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Fig 86 SX000i UoF Work Breakdown



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Fig 87 SX000i UoF Work Breakdown Context

5.67.3 Class definition

5.67.3.1 WorkBreakdown

[WorkBreakdown](#) is a class used to group all the different activities associated to a particular purpose.

5.67.3.1.1 Attribute(s)

This class has the following attributes:

- workBreakdownIdentifier
- workBreakdownDescription
- workBreakdownName

5.67.3.1.2 Associations

This class has the following associations:

- An aggregate association, zero, one or many, to one related object of type [WorkBreakdownContext](#)
- A directed association, to zero, one or many objects of type [WorkBreakdownRelationship](#)

5.67.3.1.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)

- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.67.3.2 WorkBreakdownContext

[WorkBreakdownContext](#) is an <<extend>> interface that enables the association of different instances of [WorkBreakdown](#) to individual items.

5.67.3.2.1 Class members

This <<extend>> interface includes the following class members:

- [AllowedProductConfigurationHardwarePartAsDesigned](#)
- [BreakdownElement](#)
- [CloudInfrastructure](#)
- [CommunicationsNetwork](#)
- [ComputerNetwork](#)
- [Contract](#)
- [ContractClause](#)
- [Facility](#)
- [HardwarePartAsDesigned](#)
- [Infrastructure](#)
- [InfrastructureRevision](#)
- [IPSConceptRevision](#)
- [ITConceptRevision](#)
- [MaintenanceConceptRevision](#)
- [MaintenanceFacility](#)
- [MRONetwork](#)
- [OperatingBase](#)
- [OperationalConceptRevision](#)
- [OtherFacility](#)
- [PartAsDesigned](#)
- [Port](#)
- [PowerGrid](#)
- [Product](#)
- [ProductVariant](#)
- [Project](#)
- [ProvisioningConceptRevision](#)
- [ProvisioningConceptRevision](#)
- [SerializedHardwarePart](#)
- [SerializedProductVariant](#)
- [Service](#)
- [ServiceLevelAgreementClause](#)
- [SoftwareElement](#)
- [SoftwarePartAsReleased](#)
- [TrainingConceptRevision](#)
- [TrainingFacility](#)

- [TransportNetwork](#)
- [Warehouse](#)

5.67.3.3 **WorkBreakdownRelationship**
[WorkBreakdownRelationship](#) is a <<relationship>> that associates different instances of [WorkBreakdown](#).

5.67.3.3.1 **Attribute(s)**
This class has the following attributes:

- `workBreakdownRelationshipType`

5.67.3.3.2 **Associations**
This class has the following associations:

- A directed association, zero, one or many, to one object of type [WorkBreakdown](#)

5.67.3.4 **WorkBreakdownRevision**
[WorkBreakdownRevision](#) is an iteration that is applied to a [WorkBreakdown](#).

5.67.3.4.1 **Attribute(s)**
This class has the following attributes:

- `workBreakdownRevisionIdentifier`
- `workBreakdownRevisionRationale`, zero, one or many
- `workBreakdownRevisionDate`, zero or one
- `workBreakdownRevisionStatus`, zero or one

5.67.3.4.2 **Associations**
This class has the following associations:

- An aggregate association, one or many, to one related object of type [WorkBreakdown](#)

5.67.3.4.3 **Implementations**
This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)

5.67.3.5 **WorkItem**
[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 instances of [WorkBreakdownRevision](#).

5.67.3.5.1 **Attribute(s)**
This class has the following attributes:

- `workItemIdentifier`, one or many
- `workItemType`

- workItemStatus
- workItemPeriod
- workItemDescription

5.67.3.5.2 Associations

This class has the following associations:

- A composition association, one or manychild objects of type [WorkBreakdownRevision](#)
- A directed association, to zero, one or many objects of type [WorkItemRelationship](#)
- A directed association, zero or one, to one object of type [CostItem](#)
- A directed association, zero, one or many, to object(s) from classes that are members of [Party](#)

5.67.3.5.3 Implementations

This class implements the following <<extend>> interfaces:

- [CommentItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Comment, [Para 5.16](#)
- [DocumentReferencingItem](#) (inherited from [BaseObject](#)). Refer to CDM UoF Document, [Para 5.5](#)
- [ProjectSpecificExtensionItem](#) (inherited from [BaseObject](#)). Refer to SX000i Project-specific attributes, [Para 5.3](#)
- [RemarkItem](#) (inherited from [BaseObject](#)). Refer to SX000i UoF Remark, [Para 5.58](#)
- [SecurityClassificationItem](#). Refer to SX000i UoF Security Classification, [Para 5.60](#)

5.67.3.6 WorkItemRelationship

[WorkItemRelationship](#) is a <<relationship>> that associates two instances of [WorkItem](#).

It enables the definition of both hierarchical associations and time-dependent associations.

For hierarchical associations, it defines the parent-child relationships.

For time-dependent relationships, [WorkItemRelationship](#) defines the event to which the 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).

5.67.3.6.1 Attribute(s)

This class has the following attributes:

- workItemRelationshipType
- workItemTimelineEvent, zero or one
- workItemTimelineLag, zero or one

5.67.3.6.2 Associations

This class has the following associations:

- A directed association, zero, one or many, to one object of type [WorkItem](#)

Chapter 10

Data element list

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References

Table 1 References

Chap No./Document No.	Title
Chap 7	Tailoring and contracting against SX000i
Chap 9	Data model
SX001G	Glossary for the S-Series ILS specifications
SX002D	Common data model for the S-Series IPS specifications

1 General

This chapter defines all the classes, data elements (attributes) and valid values that are used in the SX000i data model, refer to [Chap 9](#).

2 Classes

The full list of SX000i classes is provided in [Table 2](#). This includes classes from SX002D used by SX000i but defined originally in SX001G. If the UoF is "SX000i 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 9](#) on more details on class types and Stereotypes used in SX000i)

-
- Class definition contains a textual definition.
 - Unit of Functionality (UoF), identifies the section in [Chap 9](#) 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 9](#).

Note

In the following tables, the formatting conventions are as follows:

- Words formatted like [Meeting](#) or [DateRange](#) represent classes, interfaces or attribute groups
- Items formatted like <<relationship>> or <<class> (ie, between <<>>) represent stereotypes.
- Words formatted like `riskImpact` represent attributes.

Table 2 List of SX000i classes

Class name	Type	Stereotype	Definition	UoF
Action	Class	class	Action is a fact or process of doing something for the purpose of achieving an aim.	SX000i UoF Action tracking
ActionContext	Class	relationship	ActionContext is a <<relationship>> that allows the association the context of an Action.	SX000i UoF Action tracking
ActionContextItem	Interface	select	ActionContextItem is a <<select>> interface that enables the selection of the context of an action.	SX000i UoF Action tracking
ActionRelationship	Class	relationship	ActionRelationship is a <<relationship>> that associates different actions.	SX000i UoF Action tracking
ActualContractualDelivery	Class	relationship	ActualContractualDelivery is a <<relationship>> that associates an actual delivery to a ContractDeliverable	SX000i UoF Deliverable Items
ActualDeliverableItem	Interface	select	ActualDeliverableItem is a <<select>> interface that enables the association of an actual deliverable item to a ContractDeliverable by means of the ActualContractualDelivery <<relationship>>.	SX000i UoF Deliverable Items
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). Note - One and the same serialized product can adhere to different allowed product configurations over time. Note - An allowed product configuration can also include associated engineering instructions that must be adhered to during assembly and operation and that demonstrates that a product complies with applicable regulations.	CDM UoF Product Design Configuration

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Class name	Type	Stereotype	Definition	UoF
			Example – Applicable regulations can be a Type Certificate.	
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
AllowedProductConfigurationRole	Class	relationship	AllowedProductConfigurationRole is a <<relationship>> that defines what OperationalRoles can be performed by a specific AllowedProductConfiguration.	SX000i UoF Operational Roles
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.	SX000i UoF Operational Roles
ApplicabilityStatement	Class	class	ApplicabilityStatement is a <<class>> that defines the situation or situations under which related items are valid.	SX000i 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.	SX000i 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.	CDM UoF Applicability Statement
Area	Class	compoundAttribute	Area is a <<class>> that represents the extent or measurement of a surface.	SX000i UoF Compound Attributes

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Class name	Type	Stereotype	Definition	UoF
AssociatedEnvironmentDefinition	Class	relationship	AssociatedEnvironmentDefinition is a <<relationship>> that associates an EnvironmentDefinition to an item.	SX000i UoF Environment Definition
AssociatedOperationalScenario	Class	relationship	AssociatedOperationalScenario is a <<relationship>> that associates an OperationalScenario to an Item.	SX000i UoF Operational Scenario Definition
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
AvailableTrainingSite	Class	relationship	AvailableTrainingSite is a <<relationship>> that defines the available TrainingSite(s) for a specific TrainingConceptRevision .	SX000i UoF Training Concept
BaseObject	Class	metaclass	BaseObject is a <<metaclass>> that represents the most elementary behavior that is common to all S-Series classes.	S-Series Base Object Definition
BatchHardwarePart	Class	class	BatchHardwarePart is a <<class>> that represents actual physical parts which can be identified by their batch membership.	SX000i UoF Specializations
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
Budget	Class	class	Budget is a <<class>> representing a cost proposal to perform a specific service or provide a certain item.	SX000i UoF Budget
BudgetingItem	Interface	extend	BudgetingItem is an <<extend>> interface that enables the association of Budgets to specific items.	SX000i UoF Budget
CapabilityDefinition	Class	class	CapabilityDefinition is a <<class>> that defines an ability. Example - 1 month autonomy - Air vehicle accommodation - Air-to-air refuel - Body detection - Deep water exploration - Paratroop launch	CDM UoF Capability Definition

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Class name	Type	Stereotype	Definition	UoF
			- Patient transport - Small-sized ammunition resistance - Unpaved runway landing	
CapabilityDefinitionCharacteristic	Class	class	CapabilityDefinitionCharacteristic is a <<class> that specifies a measurable or observable feature which is significant for the CapabilityDefinition. Example - Provide pressure air up to 100 psi	CDM UoF Capability Definition
CapabilityDefinitionItem	Interface	extend	CapabilityDefinitionItem is an <<extend>> interface that provides its associated data model to those classes that can have an associated CapabilityDefinition.	CDM UoF Capability Definition
CapabilityDefinitionRevision	Class	class	CapabilityDefinitionRevision is a <<class>> representing an iteration applied to a CapabilityDefinition.	CDM UoF Capability Definition
ChangeRequest	Class	class	ChangeRequest is a <<class>> that represents a formal proposal for a modification to a configuration item upon a given baseline.	SX000i UoF Specializations
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).	SX000i UoF Compound Attributes
ClassInstanceAssertItem	Interface	select	ClassInstanceAssertItem is a <<select>> interface that identifies classes from which an instance can be used as the EvaluationByAssertionOfClassInstance assert item	SX000i 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.	SX000i UoF Infrastructure
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.	SX000i UoF Comment

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Class name	Type	Stereotype	Definition	UoF
CommentAction	Class	relationship	CommentAction is a <<relationship>> that allows the association a Comment to one or several Actions performed in response to the Comment .	SX000i 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.	SX000i UoF Comment
CommentParty	Class	relationship	CommentParty is a <<relationship>> defining the association between a Comment and a Party . Example - Comment raised by organization XYZ.	SX000i UoF Comment
CommentRelationship	Class	relationship	CommentRelationship is a <<relationship>> that defines the association between two different Comments .	SX000i 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.	SX000i UoF Infrastructure
CompetenceAssignmentItem	Interface	extend	CompetenceAssignmentItem is an <<extend>> interface that enables the assignment of a competence to an item.	SX000i UoF Person Competences and Labor Rates
CompetenceDefinitionItem	Interface	select	CompetenceDefinitionItem is a <<select>> interface that identifies items which define measurable or observable possession of knowledge and skills.	CDM UoF Competence Definition
CompliesWith	Class	relationship	CompliesWith is a <<relationship>> that associates an item with the PoliciesAndRegulations with which it complies.	SX000i UoF Policies and Regulations
ComputerNetwork	Class	class	ComputerNetwork is an Infrastructure that represents a number of interconnected computers, irrespectively of their location.	SX000i 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.	SX000i UoF Applicability Statement

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Class name	Type	Stereotype	Definition	UoF
ConditionInstance	Class	class	ConditionInstance is a <<class>> that defines an individual concept or object having the characteristics of a generic ConditionType. Example Uniquely identified Service Bulletin	SX000i 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. Example Environmental conditions	SX000i 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.	SX000i UoF Applicability Statement
Contract	Class	class	Contract is a <<class>> that represents a binding agreement between two or more parties Example - leasing contract - procurement contract - service contract - subcontract	SX000i UoF Specializations
ContractClause	Class	class	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.	SX000i UoF Contract Breakdown

Class name	Type	Stereotype	Definition	UoF
ContractClauseRelationship	Class	class	ContractClauseRelationship is a <<relationship>> that associates different ContractClauses .	SX000i UoF Contract Breakdown
ContractDeliverable	Class	class	ContractDeliverable is a <<class>> representing a tangible item that must be provided as a result of a contract.	SX000i UoF Deliverable Items
ContractDeliverableToBeDeliveredTo	Interface	select	ContractDeliverableToBeDeliveredTo is a <<select>> interface that defines where or to whom a ContractDeliverable must be delivered.	SX000i UoF Deliverable Items
ContractingRequirement	Interface	extend	ContractingRequirement is an <<extend>> interface that enables the association of a Requirement to contractual terms.	SX000i UoF Deliverable Items
ContractReference	Interface	select	ContractReference is a <<select>> interface that enables the referencing of a contract or contract clause.	SX000i UoF Contract Breakdown
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.	SX000i UoF Cost Breakdown
CostBreakdownContext	Interface	extend	CostBreakdownContext is an <<extend>> interface that enables the assignment of a CostBreakdown to an item.	SX000i UoF Cost Breakdown
CostBreakdownRelationship	Class	relationship	CostBreakdownRelationship is a <<relationship>> that defines associations between two different CostBreakdown instances.	SX000i UoF Cost Breakdown
CostBreakdownRevision	Class	class	CostBreakdownRevision is an iteration that is applied to a CostItem .	SX000i UoF Cost Breakdown
CostEntry	Class	class	CostEntry is an individual expense made at a specific date for a specific amount that needs to be recorded for accounting purposes.	SX000i UoF Cost Breakdown
CostEntryItem	Interface	select	A CostEntryItem is a <<select>> interface that associates a CostEntry to the item whose cost must be incurred.	SX000i UoF Cost Breakdown

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Class name	Type	Stereotype	Definition	UoF
CostItem	Class	class	CostItem is a <<class>> representing a generic concept to group individual expenses for accounting or program management purposes. Note A same CostItem can be associated to several instances of CostBreakdownRevision.	SX000i UoF Cost Breakdown
CostItemRelationship	Class	relationship	CostItemRelationship is a <<relationship>> that establishes the association between two different instances of CostItems	SX000i UoF Cost Breakdown
Country	Class	class	Country is a self-governing political entity, occupying a particular territory.	CDM UoF Location
CourseDefinition	Class	class	CourseDefinition is a <<class>> defining a combination of course elements with the objective that a trainee will acquire knowledge, skills and attitude to meet performance requirements for a particular aspect of a job or duty.	SX000i UoF Support Elements
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
DataElement	Class	class	DataElement is a <<class>> representing the smallest named item of data that conveys meaningful information or condenses a lengthy description into a short code.	SX000i UoF Data Set Definition
DataItemDescriptionDocument	Interface	extend	DataItemDescriptionDocument is a <<select>> interface that allows to associate one or several instances of DatasetDefinition to a document requiring this data. This type of document is usually referred to as Data Item Description (DID). Note There is a clear distinction between the DatasetDefinition (which is a set of data) and the document requiring it, which can identify further details such as contractual caveats associated to such data set definition(s).	SX000i UoF Data Set Definition

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Class name	Type	Stereotype	Definition	UoF
DatasetDefinition	Class	class	DatasetDefinition is a <<class>> defining a group of data elements that must be provided together, usually as part of a contractual deliverable.	SX000i UoF Data Set Definition
DataSetDefinitionRelationship	Class	relationship	DataSetDefinitionRelationship is a <<relationship>> that associates two different DataSetDefinitions .	SX000i UoF Data Set Definition
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. Note The range pattern can be open-ended.	S-Series Compound Attributes
DateTimeRange	Class	compoundAttribute	DateTimeRange is a <<compoundAttribute>> that identifies an interval of date and times.	S-Series Compound Attributes
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	DigitalFileReferencedItem is a <<select>> interface that identifies an item which in some way is associated with the content of the DigitalFile .	CDM UoF Digital File
DigitalFileReferencingItem	Interface	extend	DigitalFileReferencingItem is an <<extend>> interface that provides its associated data model to those classes that implement it.	CDM UoF Digital File
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.	SX000i UoF Compound Attributes

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Class name	Type	Stereotype	Definition	UoF
			Example - area - volume	
Document	Class	class	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. Example - drawing - manual - report	SX000i UoF Specializations
DocumentCharacteristicItem	Interface	extend	DocumentCharacteristicItem is an <<extend>> interface that provides the capability to associate additional relationships to Documents and DocumentIssues.	SX000i UoF Document
DocumentIssue	Class	class	DocumentIssue is a <<class>> that represents a specific release of a Document	SX000i UoF Specializations
DocumentItem	Interface	select	DocumentItem is a <<select>> interface that identifies items which can be selected as Document.	CDM UoF Document
DocumentParty	Class	relationship	DocumentParty is a <<relationship>> class that defines the association of a document with a specific Party. Example - approved by - prepared by - reported to	SX000i 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

Class name	Type	Stereotype	Definition	UoF
EnvironmentalDefinitionImpact	Class	relationship	EnvironmentalDefinitionImpact is a <<relationship>> defining the expected impact of an EnvironmentDefinitionRevision on an Environment as defined by an EnvironmentDefinition .	SX000i UoF Operational Scenario Definition
EnvironmentDefinition	Class	class	EnvironmentDefinition is a class that represents the environment in which the Product operation or maintenance takes place.	SX000i UoF Environment Definition
EnvironmentDefinitionImpact	Class	relationship	EnvironmentDefinitionImpact is a <<relationship>> defining the impact of an EnvironmentDefinitionRevision on an OperationalScenario .	SX000i UoF Operational Scenario Definition
EnvironmentDefinitionItem	Interface	extend	EnvironmentDefinitionItem is an <<extend>> interface that enables the association of EnvironmentDefinitions to the items implementing such interface.	SX000i UoF Environment Definition
EnvironmentDefinitionRelationship	Class	relationship	EnvironmentDefinitionRelationship is a <<relationship>> that associates two different Environments to be defined.	SX000i UoF Environment Definition
EnvironmentDefinitionRevision	Class	class	EnvironmentDefinitionRevision is a <<class>> representing an iteration applied to an Environment.	SX000i UoF Environment Definition
EnvironmentDefinitionCharacteristic	Class	class	EnvironmentDefinitionCharacteristic is a <<class>> that represents a measurable or observable characteristic for a circumstance, object, event or condition that is significant to the EnvironmentDefinition .	SX000i UoF Environment Definition
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.	SX000i 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	SX000i UoF Applicability Statement

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Class name	Type	Stereotype	Definition	UoF
			to a Boolean expression which can be evaluated to be either TRUE or FALSE.	
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 FALSE.	SX000i UoF Applicability Statement
EvaluationByNestedApplicabilityStatement	Class	class	EvaluationByNestedApplicabilityStatement is an EvaluationCriteria that enables an ApplicabilityStatement to be reused as part of this EvaluationCriteria . Note This class enables the definition of nested applicability statements.	SX000i UoF Applicability Statement
EvaluationByNestedExpression	Class	class	EvaluationByNestedExpression is an EvaluationCriteria that defines a Boolean expression between additional EvaluationCriteria that can be evaluated to either TRUE or FALSE.	SX000i UoF Expression Evaluation
EvaluationCriteria	Class	class	EvaluationCriteria is a <<class>> that defines conditions that can be mapped to a Boolean expression which can be evaluated to be either TRUE or FALSE.	SX000i UoF Applicability Statement
ExpectedProductVariantOperatingBase	Class	relationship	ExpectedProductVariantOperatingBase is a <<relationship>> that defines the OperatingBase (s) where a ProductVariant will operate.	SX000i UoF Operating Base
ExpectedTrainingFacility	Class	relationship	ExpectedTrainingFacility is a <<relationship>> that allows to associate an InstructionalStrategyRevision to the TrainingFacility where the training is expected to take place.	SX000i UoF Training Concept
ExportControlledItem	Interface	select	ExportControlledItem is a <<select>> interface that defines the items that can be subject to export control.	SX000i UoF Export Control License

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Class name	Type	Stereotype	Definition	UoF
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 .	SX000i 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.	SX000i 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.	SX000i 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.	SX000i UoF Export Control Requirement
ExportControlRequirementAppliedToCountry	Class	relationship	ExportControlRequirementAppliedToCountry is a <<relationship>> that defines to which countries an ExportControlRegulation is applied.	SX000i UoF Export Control Requirement
ExpressionEvaluation	Class	class	ExpressionEvaluation is a Boolean expression that can be evaluated to be either TRUE or FALSE.	SX000i UoF Expression Evaluation
ExternalDocument	Class	class	ExternalDocument is a specialization of class Document , and represents all documents that do not have a specialized class.	SX000i UoF Document
Facility	Class	class	Facility is a <<class>>that represents a physically limited infrastructure which exists, or is intended to be built or installed, and is established to serve a particular purpose.	SX000i UoF Specializations
FacilityEquipment	Class	relationship	FacilityEquipment is a <<relationship>> allowing the definition of the equipment that a Facility has is planned to have at a specific period of time.	SX000i UoF Facility
FacilityLocation	Class	relationship	FacilityLocation is a <<relationship>> that defines the past, present or future Location for the Facility .	CDM UoF Facility

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Class name	Type	Stereotype	Definition	UoF
FacilityOperator	Class	relationship	FacilityOperator is a <<relationship>> that identifies the party responsible for running the Facility Example The FacilityOperator has leased the Facility from the FacilityOwner.	SX000i UoF 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.	SX000i UoF Facility
FacilityRelationship	Class	relationship	FacilityRelationship is a <<relationship>> where one Facility relates to another Facility.	CDM UoF Facility
Fleet	Class	class	Fleet is a <<class>> representing 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. Example - 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	SX000i UoF Fleet Definition

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Class name	Type	Stereotype	Definition	UoF
			– warships of several countries performing joint exercises	
FleetBasedAt	Class	relationship	FleetBasedAt is a <<relationship>> that indicates the location at which as Fleet is based at a specific point in time.	SX000i UoF Fleet Environment
FleetDefinition	Class	class	FleetDefinition is a <<class>> representing a planned group of SerializedProductVariants that will operate together as a Fleet . Note It is possible to have a mixed fleet with multiple product variants from multiple Products.	SX000i UoF Fleet Definition
FleetEnvironmentItem	Interface	extend	FleetEnvironmentItem an <<extend>> interface that provides its associated data model to those classes that implement it.	SX000i UoF Fleet Definition
FleetItem	Interface	select	FleetItem is a <<select>> interface that identifies items which can be selected to identify a Fleet .	SX000i UoF Fleet Definition
FleetManager	Interface	extend	FleetManager is an <<extend>> interface that enables the assignment of capabilities to the OperatorOrganization or OperatorPerson that manages a Fleet .	SX000i UoF Fleet Environment
FleetOperatedBy	Class	relationship	FleetOperatedBy is <<relationship>> that assigns an Operator to a Fleet during a specific period of time.	SX000i UoF Fleet Environment
FleetOperatesAtLocation	Class	relationship	FleetOperatesAtLocation is a <<relationship>> that indicates the location at which as Fleet operates at a specific point in time.	SX000i UoF Fleet Environment
FleetOperator	Interface	select	FleetOperator is a <<select>> interface that enables the identification of the operator of a Fleet .	SX000i UoF Fleet Environment
FleetRelationship	Class	relationship	FleetRelationship is a <<relationship>> that indicates how two Fleets are related with each other.	SX000i UoF Fleet Environment
GeographicalArea	Class	class	GeographicalArea is a <<class>> that represents a particular extent of space.	CDM UoF Location

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Class name	Type	Stereotype	Definition	UoF
GlobalPosition	Class	class	GlobalPosition is a <<class>> that identifies a point in space by a set of coordinates.	CDM UoF Location
HardwarePartAsDesigned	Class	class	HardwarePartAsDesigned is a PartAsDesigned that will be realized as physical items, including non-countable material. Note Examples of non-countable materials are: oil, sealant, paint.	CDM UoF Part Definition
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. Note An infrastructure can be located across many different locations or can even be mobile. Example - airport - bus service - railroad - roads - set of buildings	SX000i UoF Infrastructure
InfrastructureAvailable	Class	relationship	InfrastructureAvailable is a <<relationship>> that provides the capability of associating an Infrastructure to items that can use it.	SX000i UoF Infrastructure Availability
InfrastructureAvailableItem	Interface	extend	InfrastructureAvailableItem is an <<extend>> interface that enables the definition of infrastructure items that are available for infrastructure requiring items.	SX000i UoF Infrastructure Availability
InfrastructureCompliance	Class	relationship	InfrastructureCompliance is a <<relationship>> 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

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Class name	Type	Stereotype	Definition	UoF
InfrastructureItem	Interface	extend	InfrastructureItem is an <<extend>> interface that enables the association of additional capabilities to items that can belong to an Infrastructure .	SX000i UoF Infrastructure
InfrastructureNode	Interface	select	InfrastructureNode is a <<class>> representing one item that forms part of an Infrastructure .	SX000i UoF Infrastructure
InfrastructureNodeAtLocation	Class	relationship	InfrastructureNodeAtLocation is a <<relationship>> that defines the Location at which an InfrastructureNode is located.	SX000i UoF Infrastructure
InfrastructureParty	Class	relationship	InfrastructureParty is a <<relationship>> that associates a Party to an Infrastructure .	SX000i UoF Infrastructure
InfrastructureRelationship	Class	relationship	InfrastructureRelationship is a <<relationship>> that defines how two Infrastructures are related with each other.	SX000i UoF Infrastructure
InfrastructureRequiringItem	Interface	select	InfrastructureRequiringItem is a <<select>> interface that defines items requiring an Infrastructure .	SX000i UoF Infrastructure Availability
InfrastructureRevision	Class	class	InfrastructureRevision is a <<class>> representing an iteration applied to an Infrastructure .	SX000i UoF Infrastructure
InstructionalStrategy	Class	class	InstructionalStrategy is a <<class>> representing techniques used to support the acquisition of new knowledge, skills and attitudes.	SX000i UoF Training Concept
InstructionalStrategyRevision	Class	class	InstructionalStrategyRevision is a <<class>> representing an iteration applied to an instructional strategy.	SX000i UoF Training Concept
IPSConcept	Class	class	IPSConcept is a <<class>> representing the definition of an Integrated Product Support (IPS) concept.	SX000i UoF IPS Concept Definition
IPSConceptRelationship	Class	relationship	IPSConceptRelationship is a <<relationship>> that associates two different instances of IPSConcept	SX000i UoF IPS Concept Definition

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Class name	Type	Stereotype	Definition	UoF
IPSConceptRequiringItem	Interface	extend	IPSConceptRequiringItem is an <<extend>> interface that enables the association of IPS concepts to one or more items requiring IPS.	SX000i UoF Supported Item
IPSConceptRevision	Class	class	IPSConceptRevision is a <<class>> representing an iteration applied to an IPSConcept .	SX000i UoF IPS Concept Definition
IPSConceptRevisionRequirement	Class	relationship	IPSConceptRevisionRequirement is a <<relationship>> that defines a Requirement that is required in order to enable an IPSConceptRevision .	SX000i UoF IPS Concept Definition
IPSContent	Class	exchange	IPSContent is an <<exchange>> that represents a data set allowing to send all SX000i information.	SX000i UoF Message
ITArchitectureNode	Class	class	ITArchitectureNode is a <<class>> representing a functional or physical block in the information technology ITConceptRevision architecture.	SX000i UoF IT Concept
ITArchitectureNodeRelationship	Class	relationship	ITArchitectureNodeRelationship is a <<relationship>> that associates two different instances of ITArchitectureNode .	SX000i UoF IT Concept
ITConcept	Class	class	ITConcept is a specialized IPSConcept intended to describe how the IT will be set up as part of the overall support.	SX000i UoF IT Concept
ITConceptRevision	Class	class	ITConceptRevision is a <<class>> representing an iteration applied to the definition of an ITConcept .	SX000i UoF IT Concept
ItemExportControlRegulation	Class	relationship	ItemExportControlRegulation is a <<relationship>> that associates an ItemUnderExportControl with the ExportControlRegulation that governs its export,	SX000i UoF Export Control Requirement
ItemPlanning	Class	class	ItemPlanning is a <<class>> that represents the planned schedule of an item.	SX000i UoF Planning
ItemUnderExportControl	Interface	extend	ItemUnderExportControl is an <<extend>> interface that enables to define which items are subject to export control rules.	SX000i UoF Export Control Requirement

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Class name	Type	Stereotype	Definition	UoF
ITInfrastructure	Interface	select	ITInfrastructure is an Infrastructure designed for Information Technology (IT) purposes.	SX000i UoF IT Concept
LaborRateItem	Interface	select	LaborRateItem is a <<select>> interface that enables the association of a labor rate to a skilled labor.	SX000i UoF Person Competences and Labor Rates
LaborRates	Class	relationship	LaborRates is a <<relationship>> that assigns labor rates to different skills, skill levels and trades.	SX000i 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
Limitation	Class	class	Limitation is the definition of a reduced capability or restriction that applies to an item.	SX000i UoF Limitation
LimitedItem	Interface	extend	LimitedItem is a <<select>> interface representing the items that can have one or more Limitations associated to them.	SX000i UoF Limitation
Location	Interface	extend	Location is an <<extend>> interface that provides its associated data model to those classes that implement it.	CDM UoF Location
LocationDefinition	Class	class	LocationDefinition is a <<class>> that defines a particular place or position.	SX000i UoF Location Definition
LocationDefinitionRevision	Class	class	LocationDefinitionRevision is a <<class>> representing an iteration applied to a LocationDefinition.	SX000i UoF Location Definition
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
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.	SX000i UoF Applicability Statement

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Class name	Type	Stereotype	Definition	UoF
LogicalNOT	Class	class	LogicalNOT is an EvaluationCriteria that defines a Boolean operation where the result from its associated EvaluationCriteria must be FALSE for the result to be TRUE, otherwise the result is FALSE.	SX000i 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.	SX000i 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.	SX000i UoF Applicability Statement
MaintenanceConcept	Class	class	MaintenanceConcept is a specialized IPSConcept intended to describe how maintenance will be set up and performed as part of the overall support.	SX000i UoF Maintenance Concept
MaintenanceConceptRevision	Class	class	MaintenanceConceptRevision is a <<class>> representing an iteration applied to a MaintenanceConcept .	SX000i UoF Maintenance Concept
MaintenanceConceptSite	Class	relationship	MaintenanceConceptSite is a <<relationship>> that defines the facilities where maintenance is going to be carried out as part of a MaintenanceConceptRevision .	SX000i UoF Maintenance Concept
MaintenanceFacility	Class	class	MaintenanceFacility is a Facility that is mainly established to carry out Product maintenance.	SX000i UoF Specializations
MaintenanceFacilityLevel	Class	relationship	MaintenanceFacilityLevel is a <<relationship>> that associates a MaintenanceLevel to a MaintenanceFacility	SX000i UoF Maintenance Concept
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

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Class name	Type	Stereotype	Definition	UoF
			Note MaintenanceLevel can be established either by a single organization or be distributed between a set of organizations.	
ManagedFleet	Class	relationship	ManagedFleet is a <<relationship>> that associates a FleetManager to the Fleet that it manages during a specific period of time.	SX000i UoF Fleet Environment
Meeting	Class	class	Meeting is a class representing a formal encounter taking place to address a common purpose.	SX000i UoF Meeting
MeetingAgreement	Class	class	MeetingAgreement is a formal decision taken during a Meeting .	SX000i UoF Meeting
MeetingAttendees	Class	relationship	MeetingAttendees is a <<relationship>> that documents the Parties that attended a Meeting .	SX000i UoF Meeting
MeetingContext	Class	relationship	MeetingContext is a <<select>> interface that identifies items which can be selected as the context for a Meeting .	SX000i UoF Meeting
MeetingContextItem	Interface	select	MeetingContextItem is a <<select>> interface that enables the definition of the context of a Meeting .	SX000i UoF Meeting
MeetingRelationship	Class	relationship	MeetingRelationship is a <<relationship>> that defines the associations that exist between different Meetings .	SX000i UoF Meeting
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 a <<exchange>> definition that represents the collection of information that is the subject 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. Example - Contract	CDM UoF Message

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Class name	Type	Stereotype	Definition	UoF
			- Product - Project	
MessageContextItem	Interface	select	MessageContextItem is a <<select>> interface that identifies items which can be selected as the context for a Message .	CDM UoF Message
MessageParty	Class	relationship	MessageParty is a <<relationship>> between a Message and a stakeholder for the Message .	CDM UoF Message
MessagePartyItem	Interface	select	MessagePartyItem is a <<select>> interface that identifies items which can be selected as the party for a Message .	CDM UoF Message
MessageRelationship	Class	relationship	MessageRelationship is a <<relationship>> where one Message relates to another Message. Example - One Message is a reply to another Message - One Message is an update to another Message	CDM UoF Message
Milestone	Class	class	Milestone is a situation at a specific moment in time when a certain objective is achieved.	SX000i UoF Project Milestones
MilestoneAssessment	Class	relationship	MilestoneAssessment is a <<relationship>> that documents the assessment that was performed to confirm achievement of a Milestone .	SX000i UoF Project Milestones
MissionDefinition	Class	class	MissionDefinition is a <<class>> that represents the defining information for a Product operational scenario. Example - Long haul flight - Search and rescue - Troop transport	CDM UoF Mission Definition
MissionDefinitionItem	Interface	extend	MissionDefinitionItem is an <<extend>> interface that provides its associated data model to those classes that implement it.	CDM UoF Mission Definition

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Class name	Type	Stereotype	Definition	UoF
MissionDefinitionParty	Class	relationship	MissionDefinitionParty is a <<relationship>> that establishes an association between a MissionDefinition and a MissionDefinitionPartyItem .	CDM UoF Mission Definition
MissionDefinitionPartyItem	Interface	select	MissionDefinitionPartyItem is a <<select>> interface that identifies parties which can be associated with a MissionDefinition .	CDM UoF Mission Definition
MissionDefinitionRelationship	Class	relationship	MissionDefinitionRelationship is a <<relationship>> where one MissionDefinition relates to another MissionDefinition. Note Mission definition relationship can be used to represent the relationship between an overarching mission definition and sub-mission definitions. Example – Helicopter search and rescue sub-mission definitions for search, locate and rescue, respectively. – Perform long haul flight sub-mission definitions for – Take-off, inflight and land, respectively.	CDM UoF Mission Definition
MissionDefinitionRequirement	Class	relationship	MissionDefinitionRequirement is a <<relationship>> that associates Requirements to a MissionDefinitionRevision .	SX000i UoF Mission Definition
MissionDefinitionRevision	Class	class	MissionDefinitionRevision is a <<class>> representing an iteration applied to a MissionDefinition .	CDM UoF Mission Definition
MissionDefinitionRevisionLocation	Class	relationship	MissionDefinitionRevisionLocation is a <<relationship>> allowing to associate a MissionDefinitionRevision to the location when it is performed.	SX000i UoF Mission Definition
MRONetwork	Class	class	MRONetwork is an Infrastructure consisting of Maintenance, Repair and Overhaul (MRO) facilities. Note The different facilities do not need to be in a same location, but can be spread world-wide.	SX000i UoF Infrastructure

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Class name	Type	Stereotype	Definition	UoF
			Example - aircraft overhaul center - equipment repair shop - shipyard	
NecessaryInfrastructure	Class	relationship	NecessaryInfrastructure is a <<relationship>> that defines the infrastructure that is required to fulfill a specific Requirement.	SX000i UoF Project Requirements
OperatingBase	Class	class	OperatingBase is a permanent or semi-permanent Facility that is mainly established for providing support for operations. Example - airfield - garage - harbor	SX000i 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. Example - 2 buses - 8 cars	SX000i UoF Operating Base
OperatingLocation	Interface	select	OperatingLocation is a <<select>> interface that allows the selection of the locations where a Product can operate.	SX000i UoF Operating Location
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
OperationalConcept	Class	class	OperationalConcept is a specialized IPSConcept intended to describe how the Product operation will be set up and performed as part of the overall IPS concept.	SX000i UoF Operational Concept
OperationalConceptRevision	Class	class	OperationalConceptRevision is a <<class>> representing an iteration applied to an OperationalConcept.	SX000i UoF Operational Concept

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Class name	Type	Stereotype	Definition	UoF
OperationalConceptScenario	Class	relationship	OperationalConceptScenario is a <<relationship>> that associates operational scenarios to an OperationalConceptRevision .	SX000i UoF Operational Concept
OperationalConceptSites	Class	relationship	OperationalConceptSites is a <<relationship>> that defines the sites where operation is going to be carried out during a specific period of time.	SX000i UoF Operational Concept
OperationalItem	Interface	extend	OperationalItem is an <<extend>> interface that provides its associated data model to those classes that implement it.	SX000i UoF Operator
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.	SX000i UoF Operational Roles
OperationalRoleMission	Class	relationship	OperationalRoleMission is a <<relationship>> that defines the Missions that an OperationalRole can perform.	SX000i UoF Mission Definition
OperationalScenario	Class	class	OperationalScenario represents the defining information of a period during which an item operates as planned.	SX000i UoF Operational Scenario Definition
OperationalScenarioItem	Interface	extend	OperationalScenarioItem is an <<exchange>> interface representing items that can have operational scenarios associated to them.	SX000i UoF Operational Scenario Definition
OperationalScenarioRevision	Class	class	OperationalScenarioRevision is a <<class>> representing an iteration applied to the definition of an OperationalScenario .	SX000i UoF Operational Scenario Definition
OperationalScenarioRevisionMission	Class	relationship	OperationalScenarioRevisionMission is a <<relationship>> that associates a MissionDefinition to an OperationalScenario .	SX000i UoF Operational Scenario Definition
OperationsApprovalItem	Interface	select	OperationsApprovalItem is a <<select>> interface representing an item for which an operational approval has been provided.	SX000i UoF Operator
Operator	Interface	select	Operator is a <<select>> interface that represents the entities that operate one or several SerializedProductVariants .	SX000i UoF Operator

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Class name	Type	Stereotype	Definition	UoF
OperatorOrganization	Class	class	OperatorOrganization is an Organization that operates one or several SerializedProductVariants .	SX000i UoF Operator
OperatorPerson	Class	class	OperatorPerson is a Person that operates one or several product variants. Example - drone pilot - truck driver	SX000i UoF Operator
Organization	Class	class	Organization is a <<class>> that represents an administrative structure with a particular purpose belonging to a legal entity. Example - company - Government department - International agency	SX000i UoF Specializations
OrganizationalBreakdownStructure	Interface	extend	OrganizationalBreakdownStructure is an <<extend>> interface that enables the association of an organizational structure to a Project or Contract .	SX000i UoF Organizational Breakdown Structure
OrganizationalBreakdownStructureRevision	Class	class	OrganizationalBreakdownStructureRevision is a <<class>> that represents a specific revision of an organizational breakdown structure.	SX000i 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.	SX000i UoF Organizational Breakdown Structure
OrganizationLocation	Class	relationship	OrganizationLocation is a <<relationship>> that defines the Location where an Organization is based.	SX000i UoF Organization Location
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.	SX000i UoF Operator

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Class name	Type	Stereotype	Definition	UoF
			Example – Municipal authorization to operate a bus line.	
OtherFacility	Class	class	OtherFacility is a generic Facility that has no specific classification.	SX000i UoF Facility
PartAsDesigned	Class	class	PartAsDesigned is a <<class>> that represents the definitional information for an artifact fulfilling a set of requirements, which can be produced or realized.	CDM UoF Part Definition
Party	Interface	select	Party is a <<select>> interface representing an entity that is capable of signing a contract or carrying out actions by itself without being instructed to do so. Example – organization – person	SX000i UoF Party
PartyAddress	Class	relationship	PartyAddress is a <<relationship>> that defines the association between a Party and an Address.	SX000i UoF Party
PartyContactData	Class	attributeGroup	PartyContactData is an <<attributeGroup>> that provides the contact details for a Party.	SX000i UoF Party
PartyItem	Interface	extend	PartyItem is an <<extend>> interface that enables the association of additional capabilities to Organizations and Persons.	SX000i UoF Party
PartyRelationship	Class	relationship	PartyRelationship is a <<relationship>> existing between two parties (organizations or people).	SX000i UoF Party
PartySecurityAssignment	Class	relationship	PartySecurityAssignment is a <<relationship>> that establishes the security clearance of a Party during a certain period of time.	SX000i UoF Security Classification
PerformanceParameter	Class	class	PerformanceParameter is a <<class>> that represents a metric that if changed, or not fulfilled, can have a major impact on the performance, schedule, cost and/or risk for the PerformanceParameterItem.	CDM UoF Performance Parameter

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Class name	Type	Stereotype	Definition	UoF
PerformanceParameterItem	Interface	extend	PerformanceParameterItem is an <<extend>> interface that provides its associated data model to those classes that can have an associated PerformanceParameter .	CDM UoF Performance Parameter
PerformanceParameterRevision	Class	class	PerformanceParameterRevision is a <<class>> that represents an iteration applied to a PerformanceParameter .	CDM UoF Performance Parameter
PerformanceParameterValueGroup	Class	attributeGroup	PerformanceParameterValueGroup is an <<attributeGroup>> that organizes PerformanceParameter values according to a defined purpose.	CDM UoF Performance Parameter
Person	Class	class	Person is a living human being.	SX000i UoF Party
PersonCompetence	Class	relationship	PersonCompetence is a <<relationship>> that defines the competences that a Person has acquired.	SX000i UoF Person Competences and Labor Rates
PersonGroup	Class	relationship	PersonGroup is a <<relationship>> that associates a Person to different types of persons.	SX000i 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. Example - driver's license - mariner license - pilot type certificate	SX000i UoF Operator
PlannedItem	Interface	extend	PlannedItem is a <<extend>> interface that represents an item for which a planning is made.	SX000i UoF Planning
PlannedProductVariantOperator	Class	relationship	PlannedProductVariantOperator is a <<relationship>> that documents the Operator (s) that are planned to operate a specific Product or ProductVariant .	SX000i UoF Operator

Class name	Type	Stereotype	Definition	UoF
PoliciesAndRegulations	Class	class	PoliciesAndRegulations is a Document that defines mandatory practices for a Project , Product , Contract , Service or major item requiring specific guidelines.	SX000i UoF Policies and Regulations
PoliciesAndRegulationsCompliantItem	Interface	extend	PoliciesAndRegulationsCompliantItem is an <<extend>> interface that enables the association of an item to the PoliciesAndRegulations with which it complies	SX000i UoF Policies and Regulations
Pool	Class	class	Pool is a set of parts that are managed as a functional group and that is shared by different Parties.	SX000i UoF Provisioning Concept
Port	Class	class	Port is an infrastructure used for the docking of ships.	SX000i UoF Infrastructure
PowerGrid	Class	class	PowerGrid is an Infrastructure used to generate, transport and distribute power.	SX000i UoF Infrastructure
Product	Class	class	Product is <<class>> that represents a family of items which share the same underlying design purpose. Example - Aegis Class Destroyer - Airbus A340 - Ford Fusion - iPhone 7 - Pegasus engine - Stryker	SX000i UoF Specializations
ProductUsagePhase	Class	class	ProductUsagePhase is a <<class>> that represents a distinct period of time during which a ProductUsagePhaseItem is in an operational state which has specific characteristics that need special considerations. Example - Emersion, surface and dock for a submarine. - Preflight, post-flight, cruise, taxiing for an aircraft.	CDM UoF Product Usage Phase
ProductUsagePhaseItem	Interface	extend	ProductUsagePhaseItem is an <<extend>> interface that provides its associated data model to those classes that implement it.	CDM UoF Product Usage Phase

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Class name	Type	Stereotype	Definition	UoF
ProductUsagePhaseRelationship	Class	relationship	ProductUsagePhaseRelationship is a <<relationship>> where one ProductUsagePhase relates to another ProductUsagePhase .	CDM UoF Product Usage Phase
ProductVariant	Class	class	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. Example - Boeing 787-800 versus 787-900 - Ford Fusion S versus SE versus SEL	SX000i UoF Specializations
ProductVariantInFleet	Class	relationship	ProductVariantInFleet is a <<relationship>> that defines the product variants that are expected to be associated to a FleetDefinition .	SX000i UoF Fleet Definition
Project	Class	class	Project is a <<class>> that represents the overall set of IPS activities defined for a Product. Note Project is often referred to as an IPS program.	SX000i UoF Specializations
ProjectContract	Class	relationship	ProjectContract is a <<relationship>> that establishes an association between a Project and a Contract .	CDM UoF Product and Project
ProjectImpact	Class	relationship	ProjectImpact is a <<relationship>> that associates an item with the Projects that have an impact on it.	SX000i UoF Project
ProjectImpactedItem	Interface	extend	ProjectImpactedItem is an <<extend>> document that enables the association of an item to the projects that affect it.	SX000i UoF Project
ProjectItem	Interface	select	ProjectItem is a <<select>> interface that enables the association of a project to the item(s) to which it is related.	SX000i UoF Project

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Class name	Type	Stereotype	Definition	UoF
ProjectRelationship	Class	relationship	ProjectRelationship is a <<relationship>> that defines an association between two different Projects .	SX000i UoF Project
ProjectRequirement	Class	relationship	ProjectRequirement is a <<relationship>> that associates a Requirement to a Project .	SX000i UoF Project Requirements
ProjectSpecificAttribute	Class	class	ProjectSpecificAttribute is a <<class>> that allows for the definition of an attribute that is specific to a Project .	S-Series Base Object Definition
ProjectSpecificAttributeValue	Interface	select	ProjectSpecificAttributeValue is a <<select>> interface that allows to associate an attribute type to a ProjectSpecificAttribute .	S-Series Base Object Definition
ProjectSpecificExtensionItem	Interface	extend	ProjectSpecificExtensionItem is an <<extend>> interface that allows to associate one or several ProjectSpecificAttributes to any <<class>>.	S-Series Base Object Definition
ProvisioningConcept	Class	class	ProvisioningConcept is a specialized IPSConcept intended to describe how the provisioning will be performed in the context of a global IPSConcept .	SX000i UoF Provisioning Concept
ProvisioningConceptRevision	Class	class	ProvisioningConceptRevision is a <<class>> representing an iteration applied to a ProvisioningConcept .	SX000i UoF Provisioning Concept
ProvisioningConceptSource	Class	relationship	ProvisioningConceptSource is a <<relationship>> that associates a ProvisioningConceptRevision with a provisioning source.	SX000i UoF Provisioning Concept
ProvisioningSource	Interface	select	ProvisioningSource is a <<select>> interface that enables the definition of the sources from which items can be ordered.	SX000i UoF Provisioning Concept
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.	SX000i UoF Compound Attributes

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Class name	Type	Stereotype	Definition	UoF
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
Remark	Class	attributeGroup	Remark is an <<attributeGroup>> that provides additional information about the associated item. Note A remark can be a personal opinion ("I prefer more onions in my soup") or it can be a technical fact ("The manufacturer recommends heating the soup to 45 degrees").	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. 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. Example - cost report - progress report - technical report	SX000i UoF Report
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. Example - maintenance action	SX000i UoF Reportable Activity
ReportableItem	Interface	select	ReportableItem is a <<select>> interface representing everything that is worth reporting.	SX000i UoF Report

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Class name	Type	Stereotype	Definition	UoF
			Example - incurred cost - maintenance activity - operational event	
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.	SX000i UoF Reportable Metric
ReportableMetricItem	Interface	extend	ReportableMetricItem is an <<extend>> interface that enables the assignment of instances of ReportableMetric to different items.	SX000i UoF Reportable Metric
ReportContext	Class	relationship	ReportContext is a <<relationship>> that associates a Report to its context.	SX000i UoF Report
ReportContextItem	Interface	select	ReportContextItem is a <<select>> interface that allows to indicate on which items a Report provides information.	SX000i UoF Report
ReportParty	Class	relationship	ReportParty is a <<relationship>> that associates a Report to a Party.	SX000i UoF Report
RequiredCapability	Class	relationship	RequiredCapability is a <<relationship>> that associates one or several required capabilities to a requirement.	SX000i UoF Requirement
RequiredInfrastructureNodeDeployment	Class	relationship	RequiredInfrastructureNodeDeployment is a <<relationship>> that associates an Infrastructure node to the location where it must be deployed.	SX000i UoF IPS Concept Definition
Requirement	Class	class	Requirement is a documented need that must be implemented.	SX000i UoF Requirement
RequirementParty	Class	relationship	RequirementParty is a <<relationship>> that associates a Requirement with a Party.	SX000i UoF Requirement
RequirementRelationship	Class	relationship	RequirementRelationship is a <<relationship>> that defines the association between two Requirements.	SX000i UoF Requirement

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Class name	Type	Stereotype	Definition	UoF
RequirementTarget	Class	relationship	RequirementTarget is a <<relationship that associates a Requirement with the item to which the Requirement applies.	SX000i UoF Requirement
RequirementTargetItem	Interface	select	RequirementTargetItem is a <<select>> interface that enables the selection of the item to which a Requirement applies.	SX000i UoF Requirement
ResourceRealization	Class	relationship	ResourceRealization is a <<relationship>> where a ResourceSpecification relates to an instance of PartAsDesigned that fulfills the resource specification.	CDM UoF Resource Specification
ResourceSpecification	Class	class	ResourceSpecification is a <<class>> that defines a resource by its characteristics. Note Resource specification allows for more generic resource definitions ie, a task/subtask does not need to be changed due to eg, customer specific resource preferences.	CDM UoF Resource Specification
ResourceSpecificationRevision	Class	class	ResourceSpecificationRevision is a <<class>> representing an iteration applied to a ResourceSpecification .	CDM UoF Resource Specification
Risk	Class	class	Risk is a potential happening or event that implies delay, cost overrun or non-compliance with technical requirements.	SX000i UoF Risk Management
RiskContextItem	Interface	extend	RiskContextItem is an <<extend>> interface that enables the definition of the context in which a Risk is identified.	SX000i UoF Risk Management
RiskMitigationPlan	Class	class	RiskMitigationPlan is a set of Actions defined in advance to as to reduce the impact or likelihood of an expected Risk .	SX000i UoF Risk Management
RiskMitigationPlanActions	Class	relationship	RiskMitigationPlanActions is a <<relationship>> that associates Actions to a RiskMitigationPlan .	SX000i UoF Risk Management
RiskRelationship	Class	relationship	RiskRelationship is a <<relationship>> that associates two different Risks .	SX000i UoF Risk Management

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Class name	Type	Stereotype	Definition	UoF
RiskStatus	Class	attributeGroup	RiskStatus is an <<attributeGroup>> representing the status of a Risk at a specific moment in time.	SX000i UoF Risk Management
RoleCapabilityDefinition	Class	relationship	RoleCapabilityDefinition is a <<relationship>> that defines which Product capabilities are provided by a specific OperationalRole .	SX000i UoF Operational Roles
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
S1000DPublicationModuleIssue	Class	class	S1000DPublicationModuleIssue is a DocumentIssue that identifies a specific issue of a publication module published in accordance with S1000D.	CDM UoF Document
SecurityAssignmentParty	Interface	extend	SecurityAssignmentParty is an <<extend>> interface that enables the assignment of Security clearances to specific Parties.	SX000i 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
SerializedAssertItem	Interface	select	SerializedAssertItem is a <<select>> interface that identifies classes from which an instance can be used as the EvaluationByAssertionOfSerializedItems assert item	SX000i UoF Applicability Statement

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Class name	Type	Stereotype	Definition	UoF
SerializedHardwarePart	Class	class	SerializedHardwarePart is <<class>> that represent an actual physical part which can be identified as an individual. 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. Note A SerializedHardwarePart can evolve due to modifications. The actual build standard at a given moment is defined through the relationship SerializedPartDesignAssociation.	SX000i UoF Specializations
SerializedProductVariant	Class	class	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.	SX000i UoF Specializations
SerializedProductVariantInFleet	Class	relationship	SerializedProductVariantInFleet is a <<relationship>> that defines the association between a SerializedProductVariant and the Fleet to which it belongs.	SX000i 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.	SX000i UoF Operating Base
SerializedProductVariantOperator	Class	relationship	SerializedProductVariantOperator is a <<relationship>> defining the operation of a SerializedProductVariant during a specific period of time.	SX000i UoF Operator
SerialNumberRange	Class	compoundAttribute	SerialNumberRange is a <<compoundAttribute>> that identifies an interval of serialized items.	S-Series Compound Attributes

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Class name	Type	Stereotype	Definition	UoF
			Note The range pattern can be open-ended.	
Service	Class	class	Service is a contract where technical or intellectual work is performed but no delivery of goods takes place.	SX000i UoF Service
ServiceContract	Class	relationship	ServiceContract is a <<relationship>> that allows a service being provided to be associated to a specific contract.	SX000i UoF Service
ServiceLevelAgreementClause	Class	class	ServiceLevelAgreementClause is a contractual clause related to a service that determines the level of service to be provided.	SX000i UoF Service
ServiceRelationship	Class	relationship	ServiceRelationship is a <<relationship>> that associates two Services .	SX000i UoF Service
Skill	Class	class	Skill is a <<class>> that represents human cognitive, psychomotor, and affective abilities.	CDM UoF Competence Definition
SkillLevel	Class	class	SkillLevel is a <<class>> that represents a defined proficiency of a Trade .	CDM UoF Competence Definition
SoftwarePartAsReleased	Class	class	SoftwarePartAsReleased is <<class>> that represents actual build of a software which is delivered.	CDM UoF Part As Realized
Sphere	Class	compoundAttribute	Sphere represents a three-dimensional object where every point on its surface is equidistant from its center.	S-Series Compound Attributes
StaffedBy	Class	relationship	StaffedBy is a <<relationship>> that defines the current or expected number of persons of a specific profile (TypeOfPerson) working on an entity during a specified period of time.	SX000i UoF Staffing
StaffedItem	Interface	select	StaffedItem is a <<select>> interface that represents Items to which staff can be assigned.	SX000i UoF Staffing
Staffing	Class	relationship	Staffing is a <<relationship>> that associates a TypeOfPerson with the Entity that it staffs or will staff.	SX000i UoF Staffing

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Class name	Type	Stereotype	Definition	UoF
StaffingItem	Interface	extend	StaffingItem is an <<extend>> interface that represents all items that can have staff associated to them.	SX000i UoF Staffing
StreetAddress	Class	class	StreetAddress is a <<class> that represents a locatable position along a road.	CDM UoF Location
StudentsToBeTrained	Class	relationship	StudentsToBeTrained is a <<relationships>> that defines the number of students to be trained for a specific TypeOfPerson in the context of a TrainingConceptRevision.	SX000i UoF Training Concept
SubjectOfPoliciesAndRegulations	Interface	select	SubjectOfPoliciesAndRegulations is a <<select>> interface that enables the association of policies and regulations to the items to which they apply.	SX000i UoF Policies and Regulations
SupplyProvision	Class	relationship	SupplyProvision is a <<relationship>> that defines which supply source supplies a required item to the entity requiring it.	SX000i UoF Provisioning Concept
SupplyRequiringItem	Interface	select	SupplyRequiringItem is a <<select>> interface that enables the definition of the items that can require the physical delivery of a supply.	SX000i UoF Provisioning Concept
SupplySource	Interface	extend	SupplySource is an <<extend>>interface that enables the definition of the management or items requiring supplies by the provisioning sources that can actually perform the physical supply.	SX000i UoF Provisioning Concept
SupplySourceManagement	Class	relationship	SupplySourceManagement is a <<relationship>> that defines the Organization that is managing or is planned to manage a supply source.	SX000i UoF Provisioning Concept
SupportElementItem	Interface	select	SupportElementItem is a <<select>> interface that represents an item required to support a Product.	SX000i UoF Support Elements
ThreeDimensional	Class	compoundAttribute	ThreeDimensional is a <<compoundAttribute>> that represents spatial magnitudes.	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

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Class name	Type	Stereotype	Definition	UoF
Trade	Class	class	Trade is a <<class>> that represents a craft or profession which requires specific skills.	CDM UoF Competence Definition
TrainingConcept	Class	class	TrainingConcept is a specialized IPSConcept intended to describe how the training will be performed in the context of a global IPSConcept .	SX000i UoF Training Concept
TrainingConceptRevision	Class	class	TrainingConceptRevision is a <<class>> representing an iteration applied to a TrainingConcept	SX000i UoF Training Concept
TrainingFacility	Class	class	TrainingFacility is a Facility that is mainly used to provide training. Example - Full-flight simulator building - Training center	SX000i UoF Facility
TransportNetwork	Class	class	TransportNetwork is an Infrastructure used to transport items. Example - Airline - Railroad	SX000i UoF Infrastructure
Triangle	Class	compoundAttribute	Triangle is a <<class>> representing a geometrical plane figure with three straight sides and three angles.	SX000i UoF 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 . 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. Example - class 3 welder - electronics engineer - helicopter pilot	SX000i UoF Type of Person

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Class name	Type	Stereotype	Definition	UoF
			- mechanical technician - paratrooper - truck driver	
Warehouse	Class	class	Warehouse is a Facility used to store parts.	SX000i UoF Facility
WorkBreakdown	Class	class	WorkBreakdown is a class used to group all the different activities associated to a particular purpose.	SX000i UoF Work Breakdown
WorkBreakdownContext	Interface	extend	WorkBreakdownContext is an <<extend>> interface that enables the association of different instances of WorkBreakdown to individual items.	SX000i UoF Work Breakdown
WorkBreakdownRelationship	Class	relationship	WorkBreakdownRelationship is a <<relationship>> that associates different instances of WorkBreakdown .	SX000i UoF Work Breakdown
WorkBreakdownRevision	Class	class	WorkBreakdownRevision is an iteration that is applied to a WorkBreakdown .	SX000i UoF Work Breakdown
WorkItem	Class	class	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 instances of WorkBreakdownRevision.	SX000i UoF Work Breakdown
WorkItemRelationship	Class	relationship	WorkItemRelationship is a <<relationship>> that associates two instances of WorkItem. It enables the definition of both hierarchical associations and time-dependent associations. For hierarchical associations, it defines the parent-child relationship	SX000i UoF Work Breakdown

3 Data element list

The full list of SX000i data elements is provided in [Table 3](#). This includes data elements from SX002D used by SX000i but defined in SX001G.

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[Table 3](#) is organized alphabetically by the data element name, and contains:

- Data element name
- Data element data type (refer to [Chap 8](#) on more details on data types used in SX000i)
- Data element definition contains a textual definition.
- Class name identifies the classes in the SX000i data model where the data element is used as an attribute ([Chap 8](#)).
- Unit of Functionality (UoF), identifies the section in [Chap 8](#) 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 8](#).

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	SX000i Action tracking
actionContextType	ClassificationType	actionContextType is a <<classification>> that determines the type of context that is associated to an action.	ActionContext	SX000i Action tracking
actionCreationDate	DateType	actionCreationDate is the date at which the action is created.	Action	SX000i Action tracking
actionDescription	DescriptorType	actionDescription is a textual description of a taken action.	Action	SX000i Action tracking
actionIdentifier	IdentifierType	actionIdentifier is a string of characters used to uniquely identify an Action and to differentiate it from other Action instances.	Action	SX000i Action tracking
actionPriority	ClassificationType	actionPriority is a <<classification>> that determines the urgency of an action.	Action	SX000i Action tracking
actionRelationshipType	ClassificationType	actionRelationshipType is a <<classification>> that allows to defined the type of relationship that exists between different Actions.	ActionRelationship	SX000i Action tracking
actionScheduledDate	DateType	actionScheduledDate is the date for which the action is scheduled.	Action	SX000i Action tracking

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Attribute Name	Type	Definition	Class Name	UoF
actionType	ClassificationType	actionType is a <<classification>> that characterizes an Action .	Action	SX000i Action tracking
actualContractDeliveryDate	DateType	actualContractDeliveryDate is the date at which the actual contract delivery took place.	ActualContractualDelivery	SX000i Deliverable Items
actualContractDeliveryDateStatus	StateType	actualContractDeliveryDateStatus is the state at which a ContractDeliverable that was provided at a specific date is at a specific moment in time.	ActualContractualDelivery	SX000i Deliverable Items
actualContractDeliveryDateStatusRationale	DescriptorType	actualContractDeliveryDateStatusRationale is a narrative statement describing the reason for the actualContractDeliveryDateStatus.	ActualContractualDelivery	SX000i Deliverable Items
additionalAddressInformation	DescriptorType	additionalAddressInformation is a description that provides additional information to further locate an address.	StreetAddress	CDM Location
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
allowedRoleChangeDuration	NumericalPropertyType	allowedRoleChangeDuration is the time that it takes to change from one specific OperationalRole to a different associated OperationalRole .	AllowedRoleChange	SX000i Operational Roles
altitude	umlString	altitude is a string of characters that represents the height above or below a fixed reference point.	GlobalPosition	CDM Location
applicabilityStatementDateRange	DateRange	applicabilityStatementDateRange is a date range that defines the date interval for when the applicability evaluation can result in a TRUE result.	ApplicabilityStatement	SX000i Applicability Statement

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Attribute Name	Type	Definition	Class Name	UoF
		Note If outside that date range, the ApplicabilityStatement always results in a FALSE statement.		
applicabilityStatementDescription	DescriptorType	applicabilityStatementDescription is a description that provides a human readable expression of the defined rule.	ApplicabilityStatement	SX000i 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	SX000i Applicability Statement
applicableSerialNumberRange	SerialNumberRange	applicableSerialNumberRange is a serial number range that identifies a limited effectivity with respect to a given interval of serialized items.	EvaluationByAssertionOfSerializedItems	SX000i Applicability Statement
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	SX000i Applicability Statement
authorizedLifeValue	PropertyType	authorizedLifeValue is a property that specifies the maximum usage limit.	AuthorizedLife	S-Series_Compound_Attributes_2-0_002-00
availableTrainingSiteAvailability	DateRange	availableTrainingSiteAvailability is the period of time during which a training site is available for training purposes.	AvailableTrainingSite	SX000i Training Concept
availableTrainingSiteDescription	DescriptorType	availableTrainingSiteDescription is a narrative statement explaining the available training site.	AvailableTrainingSite	SX000i Training Concept

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Attribute Name	Type	Definition	Class Name	UoF
availableTrainingSiteTrainingType	ClassificationType	availableTrainingSiteTrainingType is a <<classification>> that indicates the type(s) of training that can be performed at the training site.	AvailableTrainin gSite	SX000i Training Concept
base	PropertyType	base is the longest side of a triangle.	Triangle	SX000i Compound Attributes
batchHardwarePartLife	AuthorizedLife	batchHardwarePartLife is the AuthorizedLife for a BatchHardwarePart.	BatchHardwarePar t	SX000i Specializations
batchHardwarePartManufacturingDate	DateType	batchHardwarePartManufacturingDate is a Date at which a BatchHardwarePart was manufactured.	BatchHardwarePar t	SX000i Specializations
breakdownElementEssentiality	ClassificationType	breakdownElementEssentiality is a classification that identifies the operational importance of the BreakdownElement at the Product level. Note Based on the criticality as defined during the FMECA.	BreakdownElement	CDM UoF Breakdown Structure
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
budgetApprovedDate	DateType	budgetApprovedDate is the date at which a Budget was approved.	Budget	SX000i Budget
budgetApprovedStatus	StateType	budgetApprovedStatus is the state at which a Budget proposal is.	Budget	SX000i Budget
budgetDate	DateType	budgetDateTime is the date at which the budget was released.	Budget	SX000i Budget
budgetDescription	DescriptorType	budgetDescription is a textual narrative explaining the Budget.	Budget	SX000i Budget

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Attribute Name	Type	Definition	Class Name	UoF
budgetIdentifier	IdentifierType	budgetIdentifier is an identifier that establishes a unique designator for a Budget and to differentiate it from other instances of Budget and allows to differentiate it from other Budgets .	Budget	SX000i Budget
budgetName	DescriptorType	budgetName is a word or phrase by which the budget is commonly known.	Budget	SX000i Budget
budgetType	ClassificationType	budgetType is a <<classification>> that allows to group similar Budgets .	Budget	SX000i Budget
budgetValidUntilDate	DateType	budgetValidUntilDate is a date until which the budget is valid.	Budget	SX000i Budget
capabilityDefinitionCategory	ClassificationType	capabilityDefinitionCategory is a classification that identifies a generalization that organize capabilities into an overarching capability taxonomy.	CapabilityDefinition	CDM UoF Capability Definition
capabilityDefinitionCharacteristicDescription	DescriptorType	capabilityDefinitionCharacteristicDescription is a description that gives more information on the CapabilityDefinitionCharacteristic .	CapabilityDefinitionCharacteristic	CDM UoF Capability Definition
capabilityDefinitionCharacteristicName	NameType	capabilityDefinitionCharacteristicName is a name by which the CapabilityDefinitionCharacteristic is known and can be easily referenced.	CapabilityDefinitionCharacteristic	CDM UoF Capability Definition
capabilityDefinitionCharacteristicValue	PropertyType	capabilityDefinitionCharacteristicValue is a property that represents a measurable or observable characteristic for that is significant to the CapabilityDefinition .	CapabilityDefinitionCharacteristic	CDM UoF Capability Definition
capabilityDefinitionCharacteristicValueComparisonOperator	ClassificationType	capabilityDefinitionCharacteristicValueComparisonOperator is a classification that identifies the comparison operator which will be used in order to qualify whether an actual capability complies with the defined CapabilityDefinition .	CapabilityDefinitionCharacteristic	CDM UoF Capability Definition

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Attribute Name	Type	Definition	Class Name	UoF
capabilityDefinitionDescription	DescriptorType	capabilityDefinitionDescription is a description that gives more information on the defined capability.	CapabilityDefinitionRevision	CDM UoF Capability Definition
capabilityDefinitionIdentifier	IdentifierType	capabilityDefinitionIdentifier is an identifier that establishes a unique designator for a CapabilityDefinition and to differentiate it from other instances of CapabilityDefinition .	CapabilityDefinition	CDM UoF Capability Definition
capabilityDefinitionName	NameType	capabilityDefinitionName is a name by which the CapabilityDefinition is known and can be easily referenced.	CapabilityDefinitionRevision	CDM UoF Capability Definition
capabilityDefinitionRevisionDate	DateType	capabilityDefinitionRevisionDate is a date that specifies when the CapabilityDefinition was revised.	CapabilityDefinitionRevision	CDM UoF Capability Definition
capabilityDefinitionRevisionIdentifier	IdentifierType	capabilityDefinitionRevisionIdentifier is an identifier that establishes a unique designator for a CapabilityDefinitionRevision and to differentiate it from other instances of CapabilityDefinitionRevision .	CapabilityDefinitionRevision	CDM UoF Capability Definition
capabilityDefinitionRevisionRationale	DescriptorType	capabilityDefinitionRevisionRationale is a description that provides a justification for revising the CapabilityDefinition .	CapabilityDefinitionRevision	CDM UoF Capability Definition
capabilityDefinitionRevisionStatus	StateType	capabilityDefinitionRevisionStatus is a state that identifies the maturity of an CapabilityDefinitionRevision .	CapabilityDefinitionRevision	CDM UoF Capability Definition
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	SX000i Specializations
cityName	NameType	cityName is a name by which an incorporated municipal unit is known and can be easily referenced.	StreetAddress	CDM Location
classificationDate	DateType	classificationDate is a calendar date that identifies when the classification was recorded.	DatedClassification	S-Series_Compound_Attributes_2-0_002-00

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Attribute Name	Type	Definition	Class Name	UoF
classificationDate	DateTimeType	classificationDate is a calendar date and time that identifies when the classification was recorded.	TimeStampedClassification	S-Series_Compound_Attributes_2-0_002-00
classifier	validValue	classifier is a word or code that represents the term used for classification.	DatedClassification	S-Series_Compound_Attributes_2-0_002-00
			TimeStampedClassification	S-Series_Compound_Attributes_2-0_002-00
commentActionType	ClassificationType	commentActionType is a <<classification>> that allows to group similar CommentActions .	CommentAction	SX000i Comment
commentDate	DateType	commentDate is the date at which a comment was raised.	Comment	SX000i Comment
commentIdentifier	IdentifierType	commentIdentifier is a string of characters that is used to uniquely identify a Comment and to differentiate it from other Comment instances	Comment	SX000i Comment
commentPartyRole	ClassificationType	commentPartyRole is a <<classification>> that indicates the role of a specific Party in a specific Comment .	CommentParty	SX000i Comment
commentPriority	ClassificationType	commentPriority is a <<classification>> that allows to define the importance of a comment and the need for an urgent response.	Comment	SX000i Comment
commentRelationshipType	ClassificationType	commentRelationshipType is a <<classification>> that allows to identify the relationship between two comments.	CommentRelationship	SX000i Comment
commentStatus	ClassificationType	commentStatus is a <<classification>> that allows to determine whether a comment has been responded to.	Comment	SX000i Comment
commentText	DescriptorType	commentText is a text describing the comment.	Comment	SX000i Comment
commentTitle	DescriptorType	commentTitle is a textual description that summarizes the comment.	Comment	SX000i Comment

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Attribute Name	Type	Definition	Class Name	UoF
commentType	ClassificationType	commentType is a <<classification>> that allows the grouping of similar comments.	Comment	SX000i Comment
conditionInstanceDescription	DescriptorType	conditionInstanceDescription is a description that gives more information on the meaning of the ConditionInstance .	ConditionInstance	SX000i Applicability 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	SX000i Applicability Statement
conditionInstanceName	NameType	conditionInstanceName is a name by which the ConditionInstance is known and can be easily referenced.	ConditionInstance	SX000i Applicability Statement
conditionTypeAssertMemberAssertValue	PropertyType	conditionTypeAssertMemberAssertValue is a numerical property that specifies values which can be used to further characterize the ConditionTypeAssertMember .	ConditionTypeAssertMember	SX000i Applicability Statement
conditionTypeAssertMemberDescription	DescriptorType	conditionTypeAssertMemberDescription is a description that gives more information on meaning of the condition type assert member.	ConditionTypeAssertMember	SX000i Applicability Statement
conditionTypeAssertMemberName	NameType	conditionTypeValueName is a name that identifies a condition type member assert value.	ConditionTypeAssertMember	SX000i Applicability Statement
conditionTypeDescription	DescriptorType	conditionTypeDescription is a description that gives more information on the meaning of the condition type.	ConditionType	SX000i Applicability Statement
conditionTypeName	NameType	conditionTypeName is a name by which the ConditionType is known and can be easily referenced. Example - ashoreOrAfloat - maintenanceEnvironment - operationalEnvironment - serviceBulletin	ConditionType	SX000i Applicability Statement

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Attribute Name	Type	Definition	Class Name	UoF
contractClauseDescription	DescriptorType	contractClauseDescription is a phrase stating the contract clause or summarizing the content of the contract clause.	ContractClause	SX000i 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 ContractClause Instances.	ContractClause	SX000i Contract Breakdown
contractClauseRelationshipType	ClassificationType	contractClauseRelationshipType is a <<classification>> that defines how two ContractClause instances are related.	ContractClauseRelationship	SX000i Contract Breakdown
contractClauseValidityPeriod	DateRange	contractClauseValidityPeriod is the period of time during which the ContractClause is in effect.	ContractClause	SX000i Contract Breakdown
contractDeliverableAmount	NumericalPropertyType	contractDeliverableAmount is the amount of items that must be provided as a contractual deliverable.	ContractDeliverable	SX000i Deliverable Items
contractDeliverableDescription	DescriptorType	contractDeliverableDescription is a narrative statement explaining an item that must be delivered as the result of a contract.	ContractDeliverable	SX000i Deliverable Items
contractDeliverableIdentifier	IdentifierType	contractDeliverableIdentifier is an identifier that establishes a unique designator for ContractDeliverable to differentiate it from other instances of ContractDeliverable.	ContractDeliverable	SX000i Deliverable Items
contractDeliverablePeriodicity	SingleValuePropertyType	contractDeliverablePeriodicity is the frequency at which a contractual deliverable must be provided.	ContractDeliverable	SX000i Deliverable Items
contractDeliverableRequiredDate	DateType	contractDeliverableRequiredDate is the date at which the contractual deliverable must be provided.	ContractDeliverable	SX000i Deliverable Items
contractDeliverableStatus	StateType	contractDeliverableStatus is the state at which a ContractDeliverable is at a specific moment in time.	ContractDeliverable	SX000i Deliverable Items
contractDeliverableType	ClassificationType	contractDeliverableType is a <<classification>> that allows to group different types of contract deliverables.	ContractDeliverable	SX000i Deliverable Items

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Attribute Name	Type	Definition	Class Name	UoF
contractDescription	DescriptorType	contractDescription is a description that provides a human readable expression of a Contract .	Contract	SX000i Specializations
contractEffectivityDateTimes	DateTimeRange	contractEffectivityDateTimes is the range of time during which the Contract is effective.	Contract	SX000i Specializations
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	SX000i Specializations
contractStatus	StateType	contractStatus is a timestampedState that indicates the state of a Contract at a specific moment in time.	Contract	SX000i Specializations
contractType	ClassificationType	contractType is a <<classification>> describing the Contract .	Contract	SX000i Specializations
contractValue	SingleValuePropertyType	contractValue is the amount of money that the Contract is worth.	Contract	SX000i Specializations
costBreakdownDescription	DescriptorType	costBreakdownDescription is a narrative statement explaining the CostBreakdown .	CostBreakdown	SX000i Cost Breakdown
costBreakdownIdentifier	IdentifierType	costBreakdownIdentifier is a string of text that uniquely identifies a CostBreakdown , allowing to differentiate it from all other CostBreakdown instances.	CostBreakdown	SX000i Cost Breakdown
costBreakdownName	DescriptorType	costBreakdownName is a word or phrase by which the CostBreakdown is commonly known.	CostBreakdown	SX000i Cost Breakdown
costBreakdownRelationshipType	ClassificationType	costBreakdownRelationshipType is a <<classification>> that defines how two CostBreakdown instances are related.	CostBreakdownRelationship	SX000i Cost Breakdown
costBreakdownRevisionDate	DateType	costBreakdownRevisionDate is a Date that indicates when the CostBreakdownRevision was created.	CostBreakdownRevision	SX000i Cost Breakdown

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Attribute Name	Type	Definition	Class Name	UoF
costBreakdownRevisionIdentifier	IdentifierType	costBreakdownRevisionIdentifier is a string of characters that uniquely identifies a CostBreakdownRevision .	CostBreakdownRevision	SX000i Cost Breakdown
costBreakdownRevisionRationale	DescriptorType	costBreakdownRevisionRationale is a description that provides a human readable expression of a CostBreakdownRevision .	CostBreakdownRevision	SX000i Cost Breakdown
costBreakdownRevisionStatus	StateType	costBreakdownRevisionStatus is a state that defines the active status of a CostBreakdownRevision .	CostBreakdownRevision	SX000i Cost Breakdown
costEntryDate	DateType	costEntryDate is the date at which the cost entry was made or incurred.	CostEntry	SX000i Cost Breakdown
costEntryDescription	DescriptorType	costEntryDescription is a textual narrative statement explaining the nature of the CostEntry	CostEntry	SX000i Cost Breakdown
costEntryIdentifier	IdentifierType	costEntryIdentifier is a string of characters used to uniquely identify a CostEntry and differentiate it from other CostEntry instances.	CostEntry	SX000i Cost Breakdown
costEntryPeriod	DateRange	costEntryPeriod is the period of time during which the cost for this CostEntry was incurred.	CostEntry	SX000i Cost Breakdown
costEntryType	ClassificationType	costEntryType is a <<classification>> used to differentiate between different kinds of costs incurred.	CostEntry	SX000i Cost Breakdown
costEntryValue	PropertyType	costEntryValue is the actual or estimated value of the cost.	CostEntry	SX000i Cost Breakdown
costItemDescription	DescriptorType	costItemDescription is a narrative statement explaining what the CostItem is.	CostItem	SX000i Cost Breakdown
costItemIdentifier	IdentifierType	costItemIdentifier is a string of characters that is used to uniquely designate a CostItem and to differentiate it from other CostItem instances.	CostItem	SX000i Cost Breakdown

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Attribute Name	Type	Definition	Class Name	UoF
costItemRelationshipType	ClassificationType	costItemRelationshipType is a <<classification>> that defines the relationship between two CostItem Instances.	CostItemRelationship	SX000i Cost Breakdown
countryCode	ClassificationType	countryCode is a string of characters used to uniquely identify a Country and to differentiate it from other instances of Country . Note It is advised to use ISO 3166-1 alpha-2.	Country	CDM Location
countryName	NameType	countryName is a name by which the Country is known and can be easily referenced.	Country	CDM Location
courseDefinitionIdentifier	IdentifierType	Course definition identifier (courseDefinitionIdentifier) is an identifier that establishes a unique designator for a course definition and to differentiate it from other instances of course definition.	CourseDefinition	SX000i Support Elements
dataElementDescription	DescriptorType	dataElementDescription is a narrative statement explaining a DataElement .	DataElement	SX000i Data Set Definition
dataElementIdentifier	IdentifierType	contractDeliverable is an identifier that establishes a unique designator for a ContractDeliverable to differentiate it from other instances of ContractDeliverables .	DataElement	SX000i Data Set Definition
dataElementName	NameType	dataElementName is a name by which the DataElement is known and can be easily referenced.	DataElement	SX000i Data Set Definition
dataElementRequirement	ClassificationType	dataElementRequirement is a <<classification>> that allows to determine to what extent a DataElement is required.	DataElement	SX000i Data Set Definition
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 .	S1000DDataModuleIssue	CDM UoF Document

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Attribute Name	Type	Definition	Class Name	UoF
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
datasetDefinitionDescription	DescriptorType	datasetDefinitionDescription is a narrative statement explaining a DatasetDefinition .	DatasetDefinition	SX000i Data Set Definition
datasetDefinitionIdentifier	IdentifierType	datasetDefinitionIdentifier is an identifier that establishes a unique designator for a DatasetDefinition to differentiate it from other instances of DatasetDefinitions .	DatasetDefinition	SX000i Data Set Definition
datasetDefinitionName	NameType	datasetDefinitionName is a name by which the DatasetDefinition is known and can be easily referenced.	DatasetDefinition	SX000i Data Set Definition
dataSetDefinitionRelationshipType	ClassificationType	dataSetDefinitionRelationshipType is a <<classification>> that allows to define how two DatasetDefinitions relate to each other.	DataSetDefinitionRelationship	SX000i Data Set Definition
dateRangeEnd	DateType	dateRangeEnd is a date that represents the conclusion of the range.	DateRange	S-Series_Compound_Attributes_2-0_002-00
dateRangeStart	DateType	dateRangeStart is a date that represents the beginning of the range.	DateRange	S-Series_Compound_Attributes_2-0_002-00
dateTimeRangeEnd	DateTimeType	dateTimeRangeEnd is a calendar date and time that represents the culmination of the range.	DateTimeRange	S-Series_Compound_Attributes_2-0_002-00
dateTimeRangeStart	DateTimeType	dateTimeRangeStart is a calendar date and time that represents the beginning of the range.	DateTimeRange	S-Series_Compound_Attributes_2-0_002-00

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Attribute Name	Type	Definition	Class Name	UoF
diameter	PropertyType	diameter is a property that specifies the longitudinal dimension of a circular section when measured through its center.	Circle	SX000i Compound Attributes
			Sphere	S-Series_Compound_Attributes_2-0_002-00
			Cylinder	S-Series_Compound_Attributes_2-0_002-00
digitalFileContentClass	ClassificationType	digitalFileContentClass is a classification that determine the meaning of the information within the DigitalFile .	DigitalFile	CDM UoF Digital File
digitalFileContentDescription	DescriptorType	digitalFileContentDescription is a phrase that gives more details about the information contained in the DigitalFile	DigitalFile	CDM UoF Digital File
digitalFileLocator	IdentifierType	digitalFileLocator 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 description 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

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Attribute Name	Type	Definition	Class Name	UoF
documentCreationDate	DateType	documentCreationDate is the date at which the document was published.	Document	SX000i Specializations
documentDescription	DescriptorType	documentDescription is a textual narrative statement that explains what the document is about.	Document	SX000i Specializations
documentIssueReason	ClassificationType	documentIssueReason is a <<classification>> that allows to group DocumentIssues by the different causes for their release.	DocumentIssue	SX000i Specializations
documentPartyRelationshipType	DatedClassification	documentPartyRelationshipType is a relationship identifying the type of association between a document and a Party at a specific date.	DocumentParty	SX000i Document
documentStatus	StateType	documentStatus is a state that indicates the status of the document.	Document	SX000i Specializations
environmentalDefinitionImpactDescription	DescriptorType	environmentalDefinitionImpactDescription is a narrative statement describing how an EnvironmentDefinition impacts an OperationalScenarioRevision .	EnvironmentalDefinitionImpact	SX000i Operational Scenario Definition
environmentalDefinitionImpactSeverity	ClassificationType	environmentalDefinitionImpactSeverity is a <<classification>> that allows to categorize the severity of an OperationalScenarioRevision on an EnvironmentDefinition .	EnvironmentalDefinitionImpact	SX000i Operational Scenario Definition
environmentalDefinitionImpactType	ClassificationType	environmentalDefinitionImpactType is a <<classification>> that allows to categorize the type of an OperationalScenarioRevision on an EnvironmentDefinition .	EnvironmentalDefinitionImpact	SX000i Operational Scenario Definition
environmentDefinitionCharacteristicDescription	DescriptorType	environmentDefinitionCharacteristicDescription is a description that gives more information on the EnvironmentDefinitionCharacteristic .	EnvironmentDefinitionCharacteristic	SX000i Environment Definition
environmentDefinitionCharacteristicValueComparisonOperator	ClassificationType	environmentDefinitionCharacteristicValueComparisonOperator is a classification that identifies the comparison operator	EnvironmentDefinitionCharacteristic	SX000i Environment Definition

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Attribute Name	Type	Definition	Class Name	UoF
cValueComparisonOperator		which will be used in order to qualify whether an actual environment is as a member of the defined EnvironmentDefinition .		
environmentDefinitionDescription	DescriptorType	environmentDefinitionDescription is a textual description of an EnvironmentDefinition .	EnvironmentDefinitionRevision	SX000i Environment Definition
environmentDefinitionIdentifier	IdentifierType	environmentIdentifier is a string of characters used to uniquely identify an Environment and to differentiate it from other Environments.	EnvironmentDefinition	SX000i Environment Definition
environmentDefinitionImpactDescription	DescriptorType	environmentDefinitionImpactDescription is a descriptive narrative that explains how an EnvironmentDefinition impacts an OperationalScenario .	EnvironmentDefinitionImpact	SX000i Operational Scenario Definition
environmentDefinitionImpactSeverity	ClassificationType	environmentDefinitionImpactSeverity is a <<classification>> that allows to categorize the severity of an EnvironmentDefinition on an OperationalScenario	EnvironmentDefinitionImpact	SX000i Operational Scenario Definition
environmentDefinitionImpactType	ClassificationType	environmentDefinitionImpactType is a <<classification>> that allows to categorize the impact of an EnvironmentDefinition on an OperationalScenario .	EnvironmentDefinitionImpact	SX000i Operational Scenario Definition
environmentDefinitionName	NameType	environmentDefinitionName is a name by which the EnvironmentDefinition is known and can be easily referenced.	EnvironmentDefinitionRevision	SX000i Environment Definition
environmentDefinitionRelationshipType	ClassificationType	environmentRelationshipType is a <<classification>> that allows to indicate the kind of relationship between two Environments.	EnvironmentDefinitionRelationship	SX000i Environment Definition
environmentDefinitionRevisionDate	DateType	environmentDefinitionRevisionDate is the date at which the EnvironmentDefinitionRevision was created.	EnvironmentDefinitionRevision	SX000i Environment Definition
environmentDefinitionRevisionIdentifier	IdentifierType	environmentDefinitionRevisionIdentifier is a <<compositeKey>> that allows with a master key to uniquely identify an EnvironmentDefinitionRevision .	EnvironmentDefinitionRevision	SX000i Environment Definition

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Attribute Name	Type	Definition	Class Name	UoF
environmentDefinitionRevisionRationale	DescriptorType	environmentDefinitionRevisionRationale is a description that provides a justification for the EnvironmentDefinitionRevision .	EnvironmentDefinitionRevision	SX000i Environment Definition
environmentDefinitionRevisionStatus	StateType	environmentDefinitionRevisionStatus is a state that identifies the maturity of an EnvironmentDefinitionRevision .	EnvironmentDefinitionRevision	SX000i Environment Definition
environmentDefinitionCharacteristicValue	PropertyType	environmentDefinitionCharacteristicValue is a property that represents a measurable or observable characteristic for a circumstance, object, event or condition that is typical to the EnvironmentDefinition .	EnvironmentDefinitionCharacteristic	SX000i Environment Definition
environmentDefinitionCharacteristicName	NameType	environmentDefinitionCharacteristicName is a name by which the EnvironmentDefinitionCharacteristic is known and can be easily referenced.	EnvironmentDefinitionCharacteristic	SX000i Environment Definition
evaluationByAssertionRole	ClassificationType	evaluationByAssertionRole is a <<classification>> that defines the context in which the EvaluationByAssertionOfClassInstance is being referenced.	EvaluationByAssertionOfClassInstance	SX000i Applicability Statement
expectedDateRangeOfProductvariantsInOperatingBase	DateRange	expectedDateRangeOfProductvariantsInOperatingBase is a range of dates during which the ProductVariant (s) are expected to operate in the OperatingBase .	ExpectedProductVariantOperatingBase	SX000i Operating Base
expectedNumberOfProductvariantsInOperatingBase	NumericalPropertyType	ExpectedNumberOfProductvariantsInOperatingBase is the number of ProductVariants that are expected to operate in a specific OperatingBase .	ExpectedProductVariantOperatingBase	SX000i Operating Base
expectedTrainingFacilityTrainingPeriod	DateRange	expectedTrainingFacilityTrainingPeriod is a date range during which an InstructionalStrategyRevision is expected to be implemented at a certain TrainingFacility	ExpectedTrainingFacility	SX000i Training Concept

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Attribute Name	Type	Definition	Class Name	UoF
exportControlLicenseDescription	DescriptorType	exportControlLicenseDescription is a description that provides a human readable expression of an ExportControlLicense .	ExportControlLicense	SX000i Export Control License
exportControlLicenseIdentifier	IdentifierType	exportControlLicenseIdentifier is a string of characters that uniquely identifies an ExportControlLicense .	ExportControlLicense	SX000i Export Control License
exportControlLicenseItemCategory	ClassificationType	exportControlLicenseItemCategory is a <<classification>> that allows to group ExportControlLicenseItems .	ExportControlLicenseItem	SX000i Export Control License
exportControlLicenseItemIdentifier	IdentifierType	exportControlLicenseItemIdentifier is a string of characters that uniquely identifies an ExportControlLicenseItem .	ExportControlLicenseItem	SX000i Export Control License
exportControlLicenseItemQuantity	umlInteger	exportControlLicenseItemQuantity is a numeric value representing the amount of items covered by an ExportControlLicense .	ExportControlLicenseItem	SX000i Export Control License
exportControlLicenseItemSubCategory	ClassificationType	exportControlLicenseItemSubCategory is a <<classification>> that allows to further subgroup ExportControlLicenseItems .	ExportControlLicenseItem	SX000i Export Control License
exportControlLicensePurpose	DescriptorType	exportControlLicensePurpose is a description that provides a human readable expression of the purpose of an ExportControlLicense .	ExportControlLicense	SX000i Export Control License
exportControlLicenseType	ClassificationType	exportControlLicenseType is a <<classification>>; that defines the type of export control license.	ExportControlLicense	SX000i 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	SX000i Export Control License
exportControlPartyClearanceDate	DateType	exportControlPartyClearanceDate is a date that indicates when the exportControlParty has received the clearance to house export controlled goods.	ExportControlParty	SX000i Export Control License

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Attribute Name	Type	Definition	Class Name	UoF
exportControlPartyClearanceLevel	ClassificationType	exportControlPartyClearanceLevel is a <<classification>> that indicates the level of the clearance that the exportControlParty has received to house export controlled goods.	ExportControlParty	SX000i Export Control License
exportControlPartyIdentifier	IdentifierType	exportControlPartyIdentifier is a string of characters that uniquely identifies an ExportControlParty .	ExportControlParty	SX000i Export Control License
exportControlPartyRole	ClassificationType	exportControlPartyRole is a <<classification>> that defines the role of an ExportControlParty .	ExportControlParty	SX000i Export Control License
exportControlPartyType	ClassificationType	exportControlPartyType is a <<classification>> that indicates the characteristic of the Party involved in the export control.	ExportControlParty	SX000i Export Control License
exportControlRegulationLegalCode	ClassificationType	exportControlRegulationLegalCode is a <<classification>> that provides the identifier for the legal export control regulation.	ExportControlRegulation	SX000i Export Control Requirement
exportControlRegulationPeculiarityCode	ClassificationType	exportControlRegulationPeculiarityCode is a <<classification>> that allows to use codes used by different ExportControlRegulations .	ExportControlRegulation	SX000i Export Control Requirement
exportControlRequirementAppliedToCountryDescription	DescriptorType	exportControlRequirementAppliedToCountryDescription is a description that provides a human readable expression of how or why an ExportControlRequirement is applied to Country .	ExportControlRequirementAppliedToCountry	SX000i Export Control Requirement
exportControlRequirementAppliedToCountryDuring	DateRange	exportControlRequirementAppliedToCountryDuring is a DataRange during which an ExportControlRequirement is applied to a specific country.	ExportControlRequirementAppliedToCountry	SX000i Export Control Requirement
exportControlRequirementGrouping	ClassificationType	exportControlRequirementGrouping is a <<classification>> that allows to group similar ExportControlRegulations .	ExportControlRegulation	SX000i 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	SX000i Expression Evaluation

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Attribute Name	Type	Definition	Class Name	UoF
expressionEvaluationDescription	DescriptorType	expressionEvaluationDescription is a description that provides a human readable expression of the defined rule.	ExpressionEvaluation	SX000i Expression Evaluation
expressionEvaluationIdentifier	IdentifierType	expressionEvaluationIdentifier is an identifier that establishes a unique designator for an ExpressionEvaluation and to differentiate it from other instances of ExpressionEvaluation .	ExpressionEvaluation	SX000i Expression Evaluation
extensionCode	umlString	extensionCode is a string of characters used to identify the organization receiving the customized data module.	S1000DPublicationModule	CDM UoF Document
			S1000DDataModule	CDM UoF Document
extensionProducer	umlString	extensionProducer is a string of characters used to identify the organization providing the customized data module.	S1000DPublicationModule	CDM UoF Document
			S1000DDataModule	CDM UoF Document
externalDocumentType	ClassificationType	externalDocumentType is a <<classification>> that allows to group ExternalDocuments of a similar nature.	ExternalDocument	SX000i Document
facilityCleansiness	ClassificationType	facilityCleansiness is a <<classification>> that indicates the cleansiness that is required for the facility.	Facility	SX000i Specializations
facilityDimensions	Dimensions	facilityDimensions are the dimensions (length, width, height) of the Facility .	Facility	SX000i Specializations
facilityEquipmentAmount	PropertyType	facilityEquipmentAmount represents the amount of a specific equipment that exists or is expected to exist at a Facility during a specific period of time.	FacilityEquipment	SX000i Facility
facilityEquipmentPeriod	DateRange	facilityEquipmentPeriod is the period of time during which an equipment exists or is planned to exist at a Facility .	FacilityEquipment	SX000i Facility
facilityExistsDuring	DateRange	facilityExistsDuring represents the period of time during which a temporary Facility exists.	Facility	SX000i Specializations

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Attribute Name	Type	Definition	Class Name	UoF
facilityGovernanceType	ClassificationType	facilityGovernanceType is a classification that allows to define the rules under which a Facility is governed.	Facility	SX000i Specializations
facilityLocationIdentifier	IdentifierType	facilityLocationIdentifier is an identifier that establishes a unique designator for a FacilityLocation and to differentiate it from other instances of FacilityLocation .	FacilityLocation	CDM UoF Facility
facilityLocationPeriod	DateRange	facilityLocationPeriod is a date range that defines the date interval during which a Facility is located at a specific Location .	FacilityLocation	CDM UoF Facility
facilityOperatorDuring	DateRange	facilityOperatorDuring is the period during which a certain Party operates a Facility .	FacilityOperator	SX000i Specializations
facilityOwnedDuring	DateRange	facilityOwnedDuring is the period during which a facility is or has been owned by a specific Party .	FacilityOwner	SX000i Facility
facilityOwnershipRatio	SingleValuePropertyType	facilityOwnerRatio is the percentage of ownership that a Party has over the associated facility during the associated period.	FacilityOwner	SX000i Facility
facilityRelationshipType	ClassificationType	facilityRelationshipType is a classification that identifies the meaning of the established relationship.	FacilityRelationship	CDM UoF Facility
facilityWeight	NumericalPropertyType	facilityWeight represents the weight of the Facility .	Facility	SX000i Specializations
fleetBasedAtDuring	DateRange	fleetBasedAtDuring is a DateRange during which a Fleet is based at a specific location.	FleetBasedAt	SX000i Fleet Environment
fleetDefinitionDescription	DescriptorType	fleetDefinitionDescription is a narrative statement explaining a FleetDefinition .	FleetDefinition	SX000i Fleet Definition
fleetDefinitionIdentifier	IdentifierType	fleetDefinitionIdentifier is an identifier that establishes a unique designator for a FleetDefinition to differentiate it from other instances of FleetDefinitions .	FleetDefinition	SX000i Fleet Definition

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Attribute Name	Type	Definition	Class Name	UoF
fleetDefinitionName	NameType	fleetDefinitionName is a name by which the FleetDefinition is known and can be easily referenced.	FleetDefinition	SX000i Fleet Definition
fleetDescription	DescriptorType	fleetDescription is a narrative statement explaining the Fleet .	Fleet	SX000i Fleet Definition
fleetIdentifier	IdentifierType	fleetIdentifier is a string of text that uniquely identifies a Fleet and differentiates it from other Fleets .	Fleet	SX000i Fleet Definition
fleetOperatedByDuration	DateRange	fleetOperatedByDuring is a << DateRange >> that indicates the period of time during which a Fleet is operated by a specific Operator .	FleetOperatedBy	SX000i Fleet Environment
fleetOperatesAtLocationDuring	DateRange	fleetOperatesAtLocationDuring is a DateRange during which a Fleet has operated at a specific location.	FleetOperatesAtLocation	SX000i Fleet Environment
fleetRelationshipType	ClassificationType	fleetRelationshipType is a <<classification>> that defines how two Fleets are related.	FleetRelationship	SX000i Fleet Environment
geographicalAreaDescription	DescriptorType	geographicalAreaDescription is a description that provides more information about the GeographicalArea .	GeographicalArea	CDM Location
geographicalAreaName	NameType	geographicalAreaName is a name by which the GeographicalArea is known and can be easily referenced.	GeographicalArea	CDM Location
geographicalAreaType	ClassificationType	geographicalAreaType is a classification that identifies the nature of the GeographicalArea .	GeographicalArea	CDM Location
geographicalCoordinateSystem	ClassificationType	geographicalCoordinateSystem is a classification that identifies the geographical coordinate system used to determine latitude and longitude.	GlobalPosition	CDM Location
height	PropertyType	height is a property that specifies the vertical longitudinal dimension of an object.	Cuboid	S-Series_Compound_Attributes_2-0_002-00

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Attribute Name	Type	Definition	Class Name	UoF
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	SX000i Infrastructure Availability
infrastructureAvailableRestriction	DescriptorType	infrastructureAvailableRestriction is a textual description explaining an infrastructure restriction during the specific period of time.	InfrastructureAvailable	SX000i Infrastructure Availability
infrastructureAvailableType	ClassificationType	infrastructureAvailableType is a <<classification>> that provides information about the type of availability that is available for an item.	InfrastructureAvailable	SX000i Infrastructure Availability
infrastructureComplianceDate	DateType	infrastructureComplianceDate is a date that defines when infrastructure compliance was declared.	InfrastructureCompliance	CDM UoF Facility
infrastructureComplianceDescription	DescriptorType	infrastructureComplianceDescription is a description that gives more information on compliance fulfillment.	InfrastructureCompliance	CDM UoF Facility
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	SX000i Infrastructure
infrastructureIdentifier	IdentifierType	infrastructureIdentifier is a string of characters that uniquely identifies an Infrastructure .	Infrastructure	SX000i Infrastructure
infrastructureName	NameType	infrastructureName is a name by which the Infrastructure is known and can be easily referenced.	Infrastructure	SX000i Infrastructure

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Attribute Name	Type	Definition	Class Name	UoF
infrastructureNodeLocatedAtDuring	DateRange	infrastructureNodeLocatedAtDuring is a DateRange during which an InfrastructureNote has been located at a specific place.	InfrastructureNodeAtLocation	SX000i Infrastructure
infrastructurePartyRole	ClassificationType	infrastructurePartyRole is a <<classification>> that defines the role of an InfrastructureParty .	InfrastructureParty	SX000i Infrastructure
infrastructurePartyRoleDuring	DateRange	infrastructurePartyRoleDuring is a DateRange during which a Party has a specific role regarding a specific Infrastructure .	InfrastructureParty	SX000i Infrastructure
infrastructureRelationshipType	ClassificationType	infrastructureRelationshipType is a <<classification>> that defines how two Infrastructures are related.	InfrastructureRelationship	SX000i Infrastructure
infrastructureRevisionDate	DateType	infrastructureRevisionDate is the date at which the InfrastructureRevision was created.	InfrastructureRevision	SX000i Infrastructure
infrastructureRevisionIdentifier	IdentifierType	infrastructureRevisionIdentifier is a string of characters that uniquely identifies an InfrastructureRevision .	InfrastructureRevision	SX000i Infrastructure
infrastructureRevisionRationale	DescriptorType	infrastructureRevisionRationale is a description of the reason for the creation of the InfrastructureRevision .	InfrastructureRevision	SX000i Infrastructure
infrastructureRevisionStatus	StateType	infrastructureRevisionStatus is a state that identifies the maturity of an InfrastructureRevision .	InfrastructureRevision	SX000i Infrastructure
infrastructureRevisionValidity	DateRange	infrastructureRevisionValidity is a DateRange during which an InfrastructureRevision is valid.	InfrastructureRevision	SX000i Infrastructure
instructionalStrategyDescription	DescriptorType	Instructional strategy description (instructionalStrategyDescription) is a description that gives more information on the defined instructional strategy.	InstructionalStrategyRevision	SX000i Training Concept
instructionalStrategyLearningDomain	ClassificationType	Instructional strategy learning domain (instructionalStrategyLearningDomain) is a	InstructionalStrategy	SX000i Training Concept

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Attribute Name	Type	Definition	Class Name	UoF
		<<classification>> that determines the learning aspect for which the instructional strategy is defined.		
instructionalStrategyMedia	ClassificationType	Instructional strategy media (instructionalStrategyMedia) is a <<classification>> that identifies the delivery vehicles used to present instructional material or basic sensory stimulus presented to a student to induce learning. Example - Printed material - Simulator - Video	InstructionalStrategyRevision	SX000i Training Concept
instructionalStrategyMethod	ClassificationType	Instructional strategy method (instructionalStrategyMethod) is a <<classification>> that identifies the way in which the learning will be conducted.	InstructionalStrategyRevision	SX000i Training Concept
instructionalStrategyName	NameType	Instructional strategy name (instructionalStrategyName) is a name by which the instructional strategy is known and can be easily referenced.	InstructionalStrategy	SX000i Training Concept
instructionalStrategyRevisionDate	DateType	Instructional strategy revision date (instructionalStrategyRevisionDate) is a date that specifies when the instructional strategy definition was revised.	InstructionalStrategyRevision	SX000i Training Concept
instructionalStrategyRevisionIdentifier	IdentifierType	Instructional strategy revision identifier (instructionalStrategyRevisionIdentifier) is an identifier that establishes a unique designator for an instructional strategy and to differentiate it from other instances of instructional strategy.	InstructionalStrategyRevision	SX000i Training Concept
instructionalStrategyRevisionRationale	DescriptorType	Instructional strategy revision rationale (instructionalStrategyRevisionRationale) is a description that gives more information on the justification for revising the instructional strategy definition.	InstructionalStrategyRevision	SX000i Training Concept

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Attribute Name	Type	Definition	Class Name	UoF
instructionalStrategyRevisionStatus	StateType	Instructional strategy revision status (instructionalStrategyRevisionStatus) is a state that identifies the maturity of the instructional strategy revision.	InstructionalStrategyRevision	SX000i Training Concept
ipsConceptDescription	DescriptorType	ipsConceptDescription is a narrative statement explaining an IPS concept.	IPSConcept	SX000i IPS Concept Definition
ipsConceptIdentifier	IdentifierType	ipsConceptIdentifier is an identifier that establishes a unique designator for an IPSConcept to differentiate it from other instances of IPSConcepts .	IPSConcept	SX000i IPS Concept Definition
ipsConceptName	NameType	ipsConceptName is a name by which the IPS concept is known and can be easily referenced.	IPSConcept	SX000i IPS Concept Definition
ipSConceptRelationshipType	ClassificationType	ipSConceptRelationshipType is a <<classification>> that determines how two IPSConcept instances are related with each other.	IPSConceptRelationship	SX000i IPS Concept Definition
ipsConceptRevisionDate	DateType	ipsConceptRevisionDate is the date at which the IPSConceptRevision was created.	IPSConceptRevision	SX000i IPS Concept Definition
ipsConceptRevisionIdentifier	IdentifierType	ipsConceptRevisionIdentifier is a string of characters that uniquely identifies an IPSConceptRevision .	IPSConceptRevision	SX000i IPS Concept Definition
ipsConceptRevisionRequirementRationale	DescriptorType	ipsConceptRevisionRequirementRationale is a narrative statement explaining the reason why a Requirement is associated to a IPSConceptRevision .	IPSConceptRevisionRequirement	SX000i IPS Concept Definition
ipsConceptRevisionStatus	StateType	ipsConceptRevisionStatus is a state that identifies the maturity of an IPSConceptRevision .	IPSConceptRevision	SX000i IPS Concept Definition
ipsConceptRevisionValidity	DateRange	ipsConceptRevisionValidity is a DateRange during which an IPSConceptRevision is valid.	IPSConceptRevision	SX000i IPS Concept Definition
ispConceptRevisionRationale	DescriptorType	ipsRevisionRationale is a description of the reason for the creation of the IPSConceptRevision .	IPSConceptRevision	SX000i IPS Concept Definition

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Attribute Name	Type	Definition	Class Name	UoF
iTArchitectureNodeDescription	DescriptorType	iTArchitectureNodeDescription is a narrative statement that explains the ITArchitectureNode .	ITArchitectureNode	SX000i IT Concept
iTArchitectureNodeIdentifier	IdentifierType	iTArchitectureNodeIdentifier is an identifier that allows to uniquely identify an ITArchitectureNode and differentiate it from other ITArchitectureNodes .	ITArchitectureNode	SX000i IT Concept
iTArchitectureNodeRelationshipType	ClassificationType	iTArchitectureNodeRelationshipType is a <<classification>> that allows to define how two ITArchitectureNodes are related.	ITArchitectureNodeRelationship	SX000i IT Concept
iTArchitectureNodeType	ClassificationType	iTArchitectureNodeType is a <<classification>> that allows to group similar ITArchitectureNodes .	ITArchitectureNode	SX000i IT Concept
ITConceptRevisionArchitectureDescription	DescriptorType	ITConceptRevisionArchitectureDescription is a narrative statement explaining the IT architecture.	ITConceptRevision	SX000i IT Concept
ITConceptRevisionArchitectureType	ClassificationType	ITConceptRevisionArchitectureType is a <<classification>> that allows to group different types of IT architectures.	ITConceptRevision	SX000i IT Concept
ITConceptRevisionOperation	DescriptorType	ITConceptRevisionOperation is a narrative statement about how the IT infrastructure will operate.	ITConceptRevision	SX000i IT Concept
itemExportControlRegulationClassification	ClassificationType	itemExportControlRegulationClassification is the <<classification>> that is associated to an export controlled item under a specific ExportControlRegulation .	ItemExportControlRegulation	SX000i Export Control Requirement
itemLocationCode	umlString	itemLocationCode is a string of characters that represents the item location code attribute of the data module code.	S1000DDDataModule	CDM UoF Document
itemPlanningDate	DateType	itemPlanningDate is the planned date for an item.	ItemPlanning	SX000i Planning
itemPlanningDescription	DescriptorType	itemPlanningDescription is a narrative statement explaining the ItemPlanning .	ItemPlanning	SX000i Planning

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Attribute Name	Type	Definition	Class Name	UoF
itemPlanningIdentifier	IdentifierType	itemPlanningIdentifier is an identifier that establishes a unique designator for an ItemPlanning to differentiate it from other instances of ItemPlannings .	ItemPlanning	SX000i Planning
itemPlanningStatus	StateType	itemPlanningStatus is the state at which an ItemPlanning is at a specific moment in time.	ItemPlanning	SX000i Planning
laborRate	NumericalPropertyType	laborRate is a value indicating the monetary value of an hour of a person with particular skills or competences.	LaborRates	SX000i Contract Breakdown
latitude	umlString	latitude is a string of characters that contributes to uniquely identifies a GlobalPosition .	GlobalPosition	CDM 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
length	PropertyType	length is a property that specifies the most extended longitudinal dimension of an object.	Rectangle	SX000i Compound Attributes
			Cuboid	S-Series_Compound_Attributes_2-0_002-00
			Cylinder	S-Series_Compound_Attributes_2-0_002-00
lifeAuthorizingOrganization	Organization	lifeAuthorizingOrganization identifies the organization that is the authoritative source for the authorizedLifeValue.	AuthorizedLife	S-Series_Compound_Attributes_2-0_002-00
limitationDateRange	DateRange	limitationDateRange is the period of time during which a Limitation is in effect.	Limitation	SX000i Limitation

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Attribute Name	Type	Definition	Class Name	UoF
limitationDescription	DescriptorType	limitationDescription is a narrative statement explaining a Limitation .	Limitation	SX000i Limitation
limitationIdentifier	IdentifierType	limitationIdentifier is an identifier that establishes a unique designator for a Limitaton to differentiate it from other instances of Limitatons.	Limitation	SX000i Limitation
limitationName	NameType	limitationName is a name by which the Limitation is known and can be easily referenced.	Limitation	SX000i Limitation
limitationQualifier	ClassificationType	limitationQualifier is a <<classification>> that allows to define to which extent the limitation applies.	Limitation	SX000i Limitation
limitationType	ClassificationType	limitationType is a <<classification>> that allows to group similar Limitations .	Limitation	SX000i Limitation
limitationValue	PropertyType	limitationValue is a quantifiable measure of a Limitation .	Limitation	SX000i Limitation
locationDefinitionDescription	DescriptorType	locationDefinitionDescription is a narrative statement explaining a LocationDefinition .	LocationDefiniti on	SX000i Location Definition
locationDefinitionIdentifier	IdentifierType	locationDefinitionIdentifier is an identifier that establishes a unique designator for a LocationDefinition to differentiate it from other instances of LocationDefinition .	LocationDefiniti on	SX000i Location Definition
locationDefinitionRevisionDate	DateType	locationDefinitionRevisionDate is the creation date of the LocationDefinitionRevision .	LocationDefiniti onRevision	SX000i Location Definition
locationDefinitionRevisionIdentifier	IdentifierType	locationDefinitionRevisionIdentifier is an identifier that establishes a unique designator for a LocationDefinitionRevision to differentiate it from other instances of LocationDefinitionRevision .	LocationDefiniti onRevision	SX000i Location Definition

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Attribute Name	Type	Definition	Class Name	UoF
locationDefinitionRevisionRationale	DescriptorType	locationDefinitionRevisionRationale is a narrative statement explaining the reason for the LocationDefinitionRevision .	LocationDefinitionRevision	SX000i Location Definition
locationDefinitionRevisionStatus	StateType	locationDefinitionRevisionStatus is the state at which a LocationDefinitionRevision is at a specific moment in time.	LocationDefinitionRevision	SX000i Location Definition
locationDefinitionType	ClassificationType	locationDefinitionType is a <<classification>> that allows to group similar location definitions..	LocationDefinition	SX000i Location Definition
locationRelationshipType	ClassificationType	locationRelationshipType is a classification that identifies the meaning of the established relationship.	LocationRelationship	CDM Location
longitude	umlString	longitude is a string of characters that represents a geographic coordinate specifying the east–west position of a point.	GlobalPosition	CDM Location
lowerBound	umlString	lowerBound is a string of characters that represents the lower limit of the range.	SerialNumberRange	S-Series_Compound_Attributes_2-0_002-00
maintenanceConceptRevisionDate	DateType	maintenanceConceptRevisionDate is the date at which the MaintenanceConceptRevision was created.	ProvisioningConceptRevision	SX000i Provisioning Concept
maintenanceConceptRevisionIdentifier	IdentifierType	maintenanceConceptRevisionIdentifier is a string of characters that uniquely identifies an MaintenanceConceptRevision .	ProvisioningConceptRevision	SX000i Provisioning Concept
maintenanceConceptRevisionRationale	DescriptorType	infrastructureRevisionRationale is a description of the reason for the creation of the InfrastructureRevision .	ProvisioningConceptRevision	SX000i Provisioning Concept
maintenanceConceptRevisionStatus	StateType	maintenanceConceptRevisionStatus is a state that identifies the maturity of an MaintenanceConceptRevision .	ProvisioningConceptRevision	SX000i Provisioning Concept

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Attribute Name	Type	Definition	Class Name	UoF
maintenanceConceptRevisionValidity	DateRange	maintenanceConceptRevisionValidity is a DateRange during which an MaintenanceConceptRevision is valid.	ProvisioningConceptRevision	SX000i Provisioning Concept
maintenanceConceptSiteDescription	DescriptorType	maintenanceConceptSiteDescription is a narrative statement explaining the rationale for the need of a site in the context of a MaintenanceConceptRevision .	MaintenanceConceptSite	SX000i Maintenance Concept
maintenanceConceptSiteType	ClassificationType	maintenanceConceptSiteType is a <<classification>> that allows to categorize a site from a MaintenanceConcept point of view.	MaintenanceConceptSite	SX000i Maintenance Concept
maintenanceFacilityLevelDuring	DateRange	maintenanceFacilityLevelDuring is the period of time during which a MaintenanceFacility complies with a certain MaintenanceLevel .	MaintenanceFacilityLevel	SX000i Maintenance Concept
maintenanceFacilityShifts	umlInteger	maintenanceFacilityShifts is the number of staff shifts in a MaintenanceFacility .	MaintenanceFacility	SX000i Specializations
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 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 Product Usage Context
maintenanceLevelName	NameType	maintenanceLevelName is a name by which the MaintenanceLevel is known and can be easily referenced.	MaintenanceLevel	CDM Product Usage Context
managedFleetDuring	DateRange	managedFleetDuring is a <<DateRange>> that represents the period during which a FleetManager manages a specific Fleet .	ManagedFleet	SX000i Fleet Environment
materialItemCategoryCode	umlString	materialItemCategoryCode is a string of characters that represents the material item category code attribute of the data module code.	S1000DDataModule	CDM UoF Document

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Attribute Name	Type	Definition	Class Name	UoF
meetingAgreementDescription	DescriptorType	meetingAgreementDescription is a narrative statement explaining the MeetingAgreement .	MeetingAgreement	SX000i Meeting
meetingAgreementIdentifier	IdentifierType	meetingAgreementIdentifier is an identifier that establishes a unique designator for a MeetingAgreement to differentiate it from other instances of MeetingAgreement .	MeetingAgreement	SX000i Meeting
meetingAttendanceType	ClassificationType	meetingAttendanceType is a <<classification>> that allows to determine the means by which an attendee has attended a meeting.	MeetingAttendees	SX000i Meeting
meetingContextType	ClassificationType	meetingContextType is a <<classification>> that allows to define the type of context within the scope of an Action .	MeetingContext	SX000i Meeting
meetingDate	DateType	meetingDate is the date at which a meeting is scheduled or took place.	Meeting	SX000i Meeting
meetingDescription	DescriptorType	meetingDescription is a narrative statement explaining the reason for a meeting.	Meeting	SX000i Meeting
meetingIdentifier	IdentifierType	meetingIdentifier is an identifier that establishes a unique designator for a Meeting to differentiate it from other instances of Meeting .	Meeting	SX000i Meeting
meetingRelationshipType	ClassificationType	meetingRelationshipType is a <relationship> that allows the association a Meeting with other Meetings .	MeetingRelationship	SX000i Meeting
meetingSequence	TextPropertyType	meetingSequence is a text describing the meeting number for a series of sequential meetings about a same topic.	Meeting	SX000i Meeting
messageContentStatus	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

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Attribute Name	Type	Definition	Class Name	UoF
messageCreationDateTime	DateTimeType	messageCreationDateTime 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
milestoneAssessmentDescription	DescriptorType	milestoneAssessmentDescription is a narrative statement explaining the reason for the MilestoneAssessment .	MilestoneAssessment	SX000i Project Milestones
milestoneAssessmentResult	ClassificationType	milestoneAssessmentResult is a <<classification>> that documents the evaluation of whether a Milestone has or not been achieved.	MilestoneAssessment	SX000i Project Milestones
milestoneContractualDate	DateType	milestoneContractualDate is a date for a Milestone defined by a Contract .	Milestone	SX000i Project Milestones
milestoneDescription	DescriptorType	milestoneDescription is a narrative statement explaining a Milestone .	Milestone	SX000i Project Milestones
milestoneIdentifier	IdentifierType	milestoneIdentifier is an identifier that establishes a unique designator for a Milestone to differentiate it from other instances of Milestone .	Milestone	SX000i Project Milestones
milestoneName	NameType	milestoneName is a name by which the Milestone is known and can be easily referenced.	Milestone	SX000i Project Milestones

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Attribute Name	Type	Definition	Class Name	UoF
missionDefinitionDescription	DescriptorType	missionDefinitionDescription is a description of the Product operational scenario.	MissionDefinitionRevision	CDM UoF Mission Definition
missionDefinitionFrequency	PropertyType	missionDefinitionFrequency is a property that specifies the rate of occurrence.	MissionDefinitionRevision	CDM UoF Mission Definition
missionDefinitionName	NameType	missionDefinitionName is a name by which the mission definition is known and can be easily referenced.	MissionDefinition	CDM UoF Mission Definition
missionDefinitionObjective	DescriptorType	missionDefinitionObjective is a description that specifies the expected end state after the defined MissionDefinition is completed.	MissionDefinitionRevision	CDM UoF Mission Definition
missionDefinitionPartyRole	ClassificationType	missionDefinitionPartyRole is a classification that identifies the association that a MissionDefinitionParty has with the MissionDefinition .	MissionDefinitionParty	CDM UoF Mission Definition
missionDefinitionRelationshipType	ClassificationType	MissionDefinitionRelationshipType is a classification that identifies the meaning of the established relationship.	MissionDefinitionRelationship	CDM UoF Mission Definition
missionDefinitionRevisionDate	DateType	missionDefinitionRevisionDate is a date that specifies when a MissionDefinition was revised.	MissionDefinitionRevision	CDM UoF Mission Definition
missionDefinitionRevisionIdentifier	IdentifierType	missionDefinitionRevisionIdentifier is an identifier that establishes a unique designator for a MissionDefinitionRevision and to differentiate it from other instances of MissionDefinitionRevision .	MissionDefinitionRevision	CDM UoF Mission Definition
missionDefinitionRevisionRationale	DescriptorType	missionDefinitionRevisionRationale is a description that gives more information on the justification for revising the MissionDefinition .	MissionDefinitionRevision	CDM UoF Mission Definition
missionDefinitionRevisionStatus	StateType	missionDefinitionRevisionStatus is a state that identifies the maturity of a MissionDefinitionRevision .	MissionDefinitionRevision	CDM UoF Mission Definition

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Attribute Name	Type	Definition	Class Name	UoF
missionDefinitionType	ClassificationType	missionDefinitionType is a classification that identifies further specialization for a MissionDefinition .	MissionDefinition	CDM UoF Mission Definition
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
necessaryInfrastructureNeed	ClassificationType	necessaryInfrastructureNeed is a <<classification>> that determines the need of the infrastructure in order to comply with the requirement.	NecessaryInfrastructure	SX000i Project Requirements
necessaryInfrastructureRequirementDate	DateType	necessaryInfrastructureRequirementDate is the date at which a specific Infrastructure is required in order to fulfill the requirement for such infrastructure.	NecessaryInfrastructure	SX000i Project Requirements
operatingBaseCapacityIdentifier	IdentifierType	operatingBaseCapacityIdentifier is a string that uniquely identifies an OperatingBaseCapacity and allows to differentiate it from other OperatingBaseCapacities.	OperatingBaseCapacity	SX000i Operating Base
operatingBaseProductVariantCapacity	umlInteger	operatingBaseProductVariantCapacity is the number of ProductVariants that can operate simultaneously at a specific OperatingBase .	OperatingBaseCapacity	SX000i Operating Base
operatingBaseType	ClassificationType	operatingBaseType is a <<classification>> that identifies further specialization for an OperatingBase .	OperatingBase	SX000i Operating Base
operatingLocationTypeDescription	DescriptorType	operatingLocationTypeDescription is a description that gives more information on the OperatingLocationType , including environmental conditions to be expected.	OperatingLocationType	CDM Product Usage Context
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 Product Usage Context

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Attribute Name	Type	Definition	Class Name	UoF
operatingLocation TypeName	NameType	operatingLocationTypeName is a name by which the OperatingLocationType is known and can be easily referenced.	OperatingLocationType	CDM Product Usage Context
operationalConceptScenarioDuration	PropertyType	operationalConceptScenarioDuration is the expected time that an OperationalConceptScenario will last in the context of an OperationalConceptRevision .	OperationalConceptScenario	SX000i Operational Concept
operationalConceptScenarioFrequency	PropertyType	operationalConceptScenarioFrequency is how often it is expected that an OperationalConceptScenario will occur in the context of an OperationalConceptRevision .	OperationalConceptScenario	SX000i Operational Concept
operationalConceptSitePurpose	DescriptorType	operationalConceptSitePurpose is a narrative statement explaining the purpose of a site in the context of an OperationalConcept .	OperationalConceptSites	SX000i Operational Concept
operationalConceptSitePurposeType	ClassificationType	operationalConceptSitePurposeType is a <<classification>> that allows to group different types of OperationalConceptSitePurposes ,	OperationalConceptSites	SX000i Operational Concept
operationalConceptSiteRequiredDuring	DateRange	operationalConceptSiteRequiredDuring is the period of time during which a site is required in the context of an OperationalConcept .	OperationalConceptSites	SX000i Operational Concept
operationalRoleDelta	ValueWithTolerancesPropertyType	operationalRoleDelta is a value that describes the delta regarding the baseline configuration of the OperationalRole in regard to the baseline ProductVariant .	OperationalRole	SX000i Operational Roles
operationalRoleDescription	DescriptorType	operationalRoleDescription is a narrative statement of what a specific OperationalRole is.	OperationalRole	SX000i Operational Roles
operationalRoleIdentifier	IdentifierType	operationalRoleIdentifier is a string of characters that uniquely identifies an OperationalRole .	OperationalRole	SX000i Operational Roles
operationalRoleTime	PropertyType	operationalRoleTime is a period of time associated to the OperationalRole .	OperationalRole	SX000i Operational Roles

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Attribute Name	Type	Definition	Class Name	UoF
		Example - pre-flight time - start-up time - turn-around time		
operationalRoleType	ClassificationType	operationalRoleType is a <<classification>> that allows to group different OperationalRoles .	OperationalRole	SX000i Operational Roles
operationalScenarioDescription	DescriptorType	operationalScenarioDescription is a narrative statement explaining the OperationalScenario .	OperationalScenario	SX000i Operational Scenario Definition
operationalScenarioIdentifier	IdentifierType	operationalScenarioIdentifier is an identifier that establishes a unique designator for an OperationalScenario to differentiate it from other OperationalScenario instances.	OperationalScenario	SX000i Operational Scenario Definition
operationalScenarioRevisionDate	DateType	operationalScenarioRevisionDate is the creation date of the OperationalScenarioRevision .	OperationalScenarioRevision	SX000i Operational Scenario Definition
operationalScenarioRevisionDuration	PropertyType	operationalScenarioRevisionDuration is the expected time that an OperationalScenarioRevision will take from start to finish.	OperationalScenarioRevision	SX000i Operational Scenario Definition
operationalScenarioRevisionFrequency	PropertyType	operationalScenarioRevisionFrequency is how often it is expected that the OperationalScenarioRevision will occur. Example - If the OperationalScenario is a deployment, in one revision it can be considered that only three deployments will be performed over the life of an individual product,	OperationalScenarioRevision	SX000i Operational Scenario Definition
operationalScenarioRevisionIdentifier	IdentifierType	operationalScenarioRevisionIdentifier is an identifier that establishes a unique designator for an OperationalScenarioRevision to differentiate it from other instances of OperationalScenarioRevision .	OperationalScenarioRevision	SX000i Operational Scenario Definition

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Attribute Name	Type	Definition	Class Name	UoF
operationalScenarioRevisionMissionFrequency	PropertyType	operationalScenarioRevisionMissionFrequency is the frequency of missions that are expected to be performed as part of an OperationalScenarioRevision . Example - Daily missions are expected in one deployment operational scenario revision, and two missions per day in a different revision.	OperationalScenarioRevisionMission	SX000i Operational Scenario Definition
operationalScenarioRevisionPeriod	DateRange	operationalScenarioRevisionPeriod is a range of dates during which the OperationalScenarioRevision is expected to occur.	OperationalScenarioRevision	SX000i Operational Scenario Definition
operationalScenarioRevisionRationale	DescriptorType	operationalScenarioRevisionRationale is a narrative statement explaining the reason for the current OperationalScenarioRevision .	OperationalScenarioRevision	SX000i Operational Scenario Definition
operationalScenarioRevisionStatus	StateType	operationalScenarioRevisionStatus is the state at which an OperationalScenarioRevision is at a specific moment in time.	OperationalScenarioRevision	SX000i Operational Scenario Definition
operationalScenarioType	ClassificationType	operationalScenarioType is a <<classification>> that allows to group different types of OperationalScenarios . Example - intensive usage rate - low usage rate - normal use	OperationalScenario	SX000i Operational Scenario Definition
oppositeAngle	PropertyType	oppositeAngle is the angle between the two sides opposite of the base of a triangle.	Triangle	SX000i Compound Attributes
organizationalBreakdownStructureRevisionDate	DateType	organizationalBreakdownStructureRevisionDate is the date at which the OrganizationalBreakdownStructureRevision was created.	OrganizationalBreakdownStructureRevision	SX000i Organizational Breakdown Structure

Attribute Name	Type	Definition	Class Name	UoF
organizationalBreakdownStructureRevisionIdentifier	IdentifierType	organizationalBreakdownStructureRevisionIdentifier is a string of characters that uniquely identify an OrganizationalBreakdownStructureRevision and differentiate it from other OrganizationalBreakdownStructureRevision Instances.	OrganizationalBreakdownStructureRevision	SX000i Organizational Breakdown Structure
organizationalBreakdownStructureRevisionPeriod	DateRange	organizationalBreakdownStructureRevisionPeriod is the period of time during which an OrganizationalBreakdownStructureRevision is or has been in effect.	OrganizationalBreakdownStructureRevision	SX000i Organizational Breakdown Structure
organizationalBreakdownStructureRevisionRationale	DescriptorType	organizationalBreakdownStructureRevisionRationale is a description that indicates the reason for this OrganizationalBreakdownStructureRevision .	OrganizationalBreakdownStructureRevision	SX000i Organizational Breakdown Structure
organizationalBreakdownStructureRevisionStatus	StateType	organizationalBreakdownStructureRevisionStatus is a state that identifies the maturity of an OrganizationalBreakdownStructureRevision .	OrganizationalBreakdownStructureRevision	SX000i Organizational Breakdown Structure
organizationalRoleDescription	DescriptorType	organisationalRoleDescription is a textual narrative statement describing an OrganizationalRole	OrganizationalRole	SX000i Organizational Breakdown Structure
organizationalRoleType	ClassificationType	organisationalRoleType is a <<classification>> that allows to group similar OrganisationalRoles.	OrganizationalRole	SX000i Organizational Breakdown Structure
organizationDates	DateRange	organizationDates is a period of time during which the organization exists.	Organization	SX000i Specializations
organizationDescription	DescriptorType	organizationDescription is a textual narrative statement that explains what the Organization is.	Organization	SX000i Specializations
organizationLocationDuration	DateRange	organizationLocationDuration is the period of time during which an Organization is located at a specific Location .	OrganizationLocation	SX000i Organization Location

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Attribute Name	Type	Definition	Class Name	UoF
organizationLocationType	ClassificationType	organizationLocationType is a <<classification>> that allows to group different types of OrganizationLocations .	OrganizationLocation	SX000i Organization Location
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	SX000i Operator
organizationType	ClassificationType	organizationType is a <<classification>> that allows to define groups of organizations.	Organization	SX000i Specializations
otherFacilityType	ClassificationType	otherFacilityType is a <<classification>> that allows to differentiate between different classes of OtherFacilities.	OtherFacility	SX000i Facility
partDefinitionIdentifier	IdentifierType	partDefinitionIdentifier is an identifier that identifies the design standard to which the serialized part adheres.	SoftwarePartAsReleased	CDM UoF Part As Realized
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
partName	NameType	partName is a name by which the PartAsDesigned is known and can be easily referenced.	PartAsDesigned	CDM UoF Part Definition
partyAddressDuration	DateRange	Period of time during which the address of a Party is valid.	PartyAddress	SX000i Party
partyAddressType	ClassificationType	partyAddressType is a <<classification>> describing the type of relationship between a Party and an Address.	PartyAddress	SX000i Party
partyContactDataDetails	DescriptorType	partyContactDataDetails is a description that provides further details on the contact data of a Party .	PartyContactData	SX000i Party
partyContactDataType	ClassificationType	partyContactDataType is a <<classification>> that allows to qualify the PartyContactData .	PartyContactData	SX000i Party

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Attribute Name	Type	Definition	Class Name	UoF
partyRelationshipDescription	DescriptorType	partyRelationshipDescription is a textual narrative statement explaining the association between two Parties.	PartyRelationship	SX000i Party
partyRelationshipDuration	DateRange	The date range during which the association between two parties exists.	PartyRelationship	SX000i Party
partyRelationshipType	ClassificationType	partyRelationshipType is a relationship describing how two Parties are associated.	PartyRelationship	SX000i Party
partySecurityAssignmentPeriod	DateRange	partySecurityAssignmentPeriod is range of dates that indicates during which a Party has been assigned a certain security clearance.	PartySecurityAssignment	SX000i Security Classification
performanceParameterCalculationMethod	DescriptorType	performanceParameterCalculationMethod is a description that gives more information on the method by which the performanceParameterValue has been derived.	PerformanceParameterValueGroup	CDM UoF Performance Parameter
performanceParameterRevisionDate	DateType	performanceParameterRevisionDate is a date that defines when a PerformanceParameterRevision was defined.	PerformanceParameterRevision	CDM UoF Performance Parameter
performanceParameterRevisionIdentifier	IdentifierType	performanceParameterRevisionIdentifier is an identifier that establishes a unique designator for a PerformanceParameterRevision and to differentiate it from other instances of PerformanceParameterRevision.	PerformanceParameterRevision	CDM UoF Performance Parameter
performanceParameterRevisionRationale	DescriptorType	performanceParameterRevisionRationale is a description that gives more information on the justification for revising the defined PerformanceParameter and its values.	PerformanceParameterRevision	CDM UoF Performance Parameter
performanceParameterRevisionStatus	StateType	performanceParameterRevisionStatus is a state that identifies the maturity of a PerformanceParameterRevision.	PerformanceParameterRevision	CDM UoF Performance Parameter
performanceParameterType	ClassificationType	performanceParameterType is a classification that identifies the type of PerformanceParameter being exchanged.	PerformanceParameter	CDM UoF Performance Parameter

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Attribute Name	Type	Definition	Class Name	UoF
performanceParameterValue	PropertyType	performanceParameterValue is a property that represents a value which is determined for the PerformanceParameter .	PerformanceParameterValueGroup	CDM UoF Performance Parameter
performanceParameterValueFraction	PropertyType	performanceParameterValueFraction is a property that represents the fraction of all occurrences related to a specified PerformanceParameter that must be within the limit of the defined performanceParameterValue. Example - A customer requirement is that 98% of all replacement tasks must be performed below a specified value of two hours (= maximum replacement time)	PerformanceParameterValueGroup	CDM UoF Performance Parameter
performanceParameterValueLimitQualifier	ClassificationType	performanceParameterValueLimitQualifier is a classification that specifies a directed limit to be applied when testing a value against the defined PerformanceParameter .	PerformanceParameter	CDM UoF Performance Parameter
personCompetenceAcquired	DateType	personCompetenceAcquired is a Date at which a PersonCompetence was acquired.	PersonCompetence	SX000i Person Competences and Labor Rates
personDates	DateRange	personDates are the dates during which a Person exists.	Person	SX000i Party
personFamilyName	TextPropertyType	PersonFamilyName is a text that indicates the family name of a Person .	Person	SX000i Party
personIdentifier	IdentifierType	personIdentifier is a unique identifier that differentiates a Person from any other Person .	Person	SX000i Party
personMiddleName	TextPropertyType	personMiddleName is a text that indicates the middle name of a person.	Person	SX000i Party
personName	TextPropertyType	personName is a textual description used normally to identify a Person	Person	SX000i 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	SX000i Operator

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Attribute Name	Type	Definition	Class Name	UoF
personPrefixTitle	ClassificationType	personPrefixTitle is a <<classification>> indicating a title that is used before a Person 's name.	Person	SX000i Party
personSuffixTitle	ClassificationType	personSuffixTitle is a <<classification>> indicating a title that is added after a Person name.	Person	SX000i Party
plannedProductVariantOperatorDate	DateType	plannedProductVariantOperatorDate is the date at which the Operator is expected to start the operation of the ProductVariant .	PlannedProductVariantOperator	SX000i Operator
plannedProductVariantOperatorNumber	NumericalPropertyType	plannedProductVariantOperatorNumber is the number as a specific ProductVariant that the operator is expected to operate.	PlannedProductVariantOperator	SX000i Operator
policiesAndRegulationsEffectivity	DateRange	policiesAndRegulationsEffectivity is the period of time during which a policy or regulation is in effect.	PoliciesAndRegulations	SX000i Policies and Regulations
poolDescription	DescriptorType	poolDescription is textual narrative statement explaining the purpose of a Pool .	Pool	SX000i Provisioning Concept
poolIdentifier	IdentifierType	poolIdentifier is string of characters that allows to uniquely identify a specific Pool among other Pools .	Pool	SX000i Provisioning Concept
poolName	TextPropertyType	poolName is a word or phrase under which the Pool is commonly known and to which it can be referred.	Pool	SX000i Provisioning Concept
poolType	ClassificationType	poolType is a <<classification>> that allows to determine the kind of Pool . Example - Contractual - Customer consignment stock - Multi-customer stock, contractor-owned	Pool	SX000i Provisioning Concept
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 Location

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Attribute Name	Type	Definition	Class Name	UoF
productLife	DateRange	productLife is a date range that indicates the expected or actual life of a Product .	Product	SX000i Specializations
productUsagePhaseDescription	DescriptorType	productUsagePhaseDescription is a description that gives more information on the ProductUsagePhase .	ProductUsagePhase	CDM Product Usage Phase
productUsagePhaseDuration	PropertyType	productUsagePhaseDuration is a property that specifies the average time that the ProductUsagePhaseItem will remain in the specified state.	ProductUsagePhase	CDM Product Usage Phase
productUsagePhaseName	NameType	productUsagePhaseName is a name by which the ProductUsagePhase is known and can be easily referenced.	ProductUsagePhase	CDM Product Usage Phase
productUsagePhaseRelationshipType	ClassificationType	productUsagePhaseRelationshipType is a classification that identifies the meaning of the established relationship.	ProductUsagePhaseRelationship	CDM Product Usage Phase
productVariantDescription	DescriptorType	productVariantDescription is a narrative text explaining a ProductVariant .	ProductVariant	SX000i Specializations
productVariantDimensions	ThreeDimensional	productVariantDimensions are the ThreeDimensional characteristics of a ProductVariant ,	ProductVariant	SX000i Specializations
productVariantEntryIntoServiceDate	DateType	productVariantEntryIntoServiceDate is the date at which the first item or Product of a specific ProductVariant entered service.	ProductVariant	SX000i Specializations
productVariantInFleetNumber	PropertyType	productVariantInFleetNumber is the number of ProductVariants of a specific type that are expected to be included in a FleetDefinition .	ProductVariantInFleet	SX000i Fleet Definition
productVariantLastBuyDate	DateType	productVariantLastBuyDate is the last date at which a ProductVariant can be purchased.	ProductVariant	SX000i Specializations
productVariantProductionDates	DateRange	productVariantProductionDates is the period of time during which a ProductVariant is in production.	ProductVariant	SX000i Specializations

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Attribute Name	Type	Definition	Class Name	UoF
productVariantWeight	NumericalPropertyType	productVariantWeight is a number that represents the weight of a ProductVariant .	ProductVariant	SX000i Specializations
projectDescription	DescriptorType	projectDescription is a narrative statement explaining a Project .	Project	SX000i Specializations
projectDuration	DateRange	projectDuration is the period of time during which a Project takes place.	Project	SX000i Specializations
projectImpactDescription	DescriptorType	projectImpactDescription is a narrative statement explaining how a Project impacts an item.	ProjectImpact	SX000i Project
projectImpactType	ClassificationType	projectImpactType is a <<classification>> that allows to group different types of ProjectImpact .	ProjectImpact	SX000i Project
projectRelationshipType	ClassificationType	projectRelationshipType is a <<classification>> that defines the type of relationship between two Project Instances.	ProjectRelationship	SX000i Project
projectSpecificAttributeName	validValue	projectSpecificAttributeName is a valid value that uniquely identifies a ProjectSpecificAttribute .	ProjectSpecificAttribute	S_Series_Base_Object_Definition_2-0_003-00
provisioningConceptDescription	DescriptorType	provisioningConceptDescription is a narrative statement explaining the ProvisioningConcept .	ProvisioningConcept	SX000i Provisioning Concept
provisioningConceptIdentifier	IdentifierType	provisioningConceptIdentifier is an identifier that establishes a unique designator for a ProvisioningConcept to differentiate it from other instances of IPSConcept.	ProvisioningConcept	SX000i Provisioning Concept
provisioningConceptName	NameType	provisioningConceptName is a name by which the ProvisioningConcept is known and can be easily referenced.	ProvisioningConcept	SX000i Provisioning Concept
provisioningConceptSourceType	ClassificationType	provisioningConceptSourceType is a <<classification>> that allows to group different types of provisioning concept sources.	ProvisioningConceptSource	SX000i Provisioning Concept

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Attribute Name	Type	Definition	Class Name	UoF
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
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
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

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Attribute Name	Type	Definition	Class Name	UoF
referencedDocumentRole	ClassificationType	referencedDocumentRole is a classification that identifies the function of the established relationship.	ReferencedDocument	CDM UoF Document
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
reportableActivityDescription	DescriptorType	reportableActivityDescription is a narrative statement explaining a ReportableActivity .	ReportableActivity	SX000i Reportable Activity
reportableActivityIdentifier	IdentifierType	reportableActivityIdentifier is a string of characters that is used to uniquely identify a ReportableActivity and to differentiate it from other ReportableActivities.	ReportableActivity	SX000i Reportable Activity
reportableActivityPeriod	DateRange	reportableActivityPeriod is the period of time on which the reporting is performed.	ReportableActivity	SX000i Reportable Activity
reportableActivityReportingDate	DateType	reportableActivityDate is the date at which the reporting is performed.	ReportableActivity	SX000i Reportable Activity
reportableMetricDescription	DescriptorType	reportableMetricDescription is a textual narrative explaining the reportableMetric details.	ReportableMetric	SX000i Reportable Metric
reportableMetricIdentifier	IdentifierType	reportableMetricIdentifier is a unique identifier that allows to uniquely identify a ReportableMetric from any other one.	ReportableMetric	SX000i Reportable Metric
reportableMetricPeriod	DateTimeRange	reportableMetricPeriod is the period of time over which the metric was collected.	ReportableMetric	SX000i Reportable Metric
reportableMetricType	ClassificationType	reportableMetricType is a <<classification>> that allows to group ReportableMetrics by its characteristics.	ReportableMetric	SX000i Reportable Metric
reportableMetricValue	PropertyType	reportableMetricValue is a PropertyType providing the measurable value that a ReportableMetric has during a specific reporting period.	ReportableMetric	SX000i Reportable Metric

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Attribute Name	Type	Definition	Class Name	UoF
reportPartyRole	ClassificationType	reportPartyRole is a <<classification>> that allows to define the role of a Party in relationship with a Report .	ReportParty	SX000i Report
reportPeriod	DateRange	reportPeriod is the period of time on which a report is providing information.	Report	SX000i Report
requirementDate	DateType	requirementDate is the date at which a Requirement was defined.	Requirement	SX000i Requirement
requirementDescription	DescriptorType	requirementDescription is a narrative statement that explains what the requirement is.	Requirement	SX000i Requirement
requirementId	IdentifierType	requirementId is a string of text that allows to uniquely identify a Requirement and differentiate it from other Requirements .	Requirement	SX000i Requirement
requirementName	TextPropertyType	requirementName is a text that provides an identifier by which a Requirement is commonly known.	Requirement	SX000i Requirement
requirementPartyRole	ClassificationType	requirementPartyRole is a <<classification>> that defines the role of a Party with regard to a Requirement .	RequirementParty	SX000i Requirement
requirementRaisedBy	Organization	requirementRaisedBy represents the organization that has raised a requirement.	Requirement	SX000i Requirement
requirementRelationshipType	ClassificationType	requirementRelationshipType is a <<classification>> that defines how two Requirements are related.	RequirementRelationship	SX000i Requirement
requirementStatus	StateType	requirementStatus is a state that identifies the status of the Requirement .	Requirement	SX000i Requirement
requirementTargetLevel	ClassificationType	requirementTargetLevel is a <<classification>> that indicates the extent to which a requirement must be implemented in the RequirementTargetItem .	RequirementTarget	SX000i Requirement
requirementTargetLevelDescription	DescriptorType	requirementTargetLevelDescription is a narrative statement explaining the requirementTargetLevel.	RequirementTarget	SX000i Requirement

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Attribute Name	Type	Definition	Class Name	UoF
requirementType	ClassificationType	requirementType is a <<classification>> that allows to group Requirements of a same kind.	Requirement	SX000i 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.	ResourceSpecificationRevision	CDM Resource Specification
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 Resource Specification
resourceSpecificationName	NameType	resourceSpecificationName is a name by which the ResourceSpecification is known and can be easily referenced.	ResourceSpecificationRevision	CDM Resource Specification
resourceSpecificationRevisionDate	DateType	resourceSpecificationRevisionDate a date that specifies when the ResourceSpecification was revised.	ResourceSpecificationRevision	CDM Resource Specification
resourceSpecificationRevisionIdentifier	IdentifierType	resourceSpecificationRevisionIdentifier is an identifier that establishes a unique designator for a ResourceSpecificationRevision and to differentiate it from other instances of ResourceSpecificationRevision .	ResourceSpecificationRevision	CDM Resource Specification
resourceSpecificationRevisionRationale	DescriptorType	resourceSpecificationRevisionRationale is a description that gives more information on the justification for revising the ResourceSpecification .	ResourceSpecificationRevision	CDM Resource Specification
resourceSpecificationRevisionStatus	StateType	resourceSpecificationRevisionStatus is a state that identifies the maturity of a ResourceSpecificationRevision .	ResourceSpecificationRevision	CDM Resource Specification
resourceSpecificationType	ClassificationType	resourceSpecificationType is a classification that identifies further specialization for a ResourceSpecification .	ResourceSpecification	CDM Resource Specification
riskConsequence	DescriptorType	riskConsequence is a descriptive text outlining the consequences that the non-mitigation of a risk could have.	Risk	SX000i Risk Management

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Attribute Name	Type	Definition	Class Name	UoF
riskDescription	DescriptorType	riskDescription is a narrative statement explaining a Risk .	Risk	SX000i Risk Management
riskIdentifier	IdentifierType	riskIdentifier is an identifier that uniquely designates a Risk and allows to differentiate it from other Risk instances.	Risk	SX000i Risk Management
riskImpact	ClassificationType	riskImpact is a <<classification>> that determines the importance of the consequences if the Risk materializes.	Risk	SX000i Risk Management
riskImpactAfterMitigation	ClassificationType	riskImpactAfterMitigation is a <<classification>> that categorizes how severe a risk could be after the risk mitigation plan has been implemented.	RiskMitigationPlan	SX000i Risk Management
riskLikelihoodAfterMitigation	ClassificationType	riskLikelihoodAfterMitigation is a <<classification>> that categorizes how likely it is that a risk will occur after the risk mitigation plan has been implemented.	RiskMitigationPlan	SX000i Risk Management
riskMitigationPlanActionResult	DescriptorType	riskMitigationPlanActionResult is a narrative statement explaining the result of the implementation of an Actions as part of a RiskMitigationPlan .	RiskMitigationPlanActions	SX000i Risk Management
riskMitigationPlanContingencyPlan	DescriptorType	riskMitigationPlanContingencyPlan is a narrative statement explaining the contingency plan in case that the risk mitigation plan fails.	RiskMitigationPlan	SX000i Risk Management
riskMitigationPlanDescription	DescriptorType	riskMitigationPlanDescription is a narrative statement explaining the necessary steps that must be performed to mitigate a Risk .	RiskMitigationPlan	SX000i Risk Management
riskMitigationPlanIdentifier	IdentifierType	riskMitigationPlanIdentifier is an identifier that establishes a unique designator for a RiskMitigationPlan to differentiate it from other instances of RiskMitigationPlan .	RiskMitigationPlan	SX000i Risk Management
riskMitigationPlanName	NameType	riskMitigationPlanName is a name by which the RiskMitigationPlan is known and can be easily referenced.	RiskMitigationPlan	SX000i Risk Management
riskName	NameType	riskName is a name by which the Risk is known and can be easily referenced.	Risk	SX000i Risk Management

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Attribute Name	Type	Definition	Class Name	UoF
riskRelationshipType	ClassificationType	riskRelationshipType is a <<classification>> that determines how two Risks are related with each other.	RiskRelationship	SX000i Risk Management
riskStatusState	StateType	riskStatusState is the approval state of a riskStatus at a specific moment in time.	RiskStatus	SX000i Risk Management
riskType	ClassificationType	riskType is a <<classification>> that allows to categorize similar risks.	Risk	SX000i Risk Management
roleCapabilityDefinitionLevel	ClassificationType	roleCapabilityDefinitionLevel is a <<classification>> that allows to define the level of a CapabilityDefinition to comply with a specific OperationalRole .	RoleCapabilityDefinition	SX000i Operational Roles
roleCapabilityDefinitionLevelDescription	DescriptorType	roleCapabilityDefinitionLevelDescription is a narrative statement explaining the rationale for the roleCapabilityDefinitionLevel.	RoleCapabilityDefinition	SX000i Operational Roles
rskLikelihood	ClassificationType	rskLikelihood is a <<classification>> that determines how probable it is that the Risk materializes.	Risk	SX000i Risk Management
securityClassificationAuthority	Organization	securityClassificationAuthority identifies the Organization that is the authoritative source for the defined SecurityClassification .	SecurityClassification	CDM UoF Security Classification
securityClassificationDate	DateType	securityClassificationDate is a date when the security classification is declared.	SecurityClassification	CDM UoF Security Classification
securityClassValue	NameType	securityClassValue is a name that defines the level of confidentiality.	SecurityClass	CDM UoF Security Classification
serializedHardwarePartInServicePeriod	DateRange	serializedHardwarePartInServicePeriod is a date range during which the serialized hardware part was in service.	SerializedHardwarePart	SX000i Specializations

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Attribute Name	Type	Definition	Class Name	UoF
serializedHardwarePartManufacturingDate	DateType	serializedHardwarePartManufacturingDate is the date when the Equipment was manufactured.	SerializedHardwarePart	SX000i Specializations
serializedProductVariantDimensions	ThreeDimensional	serializedProductVariantDimensions are the ThreeDimensional characteristics of a SerializedProductVariant.	SerializedProductVariant	SX000i Specializations
serializedProductVariantEndOfServiceDate	DateType	serializedProductVariantEndOfServiceDate is the date at which the serialized Product variant was retired from service.	SerializedProductVariant	SX000i Specializations
serializedProductVariantEntryIntoServiceDate	DateType	The date at which the serialized Product variant entered into service.	SerializedProductVariant	SX000i 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	SX000i Fleet Definition
serializedProductVariantManufacturer	Organization	serializedProductVariantManufacturer is the organization which has manufactured a SerializedProductVariant.	SerializedProductVariant	SX000i Specializations
serializedProductVariantManufacturingDate	DateType	serializedProductVariantManufacturingDate is the date at which the manufacturing of a SerializedProductVariant was finished.	SerializedProductVariant	SX000i Specializations
serializedProductVariantOperatingBasePeriod	DateRange	serializedProductVariantOperatingBasePeriod is a range of dates during which a SerializedProductVariant was operating at a specific OperatingBase.	SerializedProductVariantOperatingBase	SX000i Operating Base
serializedProductVariantOperatorDuring	DateRange	serializedProductVariantOperatorDuring is the period of time during which the SerializedProductVariant was operated by a specific operator.	SerializedProductVariantOperator	SX000i Operator

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Attribute Name	Type	Definition	Class Name	UoF
serializedProductVariantWeight	NumericalPropertyType	serializedProductVariantWeight is a number that represents the weight of a SerializedProductVariantWeight.	SerializedProductVariant	SX000i Specializations
serviceContractPeriod	DateRange	serviceContractPeriod is the period of time during which a Service is associated to a Contract.	ServiceContract	SX000i Service
serviceDescription	DescriptorType	serviceDescription is a narrative statement explaining a Service.	Service	SX000i Service
serviceIdentifier	IdentifierType	serviceIdentifier is a unique identifier that allows to uniquely identify a Service from any other one.	Service	SX000i Service
serviceLevelAgreementClauseDescription	DescriptorType	serviceLevelAgreementClauseDescription is a narrative statement of the meaning of serviceLevelAgreementClause.	ServiceLevelAgreementClause	SX000i Service
serviceRelationshipType	ClassificationType	ServiceRelationship is a <<classification>> that defines how two Services are related.	ServiceRelationship	SX000i Service
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
softwareReleaseIdentifier	IdentifierType	softwareReleaseIdentifier is an identifier that establishes a unique designator for a software build and to differentiate it from other instances of software build.	SoftwarePartAsReleased	CDM UoF Part As Realized
staffedByNumber	PropertyType	StaffedBy is the expected number of people of a specific TypeOfPerson that are expected to work at a specific StaffedItem during a specified period of time.	StaffedBy	SX000i Staffing

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Attribute Name	Type	Definition	Class Name	UoF
staffedByPeriod	DateRange	StaffedByPeriod is a period of time during which a specific PersonType will work at a StaffedItem.	StaffedBy	SX000i Staffing
staffingNumber	PropertyType	staffingNumber is the number of people of a specific TypeOfPerson that are required at a staffed item during a specific period.	Staffing	SX000i Staffing
staffingPeriod	DateRange	staffingPeriod is the period of time during which a certain number of TypeOfPersons are required at a specific StaffedItem.	Staffing	SX000i Staffing
streetName	NameType	streetName is the name by which a road is officially known and can be easily referenced.	StreetAddress	CDM Location
streetNumber	umlString	streetNumber is a string of characters that represents the position along a street	StreetAddress	CDM Location
studentsToBeTrainedDescription	DescriptorType	studentsToBeTrainedDescription is a narrative statement explaining the StudentsToBeTrained.	StudentsToBeTrained	SX000i Training Concept
studentsToBeTrainedGroupIdentifier	IdentifierType	studentsToBeTrainedGroupIdentifier is an identifier that establishes a unique designator for a StudentsToBeTrainedGroup to differentiate it from other instances of StudentsToBeTrainedGroup.	StudentsToBeTrained	SX000i Training Concept
studentsToBeTrainedStrategy	ClassificationType	studentsToBeTrainedStrategy is a <<classification>> that describes the strategy to be used for the training of a group of students.	StudentsToBeTrained	SX000i Training Concept
studentsToBeTrainedValue	PropertyType	studentsToBeTrainedValue is the number of people of a specific TypeOfPerson that are expected to be trained in the context of a TrainingConceptRevision.	StudentsToBeTrained	SX000i Training Concept
subSubSystem	umlString	subSubSystem is a string of characters that represents the sub-subsystem attribute of the data module code.	S1000DDataModule	CDM UoF Document
subSystem	umlString	subSystem is a string of characters that represents the subsystem attribute of the data module code.	S1000DDataModule	CDM UoF Document

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Attribute Name	Type	Definition	Class Name	UoF
supplyProvisionTime	PropertyType	supplyProvisionTime is the average time that it takes to send an item from the supply source to the entity requiring the item.	SupplyProvision	SX000i Provisioning Concept
supplySourceManagementPeriod	DateRange	supplySourceManagementPeriod is the period of time during which a SupplySource is managed or is planned to be managed by an Organization.	SupplySourceManagement	SX000i Provisioning Concept
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
tradeName	NameType	tradeName is a name that uniquely establishes a craft or profession.	Trade	CDM UoF Competence Definition
trainingFacilityMaximumStudentCapability	PropertyType	trainingFacilityMaximumStudentCapability is the maximum number of students atht a TrainingFacility can accomodate simultaneously.	TrainingFacility	SX000i Facility
trainingFacilityType	ClassificationType	trainingFacilityType is a <<classification>> that allows to group different types of TrainingFacilities.	TrainingFacility	SX000i Facility
typeOfPersonDescription	DescriptorType	typeOfPersonDescription is a narrative statement explaining the TypeOfPerson.	TypeOfPerson	SX000i 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	SX000i Type of Person
typeOfPersonName	NameType	typeOfPersonName is a text by which a TypeOfPerson is commonly known.	TypeOfPerson	SX000i Type of Person
typeOfPersonType	ClassificationType	typeOfPersonType is a <<classification>> that allows to group different Persons that sahre the same characteristics.	TypeOfPerson	SX000i Type of Person

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Attribute Name	Type	Definition	Class Name	UoF
upperBound	umlString	upperBound is a string of characters that represents the upper limit of the range.	SerialNumberRange	S-Series_Compound_Attributes_2-0_002-00
warehouseType	ClassificationType	warehouseType is a <<classification>> that allows to differentiate between different classes of Warehouses .	Warehouse	SX000i Facility
width	PropertyType	width is a property that specifies the less extended longitudinal dimension of an object.	Rectangle	SX000i Compound Attributes
			Cuboid	S-Series_Compound_Attributes_2-0_002-00
workBreakdownDescription	DescriptorType	workBreakdownDescription is a narrative statement explaining the WorkBreakdown .	WorkBreakdown	SX000i Work Breakdown
workBreakdownIdentifier	IdentifierType	workBreakdownIdentifier is a string of text that uniquely identifies a WorkBreakdown , allowing to differentiate it from all other WorkBreakdowns .	WorkBreakdown	SX000i Work Breakdown
workBreakdownName	DescriptorType	workBreakdownName is a word or phrase by which the WorkBreakdown is commonly known.	WorkBreakdown	SX000i Work Breakdown
workBreakdownRelationshipType	ClassificationType	workBreakdownRelationshipType is a <<classification>> that defines how two WorkBreakdowns are related.	WorkBreakdownRelationship	SX000i Work Breakdown
workBreakdownRevisionDate	DateType	workBreakdownRevisionDate is a date that indicates when a WorkBreakdownRevision was created.	WorkBreakdownRevision	SX000i Work Breakdown
workBreakdownRevisionIdentifier	IdentifierType	workBreakdownRevisionIdentifier is a string of characters which uniquely identifies a WorkBreakdownRevision .	WorkBreakdownRevision	SX000i Work Breakdown
workBreakdownRevisionRationale	DescriptorType	workBreakdownRevisionRationale is a description of why the revision for the WorkBreakdown was created.	WorkBreakdownRevision	SX000i Work Breakdown

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Attribute Name	Type	Definition	Class Name	UoF
workBreakdownRevisionStatus	StateType	workBreakdownRevisionStatus is a state that identifies the maturity of a WorkBreakdownRevision .	WorkBreakdownRevision	SX000i Work Breakdown
workItemDescription	DescriptorType	workItemDescription is a narrative statement explaining what the WorkItem is.	WorkItem	SX000i Work Breakdown
workItemIdentifier	IdentifierType	workItemIdentifier is a string of characters that uniquely identifies a WorkItem .	WorkItem	SX000i Work Breakdown
workItemPeriod	DateRange	workItemPeriod is the period during which a WorkItem has to take place.	WorkItem	SX000i Work Breakdown
workItemRelationshipType	ClassificationType	workItemRelationshipType is a <<classification>> indicating the relationship type between two WorkItems .	WorkItemRelationship	SX000i Work Breakdown
workItemStatus	ClassificationType	workItemStatus is a <<classification>> that defines the situation of a WorkItem .	WorkItem	SX000i 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	SX000i 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	SX000i Work Breakdown
workItemType	ClassificationType	workItemType is a <<classification>> that allows to define different categories of work for a WorkItems .	WorkItem	SX000i Work Breakdown

4 Data element valid values

The full list of SX000i attribute valid values is provided in [Table 4](#). This includes valid values from SX002D used by SX000i but defined in SX001G. Note that the specification does not yet define valid values for all classification types and identifiers that can require one. Similarly, it should be highlighted that the valid values are recommended values and not mandatory. Refer to [Chap 7](#) for the tailoring of the valid values.

Table 4 List of SX000i valid values

Attribute name	Valid value	Valid value name
actionContextType	R	SX001G:requiredBy
actionPriority	C	SX001G:criticalAction
	R	SX001G:routineAction
	U	SX001G:urgentAction
actionType	APP	SX001G:approveAction
	BLK	SX001G:blockAction
	DIS	SX001G:discardAction
	HLD	SX001G:putOnHoldAction
	INS	SX001G:inspectAction
	RED	SX001G:redesignAction
	REJ	SX001G:rejectAction
	RPL	SX001G:replaceAction
actualContractDeliveryDateStatus	WDR	SX001G:withdrawAction
	A	SX001G:accepted
	R	SX001G:rejected
breakdownElementEssentiality	U	SX001G:underEvaluationorTest
	1	SX001G:criticalBreakdownElement
breakdownElementIdentifier	2	SX001G:partialCriticalBreakdownElement
	ASD	SX001G:asdSystemHardwareIdentificationCode
	CSN	SX001G:figureItemIdentifier
	LCN	SX001G:fullLogisticsSupportAnalysisControlNumber
budgetIdentifier	SNS	SX001G:standardNumberingSystemIdentifier
	BI	SX001G:budgetIdentifierCode
budgetType	C	SX001G:cashFlowBudget
	F	SX001G:financialBudget
	M	SX001G:masterBudget
	O	SX001G:operationalBudget
	P	SX001G:provisionalBudget

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Attribute name	Valid value	Valid value name
	S	SX001G:staticBudget
capabilityDefinitionCategory	MI	SX001G:MissionCapability
	OP	SX001G:operationalCapability
	SU	SX001G:supportCapability
capabilityDefinitionCharacteristicValueComparisonOperator		Refer to comparisonOperatorCode valid value library, Para 5
capabilityDefinitionIdentifier	ID	SX001G:capabilityDefinitionIdentifier
capabilityDefinitionRevisionIdentifier	ID	SX001G:capabilityDefinitionRevisionIdentifier
capabilityDefinitionRevisionStatus		Refer to revisionStatusCode valid value library, Para 5
commentActionType	AP	SX001G:commentApproved
	CLA	SX001G:commentClarificationRequested
	CLO	SX001G:commentClosed
	CR	SX001G:commentRaised
	RJ	SX001G:commentRejected
	RP	SX001G:commentResponded
	UI	SX001G:commentUnderInvestigation
commentIdentifier	C	SX001G:commentId
contractClauseIdentifier	C	SX001G:contract
contractDeliverableType	DOC	SX0001G:documentDeliverable
	PROD	SX000i:Product
contractRelationshipType	EXTC	SX001G:extendsContract
	RELC	SX001G:relatedContract
	REPC	SX001G:replacesContract
contractStatus	A	SX001G:contractAgreedButNotSigned
	C	SX001G:contractCancelled
	D	SX001G:contractInDraft
	E	SX001G:contractExtended
	N	SX001G:contractUnderNegotiation
	P	SX001G:contractInPrincipleAgreed
	S	SX001G:contractSigned
costBreakdownIdentifier	CBS	SX001G:costBreakdownStructure

Applicable to: All

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Attribute name	Valid value	Valid value name
costBreakdownRevisionIdentifier	CBSRID	SX001G:costBreakdownStructureRevisionId
costBreakdownRevisionStatus		Refer to revisionStatusCode valid value library, Para 5
costEntryIdentifier	C	SX001G:contract
	O	SX001G:organization
	P	SX001G:project
costItemIdentifier	CI	SX001G:costIdentifier
countryCode		Refer to countryCodeValues valid value library, Para 5
dataModuleIssueLanguage		Refer to languageCodeValues valid value library, Para 5
dataModuleIssueLanguageCountry		Refer to countryCodeValues valid value library, Para 5
digitalFileContentClass	3D	SX001G:3dModelFileContent
	AUD	SX001G:audioFileContent
	BIT	SX001G:builtInTestFileContent
	CSW	SX001G:coursewareFileContent
	DRW	SX001G:drawingFileContent
	HUM	SX001G:healthAndUsageDataFileContent
	INS	SX001G:instructionsFileContent
	INV	SX001G:invoiceFileContent
	MAN	SX001G>manualFileContent
	MOV	SX001G:movieFileContent
	OTH	SX001G:otherFileContent
	PHO	SX001G:photographFileContent
	PRB	SX001G:problemReportFileContent
	PUB	SX001G:publicationFileContent
	REP	SX001G:reportFileContent
	SCH	SX001G:schematicsFileContent
	SOU	SX001G:soundFileContent
	TST	SX001G:testResultsFileContent
	VID	SX001G:videoFileContent
	WIR	SX001G:wiringFileContent
digitalFileLocator	ID	SX001G:digitalFileLocator

Applicable to: All

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Attribute name	Valid value	Valid value name
digitalFileType	ASF	SX001G:advanceSystemsFormatFileType
	AVI	SX001G:audioVideoInterleavedFileType
	BIN	SX001G:binaryFileType
	CGM	SX001G:computerGraphicsMetafileFileType
	DAT	SX001G:dataFormatFileType
	DOC	SX001G:microsoftWordFormatFileType
	EDF	SX001G:europeanDataFormatSigalFileType
	HTM	SX001G:hyperTextMarkupLanguageFileType
	JPEG	SX001G:jointPhotographicExpertsGroupFileType
	MOV	SX001G:quickTimeMovieFileType
	MP3	SX001G:mp3AudioFileType
	MPEG	SX001G:motionPictureExpertsGroupMovieFileType
	ODS	SX001G:openDocumentSpreadsheetFileType
	ODT	SX001G:openDocumentTextFileType
	OTH	SX001G:otherFileType
	PDF	SX001G:portableDocumentFormatFileType
	PNG	SX001G:portableNetworkGraphicsFileType
	RAW	SX001G:rawSampleAudioFileType
	TIFF	SX001G:taggedImageFileFormatFileType
	TXT	SX001G:textFileType
	UNK	SX001G:unknownFileType
	WAV	SX001G:waveformAudioFileType
	XLS	SX001G:microsoftExcelFormatFileType
	XLSX	SX001G:microsoftExcelFormatFileType
	XSD	SX001G:xmlSchemaDefinitionFileType
environmentalDefinitionImpactSeverity	E	SX001G:extreme
	L	SX001G:low
	M	SX001G:moderate
	N	SX001G:none
	S	SX001G:severe
environmentDefinitionIdentifier	ID	SX001G:environmentDefinitionIdentifier
environmentDefinitionImpactSeverity	E	SX001G:extreme
	L	SX001G:low

Applicable to: All

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Attribute name	Valid value	Valid value name
	M	SX001G:moderate
	N	SX001G:none
	S	SX001G:severe
environmentDefinitionRelationshipType	SPEC	SX001G:specializationOfEnvironmentDefinition
	SSNL	SX001G:seasonalEnvironmentDefinitionVariation
environmentDefinitionRevisionIdentifier	ID	SX001G:environmentDefinitionRevisionIdentifier
environmentDefinitionRevisionStatus	Refer to revisionStatusCode valid value library, Para 5	
exportControlLicenseType	PRM	SX001G:permanent
	TMP	SX001G:temporary
exportControlPartyRole	CON	SX001G:consignor
	FRE	SX001G:freightForwarder
	MAN	SX001G:manufacturer
	SEL	SX001G:seller
	SRC	SX001G:source
	USR	SX001G:endUser
exportControlPartyType	G	SX001G:government
	I	SX001G:industry
exportControlRegulationLegalCode	AWV	SX001G:AWV
	AWV9	SX001G:AWV9
	EAR	SX001G:EAR
	EG	SX001G:EG
	ESA11	SX001G:ESA11
	ESA12	SX001G:ESA12
	ESA22	SX001G:ESA22
	ESA31	SX001G:ESA31
	FRMTG	SX001G:FRMTG
	FRNAT	SX001G:FRNAT
	ITAR	SX001G:ITAR
	KWKG	SX001G:KWKG
	UKMIL	SX001G:UKMIL
facilityGovernanceType	C	SX001G:civilianFacility
	D	SX001G:militaryAndCivilianFacility

Applicable to: All

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Attribute name	Valid value	Valid value name
	M	SX001G:militaryFacility
facilityLocationIdentifier	ID	SX001G:facilityLocationIdentifier
	SEQ	SX001G:facilityLocationSequenceIdentifier
facilityRelationshipType	INCL	SX001G:includesFacility
fleetIdentifier	OEM	SX001G:originalEquipmentManufacturer
	OPER	SX001G:operator
geographicalAreaType	ADM	SX001G:administrativeRegion
	CITY	SX001G:city
	CON	SX001G:continent
	CTYG	SX001G:countryGroup
	DES	SX001G:desert
	ISL	SX001G:island
	LAN	SX001G:landmass
	LND	SX001G:landmark
	MOU	SX001G:mountainRange
	MUL	SX001G:multiGeographicalArea
	OCE	SX001G:ocean
	REG	SX001G:geographicalRegion
	SEA	SX001G:sea
geographicalCoordinateSystem	DD	SX001G:decimalDegreeGeographicalCoordinateSystem
	DMS	SX001G:degreeMinutesSecondsGeographicalCoordinateSystem
infrastructureAvailableType	F	SX001G:fullyAvailable
	N	SX001G:notAvailable
	P	SX001G:partiallyAvailable
	R	SX001G:availableWithRestrictions
	S	SX001G:availableOnSharedBasis
infrastructureComplianceLevel	F	SX001G:fullInfrastructureCompliance
	N	SX001G:nonInfrastructureCompliance
	P	SX001G:partialInfrastructureCompliance
infrastructureIdentifier	OPER	SX001G:operator
	OWN	SX001G:owner
	OP	SX001G:infrastructureOperator

Applicable to: All

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Attribute name	Valid value	Valid value name
infrastructurePartyRole	OW	SX001G:infrastructureOwner
	USR	SX001G:infrastructureUser
infrastructureRevisionIdentifier	OPER	SX001G:operator
	OWN	SX001G:owner
infrastructureRevisionStatus		Refer to revisionStatusCode valid value library, Para 5
instructionalStrategyLearningDomain	A	Affective
	C	Cognitive
	P	Psychomotor
instructionalStrategyRevisionStatus		Refer to revisionStatusCode valid value library, Para 5
ipsConceptRevisionIdentifier	OPER	SX001G:operator
	OWN	SX001G:owner
ipsConceptRevisionStatus		Refer to revisionStatusCode valid value library, Para 5
limitationQualifier	G	SX001G:marginally
	M	SX001G:moderately
	S	SX001G:severely
limitationType	F	SX001G:functionality
	P	SX001G:performance
	R	SX001G:range
	S	SX001G:speed
	W	SX001G:weight
locationDefinitionRevisionStatus		Refer to revisionStatusCode valid value library, Para 5
locationRelationshipType	IN	SX001G:locationLocatedIn
	NXT	SX001G:locationLocatedNextTo
maintenanceConceptRevisionIdentifier	OPER	SX001G:operator
	OWN	SX001G:owner
maintenanceConceptRevisionStatus		Refer to revisionStatusCode valid value library, Para 5
maintenanceLevelIdentifier	ID	SX001G:maintenanceLevelIdentifier
meetingAttendanceType	A	SX001G:apologies
	P	SX001G:present
	PT	SX001G:partTime

Applicable to: All

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Attribute name	Valid value	Valid value name
	T	SX001G:teleconference
	V	SX001G:videoconference
messageContentStatus	F	SX001G:finalMessageContent
	P	SX001G:preliminaryMessageContent
messageContentType	B	SX001G:baselineMessage
	U	SX001G:netChangeMessage
messageLanguage		Refer to languageCodeValues valid value library, Para 5
messagePartyType	F	SX001G:messageForwarder
	R	SX001G:messageReceiver
messageRelationshipType	A	SX001G:acknowledgementOfMessage
	O	SX001G:observationOnMessage
	U	SX001G:updateToMessage
milestoneAssessmentResult	A	SX001G:achieved
	C	SX001G:achievedWithCommentsOrActions
	N	SX001G:notAchieved
	P	SX001G:partiallyAchieved
missionDefinitionPartyRole	C	SX001G:missionDefinitionCarriedOutBy
missionDefinitionRelationshipType	DEP	SX001G:dependentOnMissionDefinition
	EXT	SX001G:extensionOfMissionDefinition
	SUB	SX001G:subordinateMissionDefinition
missionDefinitionRevisionIdentifier	ID	SX001G:missionDefinitionRevisionIdentifier
missionDefinitionRevisionStatus		Refer to revisionStatusCode valid value library, Para 5
missionDefinitionType	SAR	SX001G:searchAndRescueMission
	SRV	SX001G:surveillanceMission
necessaryInfrastructureNeed	C	critical
	D	desirable
	N	necessary
operatingBaseCapacityIdentifier	OPER	SX001G:operator
	OWN	SX001G:owner
operatingBaseType	D	SX001G:deploymentOperatingBase
	F	SX001G:forwardOperatingBase
	M	SX001G:mainOperatingBase

Applicable to: All

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Attribute name	Valid value	Valid value name
operatingLocationTypeIdentifier	ID	SX001G:operatingLocationTypeIdentifier
operationalRoleIdentifier	OEM	SX001G:originalEquipmentManufacturer
	OPER	SX001G:operator
operationalScenarioRevisionStatus		Refer to revisionStatusCode valid value library, Para 5
organizationalBreakdownStructureRevisionIdentifier	C	SX001G:contract
	P	SX001G:project
organizationalBreakdownStructureRevisionStatus		Refer to revisionStatusCode valid value library, Para 5
organizationType	DIV	SX001G:companyDivision
	PROJ	SX001G:projectOrganization
	STAN	SX001G:standardizationOrganization
otherFacilityType	BLD	SX001G:generalBuilding
	COM	SX001G:computingCenter
	MFG	SX001G:manufacturingSite
	OFF	SX001G:office
	PWR	SX001G:powerStation
	RAIL	SX001G:railStation
partDefinitionIdentifier	ID	SX001G:partDefinitionIdentifier
	NSN	SX001G:natoStockNumber
	OEM	SX001G:originalEquipmentManufacturerPartNumber
	REF	SX001G:partReferenceNumber
	STD	SX001G:standardsReferenceDesignator
	SUP	SX001G:supplierPartNumber
partIdentifier	OEM	SX001G:originalEquipmentManufacturerPartNumber
	REF	SX001G:partReferenceNumber
	STD	SX001G:standardsReferenceDesignator
	SUP	SX001G:supplierPartNumber
partyContactDataType	E	SX001G:eMail
	F	SX001G:fax
	P	SX001G:phone
performanceParameterRevisionIdentifier	ID	SX001G:performanceParameterRevisionIdentifier



Attribute name	Valid value	Valid value name
performanceParameterRevisionStatus		Refer to revisionStatusCode valid value library, Para 5
performanceParameterType	AF	SX001G:maintenanceFacilityAvailabilityPerformanceParameter
	AM	SX001G:materialAvailabilityPerformanceParameter
	AO	SX001G:operationalAvailabilityPerformanceParameter
	AP	SX001G:personnelAvailabilityPerformanceParameter
	AS	SX001G:sparesAvailabilityPerformanceParameter
	ASE	SX001G:supportEquipmentAvailabilityPerformanceParameter
	CWT	SX001G:customerWaitTimePerformanceParameter
	DMC	SX001G:directMaintenanceCostPerformanceParameter
	FOH	SX001G:failuresPerOperatingHourPerformanceParameter
	FR	SX001G:failureRatePerformanceParameter
	LCC	SX001G:lifeCycleCostPerformanceParameter
	MC	SX001G:missionCapableRatePerformanceParameter
	MDT	SX001G:meanDownTimePerformanceParameter
	MFOP	SX001G:maintenanceFreeOperatingPeriodPerformanceParameter
	MISR	SX001G:missionReliabilityPerformanceParameter
	MMHOH	SX001G:maintenanceManHoursPerOperatingHourPerformanceParameter
	MR	SX001G:materialReadinessPerformanceParameter
	MTBF	SX001G:meanTimeBetweenFailurePerformanceParameter
	MTBUR	SX001G:meanTimeBetweenUnscheduledRemovalPerformanceParameter
	MTTF	SX001G:meanTimeToFailurePerformanceParameter
	MTTR	SX001G:meanTimeToRepairPerformanceParameter
	NMC	SX001G:nonMissionCapableRatePerformanceParameter
	OEE	SX001G:overallEquipmentEffectivenessPerformanceParameter
	OSC	SX001G:operatingAndSupportCostPerformanceParameter
	PMC	SX001G:partialMissionCapableRatePerformanceParameter

Applicable to: All

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Attribute name	Valid value	Valid value name
	PME	SX001G:preventiveMaintenanceEffectivenessPerformanceParameter
	PMP	SX001G:plannedMaintenancePercentagePerformanceParameter
	PSL	SX001G:productServiceLifePerformanceParameter
	RT	SX001G:replacementTimePerformanceParameter
	SE	SX001G:supplyEffectivenessPerformanceParameter
	SMI	SX001G:scheduledMaintenanceIntervalPerformanceParameter
	SPT	SX001G:shopProcessingTimePerformanceParameter
	TE	SX001G:trainingEffectivenessPerformanceParameter
	TSHIP	SX001G:shippingTimePerformanceParameter
performanceParameterValueLimitQualifier	MAX	SX001G:maximumValueLimitQualifier
	MIN	SX001G:minimumValueLimitQualifier
personIdentifier	A	SX001G:anonymizingIdentifier
	E	SX001G:employeeNumber
	I	SX001G:identificationCard
	P	SX001G:passportNumber
	S	SX001G:socialSecurityNumber
poolIdentifier	OWN	SX001G:owner
poolType	COM	SX001G:committedForSpecificPurpose
	CON	SX001G:contractorOwned
	CSHA	SX001G:CustomerSharedContractorOwned
	CUS	SX001G:customerOwned
	OEM	SX001G:originalEquipmentManufacturerOwned
	REG	SX001G:regionalPool
	SHAC	SX001G:sharedCustomerOwned
productUsagePhaseRelationshipType	A	SX001G:happensAfterProductUsagePhase
	B	SX001G:happensBeforeProductUsagePhase
	D	SX001G:happensDuringProductUsagePhase
	P	SX001G:partOfProductUsagePhase
publicationModuleIssueLanguage	Refer to languageCodeValues valid value library, Para 5	

Attribute name	Valid value	Valid value name
publicationModuleIssueLanguageCountry		Refer to countryCodeValues valid value library, Para 5
referencedDocumentRole	DES	SX001G:designDocumentReference
	DIR	SX001G:directiveDocumentReference
	DRW	SX001G:drawingDocumentReference
	REF	SX001G:generalDocumentReference
	REQ	SX001G:requirementsDocumentReference
	RES	SX001G:resultDocumentReference
	SRC	SX001G:sourceDocumentReference
	VAL	SX001G:validationDocumentReference
	VER	SX001G:verificationDocumentReference
remarkType	PUB	SX001G:publicRemark
	RSP	SX001G:responseToRemark
reportableMetricIdentifier	KPI	SX001G:keyPerformanceIndicator
reportPartyRole	A	SX001G:addressee
	R	SX001G:reporter
requirementPartyRole	ORG	SX001G:originator
	OWN	SX001G:owner
	STK	SX001G:stakeholder
requirementStatus	A	SX001G:requirementStatusApproved
	C	SX001G:requirementCancelled
	D	SX001G:requirementStatusDraft
	R	SX001G:requirementStatusUnderReview
requirementTargetLevel	D	SX001G:desirableImplementation
	F	SX001G:fullImplementationRequired
	P	SX001G:partialImplementationRequired
	R	SX001G:implementationRecommended
	X	SX001G:notToBeImplemented
resourceSpecificationIdentifier	ID	SX001G:resourceSpecificationIdentifier
	STD	SX001G:standardsReferenceDesignator
resourceSpecificationRevisionIdentifier	ID	SX001G:resourceSpecificationRevisionIdentifier
resourceSpecificationRevisionStatus		Refer to revisionStatusCode valid value library, Para 5

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Attribute name	Valid value	Valid value name
resourceSpecificationType	C	SX001G:consumablePart
	CNWK	SX001G:communicationNetworkInfrastructureResource
	COMP	SX001G:computerInfrastructureResource
	DOCK	SX001G:dockInfrastructureResource
	DRYD	SX001G:dryDockInfrastructureResource
	E	SX001G:expendableSparePart
	EP	SX001G:expendablePersonalProtectionPart
	GAR	SX001G:garageInfrastructureResource
	HNG	SX001G:hangarInfrastructureResource
	HT	SX001G:standardHandTool
	INF	SX001G:infrastructureResource
	IT	SX001G:informationTechnologyPart
	M	SX001G:rawMaterial
	PA	SX001G:packagingPart
	PE	SX001G:personalProtectionPart
	POW	SX001G:powerInfrastructureResource
	PR	SX001G:productProtectionPart
	R	SX001G:repairableSparePart
	S	SX001G:sparePart
	SE	SX001G:supportEquipment
	SSE	SX001G:safetyRelatedSupportEquipment
	TNWK	SX001G:transportNetworkInfrastructureResource
riskImpact	EH	SX001G:extremelyHigh
	EL	SX001G:extremelyLow
	H	SX001G:high
	L	SX001G:low
	M	SX001G:moderate
riskImpactAfterMitigation	EH	SX001G:extremelyHigh
	EL	SX001G:extremelyLow
	H	SX001G:high
	L	SX001G:low
	M	SX001G:moderate
	EH	SX001G:extremelyHigh

Applicable to: All

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Attribute name	Valid value	Valid value name
riskLikelihoodAfterMitigation	EL	SX001G:extremelyLow
	H	SX001G:high
	L	SX001G:low
	M	SX001G:moderate
riskRelationshipType	C	SX001G:consequenceOf
	I	SX001G:incompatibleWith
riskType	C	SX001G:cost
	Q	SX001G:quality
roleCapabilityDefinitionLevel	F	SX001G:full
	P	SX001G:partial
riskLikelihood	EH	SX001G:extremelyHigh
	EL	SX001G:extremelyLow
	H	SX001G:high
	L	SX001G:low
	M	SX001G:moderate
serviceIdentifier	S	SX001G:serviceProvider
skillCode	ID	SX001G:skillCode
softwareReleaseIdentifier	ID	SX001G:softwareReleaseIdentifier
studentsToBeTrainedStrategy	C	SX001G:classroomTraining
	J	SX001G:onTheJobTraining
	L	SX001G:laboratoryTraining
	M	SX001G:mentoringOrCoaching
	O	SX001G:onlineTraining
	R	SX001G:rolePlaying
	S	SX001G:simulatorTraining
warehouseType	PHY	SX001G:physical
	VIR	SX001G:virtual
workBreakdownIdentifier	C	SX001G:contract
workBreakdownRevisionIdentifier	WBSRID	SX001G:workBreakdownStructureRevisionId
workBreakdownRevisionStatus	Refer to revisionStatusCode valid value library, Para 5	
workItemIdentifier	WIID	SX001G:workItemIdentifier

5 Valid value libraries

The list of valid value libraries used by SX000i 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 SX000i valid value libraries

Library name	Valid value	Valid value name or source
comparisonOperatorCode	EQ	SX001G:equalToComparisonOperator
	NE	SX001G:notEqualToComparisonOperator
	LT	SX001G:lessThanComparisonOperator
	LE	SX001G:lessThanOrEqualToComparisonOperator
	GT	SX001G:greaterThanComparisonOperator
	GE	SX001G:greaterThanOrEqualToComparisonOperator
	IN	SX001G:withinRangeComparisonOperator
	OUT	SX001G:outsideRangeComparisonOperator
countryCodeValues	-	Note The country codes valid value XML schema for SX000i Issue 2.1 lists 193 county codes from ISO 3166-1
languageCodeValues	-	Note The language codes valid value XML schema for SX000i Issue 2.1 lists 136 language codes from ISO 639:1988
revisionStatusCode	A	SX001G:approvedStatus
	D	SX001G:draftStatus
	IW	SX001G:inWorkStatus
	C	SX001:cancelledStatus
	R	SX00G:reviewedStatus

Chapter 11

Terms, abbreviations and acronyms

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References

Table 1 References

Chap No./Document No.	Title
SX001G	Glossary
ISO/IEC/IEEE	Systems and software engineering - System life cycle processes
https://www.gov.uk/acquisition-operating-framework	Acquisition Operating Framework

1 Introduction

1.1 General

A comprehensive terminology dictionary for terms used in this guide is given in [Para 2](#). A dictionary of abbreviations and acronyms is provided in [Para 3](#). These include all SX000i specific definitions, abbreviations and some basic abbreviations used when using this specification. The terminology, abbreviations and acronyms will be included in SX001G.

2 Glossary of terms

[Table 2](#) provides terms and their definitions that are used throughout this guide.

Table 2 Glossary of terms

Term	Definition
Acquisition Operating Framework	The Acquisition Operating Framework (AOF) is the process by which the UK MoD conducts, governs and controls its defense acquisition process. It is a main enabler for improving the delivery to the armed forces and for producing greater value for money for the taxpayer. (https://www.gov.uk/acquisition-operating-framework)
Chap	Chapter
Compatibility	Compatibility is a state in which two things can occur together without problems or conflict. Compatibility between specifications refers to the capability to seamlessly integrate their processes or exchange their data.
Computer resource	A computer resource can be hardware, software, facilities, documentation, personnel and manpower required to develop and sustain computer resources for operation and maintenance of a Product, including planning and support requirements for post-deployment software. A computer resource is provided in the IPS element, "Computer Resources".
Computer resource plan	The computer resource plan defines all the management actions, procedures, and techniques used in determining requirements and acquiring hardware, software, facilities, documentation, personnel and manpower required to develop and sustain computer resources for operation and maintenance of a Product, including planning and support requirements for post-deployment software. The computer resource plan is generated in the IPS element, "Computer Resources".
Computer resources report	The computer resource report details necessary information about the acquired computer resources for operation and maintenance of a Product. The computer resource report is generated in the IPS element, "Computer Resources".
Configuration Management	Configuration Management (CM) is the detailed recording, updating and control of information that describes an enterprise's hardware, software and data. It is a process for establishing and maintaining consistency of a Product's performance, functional and physical attributes with its requirements, design and operational information, throughout its life cycle.
Contract	A contract is a mutually binding agreement that obligates the seller to provide the specified Product or service or result and obligates the buyer to pay for it.
Courseware	Courseware is training material on paper, electronic media, or downloaded from the internet, for use with a self-learning or coach assisted training program. Courseware is developed in the IPS element, "Training & Training Support".
Customer	Customer is the party that acquires the Product or service and maintains the authority over it.
Customer request	A customer request is defined as a request for corrective action to be taken in respect to a particular matter based on contractual obligations.
Data element	Data element is the smallest named item of data that conveys meaningful information or condenses a lengthy description into a short code.

Term	Definition
Delivery	Delivery is the transfer of possession by physical or electronic means.
Design engineering data	Design engineering data is defined as any recorded or documented information of a scientific or technical nature whatever the format, documentary characteristics or other medium of presentation. The information can include, but is not limited to, any of the following: - Experimental and test data - Specifications - Designs and design processes - Inventions and discoveries (patentable or otherwise protectable by law) - Technical descriptions and other works of a technical nature - Semiconductor topography mask works - Technical and manufacturing data packages - Know-how trade secrets and information relating to industrial techniques It can be presented in the form of documents, pictorial reproduction, drawings and other graphic representations, disc and film recordings (magnetic, optical and laser), computer software both programmatic and database, and computer memory, printouts or data retained in computer memory or any other form.
Domain	A domain is a specialized field of action, thought, influence or area of responsibility that contributes to the design, production, support or operation of a Product through the Product's life cycle.
End user	Refer to User and Operator.
Engineering	Engineering is a domain that utilizes knowledge and principles to design, build, and analyze Products and services during the whole life cycle. It encompasses a range of more specialized fields through the application of scientific, economic, social, and practical knowledge.
Engineering change request	An Engineering Change Request is a formal proposal to modify a Product/equipment, document or any other contractual item.
F&I plan	The F&I plan defines all the management actions, procedures and techniques and the requirements for facilities and infrastructure that are required to support and operate a Product. The F&I plan is generated in the IPS element, "Facilities and Infrastructure".
F&I report	The F&I report details the necessary information about the acquired Facilities and Infrastructure that are required to support and operate a Product. The F&I report is generated in the IPS element, "Facilities and Infrastructure".
Feedback data	Feedback data can be any data exchanged between different stakeholders during the operation and support of a Product or the operation of a service.
Feedback information	Feedback data summarizes the results of a technical analysis of raw Feedback data for a Product or service. Feedback data is generated in the IPS element, "Sustaining Engineering".

Term	Definition
Global supply chain	Global supply chain is the management of a network of interconnected businesses that are involved in the provision of Product and service packages required by the customers in a supply chain. A global supply chain spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption.
HAZMAT	HAZardous MATerial
In-service phase	That part of the life-cycle phase that is between the delivery of the Product to a customer to when the Product is disposed of.
Integrated Logistic Support	Refer to Integrated Product Support.
Integrated Product Support	Integrated Product Support is Product support that ensures that all support elements are considered and harmonized.
IPS element	IPS element is a logical group of product support activities.
IPS plan	The IPS Plan (IPSP) is the primary document that details the approach to IPS, tailored to meet the needs of a specific Product or service. The IPSP should include detailed information for the planning, implementation and co-ordination of the IPS program, together with element plans detailing how the appropriate IPS elements will be addressed and an IPS Work Breakdown Structure (WBS). It will be continuously updated and will apply throughout the whole life cycle. The IPSP is generated in the IPS element, "Product Support Management".
Initial Provisioning List	The Initial Provisioning List (IPL) contains the range and quantity of items (ie, spares and repair parts, special tools, test equipment, and support equipment) required to support and maintain an item for an initial period of service.
Invoice	An invoice is a non-negotiable commercial instrument issued by a seller to a buyer. It identifies both the trading parties and lists, describes, and quantifies the items sold, shows the date of shipment and mode of transport, prices and discounts (if any), and delivery and payment terms. In certain cases, especially when it is signed by the seller or seller's agent, an invoice serves as a demand for payment and becomes a document of title when paid in full. Invoices are generated in the IPS element, "Supply Support".
Life Cycle Cost (LCC)	Life Cycle Cost (LCC) is the cumulative cost of a Product over its life cycle from entry into service to disposal, 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.
LCC report	An LCC report summarizes the results of an LCC Analysis (LCCA) for a Product or service.
Level of Repair Analysis	A Level of Repair Analysis (LORA) is a prescribed procedure for determining the most economical and efficient level at which maintenance is performed.
LORA report	The LORA report summarizes the results of a LORA. The LORA report is generated in the IPS element, "Maintenance".

Term	Definition
Logistics Support Analysis (LSA) database	The Logistics Support Analysis (LSA) database is used to record resultant data from the LSA process. It is used as the single source of information for the design and development of support resource requirements. The LSA database is generated in the IPS element, "Design Influence".
Maintenance	Maintenance is an activity that retains or restores a physical item to a specified condition or level of performance.
Maintenance concept	A maintenance concept is 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 Product under analysis. The maintenance concept is generated in the IPS element, "Maintenance".
Maintenance plan	The maintenance plan specifies when, where and which maintenance tasks will be performed on the Product including both preventive and corrective maintenance. The purpose of the maintenance plan is to ensure that the Product can be maintained effectively and economically at the desired level of readiness after it is placed in operational use. The maintenance plan is generated in the IPS element, "Maintenance".
Maintenance report	A maintenance report documents a maintenance task and summarizes e.g. the performed corrective actions, used material or spares, test results or any other important data. The maintenance report is generated in the IPS element, "Maintenance".
Management report	The management report can be any official report generated by the Product support manager. The management report is generated in the IPS element, "Product support management".
Manpower and personnel report	The manpower and personnel report defines personnel with the right skills and grades required to operate and support a Product over its lifetime or to provide a service. The manpower and personnel report is generated in the IPS element, "Manpower & Personnel".
Manufacturing	Manufacturing is the production of a Product for use, operation or sale using labor and machines, tools, chemical and biological processing, or formulation. Finished Products can be used for manufacturing other, more complex Products, such as aircraft, household appliances or automobiles. Modern manufacturing includes all intermediate processes required for the production and integration of a Product's components.
Manufacturing data	Manufacturing data is defined as any recorded or documented information of a scientific or technical nature about the manufacturing of a Product whatever the format, documentary characteristics or other medium of presentation. The information can include, but is not limited to any of the following: experimental and test data, specifications, designs and design processes, technical descriptions and other works of a technical nature, semiconductor topography mask works, technical and manufacturing data packages, know-how trade secrets and information relating to industrial techniques.

Term	Definition
Maintenance Task Analysis	Maintenance Task Analysis (MTA) is a detailed analysis process that results in the identification of the procedures, spares and materials, tools, support equipment, personnel skill levels, estimated and elapsed times as well as any facility issues that must be considered for a corrective, repair or preventive maintenance task.
Maintenance Task Analysis report	The MTA report summarizes the results of an MTA. The MTA report is generated in the IPS element, "Maintenance".
Military service	Military service is a term that identifies a distinct branch of armed forces.
Obsolescence	Obsolescence is the state of an item that is no longer needed because something newer or more efficient has been invented or its components are no longer available and it can therefore no longer be maintained or operated.
Obsolescence report	The obsolescence report summarizes the results of the obsolescence management (eg, survey data, risk analysis data and related recovery actions). The obsolescence report is generated in the IPS element, "Product Support Management".
Operator	Operator is a party who is responsible for the operation of the Product.
Organization	Organization is a term that defines an administrative structure with a particular purpose.
Original equipment manufacturer	Original equipment manufacturer is an organization that owns the design and manufacturing rights for a part.
Para	Paragraph
Packaging, Handling, Storage and Transportation	The Packaging, Handling, Storage and Transportation (PHST) is a generic term to refer to the set of logistic operations that are required to deliver and store a material element until it is necessary for use.
Packaging, Handling, Storage and Transportation plan	The PHST plan identifies the program strategy for safely packaging, handling, storing, and transporting a Product or related material as well as any special requirements and interfaces with organizations responsible for transporting. The PHST plan defines the resources, procedures, design considerations and methods necessary to ensure that all Product equipment and support items are packaged, handled, stored and transported properly and in conformance with appropriate legislation, particularly for hazardous materials and the project requirements. This also includes environmental limitations, equipment preservation requirements for short- and long-term storage and transport requirements. The PHST plan is generated in the IPS element, "PHST".
Party	Party is a term that identifies one side involved in a formal agreement or activity.
Procurement plan	The procurement plan defines the products and services that must be obtained from external suppliers and also describes the process to appoint those suppliers contractually. Generally, the procurement plan defines the items that must be procured, defines the process for acquiring those items and finally, schedules the time frames for delivery. The procurement plan is generated in the IPS element, "Supply Support".

Term	Definition
Product	Product is an item that represents a family of items which share the same underlying design purpose.
Product life cycle	The Product life cycle describes the life of a Product from beginning to end using a functional model with distinct sequential phases.
Program management	Program management is a process of managing one project or multiple, related projects at the same time and all working toward the same goal or end result, including contract management, sales, marketing and finance.
Product support	Product support is an activity that develops, enables, executes and maintains a sustainment strategy for the Product.
Provisioning data	Provisioning data is defined as any recorded or documented information prepared expressly for the identification, description, installation location and verification of items, materials, supplies, and services that are to be purchased, inspected, packaged, packed and supplied, or delivered to users. The provisioning data is generated in the IPS element, "Supply Support".
Provisioning order	The provisioning order is a document that describes the required supplies or services so procurement can be initiated. The provisioning order is generated in the IPS element, "Supply Support".
Quality	Quality is a domain that ensures that the customer's requirements, enterprise's, national and international regulations for a Product or service are met throughout the life cycle.
Quotation	The quotation is a formal statement of promise (usually submitted in response to a request for quotation) by a potential supplier to supply the goods or services required by a customer, at specified prices, and within a specified period. A quotation can also contain terms of sale and payment, and warranties. The quotation is generated in the IPS element, "Supply Support".
Reliability, Availability, Maintainability and Testability reports	The Reliability, Availability, Maintainability and Testability (RAMT) report summarizes the results of any analyses for reliability, availability, maintainability and testability. The RAMT report is generated in the IPS element, "Design Influence".
Safety	Safety as a domain is based on standards that are designed to ensure the safety of Products, services, activities or processes, etc. Safety is also a process that secures the freedom from conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment.
Security	Security is a process to protect the Product and/or its associated information, from any harm due to unauthorized access or manipulation.
Service	Service is an activity where technical, physical or intellectual work is performed for another party to fulfill a need or demand.
Service, military	Refer to Military Service
Software Support Analysis report	The Software Support Analysis (SSA) report summarizes the results of software support analysis of a Product. The SMA report is generated in the IPS element, "Maintenance".

Term	Definition
Specification	A specification is a document that defines, in a complete, precise, verifiable manner the requirements, design, behavior or other characteristics of a Product, result or service and the procedures for determining whether these provisions have been satisfied. For example, requirement specification, design specification, Product specification and test specification.
Spare Parts List	The Spare Parts List (SPL) is a listing of spare parts mainly based on provisioning data charged with business data (eg, prices, contract numbers, effective/expiry dates). Its purpose is to enable customers and the contractors processing parts data without using complex provisioning processes by integration the customer. It places negotiated parts data at customers' disposal (eg, for recording purposes of material) and enables material supply processes. The SPL is generated in the IPS element, "Supply Support".
Supplier	Supplier is a party that provides a particular service or product.
Supplier data	Supplier data is defined as any recorded or documented information provided by supply chain management to support the IPS activities for a Product or for services.
Support concept	Support concept is a description that provides general considerations, constraints, and plans for interim and long-term sustainment of the item under analysis. The support concept is generated in the IPS element, "Product Support Management".
Support contract	A support contract is a contract for any service necessary to support and operate a Product. A support contract is generated in the IPS element, "Product Support Management".
Support equipment	Support equipment can be all equipment (mobile or fixed) required to support the Operation and Maintenance (O&M) of a Product. This includes associated multi-use support items, ground-handling and maintenance equipment, tools, meteorology and calibration equipment, and manual/automatic test equipment. The support equipment is provided by the IPS element, "Support Equipment".
Support equipment plan	The support equipment plan defines all support equipment. It also includes the acquisition of Integrated Product Support (IPSS) for the support equipment itself. The support equipment plan is generated in the IPS element, "Support Equipment".
Support equipment report	The Support Equipment Report details necessary information about the acquired Support Equipment that is required to support and operate a Product. The Support Equipment Report is generated in the IPS element, "Support Equipment".
Support program	Support program is a project whose purpose is to define and execute the support for one or more Products.

Term	Definition
Support strategy	Support strategy is a plan that specifies how a support concept will be implemented as a support solution.
Supportability	Degree to which the design characteristics of a standby or support system allow to meet the operational requirements of an organization.
Supportability safety analysis report	The supportability safety analysis report summarizes the results of any analyses for safety of supportability task of a Product or service. The Supportability Safety Analysis Report is generated in the IPS element, "Maintenance".
Systems engineering	Systems engineering is an interdisciplinary field of engineering that focuses on the design and management of complex engineering projects over their life cycles. Issues such as reliability, logistics, evaluation measurements, different disciplines and coordination of different teams (requirements management), become more difficult when dealing with large, complex projects. Systems engineering deals with work-processes, optimization methods and tools to manage risks in such projects, overlapping with both technical and human-centered disciplines, such as control engineering, industrial engineering, organizational studies, and project management. Systems Engineering ensures all likely aspects of a project or system have been considered and integrated into a whole.
Systems Engineering Management Plan	The Systems Engineering Plan (SEMP) is a document describing the technical effort that will be performed, what technical processes will be used, how the processes will be applied using appropriate activities, how the project will be organized to accomplish the activities, information flow within the organization, decision making structure, and the resources required for accomplishing the required activities. (NASA).
System of interest	The system whose life cycle is under consideration. Refer to ISO/IEC/IEEE 2008
Technical data	Technical data is recorded information (regardless of the form or method of recording) that is of a scientific or technical nature (including computer software documentation).
Technical Data Package	A Technical Data Package (TDP) is 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 to ensure adequacy of item performance. It consists of all applicable technical information (eg, drawings, associated lists, specifications, standards, performance requirements, Quality Assurance (QA) provisions, technical publications, and packaging details). A TDP is generated in the IPS element, "Technical Data".
Technical publications	Technical publications are manuals that contain instructions for the installation, operation, maintenance, training, and support of systems and support equipment. technical publications' information may be presented in any form or characteristic, including but not limited to hard copy, audio and visual displays, magnetic tape, discs, and other electronic devices. Technical publications normally include operational and maintenance instructions, parts lists or parts breakdown, and related technical information or procedures exclusive of administrative procedures. Technical publications are generated in the IPS element, "Technical Data".

Term	Definition
Testability report	The testability report summarizes the results of any D&PHM analyses of a Product. The testability report is generated in the IPS element, "Maintenance".
Training Needs Analysis report	The Training Needs Analysis (TNA) report summarizes the results of an analysis of the requirements for training concerning the operational and maintenance activities. The TNA report is developed in the IPS element, "Training & Training Support".
Total Ownership Cost	Total Ownership Cost (TOC) consists of all elements that are part of the LCC plus the indirect, fixed and linked costs. These can include items such as common support equipment, common facilities, personnel required for unit command, administration, supervision, operations planning and control, and fuel and munitions handling.
Training course	A training course is a series of lessons to teach the skills and knowledge for a particular job or activity. A training course is developed and conducted in the IPS element, "Training & Training Support".
Training course report	A training course report summarizes the results of a conducted training course. A training course report is developed and conducted in the IPS element, "Training & Training Support".
Training equipment	Training equipment is any hardware, software, multi-media player, projector, etc, used in a training process. The training equipment is defined in the IPS element, "Training & Training Support".
Training equipment report	The training equipment report defines the qualitative and quantitative requirements for training equipment. The training equipment report is developed in the IPS element, "Training & Training Support".
Training plan	The training plan defines qualitative and quantitative requirements for the training of operating and support personnel throughout the life cycle of the Product. It includes requirements for: - Competencies management - Factory training - Instructor and key personnel training - New equipment training team - Resident training - Sustainment training - User training - HAZMAT disposal and safe procedures training The training plan is developed in the IPS element, "Training & Training Support".
User	User is a person that has authority to use an item for a specific purpose.

Term	Definition
Vendor	Refer to Supplier.
Whole Life Cycle Cost	Whole Life Cycle Cost (WLCC) consists of all elements that are part of TOC plus non-linked costs. These can include items such as family housing, medical services, ceremonial units, basic training, headquarters and staff, academies, recruiters, employee busing or employee benefits. In WLCC all costs or expenses that are originated by the organization are attributed to the systems or Products they produce.

3 Abbreviations and acronyms

3.1 General

When an abbreviation or an acronym is used in this guide, it is written in full the first time it is used in a chapter.

The abbreviations used in this guide are defined in [Table 3](#).

3.2 Word combination - Acronym

When an acronym combines multiple words, it is always presented the same way in this guide.

Single abbreviations can be combined where necessary, when there is no abbreviation listed for the combination.

3.3 Abbreviation and acronym list

Table 3 Abbreviations and acronyms

Term	Definition
A4A	Airlines for America
ADR	Alternative Dispute Resolution
AIA	Aerospace Industries Association
AOF	Acquisition Operating Framework
ALDT	Administrative and Logistics Delay Time
ASD	AeroSpace and Defense Industries Association of Europe
BCA	Business Case Analysis
BREX	Business Rule EXchange
CBS	Cost Breakdown Structure
CC	Certification Committee
CDR	Critical Design Review
Chap	Chapter
CIL	Candidate Item List
CM	Configuration Management
CMR	Certification Maintenance Requirement

Term	Definition
COTS	Off-The-Shelf
CPF	Change Proposal Form
CR	Change Request
CRD	Customer Requirements Document
CSPA	Critical Product Support Assessment
DPHM	Diagnostics, Prognostics and Health Management
DEX	Data EXchange
DGAC	Direction Générale d'Aviation Civile
DMEWG	Data Model and Exchange Working Group
DoD	Department of Defense
EASA	European Aviation Safety Agency
ERP	Enterprise Resource Planning
F&I	Facilities and Infrastructure
FAA	Federal Aviation Authority
FAR	Federal Aviation Regulation
FAR	Final Acceptance Review
FEC	Failure Effect Category
FMECA	Failure Mode and Effects Criticality Analysis
GC	Guidance Conference
GCD	Guidance Conference Document
HAZMAT	HAZardous MATerial
HFE	Human Factors Engineering
HSI	Human System Integration
ICC	International Chamber of Commerce
IEC	International Electrotechnical Commission
IETM	Interactive Electronic Technical Manual
ILS	Integrated Logistics Support
IPC	Illustrated Parts Catalogue
IPD	Illustrated Parts Data
IPL	Initial Provisioning List
IPS	Integrated Product Support
IPSP	Integrated Product Support Plan

Term	Definition
IPT	Integrated Product Team
ISD	In-Service Date
ISMO	In-Service Maintenance Optimization
ISO	International Standards Organization
ISR	In-Service Review
IT	Information Technology
LCC	Life Cycle Cost
LCCA	Life Cycle Cost Analysis
LORA	Level of Repair Analysis
LOTAR	LOng-Term Archiving and Retrieval
LRU	Line Replaceable Unit
LSA	Logistics Support Analysis
LSAP	Logistics Support Analysis Plan
LSD	Logistics Support Date
MoD	Ministry of Defence
MoU	Memorandum of Understanding
MOTS	Modified Off-The-Shelf
MOTS	Military Off-The-Shelf
MTA	Maintenance Task Analysis
MTBF	Mean Time Between Failure
MTTR	Mean Time To Repair
NATO	North Atlantic Treaty Organization
O&M	Operation and Maintenance
OBS	Organizational Breakdown Structure
OEM	Original Equipment Manufacturer
OMP	Operator Maintenance Plan
OPM	Optimization of Preventive Maintenance
ORD	Operational Requirements Document
OT	Operating Time
OWL	Web Ontology Language
Para	Paragraph
PBL	Performance-Based Logistics

Term	Definition
PDR	Preliminary Design Review
PHST	Packaging, Handling, Storage & Transportation
PLCS	Product Life Cycle Support
PM	Program Manager
PMTR	Preventive Maintenance Task Requirements
PPP	Public-Private Partnership
PSSG	ASD Product Support Steering Group
QA	Quality Assurance
RAMCT	Reliability, Availability, Maintainability, Capability and Testability
RCM	Reliability Centered Maintenance
SC	Steering Committee
SEMP	Systems Engineering Management Plan
SEP	Systems Engineering Plan
SML	Support Maturity Level
SOI	System of Interest
SOP	Standard Operating Procedure
SPL	Spare Parts List
SRD	System Requirements Document
SRR	System Requirements Review
SSA	Software Support Analysis
SSR	Support Solution Review
ST	Standby Time
TDP	Technical Data Package
TICP	Technical Issue Contact Point
TNA	Training Needs Analysis
TOC	Total Ownership Cost
ToR	Terms of Reference
TPM	Technical Performance measure
TT	Task Team
UoF	Unit of Functionality
URD	Usage Requirements Document
US	United States

Term	Definition
WBS	Work Breakdown Structure
WG	Working Group
WLCC	Whole Life Cycle Cost
XML	eXtensible Markup Language

Chapter 12

Comparison of specification terminology

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References

Table 1 References

Chap No./Document No.	Title
Blanchard and Fabrycky	Systems Engineering and Analysis, Prentice Hall
Commandant Instruction M4105.8	United States Coast Guard System Integrated Logistic Support Policy Manual
DAU	Integrated Product Support (IPS) Element Guidebook, Defense Acquisition University
Def Stan 00-600	Integrated Logistic Support
DoD Instruction 5000.02	Operation of the Defense Acquisition System
ISO/IEC 15288	Systems and software engineering — System life cycle processes
ISO/IEC TR 19760	Systems engineering – A guide for the application of ISO/IEC 15288 (System life cycle processes)
JSP 886 Volume 7 Part 1	Integrated Logistic Support
NPD 7500.1D	NASA Policy Directive – Program and Project Life-Cycle Logistics Support Policy
NASA/SP-2007-6105 Rev1	NASA Systems Engineering Handbook
NATO AAP-20	Allied Administrative Publication 20 - Phased Armaments Programming System (PAPS)
NATO ALP-10	NATO Guidance on Integrated Logistics Support for Multinational Armament Programmes
OCCAR OMP1	OCCAR Management Procedure 1 (OMP1) - Principal Programme Management Procedures
SEMP	Florida's Statewide Systems Engineering Management Plan, Appendix U, Integrated Logistic Support Plan Template
UK MoD	Acquisition Operating Framework (AOF)
US Army Regulation 700-127	Integrated Product Support

1 General

This chapter provides an overview of the existing definitions related to the Product life cycle phases and the IPS elements. The matrix tables in this chapter are intended to help in understanding how the choice made in the current guide in terms of Product life cycle phases and IPS elements relates to existing standards in these matters.

2 Product life cycle

2.1 Comparison of SX000i life cycle with other specifications and reference information

Table 2 SX000i life-cycle phases vs other specifications

SX000i phase	Preparation phase		Development phase	Production phase	In service phase		Disposal phase
SX000i definition	Identify user needs Develop Product requirements Assess potential material solution Identify and reduce technology risks through studies, experiments and engineering models Establish a business case including analysis of alternatives, cost estimate (Life Cycle Cost) for the launch of the Development phase		Develop a Product that meets user requirements and can be produced, tested, evaluated, operated, supported and retired Develop an affordable and executable manufacturing process Ensure operational supportability with particular attention to minimizing the logistics footprint	Produce or manufacture the product Test the Product Conduct Product acceptance to confirm that the Product satisfies the requirements	Product utilization: Operate the Product Deliver the required services with continued operational and cost effectiveness Assess, decide on modifications and upgrades Evaluate continuously the effectiveness and efficiency of the Product. Product support: Provide support that enables continued Product operation and sustainable service - Implement modifications and upgrades		Demilitarize (if applicable) Dispose of the product in accordance with all legal and regulatory requirements and policy relating to safety (including explosives safety), security, and the environment - remove related operational and support services
NATO AAP-20	Pre-concept stage	Concept stage	Development stage	Production stage	Utilization stage	Support stage	Retirement stage
US DoD <i>Instruction 5000.02</i>	Material solution analysis phase	Technology development phase	Engineering and Manufacturing Development (EMD) phase	Production and deployment phase	Operations and support phase		

Applicable to: All

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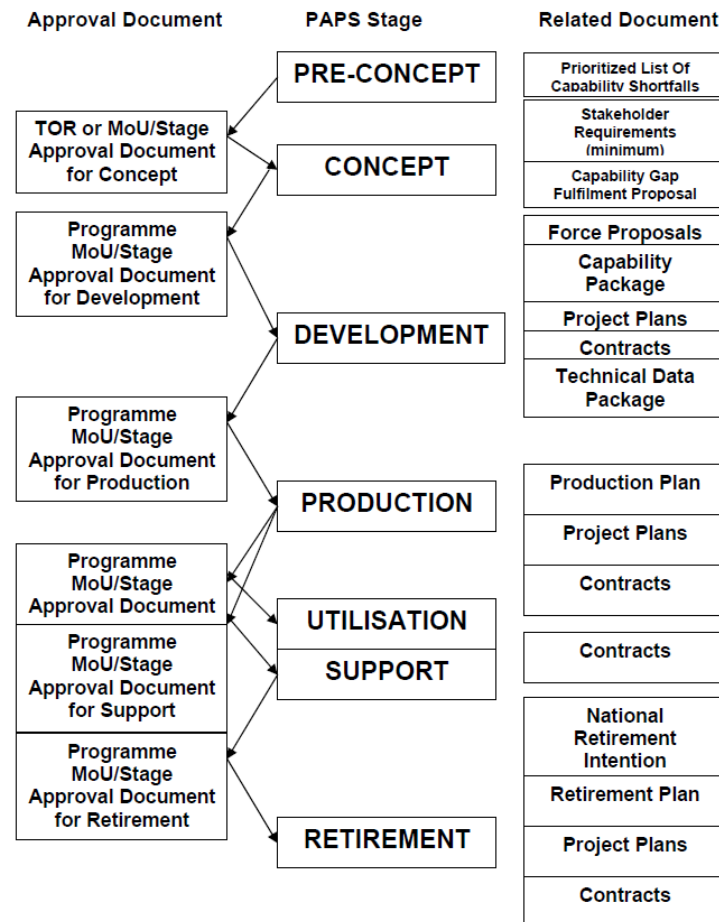
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SX000i phase	Preparation phase		Development phase		Production phase		In service phase		Disposal phase
NASA <i>NASA/SP-2007-6105 Rev1, Systems Engineering Handbook</i>	Pre-Phase A: Concept Studies	Phase A: Concept and Technology Development	Phase B: Preliminary Design and Technology	Phase C: Final Design (and Fabrication)	Phase C: (Final Design and) Fabrication	Phase D: System Assembly, Integration and Test, Launch	Phase E: Operations and Sustainment		Phase F: Closeout
UK MoD <i>Source: AOF</i>	Concept phase	Assessment phase	Demonstration phase		Manufacture phase		In-Service phase		Disposal phase
OCCAR <i>OMP1</i>	Preparation phase	Definition phase	Development phase		Production phase		In Service phase		Disposal phase
ISO/IEC TR 19760: 2003 ISO/IEC 15288 (System life cycle processes)	Concept stage		Development stage		Production stage		Utilisation stage	Support stage	Retirement stage
Wikipedia (Ref. Blanchard and Fabrycky)	Conceptual design stage	Preliminary system design stage	Detail design and development stage		Production/construction stage		Utilisation and support stage		Phase-out and disposal stage

2.2 NATO definitions for the life cycle

Table 3 NATO AAP-20 life- cycle phases

Pre-concept stage	Concept stage	Development stage	Production stage	Utilization stage	Support stage	Retirement stage
The purpose of the pre-concept stage is to identify and document stakeholder requirements (eg, force goal). It is also important that the identification of risk areas (at a high level) to the capability delivery. This provides focus for research and industry capability/capacity to ensure delivery to an acceptable timescale and affordable cost.	Based on the stakeholder requirements identified and documented in the pre-concept stage, it is the purpose of the concept stage to refine and broaden the studies, experiments, and engineering models pursued during the pre-concept stage and to develop experiments, and engineering models pursued during the pre-concept stage and to develop preliminary system requirements and a feasible design solution. One of the key objectives of the concept stage is to provide confidence that the business case is sound, and the proposed solutions are achievable.	The development stage aims at full validation of the technical solution through design engineering work to the point where production can begin. For software, the development, testing, and certification will ensure the software is ready for incorporation into new and existing hardware. The development stage is executed to develop a System Of Interest (SOI) that meets or exceeds the stated requirements and can be produced, tested, evaluated, operated, supported and retired.	The purpose of the Production stage is to manufacture and test the SOI and produce related support and enabling systems as needed. This materiel solution is based on the stakeholder requirements and the programme Memorandum of Understanding (MOU)/stage approval document for production stage.	The Utilisation stage is executed to operate the product at the intended operational sites, including modification and upgrades, to deliver the required services with continued operational and cost effectiveness. This stage ends when the SOI is taken out of service.	The Support stage is executed to provide logistics, maintenance, and support services that enable continued SOI operation and sustainable service. The Support stage is completed with the retirement of the SOI and termination of support services.	Based on the stakeholder requirements identified and documented in the pre-concept stage, it is the purpose of the concept stage to refine and broaden the studies, experiments, and engineering models pursued during the pre-concept stage and to develop experiments, and engineering models pursued during the pre-concept stage and to develop preliminary system requirements and a feasible design solution. One of the key objectives of the concept stage is to provide confidence that the business case is sound, and the proposed solutions are achievable.



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Fig 1 The NATO AAP-20 (PAPS) (Source: NATO)

2.3 US DoD definitions for the life cycle

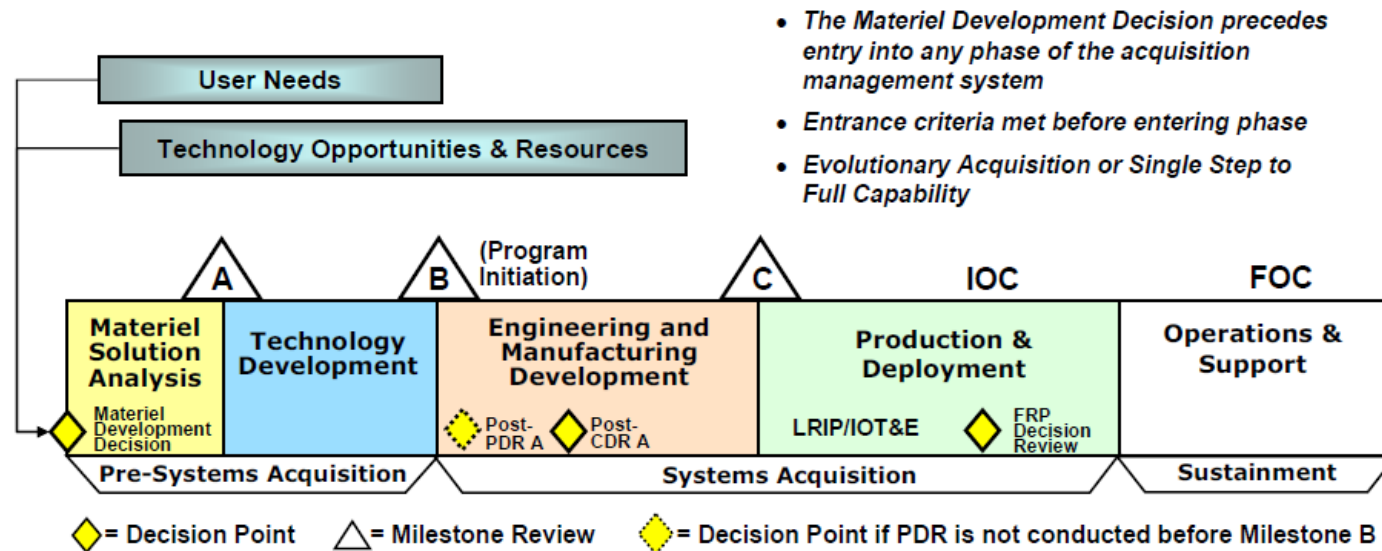
Table 4 US DoD Instruction 5000.02 life-cycle phases

Pre-Product acquisition		Product acquisition		Sustainment	
Material solution analysis phase	Technology development phase	Engineering and Manufacturing Development (EMD) phase	Production and deployment phase	Operations and support phase	Disposal
The purpose of the pre-concept stage is to identify and document stakeholder requirements (eg, force goal). It is also important that the identification of risk areas (at a high level) to the capability delivery. This provides focus for research and industry capability/capacity to ensure delivery to an acceptable timescale and affordable cost.	Based on the stakeholder requirements identified and documented in the pre-concept stage, it is the purpose of the concept stage to refine and broaden the studies, experiments, and engineering models pursued during the pre-concept stage and to develop experiments, and engineering models pursued during the pre-concept stage and to develop preliminary system requirements and a feasible design solution. One of the key objectives of the concept stage is to provide confidence that the business case is sound, and the proposed solutions are achievable.	The development stage aims at full validation of the technical solution through design engineering work to the point where production actions can be taken. For software, the development, testing, and certification will ensure the software is ready for incorporation into new and existing hardware. The development stage is executed to develop a SOI that meets or exceeds the stated requirements and can be produced, tested, evaluated, operated, supported and retired.	The purpose of the Production stage is to manufacture and test the SOI and produce related support and enabling systems as needed. This materiel solution is based on the stakeholder requirements and the programme MOU/stage approval document for production stage.	The utilisation stage is executed to operate the product at the intended operational sites, including modification and upgrades, to deliver the required services with continued operational and cost effectiveness. This stage ends when the SOI is taken out of service.	The purpose of the pre-concept stage is to identify and document stakeholder requirements (eg, force goal). It is also important that the identification of risk areas (at a high level) to the capability delivery. This provides focus for research and industry capability/capacity to ensure delivery to an acceptable timescale and affordable cost.

Applicable to: All

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Fig 2 US DoD Defense acquisition management system (Source: US DoD)

2.4 NASA definitions for the life cycle

Table 5 NASA SP-2007-6105 Rev1, Systems Engineering Handbook Life Cycle Phases

Pre-Phase A: Concept studies	Phase A: Concept and technology development	Phase B: Preliminary design and technology completion	Phase C: Final design and fabrication	Phase D: System assembly, integration, test and launch	Phase E: Operations and sustainment	Phase F: Closeout
The purpose of this phase is to devise various feasible concepts from which new projects (programs) can be selected. Typically, this activity consists of loosely structured examinations of new ideas, usually without central control and mostly oriented toward small studies. Its major product is a list of suggested projects, based on the identification of needs and the discovery of opportunities that are potentially consistent with NASA's mission, capabilities, priorities, and resources.	During Phase A, activities are performed to fully develop a baseline mission concept and begin or assume responsibility for the development of needed technologies. This work helps establish a mission concept and the program requirements on the project. Major products to this point include an accepted functional baseline for the system and its major end items.	During Phase B, activities are performed to establish an initial project baseline. Phase B culminates in a series of Preliminary Design Reviews (PDRs), containing the system-level PDR and PDRs for lower level end items as appropriate. The PDRs reflect the successive refinement of requirements into designs.	During Phase C, activities are performed to establish a complete design (allocated baseline), fabricate or produce hardware, and code software in preparation for integration. Phase C contains a series of Critical Design Reviews (CDRs) containing the system-level CDR and CDRs corresponding to the different levels of the system hierarchy. Phase C culminates with a System Integration Review (SIR). The final product of this phase is a product ready for integration.	During Phase D, activities are performed to assemble, integrate, test, and launch the system. These activities focus on preparing for the Flight Readiness Review (FRR). Other activities include the initial training of operating personnel and implementation of the logistics and spares planning. Phase D concludes with a system that has been shown to be capable of accomplishing the purpose for which it was created.	During Phase E, activities are performed to conduct the prime mission and meet the initially identified need and maintain support for that need. The products of the phase are the results of the mission. This phase encompasses the evolution of the system only insofar as that evolution does not involve major changes to the system architecture. For large flight Near the end of the prime mission, the project may apply for a mission extension to continue mission activities or attempt to perform additional mission objectives.	Phase F deals with the final closeout of the system when it has completed its mission; the time at which this occurs depends on many factors. For a flight system that returns to Earth with a short mission duration, closeout may require little more than disintegration of the hardware and its return to its owner. On flight projects of long duration, closeout may proceed according to established plans or may begin as a result of unplanned events, such as failures.

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CDR	Critical Design Review	PLAR	Post-Launch Assessment Review
CERR	Critical Events Readiness Review	PRR	Production Readiness Review
DR	Decommissioning Review	P/SDR	Program/System Definition Review
FRR	Flight Readiness Review	P/SRR	Program/System Requirements Review
KDP	Key Decision Point	PSR	Program Status Review
MCR	Mission Concept Review	SAR	System Acceptance Review
MDR	Mission Definition Review	SDR	System Definition Review
ORR	Operational Readiness Review	SIR	System Integration Review
PDR	Preliminary Design Review	SRR	System Requirements Review
PFAR	Post-Flight Assessment Review	TRR	Test Readiness Review
PIR	Program Implementation Review		

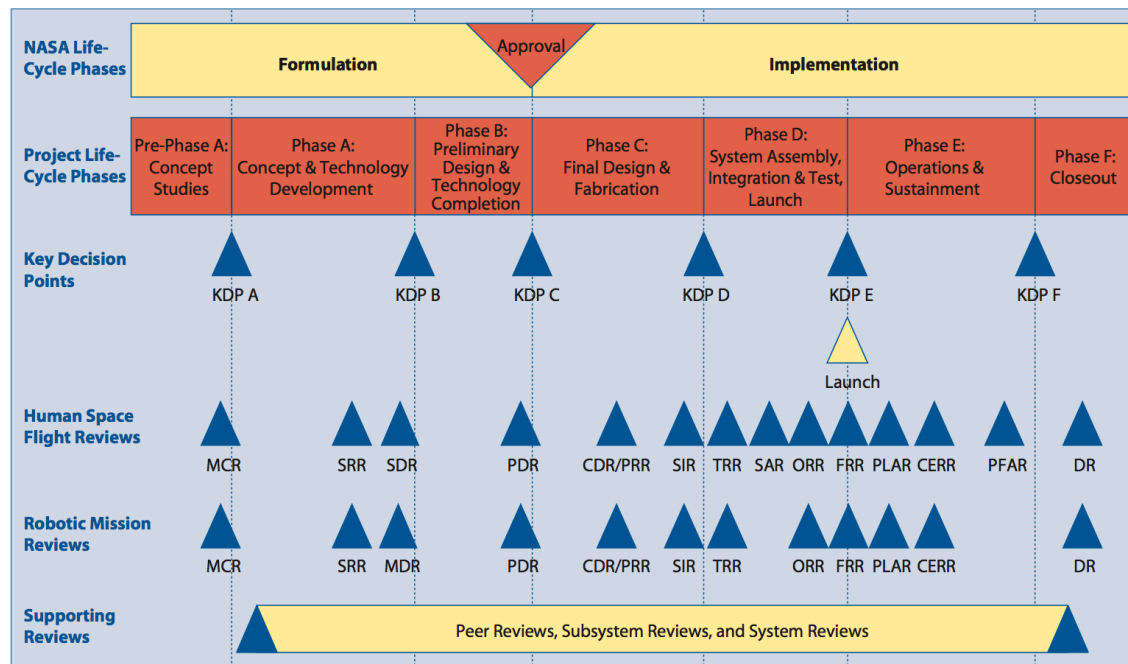


Fig 3 NASA Project Life-Cycle Phases - (Source: NASA SP-2007-6105 Rev1)

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2.5 UK MoD definitions for the life cycle

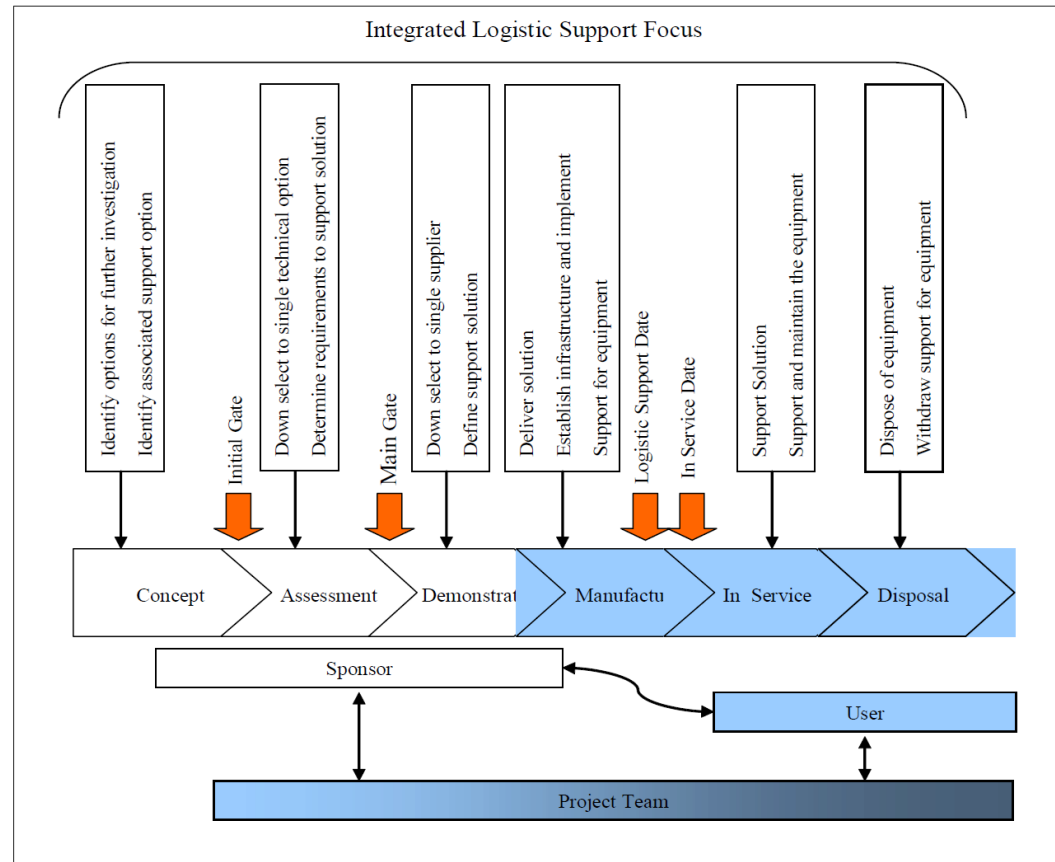
Table 6 UK MoD Acquisition Operating Framework (AOF) life-cycle phases

Concept phase	Assessment phase	Demonstration phase	Manufacture phase	In service phase	Disposal phase
Produce a statement of the outputs that users require from the system, framed as a User Requirements Document (URD) Form the delivery team Involve industry Identify technology and procurement options for meeting the requirement that merit further investigation Obtain funding and agree plan for the assessment (in detail) and subsequent stages (in outline), identifying performance, cost and time boundaries within which it is to be conducted Initiate the Through Life Management Plan (TLMP) Continuously monitor concept maturity and, when appropriate, construct and submit an initial gate business case seeking approval for the assessment stage within time, cost and performance boundaries	Produce the System Requirements Document (SRD), defining what the system must do to meet user needs as stated in the URD Establish and maintain the linkage between user and system requirements Identify the most cost-effective technological and procurement solution Develop the SRD, trading time, cost and performance to identify the technological solution Reduce risk to a level consistent with delivering an acceptable level of system performance to tightly controlled time and cost parameters Refine the TLMP, including detailed plans for the demonstration phase Continuously monitor project maturity and, when appropriate, construct and submit a main gate business case seeking approval for the project within tightly defined performance, time and cost boundaries	Eliminate progressively the development risk and fix performance targets for manufacture, ensuring there is consistency between the final selected solution and the SRD and URD Place contract(s) to meet the SRD Demonstrate the ability to produce integrated capability	Deliver the solution to the military requirement within the time and cost limits Conduct system acceptance to confirm that the system satisfies the SRD and the URD, as agreed at main gate Transfer the lead customer function to the user, for equipment	Confirm the defence capability provided by the system is available for operational use, to the extent defined at main gate, and declare the in-service date Provide effective support to the front line Maintain levels of performance within agreed parameters, whilst driving down the annual cost of ownership Carry out any agreed upgrades or improvements, refits or acquisition increments	Carry out plans for efficient, effective and safe disposal of the equipment

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Fig 4 ILS within the UK MoD AOF (Source: UK MoD)

2.6 OCCAR definitions for the life cycle

Table 7 OCCAR OMP1 life-cycle phases

Preparation phase	Definition phase	Development phase	Production phase	In service phase	Disposal phase
During the preparation phase a prospective co-operative programme is prepared in terms of outline scope, time, cost, acquisition organisation and participation to meet harmonised capability requirements that can be feasibly taken forward. The basis of how the system will be supported in service needs to be established. It is essential that the stakeholders ensure that appropriate strategies and specialist resource requirements are well defined.	The definition phase consists of the selection of a solution from those explored under the feasibility studies conducted during the preparation phase. Programme requirements, technical specifications, ILS aspects, LCC and industrial conditions for realisation are refined during this phase. Risk reduction studies can be performed during or before the definition phase. At the end of the definition phase the visibility and reduction of the remaining risks must be sufficient defined/identified in order to allow a decision on future phases.	During the development phase, the Defence System and its support systems are designed in detail, developed, tested, qualified and certified, and the industrial production resources are defined and put in place. In principle the development phase is completed when the Defence System is qualified. The certification can also be performed during the production phase.	This phase consists of all activities required to produce and deliver the Defence System to the armed forces for its subsequent use (series production, training and support resources, etc). Formally there is a decision for service acceptance taken jointly or individually by participating states. This decision formalises the authorisation for operational use of the Defence System after its acceptance trials. In principle the production phase ends when all the individual systems are produced, accepted and delivered.	The In-Service phase is composed of two sub-phases: Operational usage and support. While the operational usage is under the responsibility of the programme participating states, the Support sub-phase can be assigned to OCCAR. In this case, this support sub-phase will be referred to as the in service support phase The in-service support phase aims to maintain the Defence System's capability to the required operational availability. It begins with the first delivery of the Defence System and ends when the use of the Defence System within the forces of the participating states stops	The aim of the disposal phase is to systematically remove the Defence System from service together with the related operational and support services and to support the disposal process

2.7 ISO/IEC TR 19760 and ISO/IEC 15288 (System life cycle processes) definitions for the life cycle

Table 8 ISO/IEC TR 19760 and ISO/IEC 15288 (System life cycle processes) life-cycle phases

Concept stage	Development stage	Production stage	Utilisation stage	Support stage	Retirement stage
The concept stage is executed to assess new business opportunities and to develop preliminary system requirements and a feasible design solution.	The development stage is executed to develop a system-of-interest that meets acquirer requirements and can be produced, tested, evaluated, operated, supported and retired.	The production stage is executed to produce or manufacture the product, to test the product and to produce related supporting and enabling systems as needed.	The utilization stage is executed to operate the product, to deliver services within intended environments and to ensure continued operational effectiveness.	The support stage is executed to provide logistics, maintenance, and support services that enable continued system-of-interest operation and a sustainable service.	The retirement stage is executed to provide for the removal of a system-of-interest and related operational and support services, and to operate and support the retirement system itself.

2.8 Wikipedia definitions for the life cycle

The Wikipedia definitions for the life cycle were considered for comparison purposes because Wikipedia is an important reference for the public in general, who do not necessarily have access to other specifications mentioned elsewhere. The definitions used in Wikipedia are based on the book “*Systems Engineering and Analysis*”, 4th edition, by Blanchard and Fabrycky, published by Prentice Hall.

Table 9 Wikipedia life-cycle phases (based Blanchard and Fabrycky)

Conceptual design stage	Preliminary system design stage	Detail design and development stage	Production/construction stage	Utilisation and support stage	Phase-out and disposal stage
The conceptual design stage is where an identified need is examined, requirements for potential solutions are defined, potential solutions are evaluated, and a Product specification is developed. The Product specification represents the technical	During this stage of the system lifecycle, subsystems that perform the desired system functions are designed and specified in compliance with the system specification. Interfaces between subsystems are defined, as well as overall test and evaluation	This stage includes the development of detailed designs that brings initial design work into a completed with form of specifications. This work includes the specification of interfaces between the system and its intended environment and a comprehensive evaluation of	During the production and/or construction stage the product is built or assembled in accordance with the requirements specified in the Product, process and material specifications and is deployed and tested within the operational target environment. System	Once fully deployed, the system is used for its intended operational role and maintained within its operational environment. Key steps within the utilization and support stage include: – System operation in the user environment – Maintenance and logistics	Once deployed, the effectiveness and efficiency of the system must be continuously evaluated to determine when the product has met its maximum effective lifecycle. Considerations include: – System operation in

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Conceptual design stage	Preliminary system design stage	Detail design and development stage	Production/construction stage	Utilisation and support stage	Phase-out and disposal stage
requirements that will provide overall guidance for system design. Because this document governs all future development, the stage cannot be completed until a conceptual design review has determined that the Product specification properly addresses the motivating need. Key steps within the conceptual design stage include: - Need identification - Feasibility analysis - Product requirements analysis - Product specification - Conceptual design review	requirements. At the completion of this stage, a development specification is produced that is sufficient to perform detailed design and development. Key steps within the preliminary design stage include: - Functional analysis - Requirements allocation - Detailed trade-off studies - Synthesis of System options - Preliminary design of engineering models - Development specification	the systems logistical, maintenance and support requirements. The detail design and development is responsible for producing the Product, process and material specifications and can result in substantial changes to the development specification. Key steps within the detail design and development stage include: - Detailed design - Detailed synthesis - Development of engineering and prototype models - Revision of development specification - Product, process and material specification	assessments are conducted in order to correct deficiencies and adapt the system for continued improvement. Key steps within the Product/construction stage include: - Production and/or construction of system components - Acceptance testing - System distribution and operation - Operational testing and evaluation - System assessment	support - System modifications for improvement - System assessment	the user environment - Continued existence of operational need - Matching between operational requirements and system performance - Feasibility of system phase-out versus maintenance - Availability of alternative systems

3 IPS elements

3.1 Comparison of IPS elements across different specifications and handbooks

[Table 10](#) provides a comparison between the names of the IPS elements as defined in several specifications and guidebooks. The lines must be read across. If a table cell is blank, then that particular specification or handbook does not consider that aspect.

Note

Names (or equivalents) can cover different aspects (eg, the Product support management element in SX000i also covers obsolescence management).

Note

In the case of SX000i, missing elements are due to the exclusions defined in [Chap 1](#).

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Table 10 Naming of IPS elements across multiple specifications and handbooks.

SX000i	JSP 886 Volume 7	Def Stan 00-600	US Army Regulation 700-127	NATO ALP-10	Integrated Logistic Support Plan Template Florida's Statewide Sys. Eng. Mgt. Plan	United States Coast Guard System Integrated Logistic Support Policy Manual	DAU Integrated Product Support Element Guidebook	NASA Policy Directive Program and Project Life- Cycle Logistics Support Policy
	Part 1 - Integrated Logistic Support	Integrated Logistic Support	Rapid Action Revision (RAR)	Guidance on Integrated Support for Multinational Equipment Projects (ILS)	Appendix U, Integrated Logistic Support Plan Template	Commandant Instruction M4105.8, 1 October 2002	Release: 2011 DoD (Draft for Review 23. Mar 2011)	Release: 2015 NPD 7500.1 – Effective Date: March 02 2015
IPS elements	Current IPS elements	IPS deliverables	IPS elements	IPS elements	IPS elements	IPS elements	IPS elements	IPS elements
Computer resources	Computer and software support		Computer resources support		Computer resources support	Computer resources support	Computer resources	Computer resources support
Design influence			Design influence/ interface	Design influence/ interface		Design interface	Design interface	Design interface
Facilities and infrastructure	Facilities and infrastructure	Facilities deliverables	Facilities	Facilities and infrastructure	Facilities	Facilities	Facilities and infrastructure	Facilities required for ILS functions
Maintenance	Maintenance planning	Maintenance planning deliverables	Maintenance planning	Maintenance planning	Maintenance planning	Maintenance planning	Maintenance planning and management	Maintenance planning
Manpower and personnel			Manpower and personnel	Personnel	Manpower and personnel	Manpower and personnel	Manpower and personnel	Manpower and personnel for ILS functions
Packaging, Handling, Storage and Transportation (PHST)	PHST	Packaging, handling and transportation deliverables	PHST	PHST	PHST	PHST	PHST	PHST

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SX000i	JSP 886 Volume 7	Def Stan 00-600	US Army Regulation 700-127	NATO ALP-10	Integrated Logistic Support Plan Template Florida's Statewide Sys. Eng. Mgt. Plan	United States Coast Guard System Integrated Logistic Support Policy Manual	DAU Integrated Product Support Element Guidebook	NASA Policy Directive Program and Project Life- Cycle Logistics Support Policy
Product support management	ILS planning	Planning and management deliverables						
Supply support	Supply support	Supply support deliverables	Supply support	Supply support	Supply support	Supply support	Supply support	Supply support
Support equipment	Support and Test Equipment (S&TE)	S&TE deliverables	Support equipment	S&TE	S&TE	Support equipment	Support equipment	Support equipment
Sustaining engineering								
Technical data	Technical information	Information management deliverables	Technical data	Technical information and data	Technical data	Technical data	Technical data	Technical data
Training	Training and Training Equipment (TE)	Training and TE	Training and support	Training and training support	Training and TE	Training and training support	Training and training support	Training and training support
	Reliability and maintainability	Reliability and maintainability deliverables						
	Disposal and termination	Disposal and termination deliverables						
	Human factors integration	Human factors integration deliverables						

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SX000i	JSP 886 Volume 7	Def Stan 00-600	US Army Regulation 700-127	NATO ALP-10	Integrated Logistic Support Plan Template Florida's Statewide Sys. Eng. Mgt. Plan	United States Coast Guard System Integrated Logistic Support Policy Manual	DAU Integrated Product Support Element Guidebook	NASA Policy Directive Program and Project Life- Cycle Logistics Support Policy
		Technical documentation deliverables						
		Supportability case deliverables			Hardware/Software integration (HSI)			
		Supportability analysis deliverables						

3.2 Elements associated with IPS

[Table 11](#) provides the relationship of other elements and/or domains associated with IPS and how they are named in other documents.

Note

The SX000i IPS element, Product support management includes several activities which will be included in a future issue of SX000i. Refer to [Chap 1](#).

Table 11 Other elements associated with IPS

SX000i	JSP 886 Volume 7	Def Stan 00-600	US Army Regulation 700-127	NATO ALP-10	Integrated Logistic Support Plan Template Florida's Statewide Sys.Eng. Mgt. Plan	United States Coast Guard System Integrated Logistic Support Policy Manual	US DoD Integrated Product Support Element Guidebook
Product support management	Asset management						
Product support management	Commercial and contract management						

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SX000i	JSP 886 Volume 7	Def Stan 00-600	US Army Regulation 700-127	NATO ALP-10	Integrated Logistic Support Plan Template Florida's Statewide Sys.Eng. Mgt. Plan	United States Coast Guard System Integrated Logistic Support Policy Manual	US DoD Integrated Product Support Element Guidebook
Technical data	Configuration management	Configuration management deliverables			Standardization and interoperability		
Product support management	In service monitoring of logistic performance						
Product support management	Logistic information management						
Product support management	Obsolescence management	Obsolescence management deliverables					
	Quality management						
	Risk management						
	Safety management						
	System design						

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End of data module

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