

S-Series

The S-Series specifications provide a comprehensive framework for managing the support and maintenance of systems throughout their lifecycle, ensuring that they remain effective and reliable throughout their operational life.

In the dynamic realm of aerospace and defense, ensuring the readiness and efficiency of complex systems is paramount. To address the evolving challenges of product support, the international community, led by ASD in Europe and AIA in the US (and ATA/A4A for S1000D only), developed the S-Series Integrated Product Support (IPS) specifications. These specifications represent decades of collaborative effort, fostering interoperability and standardization across critical sectors.

The S-series specifications cover a range of topics related to IPS, including logistics, maintenance planning, supply-chain management, training and technical data, reliability and maintainability, and sustainment. They provide guidance on how to effectively manage and support complex systems, maximizing system availability and readiness while reducing lifecycle costs.

The S-Series specifications are crucial for industry stakeholders, including manufacturers, operators, and maintenance providers as well as customers, offering a common language and framework that ensures consistent quality and efficiency. Widely adopted by aerospace and defense sectors, these specifications are indispensable tools for achieving higher levels of reliability and performance.

The S-Series suite consists of the following specifications:

- S1000D: International Specification for Technical Publications Development
- S2000M: International Specification for Material Management
- S3000L: International Specification for the Logistic Support Analysis (LSA) process
- S4000P: International Specification for Developing and Continuously Improving Preventive Maintenance
- S5000F: International Specification for In-Service Data Feedback
- S6000T: International Specification for Training Analysis and Design
- SX000i: International Specification for Integrated Product Support (IPS)

Website: [S-Series](#)

Co-Chairs (Series):

- ASD: Peter Eichmueller
- AIA: Paul Haslam

Website: [S1000D |](#)

Officers (S1000D):

- Chair: John Waters (ATA e-Business Program)
- Vice-Chair: Joakim Lundquist (ASD)
- Secretary: Peirce Clark (AIA)

S1000D: International Specification for Technical Publications Development

S1000D is an international specification designed for the production of technical publications, though its application extends to non-technical publications as well. It provides businesses with a structured approach to processes and controls, enhancing efficiency across various documentation needs.

The scope of S1000D, originally centered on aerospace applications, was expanded with Issue 2 to include land and sea-specific applications. Today, S1000D supports a wide range of documentation needs, including:

- Any type of equipment (military and civil)
- Publication management
- Construction processes
- Policy procedures
- Legal documentation
- Organizational documentation

It utilizes data modules, which are self-contained information units stored in a Common Source Data Base (CSDB). This data storage system enables the generation of platform-independent output in both page-oriented and Interactive Electronic Technical Publication (IETP) formats.

Structure of S1000D

S1000D is organized into multiple chapters, each covering specific aspects such as the creation, management, and publishing of technical publications. These chapters guide the full lifecycle of technical documentation, from inception to distribution.

Principal concepts of S1000D

Key concepts within the S1000D specification enable a shift from traditional book-based documentation to an information-centric approach:

Data module

A data module is a standalone unit of information containing descriptive, procedural, or operational data for a platform, system, or component. It is designed to be stored and retrieved from a Common Source Data Base (CSDB) using a unique data module code.

Data module structure

Each data module comprises two sections:

- Identification and status: manages data module applicability, quality assurance, and retrieval processes.
- Contents: provides the actual information needed to perform tasks or describe systems. S1000D defines various information types, such as:
 - Crew information
 - Descriptions
 - Procedures
 - Fault information
 - Illustrated parts data
 - Schedules
 - Wiring Information

Common Source Data Base (CSDB)

The CSDB serves as the repository for storing and managing data modules. While S1000D does not define the functionality of the CSDB, it emphasizes the need for an organized system to manage the data modules produced within a program.

Website: <https://s1000d.org/>

Chair: Kathy Rainbolt (AIA)

Vice-Chair: Pushpa Merchant (ATA)

Secretary: Jean-Michel Pancrazi (ASD)

S2000M: International Specification for Material Management

The specification 2000M (S2000M) defines the material management processes and procedures to be used in support of a product in national or multinational projects throughout the lifecycle of that product.

The specification S2000M, Issue 8.0 consists of seven chapters:

Chapter 1 Provisioning

Provisioning is the process of selecting support items and spares, necessary for the support of all categories of products. This chapter defines the process and specifies the data, formats and transmission procedures to be used in providing provisioning information to the customer throughout the various phases of the lifecycle of the product. It also provides the database from which Illustrated Parts Catalogues (IPC) are produced. The rules for the production and presentation of the IPC in different media are covered by the specification S1000D. IPC is identical to Illustrated Parts Data Publication (IPDP).

Provisioning consists of the following four elements:

- Chapter 1.1, Provisioning general: provides general remarks, instructions and business rules concerning provisioning in accordance with S2000M.
- Chapters 1.1.1 thru 1.1.5, Provisioning Data: covers the presentation of a baseline for a product, the presentation of its data as well as the update and deletion of that presentation. It also includes the exchange of configuration management data.
- Chapter 1.2, Observations: defines the exchange of information between customer and contractor, or vice versa, during the provisioning process; they are typically based on review by either party of the provisioning data or updates thereof.
- Chapter 1.3, Codification: covers the NATO codification processes and information flow between industry, the National Codification Bureaux (NCB) and the customer for all activities related to codification. However, S2000M can be applied without using NATO codification.

Chapter 2 Spare Parts List

The Spare Parts List (SPL) allows the customer and contractor to process parts data (including commercial data elements) to allow for the processes as described in Chap 3 of this specification, without the necessity to use processes as described in Chap 1 of this specification.

Chapter 3 Material supply

Material supply describes the process, the procedures and techniques for on-line operation of pricing, ordering, invoicing, payment and shipment.

Material supply includes but is not limited to:

- Provisioning and Re-provisioning
- Maintenance, Repair & Overhaul (MRO)
- Mutual Support such as Mutual Supply Support (MSS) and Offer of
- Surplus Stock (OSS)
- Warranty Claims

Chapter 3.1, Material supply, general: provides general overview of the material supply chain as well as its individual phases and objects.

Material supply phases:

- Pricing
- Ordering
- Invoicing and Payment
- Shipment

Chapter 3.2, Material supply data exchange: provides processes, procedures and techniques for requesting quotations and providing prices using three different methods:

- Single prices
- Price lists
- Order based prices

It allows for the establishment of direct binding process as well as the involvement of a price approval authority.

Provides processes, procedures and techniques for placement of orders, order progression and delivery of ordered items.

Supports the administration of orders for items as well as for services, eg, repair.

This chapter also provides processes, procedures and techniques for generating and forwarding transport related information.

Chap 3.2 also provides processes, procedures and techniques for generating and forwarding invoices as well as for the invoice rejection or invoice acceptance and its payment.

Chapter 3.3, Performance Based Logistics: describes the concept of Performance Based Logistics (PBL) and its contractual framework. Furthermore, a description of the usage of existing messages, data elements and Key Performance Indicators (KPIs) that can be used to create an individual PBL contract is given.

Chapter 4 Communication techniques

The purpose of this chapter is to describe the standards which exist for the exchange of information in accordance with S2000M procedures.

Chapter 5 Data model

The purpose of this chapter is to describe the UML models and the resulting XML schema.

Chapter 6 Data dictionary

The data dictionary is a catalogue of all the data elements utilized by S2000M. Its purpose is to identify the standardized names, definitions and attributes to ensure a common understanding and application of the data elements.

Chapter 7 Definitions, abbreviations and reference documents

The glossary of terms and definitions is a catalogue of all the terms utilized in S2000M Chap 1 through Chap 6. Its purpose is to identify the terms and explain their definitions to ensure a common understanding of S2000M. In addition, it provides an overview of all reference documents used in S2000M.

Website: [About S2000M](#)

Co-Chairs:

- ASD: Jose Carlos Lafuente

S3000L: International Specification for the Logistic Support Analysis (LSA) process

The S3000L specification is designed to support various activities and requirements involved in establishing an LSA process, such as:

- Creating an Integrated Product Support solution.
- Identifying necessary resources to support a system.
- Reducing costs while increasing availability.
- Facilitating information exchange between different parties.
- Storing data and results for future reference in a structured and methodological manner.

The S3000L specification offers guidance for analysis activities during the LSA process, providing a framework for structured information exchange. Key aspects of S3000L include:

- Design of LSA Process: Supports the LSA process design in the initial project phases, including the conduct of an LSA Guidance Conference.
- Product Breakdown and Candidate Selection: Provides rules for creating a suitable product breakdown and selecting LSA candidate items.
- Analysis Activities: Describes the types and methodologies for specified analysis activities.
- Cost-Efficient Support Concepts: Offers guidelines on processing analysis results to develop cost-efficient support concepts.
- Customer Interface: Defines the interface between the LSA process and customer interactions.
- Support Engineering Integration: Covers the interface between LSA and support engineering areas such as Reliability, Maintainability, and Testability (RM&T) analysis.
- ILS Disciplines Integration: Describes the interface between LSA and ILS disciplines, ensuring the production of essential ILS products such as:
 - Personnel and training requirements
 - Spare parts and consumables support
 - Technical documentation
 - Special support and test equipment
 - Facilities/infrastructure requirements
 - Software support requirements
- Maintenance Task Analysis: Includes guidelines for identifying maintenance tasks and conducting Maintenance Task Analysis.

Website: [About S3000L](#)

Co-Chairs:

- ASD: Elizabeth Neyrolles
- AIA: Jeff Benner

S4000P: International Specification for Developing and Continuously Improving Preventive Maintenance

S4000P is a modern interpretation of RCM analysis principles. It gives you a series of robust analysis activities to design an applicable and effective preventive maintenance program for your product. The activities in S4000P are supported by a data model as the basis for data exchange between stakeholders.

There are other well-known and well-established processes that you could choose to follow but S4000P has several unique features that deliver greater value to you. They include:

- in-service maintenance optimization (ISMO) - A well-defined, structured approach to continuously improve your preventive maintenance.
- a data model that simplifies data exchange between system, teams and organizations.
- integration with other IPS disciplines - An applicable and effective preventive maintenance program is the cornerstone of support for your product. As part of the S-Series, S4000P enables you to integrate with your other engineering disciplines. This integration also enables you to create and maintain the required digital thread between digital twins.

Using S4000P leads you to develop a robust, fully justified preventive maintenance program. It will allow you to share the analysis data and work easily with other disciplines involved in your integrated product development activity.

Website: [About S4000P](#)

Chair: Joern Achatzi / Daan De Lange

Vice-Chair: Chad Zeigler

S5000F: International Specification for In-Service Data Feedback

S5000F describes the basic in-service feedback processes, as well as the activities to be performed during the in-service phase and the information that these activities require for their proper execution. Thus, the data to be fed back is directly related to activities and their need is evidenced if such activities have to be carried out.

With the advent of new and complex technical products, a timely and effective support system is essential. Ensuring proper product surveillance is crucial to meet product liability regulations and optimize the product's capabilities. To achieve cost-efficient and optimized product operation, a structured process for information feedback is necessary. Over the lifecycle of a complex technical system or product, support costs significantly exceed acquisition costs, making this specification vital for cost savings and optimized product utilization. S5000F outlines the data flow among involved parties and the feedback of analyzed data into actionable recommendations.

The S5000F specification is designed to cover the information required for feedback in both Integrated Product Support (IPS) and other domains. In-service data feedback is one of the most vital functions of in-service support, enabling fleet and support managers, as well as technical system manufacturers, to conduct thorough analyses of operational and maintenance performance. The use of real data in analytics and simulations is essential for informed decision-making.

The analysis results from S5000F can serve as a foundation for:

- Enhancing maintenance and support concepts.
- Improving products through modifications and retrofitting.
- Planning sophisticated operational strategies.

The overarching goal of in-service data feedback is to increase fleet and product availability while optimizing operational effectiveness. Furthermore, feedback information is critical for managing performance-based logistics (PBL) contracts, where contractors may assume partial or full maintenance responsibilities and must comply with product liability obligations.

Using S5000F, either alone or in conjunction with other S-Series or IPS specifications, enables a structured approach to handling operational, maintenance, and other data feedback from operators, contractors, vendors, suppliers, MRO centers, or any other stakeholders. This process is efficiently managed through the S5000F data model, and the common data model for the S-Series of IPS specifications, SX002D.

S5000F describes the essential in-service feedback processes and the associated activities during the in-service phase. The data to be fed back is directly related to these activities,

summarized in typical use cases, and mapped against corresponding feedback data. This structure allows S5000F to be used contractually, by selecting specific activities (use cases) and referencing tables listing the required information.

The specification is organized into 30 chapters, each addressing a specific feedback purpose or providing global-level information:

- Chapter 1: Introduction to the specification
- Chapter 2: The in-service feedback business process
- Chapter 3-10: Feedback data for analysis purposes (RAMCT, maintenance, safety, etc.)
- Chapter 11-16: Feedback data for various support and management purposes
- Chapter 17-22: Placeholder chapters for future expansion
- Chapter 23-30: Data models, exchange, element lists, tailoring, contracting, implementation examples, and terminology

Website: [About S5000F](#)

Co-Chairs:

- ASD: Gustavo Garcia De Paz

S6000T: International Specification for Training Analysis and Design

S6000T focuses on the Instructional Systems Design (ISD) process. The ISD process is comprised of five interrelated phases, often referred to as the “ADDIE” model: Analyze, Design, Develop, Implement, and Evaluate. S6000T covers the first two phases—Analyze and Design—providing a standardized approach to developing training requirements and learning objectives.

S6000T defines the process for performing a Training Needs Analysis (TNA), which includes the definition of training requirements, the identification of learning objectives, and the development of a training curriculum. The specification also outlines the data model for information exchange with other S-Series specifications, ensuring interoperability across different systems.

By standardizing these processes, S6000T aims to provide a consistent framework that guides Instructional Systems Designers (ISDs) and Subject Matter Experts (SMEs) in determining training requirements, identifying data elements, and producing a comprehensive curriculum outline for any given product.

The S6000T process model is an international standard that provides guidance for the analysis and design phases of Instructional Systems Design. It is unique in its process-based architecture, which includes defined inputs, outputs, and processes. This approach is designed to ensure that training outcomes and requirements are clearly identified and systematically developed.

Key objectives of the S6000T specification include:

1. Development of a training support plan: a comprehensive plan that identifies if there is a training requirement and, if there is, describes the methodology to be used to meet that requirement.
2. Creation of a curriculum outline: a structured outline of the curriculum for the product or system that needs to be trained.
3. Establishment of a data model: a detailed data model corresponding to the units of functionality and elements within the system, designed to support and manage training requirements effectively.

S6000T incorporates well-known industry-standard learning models, taxonomies, and domains to provide guidance on contracting requirements, data elements, and curriculum outlines. The specific standards to be used are determined by organizational regulations, contractual obligations, and the results of the ISD analysis for the unique product training requirements.

Website: [About S6000T](#)

Co-Chairs:

- ASD: Rich Clewer
- AIA: Heather Kaufmann

SX000i: International Specification for Integrated Product Support (IPS)

SX000i is designed to define common support processes across all S-Series specifications, guiding their interactions and ensuring consistency. This specification forms the foundation for secure data sharing and exchange throughout the life of products and services. Additionally, SX000i provides guidelines for establishing an integrated product support program and facilitates the exchange of program-level data between different specifications, partners, contractors, and customers.

The primary purpose of SX000i is to provide a comprehensive specification for the execution of an integrated product support program by IPS managers and practitioners. It also offers the necessary tools for exchanging required information effectively.

SX000i serves the following key functions:

1. Vision and objectives: it outlines the vision and objectives for the entire suite of S-Series specifications.
2. Global IPS Framework: it provides a framework that documents the global IPS process and the interactions within it.
3. Interfacing with other domains: SX000i explains how the S-Series IPS specifications interface with other standardization domains, including program management, global supply chain management, engineering, manufacturing, security, safety, configuration management, quality, data exchange & integration, and environment.
4. Guidance on business requirements: it provides guidance on how to satisfy specific business requirements by selecting the appropriate processes and specifications.
5. Data model and XML schemas: it offers a data model that is compatible and interoperable with the rest of the S-Series specifications, based on a Common Data Model (SX002D), as well as the XML schemas necessary for data exchange.

Alongside the SX000i WG, the ASD/AIA Data Model and Exchange Working Group (DMEWG) was formed in October 2011. This group works closely with the SX000i WG to coordinate data modeling activities across the S-Series IPS Specifications, ensuring a coherent and unified data model.

SX000i serves as the framework for global IPS processes, providing guidelines for selecting and using the S-Series IPS specifications. Additionally, SX000i defines a set of data that ensures the S-Series IPS specifications remain integrated and interoperable.

SX000i is organized into twelve chapters:

1. Introduction to the Guide
2. Integrated Product Support Framework
3. Usage of the Suite of IPS Specifications in an IPS Program
4. IPS Program Guidance
5. IPS Activities for Each Life Cycle Stage-Contract Type
6. Support System Effectiveness
7. Data Management
8. Tailoring and Contracting Against SX000i
9. IPS Program Data Model
10. IPS Program Data Elements
11. Terms, Abbreviations, and Acronyms
12. Comparison of Specification Terminology

Website: [About SX000i](#)

Co-Chairs:

- ASD: Gwen Boutet
- AIA: Tyler Opfar

Other Documents:

Interoperability between the various S-Series IPS Specifications relies on a shared understanding of key data concepts. To support this, we provide two essential documents that guide you in both understanding and implementing the S-Series Common Data Model using UML:

- **SX002D – Common Data Model for the S-Series IPS Specifications**
- **SX004G – UML Model's Reader's Guide**

These documents are integral to achieving a harmonized data exchange and understanding across the S-Series IPS Specifications. Use them as your reference guides for implementing and managing the data models in your integrated product support processes.

SX002D – Common Data Model for the S-Series IPS Specifications

Interoperability between the respective S-Series IPS Specifications requires a common understanding of key data elements that underpin each specification. The SX002D Common Data Model (CDM) offers a conceptual description of all data elements that are common to more than one S-Series specification. Developing a consolidated and harmonized data model across the S-Series is a complex task that involves collaboration across several groups. The Data Modelling and Exchange Working Group (DMEWG) coordinates the development and publication of SX002D.

The primary purpose of SX002D is to harmonize the data modelling activities performed within each individual S-Series IPS Specification. It consolidates data requirements into one coherent S-Series Data Model, documented using UML, ensuring consistency and interoperability across the board.

SX004G – UML Model's Reader's Guide

A critical element for future releases of the S-Series IPS Specifications is the definition of a robust data model that supports the processes described in each specification. These data models are documented using Unified Modelling Language (UML) class models as mandated by the DMEWG. To prevent the need for each S-Series IPS Specification to include its own instructions on reading UML models, SX004G was created. This guide is referenced across all S-Series IPS Specifications where UML class models are used.

The SX004G UML Reader's Guide explains how to read and interpret the UML class models developed for any given S-Series IPS Specification, including the Common Data Model (SX002D). It provides the necessary guidance for users to understand the structure, relationships, and semantics of the models, ensuring clear and consistent implementation.

Website: [Common Data Model for the S-Series Guidance](#)

Simplified Technical English

ASD-STE100 Simplified Technical English (STE) is an international standard to write technical documentation in a controlled natural language.

STE has two parts: a set of writing rules (part 1) and a controlled dictionary (part 2). The writing rules cover aspects of grammar and style. The dictionary gives the general approved words that a writer can use.

Website: [ASD-STE100 HOME PAGE](#)

RESOURCES:

WEBSITES:

- S-Series: www.s-series.org
- S1000D: www.s-series.org/s1000d/
- S2000M: www.s-series.org/s2000m/
- S3000L: www.s-series.org/s3000l/
- S4000P: www.s-series.org/s4000p/
- S5000F: www.s-series.org/s5000f/
- S6000T: www.s-series.org/s6000t/
- SX000i: www.s-series.org/sx000i/

S-Series

<i>IPS Council</i>	
ASD IPS Council Co-Chair	Peter Eichmueller
AIA IPS Council Co-Chair	Paul Haslam
IPS Council Secretary	Andre' Evans
<i>Steering Committees</i>	
ASD S2000M SC Co-Chair	Carlos Lafuente
AIA S2000M SC Co-Chair	None
ASD S3000L SC Co-Chair	Elizabeth Neyrolles
AIA S3000L SC Co-Chair	Jeff Benner
ASD S4000P SC Co-Chair	Daan De Lange; Joern Achatzi
AIA S4000P SC Co-Chair	Chad Ziegler
ASD S5000F SC Co-Chair	Gustavo De Paz
AIA S5000F SC Co-Chair	None
ASD S6000T SC Co-Chair	Rich Clewer
AIA S6000T SC Co-Chair	Heather Kaufmann
ASD SX000i SC Co-Chair	Gwen Boutet
AIA SX000i SC Co-Chair	Tyler Opfar
<i>Permanent Working Groups</i>	
ASD Data Model Exchange (DMEWG) Co-Chair	Josue Cerneus
AIA Data Model Exchange (DMEWG) Co-Chair	Josh Green
ASD Terminology (TWG) Co-Chair	Kees Jan Wolter
AIA Terminology (TWG) Co-Chair	Dawn Meyer
ASD Bike (BWG) Co-Chair	Jose Carlos Lafuente
AIA Bike (BWG) Co-Chair	None
ASD Business Rules (BRWG) Co-Chair	Josue Cernneus
AIA Business Rules (BRWG) Co-Chair	Paul Haslam

ASD Change Process & Production (CPPWG) Co-Chair	TBD
AIA Change Process & Production (CPPWG) Co-Chair	TBD
<i>IPS DIG</i>	
Defense Interest Group (DIG) Co-Chairs	Gerke Mulder Jim Colson

S1000D

<i>S1000D Council</i>	
S1000D Council Chair	Joakim Lundquist (ASD)
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S1000D Steering Committee Chair	Kathy Rainbolt (AIA)
S1000D SC Vice-Chair	Pushpa Merchant (Civil Aviation)
S1000D SC Secretary	Jean-Michel Pancrazi (ASD)

AIA/ASD Product Support Organizations

<i>AIA Product Support Council (PSC)</i>	
PSC Chair	Edward Melendez
PSC Vice Chair	Currently open
<i>ASD Product Support Specification Group (PSSG)</i>	
PSSG Chair	Stefano Tedeschi
PSSG Vice Chair	Achim Basel
PSSG Secretary	Alexandre Buhler