

# The S-Series ILS specifications

## Overview

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## References

Table 1 References

Document No.	Title
<a href="http://www.sx000i.org">www.sx000i.org</a>	The SX000i website
<a href="http://www.s1000d.org">www.s1000d.org</a>	The S1000D website
<a href="http://www.s2000m.org">www.s2000m.org</a>	The S2000M website
<a href="http://www.s3000l.org">www.s3000l.org</a>	The S3000L website
<a href="http://www.s4000m.org">www.s4000m.org</a>	The S4000M website
<a href="http://www.s5000m.org">www.s5000m.org</a>	The S5X000M website
<a href="http://www.s9000d.org">www.s9000d.org</a>	The S9000D website

# 1 The S-Series ILS specifications

## Introduction

The international aerospace and defense community have over the past 20 years invested considerable effort to develop specifications in the field of Integrated Logistic Support (ILS).

The work was initially accomplished by integrated working groups composed of Industry (initially members of the AeroSpace and Defence Industries Association of Europe (ASD)) and customer organizations (MOD, etc) in a collaborative environment. The structure and functional coverage of these specifications was largely determined by NATO requirements specified during an international workshop (HAW Acquisition Logistics) in Paris in 1993.

In July 2010 an MoU was signed between ASD and AIA (Aerospace Industries Association of America, Inc.) in order to promote a common, interoperable, international suite of integrated logistics support specifications in the aerospace and defense industries of Europe and the United States and to make optimal use of the resources available, ASD and AIA agreed to work in concert on the joint development of the **S-Series ILS specifications**.

An ILS Spec Council was formed to conduct the overall governance of the development of the **S-Series ILS specifications** except the S1000D which is covered under a separate agreement between ASD, AIA and ATA (Air Transport Association of America, Inc.).

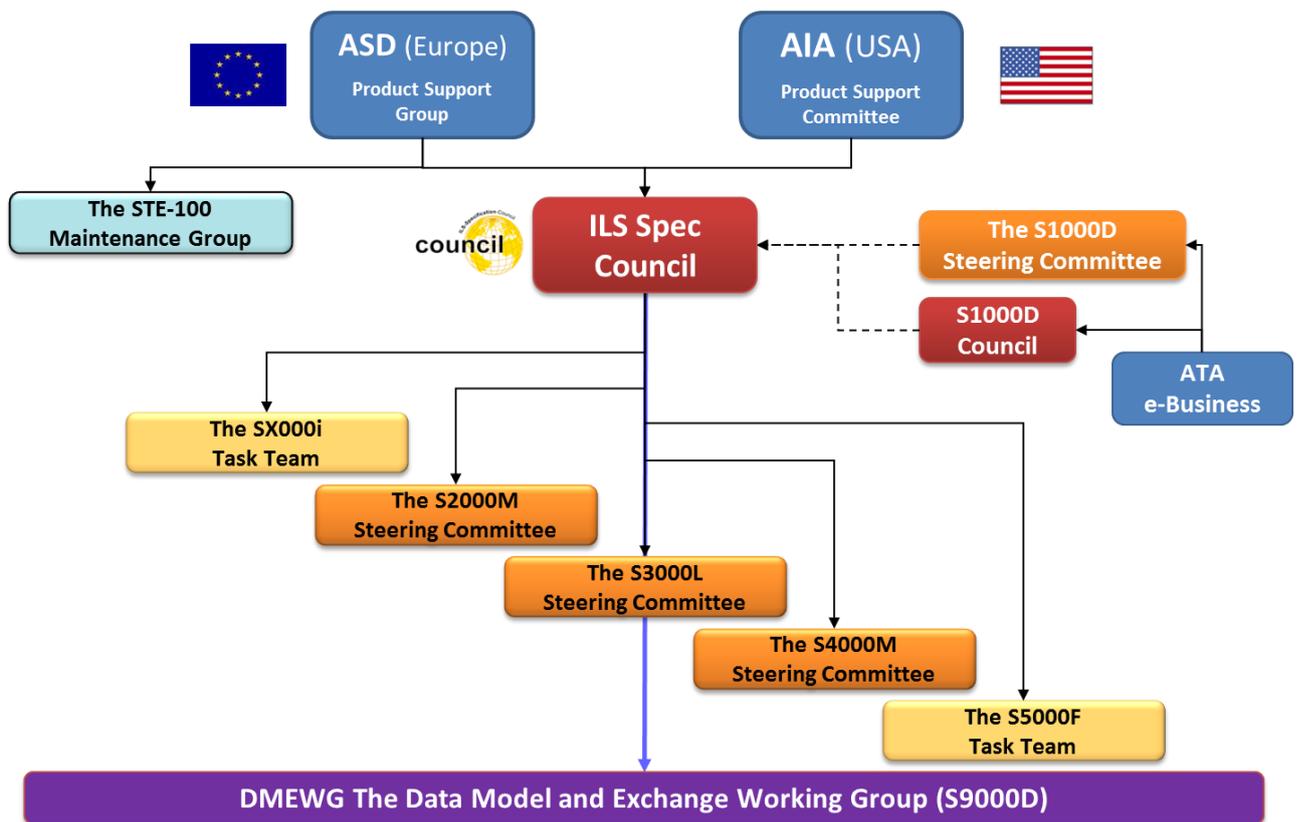


Fig 1 The organization

## Vision

The Council's vision for the **S-Series ILS specifications** is

- to be the international integrated specification suite for logistics support of aerospace and defense Products

## Mission

The mission for the Council, its specification Steering Committees and Task Teams is

- to minimize project dependency by defining clear guidance and by managing and limiting inclusion of project and national specific rules and constructs
- to ensure commonality between the ILS related specifications to support the re-use across projects
- to give rules and guideline for the realization of an integrated logistic support to emphasize the main principle of ILS, the integration of the different logistic disciplines (the "I" in ILS must be the main driver)
- to ensure the application of the basic ISO standards such as ISO Dates and Language Codes
- to establish well defined data transfer mechanism between the different logistic disciplines based on PLCS
- to cover all aspects of supportability over the entire life cycle of a product
- to be the contractual baseline for industry and customers
- to be up to date with the technical development and changes in support philosophy

The following specifications are currently available or in the process of development:

- [SX000i](#) - International guide for the use of the S-Series Integrated Logistics Support (ILS) specifications
- [S1000D](#) - International specification for technical publications using a common source database
- [S2000M](#) - International specification for materiel management - Integrated data processing
- [S3000L](#) - International specification for Logistics Support Analysis - LSA
- [S4000M](#) - International specification for developing scheduled maintenance programs
- [S5000F](#) - International specification for operational and maintenance data feedback
- [S9000D](#) - Dictionary for the S-Series ILS specifications
- [CDM](#) - The Common Data Model (CDM)
- [DEX A&D](#) - The Aerospace and defense Data Exchange Specifications (DEX)
- [S1000X, S2000X, S3000X, S4000X, S5000X](#) - eXchange specifications
- [ASD-STE-100](#) - International specification for the preparation of maintenance documentation in a controlled language (Simplified technical English)

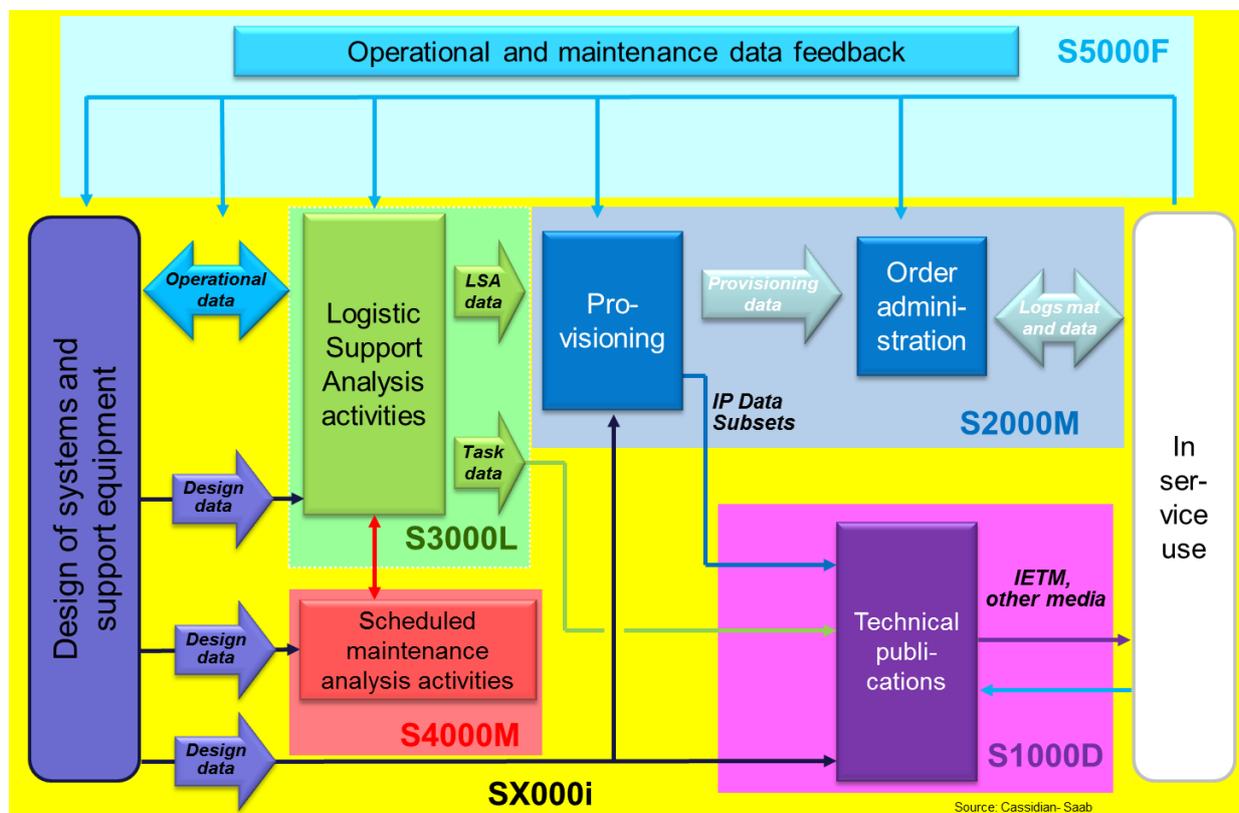


Fig 2 The S-Series specifications

## 2 SX000i - International guide for the use of the S-Series Integrated Logistics Support (ILS) specifications

### Introduction

By defining common logistics processes to be used across all S-Series specifications and the interactions of the current S-Series specifications with the logistics processes, the SX000i forms the basis for sharing and exchanging data securely through the life of products and services. The SX000i also provides governance for the maintenance of current S-Series specifications and the development of new S-Series specifications.

### Purpose

SX000i provides a guide for the use of the suite ILS Specifications by ILS managers and practitioners, as well as for the management and future development of the specifications by the ILS Specification Council and ILS specification SCs and WGs. SX000i:

- Explains the vision and objectives for the suite of specifications;
- Provides a framework that documents the global ILS process and interactions;
- Explains how the ASD/AIA ILS specifications interface with other standardization domains including Program Management, Global Supply Chain Management, Engineering, Manufacturing, Security, Safety, Configuration Management, Quality, Data Exchange & Integration, and Life Cycle Cost;
- Describes the global governance of ASD/AIA ILS specifications development;
- Provides guidance on how to satisfy specific business requirements using an appropriate selection of defined processes and specifications.

### SX000i Guide development history

During the development of the ASD ILS Specifications, the different WGs identified the need for an “umbrella” specification to ensure the compatibility and commonality of ILS processes among the suite of ILS specifications. In 2011, the decision was made to develop, publicize and maintain an Integrated Logistic Support Guide, named SX000i, so as to provide a compatible and common ILS process to be used in the other ILS specifications. Development of SX000i was viewed by the ILS Specifications Council as an essential step to achieving the vision for the suite of ILS specifications.

In June of 2011, the SX000i WG was formed and SX000i development commenced. The current title of SX000i, International Guide for the Use of the S-Series Integrated Logistics Support Specifications, was approved by the ASD/AIA ILS Specifications Council in June of 2012.

Following the formation of the SX000i WG, the ASD/AIA Data Model and Exchange Working Group (DMEWG) was formed under the ILS Specifications Council in October 2011. Working in close coordination with the SX000i WG, the DMEWG coordinates the data modeling activities that are performed within the respective ASD ILS Specification SCs and WGs so as to harmonize and consolidate data requirements into one coherent data model.

Publication of SX000i, and continuing DMEWG coordination activities, enable the achievement of the vision for the suite of ILS specifications “to apply common logistics processes so as to share and exchange data securely through the life of products and services.”

The companies and organizations that are currently participating in the development of SX000i are:

- |  |                          |
|--|--------------------------|
| • Airbus                                 | France                   |
| • Airbus Military                        | Spain                    |
| • Boeing Defence Systems                 | USA                      |
| • Bundeswehr                             | Germany                  |
| • Cassidian                              | Germany & Spain          |
| • ESG Elektroniksystem und Logistik GmbH | Germany                  |
| • Lockheed Martin                        | U.S.A.                   |
| • OCCAR-EA                               | European (multinational) |
| • UK Mod                                 | United Kingdom           |
| • Saab                                   | Sweden                   |
| • SELEX ES                               | Italy                    |
| • Tusas Aerospace Industries (TAI)       | Turkey                   |

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SX000i is expected to be published in the second quarter of 2014.

### Ten-liner

SX000i will provide the framework for the global ILS process, as well as the guidelines for the selection and use of the suite of ILS Specifications. Nonetheless, SX000i will also define the global specification governance, as well as the mechanisms that will be used to ensure that the suite of ILS Specifications is both integrated and interoperable.

SX000i consists of four chapters and several appendices. The chapters are as follows:

- Chapter 1 - Introduction to the Guide
- Chapter 2 - Integrated Logistic Support Framework
- Chapter 3 - Usage of the Suite of ILS Specifications in an ILS Program
- Chapter 4 - IA/ASD ILS Specification Governance

The appendices cover a global product lifecycle matrix and an Integrated Logistic Support element matrix, as well as a series of templates to be used across all steering committees and working groups.

### Web-site

Free download will be available at [www.sx000i.org](http://www.sx000i.org)

## 3 S1000D - International specification for technical publications using a common source database

### Introduction

S1000D<sup>®</sup> (European Community Trade Mark) is an international specification that gives rules and guidance for the production of technical publications, using XML and storing the information as "data modules" in a Common Source Database (CSDB). Data modules are small XML files that typically contain, for example, a single maintenance task procedure.

### Purpose

This specification is predicated on the concept of "write once, use many" and, to that end, uses data modules, which can be reused and/or repurposed in one or many ways. Structural integrity and consistency is supported by 26 XML schemas.

### S1000D development history

S1000D was borne from a need to support a multi-nation, multi-manufacturer aerospace project known as Eurofighter. The need was realized by project leads who observed that the technical publications from the nations and manufacturers were being written to different specifications, which led to inconsistency in the technical publications. This situation prompted, in 1985, to task the Documentation working group of ASD (formerly AECMA) to invite military representatives from the European nations to form a joint team for the development of a common military aircrafts specification for technical publications.

Release history:

#### 1989

The first issue of the specification was released at the Paris airshow in June 1989. During the following years five changes (Change 1.1 thru Change 1.5) were released.

#### 1995

The first "full blown" release of the specification (Change 1.6) was in 1995 and consisted of four main chapters in two volumes with 24 Annexes and one SGML DTD. The DTD had "marked sections" which support descriptive and procedural content only but provided for descriptive, procedural and general information for both air vehicles and ground equipment. IETPs were linear, database oriented or integrated and were supported by HyTime.

#### 1998

The next issue of S1000D was Change 1.7 which was released in 1998. There was a significant change in this issue from Change 1.6. Air ground equipment was supported by separate DTDs for descriptive, procedural and schedules information. Air vehicles were supported by these plus crew and illustrated parts

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information. SGML DTDs were also provided for data dispatch notes, In-Process reviews and CSDB lists. The concept of Web based IETPs were also introduced in this issue.

**1999**

In 1999, Change 1.8 of the specification was released. In the main, Change 1.8 harmonized the ground equipment DTDs and the air vehicle DTDs.

**2001**

Change 1.9 was released in 2001. The most significant aspects of Change 1.9 were the introduction of XML DTDs and the IETP-X, which used XML based functionality such as XLink. Also included in this change were permitting the use of different file types such as PNG and PDF, removing various elements that were presentation related.

**2003**

In 2003, at Issue 2.0, S1000D was transformed and completed restructured into nine main chapters that now supported not only aerospace and ground equipment but also land and sea based defense projects. It was at this issue that an MOU was signed between ASD (formerly AECMA) and the AIA to jointly maintain future issues of the specification. Another significant change was the introduction of XML Schemas. More information types – commenting, data module lists and publication modules were also added to the suite of SGML DTDs and XML DTDs and Schemas. This was also the issue that introduced the Process data module and the functionality matrix.

**2004**

Issue 2.1 was released in 2004. The changes were mainly editorial but more importantly, the new SGML DTDs and XML Schemas were added to support wiring data modules. Also in 2004, an MOU was signed between ASD and ADL. The intention of this MOU was to harmonize the requirements of SCORM with S1000D.

**2005**

2005 at Issue 2.2 introduced of the BREX data module and resolved a large number of change proposals.

**2007**

In 2007, an MOU was signed between ASD, the AIA and the ATA and Issue 2.3 was released. Important changes at this issue were the introduction of the Technical Information Repository and the container concept (from the ATA) and the beginnings of a new applicability model. At Issue 2.3, the concept of the “Product” was introduced.

Later in 2007 Issue 3.0 was released. This issue included important changes to the wiring DTDs and Schemas but of most significance was the enhancement of the applicability model, which finally replaced the applicability model that had been in S1000D from Change 1.6.

The support of SGML DTDs was also dropped at Issue 3.0.

**2008**

In 2008, S1000D was completely revised and now included over 100 US Army change proposals, including the introduction of the new checklist Schema and support for the Maintenance Allocation Chart (MAC). Issue 4.0 also included the first results of the harmonization with SCORM and the learn and SCORM content package Schemas were introduced. The ATAs container and TIR functionality was further enhanced.

**2012**

In 2012, Issue 4.1 was finally released. This issue included more restructuring, a large amount of editorial changes plus bringing the specification up to date in many areas. The TIR became a Common Information Repository (CIR) because it now supported documentation. The concept of incremental updates was also included, and this introduced the update file. The harmonization with SCORM was significantly enhanced to include a new Schema for the Sharable Content Object (SCO) and the assessment functionality was improved upon. New Schemas were also introduced to support Service Bulletins and Front Matter. A new Business Rules Index was added to assist readers in locating project decision points.

**Ten-liner**

- S1000D provides W3C compliant XML Schemas for all information types that are found in technical publications.

- The specification describes in detail the purpose and associated rules for every XML element and attribute that are in the Schemas.
- Consistency is assured by a rigid meta data structure that is included in every data module.
- The processes for using this meta data for managing information in the CSDDDB is fully detailed.
- Management Schemas are provided in support of the exchange of information.
- Publication modules serve as a means of gathering together all the data modules and associated graphics into a publication.
- Publication modules further enhance reuse and repurposing of data modules and associated graphics.
- Rules and guidance are provided for all output types such as the layout for paper, the presentation of page oriented publications and the display and functionality of IETPs
- The technical concepts and rules pertaining to the use of XML is fully explained.
- To support implementations in different projects, Business Rules, the BREX data module and the Business Rules Index are provided.

### Web-site

Free download at [www.s1000d.org](http://www.s1000d.org)

## 4 S2000M - International specification for materiel management - Integrated data processing

### Introduction

The specification S2000M defines the processes, procedures and provides the information for data exchange to be used for materiel management of a Product during its lifecycle.

### Purpose

The specification standardizes the business relationship between two or more parties (eg, contractor and customer) by providing the data elements, the process flow and the relevant transactions for data exchange.

S2000M is organized into basic chapters:

- Chapter 1A - Provisioning
- Chapter 1B - NATO Codification
- Chapter 1C - Spare parts list
- Chapter 2 - Procurement Planning
- Chapter 3 - Order administration including repair and warranty
- Chapter 4 - Invoicing
- Chapter 5 - Repair administration (only supplied until Issue 4.0)
- Chapter 6 - S2000M Light

### Chapter 1A Provisioning

Provisioning is the process of selecting support items and spares, necessary for the support of any military Product. The chapter defines the process and specifies the data, formats and transmission procedures to be used in providing provisioning information to the Customer. It also provides the data base from which Illustrated Parts Catalogues (IPC) or IPDP (Illustrated Parts Data Publication) are produced. The rules for the production and presentation of the IPC in different media are covered by the specification S1000D.

In addition, Chapter 1A - Updating of initial provisioning data - defines the procedure by which the customer can assess the impact of changes on items and to comment on the proposed changes.

### Chapter 1B NATO Codification

This chapter defines the process of exchanging information for NATO codification purposes between industry, the National Codification Bureaus and the customer.

### Chapter 1C Spare parts list

This chapter defines the spare parts list which enables the contractor to supply parts data (including commercial data elements) to the customer in order to use the processes as described in Chapter 2 thru

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Chapter 4, without the necessity to use processes as described in Chapter 1A and Chapter 1B of the specification.

### **Chapter 2 Procurement planning**

This chapter defines methods for Industry to provide pricing information on parts

- via price list
- via a quotation process
- via order based pricing

### **Chapter 3 Order administration**

This chapter defines the process of order placement, and the flow of information concerning the progress of orders and deliveries. This order placement takes care of spares orders as well as repair orders and exchange of transportation information.

### **Chapter 4 Invoicing**

Invoicing provides a standard process of transmitting invoice data and invoice status between the customer and contractor.

### **Chapter 5 Repair administration**

For the Issue 5.0 of S2000M, this chapter is no longer supplied and its content deleted from this chapter. Repair/Overhaul and warranty is now part of Chapter 2, Chapter 3 and Chapter 4.

### **Chapter 6: "S2000M Light"**

This chapter is a stand-alone "light" version of S2000M to support non-complex projects. It covers the processes of Chapter 1 thru Chapter 4 with a reduced set of data elements and messages.

## **S2000M specification development history**

### **1981**

The foundation of the ASD (former AECMA) supply working group at an international conference in Paris.

### **1992**

Issue 2.1 - The first issue to be used in support of a project.

### **1998**

Issue 3.0 - Introduction of Chapter 5 (Repair), SQ1 (Order based Pricing), deletion of Appendix 5 (EDIFACT).

### **2005**

Issue 4.0 - Extension to land and sea. Introduction of Chapter 6 ("S2000M Light")

### **2012**

Issue 5.0 - Move the repair information (Chapter 5) to Chapter 3

### **2014**

Issue 6.0 (in progress) - A PLCS (ILS integration) adopted issue with XML messages. This issue will be harmonized with the IT environments of S1000D, S2000M and S3000L, based on ISO 10303 STEP (STandard for the Exchange of Product model data). Simplified data flow by using PLCS data exchange specifications. The specification will be supported by the creation of interface specifications for data exchange with other disciplines (S1000D und S3000L).

## **Ten-liner**

The specification S2000M defines the processes, procedures and provides the information for data exchange to be used for materiel management of a Product during its life-cycle.

Its purpose is to standardize the business relationship between two or more parties (eg contractor and customer) by providing the data elements, the process flow and the relevant transactions for data exchange.

The specification S2000M is organized into basic chapters:

- Chapter 1A Provisioning - Chapter 1B NATO Codification - Chapter 1C Spare parts list
- Chapter 2 Procurement planning

- Chapter 3 Order administration including repair and warranty
- Chapter 4 Invoicing
- Chapter 5 Repair administration (only supplied until Issue 4.0)
- Chapter 6 S2000M Light

#### Web-site

Free download at [www.s2000m.org](http://www.s2000m.org)

## 5 S3000L - International specification for Logistics Support Analysis - LSA

### Introduction

With the introduction of new and complex technical products, a proper support system must be made available in a timely manner. This requires an extended analysis process to ensure consideration of logistic requirements during the design of the product and to support the establishment of a proper support system. The process includes a number of analysis activities concerning a wide range of technical/logistic considerations and the careful documentation of the results of these analysis activities. The achievement of proper supportability is of crucial importance concerning operation and life cycle costs. Early consideration of logistic aspects is increasingly important with regard to both operational and economic aspects. A product that cannot be operated and maintained properly and cost effectively is not acceptable to the operator.

### Purpose

The specification S3000L is designed to cover the activities and requirements governing the establishment of the LSA process.

#### S3000L

- provides rules for the establishment of the product system breakdown and for the selection of LSA candidate items to be analyzed in detail
- describes type and methodology of performance of the specified analysis activities
- gives guidelines on how to process the results of the analysis tasks and on how to achieve a cost-efficient support concept
- covers the interface to the customer within the LSA process
- covers the interface between the LSA process and the support engineering areas (eg reliability, maintainability and testability)
- covers the interface between the LSA process and the ILS disciplines, which provide the typical logistic ILS products:
  - Personnel and training requirements
  - Supply support
  - Technical data services
  - Special support and test equipment
  - Facilities and infrastructure requirements
  - IT support requirements

### S3000L specification development history

The development work was allocated in the year 2006 to an international team of experts working under the joint chairmanship of AIA and ASD representatives. The following companies and organizations contributed to the work to the initial issue:

- AgustaWestland United Kingdom
- Airbus Germany
- Boeing United States
- Dassault Aviation France
- EADS Casa Spain
- EADS Military Systems Germany

- 
- Eurocopter France
  - LOGSA United States
  - MBDA France
  - Saab AB Sweden
  - UK MoD United Kingdom

The final draft of the specification S3000L (Issue 0.1) was officially published in June 2009. The main purpose of this draft was to enable experts from interested companies and organizations to provide comments on the first approach to the S3000L expert team. The commenting phase was officially closed by end of 2009. More than 20 experts from different nations contributed with their inputs to improve the final draft for the publication of the first official Issue 1.0.

In June 2010, Issue 1.0 of S3000L was finally released and published for free download via the website of ASD-STAN. With the signing of a Memorandum of Understanding between ASD and AIA at the Farnborough Air Show in July 2010, the ASD/AIA ILS Council was formed and the ILS community implemented a new platform for harmonization and coordination of the different ILS specification activities. In November 2010 the kickoff of the S3000L Steering Committee (S3000L-SC) took place in Washington, the first official SC meeting was conducted in April 2011 in Paris. The S3000L Steering Committee is steadily growing and in April 2013 at the S3000L-SC in Berlin, it reached a size of approximately 35 persons (full members and observers) from 12 countries.

The specification is maintained and permanently harmonized with other ASD specifications. The next issue 1.1 will be published 3<sup>rd</sup> quarter of 2013. .

### Ten-liner

The specification S3000L describes the processes and analysis activities to be used for the definition of a suitable support environment to operate technical complex and long living products. Complementary to the extensive procedural chapters in the specification, the corresponding data environment is described by a detailed entity relationship model using standard UML technology (based on ISO Standard 10303, AP239, PLCS).

The specification S3000L is organized into 22 chapters, which can be grouped into the following clusters:

- Chapter 1 Introduction and general guidance how to use the Specification
- Chapter 2 - 17 Procedural chapters describing LSA process and the corresponding analysis activities
- Chapter 18 Description of interrelations to other ASD specifications S1000D, S2000M, S4000M, S5000F (will be extended with new published specifications as required)
- Chapter 19 - 20 Data part including UML model and data exchange definitions
- Chapter 21 Terms, abbreviations and acronyms
- Chapter 22 Alphabetical Data Element List (DEL)

### Web-site

Free download at [www.s3000l.org](http://www.s3000l.org)

## 6 S4000M - International specification for developing scheduled maintenance programs

### Introduction

For a new Product or Product variant a set of scheduled maintenance tasks with intervals must be developed prior to its introduction into service.

A determination of applicable and effective tasks and intervals can neither be justified nor be judged as a complete set, for example by collecting "best engineering judgments" only.

To achieve a traceable and complete determination of scheduled tasks and intervals, a structured analysis process must be applied for a Product. Such a process must cover all kind of Product types including any complex technical platform, system, equipment or facility (on air/sea/land, under sea, underground, in space)

An analysis process for developing scheduled maintenance programs must be acceptable to regulatory authorities, maintainers, operators, manufacturers and suppliers. It needs the contribution of both the

customer(s) and the responsible authorities. For a specific Product under analysis the process must be tailored to the Product requirements and adapted to the product usage scenarios. The correct application of the analysis process requires proper training of all specialists from the regulatory authorities, prime manufacturer, main equipment manufacturers and suppliers that are directly involved in the analysis process.

### **Purpose**

The main purpose of this specification is to assist regulatory authorities and all parties involved in the analysis process in developing and releasing initial scheduled maintenance tasks and intervals for new Products prior to a Product entry into service. In addition this analysis process is applicable for an implementation later in Product optimizations/modifications, too.

During the development of scheduled maintenance programs the analysis process has to determine scheduled maintenance tasks and intervals, which must

- ensure the inherent Product safety, conformity with law (covering the environmental integrity), mission/operation accomplishment and reliability levels
- maintain inherent Product safety, mission/operation accomplishment and reliability levels when deterioration has occurred when the Product is in service
- achieve the above objectives at minimum costs

Scheduled maintenance tasks and intervals that are not applicable and effective to identify and/or eliminate potential functional failure causes with their failure end-effects on Product system level, the analysis process must give appropriate feedback concerning design improvements to the responsible design departments.

During the Product in-service phase, all scheduled maintenance tasks and intervals must be revised in light of actual experience that is accumulated throughout the Product life cycle.

### **S4000M specification development history**

S4000M development work was initiated in 2004.

Experts from the following international companies and organizations developed S4000M:

- Airbus Deutschland      Germany
- BAE Systems              United Kingdom
- Dassault Aviation        France
- EADS Casa                Spain
- EADS Deutschland        Germany
- O'Neil & Associates      United States
- Saab AB                    Sweden
- UK MoD                    United Kingdom

A first draft of the specification S4000M (Issue 0.1) was officially published in June 2009. Comments have been incorporated in Issue 1.0. In parallel ASD decided to modify both scope and applicability of the specification resulting in S4000M Issue 1.0.

Issue 1.0 of S4000M is ready to be released by the ASD.

### **Ten-liner**

The specification S4000M Issue 1.0 defines the processes, procedures and provides the information to develop scheduled maintenance programs specific for complex technical products prior entry into service.

Its purpose is to contribute to continued product safety, to ensure environmental integrity and law conformity, to achieve maximum mission/operational availability and to minimize operational costs (economy).

The specification S4000M Issue 1.0 is organized into the following basic chapters:

- Chapter 1      Introduction into the specification
- Chapter 2      System and power plant analysis
- Chapter 3      Structure analysis
- Chapter 4      Zonal analysis

- Chapter 5 Terms, abbreviations and acronyms

S4000M will provide processes, procedures and information to cover the optimization of scheduled maintenance programs during the Product In-Service phase taking into account the In-Service experience / data and will describe the S4000M-relevant interfaces from/to other specifications from the ASD S-Series ILS specifications from the next issue of the specification on (foreseen in Issue 2.0).

#### Web-site

Free download will be available at [www.s4000m.org](http://www.s4000m.org)

## 7 S5000F - International specification for operational and maintenance data feedback

#### Note

The specification S5000F is still under development. There was a draft issue 0.1 issued for review. Planned issue date for the Issue 1.0 of the S5000F specification is during the second quarter of 2014.

#### Introduction

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

The results of the analysis can be the basis for:

- enhancement of the maintenance and support concept
- improvement of the product or the system by modifications and retrofit activities
- sophisticated operational planning
- management of requirements and contracts

The overall aim to be achieved through operational and maintenance data feedback is the increase of fleet availability and optimization of effectiveness. In addition the operational and maintenance data feedback information is a firm requirement by industry to agree to and manage Performance Based Logistics (PBL) contracts and to fulfil their obligations in the regard to product liability.

The aim with S5000F is to handle information from the in service operation (from the operator to the Product manufacturer or the maintainer). The processes used for this are described in the specification with focus naturally on the operational and maintenance feedback information and the activities that take place in the operational phases of the life cycle of the product. In the S5000F the life cycle of a product is generally divided into five phases:

- definition
- preparation
- development
- in service
- disposal

The last two phases, in service and disposal are the phases that mainly are handled within the scope of S5000F. The operational and maintenance data feedback information is transferred to the organization of interest using a data model based on PLCS and DEX (Data Exchange Specification) format.

#### Purpose

The purpose of using S5000F alone or together with the other S-series specification is to obtain a structured way to handle the operational and maintenance data feedback information from the operator. By using the same interfaces (based on the PLCS standard) for information handling this can be made more efficient.

#### S5000F specification development history

During 2008 the plan for developing the S5000F was drawn up within the AIA/ASD organization. There were already some S-series specifications developed and used for integrated logistic support purposes. These specifications were:

- S1000D for Technical publications

- S2000M for Material management
- S3000L for Logistic Support analysis (LSA), (S3000L was under development at the time)
- S4000M for Maintenance task analysis

The AIA/ASD organization noted that there was a need for a specification handling operational and maintenance data feedback from the operational field or the in service field to the maintainer and/or the Product manufacturer.

It was decided that the S5000F specification shall:

- take into account the activity model given by ISO 10303-239 PLCS and shall support data exchange by PLCS Data Exchange Sets
- include process application guidelines and rules for information exchange
- be tailorable and include guidelines for tailoring
- take into account current ISO/EN baseline documents
- enable online interfaces to the S-series of ILS Specs, ie S1000D, S2000M, S3000L, S4000M

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

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

- Agusta Westland           UK
- Airbus military            Spain
- Andromeda Systems       United States
- Boeing                      United States
- Bundes wehr               Germany
- Cassidian                  Germany
- Dassault Aviation         France
- ESG                         Germany
- Occar                       Europe (based in Germany)
- Rolls Royce                UK
- Saab AB                    Sweden
- UK MoD                     UK

During spring 2013 an internal draft (Issue 0.1) for AIA/ASD review was released. There will also be a draft Issue 0.2 released for public review by the summer of 2013. Data model development is on-going and planned issue date for the Issue 1.0 of the S5000F specification is the second quarter of 2014..

### **Ten-liner**

The S5000F - International specification for operational and maintenance data feedback describes a structured way to handle information from the operation of a system or product (from the operator to the Product manufacturer or the maintainer). The information will be transferred using the PLCS standard.

Collection of operational and maintenance data feedback has many purposes and is one of the most important functions of in service support. It enables fleet managers, support managers and complex technical system manufacturers to perform a thorough analysis of operational and maintenance performance of a technical system.

The overall aim to be achieved through operational and maintenance data feedback is the increase of fleet availability and optimization of effectiveness. In addition the operational and maintenance data feedback information is a firm requirement by Industry to agree to and manage performance based logistics (PBL) contracts and to fulfill their obligations in the regard to product liability.

### **Web-site**

Free download will be available at [www.s5000f.org](http://www.s5000f.org)

## 8 S9000D - Dictionary for the S-Series ILS specifications

### Introduction

Interoperability between the respective S-Series ILS specifications requires a common terminology to be applied to all the specifications. The S9000D Dictionary will contain terms and definitions used in the S-Series ILS Specifications and will guide users towards a common terminology. The work on developing the content for S9000D is done in close cooperation with the SX000i committee and the DMEWG (Data Model and Exchange Working Group). SX000i defines common logistics processes to be used across all S-Series specifications and the interactions in between the respective S-Series ILS specification logistics processes. DMEWG is responsible for the development and maintenance of

- **One** Common Data Model (CDM) based on the individual data models. The individual data models for each specification are developed by the specification teams. Refer to [Fig 3](#).
- eXchange specifications supporting the data transfer for a specific domain (Tech pubs, LSAR, etc). Refer to [Fig 4](#).
- Data Exchange Specifications (DEX) for aerospace and defense business, supporting the data transfer
- a dictionary - S9000D. Refer to [Fig 5](#).

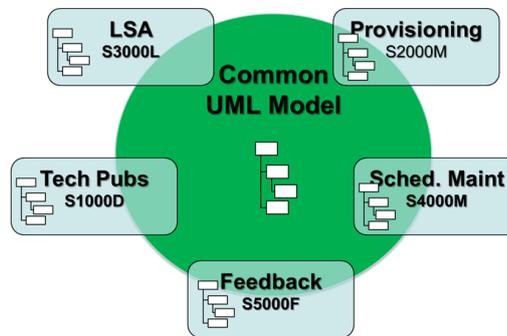


Fig 3 The Common Data Model (CDM)

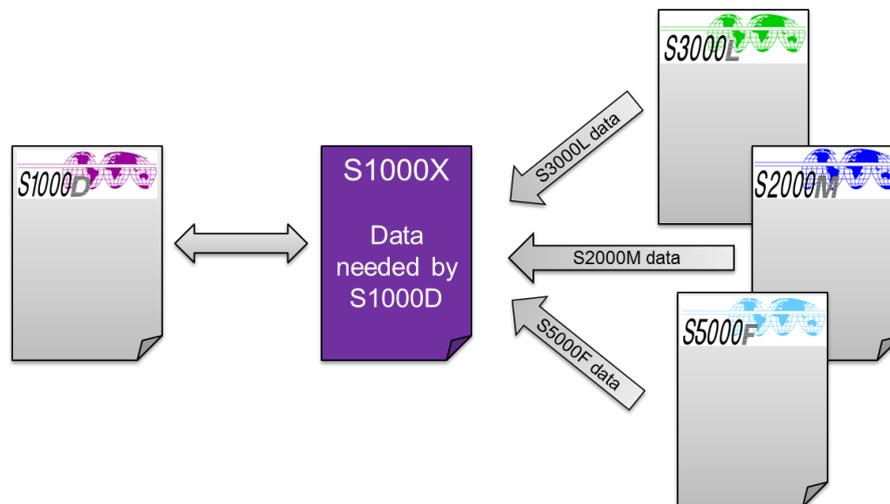


Fig 4 eXchange specification, example

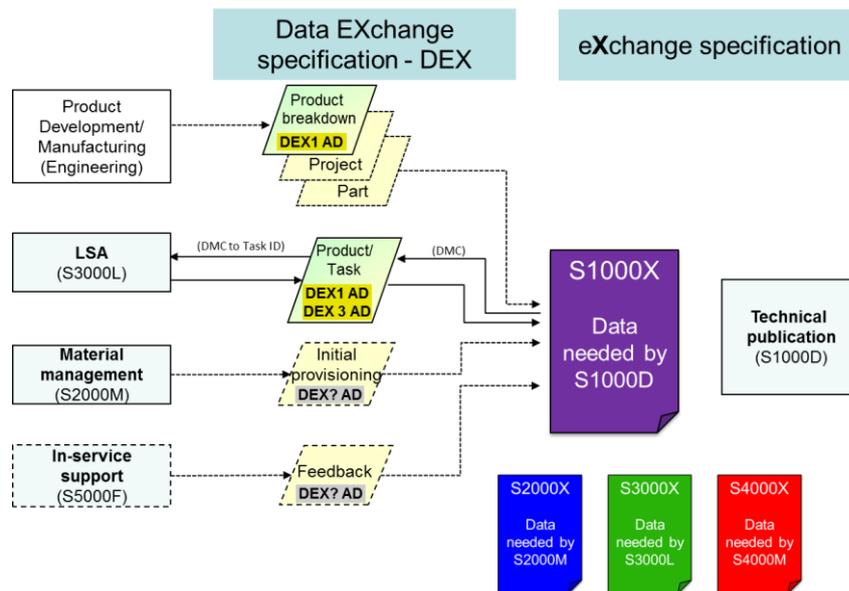


Fig 5 Data transfer supported by DEXs and eXchange specification

## Purpose

The purpose of S9000D is to manage:

- Definitions for central business terms used in the S-Series ILS specification
- Definitions for all terms used in the S-Series ILS specification data models
- Approved abbreviations and acronyms which can be used in the respective S-Series ILS specification and/or in the naming of terms within the S-Series specification data models.

S9000D also provides rules and guidelines for:

- naming conventions
- authoring of definitions for the dictionary
- meta-data required for each term
- relationship between S-Series ILS specifications terminology and OASIS PLCS Reference data

## S9000D specification development history

The development work was initiated in 2011. The following companies and organizations contribute to the work:

- Airbus Military Spain
- Boeing United States
- Cassidian Germany
- CostVision United States
- ISS United States
- LOGSA United States
- O'Neil & Associates United States
- Rolls-Royce United Kingdom
- Saab AB Sweden

A first draft (Issue 0.1) is planned to be released beginning of 2014.

## Ten-liner

S9000D includes the terms and definitions and builds up the Dictionary for the S-Series ILS specifications. The Dictionary also includes the abbreviations and acronyms as well as rules and guidelines for the authoring of S9000D (eg, naming conventions).

To support the use and development of the dictionary and the individual specifications a Common Data Model (CDM) is maintained by the DMEWG (Data Model and Exchange Working Group).

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The DMEWG is also developing and maintaining the **eXchange specifications** supporting the data transfer for a specific domain (Tech pubs, LSAR, etc) and the aerospace and defense business Data Exchange Specifications (DEX) supporting the data transfer.

### Web-site

Free download of the dictionary will be available at [www.s9000d.org](http://www.s9000d.org)

## 9 ASD-STE-100 - Simplified technical English

### Introduction

ASD-STE100<sup>®</sup> (European Community Trade Mark No. 004901195) is an **International specification for the preparation of maintenance documentation in a controlled language**. A controlled language is a form of language with special restrictions on grammar, style and vocabulary usage.

It was developed in the early Eighties (as AECMA Simplified English) to help the users of English-language documentation to understand what they read. The ASD-STE100 (STE) provides a set of Writing rules and a Dictionary of controlled vocabulary.

The Writing rules cover aspects of grammar and style; the Dictionary specifies the general words that can be used. These words were chosen for their simplicity and ease of recognition. In general, there is only one word for one meaning, and one part of speech for one word. In addition to the specified general vocabulary, STE accepts the use of company-specific or project-oriented technical words, provided that they fit into one of the categories listed in the specification. Control of any additional specific vocabulary is, of course, the responsibility of the company or the project itself.

### Purpose

The main purpose of this specification is to make technical texts easy to understand by all readers.

The international language of many industries and of the aerospace industry in particular, is English, and English is the language most used for writing technical documentation. However, it is often not the native language of the readers (or even of the authors) of such documentation. Many readers have knowledge of English that is limited, and are easily confused by complex sentence structures and by the number of meanings and synonyms which English words can have.

The major benefits of adopting STE are:

- Maintenance optimization: controlled grammatical structures and vocabulary - on which STE is based - have the purpose of producing texts that are easily understandable and, consequently, reduces errors during the maintenance tasks. Therefore, the correct usage of STE gives the operators instructions that are technically correct and unambiguous, leading to maintenance optimization and safety improvement.
- Wide applicability: although STE was originally designed for the aircraft industry, it can be used in other areas, such as land and sea vehicles, as detailed in S1000D. In addition, STE is also widely used in other industries outside its intended domains or aerospace and defense (eg, medical, automotive, software, passenger trains, engineering, manufacturing, translations and language services). There is also a growing interest within the academic world.

### ASD-STE100 specification development history

In the late 1970s, the Association of European Airlines (AEA) asked the European Association of Aerospace Industries (AECMA) to investigate the readability of maintenance documentation in the civilian aircraft industry. AECMA asked the Aerospace Industries Association (AIA) of America to assist in this project.

ASD-STE100 development work was initiated in 1983.

The specification was first released in 1986 as the AECMA Document, PSC-85-16598. Subsequently, several changes, issues and revisions were released up to the present Issue 6. The Specification is fully owned by ASD, Brussels, Belgium. As such, STE is not a part of the S-Series but fully support it.

The STE specification is maintained by the ASD STEMG consisting of representatives from ASD member countries and non-ASD member countries. The STEMG was originally formed in 1983 as a working group to develop AECMA Simplified English and subsequently, in 2004, when ASD was created, the group changed its name to the STEMG. The STEMG is reporting to the ASD Product Support Group (PSG).

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## Ten-liner

STE is a set of Writing rules (Part 1) and a Dictionary of controlled vocabulary (Part 2).

The writing rules regulate the use of words, layout, sentence length, and how to write warnings, cautions and notes. There are 65 writing rules in STE included in nine sections:

- Section 1 - Words (17 rules)
- Section 2 - Noun Phrases (3 rules)
- Section 3 - Verbs (8 rules)
- Section 4 - Sentences (4 rules)
- Section 5 - Procedures (5 rules)
- Section 6 - Descriptive writing (8 rules)
- Section 7 - Warnings, cautions and notes (6 rules)
- Section 8 - Punctuation and word counts (11 rules)
- Section 9 - Writing practices (3 rules)

The dictionary has sufficient words to express any technical sentence. The words were chosen for their simplicity and ease of recognition.

The current specification is Issue 6, 15 January 2013.

## Web-site

Free download at [www.asd-ste100.org](http://www.asd-ste100.org)