An ISO standard for Product Support data interoperability

ISO 10303-239 edition 3
Product Life Cycle Support (PLCS)

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Forewords

The Aerospace and Defence industries investment in interoperability standards
• Target: “a consistent set of standards” (Ref ASD SSG Through Lifecycle Interoperability Report)
• On-going projects: AP242 edition 2, JT edition 2, CAX IF, PDM IF, Benchmarks

Why?
• Digitalisation
• Move to the service paradigm
• Legal constraints

This investment is shared with other industries, incl. Automotive
• Need of a common approach and governance of interoperability standards.

This PLCS project is part of this global approach.
Contents

- Product support: an Integrated Logistics Support perspective
- Beyond Product Support: Through Life vision
- Existing standards landscape
- The challenge: an “interoperable” Product Support standard
- The ISO AP239 ed3 project
Product support: an Integrated Logistics Support perspective

Manage Logistics Support
- Develop ILS plan
- Capture product support requirements
- Manage contract
- Perform obsolescence management
- Perform engineering technical analyses
- Develop and provide engineering disposition & recommend design changes

Design for Support
- Perform Reliability, Availability, Maintainability analysis
- Perform LSA
- Perform LCC (affordability) analysis
- Develop maintenance concept
- Develop and continuously improve preventive maintenance

Develop Support
- Perform manpower & personal analysis
- Perform Training Need Analysis (TNA)
- Develop training plan
- Analyze support requirements
- Develop technical data package
- Analyze IHS&T requirements
- Provide provisioning data
- Perform computer resource analysis
- Perform software maintenance analysis
- Perform Maintenance Task Analysis (MTA)
- Perform supportability safety analysis
- Perform Level of Repair Analysis (LORA)
- Develop maintenance plan

Acquire and provide the Support
- Provide FSI
- Provide support equipment
- Produce technical publications
- Perform material supply
- Provide computer resources
- Execute maintenance tasks
- Perform Diagnostics, Prognostics and Health Management (DPHM) analysis

Feedback

Source: AIA-ASD SX000i, issue 1.0
Beyond Product Support: Through Life vision

Airworthiness

Operations
Incident reports, Health Monitoring, ACARS, Logbook, PAX services

Operation output data

Operation input data

Task output data

Feedback

Digital Twin

Definition dossier

As designed

As manufactured

As maintained

As flying

Maintenance dossier

Operation dossier

Certification

Type MSN

Operation dossier

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Existing standards landscape
Logistic Support, ASD industries

Defence

- Army Regulation 700-127 Integrated Logistics Support, 27 September 2007
- British Defence Standard 00-600 Integrated Logistics Support for MOD Projects
- Federal Standard 1037C in support of MIL-STD-188
- MIL-STD 1388-1A Logistic Support Analysis (LSA)
- MIL-STD 1388-2B Requirements for a Logistic Support Analysis Record
- MIL-STD-1629A, Procedures for Performing a Failure Mode, Effects and Criticality Analysis (FMECA)
- DoD Instruction 5000.02, Operation in the Defense Acquisition System
- NATO ALP-10, Guidance on Integrated Logistics Support for Multinational Armament Programmes

Civil Aviation

- MSG-3 Operator/Manufacturer Scheduled Maintenance Development
- Spec 104: Guidelines for Aircraft Maintenance Training
- Spec 105: Guidelines for Training and Qualifying Personnel in Nondestructive Testing Methods
- Spec 106: Sources and Approved Parts Qualification Guidelines
- Spec 119: Continuous Monitoring of Maintenance Instructions

Space

- NASA Policy Directive 7500.1D, Program and Project Life-Cycle Logistics Support Policy
- ECSS-M-70A Space Project Management - Integrated Logistic Support
**Existing standards landscape**

**Logistic Support data**

**AIA-ASD Specifications**

- STE100 Simplified Technical English / International Specification for the preparation of maintenance documentation in a controlled language
- 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
- 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 guide for the use of the S-Series Integrated Logistic Support (ILS) specifications
- SX001G Glossary for the S-series ILS specifications
- SX002D Common data model for the S-series ILS specifications

**ATA e-Business Specifications**

- iSpec 2200: Information Standards for Aviation Maintenance
- Spec 2300: Data Exchange Standard for Flight Operations
- Spec 42: Aviation Industry Standards for Digital Information Security
- Common Support Data Dictionary (CSDD)
- Spec 100: Manufacturers Technical Data
- Spec 101: Ground Equipment Technical Data
- Spec 1000BR: Civil Aviation S1000D Business Rules

**ISO**

- ISO 10303-239 - Product Life Cycle Support (PLCS) edition 2
- DEXlib (DEXs, ISO 10303-28 XML Schema)

**OASIS**

- Product Life Cycle Support Version 1.0 (PLCSlib, PLCS PSM)

**SAE**

- GEIA-STD-0007 Logistics Product Data

ProSTEP iViP Symposium, 20-21 April 2016, Stuttgart
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Challenge: an interoperable Life-cycle Support standard

Life-cycle data backbone

PRODUCT LIFECYCLE SUPPORT (PLCS)

STEP AP242
Product Design

STEP AP239

Design of Systems & Support Equipment

Operational and maintenance data feedback

Training needs analysis

GEIA-STD-0007 Logistics Support Data

Potential future link

Spec 2000, iSpec 2200, etc

Material management

LSA/LSAR

Operational and maintenance data feedback

Operational and maintenance data feedback

Operational and maintenance data feedback

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Operational and maintenance data feedback

Operational and maintenance data feedback
History
Towards a consistent set of standards

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The ISO AP239 ed3 project
ISO new work item

White Paper developed
With contributions from A&D trade associations and Defense bodies (U.S. DoD, UK MoD, French DGA, Swedish FMV, Norwegian DLO).

Ballot successful (January 2016):
- Supported by 10 countries
- 7 of them participating (with experts nominated)

Supporting associations:
The STEP AP239 ed3 project

Technical organisation

Planning

Project kick-off planned in Toulouse, 15-17 June 2016

ISO process:
- NWI: New Work Item
- CD: Committee Draft
- DIS: Draft International Standard
- IS: International Standard

(link to ISO/TC 184/SC 4 and WG12)
Technical target
Progress / AP239 (PLCS) edition2

• Same **functional perimeter** (ref activity model)
• **Redesign of the information model** based on the new STEP architecture (specific ILS Core Technical Capabilities and shared CTCs)
• Integration of **requested updates** (ISO process, S5000F updates, PLCS PSM issues collected by OASIS PLCS)
• Improve/extend **implementation methods** (P28/XML and openness to new methods like web services and linked data)
• **Multi-layered information model**: based on DEXlib and PLCSlib experience, a template mechanism will be proposed to map customised business objects to the AP239 core information model.
• **Mapping** with S-Series specifications and SAE GEIA-STD0007
• Use of **Reference Data Libraries** : a common mechanism for using reference data shall be defined for being used by all STEP APs based on new STEP architecture
• **Demonstration on pilots**
Example exploitation domains
Broad applicability of the AP239 edition 3 standard

• Defence
  • Air vehicle/system
  • Land vehicle/system
  • Sea vehicle/system (on- or sub-surface)

• Civil aviation
  • Helicopters
  • Aircraft (ATA)?

• Civil shipbuilding?
• Space?

• Automotive (cars, busses, trucks)?
• Rail?
• Process/Energy?
• Pharmaceutical?
• Cosmetics?

Not limitative!
Links

- Through Life-cycle Interoperability report, ASD SSG, [here](https://asd-ssg.org) on asd-ssg.org
- International guide for the use of the S-Series Integrated Logistic Support (ILS) specifications, SX000i Issue 1.0, [here](https://sx000i.org) on sx000i.org
- AIA-ASD ILS specifications [here](https://asd-ssg.org) on asd-ssg.org
- STEP AP239 (PLCS) edition 3 website: [www.ap239.org](http://www.ap239.org) (just started)
- STEP AP239 (PLCS) edition 3 White Paper [here](https://asd-ssg.org)
- OASIS PLCS specifications [here](https://oasis-open.org) on oasis-open.org
Thank you!

To join the ISO AP239 edition 3 project, contact
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Or contact your national standards mirror committee for ISO/TC 184/SC 4.