ASD SSG Newsletter

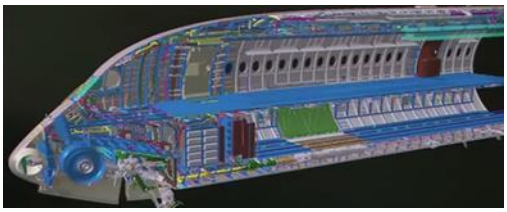
May 2015 Issue

AeroSpace and Defence Industries Association of Europe (ASD) is the European association representing the interests of industries in the aeronautics, space, defence and security sectors. Link

ASD Strategic Standardisation Group (SSG) is the governance group in charge of Aerospace and Defence digital interoperability. Link

IDENTIFYING THE SET OF STANDARDS REQUIRED FOR AEROSPACE AND DEFENCE DIGITAL INTEROPERABILITY.

New standards now published supporting interoperability in Aerospace & Defence Industry – including Digital Mock-up exchange and archiving!



Published by ISO:

- ISO 10303-242:2014: Managed model-based 3D engineering
- ISO 10303-209:2014: Multidisciplinary analysis and design
- ISO 10303-210:2014 Electronic assembly, interconnect and packaging design

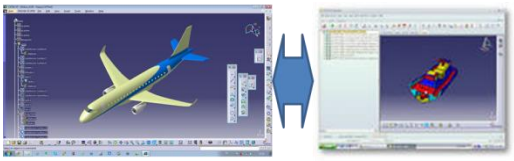
Published by AIA and ASD:

- SX001G, SX002D, draft of SX000i

International initiative launched for convergence on Product Support standard – strong interest from both Civil and Military aviation

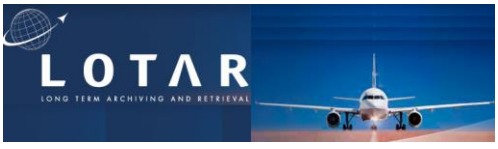
White Paper started on AP239 PLCS edition 3, a future reference standard for ASD-AIA Integrated Logistic Support suite of recommendations and other Product Support-related standards.

Progress towards interoperability between Product Data Management systems in A&D Industry supply chains



- PDM Implementer Forum White Paper now published!
- AP242 Benchmark activities have started

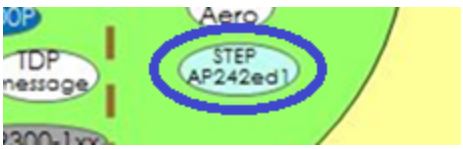
Towards robust data archiving processes for product structure and product analysis



Progress of LOTAR international project:

- LOTAR part 200 in ballot process
- New LOTAR Working Group on analysis data

ASD SSG Radar Chart



Updated version just published

- STEP AP242 Edition 1 now "adopted" by ASD.

Next events

A selection of events over the next months

New standards now published supporting interoperability in Aerospace & Defence Industry – including Digital Mock-up exchange and archiving!

Several standards have been recently published, that significantly support the ASD SSG strategy and vision towards Through Life-cycle Interoperability.

First, **three standards** have been **published by ISO in December 2014**:

- ISO 10303-242:2014 (STEP AP242 – www.ap242.org) Managed model-based 3D engineering,
- ISO 10303-209:2014 (STEP AP209 – www.ap209.org) Multidisciplinary analysis and design,
- ISO 10303-210:2014 (STEP AP210) Electronic assembly, interconnect and packaging

These 3 standards are based on a consistent set of modules (SMRL in STEP terminology), which prefigures the foreseen "STEP architecture" enabling the **interoperability between the STEP modular Application Protocols**, as required by A&D Industry.

NB: ASD SSG particularly acknowledges the publication of **STEP AP242**, an essential standard for **3D Digital Mock-up exchange, sharing and archiving**. Significant savings are expected from the deployment of this standard in A&D supply chain. Publication of STEP AP242 Edition 1 is a first step, as a second edition is in development, with a main extension to the electrical wiring harness domain. Additional on-going activities related to STEP AP242 are described in next sections of this newsletter.

Secondly, **ASD in collaboration with AIA**, have issued **several standards** providing the "common interoperability basis" between the several **AIA - ASD Integrated Logistics Support recommendations**:

- SX001G, Glossary for the S-series ILS specifications
- SX002D, Common data model for the S-series ILS specifications
- Also to be mentioned, a draft of SX000i, International guide for the use of the S-Series Integrated Logistic Support (ILS) specifications, was recently issued.

These publications, related to several life-cycle stages, together contribute to the "Through Life-cycle Interoperability" vision, as developed by ASD SSG in its report one year ago. The required interoperability between the two sets of standards above (ISO and ASD) should be enabled by STEP AP239 Edition 3 (see next section).

Read more:

STEP AP242 2014 conference (organised by GIFAS and other associations).

SSG ILS Working Group page (from which you can download the **updated S-Series ILS Specifications Overview**)

ILS Suite of specifications on SSG website

AIA/ASD SX000i website (from which you can download SX001G, SX002D and SX000i draft)

Back to top

International initiative launched for convergence on Product Support standard – strong interest from both Civil and Military aviation

Product Operations and Support is an essential phase in A&D programmes, where performance of products is intimately linked to performance of support processes. Support processes are today impacted by two main trends:

- Digitalisation of support information,
- Increased interactions between industry (Original Equipment Manufacturers) and operators – Health monitoring is an example.

This transformation requires the *ad hoc* standards to be implemented both by industry and operators.

However, the A&D Industry todays faces some "digital barriers", typically between Design – where significant progress has been made these last 10 years with implementation of Concurrent Engineering and deployment of Digital Mock-up-based processes in supply chains – and Support – that has also evolved to integrate predictive maintenance, health monitoring and Computerised Maintenance Management Systems (CMMS).

STEP AP239 "Product Life-Cycle Support" is considered as a valuable attempt providing a standard business object model supporting product support processes (from the design of the product support to the support operations). OASIS PLCS have developed a specific implementation method (introducing PLCSlib) that has demonstrated an innovative way to handle AP239 complexity and which has proven some business benefits. However this implementation is not seen by the A&D Industry as sufficiently in line with the core STEP technology (so a convergence is needed, through the STEP Future architecture activity), nor sufficiently open to alternative IT vendor implementations. These limitations have been highlighted both by ASD (through the Data Modelling and Exchange Working Group) and LOGSA in the U.S. (see "Whitepaper on Utilizing ISO 10303-239 PLCS to Exchange Logistics Product", LOGSA, Sept. 2013).

The A&D Industry need is clearly to converge on an open "backbone standard" for product support life-cycle, interoperable with up-stream life-cycle stages (e.g. with STEP AP242), supporting the AIA-ASD ILS specifications as well as other specialised standards used in the Maintenance Repair and Overhaul (MRO) field, including GEIA-STD-0007, MIMOSA and potentially ATA standards.

Considering this need, **ASD SSG has launched early 2015 an international initiative, called STEP AP239 Edition 3 White Paper**, aiming at setting-up the basis of a **new version of PLCS, called "Edition 3"**. This has been recognised as a **Preliminary Work Item** by ISO/TC 184/SC 4 at its meeting on 24th of April. This action should lead to a New Work Item Proposal at ISO in September that, once accepted, should open the way to an AP239 Edition 3 development project end of 2015.

People interested in this initiative are invited to contact the co-leaders of AP239 Edition 3 White Paper project, Didier Charpy, Airbus Group, and Jay Ganguli, The Boeing Company (see webpage for emails).

Read more on SSG website

Back to top

Progress towards interoperability between Product Data Management systems in A&D Industry supply chains

Lack of interoperability between Product Data Management (PDM) systems is still a hurdle in A&D Industry, and leads to significant over costs and lead-time, not only during development phase but also during the series phase, where product modifications have to be managed in consistency between system integrators and their partners, along the supply chains.

The use of a shared Digital Mock-ups provides in some way a partial answer, however this is far insufficient once the concept phase passed and the data is developed in parallel under control of several PDM systems.

The STEP technology provides some shared models and mechanisms to support this required interoperability. For example the new **STEP AP242 "Managed model-based 3D engineering"** is intended to enable the coupling of heterogeneous PDM systems through a neutral data model covering both the CAD information (Computer-Aided Design: geometry, product manufacturing information, part properties) and the PDM information (meta-data associated to parts, like configuration and versioning).

However the availability of such standards is not sufficient for deployment in A&D Industry: these standards need to be **implemented by a range of PLM vendors** (e.g. Dassault Systèmes, Siemens PLM, PTC) and integrators; moreover, these implementations need to be **matured** and **validated** through so-called implementer forums.

To progress in this direction, ASD SSG has contributed to initiate two projects:

1. **Organization of STEP AP242 Edition 1 Benchmark**

   To ensure quality of software implementations and accelerate the deployment of STEP AP242, the aim is to conduct a **benchmark of STEP AP 242 implementations available on the market**.

   This is envisaged as a succession of benchmark tests, the first of them being planned from April to September 2015. Functionalities to be benchmarked during this first test include 3D tessellated and exact geometry, composite design, Product Manufacturing Information, CAD assembly structure, quality control based on STEP validation properties.

   Results of this first benchmark will be published in October 2015.

2. **Setting up of the PDM Implementer Forum (PDM-IF)**

   A PDM Implementor Forum is **required by the A&D Industry to develop better communication between heterogeneous PDM systems based on open standards**. The PDM IF White Paper, published in February 2015, sums up the context and objectives of the foreseen PDM-IF. It describes the proposed methods and principles; it proposes an organization and way of working associating Aerospace & Automotive industries, SMEs, sponsoring associations, large PLM vendors, PDM vendors & integrators and collaborative platform companies.

   The main deliverables for the first year will be the development of **STEP AP 242 XML PDM recommended practices** for the use cases selected by the PDM IF users' community.

   Next step will be to get the commitment from a sufficient number of companies and associations to start the PDM-IF project in the next months.

Read more:

AP242 Benchmark page on SSG website

PDM-IF White Paper project on SSG website (from which you can download the PDF-IF White Paper)

Back to top

Towards robust data archiving processes for product structure and product analysis

The LOTAR international project develops a worldwide-accepted suite of standards for long-term archiving and retrieval of product data.

This project is a collaboration of the Aerospace Industries Association of America (AIA) and the AeroSpace and Defence Industries Association of Europe for Standardization (ASD-STAN), under the supervision of the International Aerospace Quality Group (IAQG), supported by the PDES Inc. and ProSTEP iViP standardization associations.

This effort answers to the **critical need for the A&D Industry to comply with increasingly-demanding requirements of the Authorities** (e.g. FAR/JAR regulations) to **retain some identified technical data all along the Type Certificate** (that means over a period of time which may extend 70 years), as well as maintaining the proof of compliance of each individual Manufacturing Serial Number (MSN) with these technical data for their Certificate of Airworthiness to be maintained.

Obviously, these demands from Authorities are correlated to the increasing **digitalisation of engineering and manufacturing processes,** where physical prototypes are replaced by virtual ones (e.g. configured Digital Mock-ups), and physical tests by virtual tests: the physical artefacts no longer existing cannot be archived, and their substitute digital artefacts have to be archived instead.

Two recent events linked to the LOTAR project must be highlighted:

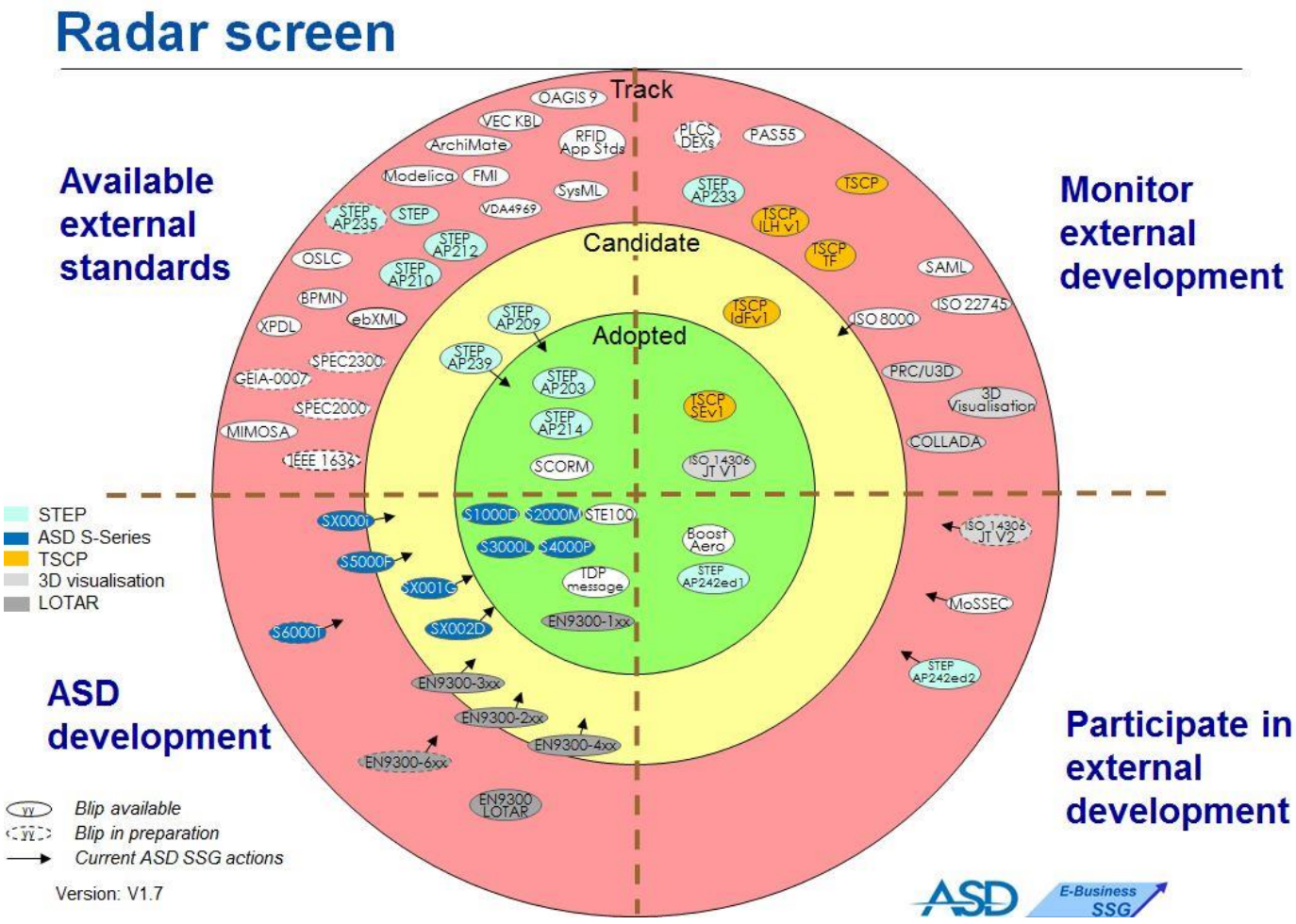
- **Start of ballot of Part 200 "Common concepts for Long term archiving and retrieval of product structure information"**. This part 200 has been prepared by the LOTAR PDM working group and aims at defining the **key concepts for long term archiving and retrieval of Product Data Management information in a standard neutral form** that can be read and reused throughout the product lifecycle, independent of changes in the IT application environment originally used for creation. Planned publication of this EN/NAS 9300 standard: end of 2015.

- **Official launch of the LOTAR "Engineering Analysis and Simulation" workgroup**, which held its first official meeting during the December 2014 LOTAR workshop in Darmstadt, Germany. This new workgroup will work on the requirements, processes and solutions for **long-term archiving and retrieval of Computer Aided Engineering (CAE) data and Simulation Data Management (SDM) information** – starting with linear quasi-static finite element analysis. The results will be documented in the Part 6xx family of the EN/NAS 9300 LOTAR standard series. This reflects a **new challenge for the Industry**, objective being to retain not only the simulation data (e.g. FEM, loads, flutter, idealisation choices) but also to maintain the ability to reproduce their results within "acceptable" tolerances, compared to the original simulation.

Read more on SSG website

Back to top

ASD SSG Radar Chart: updated version just published



An **updated version of ASD SSG Radar Chart** has been published in February 2015 (V1.7B) to take into account recent standard developments.

This version includes updated components summaries (radar "blips") for standards recently published (see 1st section of this newsletter), as well as the formal adoption by ASD of STEP AP242 Edition 1.

The **adoption statement** developed for STEP AP242 Edition 1 (www.ap242.org) states:

> ***ASD recommends the use of STEP AP242 for the exchange, long term archiving and transfer to downstream processes of CAD data (mechanical design, incl. composite) and associated configuration (PDM) data***. *The most recent editions of the standards should be used wherever possible.*
>
> ***ASD encourages CAD vendors and 3D viewer Vendors to develop AP242 interfaces*** *and visualization capabilities.*
>
> ***ASD encourages PDM vendors to develop PDM AP 242 interfaces and to support the setting up of the PDM Implementor Forum*** *(planned start in 2015), in charge of the development of AP 242 XML PDM recommended practices.*
>
> *This strategy will also support interoperability with modular STEP standards for other parts of the lifecycle, including AP233 "Systems engineering", AP209 "Multidisciplinary analysis and design", AP210 "Electronic assembly, interconnect and packaging design" and AP239 "Product life cycle support".*

Read more on SSG website

Back to top

Next events

Important events over next months:

- AIA information leadership forum, 25 June, Washington
- LOTAR workshop, 23-25 June 2015, ProSTEP iViP, Darmstadt, Germany
- STEP Future Architecture Workshop, 29-30 June, Toulouse
- ASD SSG meeting #24, 8-9 July 2015, Airbus D&S, Munich, Germany
- 2015 S1000D User Forum, 21-23 September, San Diego, California USA
- ILS Spec. Day, 24 September, San Diego, California USA
- 70th ISO/TC 184/SC 4 Meeting will be held 18-23 October 2015, Baltimore, Maryland USA

Back to top