Annual Report of LOTAR International for 2017

LOTAR is a project group managed under the AIA, ASD-Stan, PDES, Inc. and prostep ivip consortium. The project goal is to develop, test, pilot, publish and maintain standards designed to provide the capability to archive and retrieve digital product and technical information, including CAD, PDM, Composite Design, Electrical Harness, Engineering Analysis and Simulation, and 3D Visualization data, in a standard form that can be read and reused throughout the product lifecycle, independent of changes in the IT application environment originally used for creation. The multi-part standard covers the information content as well as the processes required to ingest, store, administer, manage and access the information. It is published as EN/NAS-9300.

Tasks

Goals of the project include:

- Developing a standard series (EN/NAS 9300) for archival and retrieval of product & technical data

- Standardization of methods, process modules and data models

- Providing methods, process modules and data model(s) to enable long-term archiving and retrieval of 3D CAD with PMI, PDM, 3D Composite Design, Electrical Harnesses, Engineering Analysis & Simulation, 3D Visualization and other types of data

- Development of recommendations for practical introduction of long-term archiving of relevant data in the industry

- Advancement of commercial-off-the-shelf solutions based on user requirements by close cooperation with the CAx-IF, the PDM-IF, and conjoined funded pilot projects

Milestones 2017

- The Basic and Common Parts team completed and submitted Parts 007ed3 "Terms and References" and P020ed1 "Governance and Planning" for their initial two-month ballot.

- The 3D Mechanical & PMI WG completed three proof of concept pilots (POC) through the CAx Implementor Forum (CAx-IF). This allowed completing Parts 121ed1 "Long Term Archiving & Retrieval of CAD 3D Explicit Geometry with Semantic PMI Representation" and P125ed1 "Long Term Archiving of Explicit CAD assembly structure with PMI" and submitting them to AIA and ASD-STAN for their initial two-months ballot. Parts 110ed2, P120ed1 and P120ed2 were published as International Standards. Work was completed on the relevant extensions of STEP AP242ed2, ensuring that it was ready for DIS publication. A new activity was started to define requirements, processed and recommended practices for Holes and Fasteners. This activity will produce Part 132 "LTA of Manufacturing Features for Holes and Fasteners". A draft Recommended Practice will be reviewed internally by Q1, 2018.

- The PDM WG, which has been put their resources into work on STEP AP239ed3, will reconvene Q2, 2018, based on the completion of AP239ed3 harmonization activity. Part 200ed1 "Fundamentals & Concepts of LTA of PDM Information" was published as an International Standard.

- The Composite WG continued work on Part 300ed1 "Fundamentals & Concepts of LTA Composite Design" and plans to submit it for initial draft Q1, 2018. The Composite WG also worked on the relevant extensions of STEP AP242ed2, ensuring that it was ready for DIS publication. Two Recommended Practices were completed and released, which supported both LOTAR and AP242ed2.

- The Electrical Wiring Harness WG had a very busy year supporting work on AP242ed2 as well as working on Part400ed1 "Fundamental & Concepts of LTA Electrical Wiring Harness". The Electrical Wiring Harness tutorials were updated and validated in pilot activities with two vendors.

- The Engineering Analysis and Simulation WG conducted pilot studies based on STEP AP209ed2 and provided requirements for linear static structural finite element analysis to the CAx-IF. A dedicated workgroup for testing CAE data has been formed inside the CAx-IF, called the CAE-IF. Collaboration with NAFEMS was intensified to raise visibility of the work in this domain. Work is being continued on a MOU with NAFEMS and should be completed early next year.

Outlook 2018

- The Electrical Harness, EAS and Composites teams will provide their respective first parts of the LO-TAR standard; covering:
  - Fundamentals and Concepts of each domain
  - Structural Analysis data for CAE
  - Exact Implicit and Approximate Explicit Representation for Composites
  - Physical Electrical Harness for Design and Construction.
- Each domain will conduct pilot studies and define related verification and validation properties.
- The PMI team will deliver validated Holes and Fastener guidelines and start work on further machining features
- The PDM team will restart, based on STEP AP239 Ed.3 and the harmonization of PDM data models.
- LOTAR EAS will continue to run pilot studies to explore new domains of AP209 ed2, supported by further pilot projects. In this context, the STEP AP209ed2 FEA Handbook for loads and boundary conditions and FEA results will be extended, and a tutorial presentation on how to implement FEA with AP209 ed2 will be developed.
- All teams will gather and provide LOTAR requirements for AP242 Ed.3.

Participants

Europe:

Europe: AFNeT, Airbus Commercial, Airbus Defense & Space, Airbus Helicopter, SAFRAN.

Americas:

BAE Systems, Boeing, Embraer, GE, Gulfstream, Lockheed Martin, Sandia National Labs, UTC Goodrich

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