

## Summary of the LOTAR International Workshop 18-22 September 2022, Mt Pleasant, SC, USA

The Q3 2022 LOTAR workshop was well attended by more than 53 participants in person. This was the first in-person meeting since September 2019. Below are the highlights of the meeting.

### **Project Management:**

- Opening Plenary: Quick 2-5 minute outlook (single slide) by each WG leader on planned accomplishments for the week.
- Each WG shall create a ~2 page presentation about their WG that will become part of the "LOTAR 101" presentation.
  - The goal is to have "marketing materials" to gain new users as well as vendors.
  - Slides are also needed for PDES, Inc. – to align with capabilities. Common set of slides is goal.
- Meeting dates: Need to find a new date for the June 2023 online meeting as the originally chosen dates (June 12-16) collide with the ISO SC4 Meeting the same week in Paris. So, LOTAR will have to be either the week of June 19 or June 26.
- Budget and membership
  - Reviewed budget allocations across the sponsoring organizations and the overall statement of work.
  - Need succession planning to bring new leadership in as retirements occur.
  - Membership appears to be a net gain for the year. Embraer is planning to reengage next year. There were new participants from Bell and The Aerospace Corp. in the WGs this meeting. Syberjet has inquired about participation.
- Roadmap: Draft 2023-2027 update for the 5-year LOTAR roadmap was presented.
- LOTAR Charter and Way of Working:
  - MBSE: How can LOTAR parts be qualified without an Interoperability Forum? Is it a hard requirement for two vendors to have implemented the capabilities?
  - LOTAR 500 / 520: builds on Modelica standards (FMI) - contains code. There is a risk concerning executability of the code in ~50 years.
  - Identified needs to update the LOTAR charter: add information about the process to approve and release LOTAR parts. Needs to consider standards supported by other organizations. How can we standardize the process of validating a LOTAR standard? What does compliance mean in this context, and how do you demonstrate compliance?
  - Alternative would be to create an additional document to the Charter that defines the "Way of Working". This would be the "missing link" between the charter and the "LOTAR Standards Guideline" .
- Charter also needs to be updated with current organizations.

### **General Sessions:**

- ISO 10303 Status
  - AP239 - preparing DIS release in Q4/2022. Moved contents to new ISO infrastructure and successfully published SMRL v9. FDIS expected middle of next year.
  - AP242 - two Change Requests being prepared by ISO right now, for AP242 Ed.4 content - working on smaller packages, more frequent updates.
- PDES, Inc. Capabilities
  - Started working on existing capabilities and derived work break-down structure from that
  - Calculated / assigned priorities
  - Details shown at PDES, Inc. TAC on Friday
- Captured Pros/Cons/Lessons learned from our first face to face in three years.

## **WG “LOTAR Mechanical and PMI” (Parts 1xx)**

- LOTAR EN/NAS 9300 Part 100 (all sections and annexes) content was reviewed. Only some comments and editorial activities remain to have the document ready.
- Updated 5 year roadmap of the 3D mechanical CAD with PMI work group
- STEP AP242 Edition 4:
  - PMI Module: branch merging in preparation for the next change request
  - PMI in Domain Model: presentation of development status, requirement from Automotive and Aerospace industry, Recommended Practices, and test models.
- LOTAR 3D mechanical CAD with PMI pilot ready to start
- CAX-IF User Group joint session: Discussed implementor feedback and new user items (multiple clipping planes, presentation layout of 3D saved views set, grouping of annotations)

## **WG “Composites & Adv Manufacturing” (Parts 3xx)**

- Discussed PMI needs for composites including limited length and application indicators (LLAI).
- Discussed need for data standards to support consumption of composite data in downstream manufacturing and NC processes.
- Updated 5-year roadmap
- Briefly reviewed EN/NAS 9300 Part 300 and need to restart effort to complete draft.

## **WG “LOTAR Product Data Management” (Parts 2xx)**

- Finalized Part 210 to be submitted for external ballot (both prEN and NAS)
  - Completed Annex A which captures PDM-specific As-Designed Metadata
- Reviewing and developing Part 230 revision (e.g., STEP mapping comments)
- Reviewed Part 200-1 (comparison to Rec Prac.) to prepare it for Part 205 transition (Product Data Validation Properties)
- Created potential additions to Part 007 for future release
- Reviewed current status of PDM-IF Use Cases (Export Control, Alternate/Substitute, Mirrored Parts)
- Participated in Basic & Common Parts discussion on electronic signatures

## **WG “LOTAR of Electrical Wiring Harness” (Parts 4xx)**

- Essential information of part 410 document updated
- Reviewed and validated Properties and Rules of part 410
- Contribution to EWIS-IF UG for LOTAR requirements & Use Cases for the Test Rounds
- AP242 Ed.4 Requirements review and agreement on path forward
- Kicked off ECAD/MCAD Pilots for external element references
- XML Quality Checks statement of work defined, submitted, and approved for funding

## **WG “LOTAR of Model Based Systems Engineering” (Parts 5xx)**

- The Part 520 use case extensions for 2022 are leveraging the prototype results. New technologies include a reliable process for linking requirements to a simulation model, an improved workflow, and a formal process for identifying the validation criteria. Recommendations for new prototypes have been developed and released for approval.

- The team has been progressing the maturity of the Part 500 and 520 standards documents. The P500 is very mature, and the value provided by detailed instructions governing the P520 process is easily understood and realized. The process relies on a repeatable workflow that was developed using industrial process standards.
- LOTAR / PDES teams have been coordinating deliverables with other consortia (prostep ivip, NAFEMS, INCOSE, AFNeT, A&D\_PLMAG, OMG), and sharing the MoSSEC domain specific metadata templates. Our level of engagement has increased significantly, including the Vendor community.

## **Summary of the CAx-IF meetings**

The CAx-IF held many successful and productive meetings during the Fall LOTAR meeting. Highlights include:

- The CAx-IF Implementor Group:
  - Concluded their 50<sup>th</sup> round of testing covering PMI at Part and Assembly Level, Alternative Shape Representations, Composite Materials, Kinematic Mechanism and User-Defined Attributes.
  - Discussed technical issues to enhance Recommended Practices
  - Held joint meetings with the CAx-IF User Group, LOTAR teams and the EWIS-IF
  - Defined their scope and schedule for Round 51J of testing, adding Persistent IDs for Geometry to the scope.
- The CAx-IF User Group worked on their requirements backlog, user stories, and associated priorities.

## **Summary of the EWIS-IF meetings**

- Test Round 5 Sample Data Prepared
  - Scope agreed upon for upcoming AP242 Ed. 4: Minor upward compatible extensions defined (e.g., new entries in Enumerations, Reflected Part Features for assemblies)
- CAx-IF Agreement to use STEP Part 21 ‘Anchors’ for External Element Reference
  - Needs communication plan to ensure compatibility with existing tools
- MCAD/ECAD Validation using Topology of the wire harness

## **Summary of the MBx Roundtable meeting held on September 22, 2022**

- A highly informative User/Vendor Roundtable was held with over 50 participants on site and an additional 37 remote attendees.
- For the first time, the Roundtable included presentations from the PDM-IF as well.
- Updates were provided in the following areas:
  - Summary of first Joint MBx-IF User Group meeting
  - CAx-IF Implementor Group progress and plans
  - CAx-IF User Group progress and plans
  - EWIS-IF report out
  - PDM-IF Implementor Group progress and plans
  - PDM-IF User Group progress and plans
  - NIST STEP File Analyzer and Viewer update
- STEP vendor updates from: Elysium, Jotne, PDTec, PROSTEP, T-Systems, Siemens, Dassault Systemes, Datakit, CTCore Technologie, Autodesk, Kubotek Kosmos, Open Design Alliance, and PTC