



Spring Newsletter, June 2017

General Manager's Update

At the fall 2016 Board meeting, a new Participant Fee schedule was proposed and approved. The new structure was consistent with the Board decision made some three and one-half years ago, that stated there would only be PDES Inc. participants by 2017 – not a combination of LOTAR Only and PDES Inc. participants. In addition, the structure provides for several levels of industry participants and a new SME solution provider level. A major change at the large industry level allows all divisions of a corporation to take advantage of the deliverables of PDES Inc., if they so choose. SME manufacturers were added as a category of participation, such that the advantages of business value provided through the Digital Enterprise could be better understood by the supply chain.

The Strategic Working Group, chaired by Jim Colson, just completed the yearly update of the PDES Inc. Strategic Plan. As the group launched about two years ago, the plan was to review the plan at each spring off Site. The review took place on schedule in Gaithersburg this year and updates were incorporated and briefed at the spring 2017 TAC. The plan is now being mapped to the TMP for consistency of projects with the defined strategy. As the TMP is being developed, the intent is to not only establish a technical roadmap but to establish a roadmap that aligns to the business needs of our large industrial members.

On March 9/10, 2017, it was my pleasure to chair a panel on Industry 4.0 and support an Industry 4.0

Upcoming Events

LOTAR International Workshop

20-22 June, 2017

Toulouse, France

PDES, Inc. Fall Offsite

September 10-15, 2017

Myrtle Beach, SC, USA

Global Product Data Interoperability Summit (GPDIS)

September 18, 2017

Phoenix, AZ, USA

3D Collaboration & Interoperability Congress + Quality Information Framework Summit

2-6 October 2017

Golden Colorado

ISO/TC 184/SC4 Meeting

5-10 November, 2017

Seogwipo, Korea

Digital Architecture, Design and Engineering Assess,

16 November 2017

Washington DC

World Manufacturing Forum

Monterrey, Mexico

7-9 November 2017

Workshop with SME Aerospace and Defense manufacturers. The event took place at the University of Southern California and was in partnership between AMP So Cal, the Aerospace States Association, the Intelligent Manufacturing Systems Program and PDES Inc. This was the first of many such workshops, with the intent of providing an industry driven approach to the value of Industry 4.0. The panel had three industry experts in three of the nine topics of Industry 4.0, and was well received by the audience.

We are well into the second half of FY2017 and I am happy to see many changes by your TAC to reinforce better processes in selecting projects that will populate the Technical Management Plan. In addition, you can expect to see greater focus in FY 2018 to look for external funding opportunities which will help address our Vision and Mission. To that end, we have begun performing tasks against the DMDII project being led by the University of Iowa. You can expect to hear more detail as the project progresses.

Lastly, I would say the last two off sites have been attended by several guest attendees that have shown interest in being part of PDES Inc. The potential of bringing in several OEM and Tier 1 industry players is very exciting to the future of our work.



Thanks for your continued support of the PDES Inc. Vision and Mission and let's all look forward to a productive FY2018.

Jack Harris
General Manager
PDES, Inc.

graphic representations and to semantic representations for both mechanical and composite designs.

PMI Capability Updates Include:

Geometric Tolerances, Dimension and Tolerances Callouts, Shape Property Assignment, Daughting

AP 242 ed2 PMI

Three-dimensional product and manufacturing information (3D PMI) was identified in the STEP AP242 edition2 White Paper as a domain to be enhanced. PMI includes the topic of Geometric Dimensions and Tolerances, or GD&T.

Aerospace and automotive industries have agreed that ISO 10303 AP242, 'Managed Model Based 3D Engineering' will be the cornerstone application protocol for exchange of product definition data.

AP242 ed1 focused on the convergence of AP203 ed2, (aerospace), and AP214 ed3, (automotive). AP242 ed2 will include enhancements to 3D PMI in addition to the new domains of Additive Manufacturing and Electrical Wire Harness. Other domains being enhanced for include product data management, geometry, and composites.

The 3D Enhancements will apply to both

Collaborations: The 3D PMI working group (PMI WG) is working closely with the CAX Implementor Forum (CAX-IF) and with the LOTAR International organization to ensure that the EN/NAS 9300-1xx parts reflect the latest updates to AP242 ed2 and are included in the appropriate Recommended Practices. The EN/NAS 9300 Series of Standards is the main deliverable of the LOTAR International project. LOTAR is working on standards for the preservation of specific data entities required. The information requirements are shared with the CAX-IF and PDM-IF for testing and content for Recommended Practices.

The PMI WG is also working very closely with the LOTAR PMI WG Holes & Fasteners activity currently being led by David Briggs, Boeing.

Domain Support: 3D PMI is supporting design domains that include, for example 2D Draughting and 3D Machining Form Features. Figure 1 shows the design domains covered by AP242 that are in scope for the 3D PMI working group.

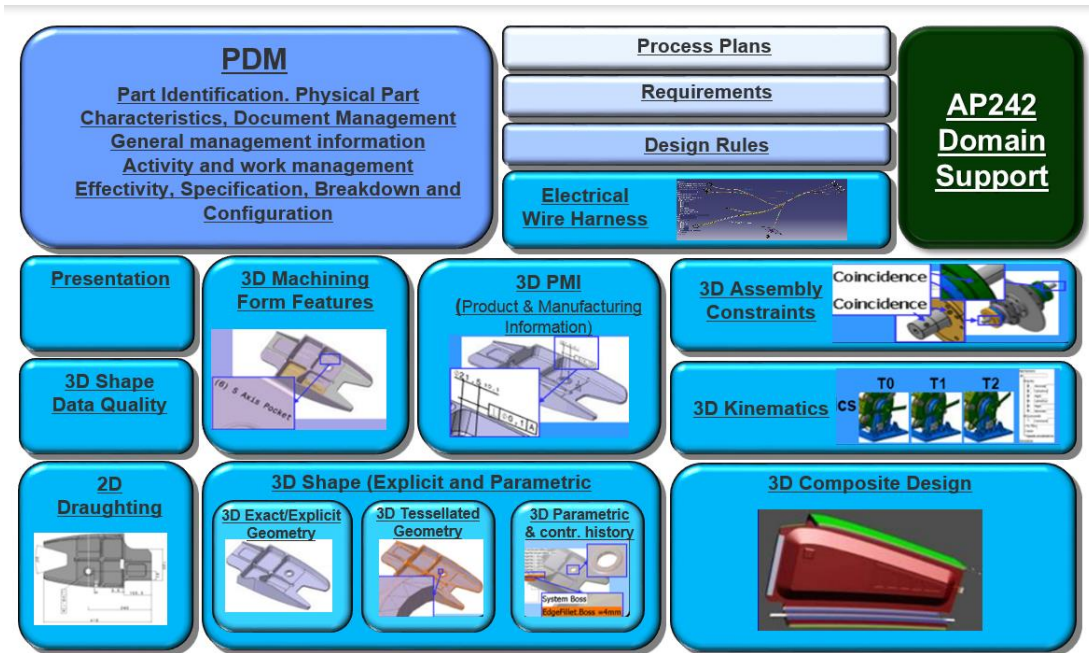


Figure 1 AP242 domains supported by 3D PMI

The 3D PMI working group will develop or update Part 113 STEP parts including:

- Part 41:** Integrated generic resource: Fundamentals of product description and support
- Part 47:** Integrated generic resource: Shape variation tolerances
- Part 101:** Integrated application resource: Draughting
- Part 113:** Integrated Application Resource, 'Mechanical design'
- Part 442:** AP Application module: AP242 managed model based 3D engineering
- Part 506:** Application interpreted construct: Draughting elements
- Part 1032:** Application module: Shape property assignment
- Part 1051:** Application module: Geometric tolerance
- Part 1362:** Application module: Dimension and tolerance callouts

The working group is also authoring a white paper "'All-Around" and "All-Over" Tolerances'. The white paper covers topics from ASME/ISO standards that will be covered by the 3D PMI working group.

Background: LOTAR International

The LOTAR International project was formed to develop a worldwide-accepted standard for long-term archiving of a 3D master and product structure. The project is an international 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).

The results of LOTAR will be released as EN 9300 and NAS 9300 series. The standards are grouped into Basic Parts, Common Process Parts, and Data Domain Specific Parts (see table). NAS 9300-120 is a new part that contains requirements for PMI.

Basic Parts	
Number	Name
prEN/NAS 9300-001	Structure
prEN/NAS 9300-002	Requirements
prEN/NAS 9300-003	Fundamentals and concepts
prEN/NAS 9300-004	Description Methods
prEN/NAS 9300-005	Authentication and Verification
prEN/NAS 9300-007	Terms and References
Common Process Parts	
Number	Name
prEN/NAS 9300-010	Overview Data Flow
prEN/NAS 9300-011	Data Preparation
prEN/NAS 9300-012	Ingest
prEN/NAS 9300-013	Archival Storage
prEN/NAS 9300-014	Retrieval
prEN/NAS 9300-015	Removal
prEN/NAS 9300-020	Governance and Preservation Planning
Data Domain Specific Parts	
Number	Name
prEN/NAS 9300-100	Fundamentals and concepts
prEN/NAS 9300-110	Explicit Geometry
prEN/NAS 9300-115	Explicit Assembly Structure
prEN/NAS 9300-120	CAD 3D Explicit Geometry with Presentation of Product and Manufacturing Information

Table 2 LOTAR Standards

CAX Implementor Forum (CAX-IF) Update

The CAX-IF has been extremely busy the past 6 months, ensuring users requirements are met and providing business value to the PDES, Inc. participating organizations. At the spring offsite meeting, the CAX-IF wrapped up its 39th round of testing. The scope of this round included:

- AP 242 Business Object Model XML assembly structure with external references
- Alternative shapes in the same STEP file – Sheet metal part, folded and unfolded shapes
- Product Manufacturing Information – Both semantic (intelligent) and presentation data

The test result review was supplemented by detailed discussions of numerous technical items in synergy with the technical teams and standardization experts present at the spring offsite. Additionally, the CAX-IF planned its 40th round of interoperability testing, which will be kicked off in June. Besides continued testing of items from the previous round's scope, new areas may include:

- Composites based on a new test case and updated recommended practices
- Kinematics using the AP 242 Business Object Model XML
- Persistent IDs to support downstream processes such as manufacturing and inspection

To support the LOTAR Engineering Analysis and Simulation (EAS) AP 209 testing, Jean-Marc Crepel of AFNeT came on-board recently. The CAX-IF had a joint meeting with the LOTAR EAS working group at the spring offsite to draft a schedule for the first round of CAE testing. This activity will kick-off at the fall offsite meeting in September. The group also started definition of statistics (success criteria) for the on-line **CAX-IF Evaluation, Statistics And Results** (CAESAR) system. To support the testing of AP 209 in a new interoperability testing forum, multi domain support is being added to CAESAR as well.

The NIST STEP File Analyzer (SFA) continues to support the CAX-IF in its testing endeavors. Recent major updates include:

- Added support for AP 209 Edition 2 in the form of a model checker and an on-line viewer (<https://pages.nist.gov/CAD-PMI-Testing/ap209-viewer.html>)
- A test case browser that allows the user to perform an interactive search and filter for PMI elements (<https://pages.nist.gov/CAD-PMI-Testing/models.html>)
- Extensive enhancements for AP 242 PMI including saved views

NIST has also developed new capabilities to provide details about the NIST CAD PMI test cases and verification results:

- A test case browser that allows the user to perform an interactive search and filter for PMI elements (<https://pages.nist.gov/CAD-PMI-Testing/models.html>).
- A PMI Verification Testing Results Browser that allows the user to perform an interactive search and filter for CAD system PMI capabilities (<https://pages.nist.gov/CAD-PMI-Testing/results.html>)

PDES, Inc. Technical Management Plan for FY18-FY19

The PDES, Inc. Technical team, with the oversight of the Technical Advisory Committee and Executive Board, is preparing a new slate of project work for PDES, Inc.'s next 2 fiscal years. The focus for this round of activity revolves around extension of the support for the Model Based Enterprise including two major STEP Application Protocol updates for AP242 and AP239. Also in scope for this round of project activity are ongoing support of the LOTAR international project, a renewed focus on Model Based Systems Engineering, a STEP architecture team and various implementor forums.

A key objective for the project proposals within the PDES, Inc workplan is to align with the strategic goals and objectives as defined by the PDES, Inc Executive Board. This strategy targets key business drivers and enabling technologies for the participating companies.

Currently, the project leaders are finalizing their project and resource plans which will be socialized to the participating companies and their technical and management representatives for confirmation of commitment to the various activities. This process may iterate until a viable set of projects has been finalized with the goal to initiate the technical work August 1st, 2017.



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