



LOTAR

LONG TERM ARCHIVING AND RETRIEVAL

LOTAR International Project Status

AIA-ASD Interoperability Conference Call

25th November, 2019

Rick, ZURAY – LOTAR International Co-chair: AIA, Americas
Jean-Yves, DELAUNAY – LOTAR International Co-chair: ASD, Europe



- LOTAR Project 4 Square
- LOTAR International Quarterly Offsites in 2019
- LOTAR Technical Working Groups
- LOTAR Technical Working Groups web pages
- LOTAR International Project WBS
- LOTAR Parts EN/NAS 9300-xxx (Status Nov 2019)
- LOTAR Tier 0 Five Year Roadmap
- LOTAR Domains and related standards Information Models
- LOTAR International Full Member Companies for 2020
- LOTAR International Quarterly Offsites for 2020
- Summary, Comments, Help Needed

LOTAR Project 4 Square



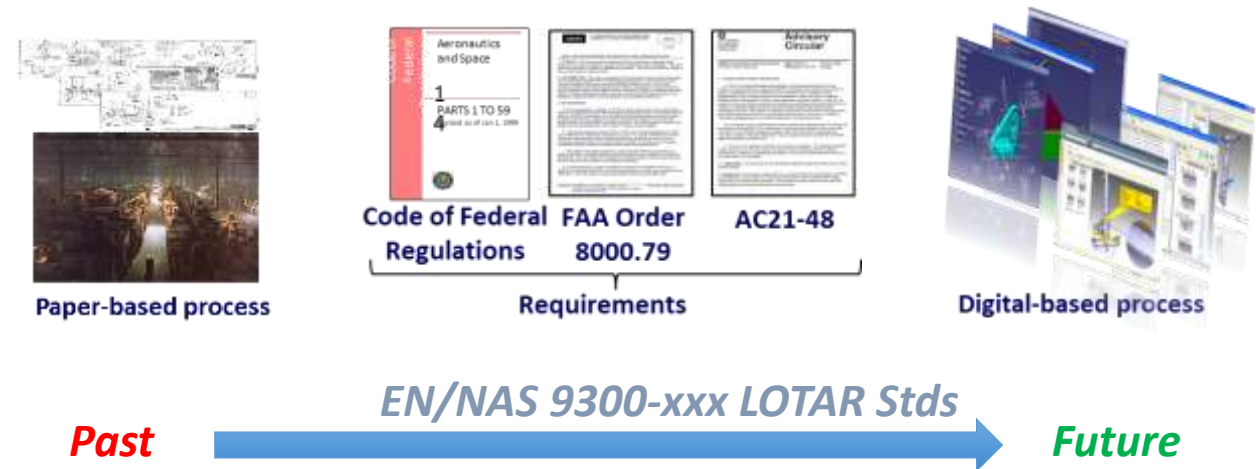
- **Problem:** With the emergence of digital data based processes, including model based definition, requirements were identified which predicate the need for a long term data retention solution(s) to meet the regulatory and business requirements. Traditional legacy retention and retrieval methods do not support complex digital product definition data.
- **Opportunity:** Develop, publish and maintain standards designed to provide the capability to archive and retrieve digital product and technical information in a standard neutral form that can be read and reused throughout the product lifecycle.

Participation

- **Leadership Team:** R. Zuray (Boeing), J. Holmlund (L-Martin), JY Delaunay (Airbus), S. Rulhoff (PROSTEP AG), M. Jahadi (L-Martin)
- **3D Mech/PMI WG:** Rick Zuray (Boeing), Pierre Duchier (Airbus)
- **PDM WG:** Jeff Klein (Boeing), Frederic Darre (Airbus)
- **Composite/Adv Mfg. WG:** Rick Zuray (Boeing), Pierre Duchier (Airbus)
- **Electrical WH WG:** Dan Ganer (Gulfstream), Sophie Herail (Airbus)
- **MBSE WG:** Mark Williams (Boeing), Adrian Murton (Airbus)
- **Eng. Analysis & Sim WG:** TBD, Albert Levy)

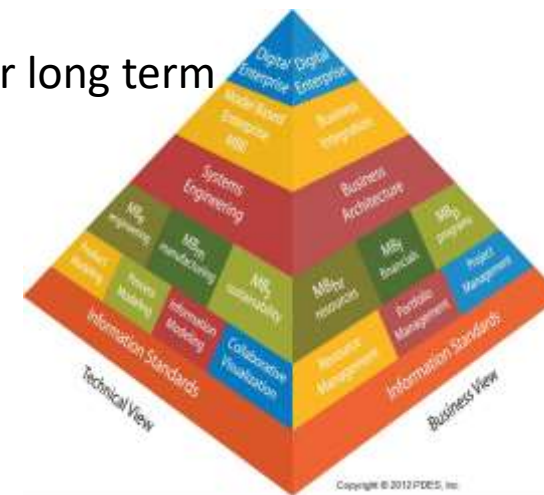


LOTAR Mission



Benefits

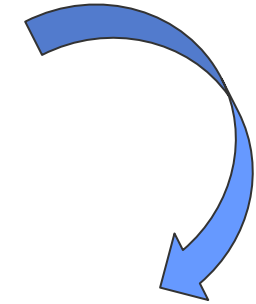
- Support Increasing Product Complexity
- Built on open standards
- Preservation of Digital Design Intent for long term
- Provide data security
- Protect intellectual property
- Independent of process
- Independent of tools
- Independent of language



LOTAR International Quarterly Offsites in 2019



- 1st meeting: (10) 11th – 14th of March, Asheville – NC, USA : done
- 2nd meeting: (20) 21st – 23rd of May, Toulouse, France : done
- 3rd meeting: (8) 9th – 12th of September, Atlanta, USA : done
- 4th meeting: (19) 10th – 12th of December, Darmstadt, Germany



Access to
LOTAR meeting summary
on LOTAR public web site

[http://www.lotar-international.org/
communication/
progress-reports.html](http://www.lotar-international.org/communication/progress-reports.html)

2019			
Document	Date	Venue	Download
2019 Year-End Report			
4th Qtr. Workshop Summary	December 09-12, 2019	Darmstadt, Germany	
3rd Qtr. Workshop Summary	September 08-12, 2019	Atlanta, GA, USA	PDF
2nd Qtr. Workshop Summary	May 20-23, 2019	Toulouse, France	PDF
1st Qtr. Workshop Summary	March 10-13, 2019	Asheville, NC, USA	PDF

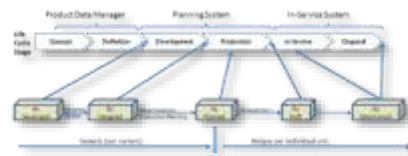


Mechanical 3D CAD with Product and Manufacturing Information (PMI)

EN/NAS 9300-1xx series

STEP AP203 ed2
STEP AP214 ed3
STEP AP242 ed1 & ed2

2004 launch



Product Data Management (PDM)

EN/NAS 9300-2xx series

STEP AP239
STEP AP242 ed1 & ed2

2004 launch

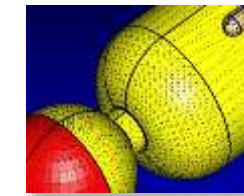


Composites and Advanced Manufacturing

EN/NAS 9300-3xx series

STEP AP203 ed2
STEP AP242 ed1 & ed2

2009 launch



3D Visualization

Requirements and Compliance Documents

2012 launch
2017 Complete



Wiring Harness

EN/NAS 9300-4xx series

STEP AP242 ed2

2012 launch



Meta Data for Archive Packages

EN/NAS 9300-21
STEP AP239 ed3
STEP AP 242 ed2

2012 launch

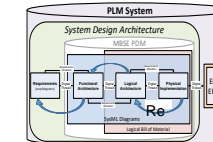


Engineering Analysis and Simulation

EN/NAS 9300-6xx series

ISO STEP AP209 ed2

2014 launch



Model-Based System Engineering

EN/NAS 9300-5xx series

STEP AP233 ed2
STEP AP239 ed3
FMI, SysML, etc

2018 launch



Basic & Common Parts

EN/NAS 9300-001-099 series

2004 launch



Electronics (PCB, etc.)

EN/NAS 9300-700 series

Launch TBD



Mechanical Transport Elements (Tubing, Mech/Hydr., Ducting, etc.)

EN/NAS 9300-800 series

Launch TBD

LOTAR Technical Working Groups

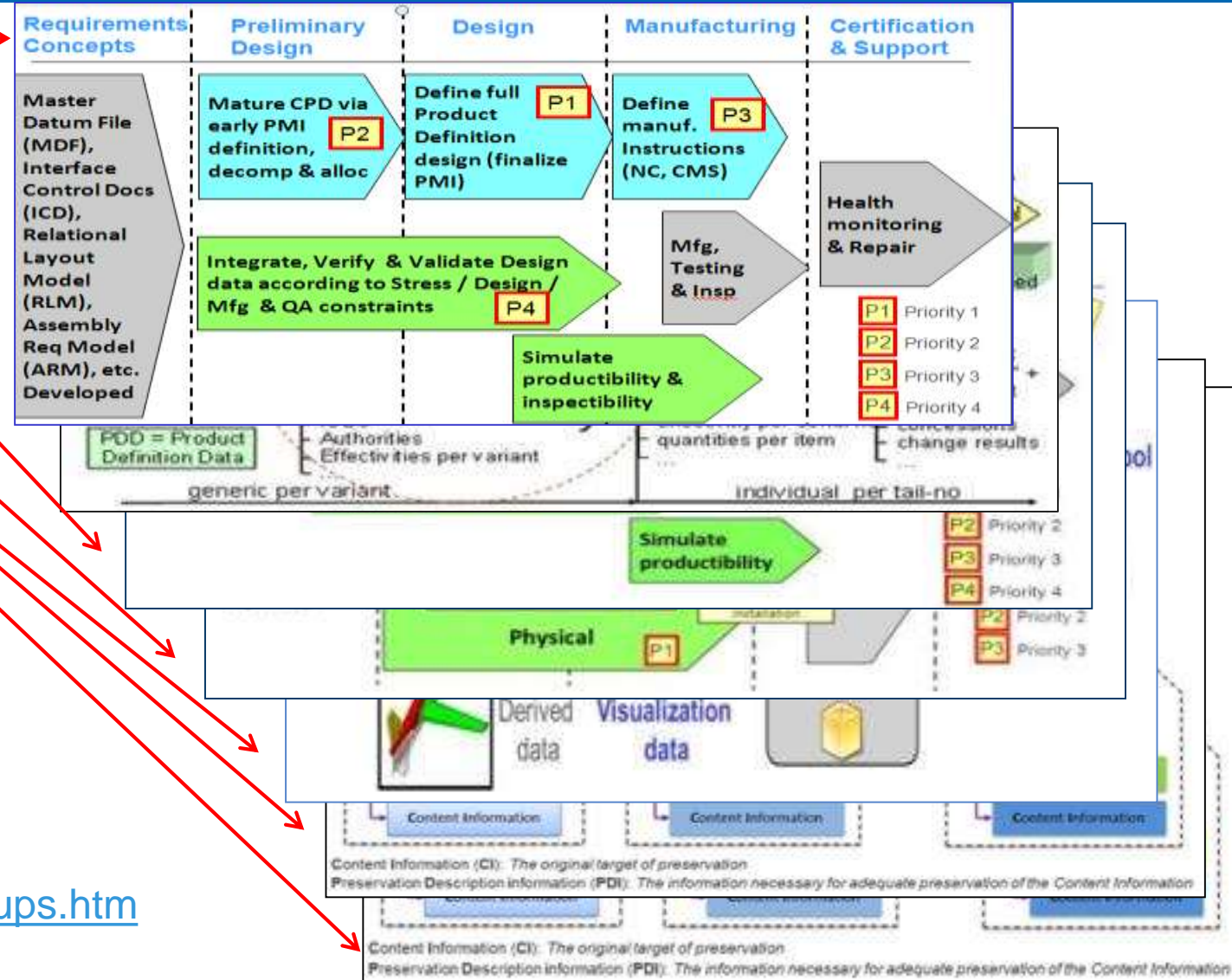


- 3D Mechanical / PMI WG
- PDM – Conf. Management data WG
- Advanced Mfg. - Composite WG
- Electrical Wiring Systems WG
- 3D Visualization WG
- Meta data for archive packages
- Model Based System Engineering WG
- Engineering Analysis & Simulation WG

Description of a LOTAR WG web page

- Goals and Objectives
- Associated LOTAR use cases
- LOTAR Family of Standards
- Associated ISO 10303 Information Models
- Meetings & teleconferences
- Accomplishments
- Related standardization projects

<http://www.lotar-international.org/lotar-workgroups.htm>



LOTAR International Project WBS

UPDATED

WP0:
Project Management

WP1: Development
of **Basic Parts**

WP2: Development
of **Common
Process Parts**

WP3: Development
of **Data Domain
Specific Parts**

WP4:
Implementation
of **Pilot Projects**

WP5:
Development of
LOTAR Rec. Practices

Mechanical (including 3D PMI) WG

Product Management & Meta data WG

Advanced Manuf. (Composite) WG

Electrical Wiring Harness WG

Model Based Systems Engineering WG

Engineering Analysis & Simulation WG

3D Visualization WG

WP6:
Harmonization
(AIA, ASD, PDES Inc,
ProSTEP iViP, ISO,
CAX Impl. Forum, ...)

WP7:
Communication
(FAA, EASA, ...
IT Vendors,
Standardization)

Standardization projects

STEP AP 242 ed2 & ed3

STEP AP239 ed3

PDM Harmo. AP242 ed2 / AP239 ed3

STEP AP243 ed1

*Essential
for the LOTAR PDM WG*

Interoperability Forums (User Gr. & Implementer Gr.)

CAX IF

CAE IF

EWIS IF

PDM IF

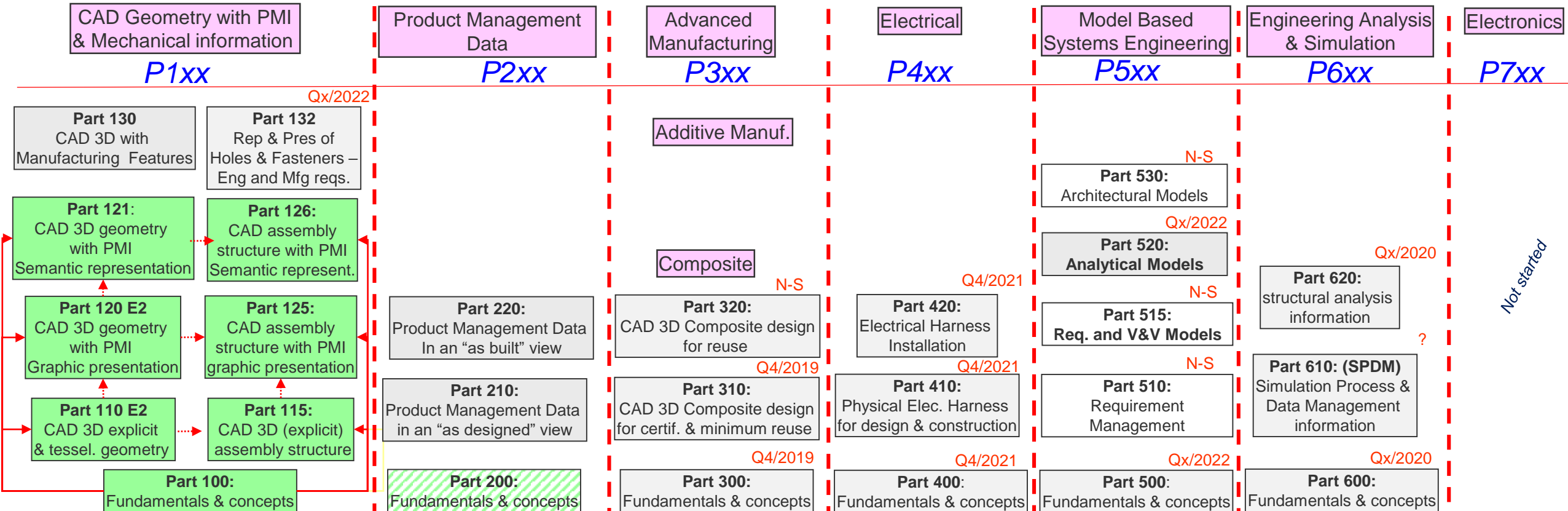
*New business model
prepared for 2019*

★ Launched in 2019

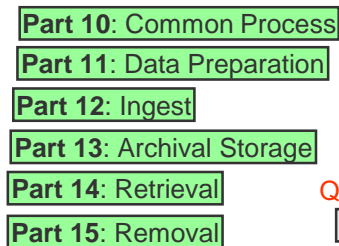
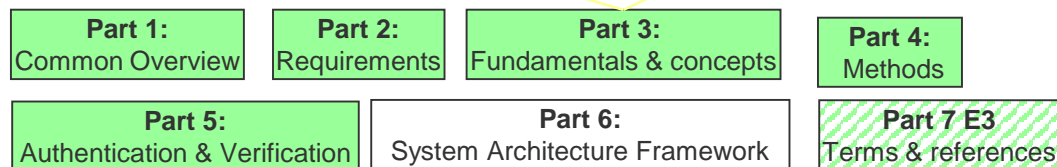
LOTAR Parts EN/NAS 9300-xxx (Status Nov 2019)



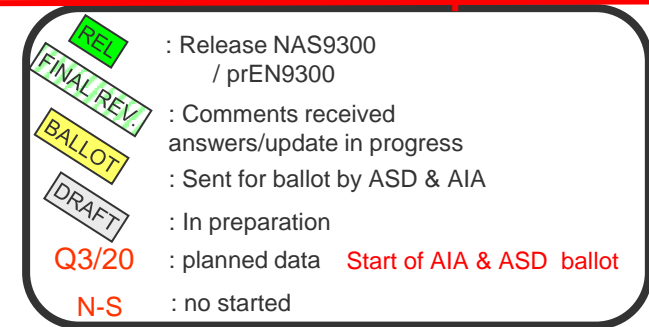
Data Domain Specific Parts



Basic Parts



Common Process Parts



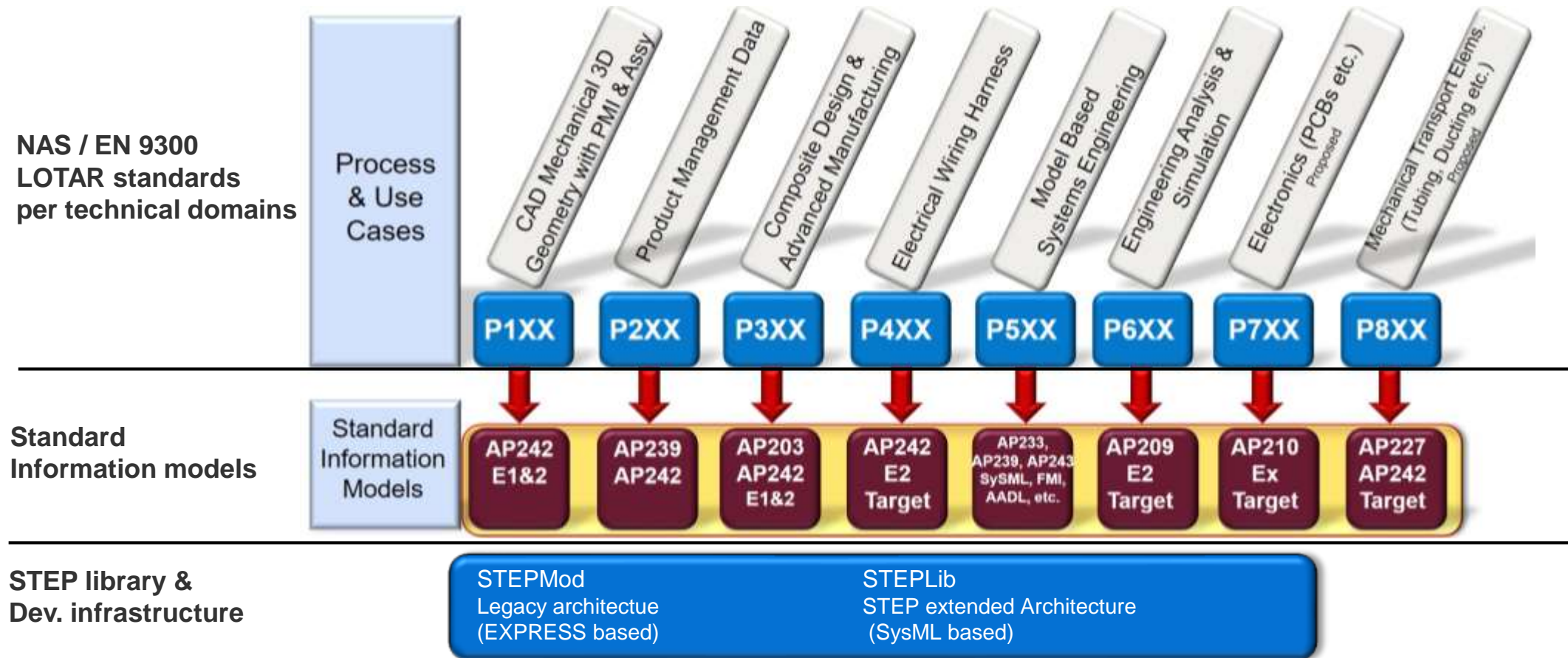
3 parts send for publication to ASD Stan and AIA: P120 ed2, part 121, part 125.

LOTAR Tier 0 Five Year Roadmap



2019	2020	2021	2022	2023
Review and Update Basic Parts (001-009)				
Review and Update Common Parts (010-099)				
	Dev and Update Mech/PMI Parts (115e2, 126e1 Assembly PMI)			Supporting AP242e2 and e3
	Dev and Update Mech/Mfg. Parts (130-132 - Mach Features, Holes/Fasteners)			
	Dev and Update Mech/QIF Parts (140-145 Quality V&V, Measurement)			
	Dev and Update PDM/PLM Parts (200e2, 210e1, 220e1 As-Designed, As-Built)			Supporting AP239e3 and AP242 ed2
	Dev and Update Composite Parts (300e1, 310e1 – Supporting AP209e2, AP242e2/e3)			
	Dev and Update Advanced Mfg. Parts (350e1, 360e1 – Supporting AP242e2/e3)			
	Dev and Update Electrical WH Parts (400e1, 410e1, 420e1 – Supporting AP242e2/e3)			
	Dev and Update MBSE Parts (500e1, 510e1, 520e1 – Supporting AP233e2/AP243e1)			
	Dev and Update Eng. Sim & Analysis Parts (600e1, 610e1, 220e1 – Supporting AP209e2, AP242e2/e3)			

LOTAR Domains and Related standards Information Models



Need to ensure

- the longevity / enhancement of the international product information standards (ISO 10303 STEP and other standards such as FMI, SysML, etc), including their development infrastructure as part of the preservation plan,
- the consistency between standards.

AMERICAS:

- BAE Systems
- Boeing
- Embraer
- General Electric
- Gulfstream
- Lockheed Martin
- Sandia National Labs
- UTC: in progress (Pratt Whitney, Collins Aerospace, Goodrich, Raytheon)

EUROPE:

- AFNeT
- Airbus
- Airbus Helicopter
- Airbus Defense & Space
- SAFRAN Engine

- 1st meeting: (16) 17 - 19 March, Toulouse, France, hosted by AFNeT
- 2nd meeting: (14) 15 - 17 June, USA, hosted by PDES Inc
- 3rd meeting: (7) 8 -11 Sept., Darmstadt hosted by prostep ivip
 - GPDIS 2020: 14th – 18th of September, USA
- 4th meeting: (6) 7 - 9 Dec., USA, hosted by PDES Inc

The Leadership Team in conjunction with AFNet, PDES, Inc. and prostep ivip, decided to alternate meeting locations bi-yearly in order to strengthen the collaboration between Interoperability Forums and associated User Groups.

- The successful implementation of LOTAR standards by the US & EU A&D industries relies on the governance through the time of open international product data standards:
 - ISO 10303: AP242 e2, AP243 MoSSEC, AP209 e2, AP239 e3 PLCS, AP238 e2, etc.,
 - completed by other standards such as QIF, SysML, FMI, AADL, etc.
 - ➔ need to prepare 5 years roadmap of these standards and the associated portfolio management
 - ➔ Need to consolidate the use of the STEP Extended Architecture, using SysML for information modeling, easing the extension to different implementation forms (services)
- Change in the scheduling of the quarterly LOTAR offsites in 2020, in order to strengthen the collaboration with the different Interoperability Forums
- FAA representatives may participate to the LOTAR offsites in USA in 2020
 - In 2020 the LOTAR leadership plans to invite EASA representatives to attend a LOTAR offsite.
- LOTAR 5 years plan anticipates extensions to support LTA of the digital thread between MB Engineering & Advanced MB Manufacturing (Digital transformation)
- Importance of the support of PDES, Inc., AFNeT and ProSTEP iViP.
 - Support of the Interoperability Forums: CAx IF, EWIS IF, CAE IF, PDM IF, etc

▪ LOTAR Leadership Team

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