



International specification for developing scheduled maintenance programs

***S1000D User Forum 2013
Vienna, 2013-09-19***

***S-Series Specification Day
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Agenda

- Background
- Issue 0.1
- Issue 1.0
- Issue 2.0
- Optimized Preventive Maintenance



Background

- 2004 Product Support Group of ASD conducted a feasibility study for a specification for Scheduled maintenance programs for military aircraft
- Results were approved
- Development of S4000M was launched



Scope - Task for the development team

To develop and publish an **International procedural handbook** for the performance of the **scheduled maintenance analysis** within the Aerospace and Defense community

Traditional add-on's
to cover
military products

MSG – 3
Basic
processes

Lesson's
learned
from
current
Program
add-on's

New
features /
processes

- optimize traditional processes
- to consider new hazards, to cover new materials (composite structures)
- to cope with **ecological and legal aspects**
- etc

The processes shall be tailorable to enable user's to adopt them according to specific requirements



Issue 0.1

- Sources
 - World-wide experience of analysts in the field
 - MIL-STD-1843 (RCM)
 - NAVAIR 00-25-403
 - UK MOD Defense Standard 00-45
 - ATA MSG3
- Issue 0.1 produced and approved by ASD Q1 2012
- Comments collected
 - Good source material
 - Cancelled, superseded, no longer supported, etc
 - Gaps



Examples of identified problems

No specification for military A/C analysis incl. UAV (*) available

Structure analysis for new materials and material combinations ?

Interface(s) to a later Product optimization based on In-Service data ?

How to harmonize tasks being identified in single analysis chapters ?

ATA MSG-3 for civil A/C: application not on other products incl. military A/C ?

No functional failure effects colliding with law/ environmental integrity !

Data traceability ?

Interface and harmonization with CMR (*) ?

Interface(s) to design department(s) and ILS disciplines ?

Unclear/limited/ missing task types for task selection

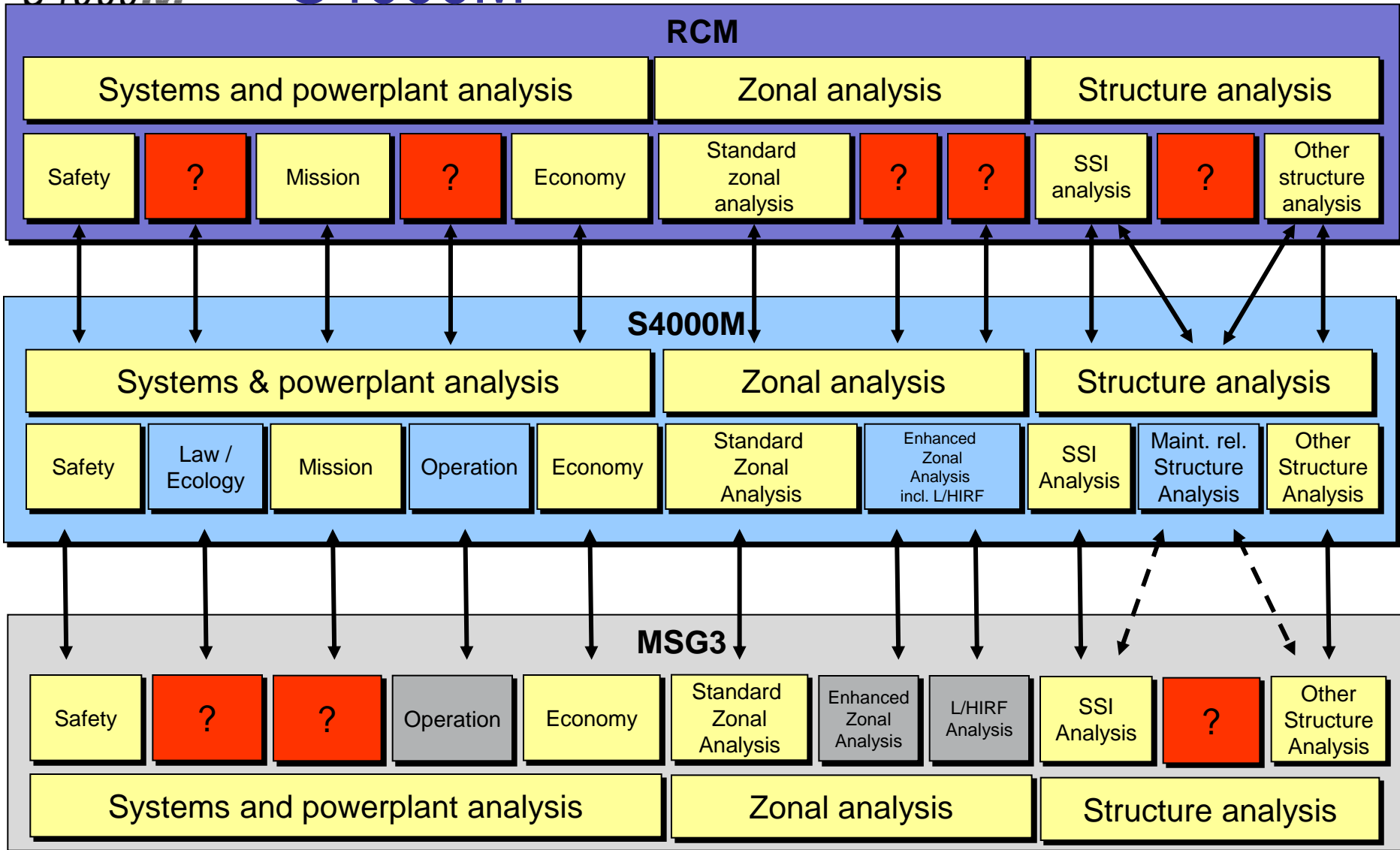
Enhanced Zonal analysis covering other civil / military Products ?

Interface(s) to product certification, qualification ?

Which IT relevant information and data ?

(*)
UAV = Unmanned Air Vehicle
CMR = Certification Maintenance Requirements
incl. law-based requirements, analysis results from safety analysis etc.

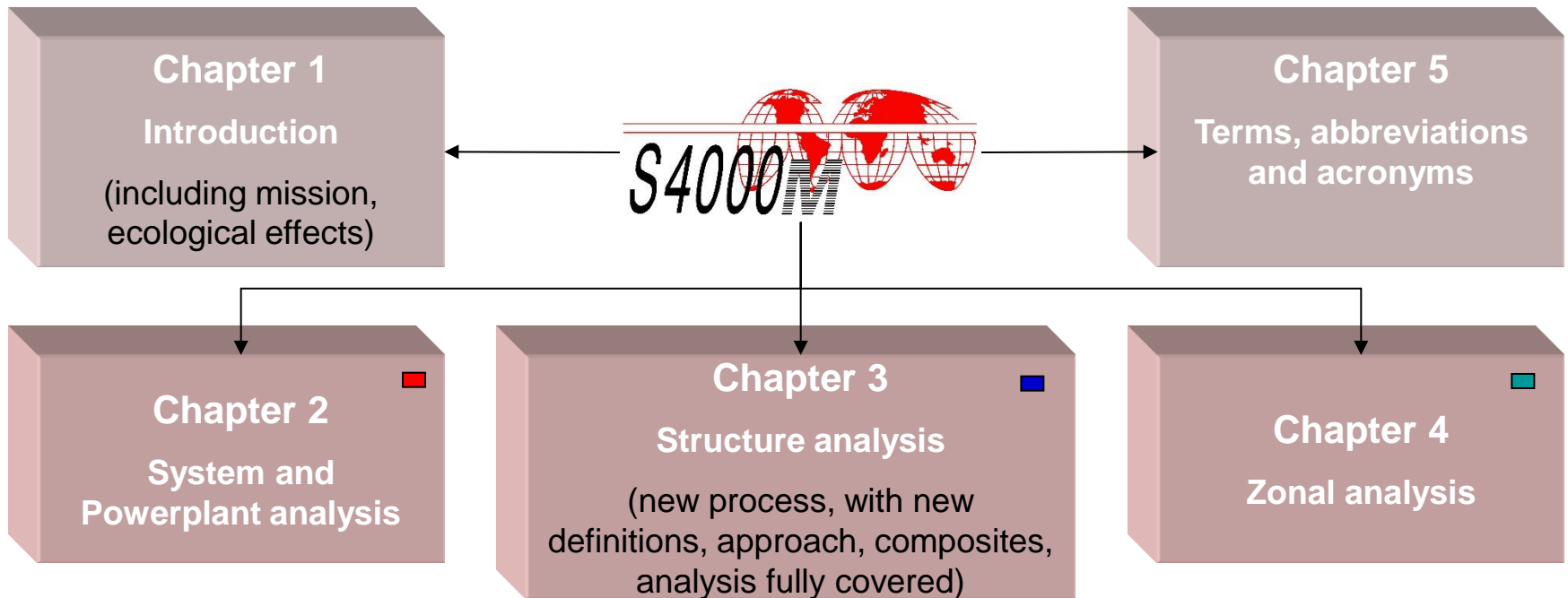
Gaps in MSG3/RCM compared to S4000M



- As well as existing analysis methodology in Issue 0.1
- Issue 1.0 also covers
 - Operation of the Product in both normal and adverse conditions
 - Introduction of the mission, as a critical input to operations
 - Analysis of typical accidental damages
 - Modifications in definitions and processes to meet the specific functionalities of the Product
 - Coverage of deployments
 - Extension of applicability on other Products
 - Extension of failure effects related to aspects of environmental integrity or other aspects covered by law
 - Introduction of maintenance relevant structure besides Structure Significant Items (SSI) and other structures
 - Introduction of Significant Details (SD) on an SSI

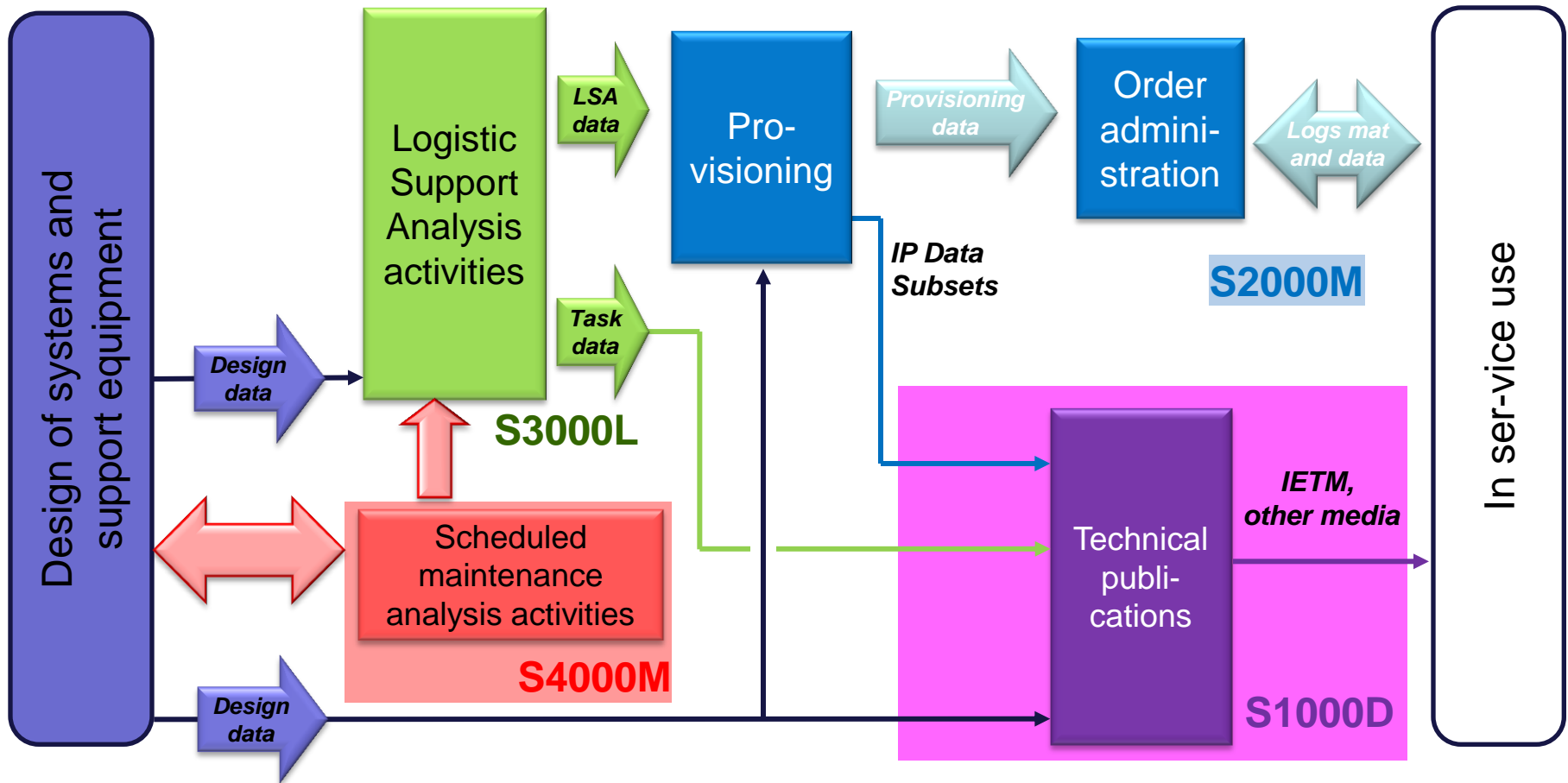


Structure of S4000M (Issue 1.0)



S4000M Issue 1.0

Issue 1.0 covers the analysis during the Product design and development phases





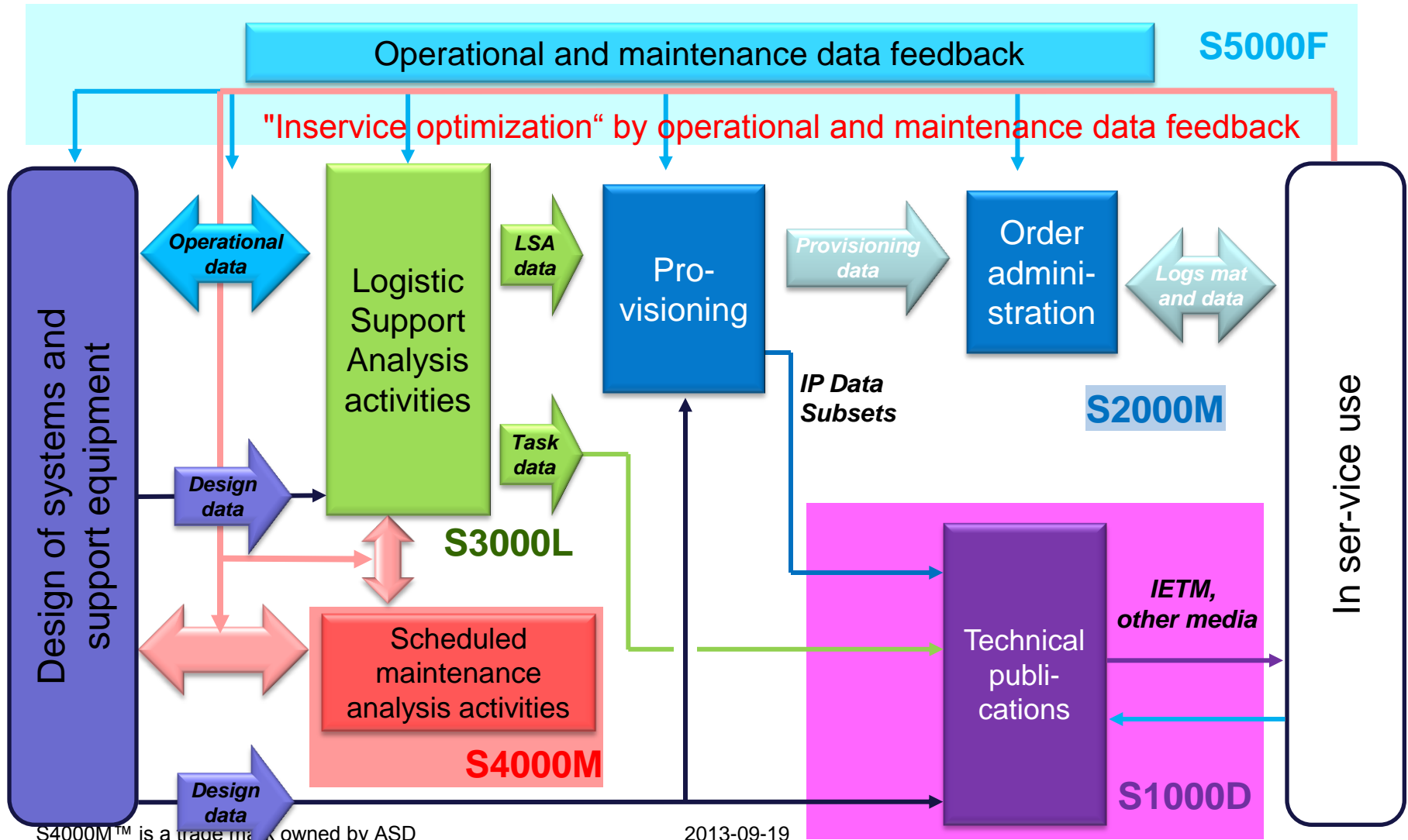
Issue 1.0

- Release of Issue 1.0 delayed
- “Copyright” issues between S4000M and MSG3
- Close to resolution
- Original Issue date: 2012-01-31
- Ready to publish after resolution



Issue 2.0

Issue 2.0 will cover the analysis during the Product lifecycle





Issue 2.0

- Alignment and integration with S-Series
- Include connection with S5000F
- Significant changes on Analysis Logic (eg, single logic for all zonal analysis)
- Optimized Preventive maintenance (**NEW**)



Optimization of Preventive Maintenance



Operational data

basic information for OPM activities

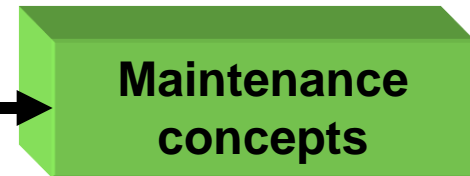


OPM
process

OPM process will be integrated into S4000M as its own chapter (from Issue 2.0 on)

Adjustment of Scheduled maintenance because of OPM results

Documentation of original results of SMA as LSA tasks with interval, MTA und packaging of the tasks



IMPORTANT

In the LSA database, the **complete view** on scheduled maintenance is documented:

Single tasks with original interval / packaging / OPM adjustment
(traceability to original task is guaranteed by complete documentation within LSA database)

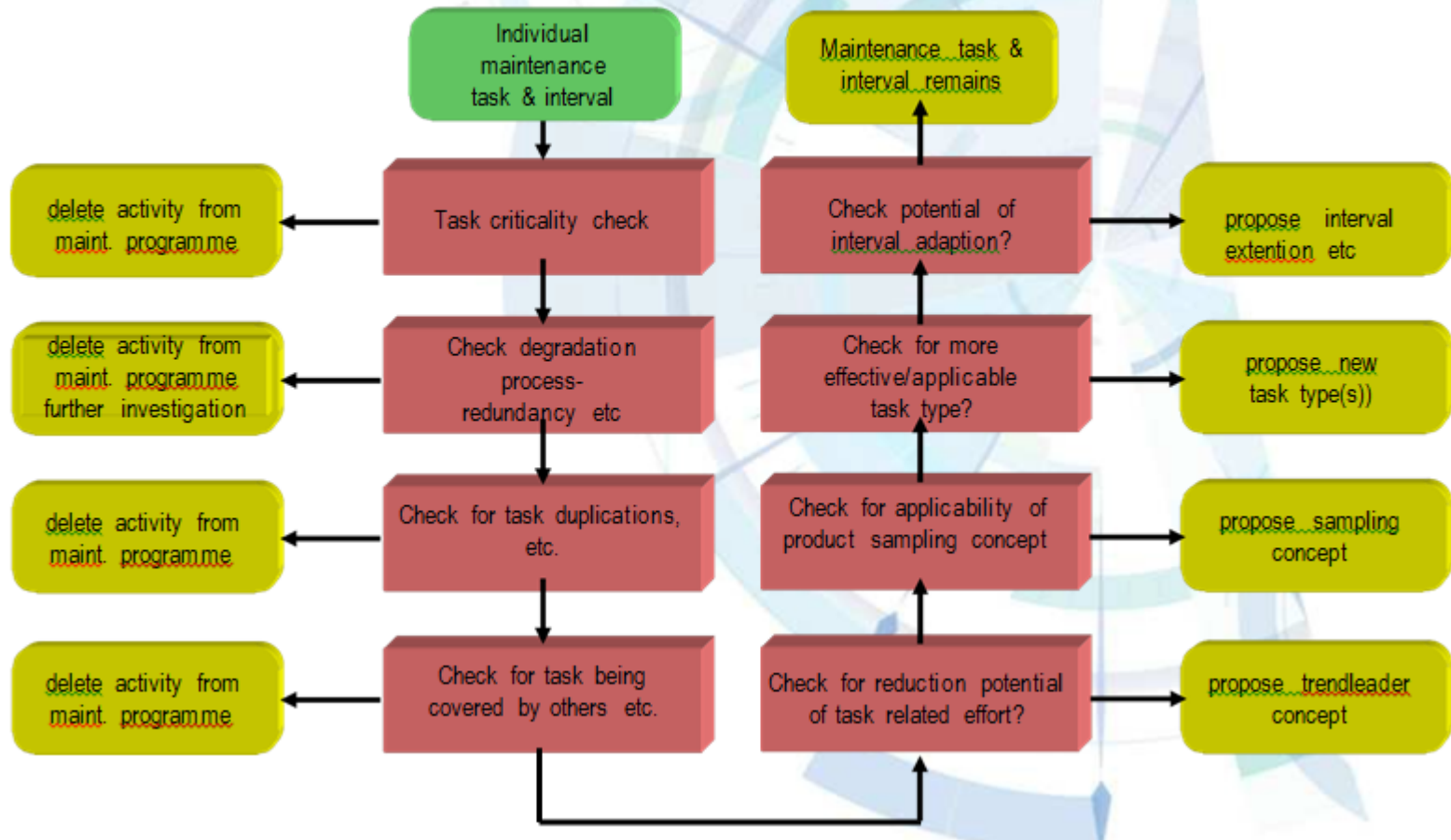
SMA = Scheduled Maintenance Analysis
MTA= Maintenance Task Analysis

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OPM Process

OPM Basis Analysis Logic:
 each of the „boxes“ shall provide a comprehensive set of specific and objective questions incl. decision rules !



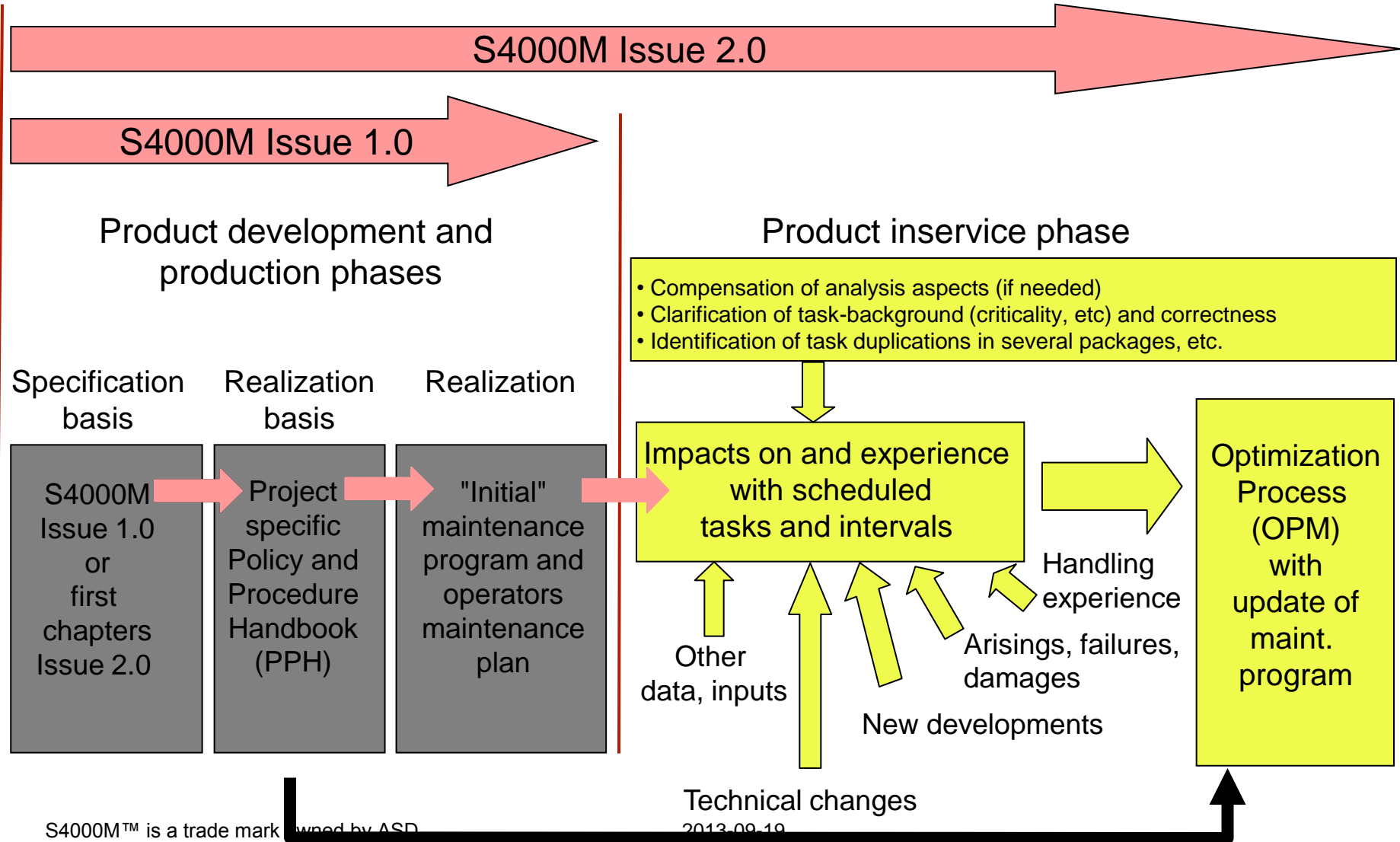


Future plans

- Modification, update and improvement of the existing chapters of S4000M Issue 1.0 to avoid any copyright-discussions
- Implementation of new chapters covering a new optimization process for scheduled tasks and intervals during the Product inservice phase
- Implementation of new chapters to clarify and define the data- and information exchange on all S4000M interfaces (specific S3000L and S5000F)
- Evaluation and implementation of comments from S4000M users, customers and steering committee members and input from other S Series specifications



S4000M Issue 1.0 and Issue 2.0

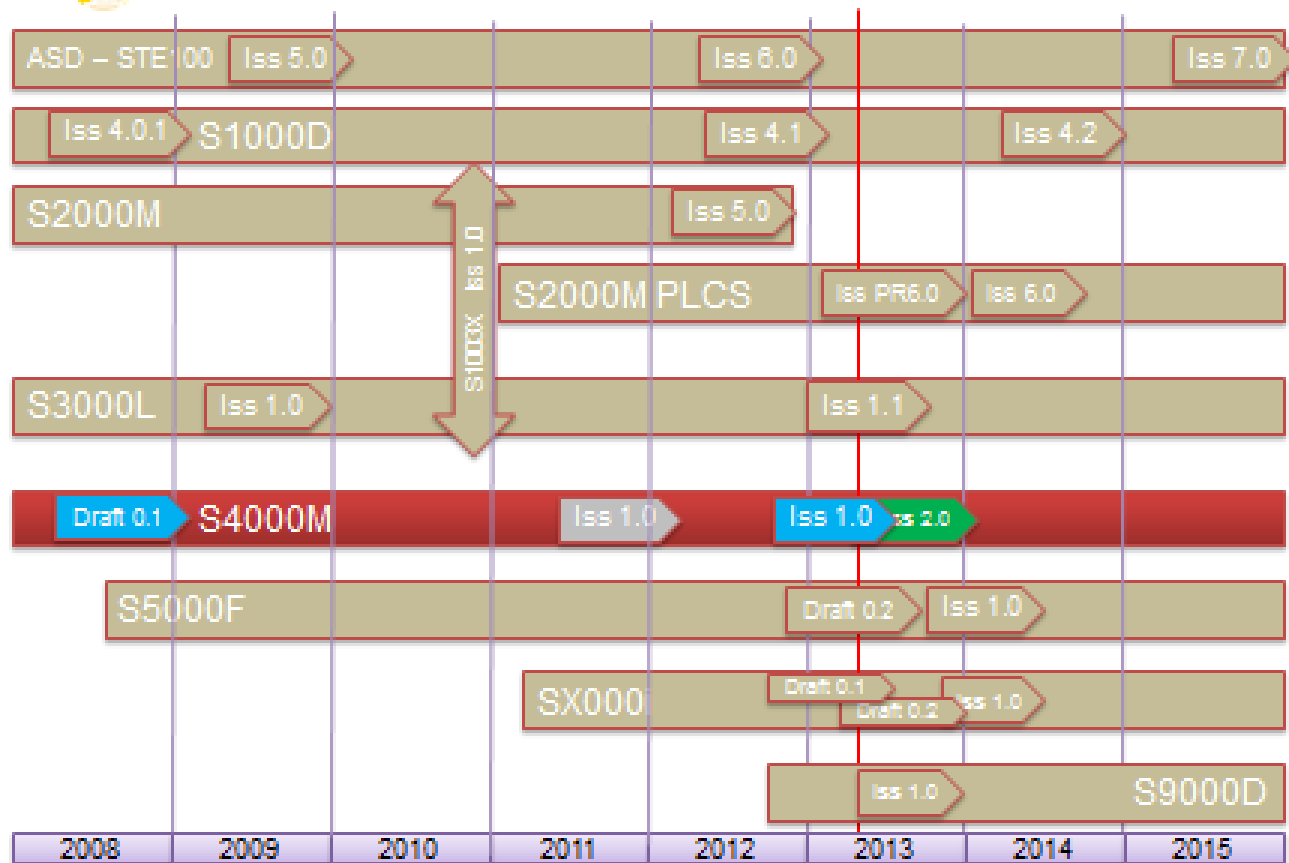




Planned issuing



The S-Series ILS specifications - Issue plan



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If your car could travel at the speed of light, would your headlights work?