



**AIA /ATA/ ASD
S1000D Users Forum**

“S1000D: Realizing the Benefits of Integrated Logistics Support”

**October 12- October 15, 2009
Crown Plaza Hilton Head Resort, Hilton Head, SC, USA
S3000L International Procedure Specification for LSA
S10003X Interchange Specification**

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Industries Association of Europe



Air Transport Association



Content

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 - Overall content
 - List of Chapters
 - Overview of Select Chapters
 - Data model and data exchange
- ASD S1003X
 - Objective and Scope
 - Overview



Team S3000L

- US and European Aerospace Industries are each represented by a chairman of the working group.
- Workpackage managers are assigned for each chapter.
- ASD/AIA Advisory Board
- Industry & government representation:





Purpose & Scope

- S3000L defines the processes, general requirements and related information exchange governing the performance of the LSA during the life cycle of aerospace and defense products.
 - Influence the product design relevant to maintainability, reliability, testability and optimize life cycle cost
 - Define all required resources to support the product in its intended use, during in-service operation
- May also be used for products from other industrial domains.



Purpose & Scope

- S3000L is designed to cover all processes and requirements governing the performance of the LSA.
 - Provides the rules for the establishment of the product breakdown and for the selection of LSA candidate items.
 - Describes the type and methodology of performance of the specified analyses.
 - Defines the guidelines on how to process the results of the analysis tasks.
 - Explains the interface between LSA and Engineering as well as the various ILS functions.



Milestones

- S3000L International Procedure Specification for Logistic Support Analysis (LSA)

January 2006

Inaugural meeting (Brussels)

March 2006

Kickoff meeting (Munich)

June 2009

Draft Specification Release (Brussels)

October 2009

End of official commenting phase

November 2009

Comment review & disposition (Tampa)
(tentative)

- Available for download

www.asd-stan.org/s3000L.html



Overall Content

- General requirements and business rules of LSA
- Comparative Analysis
- Human Factor Analysis
- System breakdown and Product configuration
- Reliability, Availability, Maintainability, Testability and Safety Analysis
- Event Driven Maintenance
 - Logistic Failure Mode and Effects Analysis; Damage Analysis; Special Event Analysis; Scheduled Maintenance Analysis (S4000M, MSG-3, RCM); Operations Analysis
- Software Support Analysis
- Level of Repair Analysis
- Maintenance Task Analysis
- Other Considerations
 - Simulation of operational scenarios
 - Training Needs Analysis (TNA)
 - Tech Data



Chapters

- 01 Introduction
- 02 General Requirements
- 03 LSA Business Process
- 04 Configuration Management
- 05 Influence on Design / RMT Interface
- 06 Human Factors Analysis
- 07 LSA FMEA
- 08 Damage and Event Analysis
- 09 Logistics Related Operations Analysis
- 10 Scheduled Maintenance Analysis
- 11 Level of Repair Analysis
- 12 Maintenance Task Analysis



Chapters

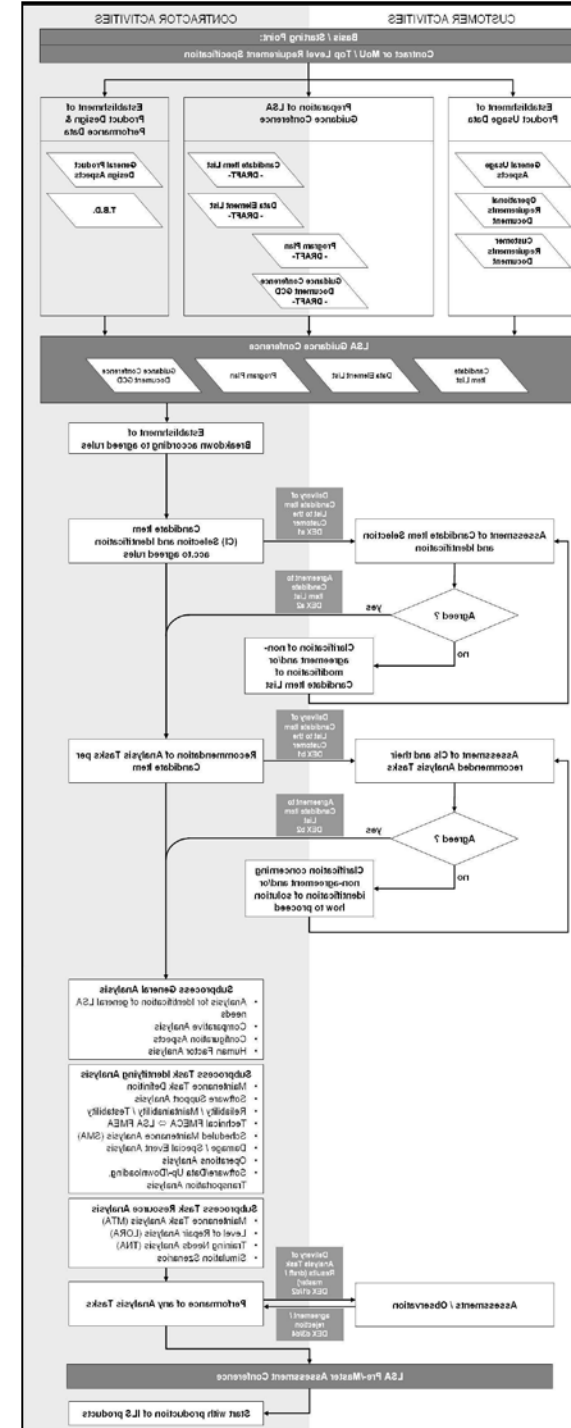
- 13 Software Support Analysis
- 14 Life Cycle Costs Considerations
- 15 Obsolescence Analysis
- 16 In Service Feedback
- 17 Disposal
- 18 Interrelation to other ASD Standards
 - 18.1 Benefits of using the ASD standard suite
 - 18.2 Interrelation to S1000D
 - 18.3 Interrelation to S2000M
 - 18.4 Interrelation to S4000M
 - 18.5 Interrelation to S5000F
- 19 Data Elements
- 20 Data Exchange
- 21 Terms, definitions and abbreviations



Chapter 3

LSA Business Process

- Establishment of Product Usage Data
- Establishment of Product Design & Performance Data
- LSA Guidance Conference
- Establishment of Breakdown according to agreed rules
- Candidate Item Selection
- Analysis activities for candidate items
- Customer Involvement
- LSA Review / Assessment Conference
- Starting Point / Interface to creation of ILS products

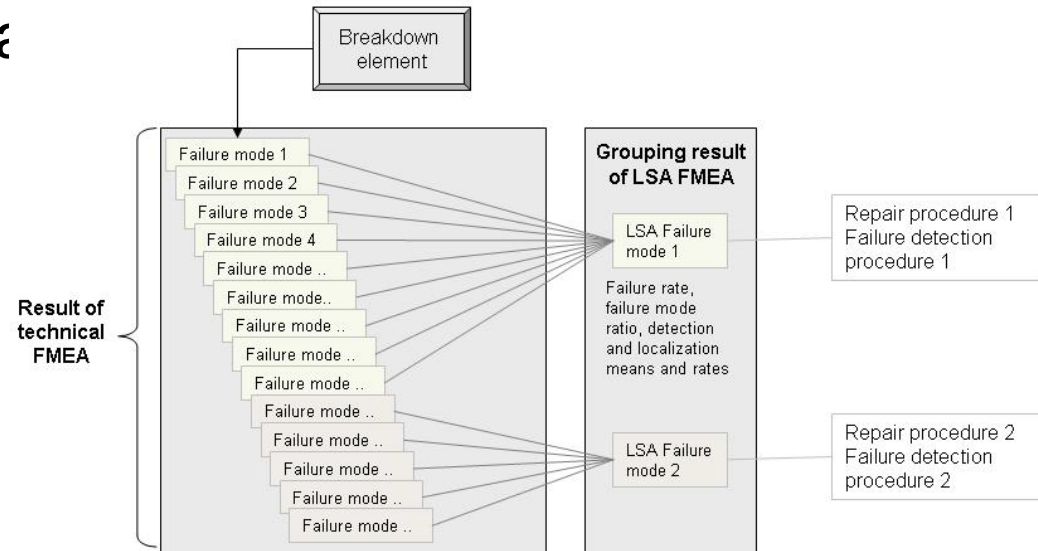




Chapter 7

LSA Failure Modes & Effects Analysis

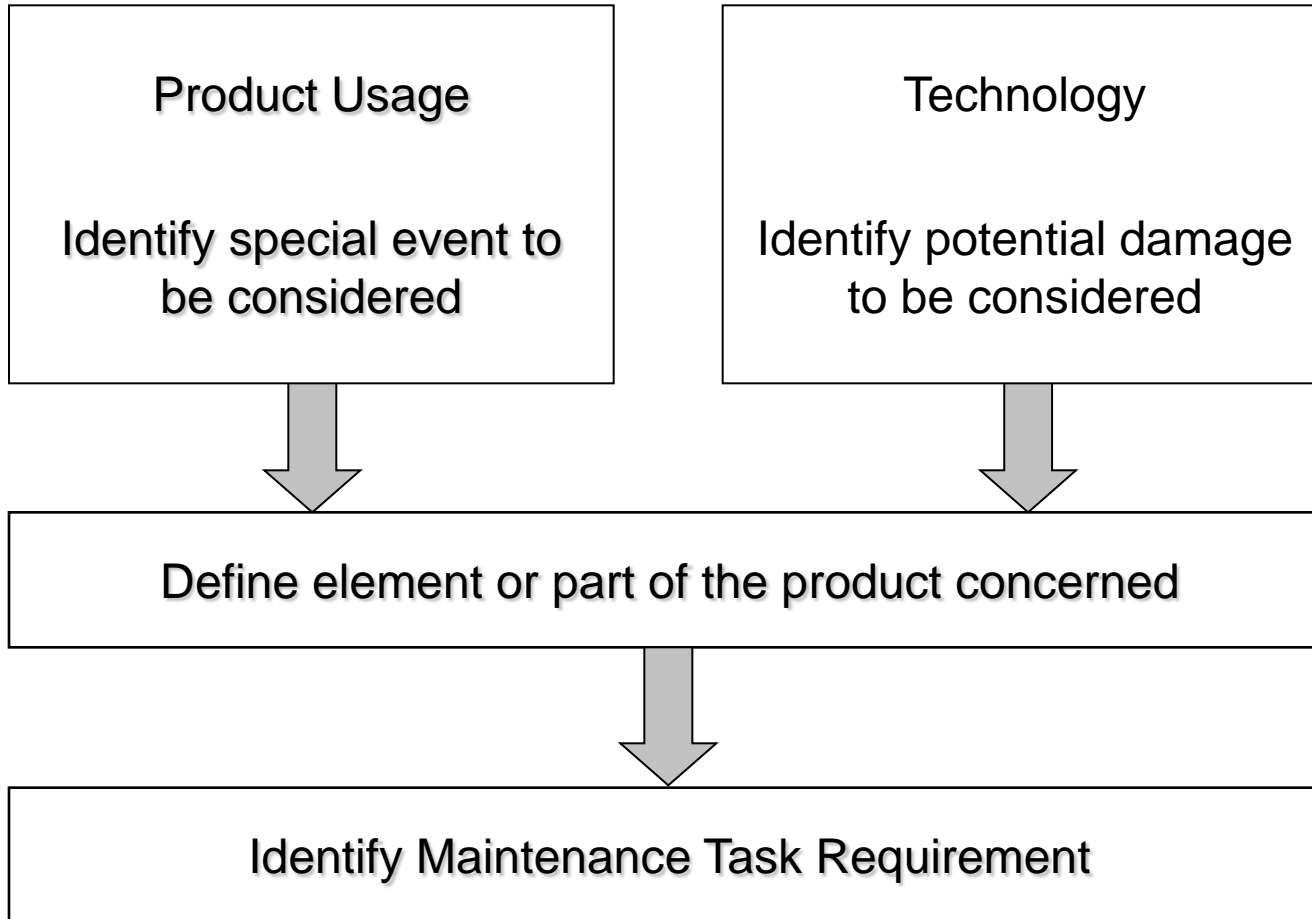
- Maintenance oriented FMEA
- Based on a product breakdown, limited in depth to replaceable units
- Analyses and records failure modes, failure effects, detection means
- Aims to detect and localize without ambiguousness replaceable units that have





Chapter 8

Damage and Special Event Analysis





Chapter 12

Maintenance Task Analysis

- Task structure – how to document a task
 - Documentation of supporting tasks with the help of subtasks/working steps
 - Documentation of rectifying tasks with the help of referenced supporting tasks and additional subtasks and working steps respectively
 - Integration of preconditions, pre-work and post-work



Chapter 12

Maintenance Task Analysis

- Task Support Resources
 - The resources necessary to perform a maintenance task should be defined at a common level within the task itself.
 - Generally, it should be possible to identify when a resource should be available within the sequence of the task.
 - The Support Resources can be (but not limited to):
 - Personnel
 - Material (spare parts and consumables)
 - Support and test equipment
 - Facilities and infrastructure
 - Technical documentation
 - IT support



Chapter 12

Maintenance Task Analysis

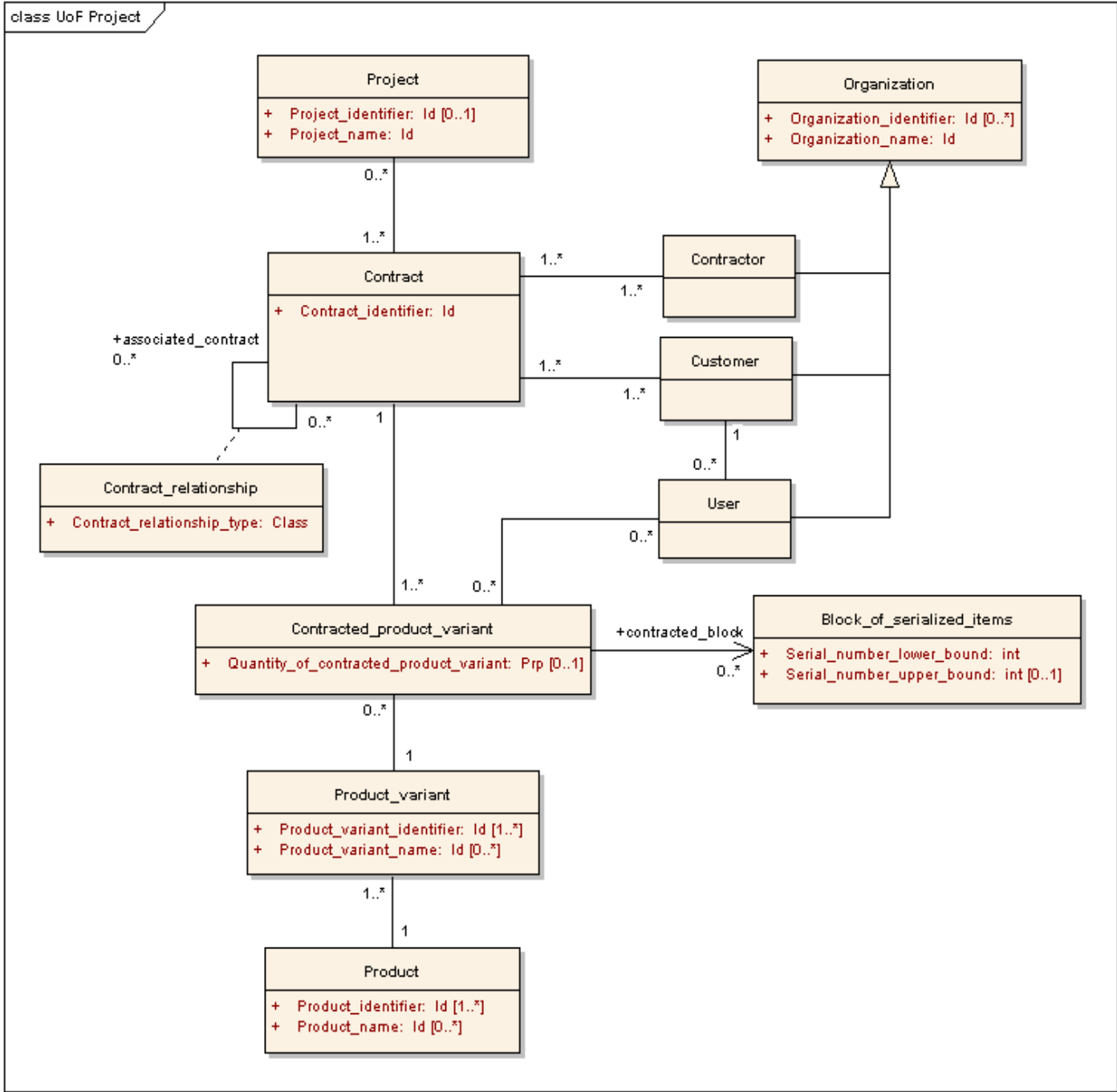
- Aspects concerning the performance maintenance tasks
 - Resources out of supporting task references
 - Interrelationship between support resources
 - Harmonization of support equipment and spare parts
 - Task location aspects
 - Product and system availability during maintenance performance
 - Support solutions (task variants)
 - Task duration and task frequency
 - Parallel activities within maintenance tasks



Chapter 19

LSA Data Model & Data Elements

- Objective
 - Express a coherent (logical) S3000L data model and data element definitions for the exchange of data with related business processes.
- Key Aspects of The Data Model
 - Predicated on ISO 10303 AP239 Product Life Cycle Support (PLCS) data model
 - Documents the data from the S3000L chapters
 - Contains the data required to “build” task related S1000D Data Modules





S1003X

Integration Specification

- Developed by a subset of S3000L core members and representatives from the S1000D community.
- Objective: Specify data required from the Product Development and Logistic Support Analysis (LSA) activities, in order to produce task related data modules in S1000D.
- Scope:
 - S1000D Maintenance Procedure schema
 - S1000D Maintenance Planning schema
 - S1000D Applicability Cross-reference Table schema
 - S1000D Conditions Cross-reference Table schema

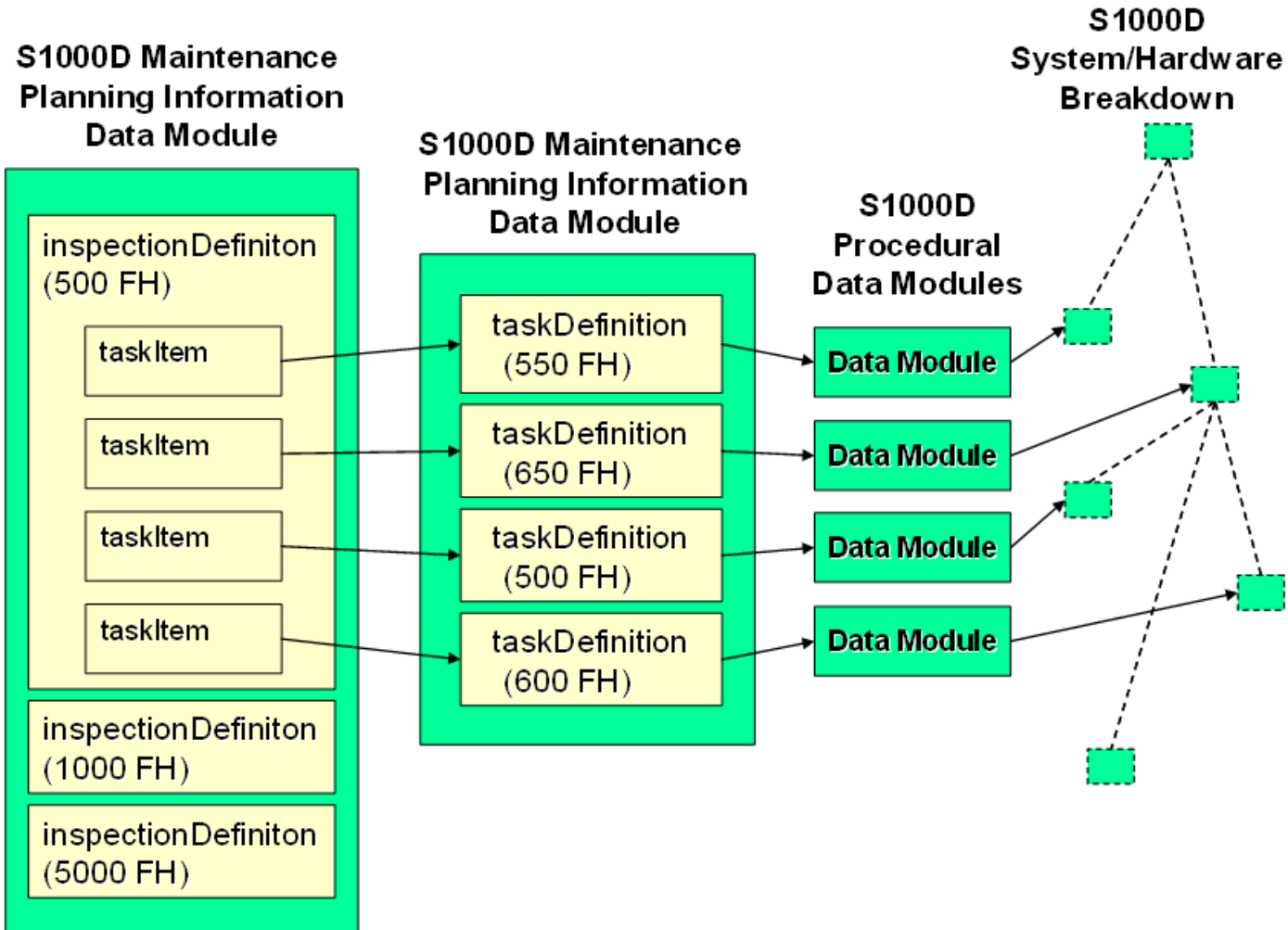


Key Areas

- Product Breakdowns
- Task and Task structures
- Task limits
 - Thresholds
 - Triggers
- Applicability statements



Task Hierarchy in S1000D

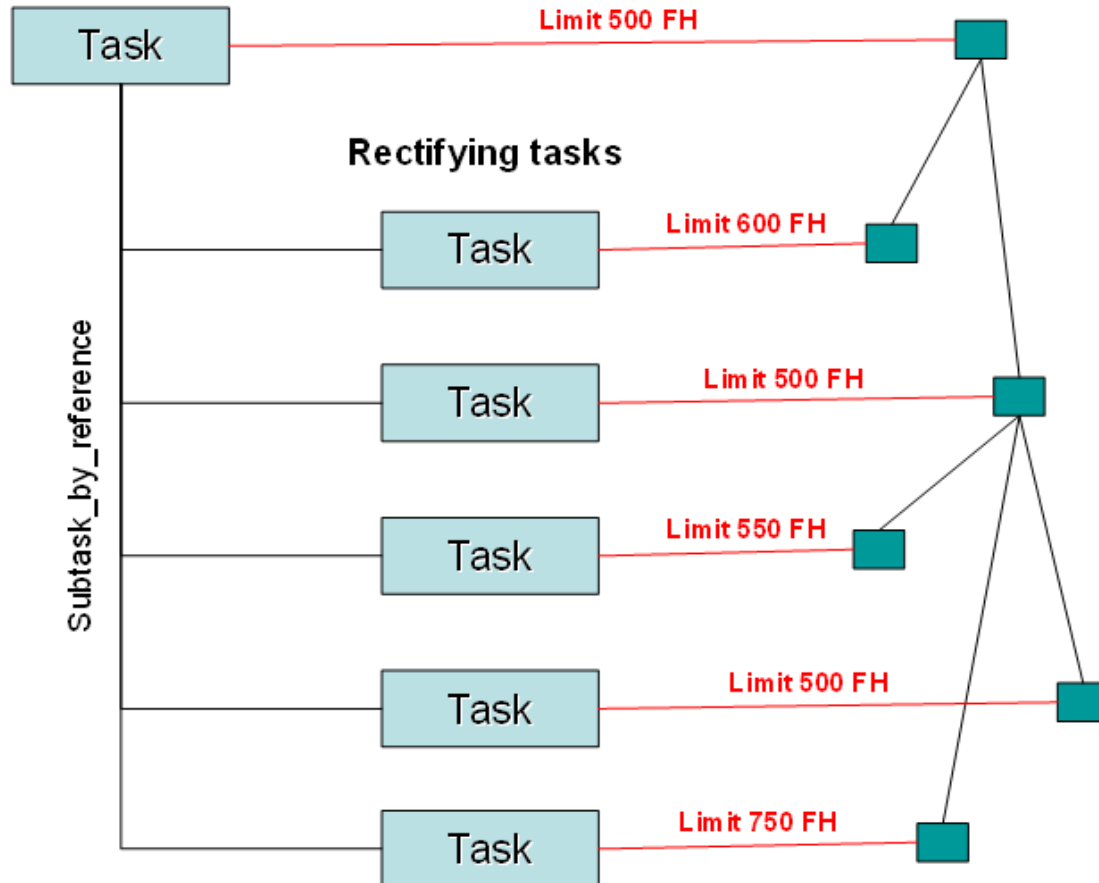




Task Hierarchy in S3000L

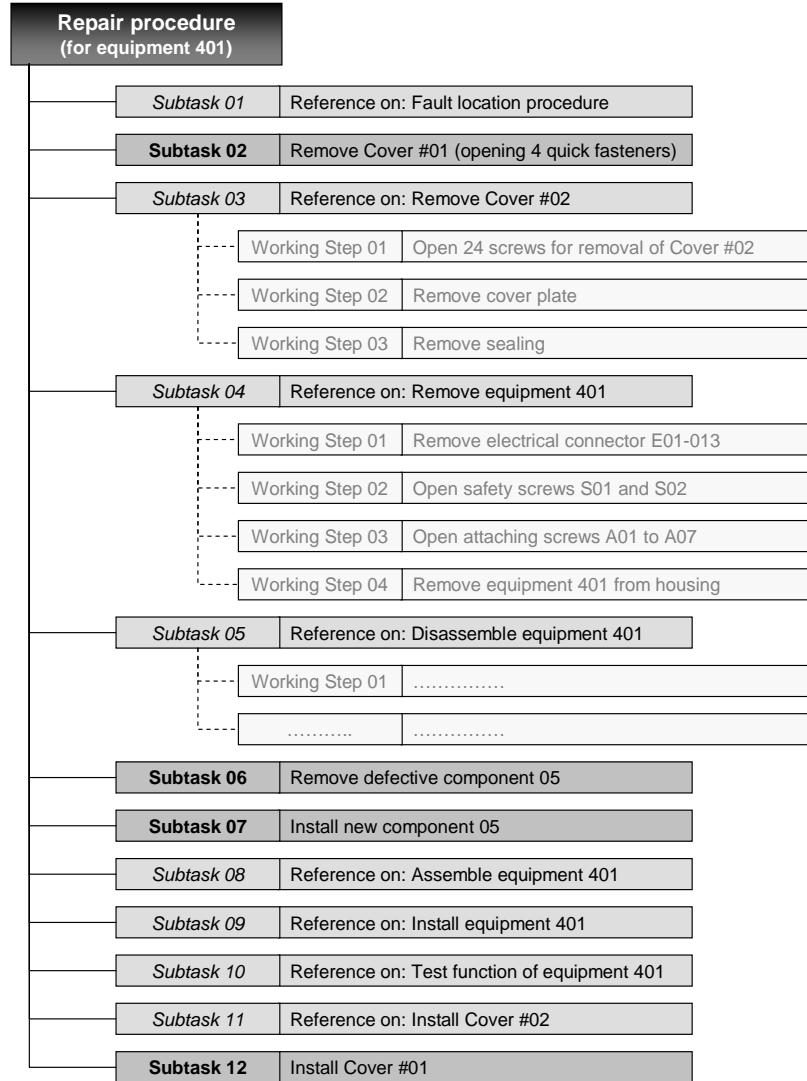
Scheduled maintenance
package task

Product breakdown



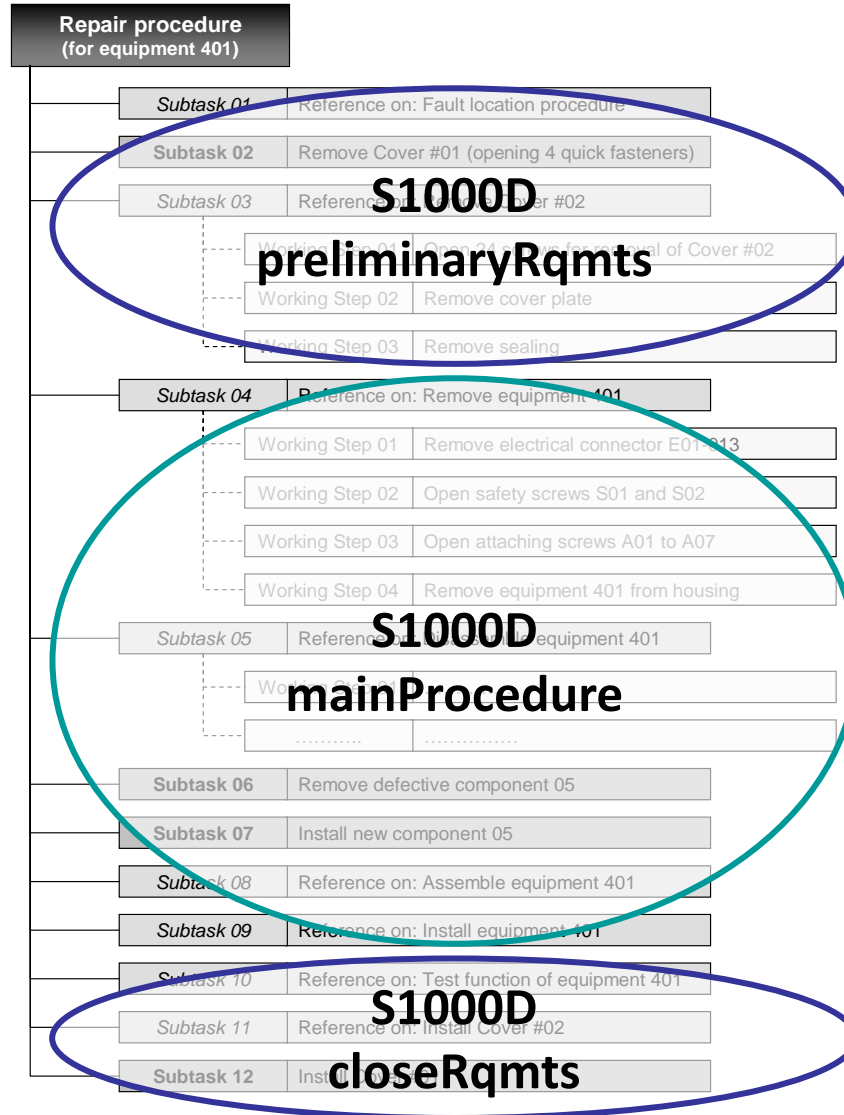


S1000D Task Scope





S1000D Task Scope





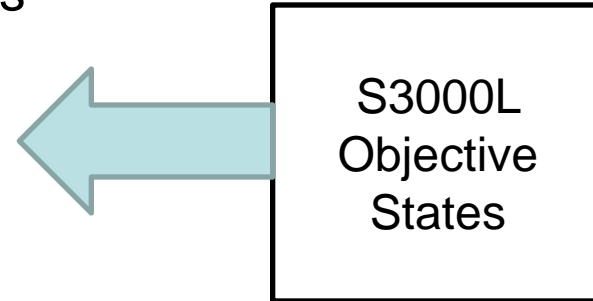
Mapping Details

- S1000D Maintenance Procedure
- S1000D Maintenance Planning
 - taskDefinition
 - inspectionDefinition
 - timeLimitInfo
 - maintenanceAllocation
- S1000D Applicability
 - S1000D Applicability Cross-reference Table
 - S1000D Condition Cross-reference Table



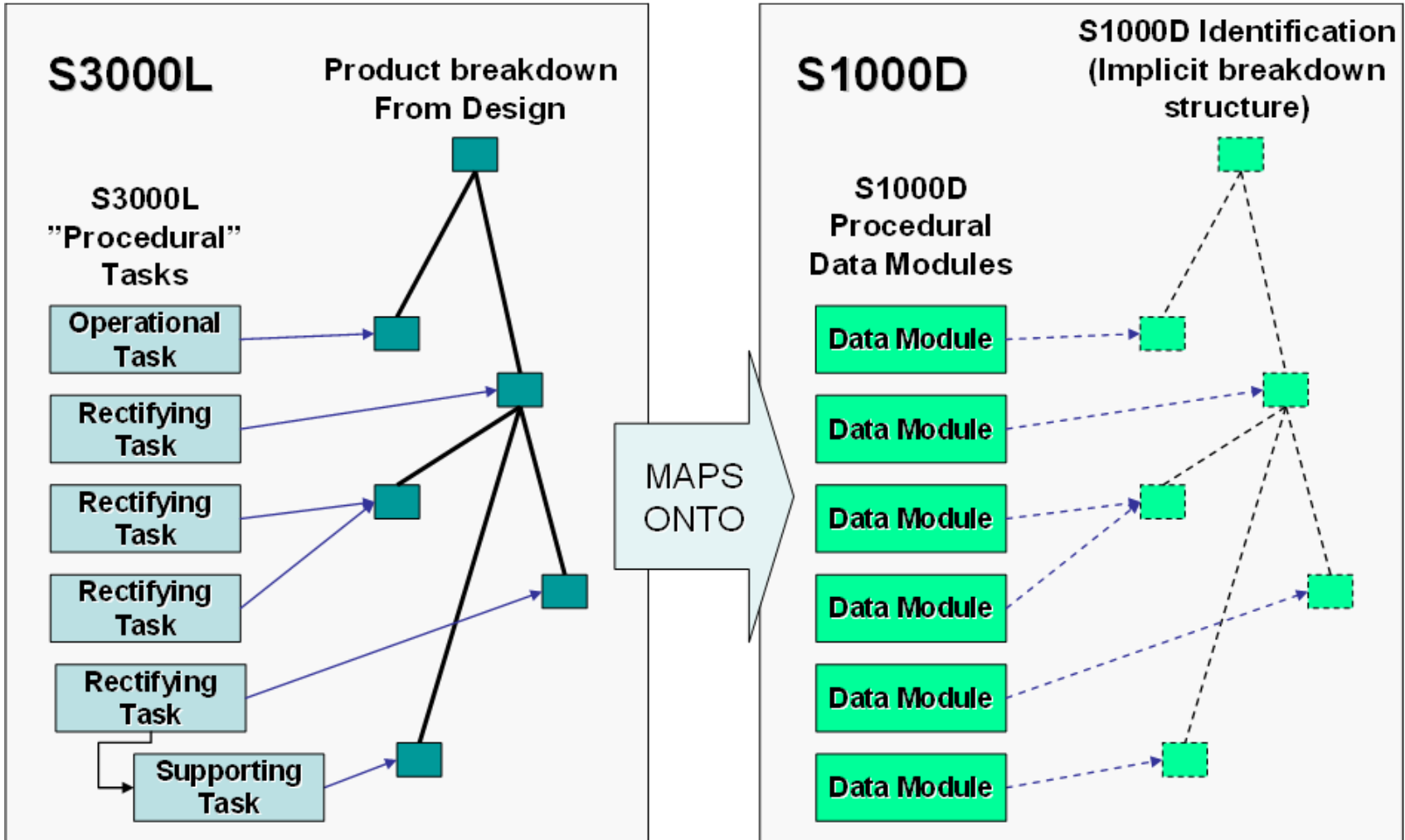
S1000D Maintenance Procedure

- Preliminary Requirements
 - Production Maintenance Data
 - Establish Required Conditions
 - Access Panels
 - Circuit Breakers
 - Defueled
 - Main Procedure
 - S3000L Startup Subtasks
 - S3000L Core Subtasks
 - S3000L Close-up Subtasks
 - Close Requirements
 - Required Conditions Reset





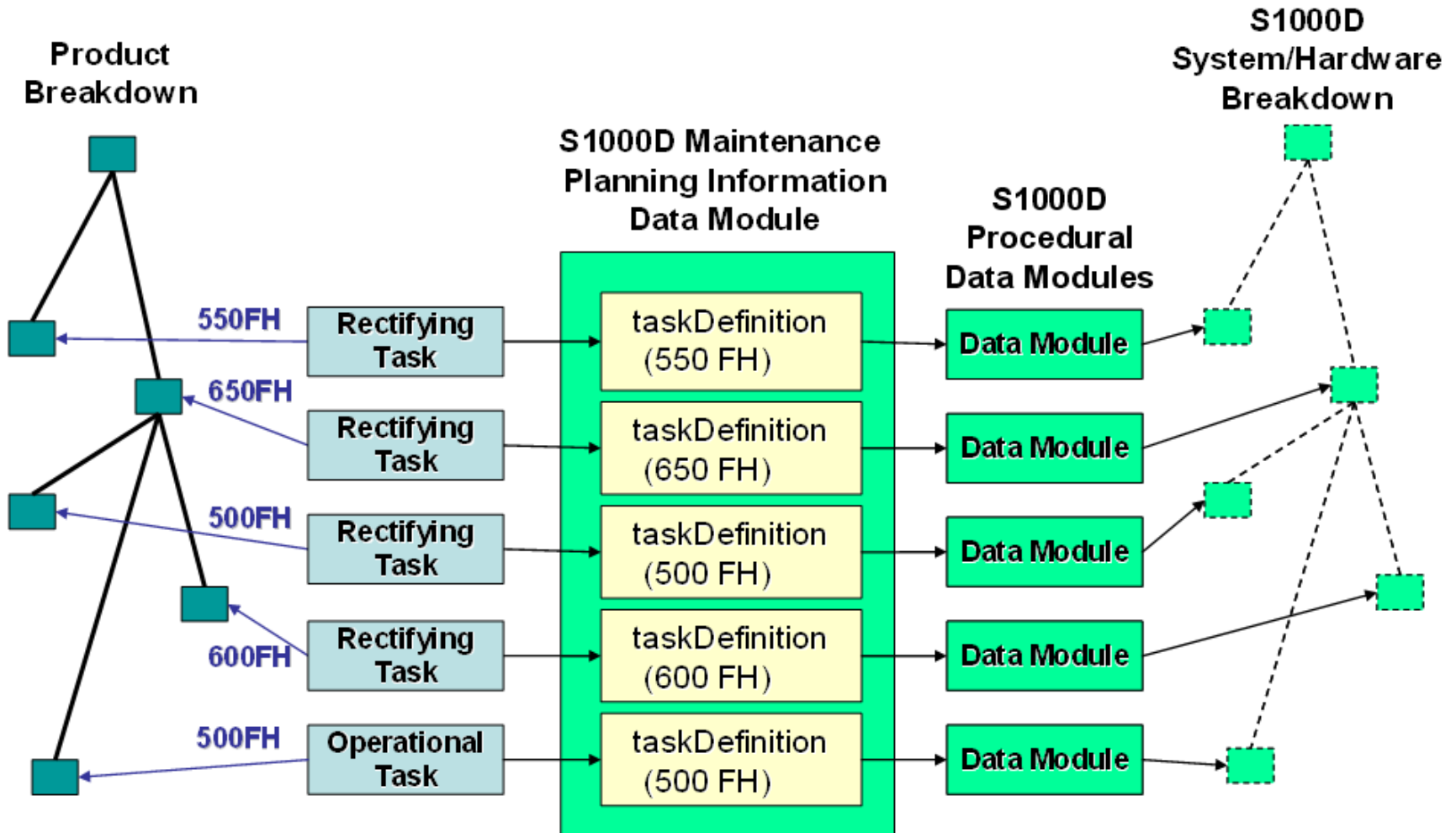
Mapping Procedural Tasks





Mapping Procedural Task Limits

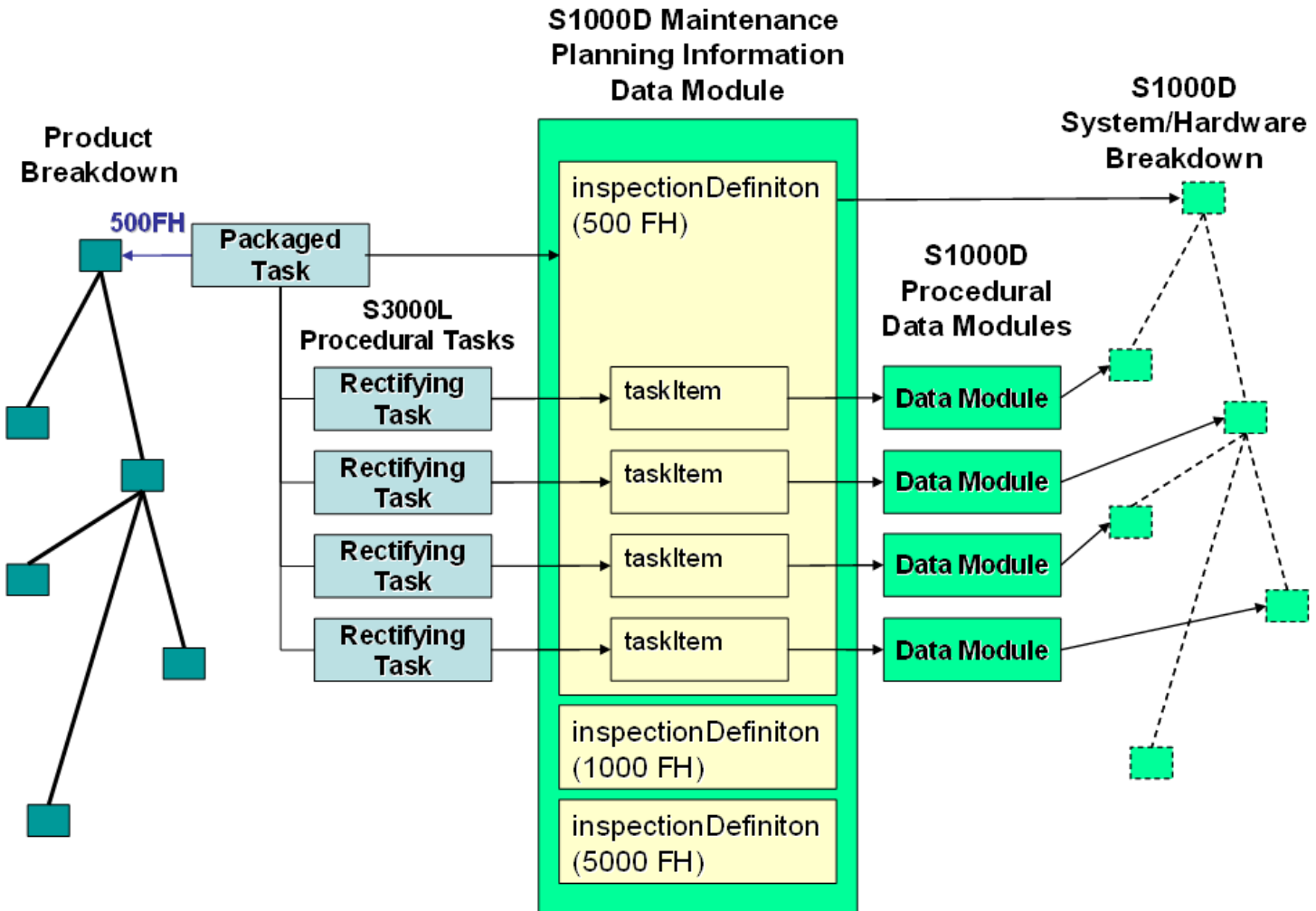
Scheduled Maintenance





Mapping Packaged Tasks

Scheduled Maintenance





S3000L to S1000D Matrix

S1000D Issue 4 Element Name	S1000D Issue 4 Element Definition	S3000L Element Name	Note	Mapping – How to Get from S3000L to S1000D (Business Rules)
mainProcedure proceduralStep	Contains a step in the procedure.	Subtask		Business rule: Create one step per S3000L 'Core' subtask.
mainProcedure proceduralStep@ independentCheck	The whole step or individual steps/substeps must be checked by a e.g. supervisor with a given qualification.	Subtask_objective_state or Task_personell_resource_role	Requirement for the step/substep to be checked by e.g. supervisor	Can be defined as a separate Subtask in S3000L, with Subtask_objective_state set to 'Task_checked'. and/or Have a Task_personell_resource with role 'Quality_assurance' NOTE: Includes all nested Subtask_by_reference.
mainProcedure proceduralStep@ skillLevelCode	Skill level required for the whole procedure and/or for individual steps/sub-steps using the attribute skill	Skill_level_name		The Skill_level_name for the Skill_level being associated with Task_personnel_resource. Identifies the lowest skill required that can perform the whole subtask (in practice the highest skill defined within the task). Rules related to the skill levels needs to be defined for the project. NOTE: Includes all nested Subtask_by_reference
mainProcedure proceduralStep@ securityClassification	Security and restrictive marking.	Security_class		Security classification relevant for the subtask. This could be derived from either the security classification of Breakdown_element, Part , Task_requirement, Task or Subtask in S3000L. Business rule: Security classification for a breakdown element/ part/software shall be propagated to the respective task being associated with the breakdown element/ part.



S3000L to S1000D Keys

- LSA key fields cannot generate SNS
 - Project/Product Variant matches ModelIdentCode
 - Data Module Code must be created by Pub's
 - Task Identifier must be stored as part of DMC Info to provide feedback mechanism
- Process will work better if LSA tasks align “one to one” with Procedural Modules
- S1000D defines Required States – S3000L defines Order of Subtasks to obtain Required States
- Packaged Tasks in S1000D are just another task in S3000L
- Unscheduled Tasks need better definition in S1000D – too much scheduled and planned work



S1003X Integration Specification

- Released with S3000L for review / comment.
- Available for download

www.asd-stan.org/s3000L.html



Thank You