"A day in the life of the S-Series"

SX000i - International guide for the use of the S-Series Integrated Logistics Support (ILS) specifications

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ILS S-Series Spec Day
September 24, 2015
SX000i - Purpose

- SX000i Specification is the *overarching document* defining the common logistics processes to be used across all S-Series specifications.

- SX000i:
  - Provides a *framework* that documents the global ILS process and interactions;
  - Forms the basis for *sharing and exchanging data* securely through the life of products and services;
  - Provides *governance* for the maintenance of current S-Series specifications and the development of new S-Series specifications.
1: Introduction to the specification

2: Integrated Logistics Support Framework

3: Use of the S-Series ILS Specifications in an ILS Program

4: Governance of the S-Series ILS Specifications

5: Terms/Abbreviations/Acronyms

6: Comparison of Specification Terminology
Objective

Apply common logistics processes to enable the sharing and exchange of data securely throughout the life of Products and services.

Intended Use

Coordination document for the S-Series ILS Specifications.

When to Use

- New Product Development
- Support of existing Products
- ILS specification development and maintenance

Exclusions

- In-service (partial)
- ILS activities broken down by life cycle phases
- Limited set of hardware outputs
- Maintenance
  - Controlled by a documented change management process

Background information on the S-Series ILS Specifications and SX000i
 SX000i – Chap 2: ILS Framework

- **Objective:**
  - Establish a common understanding of ILS and define a generic process throughout the life cycle of a Product

- **Phases:**
  - Preparation
  - Development
  - Production
  - In Service
  - Disposal

- **Domains:**
  - Program Management
  - Global Supply Chain
  - Configuration Management
  - Manufacturing
  - Security
  - Safety
  - Engineering
  - Quality
  - ILS

- **Stakeholders:**
  - Customers
  - Prime Contractors
  - OEMs
  - Subcontractors
  - Suppliers
  - Application Vendors

Documents a global ILS process and interactions at the ILS element level
Application to Bike:

Phase: Development

Domains:
- Program Management
- Configuration Management
- Security
- Engineering

Stakeholders:
- Customers
- OEMs
- Suppliers
- Prime Contractors
- Subcontractors
- Application Vendors

- Global Supply Chain
- Manufacturing
- Safety
- Quality
Documents the ILS Process:

- Process:
  - Manage Support
  - Design for Support
  - Deliver Support
  - Acquire and Provide Support

- Identifies each ILS activity, Input, and Output
Application to Bike:

**PROCESS**

- Manage Support
- Design for Support
- Deliver Support
- Acquire and Provide

**Activities:**
- Capture requirements
- Develop ILS Plan
- Perform LSA
- Perform LCC Analysis
- ……..

**The BIKE 2.3**

$1000DBIKE-U8025-MBIKE-00
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Application to Bike:

**PROCESS**

- **Manage Support**
- **Design for Support**
- **Deliver Support**
- **Acquire and Provide**

**Activities:**
- Capture requirements
- Develop ILS Plan
- Perform LSA
- Perform LCC Analysis
- ……..

**Input**
- Engineering drawings
- Support Concept
- MTA Report
- Supplier Data
- ……….
Application to Bike:

**PROCESS**

- Manage Support
- Design for Support
- Deliver Support
- Acquire and Provide

**Activities:**
- Capture requirements
- Develop ILS Plan
- Perform LSA
- Perform LCC Analysis
- ……

**Input:**
- Engineering drawings
- Support Concept
- MTA Report
- Supplier Data
- ……

**Output:**
- Provisioning data
- Maintenance Schedule
- Repair Pubs
- Training Analysis
- ……..
SX000i – Chap 2: ILS Framework

- Defines the ILS Elements:
  - Sustaining Engineering
  - Product Support Management
  - Design Influence
  - Maintenance
  - Manpower & Personnel
  - PHS&T
  - Supply Support
  - Support Equipment
  - Technical Data
  - Training & Training Support
  - Facilities & Infrastructure
  - Computer Resources
SX000i – Chap 2: ILS Framework

- CONOPs
- Fleet Management Plan
- Business Case
- Obsolescence Management Plan
SX000i – Chap 2: ILS Framework

- Ergo considerations
- Station Design for Supportability
- Type of brakes
SX000i – Chap 2: ILS Framework

- **Maintenance**
  - Scheduled:
    - Tune-ups
    - Lubrication
  - Unscheduled
SX000i – Chap 2: ILS Framework

- Number and skills of mechanics
- Office personnel
• Transporting bikes to ensure minimum numbers of bikes at stations
SX000i – Chap 2: ILS Framework

- Part numbers
- Inventory
SX000i – Chap 2: ILS Framework

- Hand Tools:
  - Wrenches
  - Screwdrivers
  - Air pumps
  - Fixture to align bike frame
SX000i – Chap 2: ILS Framework

- Repair manual
- Rental Instructions
- Station Maps
• Training for mechanics
SX000i – Chap 2: ILS Framework

- Bike racks/stations
- Maintenance Garage

- Sustaining Engineering
- Design Influence
- Computer Resources
- Maintenance
- Manpower & Personnel
- Training & Training Support
- PHS&T
- Technical Data
- Support Equipment
- Supply Support
- Facilities & Infrastructure

- Product Support Management
SX000i – Chap 2: ILS Framework

- Software for RFID tracking devices
- On-line payment system
• Tracking system
• Tailored maintenance plan
• Upgrades: Higher reliability brakes ….
SX000i – Chap 3: Use in an ILS Program

- Interfaces of the Specifications:
  - Spec processes and domains
  - Spec processes and ILS elements
  - Spec processes and specs

- Applying the Specs
  - Selecting and tailoring the specs
  - Organization structure
  - Roles and responsibility
  - Establishing rules and requirements between specs
  - IT architecture/technical data exchange document

Explains the use of the S-Series ILS Specifications in an ILS project, how they relate to the global ILS processes and elements, and how to use them as a part of an ILS project.
Application to Bike:

- Utilizes all S-Series specs
- ILS Plan describes:
  - Requirements
  - CONOPs
  - WBS
  - Organization
  - Stakeholders
  - Roles and responsibilities
  - CONOPs
  - Processes/specs used
  - Interfaces
  - …
### Specification Mapping Table

- Cross reference table of each activity for all ILS elements to the individual specification

- Ensures integration and coverage

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**Extract of Mapping Table from Sx000i**

<table>
<thead>
<tr>
<th>ILS Element</th>
<th>Activities</th>
<th>S$6000D</th>
<th>S$2000M</th>
<th>S$6000L</th>
<th>S$6600F</th>
<th>S$6000I</th>
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<td>Computer Resources</td>
<td>Perform Computer Resource Analysis</td>
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<td>Design Influence</td>
<td>Perform Reliability, Availability, Maintainability Analysis</td>
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<td>Perform LCC (Affordability) Analysis</td>
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<td>Facilities and Infrastructure</td>
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<td>Develop and continuously improve preventive maintenance</td>
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<td>Perform Scheduled Maintenance Analysis</td>
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<td>Perform Software Maintenance Analysis</td>
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<td>Packaging, Handling, Storage &amp; Transport (PHST)</td>
<td>Manage contract</td>
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Note: P, I, and T represent different levels of integration and coverage.
SX000i – Chap 4: Governance

- ASD/AIA ILS Specification Organization
- Spec maintenance schedules
- Common authoring rules
- Common Data Model / Data Exchange
  - ISO 10303-239 (AP239, PLCS)
  - XML schemas
- Management of spec websites
- User Community feedback and process
  - Change Requests and feedback via MANTIS BT
- Translation of specs
- User Forums

Describes the structure of the S-Series ILS specifications organization and the processes used to manage the development and maintenance of those specifications.
**Glossary of Terms**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Acquisition Operating Framework</td>
<td>The Acquisition Operating Framework is the process by means of which the UK MoD conducts, governs and controls its defense acquisition process and is a main enabler for improving the delivery to the armed forces and for producing greater value for money for the taxpayer. (<a href="https://www.gov.uk/acquisition-operating-framework">https://www.gov.uk/acquisition-operating-framework</a>)</td>
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<tr>
<td>Configuration Management (CM)</td>
<td>Configuration Management (CM) is the detailed recording, updating and control of information that describes an enterprise data. It is a process for establishing and maintaining performance, functional and physical attributes and operational information, throughout its life cycle.</td>
</tr>
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</table>

**Abbreviations & Acronyms**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>ADR</td>
<td>Alternative Dispute Resolution</td>
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<td>AIA</td>
<td>Aerospace Industries Association</td>
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<td>AOF</td>
<td>Acquisition Operating Framework</td>
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<td>ASD</td>
<td>AeroSpace and Defense Industries Association of Europe</td>
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<td>BREX</td>
<td>Business Rule EXchange</td>
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<td>CC</td>
<td>Certification Committee</td>
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<td>Chap</td>
<td>Chapter</td>
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<td>CM</td>
<td>Configuration Management</td>
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</table>

*Provides the definition of the main terms, abbreviations, and acronyms*
### SX000i – Chap 6: Comparison of Terminology

- **SX000i life cycle phases vs other specs**
  - NATO definitions of life cycle
  - UK MoD definitions of life cycle
  - ISO/IEC TR 19760 definitions of life cycle
  - US DoD definitions of life cycle
  - OCCAR definitions of life cycle
  - Wikipedia definitions of life cycle

<table>
<thead>
<tr>
<th>SX000i PHASE</th>
<th>PREPARATION PHASE</th>
<th>DEVELOPMENT PHASE</th>
<th>PRODUCTION PHASE</th>
<th>IN SERVICE PHASE</th>
<th>DISPOSAL PHASE</th>
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</table>
| SX000i definition | - Identify user needs  
- Develop Product requirements  
- Assess potential material solution  
- Identify and reduce technology risks through studies, experiments and engineering models  
- Establish a business case including analysis of alternatives, cost estimate (Life Cycle Cost) for the launch of the Development phase | - Develop a Product that meets user requirements and can be produced, tested, evaluated, operated, supported and retired  
- Develop an affordable and executable manufacturing process  
- Ensure operational supportability with particular attention to minimizing the logistics footprint | - Produce or manufacture the product  
- Test the Product  
- Conduct Product acceptance to confirm that the Product satisfies the requirements | - Product utilization: Operate the Product  
- Deliver the required services with continued operational and cost effectiveness  
- Assess, decide on modifications and upgrades  
- Evaluate continuously the effectiveness and efficiency of the Product  
- Product support: Provide support that enables continued Product operation and sustainable service - Implement modifications and upgrades | - Demilitarize (if applicable)  
- Dispose of the product in accordance with all legal and regulatory requirements and policy relating to safety (including explosives safety), security, and the environment  
- Remove related operational and support services |
| NATO AAP-20 | Pre-concept stage  
Concept stage | Development stage | Production stage | Utilization stage | Support stage |
| US DoD Instruction 5000.02 | Material solution analysis phase  
Technology development phase | Engineering and Manufacturing Development (EMD) phase | Production and deployment phase | Operations and support phase |

Provides a comparison of the terms, life cycle phases, and ILS elements between SX000i and other international and military specifications.
Comparison of ILS elements across different specs and handbooks

Elements associated with ILS

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<tr>
<td>ILS elements</td>
<td>Current ILS elements</td>
<td>ILS deliverables</td>
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Provides a comparison of the terms, life cycle phases, and ILS elements between SX000i and other international and military specifications
SX000i – What’s Next

- **SX000i Issue 1.0:**
  - In disposition period
  - Publish in Dec 2015

- **SX000i Issue 2.0**

  - Begin incorporating updates to Issue 2.0 in 2016

- Collecting topics for inclusion:
  - Chart for the logistics tasks to be done during the various phases of a system’s lifecycle, the minimum ILS tasks to be performed for each Life Cycle phase, and for different contract types
  - Interoperability with non-ASD/AIA specifications
  - In-service ILS
  - Use cases
  - ILS for System of Systems
  - Support System Design effectiveness
  - Application of S-Series specifications for a wide range of products (air, ground, sea, space, UAVs, military, commercial, civil, etc)
Please visit: http://www.sx000i.org

Please contact: chairman@sx000i.org

Download a free copy of draft SX000i issue 0.2: http://www.sx000i.org/downloads.html
Questions?

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E: dawn.j.meyer@boeing.com

Thanks!