AIA /ATA/ ASD
S1000D Users Forum

October 12- October 15, 2009
Crown Plaza Hilton Head Resort, Hilton Head, SC, USA

“S1000D for Boeing 787”
Freelon F. Hunter
The Boeing Company
September 1994
1st Boeing ATA SGML Data Delivery to Airlines

March 2005
Boeing Commits to S1000D as 787 Support Information Architecture

Systems Requirement & Standards Refinement
• S1000D V2.x – V2.3; 2 CAWG CPFs Submitted
• 787 Content Creation & Management Systems
• Information Delivery Systems
• Customer Content Management, Creation, and Delivery

2006
• 787 Support Data Systems Development Begins
• S1000D V2.3 – V3.0 Requirements Work; 5 CAWG CPF’s Submitted

March 2008
First S1000D V2.3 Sample Data Delivered to Airlines

Jan 2009
Systems upgraded to S1000D v3

2009-2010
System & Data Refinement

Time (not to linear scale)
787 Information Types in S1000D

Information Targeted:

- System Description Section (AMM part 1)
- Aircraft Maintenance Procedures (AMM part 2)
- Fault Isolation Procedures (FIM)
- Structural Repair Data (SRM) *
- Wiring Diagrams (WDM)
- System Schematics (SSM)
- Illustrated Parts Data (IPD/IPC)
- Service Bulletins (SB) *

* - FAA Approved Information

Criteria For Selection:

- Instructions for Continued Airworthiness
- Level of customization
- Frequency of revision
- Volume of data
- Linkage to other manuals
- Available Today in ATA Spec 2200 SGML
- S1000D Support
Boeing Offers Technical Information Primarily via Toolbox on MyBoeingFleet.com

Bulk Data also Offered in S1000D for Selected Information Types
Information Customers in Civil Aviation

- Airline Operations & Maintenance Control
- Line Maintenance
  - Aircraft operator and 3rd Parties
- Heavy Maintenance
  - Aircraft operator and 3rd Parties
- Airline Engineering (includes Airline Technical Publications)
- Regulatory Agencies
- OEM Engineering and Field Support
  - Includes Engine Manufacturers and other suppliers
- Aircraft Modification (Usually not aircraft operator)
- Tooling Suppliers
- Aircraft Owner (Leasing Companies)
In Civil Aviation there are information types that are Approved, those that are Accepted, and those that require no review.

- **Approved** means there is actually a signature on file following a formal review process (e.g. Structural Repair).
- **Accepted** means information is forwarded to the Regulatory Agency prior to aircraft delivery and certification as demonstrated compliance including the Instructions for Continued Airworthiness requirements (FAR Part 25).

In addition, Maintenance Information is part of an airline’s Maintenance Program per FAR Part 121.

- FAA has accepted Maintenance Performance Toolbox as a data delivery tool.
- FAA has NOT approved information in S1000D yet.
  - Service Bulletins released after delivery of aircraft.
Data Configuration managed for life of aircraft

Applicability was the major function added in S1000D V3 to support the 787

Data managed by tail number and component

- Service Bulletins (Modifications) can apply to both airframe and component
  - Track Pre and Post over time
  - Bulletins can be nested

Great Support by S1000D Community to Develop Version 3
Lessons Learned (1)
Innovation versus Standardization

The time and effort required to update the specification is significant, often causing proprietary updates to be made in advance of the specification.

Examples:

Use of N2D Tag within Parts
- For Part data that has no definition in the IPD schema, N2D tags are allowed to be defined by the OEM to place this data.
- For OEM data, there is a common XML schema, but the IPD N2D tags are project specific.
- Airlines and their suppliers likely will be forced to create a different solution for Boeing data.

BCME (Boeing Common Metadata Edition)
- Boeing created an XML metadata definition for non-S1000D Boeing data.
  - Organization of content is not DMC based – it is ATA based due to cross model documents.
- Airlines will need to understand Boeing’s XML metadata definition to handle non S1000D data.
Lessons Learned (2)

Paradigm shift for Boeing, customers and regulatory agencies to think in Data Modules versus publications

Examples:

♦ Approval and Acceptance of ICA by Publication Type
♦ Organization Structure in Boeing by Publication Type
♦ Access Control by Documentation Type

Delivery System UI is Bridge
Lessons Learned (3) – Search becomes even more important in UI

Standard Numbering System (SNS)/S1000D DMC based navigation is cumbersome and does not meet industry usability expectations.
Lessons Learned (4) – Data management costs increase due to incremental revisions

OEM Costs
- Higher capacity “data factory”
- Data storage
- Authoring processes change

Customer Costs
- Faster data synchronization (Warnings & cautions in Kanji)
- Movement of data to remote sites and devices
- Keep Task Cards synchronized with changes in procedures

Need to plan process changes carefully
Conclusion

- Being first to deliver S1000D in commercial aviation has both advantages and disadvantages
  - Simultaneous development of final specifications, business rules, OEM systems and Customer systems
  - Lessons generally learned the hard way

- Choice of using S1000D instead of ATA Spec 2200 is a long term investment
  - Aircraft models have a 50 year life cycle

*Focus must be on information Customer*
Questions ?