A350 Entry In Service
Case Study S1000D & Spec 2000 Ch. 15

ATA E-BUSINESS FORUM & S1000D USER FORUM
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Data Challenge at New Aircraft EIS

- When the first aircraft of a new type is delivered, it must start flying within days
- Maintenance Information System (MIS) needs to be set up before that
- Huge amount of data required for Maintenance processes to work
- Data is coming from different sources in different formats having different revision cycles
- High percentage of the data is one-time-only involving manual processing

How to streamline and digitalize this?
Key Data in Aircraft Maintenance

- Consumable Parts with Supply Chain Data
- Rotable Parts with related data sets
  - Rotables Support in-house or through pooling contracts
  - Rotable Part Requirements
  - Warranty Data
- Maintenance Program with Taskcard Data
- Allowable Configuration with related data sets
  - Function Positions
  - Fleet Applicability
  - Assembly Configurations
- Actual Configuration with Serial Number Data
Airbus A350 Next Generation Data

- With A350, Airbus applies two next generation standards providing operators better data
  - **S1000D**
    - New standard for delivering Technical Data
    - Data content more exhaustive than previous iSPEC2200 standard
    - Data structured in a relational way
    - Deliverables in XML format
  - **SPEC2000 Chapter 15 Delivered Parts List**
    - New standard for delivering Serial Number data at aircraft EIS
    - Data more punctual, robust and easily machine readable than earlier Excel based delivered parts lists
    - Deliverable in XML format
A350 Data Upload to Finnair AMOS

Airbus RSPL
Component Support Contracts
Other Sources
Airbus S2000 Ch 15 XML
Airbus S1000D RAW XML

Parts Data Excel
CSV Files
XSL Transform
Upload Program

AMS Test
S1000D database
Allowable Config

MS Access Repository
AMOS Data Transfer files
Data Refresh Monthly
AMOS Prod

允许可配置S1000D数据库

Upload Program

Airbus S1000D RAW XML
Iterative Way of Working

- Collect Data
- Test and Fix
- Process and Transfer
- Wait for new Revisions

- 22 rounds of iteration for the first A350
- Average 8 rounds per subsequent A350
A350 S1000D data package

- At EIS 3.9GB / ~108000 files
- Currently 6.5GB / ~139000 files
CIR data modules

- CIR data extraction one-time-only with simple xslt scripts
  - ACT, PCT and CCT to resolve effectivity
  - AIRCRAFT BREAKDOWN -> A350 ATA list
  - ZONE -> Zone list to AMOS
  - ACCESS_PANEL-> Access panels with open/close times, fastener type & quantity and hinge Y/N to AMOS

- AMOS S1000D Upload automatically extracts some CIR data modules
  - ENTERPRISE -> Supplier list
  - FIN list reduced set (4500) to AMOS
  - PART -> Part list w. classification, alternates and suppliers
Business data modules

- S1000D business data consists of more than 60000 small data modules
- Simple xslt scripts traverse Maintenance IPD and select data modules for processing based on DDN
  - CSN – Part No and CSN – FIN relations from Maintenance IPD data modules
- AMOS S1000D Upload automatically extracts some Business data modules
  - Externalised applicability
A350 Parts to AMOS

- Sources for A350 Part data
  - A350 S1000D CIR Part and Maintenance IPD
  - Airbus RSPL
  - Preliminary Airbus SPEC2000 Chapter 15 Delivery Data
  - Component Support Contracts
  - AMOS System

- Selected Parts collected manually in Excel
  - Appended with related data from above sources
  - Complex network of cross-checks between different data sets and against current AMOS data

- After multiple test rounds ~1800 Consumable Parts and ~2100 Rotable Parts were transferred to AMOS with all related data

- In addition to that hundreds of Parts were manually typed in AMOS during the EIS project
A350 Configuration Data to AMOS

➢ Allowable Configuration
   • First draft built in semi-automated way using data from:
     - A350 S1000D CIR FIN and Maintenance IPD
     - Preliminary Airbus SPEC2000 Chapter 15 Delivery Data
   • Allowable Configuration completed manually and revised manually for each new MSN
     - ATA CMWG is working on a standard to enable automatic MIS upload

➢ Actual Configuration
   • Built for each new MSN using data from:
     - Airbus SPEC2000 Chapter 15 Delivery Data
     - Panasonic IFE Configuration Data Dump
     - Rolls-Royce Engine Configuration Excel
     - Messier Landing Gear Configuration Pdf
   • Complex network of cross-checks between different data sets and against Allowable Configuration
   • Each A350 Configuration has ~5400 Serial Numbers
Lessons Learned after nine A350 aircraft

- **Learning Curve at Airbus**
  - Our first A350 was MSN 18
  - S1000D IPD data was far from complete to start with
  - Finnair was a pilot customer with Spec 2000 Ch. 15
  - Major configuration changes between MSNs

- **Learning Curve at Finnair**
  - A350 was the first aircraft type with digital data EIS
  - Continuous development and evolution
  - From coping with missing data to utilizing new data

- Massive amount of repetitive manual work saved
- Finnair A350 data quality is high and consistent, and improves with each new delivery
Thank You!

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