Compliance RFID Maintenance Program at Delta Air Lines

3rd RFID and Paperless Aircraft Operation Conference

Eri Hokura
RFID Program Manager
1. Who We Are
2. RFID Use Case “Why RFID?”
3. Standards and Regulations
4. RFID Mtc. Program: Read Distance is the “KEY”
   • Phase 1, 2, and 3 approach
5. Q & A
Delta Air Lines

Who We Mtc:

- Headquarters: Atlanta, GA, USA
- 828 mainline aircraft in service
- 19 Fleets, 25 Configurations

Compliance RFID Mtc. Program:

- RFID Engineering: Atlanta, GA
- 741 mainline aircraft in service
- 17 Fleets, 71 Configurations
RFID Use Case Outside of Aviation...

Healthcare and Medical:
Who: Pharmaceutical, Hospitals...
What: Asset management, patient tracking, surgical devices...
Why: Reduce liabilities, prevent counterfeiting...

Travel & Leisure:
Who: Disney Resort, Cruise Lines, All-Inclusive Hotels...
What: Guest tracking, Room keys, Ride tickets etc...
Why: Improve guest experience ...

Retail: Main RFID users, Over 4 billion RFID tags
Who: Macy’s, Target, Wal-Mart, TESCO...
What: Inventory Management, Streamlining supply chain...
Why: Track on-the-floor inventory, Track shopper movements...

Greatest Benefits Come from the Network Effect
RFID in Aviation

- Tracking
- Presence/Security
- Shelf Life
- Configuration
What is the RFID Maintenance Program?
RFID End Users

THE MECHANIC!!
RFID/Barcode Specs/Standards in Aviation

FAA Recommend to follow latest version of below RFID spec, standard and regulations

✈ **AC 20-162A** (Airworthiness of RFID Installations)
  - New version allows Ancillary Part Marking

✈ **DO-160** (Airworthiness Test Requirement of A/C Components)

✈ **SAE AS 5678A** (Requirements for RFID Tags)

✈ **ATA Spec 2000 Ch.9-4** (Barcode) & **9-5** (RFID)
  - FAA expects RFID to meet Spec2000 standards

✈ **ATA Spec 2000 Ch.15** Delivery Configuration Data

✈ **ATA Spec 2000 Ch.18** *(Pending)*: Electronic Aircraft Transfer Records (aircraft records transfer to lessor)

Following Industry Standard could increase compliance
Airlines RFID Performance Requirement

**Issue**

- Current RFID Specs and standards do not cover Airlines use case and needs

**What the Airline RFID User Group Has Agreed**

1. Utilizing Spec 2000 Ch.9-4 (Barcode) and 9-5 (RFID) standard
2. Minimum read performance on RFID tag installed by OEM/MRO/Suppliers at the time of delivery or fulfill retrofit requirement
   - Phase 1: Maintenance Program Driven Parts
   - Phase 2: Interior Low Removable Rate Parts
   - Phase 3: Exterior Low Removable Rate Parts
3. Electronic Data Transfer from OAM with RFID data must become standard requirement

OAM/OEM RFID strategy needs to be aligned with CUSTOMER!
Phase 1: Maintenance Program Driven Parts

- **Minimum Attributes on Integrated Nameplate or Ancillary Part Marking RFID Tag**
  - Synchronized - RFID Chip, 2D Barcode, Human Readable

- **Birth Records**
  - Cage Code
  - Manufacturer P/N
  - Serial# (If Applicable)
  - Manufacture Date and/or Expiry Date If Applicable

- **Read Distance** (Installed on metal or non-metal)
  - 15ft./4.6m minimum

- **Tag Application**
  - Tag
    - Most parts require an ancillary part marking RFID tag rather than integrated nameplate
  - Installation Flexibility Required
    - Hang tag
    - Some RFID tags should not be attached until part has been installed in aircraft

Examples:
- Frequent Visual Inspection Requirements
- Presence, Security (Tamper Evidence), Time on AC, and Expiration Date
  - Inflatables (Rafts, Slides, Life Vests etc.)
  - O2 Generators
  - Other Emergency Equipment
Phase 2: Interior Low Removal Rate Parts
Phase 3: Exterior Low Removal Rate Parts

- Minimum Attributes on Integrated Nameplate or an Ancillary Part Marking RFID Tag
  - Synchronized RFID Attributes:
    - RFID
    - 2D Barcode
    - Human Readable
- Birth Records
  - Cage Code
  - Manufacturer P/N
  - Serial# (If Applicable)
  - Manufacture Date and/or Expiry Date (If Applicable)
- Read Distance
  - 5ft./1.5m minimum (Installed on metal or non-metal)
- Flexible Attachment
  - Safety Wire, Glue, Fob, Rivet

Examples:
- Fly to Failure Parts (Interior Components)
  - Flight Instruments
  - IFE
  - Ovens
  - Seats
- Low Removal Rate LRUs (External components)
  - Engines / APUs
  - Landing Gears, etc.
  - Valves / Actuators
Electronic Data Transfer

*Use Spec2000 Ch. 15 (Change Request in pending past 3 yrs)*

- **60-120 Days Pre-Delivery:**
  - Preliminary LOPA (item position, location description etc.)
  - Tag Installation Location on Component (Supplier Drawing)

- **30-60 Days Pre-Delivery:**
  - AIR/ARL/Delivered Aircraft Transfer Parts list
    - RFID Tagged Indication (Tagged: Y/N similar to BFE indicator)
    - EPC ID
    - TID
  - Current AIR/ARL already have below info:
    - Installed Location, Part Description, Part Number, Serial#, Cage Code, Date: MFD, Exp./Overhaul, Hydro date, Battery etc.

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Data must be digitally delivered in the agreed format
### Electronic Data Transfer

**Sample**

ARL Part List: Download date: September 28, 2015

Filter Criteria:
Selected Airline(s): DAL

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Thank You
Questions?

For more Information
Please contact:
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