New Technology Implementation at Delta TechOps

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Cabin Maintenance

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Delta Air Lines

Who we are

Delta began flying passengers 85 years ago, and has been committed to innovation and climbing to new heights ever since.

- Headquarters: Atlanta, Georgia, USA
- Nearly 80,000 Employees Worldwide
- Aircraft: 17+ fleet types, 700+ Aircraft
- Daily Flights: Over 2,950 Mainline Flights
- On-Time Performance: 86.3%
- Serving nearly 165m customers each year
- Recent partnership addition - Virgin Atlantic
Delta TechOps - Cabin Maintenance
Mission: Protect the Brand

Mission Objectives:
• Quickly (Fast)
• Lowest Cost (Competitive)
• Minimal Inconvenience (Good)
Why RFID?

What is RFID?

- **RFID**: Radio Frequency Identification
- **1D/2D Barcode**: Line of Sight Communication
- **RFID**: Non-Line of Sight Communication

1. **Compliance & Configuration:**
   - Presence
   - Expiration

2. **Material Yield:**
   - Material Life on Shelf
   - Predictability: Just in Case vs. Just in Time

3. **Labor Savings:**
   - Reduce Time Spent on Date Checks
   - Reduce Human Factors Errors
Compliance & Configuration

**RFID Benefits:**

- Reduce risk of overrun on life limited parts
- Quickly check presence and expiration of life-limited components
- Check security and tamper evidence to comply with TSA regulations
Material Yield
O2 Generators

Life Limit: 12 Years

On Shelf

On Aircraft

Replace

On Shelf - Buffer stock for the unknown demand
- High inventory count
- Reduced material life on shelf (avg. 12 months)

Replace - Early replacement
- Replace at avg. 14 months remaining

Example - Waste
- Avg. Cost: $400 /pc
- Avg. Waste: $78 /pc
- Fleet Waste: $130K (*$13K/AC x 10 A/C)

Potential Fleet Waste Reduction: $110K
*Estimate: life on shelf 3 month in Inventory & 2 month life remaining

Just in Case to Just In Time
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Visual Inspection vs. RFID Scan (B777)
Presence, Expiration Status

Life Vests
- Visual: 12 hrs
- RFID: 35 min (2 min to scan)

Life Vest Security Seals
- Visual: 45 min
- RFID: 17 min (2 min to scan)

O2 Generators
- Visual: 8 hrs
- RFID: 32 min (2 min to scan)

Emergency Equipment
- Visual: 4 hrs
- RFID: 40 min (10 min to scan)

Potential: 22.7 Labor Hrs/ Aircraft!
Human Factors Errors

- Delta is required to visually check the **presence**, **condition**, **security**, and **expiration** of all life limited parts

- Each part may have manufacture, expiration, service, or packaging dates, etc. which can introduce **human factors errors** and increase **labor required**
OEM vs. Legacy RFID Tagging

ELT - Legacy Tagging

EEMK - OEM Tagging
O2 Generator RFID Scan
Program Timeline

2011
1st RFID Induction on B757

2013
RFID Mtc. program approved by FAA

2014
34K+ tags flying and increasing daily!

2016
800+ Aircraft will be fully RFID tagged!

1st Airline to receive FAA approval on RFID Maintenance Program
So, What’s Next?
Continue Our Climb

Next RFID Targeted Items:

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<td>O2 Generator</td>
<td>Chillers/Coffee Makers/Oven</td>
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<td>Emergency Equipment</td>
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Tablet Solution: Paperless operation, Information at your fingertip!

- e-document
- e-signature
Thank You
Questions?

For more Information
Please contact:
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eri.hokura@delta.com