Lithium Battery Update

Recent Battery Incidents

Presented to: Systems Working Group
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Lithium Battery Incidents

• **UPS**
  – E-Bikekit Lithium Battery, Honolulu

• **UPS**
  – Undeclared shipment of cell phone batteries

• **FEDEX**
  – In-flight fire involving e-cigarette shipment

• **American Airlines**
  – In-flight Lithium battery fire, ARCHOS 704 media player
UPS, E-BikeKit Fire

- **Shipment of one LiFePO4 battery**
  - Lithium-ion Iron Phosphate chemistry
  - Battery is designed to power bicycles converted to electric motor drive

- **Fire was discovered after ULD was removed from the aircraft and unloaded**
  - Unit had been shipped by air from NJ to Honolulu

- **Battery was analyzed by NTSB and Fire Safety Team at FAA Technical Center**
UPS, E-BikeKit Fire
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UPS, E-BikeKit Fire

• Findings
  – A wire that connected the cells at each end of the battery had gotten very hot, with the last 3 inches completely burned away
  – Several of the individual cells showed bulging indicating that they had gotten very hot
  – None of the cells ruptured or vented
  – Cause of the fire appears to be short circuiting, causing overheating of the cells and circuitry
UPS, Undeclared Cell Phone Battery Shipment

• July 15 2009
• 3 skids of boxes found to contain used cell phone batteries
  – Shipped by truck from Detroit to Miami, then flown from Miami to Santo Domingo
• At the Santo Domingo UPS facility, smoke was seen escaping one of the boxes
  – The box was opened by the handler where several burned cell phone batteries were discovered
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American Airlines, ARCHOS 704

- September 10, 2009
- Descending through 10,000 feet, the cabin crew was collecting portable media players
- As a passenger handed over the Archos 704 player, the battery fell out and struck the floor, catching fire
- Battery was extinguished with Halon 1211, doused with water and covered with a wet towel.
- Lithium-ion polymer battery
American Airlines, ARCHOS 704
American Airlines, ARCHOS 704
FEDEX, Ruyan Inhaler

- August 14, 2009
- Indianapolis to Minneapolis-St. Paul
- On approach, crew got fire warning in lower cargo compartment
- Fire suppression was activated
- Emergency was declared, and plane was met by Fire Rescue
- Fire discovered in one LD3 on arrival after unloading
- No damage to aircraft or LD3
FEDEX, Ruyan Inhaler

- Fire was determined to have originated in a shipment of Ruyan Inhalers, model RappE-Mystick, a tobacco delivery system
- 40 cartons, 50 units per carton
- Lithium battery powered
- Not declared as hazardous goods
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Lithium Battery Test Program

• Polymer batteries
• Agent effectiveness tests
  – Lithium primary and ion
  – All available handheld agents
  – Other agents not normally available as handheld
    • NOVEC1230
    • BTP
• Shipment of large scale (automotive) lithium batteries