

Lithium Battery Update

Recent Battery Incidents

Presented to: Systems Working Group

By: Harry Webster

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Federal Aviation
Administration



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



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

UPS, Undeclared Cell Phone Battery Shipment



UPS, Undeclared Cell Phone Battery Shipment



UPS, Undeclared Cell Phone Battery Shipment



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**

FEDEX, Ruyan Inhaler



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FEDEX, Ruyan Inhaler



FEDEX, Ruyan Inhaler



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**