IASFPWG – May 2014

Paul ROHRBACH – Fire Protection
Pressurized Fuselage

Lithium Batteries in Aircraft Applications

Transport Of Lithium Batteries In Cargo

Introduction

- The growing threat of Lithium Batteries on Aircraft is considered at all levels
  - ➢ Airbus is active in supporting international efforts to address this threat.

Cabin Crew Procedures

Flight Crew Procedures

Lithium Batteries in Design

Carriage of Lithium Batteries as Cargo

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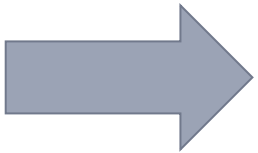
Airbus Status of Different Applications of Lithium Battery Technology on Aircraft

- ✓ Cabin Procedures:
  - Airbus procedures developed and published in operational documentation
- ✓ Cockpit Procedures:
  - Generic procedure developed and available
  - Airbus tests for finalization of procedures should be completed by Q3 2014
- ✓ Lithium Batteries in Design:
  - Review of installation of all equipment using Lithium based Battery technology
- ✓ Carriage of Lithium Batteries as Cargo:
  - Airbus status to be advised during this presentation…

Lithium Battery As Cargo → Where Are We Today?

- ICAO Hazardous Material regulations **do not** prevent carriage of large quantities of Lithium Batteries on the same aircraft.
  - Weight of batteries packed in the same box is limited,
    - ➢ Number of boxes to be loaded on same pallet on aircraft **is not** limited
  - Small batteries (section II), batteries fitted in electronic devices or inside same packages do not need to be declared as "**Declared Dangerous Goods**".
    - ➢ Operator may not be aware of the Lithium Batteries in such cargo.



- **Next step is Industry position on prohibition of carriage of Lithium Metal Batteries on passenger Aircraft**
- **Industry to develop advice relating to similar fire threat of shipment of large quantity of Lithium Ion Batteries**

The Industry Reaction

✓ Airbus Participation

- Intense activity from International Working Groups to address new threat
  - ✓ Commercial Aviation Safety Team - Safety Enhancement (**CAST** SE) 126
    - ➢ Co-chaired by representatives from UPS and FAA
  - ✓ International Aircraft Systems Fire Protection Working Group (**IASFPWG**)
    - ➢ Chaired by FAA
  - ✓ ICAO Dangerous Goods Panel (DGP) WG and Subgroups
  - ✓ Development of packaging performance criteria and test method for safe Lithium Battery shipment, chaired by FAA

But

➢ Industry position is unlikely to limit carriage of lithium batteries

- Tentative to draw a common approach (lobbying) from aircraft manufacturers:

"Layered protection sequence should be focused at the source of the threat and then expand outward as necessary:
➔ Battery ► Box ► Container ► Compartment ► A/C level"

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Carriage of Lithium Batteries as Cargo

- Lithium Batteries on board aircraft represent an increased fire threat:
  - Existing cargo compartment fire protection standards only consider carriage of general cargo
  - The existing fire protection capabilities of the compartments do not consider specific hazards of transport of Lithium Batteries

Air-Carrying exposure increasing, in line with increased global carriage of Lithium Batteries.

But

Current certification standards do not take into consideration this threat

Consideration of Risk of Lithium Battery Carriage

- Key parameter is level of energy associated with quantity of batteries involved:

A PED Lithium Batteries fire located in a ***cabin passenger*** bag or within the flight deck will be **manageable**

A small number of Lithium Battery packs in a **class C cargo** compartment, **aircraft survivability is expected**.

- Industry Testing needed to validate this hypothesis

Aircraft survivability threatened in case of Lithium Battery fire involving a high number/weight/energy of battery in a Class C or Class E cargo compartment ➔ Demonstrated by FAA full scale tests

As an industry we need to fully categorize and understand risks relating to limit of Lithium Battery quantity that can be safely carried.

PED Portable Electrical Device

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Airbus Way Forward And Action Plan

There are no readily available practical solutions on the market today

Action I: Verification tests for hazard classification of Lithium Battery Fires.

Action II: Active participation in WGs : CAST, IASFPWG, ICAO DGB-WGs and Subgroups

Action III: Benchmarking/adaption of available industrial technologies for aircraft application

Addressed via Iterative Process

Conclusion

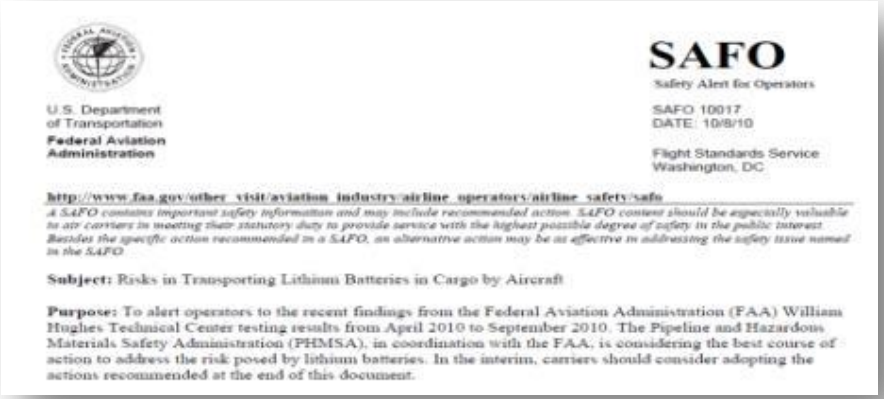
- ✓ Lithium batteries pose a unique hazards for cargo compartments design, the cargo is certified for carriage of general cargo.
- ✓ As an industry we need to fully categorize and understand risks relating to limit of Lithium Battery quantity that can be safely carried.
- ✓ The industry needs to work together. As a first step to mitigate against the risk:
  - ➢ Restrictions on carriage of Lithium Metal Batteries on passenger aircrafts need to be published.
  - ➢ Layered solutions to ensure safe transport of Lithium Battery have to be developed.
- ✓ Airbus is a key participant of the industry working groups
  - ➢ The action plan to address risks of carriage of Lithium Batteries considers the industry positions

Thank You

Questions?

Lithium Battery Transport Guidance (Airbus Position)

- Controlled by International and Local Regulations
- Most countries follow ICAO Technical Instructions for Safe Transport of Dangerous Goods by Air
  - ➢ Many countries have local variations
- Airbus supports recommendations made in SAFO 10017
  - ➢ Ref SIL 00-066 “Transport of Dangerous Goods, Lithium Batteries”



U.S. Department of Transportation
Federal Aviation Administration

SAFO
Safety Alert for Operators

SAFO 10017
DATE: 10/8/10

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

Subject: Risks in Transporting Lithium Batteries in Cargo by Aircraft

Purpose: To alert operators to the recent findings from the Federal Aviation Administration (FAA) William Hughes Technical Center testing results from April 2010 to September 2010. The Pipeline and Hazardous Materials Safety Administration (PHMSA), in coordination with the FAA, is considering the best course of action to address the risk posed by lithium batteries. In the interim, carriers should consider adopting the actions recommended at the end of this document.

CUSTOMER SERVICES DIRECTORATE
1 ROND POINT MAURICE BELLONTE
31707 BLAGNAC CEDEX FRANCE
TELEPHONE + 33 (0)5 61 93 33 33
TELEX AIRBU 530526F

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SERVICE INFORMATION LETTER

SUBJECT: TRANSPORT OF DANGEROUS GOODS, LITHIUM BATTERIES

ATA CHAPTER: 00

AIRCRAFT TYPE: A300/A300-600/A310/A318/A319/A320/A321/A330/A340/A380

APPLICABILITY: All aircraft

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