IATA CARGO WEBINARS

14 October 2020

Lithium Battery Webinar

Today's session will begin shortly

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Welcome

IATA CARGO WEBINARS

Microphones have been muted

Please submit your questions through the **Question box** and **send to Everyone**



The webinar is being recorded and will be made available afterwards, including the PPT slides.



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- Participants are cautioned that any discussion regarding matters such as fares, charges, division or sharing of traffic or revenues, or concerning any other competitively sensitive topics outside the scope of the agenda is strictly prohibited.
- As a result, questions pertaining to individual policies or commercial decisions and/or being subject to bilateral commercial discussions between airlines and their suppliers or customers will not be answered.



Agenda

- Welcome Address
- Regulatory Update
- Fire Containment Covers / Fire Containment Bags – Panel Session
- Managing Safety Risk Associated with the Carriage of Cargo and Mail – Panel Session
- Wrap up

Biographies are available on the IATA Website



Welcome Address



Geoff Leech Director DG Office UK





Regulatory Update



David Brennan Assistant Director Cargo Safety & Standards IATA





Section 1 – Applicability

New exception in 1.2.7.1 to except data loggers and cargo tracking devices from the Regulations when in use has not been adopted.

- The ICAO Air Navigation Commission expressed concern at the potential risk of data loggers / cargo tracking devices with lithium ion cells up to 20 Wh and batteries up to 100 Wh.
- There was supposed to be work by ICAO in the interim to consider what limit should be placed on lithium ion cells and batteries to allow the provision to be adopted for 1 January 2021.



Section 1 – Applicability (cont.)

1.5 – Training

- Changes agreed to implement competency-based training. Tables 1.5.A and 1.5.B have been deleted;
- List of employers and categories of personnel replaced with training related to function being performed;
- Employer accountable for assessment of competence of employee;
- 2-year transitional period until 31 December 2022 during which the dangerous goods training provisions in 2020 DGR may continue to be used. Subsection 1.5 from 2020 edition moved to Appendix H.



4.4 – Special Provisions

Special Provisions:

- A88 / A99 revised to add the State of the operator into the approval requirement. If A88 or A99 are applied then the packing instruction number on the Shipper's Declaration must be "910" or "974", respectively.
- A154 for damaged / defective lithium batteries revised to bring in UN text and maintain forbidden status for air transport.
- A201 revised to allow for the transport of a maximum of 4 lithium batteries for urgent medical need on a passenger aircraft with the approval of the authority of the State of origin and the approval of the operator.



Section 5 – Packing Instructions

Lithium Battery Packing Instructions

- Replacement of existing text referring to damaged or defective lithium batteries being forbidden with a reference to the revised special provision A154;
- Section II allowance for a combined statement where the air waybill includes packages from multiple packing instructions;
- PI 967 / PI 970 packing requirements revised to ensure that multiple pieces of equipment must be packed and protected against damage from contact with other equipment.



Section 7 – Marking & Labelling

7.1.5.5 Lithium Batteries

- change to allow for the lithium battery mark to be a rectangle or a square with minimum dimensions of 100 mm x
 100 mm. Reduced size to be 100 mm x 70 mm
- Current rectangular mark, 120 mm x 110 mm or reduced size, 105 mm x 74 mm may continue to be used.







Section 9 – Handling

Existing text that operators "should" include a safety risk assessment for the transport of dangerous goods, including lithium batteries, has been changed to a mandatory requirement.

This reflects to adoption of a new Chapter 15 – Cargo Compartment Safety into ICAO Annex 6 — *Operation of Aircraft*, Part I — *International Commercial Air Transport* — *Aeroplanes*



SAE G-27 Committee

AS 6413 - Performance based package standard for lithium batteries as cargo on aircraft



Background

In 2015 ICAO approached SAE International to develop a package performance standard for lithium cell and batteries (UN 3090 and UN 3480).

- Based on the decision by the ICAO Council to prohibit the transport of lithium ion cells and batteries as cargo on passenger aircraft until control were in place to establish an acceptable level of safety.
- Objective of the packaging standard is that the effects of a thermal runaway of a lithium cell in a package will not result in hazardous effects (fire, flammable gas, projectiles) outside the package.
- G-27 Committee established in February 2016.



Current Status

The draft standard (AS 6413) is in its 7th draft version and includes:

- Baseline test for packages containing lithium metal or lithium ion cells or batteries. The package is only valid for the type/quantity of cells/batteries as tested.
- Tests to determine benign cells / batteries. These are cells that have been determined through testing to pose no significant hazard.
- Generic package tests. A generic package is one that may be used for any combination of cells/ batteries within specified limit. Analogous to UN "V" packagings.
- Oversize cells / batteries. Those too large to fit into the test chamber.



2020 / 2021 Work

- Continue consideration of requirements for benign cells / batteries and generic package.
- Round-robin testing by 6 laboratories on identical 18650 lithium ion cells from same manufacturer / batch to validate that the laboratories achieve identical or very comparable results. If not, then more work required to develop more specification on the test setup and performance.
- Ongoing discussion on consideration for an external fire test, or other protection against external fire.
- Possible ballot of voting Committee members end of 2021.



Next Steps

- If the G-27 Committee agrees to the content of the AS 6413 standard, then next step is SAE Aerospace internal approval and release.
- Consideration by ICAO DGP, Flight Operations Panel and Airworthiness Panel on how, if standard should be incorporated into Technical Instructions and/or other ICAO documents.
- Timeframe 2025...



Fire Containment Equipment Standards



Candy Chan Manager, Dangerous Goods Standards IATA





Fire Containment Equipment Are Considered

ICAO Annex 6 – Operation of Aircraft, Part I, International Commercial Air Transport – Aeroplanes, Chapter 15, Cargo Compartment Safety.

One of the requirements to be considered in the risk assessment – containment characteristics of unit load devices.



What are being transported?



What Are the Existing Standards?





*Photos supplied by Nordisk and UPS

What Are the Existing Standards?







*Photos supplied by AmSafe Bridport

Panel Session Fire Containment Equipment Standards



Moderator:

Candy Chan Manager, Dangerous Goods Standards IATA



Tharindu Senanayaka

Business Unit Manager -Cargo

AmSafe Bridport



Enzo Canari

Cabin Safety Expert

EASA

Trevor Howard

Manager, Quality & Standards







AMSAFE BRIDPORT MANTLE FIRE CONTAINMENT COVERS

Tharindu Senanayake

- Test spec
- ➢ 12 Battery Box's with 400each
- ⊗ 12, 1000w Heat cartridges
- ▶ 18 Class A Box's
- ➢ 16 Thermocouples, 8 inside Box's, 8 4" Away











- Result: FIRE CONTAIN
 - _ 6 hour fire containment
 - _ 100% of batteries vented
 - _ No flame penetration / burn through
 - No external flames

- _ 3min initial smoke visible
- _ Peak internal temp 1633°C (2971°F)
- _ Peak temps 4" away below 119°C (246°F)
- Peak Bottom 163c







Thank you for your time





IATA Lithium Battery Webinar 14th Oct 2020

EASA research on lithium battery fire

Enzo Canari EASA Certification Directorate 14.10.2020



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EASA research on lithium battery fire

Sabatair Research

Sabatair: External Fire

New EASA research project

Update on Fire Containment Covers and Fire Resistant Containers



SABATAIR Research Project

SaBatAir Project (Safe Battery Transport by air)

- Research project funded by the European Union and supervised by EASA and DG MOVE with the support of a Scientific Committee.
- > The Consortium:





SABATAIR Research Project

Objectives:

- Give inputs and recommendations to the SAE G-27 committee
- Study and assess the effectiveness of potential mitigating measures against fire risk related to the transport of lithium metal and lithium ion batteries on Large Aeroplanes.
- Develop guidelines to support the production of a safety risk assessment for operators.







Sabatair: External Fire

- Only 18650 cells from two manufacturers were tested: additional tests should be performed with different cell designs from different manufacturers.
- FCC provide significant mitigation to the severity of the event: no testing was conducted with additional mitigating measures (thermal acoustic insulation).



Cold Test: Proof that the Halon concentration is 3% at the location of the battery box Fire initiation test: Place half amount of cells (400) next to the ignition box – do not use the Fire Suppression System

Halon baseline test

800 cells

FCC test

800 cells

FCC + thermal insulation test

800 cells



Sabatair: External Fire





New EASA research project

- Battery fire in cargo compartments (incl. halon replacement)
- Objectives:
 - effectiveness of cargo fire suppression systems (Halon-based and Halonfree) in case of Li battery thermal runaway of battery-powered devices in checked baggage
 - Revision of the Cargo compartment Halon replacement MPS: validation of the definition of a new cargo fire test scenario involving lithium batteries
 - Perform the same tests (including FCCs) as in the Sabatair project on different cell types
 - Budget: 0.6 M€
- Call for Tender published (deadline 10 Nov. 2020) Duration : 12 months



Update on Fire Containment Covers and Fire Resistant Containers

- FCCs: ETSO-C203 will be updated to make reference to SAE AS6453A (WIP):
 - Improved test setup and test procedure
 - Objective: demonstrate containment of a Class A fire (ordinary combustibles such as wood, cloth, paper, rubber and plastics)
- FRCs: ETSO-C90d will be updated to make reference to SAE AS8992 (WIP):
 - Improved test setup and test procedure
 - Objective: demonstrate containment of a Class A fire (ordinary combustibles such as wood, cloth, paper, rubber and plastics)
- Future objectives:
 - Improve the ETSO MPS to cover other classes of fires
 - Create standard to evaluate impact on performance of fire protection systems (detection and suppression)





Any questions?



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Panel Session Fire Containment Equipment Standards



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Managing Safety Risk the Carriage of Cargo & Mail



Geoff Leech Director DG Office UK





MH 370 – 8 March 2014





Nothing's Changed.....



"Even though it is currently unknown how the fire began, it is raising renewed questions over the acceptability of lithium batteries in flight."

"this calls into question IATA's support for allowing these batteries on passenger aircraft"



ICAO Actions

- Annex 6 Operation of Aircraft, Part I, International Commercial Air Transport – Aeroplanes includes a new Chapter 15 – Cargo Compartment Safety, effective 5 November 2020:
 - the operator shall establish policies and procedures that address items to be carried in the cargo compartment. Ensure to a reasonable certainty that a fire can be detected and suppressed, until the aircraft makes a safe landing.
 - transport of "items" in the cargo compartment, the State of the Operator shall ensure that the operator establishes policy and procedures, which includes a specific safety risk assessment......



ICAO Actions

> The safety risk assessment must consider:

- specific hazard of items being carried;
- capabilities of the operator;
- operational considerations;
- capabilities of the aeroplane and its systems;
- containment characteristics of ULDs;
- packing and packaging;
- quantity and distribution of dangerous goods; and
- safety of the supply chain.....



ICAO Actions

New ICAO Document (Doc. 10102) – *Guidance for Safe Operations Involving Aeroplane Cargo Compartments* provides guidance

Expected to be published in mid-2020.

"An operator should have procedures in place for monitoring the effectiveness of its interface management controls for *ensuring nothing* contained in cargo will endanger an aircraft."

"Given the potential for a significant fire event that may be severe enough to overwhelm the aeroplane and its systems, an operator may therefore wish to consider *the quantity of individual cells to* be transported on a single aircraft when determining the acceptable level of risk."



Managing Safety Risk Associated with the Carriage of Cargo and Mail – Panel Session





Moderator:

Geoff Leech Director The Dangerous Goods Office Ltd.

Nigel Patience

Corporate Safety Manager, Health & Safety and Dangerous Goods

British Airways



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Kerstin Strauss

VP, Air Logistics Operations

Kuehne + Nagel

Dawn M. Wilkes Program Manager, Security Universal Postal Union (UPU)



Please submit your questions through the Questions box and send to Everyone

Wrap Up



Candy Chan Manager, Dangerous Goods Standards IATA





Dangerous Goods Solutions

- Building confidence and trust through knowledge, training and global standards
- Continuous improvements, harmonization, collaboration and alignment with industry initiatives are key elements that will transform the future





Thank you

- Please visit iata.org/events for the upcoming webinars
- Please visit iata.org/cargo for all COVID-19 resources
- Contact us at <u>cargo@iata.org</u>

