

UK CAA's first International Lithium Battery Workshop to explore ways to reduce the risk to safety: Post workshop report

CAP 1846

Published by the Civil Aviation Authority, 2019

Civil Aviation Authority
Aviation House
Beehive Ring Road
Crawley
West Sussex
RH6 0YR

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Published September 2019

The latest version of this document is available in electronic format at: www.caa.co.uk

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Post workshop report

Introduction

On 13-14 June 2019, the UK Civil Aviation Authority (UK CAA) hosted its' first international lithium battery workshop to explore key issues faced in the safe transportation of lithium batteries.

The two-day workshop was attended by over seventy stakeholders (Appendix A) from manufacturing, testing, logistics, airline operators, government agencies and aviation regulators. The group discussed lithium batteries and the risk to flight safety and evaluated practical solutions that could see the reduction of non-compliant shipments in air transport.

The UK CAA's International Group hosted the workshop, with sponsorship from the UK Government's Department for Transport, Aviation Policy and Strategy, Aviation Strategy and Consumers Division. Keynote speeches and panel discussions included representatives of the International Civil Aviation Organisation (ICAO) and the International Air Transport Association (IATA).

The workshop identified practical actions that could:

1. help ensure lithium batteries meet the existing design and manufacturing standards; and
2. significantly reduce the number of non-compliant shipments in air transport

The workshop objectives were achieved through presentations followed by breakout sessions (Appendix B) to consider specific challenges within and outside of the aviation system, with the potential mitigations briefed to the group.

Appendix C shows a table of recommendations of how to mitigate the safety risk and by whom. The numbering of the recommendations provides a link to the workshop sessions and questions posed.

Background

There have been three major aircraft accidents where, whilst not proven to be the source of the fire, lithium battery cargo shipments were strongly implicated:

1. UPS DC-8-71F Philadelphia, February 2006
2. UPS 747-44AF Dubai, September 2010
3. Asiana Airlines B747-400F, July 2011

According to the accident investigation reports, the two UPS aircraft referred to above were carrying undeclared dangerous goods. In the case of the Dubai 747 accident, there were shipments of lithium batteries for which evidence of successful UN38.3 safety testing could not be provided by the shipper. These tests are mandatory for all modes of transport.

Global records of lithium battery fires in air transport are not available. However, since 2012 the UK CAA has received ten reports of fire/smoke events involving air cargo or air mail on the ground before or after carriage. These events all occurred in the UK and no mishandling was reported. More recently, the UK CAA has experienced an increase in the number of reports of undeclared and misdeclared lithium batteries (batteries shipped as equipment) discovered after flight to the UK, including multi-tonne shipments carried on both cargo and passenger aircraft.

Lithium batteries packed on their own, are only permitted for carriage onboard cargo aircraft where the crew may have more options to respond. This restriction cannot be applied when the goods are undeclared. Thus, there is a safety risk from undeclared or untested lithium batteries to all flights including passenger operations. There is also a significant hazard to the population at large should an aircraft accident occur in a densely populated area.

The International Civil Aviation Organization (ICAO) Annex 18 requires States establish inspection, surveillance and enforcement procedures for all entities subject to their dangerous goods regulations. Such entities include shippers, freight forwarders, designated postal operators, ground handling service providers and air operators (Appendix D).

Within many States including the UK there are millions of shippers as the population has easy access to mail services. In addition, exposure to undeclared dangerous goods has increased following the advent of e-commerce whereby goods are sold and distributed by an increased number of small and medium enterprises. Shippers are not typically required to hold any aviation approval; therefore, States cannot proactively identify all shippers, nor schedule oversight on all their dangerous goods activities. Instead, some States implement regulatory actions in response to occurrence reports received. This necessitates a strong reporting culture within a State as the report provides the necessary input prompting an investigation and response aimed at preventing recurrence.

Freight forwarders perform a critical function in the transport of air cargo by enabling individuals or corporations to get goods from the manufacturer or producer to a market, customer or final point of distribution. Responsible freight forwarders are well placed to advise their customers on the requirements for the safe transport of dangerous goods by air.

At present the only requirement within the Technical Instructions placed directly on a freight forwarder is to provide dangerous goods training to its personnel. The obligation placed on cargo acceptance staff of the air operator, to seek confirmation from

shippers about the contents of any item of cargo where there are suspicions that it may contain dangerous goods, with the aim of preventing undeclared dangerous goods from being loaded on an aircraft as general cargo, is not currently applied to the staff of freight forwarders.

Even where States are seeking to resolve issues within their territories, the problems could conceivably migrate. Lithium battery manufacturing bases are already moving from China to Vietnam, India and Malaysia. Thailand is expected to become an Electric Vehicle production hub soon and with that comes the potential for localised cell production. We therefore need systemic solutions that can be applied globally, or at least dynamically to the changing risk environment.

With regards to other ongoing activities related to this workshop:

- The SAE G-27 Lithium Battery packaging performance standard commissioned by ICAO is intended to develop a test method to demonstrate that hazards which might arise from a failure of an individual cell could be safely contained within the package.
- The Sabatair project within the EU is to propose and evaluate novel and tailored packaging solutions and other operational measures aimed at the safe transport of both lithium metal and lithium ion batteries on board an aircraft - passenger and cargo alike.

The deliverables from these activities should enhance the safety of compliant shipments but will not address the safety threat from untested batteries or undeclared shipments, whether these be caused through omissions due to ignorance of the transport requirements, or deliberate violations of the national regulations that apply them.

ICAO Annex 6 will soon require the air operator to conduct a specific safety risk assessment on the range of items placed within cargo compartments¹. The safety of the supply chain must be considered, and the safety risk management approach requires mitigations to be implemented where required. This presents a significant challenge to air operators because shippers and forwarders are the customers of airlines, not their service providers. Further, as cargo is often consolidated², and consolidations may themselves be consolidated prior to being ultimately offered for air transport, it can be difficult for the air operator to apply effective controls at source. A consolidation may be received by the air operator palletised and covered in shrink-wrapping which hides any visual indications that dangerous goods may be present.

¹ Subject to adoption by ICAO Council during Q1 2020.

² Consignments from several shippers or forwarders ultimately booked for air transport by a single freight forwarder under a single master air waybill.