

Boeing Guidance on Lithium ion and Lithium Metal Batteries

July 17, 2015

SUMMARY:

This message provides updated guidance information on transporting lithium batteries as cargo on Boeing airplanes.

Based on the latest results of the FAA Technical Center's fire testing on high density shipments of lithium batteries, and other available research (Refer to reference /A/), Boeing is providing additional guidance to be considered, in addition to the information provided in the reference /C/ MOM.

DESCRIPTION:

Boeing has received operator inquiries on transporting lithium batteries as cargo on passenger and freighter airplanes. This message is intended to provide recommendations for transporting lithium batteries as cargo on Boeing airplanes.

This message does not address lithium batteries carried by passengers or crew members in checked or carry-on baggage and it does not address lithium batteries contained in equipment installed onboard the aircraft.

Generally, most government regulations governing the transport of lithium batteries as cargo are based on the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air (Document 9284). Some governments follow local regulations such as the United States Department of Transportation (DOT)/Pipeline and Hazardous Materials Safety Administration (PHMSA) regulations. As of January 2015, the transport of many types of lithium metal batteries as cargo on passenger airplanes has been banned by governments. The transport of lithium ion batteries as cargo on passenger airplanes is allowed by most governments. For freighter airplanes, the transport of both lithium metal and lithium ion batteries as cargo is allowed by most States.

The International Coordinating Council of Aerospace Industries Association (ICCAIA), with Boeing's participation, has determined that a fire involving one or more packages of lithium ion batteries packed and transported in accordance with the Dangerous Goods Technical Instructions could create hazards that the aircraft fire protection features are not able to adequately protect against.

Boeing agrees with the recommendations of the ICCAIA as detailed in reference /A/ "Transport of Lithium Batteries as Cargo via Air." Those recommendations are as follows:

- 1) Given the known and unknown risks of fires involving lithium metal and lithium ion batteries, ICCAIA recommends that appropriate packaging and shipping requirements be established to safely ship lithium ion batteries as cargo on aircraft.

2) The ICCAIA recommends that high density packages of lithium ion batteries and cells (such as defined by UN3480) not be transported as cargo on passenger aircraft until such time where safer methods of transport are established and followed.

3) The ICCAIA further recommends that appropriate packaging and shipping requirements [be] established to more safely ship lithium metal and lithium ion batteries as cargo on freighter aircraft.

Actions to be taken in support of the ICCAIA recommendation:

Boeing recommends operators not carry lithium ion batteries as cargo on passenger aircraft until safer methods of packaging and transport are established and implemented.

Boeing recommends operators who choose to carry lithium ion batteries as cargo on passenger airplanes, and operators that carry lithium ion or lithium metal batteries as cargo on freighter airplanes, conduct a safety assessment that considers the following:

- The types and quantities of lithium batteries carried
- The fire protection features of each model aircraft in their fleet
- The expected flight profile (flight duration, ETOPS, etc.)
- History of battery shippers compliance to dangerous goods transport regulations
- Quantity of batteries per flight
- Location of batteries within the cargo compartment
- Proximity to other dangerous goods
- Potential ignition sources in compartment
- Other relevant aspects of the operator's cargo carriage experience

Other information relevant to the transport of lithium batteries as cargo is included in references /A/ through /G/.

Boeing is currently participating in ICAO Dangerous Goods Panel (DGP) working group in support of developing packaging requirements for current types of lithium batteries. Boeing will also continue to work with governments and industry (manufacturers, airlines, regulatory agencies, etc.) to develop information to promote safe air transport of current lithium batteries and other future stored energy devices. An overall solution which reduces the risks associated with transport of any stored energy device will likely require concerted efforts by airlines, airplane manufacturers, regulatory agencies, stored energy device producers, package manufacturers, shippers, freight forwarders, Unit Load Devices (ULD) and equipment manufacturers, and other involved parties.