



Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

Sub-Committee of Experts on the Transport of Dangerous Goods

Fiftieth session

Geneva, 28 November-6 December 2016

Item 2 (d) of the provisional agenda

**Recommendations made by the Sub-Committee
on its forty-seventh, forty-eighth and forty-ninth
sessions and pending issues: electric storage systems**

The safe transport of lithium batteries by air

Submitted by the International Civil Aviation Organization (ICAO)

1. At the forty-ninth session of the Sub-Committee, ICAO submitted ST/SG/AC.10/C.3/2016/39 outlining decisions made by its Council with respect to the transport of lithium batteries by air. These included the approval of an amendment to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) forbidding the transport of UN 3480 — **Lithium ion batteries** as cargo on passenger aircraft and the incorporation of additional restrictions on the transport of lithium batteries as cargo on cargo aircraft. The decision to incorporate these amendments was based on a review of information provided to ICAO's Air Navigation Commission (ANC) through its Dangerous Goods (DGP), Airworthiness (AIRP) and Flight Operations (FLTOSP) panels. The Council considered the prohibition a temporary measure until controls are in place which establish an acceptable level of safety.

2. Factors that contributed to the Council's decisions included:

- (a) The inability of cargo compartment fire protection systems to suppress or extinguish a fire involving significant quantities of lithium batteries;
- (b) The inability to establish an absolute safe quantity limit for lithium ion batteries because of the number of variables that contribute to the degree of risk posed by different battery or cell chemistries, sizes, design types and quantities being transported;
- (c) The lack of a mechanism to identify and communicate the specific hazards and safety risks associated with each battery and cell type offered for transport to the operator;

(d) The lack of transparency with regard to batteries excepted from full regulation making it impossible or impractical for operators to accurately determine the quantities of batteries carried as cargo; and

(e) The absence of a packaging standard to mitigate the risks.

3. ICAO is progressing work on addressing risks posed specifically to air transport. However, the following issues need the Sub-committee's consideration:

(a) The forty-ninth session of the Sub-Committee was advised (ST/SG/AC.10/C.3/2016/39) that ICAO's governing bodies had questioned whether there was a mechanism to establish greater granularity with respect to classification of different battery types so that the varying risks posed by different batteries and cells could be communicated and mitigated appropriately. During the Sub-Committee's discussion, a suggestion to base classification on tests similar to the approach taking for Class 1 to better define the actual dangers posed by the various types of cells was made. The Sub-Committee is invited to continue consideration of this matter;

(b) The risks posed by non-compliant shipments, both deliberate and inadvertent, needs to be addressed. Fully complying with the complex regulations can be difficult if not impossible to do. Numerous entities play a role, including cell manufacturers, battery manufacturers, and all manufacturing entities who use these cells or batteries downstream, potentially from different States. The current regulatory framework depends on shippers knowing that batteries and cells have passed tests in accordance with the UN *Manual of Tests and Criteria*. Acquiring this knowledge can be difficult, especially when one notes there is no obligation on the manufacturer to supply this information, only to produce it when requested by a regulatory authority. This is complicated further in cases where cells or batteries are shipped multiple times during their production life cycle.

While regulators have been asked to improve oversight activities to address non-compliance, the complexity of the regulatory framework makes an effective oversight system for lithium batteries difficult to achieve. The enormous quantities being shipped and the expectation that oversight is required for excepted lithium batteries not subject to full regulation further complicates matters.

4. The Sub-Committee is invited to discuss the issues raised in this paper and consider how they may be addressed in the next biennium. Feedback will be provided to the ICAO Air Navigation Commission and its Dangerous Goods, Airworthiness and Flight Operations panels. The Air Navigation Commission will review information from all these bodies once the package performance standard currently being developed by SAE is complete and any additional controls necessary are established to ensure all identified risks are mitigated before considering lifting the prohibition.