



**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****Forty-ninth session**

Geneva, 27 June – 6 July 2016

Item 4 (d) of the provisional agenda

Electric storage systems: miscellaneous**Prohibition on the transport of lithium ion batteries as cargo
on passenger aircraft and additional mitigation measures for
cargo aircraft****Transmitted by the International Civil Aviation Organization (ICAO)¹**

1. The Council of the International Civil Aviation Organization (ICAO) approved an amendment to the 2015-2016 Edition of the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Technical Instructions, Doc 9284) forbidding the transport of UN 3480 — **Lithium ion batteries** as cargo on passenger aircraft.

2. The Council also approved amendments incorporating additional restrictions on the transport of lithium batteries into the Technical Instructions which were brought to the attention of the forty-eighth session of the sub-committee (informal document INF.40, forty-eight session) and which will now apply to cargo aircraft. The additional restrictions, recommended by the twenty-fifth meeting of the Dangerous Goods Panel (DGP) (Montréal, 19 to 30 October 2015), include:

- (a) Requiring all lithium ion batteries to be shipped at a 30 per cent state of charge;
- (b) Limiting the number of packages of excepted batteries (Section II batteries) that a shipper could send per consignment to one; and
- (c) Limiting the number of packages containing Section II batteries placed in an overpack to one.

¹ In accordance with the programme of work of the Sub-Committee for 2015–2016 approved by the Committee at its seventh session (see ST/SG/AC.10/C.3/92, paragraph 95 and ST/SG/AC.10/42, para. 15).

At its forty-eighth session, the Sub-Committee was advised that the addendum was being processed through ICAO's governing bodies through an accelerated amendment process. While agreeing that the measures provided improvements to safety, Council members expressed concerns with whether they provided an acceptable level of safety. Additionally, a meeting of the ICAO Airworthiness Panel (AIRP/3, Montréal, 7 to 11 December 2015) was convened subsequent to DGP/25 at which the following position statement on the carriage of lithium batteries by air was developed:

The fire protection capabilities and certification of aircraft were developed considering the carriage of general cargo and not the unique hazards associated with the carriage of articles containing dangerous goods including lithium batteries. A growing body of test data has identified that existing cargo compartment fire protection systems certified to EASA CS 25.857 and US CFR Part 25.857 (CS/CFR Part 25) regulations are unable to suppress or extinguish a fire involving significant quantities of lithium batteries, resulting in reduced time available for safe flight and landing of an aircraft to a diversion aerodrome. Continuing to allow the carriage of significant quantities of lithium batteries within today's transport category aircraft cargo compartments which have not been certified to withstand a fire involving them, is an unacceptable risk to aircraft.

In consequence, lithium batteries and cells should not be transported in aircraft engaged in commercial air transport operations as cargo unless acceptable means to mitigate the risk can be established.

3. The Air Navigation Commission (ANC), at the request of the Council, reviewed information provided by the ICAO DGP, Flight Operations Panel (FLTOSP), Airworthiness Panel (AIRP), aircraft manufacturers and the Secretariat on the subject. The ANC concluded that the risks associated with the carriage of lithium ion batteries as cargo on aircraft were not adequately controlled and recommended that the Council approve an addendum to the Technical Instructions prohibiting their transport as cargo on passenger aircraft until safer methods of transport were established. The ANC also recommended that the additional mitigating measures recommended by DGP/25 and approved by the Council be maintained so that the safety benefits they provide remain for all-cargo aircraft. Factors that contributed to the Commission's conclusion 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.

4. The Council supported the ANC's recommendations and approved Addendum No. 4 to the 2015-2016 Edition of the Technical Instructions prohibiting the transport of lithium ion batteries as cargo on passenger aircraft as a temporary measure until controls are in place which establish an acceptable level of safety. The controls include:

- (a) A performance-based packaging standard which, at the request of ICAO, is currently being developed by a committee established by SAE International;
- (b) Provisions and supporting guidance material for air operators to conduct safety risk assessments;
- (c) Additional operational controls to mitigate aviation-specific risks posed by lithium batteries including a mechanism to identify and communicate specific hazards associated with different battery types and to ensure transparency of shipments including those not subject to full regulation;
- (d) Measures to reduce levels of non-compliance.

5. ICAO does recognize that the risks posed by lithium batteries varies depending on the size, chemistry, design type and quantities shipped and that some may pose little risk to aircraft. There have been proposals presented to the DGP in the past to alleviate restrictions placed on batteries being transported by air which pose a lower risk. These proposals have not been supported on the basis that there is no way to distinguish between different batteries types presented for transport other than under the two major groups, lithium ion or lithium metal. ICAO's governing bodies have questioned whether there was a mechanism for ICAO to establish greater granularity and have been advised that this would be an issue for the Sub-committee to consider.

6. Addendum No. 3 and Addendum No. 4 to the 2015-2016 Edition of the Technical Instructions can be downloaded from:

<http://www.icao.int/safety/DangerousGoods/Pages/technical-instructions.aspx>
