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## 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

#### Sixty-fourth session

Geneva, 24 June-3 July 2024

Item 4 (a) of the provisional agenda

#### Electric storage systems:

#### Testing of lithium batteries

## Additional mitigation measures for the transport of lithium batteries

Transmitted by the International Civil Aviation Organization (ICAO)\*

### I. Introduction

1. At the sixty-third session of the Sub-Committee of Experts on the Transport of Dangerous Goods, ICAO brought a number of issues arising from the twenty-ninth meeting of the Dangerous Goods Panel (DGP/29) in informal document INF.43. One was related to amendments to the “Technical Instructions for the Safe Transport of Dangerous Goods by Air” (Technical Instructions) recommended by the panel which introduce additional state of charge limits on the transport of lithium batteries by air. The amendments were described in the aforementioned informal document and provided in appendix A to the [DGP/29 Report](#)<sup>1</sup>. The ICAO Council approved the amendments on 18 March 2024, subject to revisions to remove editorial inconsistencies and to clarify intent. These are provided in the Supplement to the [DGP/29 Report](#)<sup>1</sup>. The amendments will be incorporated in the 2025-2026 edition of the Technical Instructions.

2. The panel’s decision to introduce the new restrictions was based on the outcome of an extensive safety risk assessment using the system theoretic process analysis (STPA) approach<sup>2</sup> (see paragraph 4.1 of the [DGP/29 Report](#)<sup>1</sup> for a detailed overview of the panel’s safety risk assessment). The panel identified a list of existing and potentially new mitigation measures and ranked them based on their effectiveness as part of this process. Reducing the state of charge for rechargeable batteries was identified as the most effective mitigation measure out of those that would be feasible to implement through the Technical Instructions. Other mitigation measures identified would need to be adopted in the *Model Regulations* as a first step. The panel therefore recommended that the Sub-Committee consider them. These are:

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\* A/78/6 (Sect. 20), table 20.5.

<sup>1</sup> DGP/29 Report: <https://www.icao.int/safety/DangerousGoods/Pages/DGP29Report.aspx>

<sup>2</sup> STPA Handbook (Leveson & Thomas, 2018):

[https://psas.scripts.mit.edu/home/get\\_file.php?name=STPA\\_handbook.pdf](https://psas.scripts.mit.edu/home/get_file.php?name=STPA_handbook.pdf)



- (a) To address the risk of invalid test results according to section 38.3 of the *Manual of Tests and Criteria*: Include a requirement in the *Model Regulations* for competent authority approval of laboratories conducting such testing; and
- (b) To address the risk that cell and battery manufacturers do not develop and adhere to a quality management system: Develop detailed requirements for quality assessments, including third-party verification, for inclusion in the *Model Regulations*.

## II. Proposal

- 3. The Sub-Committee is requested to consider:
    - (a) Including a requirement in the *Model Regulations* for competent authority approval of laboratories conducting testing according to section 38.3 of the *Manual of Tests and Criteria*; and
    - (b) Developing detailed requirements for quality assessments, including third-party verification, for inclusion in the *Model Regulations*.
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