

APPENDIX D

TERMS OF REFERENCE DANGEROUS GOODS PANEL (DGP) WORKING GROUP ON PERFORMANCE-BASED STANDARDS FOR THE SAFE AIR TRANSPORT OF LITHIUM BATTERIES

1. INTRODUCTION

1.1 The ICAO Second International Multidisciplinary Lithium Battery Transport Coordination Meeting held in Cologne Germany from 9 to 11 September 2014 recommended several mitigating measures be taken to reduce the risk of a fire involving significant quantities of lithium cells/batteries (UN 3090 and UN 3480) that may exceed the fire suppression capability of the aircraft and could lead to a catastrophic failure of the airframe. The relevant recommendations considered by the 2015 Dangerous Goods Panel (DGP) Working Group Meeting (DGP-WG/15) included:

- a) Recommendation 2/14 — Performance based provision to limit the probability of propagation of thermal runaway between cells:

That a performance based provision be developed that would limit the probability of propagation of thermal runaway between cells to an acceptable level of risk.

- b) Recommendation 3/14 — State of charge level of all cells:

That all lithium-ion cells for shipment be limited to a state of charge of no more than 30% as an interim means to reduce the probability of propagation of thermal runaway between cells.

- c) Recommendation 8/14 — Performance based packaging of lithium batteries:

That further research and testing be completed as soon as possible on packagings for lithium batteries, that may include the use of cooling agents such as gel packs as a means to add additional protective layers to mitigate the risks associated with the carriage of lithium batteries.

2. PROBLEM STATEMENT

2.1 The 2015 Dangerous Goods Panel Working Group meeting (DGP-WG/15) endorsed the problem statement from the Second International Multidisciplinary Lithium Battery Transport Coordination Meeting (reproduced below) and established a working group to develop a performance standard focused on the cell/battery and packaging to improve lithium battery safety when transported in aircraft cargo compartments. The purpose of this document is to set forth the terms of reference for the informal working group.

“A fire involving significant quantities of lithium batteries (UN 3090 and UN 3480) may exceed the fire suppression capability of the aircraft and could lead to a catastrophic failure of the airframe.”

3. **GOAL**

3.1 To develop performance-based standards based on the principle that hazardous effects will be contained within the package.

4. **ORGANIZATION**

4.1 The informal working group will be open to all interested parties. The dangerous goods panel member nominated by the United States will serve as chair. Participation in the group will be comprised of members from States, international organizations, and their advisors whose charter is to provide subject matter expertise on aircraft cargo compartment fire safety and the safe shipment of lithium batteries in aircraft.

5. **OBJECTIVES**

5.1 The main objectives are to:

- a) Consider performance-based standards to address Recommendations 2/14, 3/14, and 8/14 of the Second International Multidisciplinary Lithium Battery Transport Coordination Meeting and to prevent or minimize any hazardous effects outside the package. Consideration should include performance-based standards that may lead to possible off-the-shelf package solutions.
- b) Define the scope and application of the standard (e.g. cells, batteries, packaging material, outer packaging).
- c) Review the effects of the performance with aircraft systems/equipment ability to mitigate the resultant effects.
- d) Submit the output to the DGP.

6. **OUTPUTS**

6.1 The group will provide the following results:

- a) Recommend performance-based standards for the safe carriage of lithium cells and batteries in aircraft cargo compartments.
- b) Report to the Dangerous Goods Panel to explain the rationale behind the proposed standard(s).

7. REFERENCES

Annex 18 — *The Safe Transport of Dangerous Goods by Air*

Annex 8 — *Airworthiness of Aircraft*

Annex 6 — *Operation of Aircraft*

[Report of the Second International Multidisciplinary Lithium Battery Transport Coordination Meeting](#)

Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284, 2015-2016 Edition)

Relevant meeting materials

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