



WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-FIFTH MEETING

Montréal, 19 to 30 October 2015

Agenda Item 5: Development of a comprehensive strategy to mitigate risks associated with the transport of lithium batteries including development of performance-based packaging standards and efforts to facilitate compliance

MITIGATION MEASURES FOR LITHIUM BATTERIES ON ALL-CARGO AIRCRAFT

(Presented by M. Rogers)

SUMMARY

This working paper presents mitigation strategies for the carriage of **Lithium ion batteries** (UN 3480) and **Lithium metal batteries** (UN 3090) on all-cargo aircraft.

Action by the DGP: The DGP is invited to consider adopting revisions to the Technical Instructions as presented in the appendix to this working paper.

1. INTRODUCTION

1.1 At a special additional meeting of DGP/24 in April 2014 (DGP-WG/LB/2, Montréal, 7 to 11 April 2014), the panel adopted a prohibition on **Lithium metal batteries** (UN 3090) as freight on passenger aircraft. This action was taken, in part, due to the inability of on-board fire suppression systems to adequately suppress a fire involving lithium metal batteries. No change to the transport provisions for lithium metal batteries on all-cargo aircraft was adopted.

1.2 Subsequent testing of **Lithium ion batteries** (UN 3480) by the U.S. Federal Aviation Administration (FAA) at the William J. Hughes Technical Center in Atlantic City, New Jersey, demonstrated that lithium ion batteries present an explosion hazard on aircraft, due to the venting of flammable gasses during thermal runaway. This testing, along with other recognized hazards of lithium ion batteries, led to a separate proposal being presented to DGP/25 to prohibit **Lithium ion batteries** (UN 3480) as freight on passenger aircraft.

1.3 While it is recognized that revisions to the Technical Instructions regarding the transport provisions on passenger aircraft for both lithium metal and lithium ion batteries were made and are being

considered to enhance flight safety, it is nevertheless evident that significant quantities of lithium ion and lithium metal batteries are transported on all-cargo aircraft. These aircraft may be carrying lithium batteries in higher quantities than on passenger aircraft, and in cargo compartments that do not have as capable of fire suppressions systems as are present on the majority of passenger aircraft.

1.4 Several proposals have been made to prohibit lithium metal and lithium ion battery shipments on all-cargo aircraft until adequate packaging can be developed to ensure their safe transport. Recognizing that a packaging solution is still years away, and that the panel has shown little support for a prohibition of either lithium metal or lithium ion batteries on all-cargo aircraft, it is nevertheless felt that additional mitigation strategies should be employed for all-cargo aircraft carrying lithium batteries as freight. It is recognized that these are only incremental measures proposed to increase the safety of lithium battery transport and that they do not, in themselves, ensure the safe transport of lithium batteries. They are proposed as temporary measures pending a comprehensive solution that would mitigate the hazards posed by lithium battery shipments.

2. ACTION BY THE DGP

2.1 The panel is invited to adopt revisions to the Technical Instructions to improve the safety of lithium battery shipments on all-cargo aircraft as shown in the appendix to this working paper.

APPENDIX

PROPOSED AMENDMENT TO PART 7 OF THE TECHNICAL INSTRUCTIONS

Part 7

OPERATOR'S RESPONSIBILITIES

...

Chapter 2

STORAGE AND LOADING

Parts of this Chapter are affected by State Variations CA 1, CA 4, IR 2, IR 4, JP 9, JP 10, JP 11, JP 12, US 15; see Table A-1

2.1 LOADING RESTRICTIONS ON THE FLIGHT DECK AND
FOR PASSENGER AIRCRAFT

...

**2.15 LOADING OF UN 3090, LITHIUM METAL BATTERIES
AND UN 3480, LITHIUM ION BATTERIES ON CARGO AIRCRAFT**

Packages and overpacks of UN 3090 — Lithium metal batteries and UN 3480 — Lithium ion batteries must be loaded for carriage on cargo aircraft according to the following provisions:

- a) in a Class C aircraft cargo compartment, or in the cargo compartment with the most capable fire suppression system;
- b) segregated from other dangerous goods. This requirement does not apply to shipments of flammable liquids, (Class 3) of Packing Group III, toxic or infectious substances (Class 6), radioactive material (Class 7), or miscellaneous dangerous goods (Class 9); and
- c) to the extent possible, lithium battery shipments should be separated from other lithium battery shipments to reduce the density of batteries at any single location.

— END —