



WORKING PAPER

**DANGEROUS GOODS PANEL (DGP)
MEETING OF THE WORKING GROUP OF THE WHOLE**

Memphis, 30 April to 4 May 2007

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2009/2010 Edition

2.3: Part 3 — Dangerous Goods List and Limited Quantities Exceptions

**PROHIBITION OF TRANSPORT OF CERTAIN TYPES OF LITHIUM
METAL BATTERIES ABOARD PASSENGER AND CARGO AIRCRAFT**

(Presented by M. Rogers)

SUMMARY

This paper proposes to forbid the transport of certain types of lithium metal batteries aboard passenger and cargo aircraft, except for small lithium metal batteries packed in or with equipment. This prohibition is based on the flammability characteristics of lithium metal batteries and the inability of onboard equipment to suppress a fire involving these batteries.

Action by the DGP-WG is in paragraph 2.

1. INTRODUCTION

1.1 At DGP-WG/06, the panel agreed in principle to a proposal by the United States to ban lithium metal batteries shipped as cargo on passenger carrying aircraft. This proposal was based on the flammability characteristics of lithium metal batteries and the inability of aircraft suppression systems to be successfully used against a fire involving these batteries, as identified in a test conducted by the United States Department of Transportation's Federal Aviation Administration (FAA). The flammability characteristics include the fact that the auto-ignition temperature for lithium metal batteries is below the average temperature of a suppressed cargo fire, resulting in the likely ignition of a shipment of lithium metal batteries following a cargo fire of any origin. Once ignited, the batteries burn at a temperature above the melting point of aluminium, with a pressure pulse that may cause the cargo liner to fail, and with a molten lithium spray that may perforate the cargo liner. The FAA also found that the fire suppression agent used on aircraft, Halon 1301, had no effect on the progress of the fire.

1.2 On the basis of the risks associated with the transport of lithium metal batteries as cargo and the inability of an aircraft fire suppression system to extinguish a fire involving lithium metal batteries, it is proposed to ban shipments of these batteries as cargo on all aircraft. It is inappropriate to allow the shipment of thousands of batteries on a cargo aircraft under a Special Provision, when the same batteries are completely forbidden from transport as cargo on passenger aircraft, and will result in an uncontrollable fire following the successful suppression of a fire from any other source.

2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to adopt a new special provision prohibiting the transport of lithium metal batteries as cargo on passenger and cargo aircraft. An exception would be allowed for small lithium metal batteries shipped in or with equipment. Provisions for carriage in the cabin of a passenger aircraft by passengers and crew would be unaffected.

Part 3 DANGEROUS GOODS LIST AND LIMITED QUANTITIES EXCEPTIONS

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Chapter 3 SPECIAL PROVISIONS

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Table 3-2. Special provisions

Axx Lithium metal batteries and cells are forbidden for transportation aboard passenger-carrying and cargo aircraft, unless contained in or packed with equipment and complying with the provisions specified in this Special Provision. Lithium metal batteries and cells excepted from the requirements of these Technical Instructions by Special Provision A45 must be marked “LITHIUM METAL BATTERIES – FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AND CARGO AIRCRAFT”.

When contained in or packed with equipment, lithium metal batteries and cells are forbidden from transport aboard passenger-carrying and cargo aircraft unless the following conditions are met:

- a) for a cell, the lithium content is not more than 1 g;
- b) for a battery, the aggregate lithium content is not more than 2 g;
- c) each cell or battery is of the type proved to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, sub-section 38.3;
- d) the package contains no more than the number of lithium batteries or cells necessary to power the intended piece of equipment;
- e) the equipment and the battery or cell are packed in a strong outer packaging that is constructed from suitable material of adequate strength and design in relation to the packaging’s capacity and its intended use; and

f) the net weight of lithium batteries within a package does not exceed 5 kg.

Lithium metal batteries or cells contained in or packed with equipment conforming to the above conditions a) to f) are excepted from all other requirements of these Instructions.

As used above and elsewhere in the Instructions, “lithium content” means the mass of lithium in the anode of a lithium metal or lithium alloy cell.

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