



DANGEROUS GOODS PANEL (DGP)

TWENTY-FIRST MEETING

Montréal, 5 to 16 November 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

Agenda Item 5: Resolution, where possible, of the non-recurrent work items identified by the Air Navigation Commission or the panel

5.4: Review of provisions for dangerous goods relating to lithium batteries

AMENDMENT OF SPECIAL PROVISION A45

(Presented by M. Rogers)

REVISED

SUMMARY

This working paper presents an amendment to Special Provision A45 to apply only to batteries packed in or with equipment with separate proposals for lithium ion and lithium metal batteries.

Action by the DGP is in paragraph 2.

1. INTRODUCTION

1.1 At the DGP Working Group of the Whole Meeting in Memphis in May 2007, the International Federation of Air Line Pilots' Associations (IFALPA) proposed amending Special Provision A45 to apply only to batteries packed in or with equipment (see DGP-WG/07-WP/19). The paper was tabled for discussion at the Ad hoc Working Group Meeting on Lithium Batteries, to be held in Montreal from 4 to 5 October 2007. To facilitate discussion at that meeting and at DGP/21, the IFALPA proposal is separated into two separate proposals; one for lithium metal batteries and one for lithium ion batteries.

1.2 The *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) provide a system to test, package, mark, label and ship dangerous goods, including a provision for notification to the pilot in command. Special Provision A45, however, exempts lithium metal and lithium ion batteries from the majority of these provisions.

1.3 Recent amendments to Special Provision A45 have resulted in a quasi-regulatory system, including a marking specific to lithium metal and lithium ion batteries, a telephone number for emergency

response, a drop test, packaging requirements, and a quantity limitation. Unlike the dangerous goods not shipped under special provision, however, all of the markings are in English and differ from the internationally-recognized diamond labels associated with dangerous goods. There is also no notification to the pilot in command.

1.4 In light of the number of incidents involving lithium metal and lithium ion batteries, it is felt that the quasi-regulatory treatment of these batteries is not justified. The batteries should be shipped fully in accordance with the provisions of the Technical Instructions, including marking, labelling, testing, packaging standards, and pilot notification. The only exception should be for batteries shipped in or with equipment, where some level of protection to the batteries is afforded. Provisions for passengers and crew members remain unchanged.

2. ACTION BY THE DGP

2.1 The DGP is invited to agree to the following:

2.2 Proposal A

2.2.1 The DGP is invited to remove the entry for A45 against UN 3090, **Lithium metal batteries** (including lithium alloy batteries), in column 7 of Table 3-1 in Part 3, Chapter 2 of the Technical Instructions.

2.3 Proposal B

2.4 The DGP is invited to remove the entry for A45 against UN 3480, **Lithium ion batteries** (including lithium ion polymer batteries), in column 7 of Table 3-1 in Part 3, Chapter 2 of the Technical Instructions.

2.4.1 If both proposal A and B are adopted, the DGP is invited to revise Special Provision A45 to read:

A45 ~~Lithium-c~~Cells and batteries offered for transport are not subject to other provisions of these Instructions if they are contained in or packed with equipment and meet the following:

- a) For a lithium metal or lithium alloy cell, the lithium content is not more than 1 g, and for a lithium ion cell, the ~~lithium equivalent content is not more than 1.5 g~~ Watt-hour rating is not more than 20 Wh;
- b) For a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g, and for a lithium ion battery, the ~~aggregate lithium equivalent content is not more than 8 g~~ Watt-hour rating is not more than 100 Wh. Lithium ion batteries subject to this provision must be marked with the Watt-hour rating on the outside case;
- 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, subsection 38.3;
- d) ~~Cells and batteries are separated so as to prevent short circuits and are packed in strong packagings, except when installed in equipment; and~~ must be protected from damage and short circuit, and the equipment must be equipped with an effective means of preventing accidental activation. The equipment must be packed in strong outer

packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.

e) ~~Except when installed in equipment, each package containing more than 24 lithium cells or 12 lithium batteries must in addition meet the following requirements~~ for packages containing no more than four cells installed in equipment or no more than two batteries installed in equipment, each package must be marked with the following:

i) ~~Each package must be marked indicating that it contains lithium batteries and that special procedures should be followed in the event that the package is damaged~~ an indication that the package contains "lithium metal" or "lithium ion" cells or batteries, as appropriate;

ii) ~~Each shipment must be accompanied with a document indicating that packages contain lithium batteries and that special procedures should be followed in the event a package is damaged~~ an indication that the package must be handled with care and that a flammability hazard exists if the package is damaged;

iii) ~~Each package is capable of withstanding a 1.2 m drop test in any orientation without damage to cells or batteries contained therein, without shifting of the contents so as to allow battery to battery (or cell to cell) contact and without release of contents~~ an indication that special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary;
and

iv) ~~Except in the case of lithium batteries packed with equipment, packages may not exceed 30 kg gross mass~~ a telephone number for additional information.

f) each consignment of one or more packages marked in accordance with paragraph e) must be accompanied with a document including the following:

i) an indication that the package contains "lithium metal" or "lithium ion" cells or batteries, as appropriate;

ii) an indication that the package must be handled with care and that a flammability hazard exists if the package is damaged;

iii) an indication that special procedures should be followed in the event that the package is damaged, to include inspection and repacking if necessary; and

iv) a telephone number for additional information.

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, ~~except in the case of a lithium ion cell the "lithium equivalent content"~~ in grams is calculated to be 0.3 times the rated capacity in ampere-hours.