



WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-FOURTH MEETING

Montréal, 28 October to 8 November 2013

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

5.1: Review of provisions for the transport of lithium batteries

TRANSPORT OF LARGE LITHIUM ION BATTERIES OVER 35 KG AND EQUIPMENT CONTAINING THEM

(Presented by PRBA – The Rechargeable Battery Association)

SUMMARY

The paper proposes amendments to Special Provision A99 and a new Packing Instruction to provide for the transport of large lithium ion batteries in excess of 35 kg.

Action by the DGP: The DGP is invited to amend Special Provision A99, Table 3-1 and to add a new packaging instruction in the Technical Instructions as presented in appendix to this working paper.

1. INTRODUCTION

1.1 The Dangerous Goods Panel has considered a number of proposals over the last two and half years regarding the transport of large lithium ion batteries and equipment containing them that exceed the 35 kg cargo aircraft limit. The proposals were intended to provide relief from the approval requirement in Special Provision A99 of the Technical Instructions.

1.2 It is important for panel members to recognize that large lithium ion batteries often consist of components that are not dangerous goods. The chart below (the same chart that was presented to the Working Group of the Whole in Auckland in 2009) is a list shipments of large lithium ion batteries by the Rechargeable Battery Association (PRBA) members. The chart shows the net mass of the lithium ion cells, battery components and packaging materials. Taken together, the packaging and components (non-dangerous goods) can average 60 per cent of the gross mass of the shipment. For example, a large lithium ion battery shipment with a mass of 240 kg should not be construed as 240 kg of lithium ion cells. In fact, in the example below, such a shipment may only contain 130 kg of lithium ion cells.

LIST OF SHIPMENTS OF LARGE LITHIUM ION BATTERIES BY PRBA MEMBERS			
Chemistry	Mass of Cells	Mass of Battery Components and Packaging	Total Gross Mass of Package
Lithium ion	300 kg	270 kg (47% of total gross mass)	570 kg
Lithium ion	130 kg	110 kg (45% of total gross mass)	240 kg
Lithium ion	52 kg	123 kg (70% of total gross mass)	175 kg
Lithium ion	48 kg	170 kg (78% of total gross mass)	218 kg

1.3 Based on comments that were offered by panel members over the past two and half years and after consulting with battery, automobile and packaging industries, PRBA has developed the proposal contain in the appendix to this working paper that includes amendments to Special Provision A99 and a new Packing Instruction XXX. The proposal provides for the safe transport of large lithium ion batteries up to 400 kg without an approval and a number of redundant safety measures in the new packing instruction. These include:

- a) Only one battery or piece of equipment may be contained in any outer packaging.
- b) Batteries may not exceed 50% state of charge, unless equipped with a service disconnect. The service disconnect must be removed during transit. For batteries with a non-removable service disconnect, the disconnect must be disengaged and locked to prevent accidental engagement during transit.
- c) Batteries may not exceed 400 kg net mass.
- d) Batteries must be secured against movement within the outer packaging and protected against short circuits.
- e) Equipment must be secured against movement within the outer packaging and equipped with an effective means of preventing accidental activation.
- f) Batteries, inner packaging or equipment must be completely surrounded by non-combustible and non-conductive cushioning material to provide thermal insulation during transport.
- g) The completed package must meet the Packing Group II performance requirements.
- h) Batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries or equipment may also be packed in strong outer packagings or protective enclosures (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions.

Chapter 3

SPECIAL PROVISIONS

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Table 3-2. Special provisions

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A99	<p>Irrespective of the quantity limits for cargo aircraft specified in column 13 of Table 3-1, and in Section <u>IA</u> of Packing Instructions 965 <u>or 968, or Section I of Packing Instructions</u>, 966, 967, 968, 969 and 970, <u>as appropriate</u>, a lithium battery or battery assembly (i.e. UN 3090 or UN 3480), including when packed with equipment or contained in equipment (i.e. UN 3091 or UN 3481) that meets the other requirements of Section <u>IA or Section I</u> of the applicable packing instruction, may have a <u>net</u> mass exceeding 35 kg, if:</p> <p>a) <u>approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment;</u> <u>or</u></p> <p>b) <u>In the case of lithium ion batteries, lithium ion batteries contained in equipment, and lithium ion batteries packed with equipment (UN 3480 and UN 3481), the batteries or equipment are packed in accordance with Packing Instruction XXX.</u></p>
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Part 4

PACKING INSTRUCTIONS

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Packing Instruction XXX

Passenger and cargo aircraft for UN 3473 (contained in equipment) only
Cargo aircraft only for UN3480 and UN3481 in excess of 35 Kg (see Special Provision A99)

General requirements

- Each cell or battery must meet all the provisions of 2.9.3.
- Part 4:1 requirements must be met.

OUTER PACKAGINGS

Boxes

Aluminium (4B)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H2)
Plywood (4D)
Reconstituted wood (4F)
Fibreboard (4G)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N1)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

ADDITIONAL PACKING REQUIREMENTS

- Only one battery or piece of equipment may be contained in any outer packaging.
- Batteries may not exceed 50% state of charge, unless equipped with a service disconnect. The service disconnect must be removed during transit. For batteries with a non-removeable service disconnect, the disconnect must be disengaged and locked to prevent accidental engagement during transit.
- Batteries may not exceed 400 kg net mass.
- Batteries must be secured against movement within the outer packaging and protected against short circuits.
- Equipment must be secured against movement within the outer packaging and equipped with an effective means of preventing accidental activation.

- Batteries, inner packaging or equipment must be completely surrounded by non-combustible and non-conductive cushioning material to provide thermal insulation during transport.
- The completed package must meet the Packing Group II performance requirements.
- Batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries or equipment may also be packed in strong outer packagings or protective enclosures (e.g., in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions.

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