



WORKING PAPER

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

Auckland, 4 to 8 May 2009

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

5.3: Review of provisions for dangerous goods relating to batteries

- a) lithium batteries**
- b) battery-powered devices**
- c) battery-powered mobility aids**

**PROPOSED CHANGES TO CARGO AIRCRAFT MASS LIMITATIONS FOR
LITHIUM ION AND LITHIUM METAL BATTERIES**

(Presented by PRBA – The Rechargeable Battery Association)

SUMMARY

This paper proposes the elimination of the lithium battery 35 kg cargo aircraft mass limit.

Action by the DGP-WG is in paragraph 2.

1. INTRODUCTION

1.1 The 35 kg cargo aircraft package mass limitation on lithium ion and lithium metal batteries (including batteries packed with or contained in equipment) places an unrealistic limitation on manufacturers of large lithium batteries, which are designed for use in hybrid-electric vehicles, electric vehicles, stationary, military and aerospace applications. In this paper, PRBA is proposing the elimination of the lithium battery 35 kg cargo aircraft mass limit, which would be generally consistent with other battery entries in the Technical Instructions.

1.2 Currently, shippers of large lithium batteries are required to secure an approval from the appropriate authority of the State of Origin, pursuant to Special Provision A99, if their batteries exceed the 35 kg mass limitation. Shippers of large *prototype* lithium batteries also must secure an approval pursuant to Special Provision A88. Shippers of large lithium batteries also must secure an approval if they want to utilize the provisions in Packing Instructions 965 or 969 that authorize the use of non-specification packaging if the batteries weigh over 12 kg and have an impact-resistant outer casing. While PRBA recognizes the importance of securing approvals for prototypes and batteries shipped in

non-specification packaging, it does not appear necessary to require an approval for batteries that exceed 35 kg.

1.3 Below is a chart showing recent shipments of large lithium ion batteries by PRBA members. The chart contains the 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 consignment. With that in mind, it seems impractical to limit lithium batteries to 35 kg on cargo aircraft.

LIST OF RECENT SHIPMENTS OF LARGE LITHIUM 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

1.4 Below is a list of battery entries and corresponding mass limits on passenger and cargo aircraft from the Technical Instructions I. As noted earlier, most of these battery entries are not assigned a mass limit when shipped by cargo aircraft.

UN number	Proper Shipping Name	Class	Passenger Aircraft Mass Limitation	Cargo Aircraft Mass Limitation
UN2794	Batteries, wet, filled with acid	8	30 kg	No limit
UN2795	Batteries, wet, filled with alkali	8	30 kg	No limit
UN2800	Batteries, wet, nonspillable	8	No limit	No limit
UN3028	Batteries, dry, containing potassium hydroxide solid	8	25 kg	230 kg
UN3171	Battery powered vehicle or equipment	9	No limit	No limit
UN3292	Batteries containing sodium	4.3	Forbidden	No limit

1.5 Lithium cells and batteries, unlike most other batteries listed in the Technical Instructions, are subject to the following UN testing requirements prior to being offered for transportation: Altitude Simulation, Thermal, Vibration, Shock, External Short Circuit, Impact,

Overcharge and Forced Discharge. These tests provide an additional measure of safety to ensure the batteries are able to withstand conditions normally incident to transportation.

1.6 If removal of the 35 kg limit is approved, Special Provision A99 would no longer be necessary and could be deleted.

2. ACTION BY THE DGP-WG

2.1 Based on the information contained above, the DGP-WG is invited to amend the following sections in the Technical Instructions:

- a) for entry “Lithium metal batteries” (UN3090) in Column 12 of Table 3-1 Dangerous Goods List, delete “35 kg” and replace with “No Limit.” Also delete “A99” from Column 7 for this entry.
- b) for entry “Lithium ion batteries” (UN3480) in Column 12 of Table 3-1 Dangerous Goods List, delete “35 kg” and replace with “No Limit”. Also delete “A99” from Column 7 for this entry.
- c) in Section I of Packing Instructions 966, 967, 969 and 970 delete “35 kg” under cargo package quantity and replace with “No limit.”
- d) delete Special Provision A99.

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