



## **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**

### **SECONDARY LITHIUM BATTERIES**

(Presented by H. Brockhaus)

#### **SUMMARY**

This paper provides supplemental information about the rationale applied to the proposed packaging and shipping requirements for large lithium-ion batteries as outlined in DGP/24-WP/65.

With DGP/24-WP/65 a limitation of the battery state of charge (SOC) is implemented for the first time following discussions at the Dangerous Goods Panel (DGP) Working Group of the Whole Meeting in April 2013 in Montreal. Reasonable packaging and shipping requirements adjusted to a limited SOC have been added to the working paper.

## **1. INTRODUCTION**

1.1 DGP/24-WP/65 offers two approaches for the incorporation of transport conditions for large lithium-ion batteries (UN 3480) in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284).

1.2 Both approaches promote exactly the same content. The first includes such additional conditions in a new special provision, while the second proposal incorporates these conditions as a new paragraph within existing Packaging Instruction 965.

1.3 Concerns about safety measures and transport conditions included in previous working papers, no longer contained in the actual DGP/24-WP/65, were raised. These concerns will be discussed and supplemental information given.

1.4 Transportation requirements for large lithium ion batteries have been discussed for a long time and several different approaches have been presented. SOC has not been considered up to now.

Rationale was included and intensively discussed at the 2013 Meeting of the Dangerous Goods Panel Working Group of the Whole (DGP-WG/13, Montreal, 15 to 19 April 2013) (DGP-WG/13- WP/60) (see paragraph 3.5.1 of the DGP-WG/13 report (DGP/24-WP/3).

1.4.1 The safety measures for the transport of large lithium ion batteries proposed in DGP-WG/13-WP/60 were:

- a) Packing Group I performance level outer packaging for lithium battery;
- b) One single battery per package only;
- c) Strong outer casing for battery required;
- d) Inner packaging, leak proof, required;
- e) Non-combustible, non-conductive cushioning material;
- f) Means of fully disconnecting battery terminals from internal electrical components; and
- g) Clear battery marking that UN 38.3 tests have been passed.

1.4.2 The guiding principles and requirements of DGP/24-WP/65 are:

- a) Packing Group II performance level outer packaging for lithium battery;
- b) One single battery per package only;
- c) Strong outer casing for battery required;
- d) Inner packaging, leak proof, required; and
- e) Non-combustible, non-conductive cushioning material.

1.5 The currently proposed battery, packaging and documentation requirements do not form a reduction of transport safety versus previous proposals but represent a reasonable set of conditions for the safe transport of a large lithium-ion batteries.

1.6 Packing Group II is the regular packaging performance level for UN 3480 **Lithium ion batteries** fully suitable to cope with all normal air transport conditions. Increasing the requirement to Packing Group I would mean an increased overall safety level. This safety increase was intended in previous working papers to promote the acceptance for the transport without an approval from the authority of the State of Origin as required in Special Provision A99.

1.7 Requirements for Packing Group I were discussed at DGP-WG/13 but no clear decision was taken that this requirement was key for the adoption of a related proposal. Furthermore, various panel members clearly voted for Packing Group II being the appropriate packaging level, because in combination with the SOC this would be a higher level of safety.