



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

SPECIAL PROVISION A123

(Presented by G. A. Leach)

SUMMARY

This paper seeks to clarify that batteries or any type, if they have the potential for a dangerous evolution of heat, must be protected against unintentional activation.

Action by the DGP-WG is in paragraph 2.

1. INTRODUCTION

1.1 At Working Group 06, WP/6 proposed that Special Provision A123, which appears in Table 3-1 against the light type entry for “Batteries, electric storage”, be amended so as to clarify that if capable of a dangerous evolution of heat, batteries and equipment must be protected against unintentional activation. Although the intent of the paper was supported, it was withdrawn after it was pointed out that similar provisions were equally relevant to other battery entries.

1.2 A study of Table 3-1 has identified the following entries for various types of batteries:

Proper shipping name	UN number
Batteries, electric storage	n/a
Batteries, wet, filled with acid electric storage	2794

Proper shipping name	UN number
Batteries, wet, filled with alkali , electric storage	2795
Batteries, wet, non-spillable , electric storage	2800
Battery-powered equipment	3171
Battery-powered vehicle	3171
Lithium batteries	3090
Lithium batteries contained in equipment	3091
Lithium batteries packed with equipment	3091

Note.— Batteries, dry, containing potassium hydroxide solid, electric storage, UN3028, have been discounted because until water is added to the battery, it is not capable of producing an electrical charge and thus protection against short circuit or inadvertent activation is not applicable.

1.3 Initially, it appeared that the simplest way of addressing this issue would be to develop a new Special Provision containing the text proposed in WG06-WP/6 and apply this to all battery entries. However, other aspects have had to be taken into account e.g. batteries not subject to the requirements of the Technical Instructions and duplications which arise due to existing requirements for protection against short circuit contained in Packing Instructions. Consequently, this has been reflected in the proposals below.

2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to the following action:

2.1.1 For “Batteries, electric storage”, it is proposed to amend Special Provision A123 as follows:

A123 This entry applies to Batteries, electric storage, not otherwise listed in Table 3-1. Examples of such batteries are: alkali-manganese, zinc-carbon, nickel-metal hydride and nickel-cadmium batteries. Any electrical battery or battery-powered device, equipment or vehicle having the potential of a dangerous evolution of heat ~~that is not prepared~~ must be packed for transport so as to prevent:

a) -a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or, in the case of equipment, by disconnection of the battery and protection of exposed terminals, or removal of circuit breakers or removal of circuit breakers); and

b) unintentional activation is forbidden from transport.

2.1.2 For **Batteries, wet, filled with acid** electric storage (UN 2794), **Batteries, wet, filled with alkali**, electric storage (UN 2795), **Batteries, wet, non-spillable**, electric storage (UN 2800),

Battery-powered equipment (UN 3171), Battery-powered vehicle (UN 3171), Lithium batteries (UN 3090), Lithium batteries contained in equipment (UN 3091) and Lithium batteries packed with equipment (UN 3091) it is proposed to add the following Special Provision to Table 3-2:

AXX Any electrical battery or battery powered device, equipment or vehicle having the potential of a dangerous evolution of heat must be packed for transport so as to prevent:

a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals, or removal of circuit breakers); and

b) unintentional activation.

Note.— The requirement for protection against short circuit appears in Packing Instruction 800 (for UN 2794 and UN 2795), Packing Instruction 806 (for UN 2800), Packing Instruction 900 (for UN 3171), Packing Instruction 903 (for UN 3090) and Packing Instructions 912 and 918 for (UN 3091). The Working Group is invited to consider whether it is acceptable for duplications to exist and if not whether this requirement should appear in the applicable Packing Instruction or the new Special Provision.

2.1.3 For **Batteries, wet, non-spillable**, electric storage, UN 2800, there is also the need to address batteries which are not subject to the requirements of the Technical Instructions in accordance with Special Provision A67. Consequently, it is proposed that Special Provision A67 is amended as follows:

A67 Non-spillable batteries meeting the requirements of Packing Instruction 806 are not subject to these Instructions if, at a temperature of 55°C, the electrolyte will not flow from a ruptured or cracked case. The battery must not contain any free or unabsorbed liquid. ~~When packaged for transport, the terminals must be protected from short circuit such as by the use of non-conductive caps that entirely cover the terminals.~~ Any electrical battery or battery powered device, equipment or vehicle having the potential of dangerous evolution of heat must be packed for transport so as to prevent:

a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals, or removal of circuit breakers); and

b) unintentional activation.

2.1.4 For **Lithium batteries** (UN 3090), **Lithium batteries contained in equipment** (UN 3091) and **Lithium batteries packed with equipment** (UN 3091), there is also the need to address batteries which are not subject to the requirements of the Technical Instructions in accordance with Special Provision A45. Consequently, it is proposed that Special Provision A45 is amended as follows:

A45 Lithium cells and batteries offered for transport are not subject to other provisions of these Instructions if they meet the following:

...

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.

Any lithium battery or lithium battery powered device, equipment or vehicle having the potential of dangerous evolution of heat must be packed for transport so as to prevent:

a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals, or removal of circuit breakers); and

b) unintentional activation.

2.1.5 This will result in the following consequential changes to Table 3-1:

<i>Name</i>	<i>UN No</i>	<i>Class or division</i>	<i>Subsidiary Risk</i>	<i>Labels</i>	<i>State variations</i>	<i>Special provisions</i>
1	2	3	4	5	6	7
Batteries, wet, filled with acid electric storage	2794	8		Corrosive		A51 AXX
Batteries, wet, filled with alkali, electric storage	2795	8		Corrosive		A51 AXX
Batteries, wet, non-spillable, electric storage	2800	8		Corrosive		A48 A67 AXX
Battery-powered equipment	3171	9		Corrosive		A21 A67 A87 A94 AXX

<i>Name</i>	<i>UN No</i>	<i>Class or division</i>	<i>Subsidiary Risk</i>	<i>Labels</i>	<i>State variations</i>	<i>Special provisions</i>
1	2	3	4	5	6	7
Battery-powered vehicle	3171	9		Corrosive		A21 A67 A87 A94 <u>AXX</u>
Lithium batteries	3090	9		Miscellaneous		A45 A88 A99 <u>AXX</u>
Lithium batteries contained in equipment	3091	9		Miscellaneous		A45 A48 <u>AXX</u>
Lithium batteries packed with equipment	3091	9		Miscellaneous		A45 <u>AXX</u>

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