



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

Montréal, 15 to 19 April 2013

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 2015-2016 Edition

2.4 : Part 4 — Packing Instructions

TRANSPORT OF WASTE LITHIUM BATTERIES AND DAMAGED OR DEFECTIVE LITHIUM BATTERIES

(Presented by PRBA-The Rechargeable Battery Association)

SUMMARY

This paper addresses the issues associated with the transport of waste lithium batteries and damaged or defective lithium batteries based on new Special Provisions and Packing Instructions adopted in December 2012 by the UN Sub-Committee of Experts.

1. INTRODUCTION

1.1 At the forty-second session of the UN Sub-Committee of Experts on the Transport of Dangerous Goods, a new Special Provision and Packing Instructions were adopted for the transport of damaged or defective lithium batteries. In addition, the Sub-Committee adopted a new Special Provision and Packing Instruction for waste lithium batteries. The Special Provisions and Packing Instructions adopted by the Sub-Committee were based on proposals submitted in 2011 and 2012 by PRBA and RECHARGE, The European Association for Advanced Rechargeable Batteries.

1.2 Special Provision A183 of the Technical Instructions prohibits the transport of waste lithium batteries for disposal or recycling unless approved by the appropriate national authority of the State of origin and the State of the operator. In those cases where shipments of waste lithium batteries are authorized by the national authority and operator, we believe it would be beneficial to provide guidance on the type of packaging that could be utilized for these shipments. Therefore, the DGP-WG may want to consider including the Packing Instructions adopted by the Sub-Committee in the Supplement to the Technical Instructions. An unofficial version of the Packing Instruction (P909) is provided in Exhibit A.

1.3 Special Provision A154 of the Technical Instructions prohibit the transport of lithium batteries identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit. The lengthy discussions during UN Sub-Committee meetings in 2011 and 2012 regarding the transport of damaged or defective lithium batteries clearly showed there is a need to ship these batteries by all modes of transport. The recent events involving the Dreamliner lithium ion battery is an example of a time-sensitive situation where a damaged lithium ion battery required immediate failure analysis and transporting the battery by air to a lab may have been warranted.

1.4 We believe the Special Provision and Packing Instructions for damaged or defective lithium batteries adopted by the Sub-Committee should be considered by the DGP-WG for incorporation into the Technical Instructions. An unofficial version of the Special Provision and Packing Instructions adopted by the UN Sub-Committee are attached as Exhibit B. However, we recognize that additional packaging requirements and approvals may be warranted for shipments of damaged or defective lithium batteries by air.

1.5 In order to facilitate the transport of damaged or defective lithium batteries by air, we welcome the DGP-WG's views on whether provisions should be included in the Technical Instructions authorizing the transport of damaged or defective lithium batteries. If so, we welcome comments on what conditions (e.g., with approval) and the type of packaging should be considered.

Exhibit A

P909	Packing Instruction	P909
<p>This packing instruction applies to UN Nos. 3090, 3091, 3480 and 3481 transported for disposal or recycling, either packed together with or packed without non-lithium batteries:</p> <p>(1) Cells and batteries shall be packed in accordance with the following:</p> <p>(a) The following packagings are authorized, provided that the general provisions of 4.1.1 and 4.1.3, are met:</p> <p style="padding-left: 40px;">Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G); Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H2); and Jerricans (3A2, 3B2, 3H2).</p> <p>(b) Packagings shall conform to the packing group II performance level.</p> <p>(c) Metal packagings shall be fitted with a non-conductive lining material (<i>e.g.</i>, plastics) of adequate strength for the intended use.</p> <p>(2) However, lithium ion cells with a Watt-hour rating of not more than 20 Wh, lithium ion batteries with a Watt-hour rating of not more than 100 Wh, lithium metal cells with a lithium content of not more than 1 g and lithium metal batteries with an aggregate lithium content of not more than 2 g may be packed in accordance with the following:</p> <p>(a) In strong outer packaging up to 30 kg gross mass meeting the general provisions of 4.1.1, except 4.1.1.3, and 4.1.3.</p> <p>(b) Metal packagings shall be fitted with a non-conductive lining material (<i>e.g.</i>, plastics) of adequate strength for the intended use.</p> <p>(3) For cells or batteries contained in equipment, strong outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use, may be used. Packagings need not meet the requirements of 4.1.1.3. Large equipment may be offered for transport unpackaged or on pallets when the cells or batteries are afforded equivalent protection by the equipment in which they are contained.</p> <p>(4) In addition, for cells or batteries with a gross mass of 12 kg or more employing a strong, impact resistant outer casing, strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packagings capacity and its intended use, may be used. Packagings need not meet the requirements of 4.1.1.3.</p>		

Exhibit B

SP 376 Lithium ion cells or batteries and lithium metal cells or batteries identified as being damaged or defective such that they do not conform to the type tested according to the applicable provisions of the Manual of Tests and Criteria shall comply with the requirements of this Special Provision.

For the purposes of this Special Provision, these may include, but are not limited to:

- Cells or batteries identified as being defective for safety reasons;
- Cells or batteries that have leaked or vented;
- Cells or batteries that cannot be diagnosed prior to transport; or
- Cells or batteries that have sustained physical or mechanical damage.

Note: In assessing a battery as damaged or defective, the type of battery and its previous use and misuse shall be taken into account.

Cells and batteries shall be transported according to the provisions applicable to UN3090, UN3091, UN3480 and UN3481, except Special Provision 230 and as otherwise stated in this Special Provision.

Packages shall be marked “Damaged/Defective Lithium-ion Batteries” or “Damaged/Defective Lithium Metal Batteries”, as applicable.

Cells and batteries shall be packed in accordance with Packing Instructions P908 of 4.1.4.4. or LP904, of 4.1.4.3. as applicable.

Cells and batteries liable to rapidly disassemble, dangerously react, produce a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours under normal conditions of transport shall not be transported except under conditions specified by the Competent Authority.

P908	PACKING INSTRUCTION	P908
	This instruction applies to UN Nos. 3090, 3091, 3480 and 3481	
	<p>The following packagings are authorized for damaged or defective lithium ion cells and batteries and lithium metal cells and batteries including those contained in equipment, provided the general provisions of 4.1.1 and 4.1.3 are met:</p> <p>For cells and batteries and equipment containing cells and batteries:</p> <p style="padding-left: 40px;">Drums (1A2, 1B2, 1N2, 1H2, 1D, 1G) Boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2) Jerricans (3A2, 3B2, 3H2)</p> <p>Packagings shall conform to the packing group II performance level.</p> <p>Each cell or battery or equipment containing such cells and batteries:</p>	

1. Shall be individually packed in inner packaging and placed inside of an outer packaging. The inner packaging or outer packaging shall be leak-proof to prevent the potential release of electrolyte.
2. Each inner packaging shall be surrounded by sufficient non-combustible and non-conductive thermal insulation material to protect against a dangerous evolution of heat.
3. Sealed packagings shall be fitted with a venting device when appropriate.
4. Appropriate measures shall be taken to minimize the effects of vibrations and shocks, prevent movement of the cells or batteries within the package that may lead to further damage and a dangerous condition during transport. Cushioning material that is non-combustible and non-conductive may also be used to meet this requirement.
5. Non combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured.

For leaking cells or batteries, sufficient inert absorbent material shall be added to the inner or outer packaging to absorb any release of electrolyte.

A cell or battery with a net mass of more than 30 kg shall be limited to one cell or battery per outer package.

Additional requirements:

Cells or batteries shall be protected against short circuit.

LP904	PACKING INSTRUCTION	LP904
<p>This instruction applies to UN Nos. 3090, 3091, 3480 and 3481</p>		
<p>The following large packagings are authorized for a single damaged or defective battery and for a single damaged or defective battery contained in equipment, provided the general provisions of 4.1.1 and 4.1.3 are met.</p> <p>For cells and batteries and equipment containing cells and batteries:</p> <ul style="list-style-type: none">steel (50A)aluminium (50B)metal other than steel or aluminium (50N)rigid plastics (50H)plywood (50D) <p>Packagings shall conform to the packing group II performance level.</p> <ol style="list-style-type: none">1. Each battery or equipment containing such battery shall be individually packed in inner packaging and placed inside of an outer packaging. The inner packaging or outer packaging shall be leak-proof		

to prevent the potential release of electrolyte.

2. Each inner packaging shall be surrounded by sufficient non-combustible and non-conductive thermal insulation material to protect against a dangerous evolution of heat.
3. Sealed packagings shall be fitted with a venting device when appropriate.
4. Appropriate measures shall be taken to minimize the effects of vibrations and shocks, prevent movement of the cells or batteries within the package that may lead to further damage and a dangerous condition during transport. Cushioning material that is non-combustible and non-conductive may also be used to meet this requirement.
5. Non combustibility shall be assessed according to a standard recognized in the country where the packaging is designed or manufactured.

For leaking cells or batteries, sufficient inert absorbent material shall be added to the inner or outer packaging to absorb any release of electrolyte.

Additional requirements:

Cells or batteries shall be protected against short circuit.

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