



## DANGEROUS GOODS PANEL (DGP)

### TWENTY-EIGHTH MEETING

Virtual, 15 to 19 November 2021

**Agenda Item 4: Managing safety risks posed by the carriage of lithium batteries by air (Ref: Job Card DGP.003.03)**

### LITHIUM BATTERIES INSTALLED IN VEHICLES THAT ARE NOT UN 38.3 TESTED

(Presented by T. Muller)

#### SUMMARY

This working paper proposes an alignment of the text of Packing Instructions 950, 951 and 952 with the text of Special Provision A88 to include the need for an approval of the appropriate authority of the State of the Operator for transport of lithium batteries that are not UN 38.3 tested.

**Action by the DGP:** The DGP is invited to consider the proposed amendment shown in the appendix to this working paper.

#### 1. INTRODUCTION

1.1 The Dangerous Goods European Liaison Group — Advisory Group to the European Union Aviation Safety Agency (EASA) (DGELG) identified an inconsistency in the approval process for batteries that are not tested against the requirements set in Part III, subsection 38.3 of the UN *Manual of Tests and Criteria*. The inconsistency exists between non-tested batteries that are installed in vehicles and those that are not. This inconsistency was discussed by the DGP Working Group on the Supplement, which came to the same conclusion.

1.2 For lithium batteries installed in vehicles, the appropriate Packing Instruction (950, 951 or 952) indicates that for lithium batteries not meeting the provisions of Part 2;9.3, only an approval by the State of Origin is required. There is no requirement to obtain an approval by the State of the Operator.

1.3 For lithium batteries not installed in vehicles, including batteries packed with equipment or contained in equipment, it is clearly stated in Special Provision A88 that an approval by both the State of Origin and the State of the Operator is needed when the batteries have not been tested against the requirements set in Part III, subsection 38.3 of the UN *Manual of Tests and Criteria*.

1.4 The current text from Packing Instruction 950 (similar text exists in Packing Instructions 951 and 952) and Special Provision A88 is provided below:

**Packing Instruction 950**

Passenger and cargo aircraft for UN 3166 only  
(See Packing Instruction 220 for flammable gas-powered engines and machinery, Packing Instruction 378 for flammable liquid-powered engines and machinery, Packing Instruction 951 for flammable gas-powered vehicles, Packing Instruction 952 for battery-powered equipment and vehicles or Packing Instruction 972 for engines or machinery containing only environmentally hazardous fuels)

**General requirements**

Part 4, Chapter 1 requirements must be met, including:

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**ADDITIONAL PACKING REQUIREMENTS**

...

*Batteries*

All batteries must be installed and securely fastened in the battery holder of the vehicle and must be protected in such a manner so as to prevent damage and short circuits. In addition:

- 1) if spillable batteries are installed, and it is possible for the vehicle to be handled in such a way that batteries would not remain in their intended orientation, they must be removed and packed according to Packing Instruction 492 or 870 as applicable;
- 2) if lithium batteries are installed, they must meet the provisions of Part 2;9.3, unless otherwise approved by the appropriate authority of the State of Origin, must be securely fastened in the vehicle and must be protected in such a manner so as to prevent damage and short circuits; and
- 3) if sodium batteries are installed they must conform to the requirements of Special Provision A94.

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A88 Pre-production prototypes of lithium batteries or cells, when these prototypes are transported for testing, or low production runs (i.e. annual production runs consisting of not more than 100 lithium batteries or cells) of lithium batteries or cells that have not been tested to the requirements in Part III, subsection 38.3 of the UN *Manual of Tests and Criteria* may be transported aboard cargo aircraft if approved by the appropriate authority of the State of Origin and the State of the Operator and the requirements in Packing Instruction 910 of the Supplement are met.

A copy of the document of approval including the quantity limitations must accompany the consignment. Transport in accordance with this special provision must be noted on the dangerous goods transport document.

Irrespective of the limit specified in column 13 of Table 3-1, the battery or battery assembly as prepared for transport may have a mass exceeding 35 kg.

1.5 The process for the transport of lithium batteries which have not been tested against the requirements set in Part III, subsection 38.3 of the UN *Manual of Tests and Criteria* should be similar whether they are installed in vehicles or not. It is believed that a non-tested battery installed in a vehicle poses at least an equivalent risk compared to a non-tested battery installed in equipment. Therefore, a

consistent approach for the evaluation of the risk related to the transport of non-tested batteries seems reasonable. This implies that an approval from both the State of Origin and of the State of the Operator should be required.

1.6 To address the inconsistency, this working paper proposes an amendment to Packing Instructions 950, 951 and 952 in Part 4;11 of the Technical Instructions. This ensures the alignment of the approval process for batteries which have not been tested against the requirements set in Part III, subsection 38.3 of the UN *Manual of Tests and Criteria*, independent of the fact they are installed in vehicles, contained in equipment or transported as such.

1.7 Additionally it was found that duplicate text exist in the additional packing requirements related to batteries in Packing Instructions 950 and 951. Therefore it is proposed to delete the duplicated text in paragraph 2 of these additional packing requirements related to batteries.

## 2. ACTION BY THE DGP

2.1 The DGP is invited to consider the proposed amendment shown in the appendix to this working paper.

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APPENDIX

PROPOSED AMENDMENT TO PART 4 OF THE TECHNICAL INSTRUCTIONS

Part 4

PACKING INSTRUCTIONS

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Chapter 11

CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

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**Packing Instruction 950**

Passenger and cargo aircraft for UN 3166 only  
(See Packing Instruction 220 for flammable gas-powered engines and machinery, Packing Instruction 378 for flammable liquid-powered engines and machinery, Packing Instruction 951 for flammable gas-powered vehicles, Packing Instruction 952 for battery-powered equipment and vehicles or Packing Instruction 972 for engines or machinery containing only environmentally hazardous fuels)

**General requirements**

Part 4, Chapter 1 requirements must be met, including:

...

**ADDITIONAL PACKING REQUIREMENTS**

...

*Batteries*

All batteries must be installed and securely fastened in the battery holder of the vehicle and must be protected in such a manner so as to prevent damage and short circuits. In addition:

- 1) if spillable batteries are installed, and it is possible for the vehicle to be handled in such a way that batteries would not remain in their intended orientation, they must be removed and packed according to Packing Instruction 492 or 870 as applicable;
- 2) if lithium batteries are installed, they must meet the provisions of Part 2;9.3, unless otherwise approved by the appropriate authority of the State of Origin, ~~must be securely fastened in the vehicle and must be protected in such a manner so as to prevent damage and short circuits.~~ If lithium batteries are installed and have not been tested to the requirements in Part III, subsection 38.3 of the UN *Manual of Tests and Criteria*, they may be transported aboard cargo aircraft if approved by the appropriate authority of the State of Origin and the State of the Operator; and
- 3) if sodium batteries are installed they must conform to the requirements of Special Provision A94.

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## Packing Instruction 951

Cargo aircraft only for UN 3166 only

(See Packing Instruction 220 for flammable gas-powered engines and machinery, Packing Instruction 378 for flammable liquid-powered engines and machinery, Packing Instruction 950 for flammable liquid-powered vehicles, Packing Instruction 952 for battery-powered equipment and vehicles or Packing Instruction 972 for engines or machinery containing only environmentally hazardous fuels)

### General requirements

Part 4, Chapter 1 requirements must be met, including:

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### ADDITIONAL PACKING REQUIREMENTS

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#### *Batteries*

All batteries must be installed and securely fastened in the battery holder of the vehicle and must be protected in such a manner so as to prevent damage and short circuits. In addition:

- 1) if spillable batteries are installed, and it is possible for the vehicle to be handled in such a way that batteries would not remain in their intended orientation, they must be removed and packed according to Packing Instruction 492 or 870 as applicable;
- 2) if lithium batteries are installed, they must meet the provisions of Part 2;9.3, unless otherwise approved by the appropriate authority of the State of Origin, ~~must be securely fastened in the vehicle and must be protected in such a manner so as to prevent damage and short circuits~~. If lithium batteries are installed and have not been tested to the requirements in Part III, subsection 38.3 of the UN *Manual of Tests and Criteria*, they may be transported aboard cargo aircraft if approved by the appropriate authority of the State of Origin and the State of the Operator; and
- 3) if sodium batteries are installed they must conform to the requirements of Special Provision A94.

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## Packing Instruction 952

Passenger and cargo aircraft for UN 3171 only  
(See Packing Instruction 220 for flammable gas-powered engines and machinery, Packing Instruction 378 for flammable liquid-powered engines and machinery, Packing Instruction 950 for flammable liquid-powered vehicles, Packing Instruction 951 for flammable gas-powered vehicles or Packing Instruction 972 for engines or machinery containing only environmentally hazardous fuels)

### General requirements

Part 4, Chapter 1 requirements must be met, including:

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### ADDITIONAL PACKING REQUIREMENTS

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Battery-powered vehicles, machines or equipment must meet the following requirements:

#### *Batteries*

All batteries must be installed and securely fastened in the battery holder of the vehicle, machine or equipment and must be protected in such a manner so as to prevent damage and short circuits. In addition:

- 1) if spillable batteries are installed, and it is possible for the vehicle, machine or equipment to be handled in such a way that batteries would not remain in their intended orientation, they must be removed and packed according to Packing Instruction 492 or 870 as applicable;
- 2) if lithium batteries are installed in a vehicle, they must meet the provisions of Part 2;9.3, unless otherwise approved by the appropriate authority of the State of Origin. If lithium batteries are installed and have not been tested to the requirements in Part III, subsection 38.3 of the UN Manual of Tests and Criteria, they may be transported aboard cargo aircraft if approved by the appropriate authority of the State of Origin and the State of the Operator. Where the lithium battery is removed from the vehicle and is packed separate from the vehicle in the same outer packaging, the package must be consigned as UN 3481— **Lithium ion batteries packed with equipment** or UN 3091 — **Lithium metal batteries packed with equipment** and packed according to Packing Instruction 966 or 969, as applicable; and
- 3) if sodium batteries are installed they must conform to the requirements of Special Provision A94.

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