International Civil Aviation Organization

DGP/25-WP/5
24/8/15

WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-FIFTH MEETING

Montréal, 19 to 30 October 2015

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 2017-2018 Edition

REVISION TO PACKING INSTRUCTION 952 FOR SMALL BATTERY-POWERED VEHICLES

(Presented by D. Brennan)

SUMMARY

This working paper proposes revisions to Packing Instruction 952 to address small battery-powered vehicles.

Action by the DGP: The DGP is invited to revise Packing Instruction 952 as shown in Appendix B to this working paper.

1. INTRODUCTION

1.1 The structure and content of Packing Instruction 952, which applies to UN 3171, **Battery-powered equipment** and **Battery-powered vehicles** is based on the assumption that the vehicles and equipment are large and robust enough not to require being placed in a packaging as there are no requirements or provisions in Packing Instruction 952 for the equipment or vehicle to be in an outer packaging.

1.2 However, there are now many small lithium battery-powered vehicles that unless packaged are subject to damage during transport; examples of these are small gyro stabilised unicycles and underwater propulsion units, see Appendix A for images.

1.3 All of the items shown meet the definition of a vehicle as stated in Special Provision A21, which reads: “vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are electrically-powered cars, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, trucks, locomotives, bicycles (pedal cycles with an electric motor) and other vehicles of this type (e.g. self-balancing vehicles or vehicles not equipped with at least one seating position)…”.

1.4 In addition, the UN Subcommittee adopted a change to Special Provision 240 that recognised that vehicles may have to be shipped in a packaging and that some parts of the vehicle, including the battery may be detached from the vehicle when being shipped. This change is being proposed for adoption into Special Provision A21, see DGP/25-WP/13.

1.5 The change adopted by the UN Subcommittee is as follows: “…This includes vehicles transported in a packaging. In this case some parts of the vehicle may be detached from its frame to fit into the packaging.”.

1.6 To address these specific issues, and to ensure that lithium battery-powered vehicles in particular are protected from damage during transport, it is proposed to adopted some specific text into Packing Instruction 952 to require the vehicle to be placed in a strong, rigid outer packaging if the vehicle can be handled in other than an upright orientation.

1.7 The standard approach adopted for the packing instructions for articles in the Technical Instructions is to require the use of strong outer packagings. However, lithium ion batteries with a Watt-hour rating exceeding 100 Wh, when shipped as **Lithium ion batteries** (UN 3480) must be in UN specification packagings, or in the case of **Lithium ion batteries packed with equipment** (UN 3481) either the battery or the battery and equipment must in UN specification packagings. The DGP is therefore invited to consider whether a lithium ion battery which has been removed from a vehicle should be required to be packed in a UN specification packaging.

1.8 The DGP may also wish to consider if the change from the UN to Special Provision A21 should be adopted into the Technical Instructions or whether it should be required that all batteries must be secured within the vehicle?

2. ACTION BY THE DGP

2.1 The DGP is invited to revise Packing Instruction 952 as shown in Appendix B to this working paper.

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APPENDIX A

SMALL GYRO STABILISED UNICYCLES AND UNDERWATER PROPULSION UNITS

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APPENDIX B

PROPOSED AMENDMENT TO PART 4 OF THE TECHNICAL INSTRUCTIONS

Part 4

PACKING INSTRUCTIONS

Chapter 11

CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

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Packing Instruction 952

Passenger and cargo aircraft for UN 3171 only
(See Packing Instruction 950 for flammable liquid-powered vehicles and engines or
Packing Instruction 951 for flammable gas-powered vehicles and engines)

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ADDITIONAL PACKING REQUIREMENTS

This entry applies to vehicles and equipment which are powered by wet batteries, sodium batteries or lithium batteries and which are transported with these batteries installed, unless the vehicle is powered by a lithium or sodium battery and shipped in a disassembled state. Where the vehicle is shipped in a disassembled state the lithium or sodium battery must be packed in a strong, rigid outer packaging [UN specification outer packaging] of the type show below. Examples of such vehicles and equipment are electrically-powered cars, lawn mowers, wheelchairs and other mobility aids. Vehicles that also contain an internal combustion engine must be consigned under the entry UN 3166 Vehicle (flammable gas powered) (See Packing Instruction 951) or Vehicle (flammable liquid powered) (See Packing Instruction 950), as appropriate.

The vehicles must be oriented to prevent inadvertent leakage of dangerous goods. Where vehicles could possibly be handled in other than an upright position, the vehicle must be secured in a strong, rigid outer packaging of the type below. The vehicle must be secured by means capable of restraining the vehicle in the outer packaging to prevent any movement during transport which would change the orientation or cause the vehicle to be damaged.

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. Except as otherwise provided, lithium batteries 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.

Other operational equipment

1) Dangerous goods required for the operation or safety of the vehicle, machine or equipment, such as fire extinguishers, tire inflation canisters or safety devices, must be securely mounted in the vehicle, machine or equipment. Aircraft may also contain other articles and substances which would otherwise be classified as

dangerous goods but which are installed in that aircraft in accordance with the pertinent airworthiness requirements and operating regulations. If fitted, life-rafts, emergency escape slides and other inflation devices must be protected such that they cannot be activated accidentally. Vehicles containing dangerous goods identified in Table 3-1 as forbidden on passenger aircraft may only be transported on cargo aircraft. Replacements for the dangerous goods permitted must not be carried under this packing instruction.

2) Vehicles equipped with theft-protection devices, installed radio communications equipment or navigational systems must have such devices, equipment or systems disabled.

[Outer packagings (see 6;3.1) ─ lithium ion or sodium batteries packed with the vehicle

Boxes	*Drums*	*Jerricans*
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Other metal (4N)	Plastics 1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)]	
Reconstituted wood (4F)		
Steel (4A)		

Strong outer packagings ─ vehicles

Boxes	*Drums*	*Jerricans*
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
Other metal	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

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