



DANGEROUS GOODS PANEL (DGP)

TWENTY-FOURTH MEETING

Montréal, 28 October to 8 November 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

PACKING INSTRUCTION 203: UN 1950 AND UN 2037

(Presented by B. Firkins)

SUMMARY

This paper proposes amendments to Packing Instruction 203 relating to UN 1950 and UN 2037. The manner in which the information is currently presented in Packing Instruction 203 gives the impression that UN 2037 (Gas cartridges or Receptacles, small, containing gas) are not required to be packed in UN specification outer packaging. Also the current wording of Packing Instruction 203 is ambiguous with regard to the term “receptacle”.

Action by the DGP: The DGP-WG is invited to consider and adopt a revised Packing Instruction 203 that:

- makes it clear that outer packaging conforming to Part 6 is required for UN 2037;
- permits outer packagings of drums and jerricans; and
- includes a note to Packing Instruction 203 to make it clear that references in the packing instruction to “receptacle” includes aerosols.

Should the DGP consider that the proposed amendments to Packing Instruction 203 are satisfactory, then the DGP is invited to consider similar amendments to Packing Instruction Y203.

The DGP is invited to comment upon whether there should be closer harmonization between the Technical Instructions and the UN Model Regulations – and if so, whether UN 2037 and UN 1950 should have different packing instructions, as per the UN Model Regulations; or the Model Regulations ought to be considered for amendment, based on the experience of ICAO member States.

The proposed Packing Instruction 203 is shown at Appendix A. Proposed amendments to Packing Instruction Y203 are shown at Appendix B.

1. INTRODUCTION

1.1 Packing Instruction 203 for UN 1950 **Aerosols** and UN 2037 **Gas cartridges** or **Receptacles, small, containing gas** states that single packagings are not permitted.

1.1.1 The presentation of the information is then separated into three sections with the headings:

- “Metal aerosols and non-refillable receptacles containing gas (gas cartridges)”;
- “Plastic aerosols (IP.7C)”;
- “All aerosols”.

1.1.2 In the section titled “**All aerosols**” the following is applied:

- a) the valves, if fitted, must be protected by a cap or other suitable means during transport;
- b) receptacles must be tightly packed, so as to prevent movement in wooden boxes (4C1, 4C2), plywood boxes (4D), reconstituted wood boxes (4F), fibreboard boxes (4G) or plastic boxes (4H1, 4H2) of Packing Group II.

1.1.3 This gives the impression that outer packaging types listed in item b), being under the heading “All aerosols”, only applies to **Aerosols** (UN 1950) and do not apply to **Gas cartridges** and **Receptacles, small, containing gas** (UN 2037).

1.1.4 The UN Recommendations on the Transport of Dangerous Goods, Model Regulations, 17th revised edition, applies the following packing instructions to the respective UN numbers:

- UN 2037 — Packing Instruction P003
- UN 1950 — Packing Instruction P207.

1.1.5 Packing Instruction P003 permits the use of any suitable outer packaging meeting the construction requirements of 6.1.4 which is equivalent to 6;3 of the Technical Instructions. This means that only outer packaging conforming to Part 6 and bearing a UN packaging identification code suitable for use such as 4G, 4F, etc, may be used.

1.1.6 It is proposed that the outer packaging requirements of Packing Instruction 203 be clarified.

1.2 Packing Instruction P003 permits boxes and drums; whilst Packing Instruction 203 only permits boxes. In reviewing other packing instructions in the Technical Instructions, it is proposed to amend Packing Instruction 203 to include UN specification drums and jerricans.

1.3 Another problem arises through the use of the word “receptacle” throughout Packing Instruction 203.

1.3.1 One interpretation is that “receptacles” as defined in the definitions at Part 1; Chapter 3 “*means containment vessels for receiving and holding substances or articles, including any means of closing*” applies to the whole of the packing instruction i.e. metal aerosols are receptacles, plastic aerosols are receptacles; and, “receptacles small containing gas” are receptacles. Conditions a) to g), in applying to “receptacles” apply equally to metal aerosols.

1.3.2 A different interpretation is that “the receptacle” mentioned throughout the packing instruction, only applies to UN 2037 and “receptacles small containing gas”; not to metal aerosols. Under “**Plastic aerosols (IP.7C)**”, condition a) refers to “closed receptacle” whilst condition b) refers to “the container”.

1.3.3 In the 2001-2002 Edition of the Technical Instructions, Packing Instruction 200 applied to “Receptacle small containing gas” whilst Packing Instruction 203 applied to “aerosols”. The current conditions for “metal aerosols and non-refillable receptacles containing gas” are the same as the conditions for Packing Instruction 203 in 2001-2002 Edition of the Technical Instructions. It is evident that a broad interpretation of “receptacles” should be applied.

1.3.4 It is proposed that a note be added to Packing Instruction 203.

1.4 The issue of the UN Model Regulations having separate packing instructions for UN 2037, receptacle small containing gas (P003), and UN 1950 Aerosols (P207); whilst Technical Instructions has the two dangerous goods with a common Packing Instruction 203 has been considered.

1.4.1 The provision of a common packing instruction for UN 2037 and UN 1950 has been with the Technical Instructions for ten years. There do not appear to have been any significant problems with this approach. Technical Instructions packaging standards are higher than that required by the UN.

1.4.2 In the interests of international modal harmonisation it is suggested that either the Technical Instructions should split the two dangerous goods into separate packing instructions; or propose to the UN that a common packing instruction be developed.

1.4.3 The feedback of panel members is sought.

APPENDIX A

PROPOSED AMENDMENT TO PART 4 OF THE TECHNICAL INSTRUCTIONS

Part 4

PACKING INSTRUCTIONS

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Chapter 4

CLASS 2 — GASES

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4.2 PACKING INSTRUCTIONS

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Packing Instruction 203

Passenger and cargo aircraft for UN 1950 and UN 2037 only

This instruction applies to UN 1950 and 2037.

The general packing requirements of 4;1 must be met.

Single packagings are not permitted.

COMBINATION PACKAGINGS

INNER:

Note. — “Receptacle” and “the receptacle” have the same meaning as set out in 1.3. Any reference in this packing instruction to receptacle will include “aerosols” of UN 1950 and “receptacles, small, containing gas” of UN 2037.

Metal aerosols (IP.7, IP.7A, IP.7B) and non-refillable receptacles containing gas (gas cartridges)

Non-refillable metal aerosols and non-refillable receptacles containing gas (gas cartridges) must not exceed 1 000 mL capacity.

The following conditions must be met:

- a) the pressure in the receptacle must not exceed 1 500 kPa at 55°C and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55°C;
- b) if the pressure in the receptacle exceeds 970 kPa at 55°C but does not exceed 1 105 kPa at 55°C, an IP.7, IP.7A or IP.7B metal receptacle must be used;
- c) if the pressure in the receptacle exceeds 1 105 kPa at 55°C but does not exceed 1 245 kPa at 55°C, an IP.7A or IP.7B metal receptacle must be used;
- d) if the pressure in the receptacle exceeds 1 245 kPa at 55°C, an IP.7B metal receptacle must be used;
- e) IP.7B metal receptacles having a minimum burst pressure of 1 800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated in a), b), c) or d) do not apply to the pressure within the capsule for an aerosol. The quantity of gas contained in the capsule must be so limited such that the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into the outer metal receptacle;

- f) the liquid content must not completely fill the closed receptacle at 55°C;
- g) each receptacle exceeding 120 mL capacity must have been heated until the pressure in the receptacle is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect.
- h) UN 2037, Receptacles, small, containing gas are not fitted with a release device

Plastic aerosols (IP.7C)

Non-refillable plastic aerosols must not exceed 120 mL capacity, except when the propellant is a non-flammable, non-toxic gas and the contents are not dangerous goods in accordance with the provisions of the Technical Instructions, in which case the quantity must not exceed 500 mL.

The following conditions must be met:

- a) the contents must not completely fill the closed receptacle at 55°C;
- b) the pressure in the ~~container~~ receptacle may not exceed 970 kPa at 55°C; and
- c) each receptacle must be leak tested in accordance with the provisions of 6;3.2.8.1.6.

All aerosols

- ~~a) the valves, if fitted, must be protected by a cap or other suitable means during transport;~~
- ~~b) receptacles must be tightly packed, so as to prevent movement in wooden boxes (4C1, 4C2), plywood boxes (4D), reconstituted wood boxes (4F), fibreboard boxes (4G) or plastic boxes (4H1, 4H2) of Packing Group II.~~

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Packagings must meet the Packing Group II performance requirements.
- Release valves, if fitted, on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents during normal conditions of air transport.
- Aerosols and receptacles must be tightly packed, so as to prevent movement.

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

APPENDIX

PROPOSED AMENDMENT TO PART 4 OF THE TECHNICAL INSTRUCTIONS

Part 4

PACKING INSTRUCTIONS

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Chapter 4

CLASS 2 — GASES

...

4.2 PACKING INSTRUCTIONS

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Packing Instruction Y203

Passenger and cargo aircraft for UN 1950 and UN 2037 only

~~This instruction applies to UN 1950 and 2037.~~

The requirements of 3;4 must be met.

Single packagings are not permitted.

COMBINATION PACKAGINGS:

INNER:

Note. — "Receptacle" and "the receptacle" have the same meaning as set out in 1;3. Any reference in this packing instruction to receptacle will include "aerosols" of UN 1950 and "receptacles, small, containing gas" of UN 2037.

Metal aerosols (IP.7, IP.7A, IP.7B) and non-refillable receptacles containing gas (gas cartridges)

Non-refillable metal aerosols and non-refillable receptacles containing gas (gas cartridges) containing toxic substances must not exceed 120 mL capacity.

All other non-refillable metal aerosols and non-refillable receptacles containing gas (gas cartridges) must not exceed 1 000 mL capacity.

The following conditions must be met:

- a) the pressure in the receptacle must not exceed 1 245 kPa at 55°C and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55°C;
- b) if the pressure in the receptacle exceeds 970 kPa at 55°C but does not exceed 1 105 kPa at 55°C, an IP.7, IP.7A or IP.7B metal receptacle must be used;
- c) if the pressure in the receptacle exceeds 1 105 kPa at 55°C, an IP.7A or IP.7B metal receptacle must be used;
- d) if the pressure in the receptacle exceeds 1 245 kPa at 55°C, an IP.7B metal receptacle must be used;

- e) IP.7B metal receptacles having a minimum burst pressure of 1 800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated in a), b), c) or d) do not apply to the pressure within the capsule for an aerosol. The quantity of gas contained in the capsule must be so limited such that the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into the outer metal receptacle;
- f) the liquid content must not completely fill the closed receptacle at 55°C;
- g) each receptacle exceeding 120 mL capacity must have been heated until the pressure in the receptacle is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect.
- h) UN 2037, Receptacles, small, containing gas are not fitted with a release device

Plastic aerosols (IP.7C)

Non-refillable plastic aerosols must not exceed 120 mL capacity, except when the propellant is a non-flammable, non-toxic gas and the contents are not dangerous goods in accordance with the provisions of the Technical Instructions, in which case the quantity must not exceed 500 mL.

The following conditions must be met:

- a) the contents must not completely fill the closed receptacle at 55°C;
- b) the pressure in the ~~container~~ receptacle may not exceed 970 kPa at 55°C; and
- c) each receptacle must be leak tested in accordance with the provisions of 6;3.2.8.1.6.

All aerosols

- ~~a) the valves, if fitted, must be protected by a cap or other suitable means during transport;~~
- ~~b) receptacles must be tightly packed, so as to prevent movement.~~

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- ~~— Packagings must meet the Packing Group II performance requirements.~~
- ~~— Release valves, if fitted, on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents during normal conditions of air transport.~~
- ~~— Aerosols and receptacles must be tightly packed, so as to prevent movement.~~

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Wooden
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel