



WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-THIRD MEETING

Montréal, 11 to 21 October 2011

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 2013-2014 Edition

UN 3506 — MERCURY CONTAINED IN MANUFACTURED ARTICLES

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SUMMARY

UN 3506, **Mercury contained in manufactured articles**, is a new entry to the dangerous goods list.

At the DGP working group of the whole meetings in Abu Dhabi (DGP-WG/10, 7 to 11 November 2010) and Atlantic City (DGP-WG/11, 4 to 8 April 2011), a number of proposals were made in relation to special provisions relating to the new entry. There was also a proposal to amend Packing Instruction 869.

The purpose of this working paper is to consolidate the decisions regarding UN 3506 and propose that all items be reconsidered in order to avoid any inconsistency due to the consequential changes.

The invasive nature of mercury and its corrosive effect on aircraft is such that strict control of its transport must occur to protect the safety of air navigation.

Action by the DGP: The DGP is invited to consider the information provided in the appendix to this working paper which gives an outline of the existing changes and the proposed changes, specifically:

- Should Special Provision A1xy be adopted and applied to UN 3363 and UN 2809?
- Should Special Provision A1xz or A69 be adopted and applied to UN 3506?
- Should Special Provision Axxx be adopted? (Basically, in A1xx, is toxicity still a significant risk if the package is under 5 kg and the toxicity hazard is inhalation?)

- Should Special Provision A104 also be applied if Axxx (or A1xx) is adopted?
- UN 3506 should be added to 3;4.1.2 for consistency to show UN 3506 is not permitted in limited quantities.
- The amended and reformatted Packing Instruction 869 should be adopted.

Relevant information related to related to UN 3506 — **Mercury contained in manufactured articles** contained in the 17th Revised Edition of the UN Model Regulations is provided in Appendix B to this working paper.

1. INTRODUCTION

1.1 At DGP-WG/11, changes were agreed to Table 3-1 — Dangerous Goods List that introduced a UN number and entry for UN 3506 **Mercury contained in manufactured articles**. This change was consequential to the UN introducing this entry into the UN Model Regulations.

1.2 DGP/23-WP/6 contains the changes and other proposals relevant to UN 2809 **Mercury** and UN 3506 **Mercury contained in manufactured articles** including the addition of sub-risk 6.1 Toxic for both entries and consideration of two special provisions. These special provisions are listed as A1xy and A1xz at Page 3 of this Working Paper and retain the same text as adopted in the UN Model Regulations.

1.3 A1xy and A1xz correspond to UN Special Provisions 365 and 366. WG/11 decided not to adopt these provisions (presented as A189 and A190 in DGP-WG/11-WP/6. See WG/11 Report, paragraph 3.2.9.1 b.) *A189 was unnecessary due to the list in Table 3-1 being alphabetical rather than numerical whilst UN SP 366 (A190) should be included in the packing instruction, yet to be developed.*

1.4 However, from a practical point of view, it is easier for shippers to refer to a Special Provision that mirrors the information in the Model Regulations rather than needing to find it by reading all the of the Packing Instruction to be able to find it.

1.5 The wording of Special Provision 366 in the Model Regulations is also relevant as readers of the UN Model Regulations might not look at the Technical Instructions despite PP90 in P003 of the UN Model Regulations. This is reproduced at Page 7 of this Working Paper.

1.6 Proposed changes to Packing Instruction 869 relating to UN 3056 — **Mercury contained in manufactured articles** were discussed at DG-WG/11 (DGP/23-WP/3, paragraph 3.2.21 refers). The result of the discussion on the proposed changes was that members of the DGP were asked to consider the changes as the matter would be presented again at DGP/23. The changes to Packing Instruction 869 proposed in DGP/23-WP/86 are included in Appendix A to this working paper to assist in the discussion.

1.7 The report of the DGP-WG/11 Meeting (DGP/23-WP/3, paragraph 3.2.9.2 c) refers) indicates:

provisions for **Mercury contained in manufactured articles** (new UN No. 3506) — it was noted that an approach similar to that taken in A104 would be necessary in developing a special provision to cater for segregation requirements;

Further discussion on the subject is planned for DGP/23 and therefore the following items have been included in Appendix A for consideration:

- a) The Division 6.1 Toxic subsidiary risk for UN 2809 and UN 3506 has implications relating to the stowage of these items on aircraft. A working paper proposing a new special provision that the 6.1 toxic subsidiary risk is not applied subject to a quantity limit has been submitted separately to DGP/23 as DGP/23-WP/19. The text for the proposed Special Provision A1xx has been reproduced in Appendix A.
- b) Technical Instructions Part 5;3.2.2 should also be considered in respect to the need for a 6.1 toxic label and has been reproduced in Appendix A.
- c) Having regard to 5;3.2.2, Special Provision Axxx is proposed as a possible alternative to the need for a toxic subsidiary risk label keeping in mind that a package prepared for air transport but then moving to another mode may in fact need to have the Division 6.1 label for the other mode.
- d) In Part 3;4.1.2 of the Technical Instructions relating to limited quantities, there is specific mention of UN 2809 as being excluded from the provisions for carriage of dangerous goods in limited quantities. For consistency, UN 3506 could be added to this entry.
- e) One item not yet considered is that the entries for UN 3363 — **Dangerous goods in apparatus / Dangerous goods in machinery** are relevant to UN 3506 **Mercury contained in manufactured articles** and it may be appropriate that a special provision be considered to alert users of the Technical Instructions to the entry specific to UN 3506. Therefore, A1xy may be appropriate for this purpose.
- f) Changes to Special Provision A69 were proposed at WG/10 (DGP/23-WP/2, paragraph 3.2.15 refers) but not accepted. and were presented again at WG/11 (DGP/23-WP/3, paragraph 3.2.21 refers).

1.8 In order to complete the review of requirements for UN 3506, it was considered important that all recent and relevant information was included in this working paper.

APPENDIX A

AMENDMENTS RELATED TO MERCURY CONTAINED IN MANUFACTURED ARTICLES

Part 3

**DANGEROUS GOODS LIST,
SPECIAL PROVISIONS AND
LIMITED AND EXCEPTED QUANTITIES**

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Table 3-1. Dangerous Goods List

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Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
									Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	5	6	7	8	9	10	11	12	13
Dangerous goods in apparatus	3363	9		Miscellaneous		A48 A107 A1XY		E0	see 962		see 962	
Dangerous goods in machinery	3363	9		Miscellaneous		A48 A107 A1XY		E0	see 962		see 962	
Mercury	2809	8	6.1	Corrosive & Toxic	US 4	(A104) A1XZ AXXX	III	E0	868	35 kg	868	35 kg
Mercury contained in manufactured articles	2809 3506	8	6.1	Corrosive & Toxic		A48 A69 (A104) A1XX A1XZ AXXX	III	E0	869	No limit [5 kg]	869	No limit [50 kg]

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Table 3-2. Special provisions

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A48 Packaging tests are not considered necessary.

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A69 The following are not subject to these Instructions when carried as cargo:

a) Articles, each containing not more than 100 mg of mercury, gallium or inert gas and packaged so that the quantity of mercury, gallium or inert gas per package ~~does not exceed~~ is 1 g or less, ~~are not subject to these Instructions when carried as cargo.~~

b) Thermometers, switches and relays, each containing a total quantity of not more than 15 g of mercury, if they are installed as an integral part of a machine or apparatus and so fitted that shock or impact damage, leading to leakage of mercury, is unlikely to occur under normal conditions of transport.

c) Lamps, each containing not more than 1 g of mercury and packaged so that there is not more than [30 g] of mercury per package. Packages must be so designed and constructed such that when subjected to drop tests from a height of not less than 0.5 m the packages must still be fit for transport and there must be no damage to the contents.

The words "not restricted" and the special provision number A69 must be provided on the air waybill when an air waybill is issued.

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A104 A toxic subsidiary risk label, although not required by these Instructions, may be applied.

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A107 This entry only applies to machinery or apparatus containing dangerous goods as a residue or as an integral element of the machinery or apparatus. It must not be used for machinery or apparatus for which a proper shipping name already exists in Table 3-1.

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A1XX Notwithstanding the Division 6.1 subsidiary risk shown in column 4 of Table 3-1, the toxic subsidiary risk label and an indication of this subsidiary risk on the dangerous goods transport document are not required when the manufactured articles contain not more than 5 kg of mercury.

AXXX Packages need not show a subsidiary risk label for Division 6.1 if the toxicity arises solely from the destructive effect on tissue.

A1XY (365) For manufactured instruments and articles containing mercury, see UN 3506.

A1XZ (366) Articles containing not more than 15 g of mercury are not subject to these Instructions.

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Chapter 4

DANGEROUS GOODS IN LIMITED QUANTITIES

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4.1.2 Only dangerous goods which are permitted on passenger aircraft and which meet the criteria of the following classes, divisions and packing groups (if appropriate) may be carried under these provisions for dangerous goods in limited quantities:

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Class 8 Packing Groups II and III but excluding UN 2794, UN 2795, UN 2803, UN 2809 ~~and~~ UN 3028 and UN 3506.

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Part 4

PACKING INSTRUCTIONS

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Packing Instruction 869

Passenger and cargo aircraft for UN 3506 contained in manufactured articles only

General requirements

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

1) **Compatibility requirements**

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion.

2) **Closure requirements**

- Closures must meet the requirements of 4;1.1.4.

COMBINATION PACKAGINGS			SINGLE PACKAGINGS
UN number and proper shipping name	Total Net quantity per package — passenger	Total Net quantity per package — cargo	
UN 3506 Mercury contained in manufactured articles	No limit <u>[5 kg]</u>	No limit <u>[50 kg]</u>	No

ADDITIONAL PACKING REQUIREMENTS

- Manufactured articles or apparatuses of which metallic mercury is a component part, such as manometers, pumps, thermometers, and switches, must be packed in sealed inner liners or bags of strong leakproof and puncture-resistant material impervious to mercury which will prevent the escape of mercury from the package irrespective of its position before being packed in outer packagings.

Note.— Mercury switches and relays are excepted from the requirement for a sealed inner liner or bag providing they are of the totally enclosed leakproof type in sealed metal or sealed plastic units.

- Electron tubes, mercury vapour tubes (tubes with less than a total net quantity of 450 g of mercury) must be packed in strong outer packagings with all seams and joints sealed with self-adhesive, pressure-sensitive tape which will prevent the escape of mercury from the package.

Note.— Tubes with more than 450 g of mercury must be packaged according to the requirements for manufactured articles or apparatuses.

- Electron tubes which are completely jacketed packed in sealed leakproof metal cases may be shipped in the manufacturer's original packagings.

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Drums

Jerricans

Strong outer packagings

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Part 5

SHIPPER'S RESPONSIBILITIES

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Chapter 3

LABELLING

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3.2 APPLICATION OF LABELS

3.2.1 The labels required to be displayed on packages of dangerous goods are identified in the Dangerous Goods List for articles and substances specifically listed by name and for articles and substances not specifically listed by name which are covered by generic or n.o.s. entries.

3.2.2 Packages containing substances of Class 8 need not show a subsidiary risk label for Division 6.1 if the toxicity arises solely from the destructive effect on tissue. Substances of Division 4.2 need not show a subsidiary risk label for Division 4.1 if the substance is also a flammable solid.

APPENDIX B

RELEVANT INFORMATION RELATED TO UN 3506 — MERCURY CONTAINED IN MANUFACTURED ARTICLES CONTAINED IN THE 17TH REVISED EDITION OF THE UN MODEL REGULATIONS

P003 – Packing Instruction

Dangerous goods shall be placed in suitable outer packagings. The packagings shall meet the provisions of **4.1.1.1, 4.1.1.2, 4.1.1.4, 4.1.1.8** and **4.1.3** and be so designed that they meet the construction requirements of **6.1.4**. Outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use, shall be used. Where this packing instruction is used for the transport of articles or inner packagings of combination packagings the packaging shall be designed and constructed to prevent inadvertent discharge of articles during normal conditions of transport.

PP90 – Particular Packing Provision

For UN 3506, sealed inner liners or bags of strong leak-proof and puncture resistant material impervious to mercury which will prevent escape of the substance from the package irrespective of the position of the package shall be used. For air transport additional requirements may apply.

Special Provisions

- 365 For manufactured instruments and articles containing mercury, see UN 3506.
- 366 For land and sea transport, manufactured instruments and articles containing not more than 1 kg of mercury are not subject to these Regulations. For air transport, articles containing not more than 15 g of mercury are not subject to these Regulations.

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