



WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-NINTH MEETING

Montréal, 13 to 17 November 2023

Agenda Item 1: Harmonizing ICAO dangerous goods provisions with UN Recommendations on the Transport of Dangerous Goods (Ref: REC-A-DGS-2025)

1.2: Develop proposals, if necessary, for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2025-2026 Edition

EXTENSION OF THE CONCEPT OF “EXCLUSIVE USE” TO AIRCRAFT CONTAINERS (ULDS)

(Presented by Pascal Tatin)

SUMMARY

This working paper seeks feedback from the DGP on an amendment proposed to the International Atomic Energy Agency (IAEA) for incorporation in its Safety Standards Series No. SSR-6 (Rev.1), Regulations for the Safe Transport of Radioactive Material and proposes that it be incorporated in the Technical Instructions. The amendment would facilitate the transport of small packages classified as fissile excepted by air, in particular:

- a) uranium samples exceeding 3.5 g or 2 g per package, up to a total of 45 g classified as UN 2978 — **Radioactive material, uranium hexafluoride** or 3507 — **Uranium hexafluoride, radioactive material, excepted package**; and
- b) industrial products intended for research and industrial laboratory sectors of the nuclear cycle classified as UN 2910 — **Radioactive material, excepted package — limited quantity of material**, UN 2912 — **Radioactive material, low specific activity (LSA-I)** or UN 2915 — **Radioactive material, Type A**

Regulations currently allow transport of this material either:

- a) by full aircraft under exclusive use, but this is proving to be too expensive in practice; or
- b) with large freight containers for exclusive use on cargo aircraft, but this is challenging because it makes re-routing compulsory and there is limited compatibility of freight containers with standard cargo aircraft.

The proposal in this working paper aims to amend the provisions for allowing transport in large freight containers on cargo aircraft by allowing packages to be transported in regular, non-dedicated cargo aircraft, provided that they are in closed rigid unit load devices (ULDs) (such as AKNs) with curtains or rigid doors, but not nets. This would not affect the current possibility of using ULDs of any type (such as pallets and containers) for other shipments of radioactive materials that do not need to be declared for exclusive use.

Action by the DGP: The DGP is invited to:

- a) provide its position on the proposal to the IAEA – TRANSSC presented in Appendix B to this working paper so that it can be considered by that body for incorporation in the next revision of SSR-6 (Rev.1);
- a) agree to the amendment to the Technical Instructions proposed in Appendix A to this working paper; and
- c) if the amendment is agreed, consider whether the amendment in Appendix A should be included in a corrigendum to the 2023-2024 Edition of the Technical Instructions.

1. INTRODUCTION

1.1 The International Atomic Energy Agency (IAEA) Transport Safety Standards Committee (TRANSSC) decided, during its 43rd meeting (TRANSSC 43, 1 to 4 November 2021, Virtual), to initiate a review of the 2018 edition of the IAEA Transport Regulations: *Regulations for the Safe Transport of Radioactive Material: 2018 Edition* (IAEA Safety Standards Series No. SSR-6 (Rev. 1)), on which the provisions for transporting radioactive material contained in the current edition of the Technical Instructions are based.

1.2 IAEA Member States were invited to submit proposals for change and to identify problems for review, as appropriate, on 5 November 2021 and to transmit them to the TRANSSC Secretariat no later than 18 March 2022.

1.3 A set of proposals was submitted by France (proposals N° F-16 to F-18) and the World Nuclear Transport Institute (WNTI) (proposals WNTI N° 09 a) to c)) to extend the definition of “exclusive use” to the use of “aircraft containers” (a category of unit load devices (ULD)) as an alternative to using a complete aircraft (conveyance) or a large freight container.

1.4 A review of the proposed amendments to SSR-6 (Rev.1) was initiated at the 44th meeting of TRANSSC (TRANSSC 44, 13 to 17 June 2022, Vienna). It was agreed that the opinion of the DGP was needed before the proposed amendment could be adopted, given it relates exclusively to transport by air.

1.5 Challenges resulting from limitations imposed by the definitions for exclusive use, large freight container and unit load device (ULD) were raised at the 2022 Working Group Meeting of the DGP (DGP-WG/22, 21 to 25 November 2022) (see paragraph 4.3.1 of the DGP-WG/22 Report). An aircraft container, which is a ULD according to its definition in the Technical Instructions, with an internal

volume of more than 3 m³ cannot be considered as a large freight container for the purpose of carrying radioactive material by air. This implies that, when “exclusive use shipment” is required, only the complete aircraft or a freight container as defined for Class 7 can be declared under “exclusive use” (the term freight container as defined for Class 7 signifies a multimodal freight container, in most cases an ISO freight container). However, standard ISO freight containers, due to their large size, can only be carried in a very limited number of aircraft designs. A new definition for aircraft container and an amendment to the definition for exclusive use was proposed at DGP-WG/23 to address the challenges.

1.6 DGP-WG/23 did not support the proposal, but it did provide feedback. This feedback was considered when drafting a new amendment proposed in Appendix B to this working paper. It requires just a small modification to the Technical Instructions without introducing new requirements. A small change is proposed to the transport requirements for fissile exception in 7;2.9.4.3 e) which is a reference to a new provision allowing for an alternative to exclusive use. The new provision allows packaged fissile material classified under UN 2910, UN 2912, UN 2915, UN 2978 and UN 3507 to be transported on an aircraft with no more than 45 g of fissile nuclides either:

- under exclusive use either of the aircraft or of a large freight container, or
- in a certified **closed rigid aircraft container**, with rigid or flexible doors, having an internal volume of more than 3 m³ used **by a single consignor**. The aircraft container **must** be security sealed. For loading of the aircraft container, the **consignor must provide instructions to the operator and must be represented** or, failing that present, at ULD build-up to verify correct implementation of instructions.

1.7 Situations for which “exclusive use” shipment is required in case of air transport are listed in Appendix C.

2. ACTION BY THE DGP

2.1 The DGP is invited to support the proposal to allow the use of a "large aircraft container" to delineate the cargo space of an aircraft to which the definition of "exclusive use" may apply as an alternative to the complete aircraft or to a large freight container.

2.2 If the DGP is supporting and agreeing to this proposal, it is invited to inform the IAEA secretary of its position, including the notification of any amendment deemed necessary to the requirements that are proposed to be added or modified in the IAEA SSR-6 (Rev.1) related to this proposal, in view of facilitating understanding and transcription of these texts into the *Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284)*.

2.3 The DGP is also invited to consider if this change, if adopted, should be included in a corrigendum to the 2023-2024 Edition of the *Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284)*.

APPENDIX A

PROPOSED AMENDMENT TO PART 7 OF THE TECHNICAL INSTRUCTIONS

Part 7

OPERATOR'S RESPONSIBILITIES

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Chapter 2

STORAGE AND LOADING

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2.9 SPECIAL PROVISIONS APPLICABLE TO THE CARRIAGE OF RADIOACTIVE MATERIAL

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2.9.4 Additional requirements relating to transport and storage during transit of fissile material

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2.9.4.3 Fissile material meeting one of the provisions in a) to f) of 2;7.2.3.5.1 must meet the following requirements:

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- d) fissile material in packages classified in accordance with 2;7.2.3.5.1 d) must be transported in a consignment with no more than 15 g of fissile nuclides;
- e) fissile material classified in accordance with 2;7.2.3.5.1 e) must be transported under ~~exclusive use~~ the provisions of 7;2.9.5.5 on an aircraft with no more than 45 g of fissile nuclides.

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2.9.5 Transport by air

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2.9.5.4 Except in the case of shipment under special arrangement, mixing of packages of different kinds of radioactive material, including fissile material, and mixing of different kinds of packages with different transport indexes is permitted without specific competent authority approval. In the case of shipments under special arrangement, mixing is not permitted except as specifically authorized under the special arrangement.

2.9.5.5 Packaged fissile material classified under UN 2910, UN 2912, UN 2915, UN 2978 and UN 3507 and in accordance with 2;7.2.3.5.1 e) must be transported on an aircraft with no more than 45 g of fissile nuclides:

- under exclusive use either of the aircraft or of a large freight container, or
- in a certified closed rigid aircraft container, with rigid or flexible doors, having an internal volume of more than 3 m³ used by a single consignor. The aircraft container must be security sealed. For loading of the aircraft container, the consignor must provide instructions to the operator and must be represented or, failing that present, at ULD build-up to verify correct implementation of instructions.

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APPENDIX B

PROPOSED AMENDMENT TO SSR-6 (REV. 1)

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Section V

REQUIREMENTS AND CONTROLS FOR TRANSPORT

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Additional requirements relating to transport and storage in transit of fissile material

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570. Fissile material meeting one of the provisions (a)–(f) of para. 417 shall meet the following requirements:

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(e) Unpackaged or packaged fissile material classified in accordance with para. 417(e) shall be transported on a conveyance or in a large freight container under exclusive use ~~on a conveyance~~ with no more than 45 g of fissile nuclides, except for consignments transported by air for which the requirements are set forth in para. 579A. If exclusive use applies to a large freight container on a conveyance, the 45 g fissile nuclide mass limit applies to the conveyance.

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Additional requirements relating to transport by air

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579A. Packaged fissile material classified under UN 2910, UN 2912, UN 2915, UN 2978 and UN 3507 and in accordance with para. 417(e) shall be transported on an aircraft with no more than 45 g of fissile nuclides either:

(a) under exclusive use either of the aircraft or of a large freight container, or

(b) in a certified closed rigid aircraft container, with rigid or flexible doors, having an internal volume of more than 3 m³, used by a single consignor. The aircraft container must be security sealed. For loading of the aircraft container, the consignor shall provide instructions to the airline company and shall be represented or, failing that, present at the aircraft container build-up [OR at the loading of the aircraft container] to verify correct implementation of instructions.

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APPENDIX C

LIST OF SITUATIONS FOR WHICH EXCLUSIVE USE IS REQUIRED

#	Description (as listed in Annex III of SSR-6 (Rev.1))	IAEA SSR-6 (Rev.1)	ICAO Technical Instructions
(a)	Unpackaged <i>LSA-I material, SCO-I and SCO-III</i>	para. 520	Air transport not concerned: See 2;7.2.3.2 c) (SCO-III forbidden) and 4;9.2.4 (unpackaged LSA-I and SCO-I forbidden)
(b)	Liquid <i>LSA-I material</i> in a <i>Type IP-1 package</i>	para. 521 and Table 5	See 4;9.2.5 and Table 4-2
(c)	Gaseous and/or liquid <i>LSA-II material</i> in a <i>Type IP-2 package</i>	para. 521 and Table 5	See 4;9.2.5 and Table 4-2
(d)	<i>LSA-III material</i> in a <i>Type IP-2 package</i>	para. 521 and Table 5	See 4;9.2.5 and Table 4-2
(e)	<i>Packages or overpacks</i> having an individual <i>TI</i> greater than 10 or a <i>CSI</i> greater than 50, <i>conveyances</i> or <i>large freight containers</i> having a <i>CSI</i> greater than 50	paras 526 and 567	See 4;9.1.10 and 7;2.9.3.3 d) and Table 7-7
(f)	<i>Packages or overpacks</i> having the maximum <i>dose rate</i> at any point on the external surfaces that exceed 2 mSv/h	para. 527	See 5;1.2.3.1.4 c) and 7;2.9.5.3: special arrangement required
(g)	Loaded <i>conveyance</i> or <i>large freight containers</i> with a total sum of <i>TI</i> exceeding the values given in Table 10	para. 566(a)	See 7;2.9.3.3 a) and Table 7-6
(h)	Loaded <i>conveyances</i> or <i>large freight containers</i> with a total sum of <i>CSI</i> exceeding the values given in Table 11 for “not under <i>exclusive use</i> ”	para. 569	See 7;2.9.3.3 d) and Table 7-7
(i)	<i>Type B(U), Type B(M) or Type C package</i> whose temperature of accessible surfaces exceeds 50°C when subject to an ambient temperature of 38°C in the absence of insolation	para. 654	Air transport not concerned: See 6;7.2.1 (temperature of accessible surfaces of packages in excess of 50°C when subject to an ambient temperature of 38°C in the absence of insolation, are not allowed)
(j)	Up to 45 g of <i>fissile nuclides</i> on a <i>conveyance</i> , either packaged or unpackaged, in accordance with the provisions of paras 417(e) and 520(d)	paras 417(e) and 520(d)	See 7;2.9.4.3 c) and 4;9.2.4 (unpackaged fissile material forbidden)
(k)	<i>Packages</i> containing <i>fissile material</i> classified as non-fissile or fissile-excepted under para. 417(a)(i) or (iii) of the 2009 Edition of these Regulations	para. 822	Transport by air not concerned: This transitional provision has not been taken into account in the current ICAO-TI