



工 作 文 件

危险物品专家组 (DGP)

第二十九次会议

2023 年 11 月 13 日至 17 日，蒙特利尔

议程项目 1: 国际民航组织危险物品的规定与联合国《关于危险货物运输的建议书》的协调统一  
(编号: REC-A-DGS-2025)

1.2: 如有必要, 拟定对《危险物品安全航空运输技术细则》(Doc 9284 号文件) 的修订  
提案, 以便纳入 2025 年—2026 年版

将“独家使用”的概念扩展到航空器集装箱 (ULDS)

(由 Pascal Tatin 提交)

摘要

本工作文件就国际原子能机构 (IAEA) 提出的一项修订征求危险物品专家组的反馈意见, 以便纳入该机构《安全标准丛书》SSR-6 (第 1 修订版)《放射性物质安全运输条例》之中, 并建议将这一修订纳入《技术细则》。该修订将有助于空运被列为例外的易裂变小包装件, 尤其是:

- a) 每包装件超过 3.5 克或 2 克的铀样品, 总量不超过 45 克, 按照 UN 2978 — 放射性物质, 六氟化铀或 3507 — 六氟化铀, 放射性物质, 例外包装件分类; 和
- b) 用于核循环研究和工业实验室部门的工业产品, 按照 UN 2910 — 放射性物质, 例外包装件 — 限制数量的物质、UN 2912 — 放射性物质, 低比活度 (LSA-I) 或 UN 2915 — A 型放射性物质分类。

现行规定允许以下列方式之一运输这种物质:

- a) 按照独家使用来用整架航空器运输, 但这在实践中证明过于昂贵; 或
- b) 用大型货运集装箱在货机上独家使用来运输, 但这具有挑战性, 因为这样就必须改变航线, 而且货运集装箱与标准货机的兼容性有限。

本工作文件中的提案旨在修订关于允许在货机上使用大型货运集装箱运输的规定，允许在普通的非专用货机上运输包装件，条件是这些包装件必须装在带有帘子或硬质门但不带网的封闭式硬质集装箱（ULDs）（如 AKN）中。这不会影响目前使用任何类型的集装箱（如集装箱板和集装箱）来装运其他不需要申报为独家使用的放射性物质货物的可能性。

**危险物品专家组的行动：**请危险物品专家组：

- a) 就本工作文件附录 B 中向 IAEA-TRANSSC 提出的提案表明立场，以便该机构能够考虑将其纳入 SSR-6（第 1 修订版）的下一轮修订中；
- b) 同意本工作文件附录 A 提出的对《技术细则》的修订；和
- c) 如果同意修订，考虑是否应将附录 A 中的修订纳入《技术细则》2023—2024 年版的更正中。

## 1. INTRODUCTION

1.1 The International Atomic Energy Agency (IAEA) Transport Safety Standards Committee (TRANSSC) decided, during its 43<sup>rd</sup> 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 44<sup>th</sup> 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 m<sup>3</sup> 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 m<sup>3</sup> 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)*.



## 附录 A

### 对《技术细则》第 7 部分的拟议修订

## 第 7 部分 运营人的责任

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### 第 2 章

#### 仓储和装载

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#### 2.9 适用于放射性物质载运的特殊规定

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##### 2.9.4 关于易裂变材料运输和途中存储的补充要求

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2.9.4.3 符合 2; 7.2.3.5.1 a)至 f)中一项规定的的易裂变材料必须满足以下要求:

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- d) 在运输按照 2;7.2.3.5.1 d) 分类的易裂变材料包装件时, 该批托运货物的易裂变核素不得超过 15 克;
- e) 按照 2; 7.2.3.5.1 e) 分类的无包装或有包装易裂变材料必须按照 ~~独家使用~~ 7;2.9.5.5 的规定放在航空器上运输, 易裂变核素不得超过 45 克。

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##### 2.9.5 航空运输

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2.9.5.4 除特殊安排的货物, 不同种类的放射性物质包括易裂变材料的包装件的混装以及不同运输指数的不同类型包装件的混装, 无主管当局的批准仍可允许。至于有特殊安排的货物, 除非在特殊安排中经具体批准, 否则不允许混装。

2.9.5.5 按照 UN 2910、UN 2912、UN 2915、UN 2978 和 UN 3507 分类并符合 2;7.2.3.5.1 e) 规定的已包装易裂变材料必须以下列方式用航空器运输, 易裂变核素不得超过 45 克:

- 按照航空器独家使用或大型货运集装箱独家使用运输, 或者
- 装在经认证的封闭式硬质航空器集装箱内运输, 带有硬质门或软质门, 供单个托运人使用的内部容积超过 3 立方米。航空器集装箱必须安全密封。在装载航空器集装箱时, 托运人必须向运营人提供指令并且必须有代表在场, 否则必须有代表在集装箱组装时在场, 以核实是否正确执行了指令。

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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 m<sup>3</sup>, 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</i> , <i>SCO-I</i> and <i>SCO-III</i>	para. 520	<b>Air transport not concerned:</b> See 2;7.2.3.2 c) ( <i>SCO-III</i> forbidden) and 4;9.2.4 (unpackaged <i>LSA-I</i> and <i>SCO-I</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</i> or <i>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</i> or <i>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)</i> , <i>Type B(M)</i> or <i>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	<b>Air transport not concerned:</b> 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	<b>Transport by air not concerned:</b> This transitional provision has not been taken into account in the current ICAO-TI