国 际 民 用 航 空 组 织

DGP/30-WP/31*
14/7/25

工 作 文 件

危险物品专家组（DGP）

第三十次会议

2025 年 10 月 6 日至 10 日，蒙特利尔

议程项目 2：　管理航空特有的安全风险和查明异常情况（REC-A-DGS-2027）

2.2　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 2027 年—2028 年版

适用于含放射性物质包装的压差要求

（由 S. Bitossi 提交）

摘要

本工作文件提出在《技术细则》第6部分7.2.3条加一个注，并在国际民航组织公共网站上发布指导材料，以支持该条款的实施。

第 6 部分 7.2.3 条要求，装有放射性物质的包装件必须能经受产生不低于最大标称使用压力加 95 kPa 的压差的内部压力。 拟议的注基于国际原子能机构关于危险物品安全运输规章的咨询材料中的规定，为装有固体放射性物质的包装件提供了一种遵守该条款的替代方法。拟在国际民航组织网站上发布的案文为各国和托运人提供了关于正常和紧急飞行条件下压差的指导。该提案虑及 2024 年危险物品专家组工作组会议（DGP-WG/24，2024 年 10 月 21 日至 25 日，蒙特利尔）上提出的关于类似提案的讨论中提出的意见，以及此前危险物品专家组会议上就该题目的讨论中的意见。

危险物品专家组的行动：请危险物品专家组：

a) 审查并考虑将拟议的注纳入《技术细则》第 6 部分 7.2.3 条，如本工作文件附录 A 所示，并同意将其纳入 2027-2028 年版《技术细则》；和

b) 审查并考虑本工作文件附录 B 中拟议的指导材料，供发布在国际民航组织公共网站。

* 仅提供了摘要和附录的翻译。

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1. INTRODUCTION

1.1 This working paper follows on from discussions that were had at the Dangerous Goods Panel Working Group Meeting in 2024 (DGP-WG/24, 21 to 25 October 2024, Montreal) (see paragraph 4.3.5 of the DGP-WG/24 Report).

1.2 Part 6;7.2.3 of the Technical Instructions states that:

> Packages containing radioactive material must be capable of withstanding, without loss or dispersal of radioactive contents from the containment system, an internal pressure that produces a pressure differential of not less than maximum normal operating pressure plus 95 kPa.

1.3 The IAEA published *Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material (2018 Edition) Specific Safety Guide No. SSG-26 (Rev. 1)*, where explanatory text in para 621.2 states that:

> In the case of solid material, to comply with para. 621 of the Transport Regulations, means other than pressure resistance may be used to demonstrate compliance. If it can be demonstrated that there is no loss or dispersal of the radioactive contents from the containment system when the package is exposed to the pressure differential expected during flight, the package design can be considered to meet the requirement even if the internal pressure is not maintained.

1.4 Some radioactive packages designed for solid radioactive material do not evidence differential pressure testing to maximum normal operating pressure (MNOP) plus 95kPa in line with Part 6;7.2.3 and are at risk of perceived non-compliance with the regulations with the current wording.

1.5 These radioactive packages (designed for solid radioactive material) are able to evidence other means of compliance to demonstrate that there is no loss or dispersal of the radioactive contents from the containment system (this is in line with IAEA SSR-6 and corresponding IAEA SSG-26 (current editions)).

1.6 The Technical Instructions (or its Supplement) do not have explanatory text or provide for other means of demonstrating compliance with Part 6;7.2.3 for solid radioactive material packages, which is conflicting with the guidance published in IAEA SSG-26 and ultimately resulting in the denial of shipments.

1.7 Noting the above, Appendix A to this working paper proposes a note after Part 6;7.2.3 which has been extracted from para 621.2 of the IAEA SSG-26 and adjusted to ensure that it is limited to packages containing solid material only.

1.8 Appendix B to this working paper presents the proposed guidance material regarding normal and emergency flight conditions with respect to differential pressure for packages containing solid radioactive material. This wording was developed by a DGP/IAEA Working Group on Pressure Differential Requirements and is aimed at providing clarification to both States and Shippers.

1.9 This guidance was discussed at DGP-WG/24, and consideration was given as to whether it should reside within the Supplement or on a specified ICAO website. DGP-WG/24 did not consider the Supplement to be the most effective location for this guidance, given that the material is more directed at shippers than States. Therefore, this paper proposes that the guidance in Appendix B be published on the ICAO public website, at a suitable location, to be determined by the DGP Secretariat.

2. ACTION BY THE DGP

2.1 The DGP is invited to:

a) review and consider the note proposed for inclusion under Part 6;7.2.3 of the Technical Instructions as presented in Appendix A to this working paper and agree to its incorporation in the 2027-2028 edition of the Technical Instructions; and

b) review and consider the proposed guidance material in Appendix B to this working paper for publication on the ICAO public website.

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附录 A

《技术细则》第 6 部分的拟议修订

第 6 部分

包装术语、标记、要求和试验

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第 7 章

放射性物质包装件的制造、试验和批准要求以及此类物质的批准要求

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7.2 对空运包装件的附加要求

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7.2.3 装有放射性物质的包装件必须能经受产生不低于最大标称使用压力加 95 kPa 之后所得压差的内部压力而放射性内装物不从容器系统中漏失或弥散。

注：对于固体材料，为了符合 7.2.3 的规定，可以使用除耐压之外的其他方法来证明符合规定。如果能证明，当包装件受到飞行过程中预期的压差时，放射性内装物不会从封存系统中漏失或弥散，则包装件设计可视为符合要求，即使未维持内部压力。

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APPENDIX B

PROPOSED GUIDANCE FOR PUBLICATION ON ICAO WEBSITE

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ADDITIONAL GUIDANCE FOR PACKAGES OF RADIOACTIVE MATERIAL TRANSPORTED BY AIR

GUIDANCE TO SHIPPERS AND STATES ON NORMAL AND EMERGENCY FLIGHT CONDITIONS WITH RESPECT TO DIFFERENTIAL PRESSURE

1. The normal conditions of flight and the emergency flight conditions are defined in ISO Standard 11242 as follows:

a) **Normal flight conditions:** Flight conditions with cabin/cargo compartment pressure decreasing from standard sea level 100 kPa to minimum cruise flight cabin altitude pressure 75 kPa (8000 ft) during climb at minimum rate of 150 Pa/s (2500 ft/min), and increasing back to standard sea level during descent, at minimum rate of 90 Pa/s (1500 ft/min). Some cargo-only aircraft are designed and operated such that the cargo compartment is not pressurized during flight. For these type of aircraft the normal rate of pressure change experienced by the cargo is the actual rate of aircraft climb and descent which is expected to be greater than the "normal" pressure change provided in the ISO standard 11242.

b) **Emergency (rapid decompression) flight conditions:** Cabin/cargo compartment atmosphere dropping linearly from a minimum normal equivalent altitude of 6000 ft, i.e. a maximum normal pressure of 81 kPa in cruise flight, to the standard ambient pressure of 15 kPa at 45000 ft altitude in a duration of 1 s.

2. The maximum normal operating pressure (MNOP) is at least the gauge pressure developed in the containment system of the package at 55°C (primary receptacle, or intermediate packaging or outer packaging), i.e. the absolute pressure developed in the package at 55°C less 100 kPa.

3. The differential pressure of MNOP + 95 kPa results from a consideration of aircraft depressurization at a maximum civil aviation flight altitude together with any pressure already inside the package, plus a safety margin.

4. In the particular case of solid material, in order to comply with Part 6, 7.2.3 other means of demonstration than pressure resistance may be used by the designer of a package design.

5. If "no loss or dispersal" can be justified when the package is exposed to pressure differential the package design is considered to meet the requirement even if the internal pressure is not maintained.

6. *Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material* (2018 edition), Safety Standard Series No. SSG-26 (Rev.1), paragraph 621.3 states:

> If, within the definition of MNOP, the phrase "conditions of temperature and solar radiation corresponding to environmental conditions" is interpreted to include consideration of conditions specific to air transport (para. 620), then the MNOP does provide a suitable basis for specifying this requirement. If the temperature range given in para. 620 (–40°C to 55°C) is used, self-heating of the package contents is taken into account and the solar radiation input is considered to be zero, as the package is inside an aircraft, and hence the MNOP is consistent with the ICAO approach.

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