



NOTA DE ESTUDIO

GRUPO EXPERTO EN MERCANCÍAS PELIGROSAS (DGP)

TRIGÉSIMA REUNIÓN

Montreal, 6 - 10 de octubre de 2025

- Cuestión 2:** Gestión de los riesgos de seguridad operacional específicos del transporte por vía aérea e identificación de anomalías (*REC-A-DGS-2027*)
- 2.2:** Formular propuestas de enmienda de las *Instrucciones Técnicas para el transporte sin riesgos de mercancías peligrosas por vía aérea* (Doc 9284), si se considera necesario, para su incorporación en la edición de 2027-2028

CONDICIONES DE PRESIÓN DIFERENCIAL APLICABLES A BULTOS QUE CONTIENEN MATERIAL RADIATIVO

(Nota presentada por S. Bitossi)

RESUMEN

En esta nota de estudio se propone enmendar la parte 6;7.2.3 de las Instrucciones Técnicas mediante la adición de una nota con el fin de facilitar la implementación de las disposiciones recogidas en dicha parte y se ofrece un texto de orientación para su publicación en el sitio web público de la OACI.

En la parte 6;7.2.3 se establece que los bultos que contengan material radiactivo deben ser capaces de resistir una presión interna que produzca una diferencia de presión no inferior a la presión operacional normal máxima más 95 kPa. En la nota que se propone añadir a esta parte se ofrece un medio alternativo para cumplir esta disposición en el caso de bultos que contengan material radiactivo sólido, que se basa en el material explicativo del Organismo Internacional de Energía Atómica (OIEA) para la aplicación de Reglamento para el transporte seguro de mercancías peligrosas. El texto que se propone para su publicación en el sitio web de la OACI proporciona orientaciones a los Estados y a los expedidores con respecto a la presión diferencial en condiciones de vuelo normales y de emergencia. Esta propuesta tiene en cuenta las observaciones formuladas durante los debates sobre una propuesta similar presentada en la reunión del grupo de trabajo del Grupo Experto en Mercancías Peligrosas (DGP) en 2024 (DGP-WG/24, 21-25 de octubre de 2024, Montreal) y durante los debates sobre el tema en reuniones anteriores del DGP

Medidas propuestas al DGP: Se invita al DGP a:

- examinar la nota propuesta y considerar su inclusión en la parte 6;7.2.3 de las Instrucciones Técnicas, tal y como se indica en el apéndice A de esta nota de estudio y acordar su incorporación en la edición de 2027-2028 de las Instrucciones Técnicas; y
- examinar el texto de orientación propuesto en el apéndice B de esta nota de estudio y considerar su publicación en el sitio web público de la OACI.

* Solo se han traducido el resumen y el apéndice.

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.

— — — — —

APÉNDICE A

PROPUESTA DE ENMIENDA DE LA PARTE 6 DE LAS INSTRUCCIONES TÉCNICAS

Parte 6

NOMENCLATURA, MARCADO, REQUISITOS Y ENSAYOS DE LOS EMBALAJES

...

Capítulo 7

REQUISITOS DE CONSTRUCCIÓN, ENSAYO Y APROBACIÓN DE BULTOS DE MATERIAL RADIATIVO Y APROBACIÓN DEL MATERIAL

7.2 REQUISITOS ADICIONALES RELATIVOS A LOS BULTOS TRANSPORTADOS POR VÍA AÉREA

...

7.2.3 Los bultos que contengan material radiactivo deben ser capaces de resistir, sin que se produzca pérdida o dispersión de contenido radiactivo del sistema de contención, una presión interna que produzca una diferencia de presión no inferior a la presión operacional normal máxima más 95 kPa.

Nota.—En el caso de materiales sólidos, a fin de cumplir lo dispuesto en el apartado 7.2.3, se pueden utilizar medios distintos a la evaluación de la resistencia a la presión para demostrar el cumplimiento. Si se puede demostrar que no hay pérdida o dispersión de contenido radiactivo del sistema de contención cuando el bulto queda sometido a la presión diferencial prevista durante el vuelo, se puede considerar que el diseño del bulto cumple los requisitos, aunque no se mantenga la presión interna.

...

APPENDIX B

PROPOSED GUIDANCE FOR PUBLICATION ON ICAO WEBSITE

...

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.