International Civil Aviation Organization

DGP/27-WP/16
18/6/19

WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-SEVENTH MEETING

Montréal, 16 to 20 September 2019

Agenda Item 1: Harmonizing ICAO dangerous goods provisions with UN Recommendations on the Transport of Dangerous Goods

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 2021-2022 Edition

DRAFT AMENDMENTS TO THE TECHNICAL INSTRUCTIONS TO ALIGN WITH THE UN RECOMMENDATIONS — PART 6

(Presented by the Secretary)

SUMMARY

This working paper contains draft amendments to Part 6 of the Technical Instructions to reflect the decisions taken by the UN Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals at its ninth session (Geneva, 7 December 2018).

The DGP is invited to agree to the draft amendments in this working paper.

Part 6

PACKAGING NOMENCLATURE, MARKING, REQUIREMENTS AND TESTS

Chapter 2

MARKING OF PACKAGINGS OTHER THAN INNER PACKAGINGS

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2.1 MARKING REQUIREMENTS FOR PACKAGINGS OTHER THAN INNER PACKAGINGS

DGP-WG/18-WP/11 (see paragraph 3.1.2.2 of the DGP-WG/18 report) and UN Model Regulations, 6.1.3.1 (see ST/SG/AC.10/46/Add.1):

2.1.1 Each packaging intended for use according to these Instructions must bear marks which are durable, legible and placed in a location and of such a size relative to the packaging as to be readily visible. For packages with a gross mass of more than 30 kg the marks, or a duplicate thereof, must appear on the top or on a side of the packaging. Letters, numerals and symbols must be at least 12 mm high, except for packagings of 30 L capacity or less or of 30 kg ~~capacity or less~~ maximum net mass, when they must be at least 6 mm in height and except for packagings of 5 L capacity or less or of 5 kg maximum net mass ~~or less~~ when they must be of an appropriate size. The marks must show:

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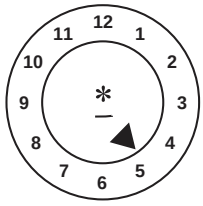
e) the last two digits of the year during which the packaging was manufactured. Packagings of types 1H1, 1H2, 3H1 and 3H2 must also be appropriately marked with the month of manufacture; this may be marked on the packaging in a different place from the remainder of the mark. An appropriate method is:



UN Model Regulations, 6.1.3.1 e) (see ST/SG/AC.10/46/Add.1):

* The last two digits of the year of manufacture may be displayed at that place. In such a case and when the clock is placed adjacent to the UN design type mark, the ~~two digits~~ indication of the year in the ~~type approval mark and in the inner circle of the clock~~ mark may be waived. However, when the clock is not placed adjacent to the UN design type mark, the two digits of the year in the mark and in the clock must be identical.

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Note.— Other methods that provide the minimum required information in a durable, visible and legible form are also acceptable.

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UN Model Regulations, 6.1.3.13 (see ST/SG/AC.10/46/Add.1):

2.1.15 Where a packaging conforms to more than one tested packaging design type, the packaging may bear more than one mark to indicate the relevant performance test requirements that have been met. The marks must appear in close proximity to one another and each mark must appear in its entirety.

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Chapter 3

REQUIREMENTS FOR PACKAGINGS

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3.1.2 Aluminium drums
1B1 non-removable head
1B2 removable head

3.1.2.1 Body and heads must be constructed of aluminium at least 99 per cent pure or of an aluminium base alloy. Materials must be of a suitable type and of adequate thickness in relation to the capacity of the drum and to its intended use.

3.1.2.2 All seams must be welded. Chime seams, if any, must be reinforced by the application of separate reinforcing rings.

3.1.2.3 The body of a drum of a capacity greater than 60 L must, in general, have at least two expanded rolling hoops or, alternatively, at least two separate rolling hoops. If there are separate rolling hoops they must be fitted tightly on the body and so secured that they cannot shift. Rolling hoops must not be spot welded.

3.1.2.4 Openings for filling, emptying and venting in the bodies or heads on non-removable head (1B1) drums must not exceed 7 cm in diameter. Drums with larger openings are considered to be of the removable head type (1B2). Closures for openings in the bodies and heads of drums must be so designed and applied that they will remain secure and leakproof under normal conditions of transport. Closure flanges must be welded in place so that the weld provides a leakproof seam. Gaskets or other sealing elements must be used with closures, unless the closure is inherently leakproof.

3.1.2.5 Closure devices for removable head drums must be so designed and applied that they will remain secure and drums will remain leakproof under normal conditions of transport. Gaskets or other sealing elements must be used with all removable heads.

UN Model Regulations, 6.1.4.2.6 (see ST/SG/AC.10/46/Add.1):

3.1.2.6 If materials used for body, heads, closures and fittings are not in themselves compatible with the contents to be transported, suitable internal protective coatings or treatments must be applied. These coatings or treatments must retain their protective properties under normal conditions of transport.

~~3.1.2.6~~3.1.2.7 Maximum capacity of drum: 450 L.

~~3.1.2.7~~3.1.2.9 Maximum net mass: 400 kg.

3.1.3 Drums of metal other than aluminium or steel
1N1 non-removable head
1N2 removable head

3.1.3.1 The body and heads must be constructed of a metal or of a metal alloy other than steel or aluminium. Material must be of a suitable type and of adequate thickness in relation to the capacity of the drum and to its intended use.

3.1.3.2 Chime seams, if any, must be reinforced by the application of separate reinforcing rings. All seams, if any, must be joined (welded, soldered, etc.) in accordance with the technical state-of-the-art for the metal or metal alloy used.

3.1.3.3 The body of a drum of a capacity greater than 60 L must, in general, have at least two expanded rolling hoops or, alternatively, at least two separate rolling hoops. If there are separate rolling hoops, they must be fitted tightly on the body and so secured that they cannot shift. Rolling hoops must not be spot welded.

3.1.3.4 Openings for filling, emptying and venting in the bodies or heads or non-removable head (1N1) drums must not exceed 7 cm in diameter. Drums with larger openings are considered to be of the removable head type (1N2). Closures for openings in the bodies and heads of drums must be so designed and applied that they will remain secure and leakproof under normal conditions of transport. Closure flanges must be joined in place (welded, soldered, etc.) in accordance with the technical state of the art for the metal or metal alloy used so that the seam join is leakproof. Gaskets or other sealing elements must be used with closures, unless the closure is inherently leakproof.

3.1.3.5 Closure devices for removable head drums must be so designed and applied that they will remain secure and drums will remain leakproof under normal conditions of transport. Gaskets or other sealing elements must be used with all removable heads.

UN Model Regulations, 6.1.4.3.6 (see ST/SG/AC.10/46/Add.1):

3.1.3.6 If materials used for body, heads, closures and fittings are not in themselves compatible with the contents to be transported, suitable internal protective coatings or treatments must be applied. These coatings or treatments must retain their protective properties under normal conditions of transport.

~~3.1.3.6~~3.1.3.7 Maximum capacity of drum: 450 L.

~~3.1.3.7~~3.1.3.8 Maximum net mass: 400 kg.

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Chapter 5

REQUIREMENTS FOR THE CONSTRUCTION AND TESTING OF CYLINDERS AND CLOSED CRYOGENIC RECEPTACLES, AEROSOL DISPENSERS AND SMALL RECEPTACLES CONTAINING GAS (GAS CARTRIDGES) AND FUEL CELL CARTRIDGES CONTAINING LIQUEFIED FLAMMABLE GAS

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5.2.1 Design, construction and initial inspection and testing

5.2.1.1 The following standards apply for the design, construction and initial inspection and test of UN cylinders, except that inspection requirements related to the conformity assessment system and approval must be in accordance with 5.2.5:

Reference	*Title*	*Applicable for manufacture*
ISO 11119-2:2012 + Amd 1:2014	Gas cylinders — Refillable composite gas cylinders and tubes — Design, construction and testing — Part 2: Fully wrapped fibre reinforced composite gas cylinders and tubes up to 450 L with load-sharing metal liners	Until further notice
UN Model Regulations, 6.2.2.1.1 (see ST/SG/AC.10/46/Add.1) and paragraph 3.1.2.8.1 c) of the DGP-WG/19 report:		
ISO 11119-3:2002	Gas cylinders of composite construction — Specification and test methods — Part 3: Fully wrapped fibre reinforced composite gas cylinders with non-load-sharing metallic or non-metallic liners. *Note.— This standard must not be used for linerless cylinders manufactured from two parts joined together.*	Until 31 December 2020
ISO 11119-3:2013	Gas cylinders — Refillable composite gas cylinders and tubes — Design, construction and testing — Part 3: Fully wrapped fibre reinforced composite gas cylinders and tubes up to 450 L with non-load-sharing metallic or non-metallic liners *Note.— This standard must not be used for linerless cylinders manufactured from two parts joined together.*	Until further notice
ISO 11119-4: 2016	Gas cylinders — Refillable composite gas cylinders — Design, construction and testing — Part 4: Fully wrapped fibre reinforced composite gas cylinders up to 150 l with load-sharing welded metallic liners.	Until further notice

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5.2.1.3 The following standards apply for the design, construction and initial inspection and test of UN acetylene cylinders except that inspection requirements related to the conformity assessment system and approval must be in accordance with 5.2.5.

Note.— The maximum of 1 000 L volume as mentioned in the ISO standard ISO 21029-1:2004 Cryogenic vessels, does not apply for refrigerated liquefied gases in closed cryogenic receptacles installed in apparatus (e.g. MRI or cooling machines).

For the cylinder shell:

Reference	*Title*	*Applicable for manufacture*
ISO 9809-1:1999	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa. *Note.— The note concerning the F factor in section 7.3 of this standard must not be applied for UN cylinders.*	Until 31 December 2018
ISO 9809-1:2010	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa.	Until further notice
ISO 9809-3:2000	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 3: Normalized steel cylinders.	Until 31 December 2018
ISO 9809-3:2010	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 3: Normalized steel cylinders.	Until further notice
UN Model Regulations, 6.2.2.1.3 (see ST/SG/AC.10/46/Add.1) and paragraph 3.1.2.8.1 c) of the DGP-WG/19 report:		
ISO 4706:2008	Gas cylinders — Refillable welded steel cylinders — Test pressure 60 bar and below	Until further notice
ISO 7866:2012 + Cor 1:2014	Gas cylinders — Refillable seamless aluminum alloy gas cylinders — Design, construction and testing *Note.— Aluminum alloy 6351A or equivalent must not be used*	Until further notice

For the acetylene cylinder including the porous mass in the cylinder:

Reference	*Title*	*Applicable for manufacture*
ISO 3807-1:2000	Cylinders for acetylene — Basic requirements — Part 1: Cylinders without fusible plugs.	Until 31 December 2020
ISO 3807-2:2000	Cylinders for acetylene — Basic requirements — Part 2: Cylinders with fusible plugs.	Until 31 December 2020
ISO 3807:2013	Gas cylinders — Acetylene cylinders — Basic requirements and type testing	Until further notice

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5.2.2 Materials

In addition to the material requirements specified in the cylinder and closed cryogenic receptacle design and construction standards, and any restrictions specified in the applicable Packing Instruction for the gas(es) to be transported (e.g. Packing Instruction 200, Packing Instruction 202 or Packing Instruction 214), the following standards apply to material compatibility:

Reference	*Title*	*Applicable for manufacture*
UN Model Regulations, 6.2.2.2 (see ST/SG/AC.10/46/Add.1):		
~~ISO 11114-1:2012~~ ISO 11114-1:2012 + A1:2017	Gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 1: Metallic materials.	Until further notice
ISO 11114-2:2013	Gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 2: Non-metallic materials.	Until further notice

5.2.3 Service equipment

The following standards apply to closures and their protection:

	Reference	*Title*	*Applicable for manufacture*
	ISO 11117:1998	Gas cylinders — Valve protection caps and valve guards for industrial and medical gas cylinders — Design, construction and tests.	Until 31 December 2014
	ISO 11117:2008+ Cor 1:2009	Gas cylinders — Valve protection caps and valve guards — Design, construction and tests.	Until further notice
	ISO 10297:1999	Gas cylinders – Refillable gas cylinder valves – Specification and type testing.	Until 31 December 2008
	ISO 10297:2006	Gas cylinders — Refillable gas cylinder valves — Specification and type testing.	Until 31 December 2020
	ISO 10297:2014	Gas cylinders — Cylinder valves — Specification and type testing	~~Until further notice~~Until 31 December 2022
	ISO 10297:2014 + A1:2017	Gas cylinders — Cylinder valves — Specification and type testing;	Until further notice
	UN Model Regulations, 6.2.2.3 (see ST/SG/AC.10/46/Add.1):		
≠	ISO 13340:2001	Transportable gas cylinders — Cylinder valves for non-refillable cylinders — Specification and prototype testing.	Until 31 December 2020
+	ISO 14246:2014	Gas cylinders — Cylinder valves — Manufacturing tests and examination	~~Until further notice~~Until 31 December 2024
	ISO 14246:2014 + A1:2017	Gas cylinders — Cylinder valves — Manufacturing tests and examinations	Until further notice
+	ISO 17871:2015	Gas cylinders — Quick-release cylinders valves — Specification and type testing	Until further notice
	ISO 17879:2017	Gas cylinders — Self-closing cylinder valves — Specification and type testing *Note.— This standard must not be applied to self-closing valves in acetylene cylinders.*	Until further notice

For UN metal hydride storage systems, the requirements specified in the following standard apply to closures and their protection:

Reference	*Title*	*Applicable for manufacture*
ISO 16111:2008	Transportable gas storage devices — Hydrogen absorbed in reversible metal hydride	Until further notice

5.2.4 Periodic inspection and test

≠ 5.2.4.1 The following standards apply to the periodic inspection and testing of UN cylinders and their closures:

Reference	*Title*	*Applicable for manufacture*
ISO 6406:2005	Seamless steel gas cylinders — Periodic inspection and testing.	Until further notice
ISO 10460:2005	Gas cylinders – Welded carbon-steel gas cylinders – Periodic inspection and testing. *Note.— The repair of welds described in clause 12.1 of this standard must not be permitted. Repairs described in clause 12.2 require the approval of the appropriate national authority which approved the periodic inspection and test body in accordance with 5.2.6.*	Until further notice
ISO 10461:2005/A1:2006	Seamless aluminium-alloy gas cylinders — Periodic inspection and testing.	Until further notice

	UN Model Regulations, 6.2.2.4 (see ST/SG/AC.10/46/Add.1):		
	~~ISO 10462:2005~~	~~Transportable cylinders for dissolved acetylene Periodic inspection and maintenance.~~	~~Until 31 December 2018~~
	ISO 10462:2013	Gas cylinders — Acetylene cylinders — Periodic inspection and maintenance.	Until further notice
	ISO 11513:2011	Gas cylinders — Refillable welded steel cylinders containing materials for sub-atmospheric gas packaging (excluding acetylene) — Design, construction, testing, use and periodic inspection.	Until further notice
≠	ISO 11623:2002	Transportable gas cylinders — Periodic inspection and testing of composite gas cylinders.	Until 31 December 2020
+	ISO 11623:2015	Gas cylinders — Composite construction — Periodic inspection and testing	Until further notice
+	ISO 22434:2006	Transportable gas cylinders — Inspection and maintenance of cylinder valves *Note.— These requirements may be met at times other than at the periodic inspection and test of UN cylinders.*	Until further notice
	UN Model Regulations, 6.2.2.4 (see ST/SG/AC.10/46/Add.1):		
	ISO 20475:2018	Gas cylinders — Cylinder bundles — Periodic inspection and testing	Until further notice

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5.2.7 Marking of UN refillable cylinders and closed cryogenic receptacles

Note.— Marking requirements for UN metal hydride storage systems are given in 5.2.9.

5.2.7.1 Refillable UN cylinders and closed cryogenic receptacles must be marked clearly and legibly with certification, operational and manufacturing marks. These marks must be permanently affixed (e.g. stamped, engraved or etched) on the cylinder. The marks must be on the shoulder, top end or neck of the cylinder and closed cryogenic receptacle or on a permanently affixed component of the cylinder and closed cryogenic receptacle (e.g. welded collar or corrosion-resistant plate welded to the outer jacket of a closed cryogenic receptacle). Except for the UN packaging symbol, the minimum size of the marks must be 5 mm for cylinders and closed cryogenic receptacles with a diameter greater than or equal to 140 mm and 2.5 mm for cylinders and closed cryogenic receptacles with a diameter less than 140 mm. The minimum size of the UN packaging symbol must be 10 mm for cylinders and closed cryogenic receptacles with a diameter greater than or equal to 140 mm and 5 mm for cylinders and closed cryogenic receptacles with a diameter less than 140 mm.

5.2.7.2 The following certification marks must be applied:

a) The UN packaging symbol (u n)

This symbol must not be used for any purpose other than certifying that a packaging complies with the relevant requirements in Chapters 1 to 6;

b) The technical standard (e.g. ISO 9809-1) used for the design, construction and testing;

c) The character(s) identifying the country of approval, as indicated by the distinguishing signs used on vehicles in international road traffic;

Note 1.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

UN Model Regulations, 6.2.2.7.2 c) (see ST/SG/AC.10/46/Add.1) and paragraph 3.1.2.8.1 c) of the DGP-WG/19 report:

Note 2.— For the purpose of this mark the State of approval means the country of the competent authority that authorized the initial inspection and test of the individual receptacle at the time of manufacture.

d) The identity mark or stamp of the inspection body that is registered with the appropriate national authority of the country authorizing the marking;

e) The date of the initial inspection, the year (four digits) followed by the month (two digits) separated by a slash (i.e. "/").

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5.2.9 Marking of UN metal hydride storage systems

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5.2.9.2 The following marks must be applied:

a) The UN packaging symbol (un)

This symbol must not be used for any purpose other than for certifying that a packaging complies with the relevant requirements in Chapters 1 to 6;

b) "ISO 16111" (the technical standard used for design, manufacture and testing);

c) The character(s) identifying the country of approval, as indicated by the distinguishing signs used on vehicles in international road traffic;

UN Model Regulations, 6.2.2.9.2 c) (see ST/SG/AC.10/46/Add.1) and paragraph 3.1.2.8.1 c) of the DGP-WG/19 report:

Note 1.— The distinguishing sign used on vehicles in international road traffic is the distinguishing sign of the State of registration used on motor vehicles and trailers in international road traffic, e.g. in accordance with the Geneva Convention on Road Traffic of 1949 or the Vienna Convention on Road Traffic of 1968.

Note 2.— For the purpose of this mark the State of approval means the country of the appropriate national authority that authorized the initial inspection and test of the individual system at the time of manufacture.

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Chapter 6

UN Model Regulations, 6.3 (see ST/SG/AC.10/46/Add.1):

PACKAGINGS FOR INFECTIOUS SUBSTANCES OF CATEGORY A (UN 2814 AND UN 2900)

6.1 GENERAL

UN Model Regulations, 6.3.1.1 (see ST/SG/AC.10/46/Add.1):

The requirements of this chapter apply to packagings intended for the transport of infectious substances of Category A, UN 2814 and UN 2900.

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DGP-WG/18-WP/11 (see paragraph 3.1.2.2 of the DGP-WG/18 Report) and UN 6.3.4.1:

6.4.1 Each packaging intended for use according to these Instructions must bear marks which are durable, legible and placed in a location and of such a size relative to the packaging as to be readily visible. For packages with a gross mass of more than 30 kg the marks, or a duplicate thereof, must appear on the top or on a side of the packaging. Letters, numerals and symbols must be at least 12 mm high, except for packagings of 30 L capacity or less or of 30 kg ~~capacity or less~~ maximum net mass, when they must be at least 6 mm in height and except for packagings of 5 L capacity or less or of 5 kg ~~or less~~ maximum net mass, when they must be of an appropriate size.

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Table 6-4. Tests required for packaging types

UN Model Regulations, 6.3.5.2.2:

Type of packaging[a]			*Tests required*					
	Primary receptacle		*Water spray 6.5.3.~~6~~.5.1*	*Cold conditioning 6.5.3.~~6~~.5.2*	*Drop 6.5.3*	*Additional drop 6.5.3.~~6~~.5.3*	*Puncture 6.5.4*	*Stacking 6;4.6*
Rigid outer packaging	*Plastics*	*Other*	*No. of samples*	*No. of samples*	*No. of samples*	*No. of samples*	*No. of samples*	*No. of samples*
Fibreboard box	X		5	5	10		2	
		X	5	0	5		2	
Fibreboard drum	X		3	3	6		2	
		X	3	0	3		2	Required on three samples when testing a "U"-marked packaging, as defined in 6.5.1.6 for specific provisions.
Plastics box	X		0	5	5	Required on one sample when the packaging is intended to contain dry ice.	2	
		X	0	5	5		2	
Plastics drum/ jerrican	X		0	3	3		2	
		X	0	3	3		2	
Boxes of other material	X		0	5	5		2	
		X	0	0	5		2	
Drums/ jerricans of other material	X		0	3	3		2	
		X	0	0	3		2	

a. *Type of packaging* categorizes packagings for test purposes according to the kind of packaging and its material characteristics.

Note 1.— In instances where a primary receptacle is made of two or more materials, the material most liable to damage determines the appropriate test.

Note 2.— The material of the secondary packagings are not taken into consideration when selecting the test or conditioning for the test.

6.5.2.2.1 *Explanation for use of Table 6-4*

UN Model Regulations, 6.3.5.2.2 (see ST/SG/AC.10/46/Add.1):

6.5.2.2.1.1 If the packaging to be tested consists of a fibreboard outer box with a plastics primary receptacle, five samples must undergo the water spray test (see 6.5.3.~~6~~.5.1) prior to dropping and another five must be conditioned to –18°C (see 6.5.3.~~6~~.5.2) prior to dropping. If the packaging is to contain dry ice, then one further single sample must be dropped ~~five times after conditioning~~ in accordance with 6.5.3.~~6~~.5.3.

6.5.2.2.1.2 Packagings prepared as for transport must be subjected to the tests in 6.5.3 and 6.5.4. For outer packagings, the headings in Table 6-4 relate to fibreboard or similar materials whose performance may be rapidly affected by moisture, plastics which may embrittle at low temperature, and other materials such as metal whose performance is not affected by moisture or temperature.

6.5.3 Drop test

UN Model Regulations, 6.3.5.3.1 (see ST/SG/AC.10/46/Add.1):

6.5.3.1 *Drop height and target*

6.5.3.1.1 Samples must be subjected to free-fall drops from a height of 9 metres onto a non-resilient, horizontal, flat, massive and rigid surface in conformity with 6;4.3.3.

UN Model Regulations, 6.3.5.3.2 (see ST/SG/AC.10/46/Add.1):

6.5.3.2 *Number of test samples and drop orientation*

6.5.3.2.1 Where the samples are in the shape of a box, five must be dropped, one in each of the following orientations:

a) flat on the base;

b) flat on the top;

c) flat on the longest side;

d) flat on the shortest side;

e) on a corner.

6.5.3.~~3~~2.2 Where the samples are in the shape of a drum, three must be dropped, one in each of the following orientations:

a) diagonally on the top chime, with the centre of gravity directly above the point of impact;

b) diagonally on the base chime;

c) flat on the side.

6.5.3.~~4~~.3 While the sample must be released in the required orientation, it is accepted that for aerodynamic reasons the impact may not take place in that orientation.

6.5.3.~~5~~.4 Following the appropriate drop sequence, there must be no leakage from the primary receptacle(s), which must remain protected by cushioning/absorbent material in the secondary packaging.

6.5.3.~~6~~5 *Special preparation of test sample for the drop test*

6.5.3.~~6~~5.1 *Fibreboard — water spray test*

Fibreboard outer packagings: The sample must be subjected to a water spray that simulates exposure to rainfall of approximately 5 cm per hour for at least one hour. It must then be subjected to the test described in 6.5.3.1.

6.5.3.~~6~~5.2 *Plastics material — cold conditioning*

Plastics primary receptacles or outer packagings: The temperature of the test sample and its contents must be reduced to -18°C or lower for a period of at least 24 hours and within 15 minutes of removal from that atmosphere the test sample must be subjected to the test described in 6.5.3.1. Where the sample contains dry ice, the conditioning period may be reduced to four hours.

6.5.3.~~6~~5.3 *Packagings intended to contain dry ice — additional drop test*

Where the packaging is intended to contain dry ice, a test additional to that specified in 6.5.3.1 and, when appropriate, in 6.5.3.~~6~~.5.1 or 6.5.3.~~6~~.5.2 must be carried out. One sample must be stored so that all the dry ice dissipates and then that sample must be dropped in one of the orientations described in 6.5.3.2.1 or in 6.5.3.2.2, as appropriate which must be that most likely to result in failure of the packaging.

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Chapter 7

REQUIREMENTS FOR THE CONSTRUCTION, TESTING AND APPROVAL OF PACKAGES FOR RADIOACTIVE MATERIAL AND FOR THE APPROVAL OF SUCH MATERIAL

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7.1 GENERAL REQUIREMENTS

7.1.1 The package must be so designed in relation to its mass, volume and shape that it can be easily and safely transported. In addition, the package must be so designed that it can be properly secured in the aircraft during transport.

7.1.2 The design must be such that any lifting attachments on the package will not fail when used in the intended manner and that, if failure of the attachments should occur, the ability of the package to meet other requirements of these Instructions would not be impaired. The design must take account of appropriate safety factors to cover snatch lifting.

7.1.3 Attachments and any other features on the outer surface of the package which could be used to lift it must be designed either to support its mass in accordance with the requirements of 7.1.2 or must be removable or otherwise rendered incapable of being used during transport.

UN Model Regulations, 6.4.2.4 (see ST/SG/AC.10/46/Add.1):

7.1.4 As far as practicable, the packaging must be designed ~~and finished~~ so that the external surfaces are free from protruding features and can be easily decontaminated.

7.1.5 As far as practicable, the outer layer of the package must be designed so as to prevent the collection and the retention of water.

7.1.6 Any features added to the package at the time of transport which are not part of the package must not reduce its safety.

7.1.7 The package must be capable of withstanding the effects of any acceleration, vibration or vibration resonance, which may arise under routine conditions of transport without any deterioration in the effectiveness of the closing devices on the various receptacles or in the integrity of the package as a whole. In particular, nuts, bolts and other securing devices must be designed so as to prevent them from becoming loose or being released unintentionally, even after repeated use.

UN Model Regulations, 6.4.2.8 (see ST/SG/AC.10/46/Add.1):

7.1.8 The design of the package must take into account ageing mechanisms.

~~7.1.8~~7.1.9 The materials of the packaging and any components or structures must be physically and chemically compatible with each other and with the radioactive contents. Account must be taken of their behaviour under irradiation.

~~7.1.9~~7.1.10 All valves through which the radioactive contents could escape must be protected against unauthorized operation.

~~7.1.10~~7.1.11 The design of the package must take into account ambient temperatures and pressures that are likely to be encountered in routine conditions of transport.

~~7.1.11~~7.1.12 A package must be so designed that it provides sufficient shielding to ensure that, under routine conditions of transport and with the maximum radioactive contents that the package is designed to contain, the radiation level at any point on the external surface of the package would not exceed the values specified in 2;7.2.4.1.1.2, 4;9.1.10 and 4;9.1.11, as applicable, with account taken of 7;2.10.3.3 c).

~~7.1.12~~7.1.13 For radioactive material having other dangerous properties, the package design must take into account those properties (see Part 2, Introductory Chapter, 3.1, 3.2 and 4;9.1.5).

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7.3 REQUIREMENTS FOR EXCEPTED PACKAGES

UN Model Regulations, 6.4.4 (see ST/SG/AC.10/46/Add.1):

An excepted package must be designed to meet the requirements specified in 7.1 ~~and 7.2~~ to 7.12 and, in addition, the requirements of 7.6.2 if it contains fissile material allowed by one of the provisions of 2;7.2.3.5.1 a) to f), and the requirements of 7.2 if carried by air.

. . .

UN Model Regulations, 6.4.6.2 (see ST/SG/AC.10/46/Add.1):

7.5 REQUIREMENTS FOR PACKAGES CONTAINING URANIUM HEXAFLUORIDE

. . .

7.5.2 Each package designed to contain 0.1 kg or more of uranium hexafluoride must be designed so that ~~it would meet~~ the package would meet the following requirements:

a) withstand, without leakage and without unacceptable stress, as specified in ISO 7195:2005, the structural test as specified in 7.20 except as allowed in 7.5.4;

b) withstand, without loss or dispersal of the uranium hexafluoride, the free drop test specified in 7.14.4; and

c) withstand, without rupture of the containment system, the thermal test specified in 7.16.3 except as allowed in 7.5.4.

. . .

7.6 REQUIREMENTS FOR TYPE A PACKAGES

. . .

7.6.8 Special form radioactive material may be considered as a component of the containment system.

UN Model Regulations, 6.4.7.9 (see ST/SG/AC.10/46/Add.1):

7.6.9 If the containment system forms a separate unit of the package, ~~it~~ the containment system must be capable of being securely closed by a positive fastening device which is independent of any other part of the packaging.

. . .

UN Model Regulations, 6.4.7.17 (see ST/SG/AC.10/46/Add.1):

7.6.17 Type A packages to contain gas

A Type A package designed for gases must prevent loss or dispersal of the radioactive contents if the package were subjected to the tests specified in 7.15 ~~. A~~, except for a Type A package designed for tritium gas or for noble gases ~~must be excepted from this requirement~~.

7.7 REQUIREMENTS FOR TYPE B(U) PACKAGES

7.7.1 Type B(U) packages must be designed to meet the requirements specified in 7.1, 7.2 and 7.6.2 to 7.6.15, except 7.6.14 a), and, in addition, to the requirements specified in 7.7.2 to 7.7.15.

UN Model Regulations, 6.4.8.2 (see ST/SG/AC.10/46/Add.1):

7.7.2 A package must be designed so that, under the ambient conditions specified in 7.7.5 and 7.7.6, heat generated within the package by the radioactive contents does not, under normal conditions of transport, as demonstrated by the tests in 7.14, adversely affect the package in such a way that it would fail to meet the applicable requirements for containment and shielding if left unattended for a period of one week. Particular attention must be paid to the effects of heat, which may cause one or more of the following:

a) alter the arrangement, the geometrical form or the physical state of the radioactive contents or, if the radioactive material is enclosed in a can or receptacle (for example, clad fuel elements), cause the can, receptacle or radioactive material to deform or melt;

b) lessening of the efficiency of the packaging through differential thermal expansion or cracking or melting of the radiation shielding material;

c) in combination with moisture, accelerate corrosion.

. . .

7.7.8 A package must be so designed that, if it were subjected to:

a) the tests specified in 7.14, it would restrict the loss of radioactive contents to not more than 10^{-6} A_2 per hour; and

b) the tests specified in 7.16.1, 7.16.2 b), 7.16.3 and 7.16.4 and either the tests in:

i) 7.16.2 c), when the package has a mass not greater than 500 kg, an overall density not greater than 1 000 kg/m^3 based on the external dimensions, and radioactive contents greater than 1 000 A_2 not as special form radioactive material; or

ii) 7.16.2 a), for all other packages,

it would meet the following requirements:

UN Model Regulations, 6.4.8.8 (see ST/SG/AC.10/46/Add.1):

— retain sufficient shielding to ensure that the ~~radiation level~~ dose rate at 1 m from the surface of the package would not exceed 10 mSv/h with the maximum radioactive contents which the package is designed to contain; and

— restrict the accumulated loss of radioactive contents in a period of one week to not more than 10 A_2 for krypton-85 and not more than A_2 for all other radionuclides.

Where mixtures of different radionuclides are present, the provisions of 2;7.2.2.4 to 2;7.2.2.6 must apply except that for krypton-85, an effective A2(i) value equal to 10 A2 may be used. For case a) above, the assessment must take into account the external non-fixed contamination limits of 4;9.1.2.

. . .

7.8 REQUIREMENTS FOR TYPE B(M) PACKAGES

UN Model Regulations, 6.4.9.1 (see ST/SG/AC.10/46/Add.1):

Type B(M) packages must meet the requirements for Type B(U) packages specified in 7.7.1, except that for packages to be transported solely within a specified country or solely between specified countries, conditions other than those given in 7.6.5, 7.7.4 to 7.7.6 and 7.7.9 to 7.7.15 may be assumed with the approval of the competent authorities of these countries. ~~Notwithstanding, t~~The requirements for Type B(U) packages specified in 7.7.4 and 7.7.9 to 7.7.15 must be met as far as practicable.

. . .

7.10 REQUIREMENTS FOR PACKAGES CONTAINING FISSILE MATERIAL

. . .

7.10.2 Packages containing fissile material that meet the provisions of subparagraph d) and one of the provisions of a) to c) below are excepted from the requirements of 7.10.4 to 7.10.14.

. . .

c) packages containing fissile material in any form provided that:

i) the smallest external dimension of the package is not less than 10 cm;

ii) the package, after being subjected to the tests specified in 7.14.1 to 7.14.6:

— retains its fissile material contents;

— preserves the minimum overall outside dimensions of the package to at least 10 cm;

— prevents the entry of a 10 cm cube;

iii) the criticality safety index of the package is calculated using the following formula:

$$CSI=50x2x\left(\frac{\textit{Mass of U-235 in package(g)}}{450}\right)+\left(\frac{\textit{Mass of other fissile nuclides}^{*}\textit{ in package (g)}}{280}\right)$$

* Plutonium may be of any isotopic composition provided that the amount of Pu-241 is less than that of Pu-240 in the package

UN Model Regulations, 6.4.11.2 (see ST/SG/AC.10/46/Add.1):

iv) the ~~maximum~~ total mass of fissile nuclides in any package does not exceed 15 g;

d) the total mass of beryllium, hydrogenous material enriched in deuterium, graphite and other allotropic forms of carbon in an individual package must not be greater than the mass of fissile nuclides in the package except where ~~their~~ the total concentration of these materials does not exceed 1 g in any 1 000 g of material. Beryllium incorporated in copper alloys up to 4 per cent in weight of the alloy does not need to be considered.

. . .

7.10.8 For a package in isolation, it must be assumed that water can leak into or out of all void spaces of the package, including those within the containment system. However, if the design incorporates special features to prevent such leakage of water into or out of certain void spaces, even as a result of error, absence of leakage may be assumed in respect of those void spaces. Special features must include either of the following:

a) multiple high standard water barriers not less than two of which would remain watertight if the package were subject to the tests prescribed in 7.10.13 b), a high degree of quality control in the manufacture, maintenance and repair of packagings and tests to demonstrate the closure of each package before each shipment; or

b) for packages containing uranium hexafluoride only, with maximum enrichment of 5 mass per cent uranium-235:

UN Model Regulations, 6.4.11.8 (see ST/SG/AC.10/46/Add.1):

i) packages where, following the tests prescribed in 7.10.13 b), there is no physical contact between the valve or the plug and any other component of the packaging other than at its original point of attachment and where, in addition, following the test prescribed in 7.16.3, the valves and the plug remain leaktight; and

ii) a high degree of quality control in the manufacture, maintenance and repair of packagings coupled with tests to demonstrate closure of each package before each shipment.

. . .

7.10.11:

a) The package must be subcritical under conditions consistent with the Type C package tests specified in 7.19.1 assuming reflection by at least 20 cm of water but no water-in leakage.

UN Model Regulations, 6.4.11.11 b) (see ST/SG/AC.10/46/Add.1):

b) In the assessment of 7.10.10~~, allowance must not be made for~~ use of special features ~~of~~ as specified in 7.10.8 ~~unless, following the Type C package tests specified in 7.19.1 and, subsequently, the water in leakage test of 7.18.3, leakage of water into or out of the void spaces is prevented~~ provided that leakage of water into or out of the void spaces is prevented when the package is submitted to the Type C package tests specified in 7.19.1 followed by the water leakage test specified in 7.18.3.

. . .

7.11 TEST PROCEDURES AND DEMONSTRATION OF COMPLIANCE

7.11.1 Demonstration of compliance with the performance standards required in 2;7.2.3.1.3, 2;7.2.3.1.4, 2;7.2.3.3.1, 2;7.2.3.3.2, 2;7.2.3.4.1, 2;7.2.3.4.2 and 6;7.1 to 6;7.10 must be accomplished by any of the methods listed below or by a combination thereof:

UN Model Regulations, 6.4.12 a) (see ST/SG/AC.10/46/Add.1):

a) Performance of tests with specimens representing ~~LSA-III material, or~~ special form radioactive material, or low dispersible radioactive material or with prototypes or samples of the packaging, where the contents of the specimen or the packaging for the tests must simulate, as closely as practicable, the expected range of radioactive contents and the specimen or packaging to be tested must be prepared as presented for transport;

b) Reference to previous satisfactory demonstrations of a sufficiently similar nature;

c) Performance of tests with models of appropriate scale incorporating those features which are significant with respect to the item under investigation when engineering experience has shown results of such tests to be suitable for design purposes. When a scale model is used, the need for adjusting certain test parameters, such as penetrator diameter or compressive load, must be taken into account;

d) Calculation, or reasoned argument, when the calculation procedures and parameters are generally agreed to be reliable or conservative.

. . .

7.12 TESTING THE INTEGRITY OF THE CONTAINMENT SYSTEM AND SHIELDING AND EVALUATING CRITICALITY SAFETY

UN Model Regulations, 6.4.13 (see ST/SG/AC.10/46/Add.1):

After each ~~of the applicable tests~~ test or group of tests or sequence of the applicable tests, as appropriate, specified in 7.14 to 7.20:

a) faults and damages must be identified and recorded;

b) it must be determined whether the integrity of the containment system and shielding has been retained to the extent required in 7.1 to 7.10 for the package under test; and

c) it must be determined, for packages containing fissile material, whether the assumptions and conditions used in the assessments required by 7.10.1 to 7.10.14 for one or more packages are valid.

. . .

7.14 TESTS FOR DEMONSTRATING ABILITY TO WITHSTAND NORMAL CONDITIONS OF TRANSPORT

. . .

7.14.4 Free drop test: the specimen must drop onto the target so as to suffer maximum damage in respect of the safety features to be tested.

UN Model Regulations, 6.4.15.4 a) (see ST/SG/AC.10/46/Add.1):

a) The height of the drop, measured from the lowest point of the specimen to the upper surface of the target, must be not less than the distance specified in Table 6-6 for the applicable mass. The target must be as defined in 7.13;

b) For rectangular fibreboard or wood packages not exceeding a mass of 50 kg, a separate specimen must be subjected to a free drop onto each corner from a height of 0.3 m;

c) For cylindrical fibreboard packages not exceeding a mass of 100 kg, a separate specimen must be subjected to a free drop onto each of the quarters of each rim from a height of 0.3 m.

. . .

7.14.6 Penetration test: the specimen must be placed on a rigid, flat, horizontal surface which will not move significantly while the test is being carried out.

a) A bar of 3.2 cm in diameter with a hemispherical end and a mass of 6 kg must be dropped and directed to fall, with its longitudinal axis vertical, onto the centre of the weakest part of the specimen so that, if it penetrates sufficiently far, it will hit the containment system. The bar must not be significantly deformed by the test performance;

UN Model Regulations, 6.4.15.6 b) (see ST/SG/AC.10/46/Add.1):

b) The height of the drop of the bar, measured from its lower end to the intended point of impact on the upper surface of the specimen, must be 1 m.

. . .

7.16 TESTS FOR DEMONSTRATING THE ABILITY TO WITHSTAND ACCIDENT CONDITIONS IN TRANSPORT

7.16.1 The specimen must be subjected to the cumulative effects of the tests specified in 7.16.2 and 7.16.3, in that order. Following these tests, either this specimen or a separate specimen must be subjected to the effect(s) of the water immersion test(s) as specified in 7.16.4 and, if applicable, 7.17.

7.16.2 Mechanical test: the mechanical test consists of three different drop tests. Each specimen must be subjected to the applicable drops as specified in 7.7.8 or 7.10.13. The order in which the specimen is subjected to the drops must be such that, on completion of the mechanical test, the specimen must have suffered such damage as will lead to the maximum damage in the thermal test which follows:

a) For drop I, the specimen must drop onto the target so as to suffer the maximum damage, and the height of the drop measured from the lowest point of the specimen to the upper surface of the target must be 9 m. The target must be as defined in 7.13;

UN Model Regulations, 6.4.17.2 b) (see ST/SG/AC.10/46/Add.1):

b) For drop II, the specimen must drop onto a bar rigidly mounted perpendicularly on the target so as to suffer the maximum damage. The height of the drop measured from the intended point of impact of the specimen to the upper surface of the bar must be 1 m. The bar must be of solid mild steel of circular cross-section, (15.0 ± 0.5 cm) in diameter and 20 cm long unless a longer bar would cause greater damage, in which case a bar of sufficient length to cause maximum damage must be used. The upper end of the bar must be flat and horizontal with its edge rounded off to a radius of not more than 6 mm. The target on which the bar is mounted must be as described in 7.13;

c) For drop III, the specimen must be subjected to a dynamic crush test by positioning the specimen on the target so as to suffer maximum damage by the drop of a 500 kg mass from 9 m onto the specimen. The mass must consist of a solid mild steel plate 1 m by 1 m and must fall in a horizontal attitude. The lower face of the steel plate must have its edges and corners rounded off to a radius of not more than 6 mm. The height of the drop must be measured from the underside of the plate to the highest point of the specimen. The target on which the specimen rests must be as defined in 7.13.

7.16.3 Thermal test: the specimen must be in thermal equilibrium under conditions of an ambient temperature of 38°C, subject to the solar insolation conditions specified in Table 6-5 and subject to the design maximum rate of internal heat generation within the package from the radioactive contents. Alternatively, any of these parameters are allowed to have different values prior to and during the test, provided due account is taken of them in the subsequent assessment of package response. The thermal test must then consist of:

a) exposure of a specimen for a period of 30 minutes to a thermal environment which provides a heat flux at least equivalent to that of a hydrocarbon fuel/air fire in sufficiently quiescent ambient conditions to give a minimum average flame emissivity coefficient of 0.9 and an average temperature of at least 800°C, fully engulfing the specimen, with a surface absorptivity coefficient of 0.8 or that value which the package may be demonstrated to possess if exposed to the fire specified, followed by;

UN Model Regulations, 6.4.17.3 b) (see ST/SG/AC.10/46/Add.1):

b) exposure of the specimen to an ambient temperature of 38°C, subject to the solar insolation conditions specified in Table 6-5 and subject to the design maximum rate of internal heat generation within the package by the radioactive contents for a sufficient period to ensure that temperatures in the specimen are ~~everywhere~~ decreasing in all parts of the specimen and/or are approaching initial steady-state conditions. Alternatively, any of these parameters are allowed to have different values following cessation of heating, provided due account is taken of them in the subsequent assessment of package response.

. . .

7.22 APPLICATIONS AND APPROVALS FOR RADIOACTIVE MATERIAL TRANSPORT

See 6.4.23 of the UN Model Regulations.

7.23 REGISTRATION OF SERIAL NUMBERS AND VALIDATION

7.23.1 The competent authority must be informed of the serial number of each packaging manufactured to a design approved by them. The competent authority must maintain a register of such numbers.

7.23.2 Multilateral approval may be by validation of the original certificate issued by the competent authority of the State of Origin of the design or shipment.

7.24 TRANSITIONAL MEASURES FOR CLASS 7

UN Model Regulations, 6.4.24 (see ST/SG/AC.10/46/Add.1):

7.24.1 Packages not requiring competent authority approval of design under the 1985~~,~~ ~~and~~ 1985 (As Amended 1990), 1996 edition, 1996 edition (revised), 1996 (as amended 2003), 2005, 2009 editions of IAEA Safety Series No. 6 and 2012 edition of IAEA Safety Standards Series No. SSR-6 ~~editions of IAEA Safety Series No. 6~~

7.24.1.1 Packages not requiring competent authority approval of design (excepted packages, Type IP-1, Type IP-2, Type IP-3 and Type A packages) must meet these Instructions in full, except that~~-~~:

a) packages that meet the requirements of the 1985 or 1985 (As Amended 1990) Editions of ~~IAEA Regulations for the Safe Transport of Radioactive Material (~~ IAEA Safety Series No.6~~)~~:

~~a)~~i) may continue in transport provided that they were prepared for transport prior to 31 December 2003, and are subject to the requirements of 6.4.24.4 of the UN Model Regulations, if applicable;

~~b)~~ii) may continue to be used, provided that all the following conditions are met:

~~i~~1) they were not designed to contain uranium hexafluoride;

~~ii~~2) the ~~a~~applicable requirements of 1;6.3 of these Instructions are applied;

3) iii) the activity limits and classification in Part 2;7 of these Instructions are applied;

~~iv~~4) the requirements and controls for transport in Parts 1, 3, 4, 5 and 7 of these Instructions are applied;

~~v~~5) the packaging was not manufactured or modified after 31 December 2003.

Secretariat Note.— The yellow-shaded text below is an indication of editorial amendments since DGP-WG/19.

b) packages that meet the requirements of the 1996, 1996 (revised), 1996 (as amended 2003), 2005 or 2009 Editions of IAEA Safety Series No. 6, or 2012 Edition of IAEA Safety Standards Series No. SSR-6:

(i) may continue in transport provided that they were prepared for transport prior to 31 December 2025 and are subject to the requirements of 6.4.24.4 of the UN Model Regulations, if applicable; or

(ii) may continue to be used, provided that all the following conditions are met:

1) the applicable requirements of 1;6.3 of these Instructions are applied;

2) the activity limits and classification in Part 2;7of these Instructions are applied;

3) the requirements and controls for transport in Parts 1, 3, 4, 5 and 7 of these Instructions are applied; and

4) the packaging was not manufactured or modified after 31 December 2025.

~~7.24.1.2 Any packaging modified, unless to improve safety, or manufactured after 31 December 2003, must meet the requirements of these Instructions in full. Packages prepared for transport not later than 31 December 2003 under the 1985 or 1985 (As Amended 1990) editions of IAEA Safety Series No. 6 may continue in transport. Packages prepared for transport after this date must meet the requirements of these Instructions in full.~~

UN Model Regulations, 6.4.24.2 (see ST/SG/AC.10/46/Add.1):

7.24.2 ~~Packages approved under the 1973, 1973 (As Amended), 1985 and 1985 (As Amended 1990) editions of IAEA Safety Series No. 6~~Package designs approved under the 1985, 1985 (as amended 1990), 1996, 1996 (revised), 1996 (as amended 2003), 2005 and 2009 Editions of IAEA Safety Series No. 6 and 2012 Edition of IAEA Safety Standards Series No. SSR-6

Secretariat Note.— The yellow-shaded text below is an indication of editorial amendments since DGP-WG/19.

7.24.2.1 Packages requiring competent authority approval of the design must meet these Instructions in full ~~unless the following conditions are met~~ except that:

a) ~~the~~ packagings that were manufactured to a package design approved by the competent authority under the provisions of ~~the~~ 1973 or 1973 (As Amended) ~~or~~ the 1985 or 1985 (As Amended 1990) Editions of IAEA Safety Series No.6~~)~~ may continue to be used provided that all of the following conditions are met;

~~b~~i) the package design is subject to multilateral approval;

~~c~~ii) the applicable requirements of 1;6.3 of these Instructions are applied;

~~d~~iii) the activity limits and classification in Part 2;7 of these Instructions are applied;

~~e~~iv) the requirements and controls for transport in in Parts 1, 3, 4, 5 and 7 of these Instructions are applied;

~~f~~v) for a package containing fissile material and transported by air, the requirement of 7.10.11 is met;

~~g) for packages that meet the requirements of the 1973 or 1973 (As Amended) Editions of IAEA Safety Series No. 6:~~

~~i) the packages retain sufficient shielding to ensure that the radiation level at 1 m from the surface of the package would not exceed 10 mSv/h in the accident conditions of transport defined in the 1973 Revised or 1973 Revised (As Amended) Editions of IAEA Safety Series No. 6 with the maximum radioactive contents which the package is authorized to contain;~~

~~ii) the packages do not utilize continuous venting;~~

~~iii) a serial number in accordance with the provision of 5;2.4.5.1 c) is assigned to and marked on the outside of each packaging.~~

b) packagings that were manufactured to a package design approved by the competent authority under the provisions of the 1996, 1996 (revised), 1996 (as amended 2003), 2005 or 2009 Editions of IAEA Safety Series No. 6, or 2012 Edition of IAEA Safety Standards Series No. SSR-6 may continue to be used provided that all of the following conditions are met:

i) the package design is subject to multilateral approval after 31 December 2025;

ii) the applicable requirements of 1;6.3 of these Instructions are applied;

iii) the activity limits and material restrictions of Part 2;7 of these Instructions are applied;

iv) the requirements and controls for transport in Parts 1, 3, 4, 5 and 7 of these Instructions are applied.

7.24.2.2 No new manufacture of packagings to a package design meeting the provisions of the 1973, 1973 (As Amended), 1985, and 1985 (As Amended 1990) Editions of IAEA Safety Series No. 6 must be permitted to commence.

UN Model Regulations, 6.4.24.4 (see ST/SG/AC.10/46/Add.1):

7.24.2.3 No new manufacture of packagings of a package design meeting the provisions of the 1996, 1996 (revised), 1996 (as amended 2003), 2005 or 2009 Editions of IAEA Safety Series No. 6, or 2012 Edition of IAEA Safety Standards Series No. SSR-6 must be permitted to commence after 31 December 2028.

UN Model Regulations, 6.4.24.6 (see ST/SG/AC.10/46/Add.1):

7.24.3 Special form radioactive material approved under the ~~1973, 1973 (As Amended), 1985 and 1985 (As Amended 1990) editions of IAEA Safety Series No. 6~~ the 1985, 1985 (as amended 1990), 1996, 1996 (revised), 1996 (as amended 2003), 2005 or 2009 Editions of IAEA Safety Series No. 6 or 2012 Edition of IAEA Safety Standards Series No. SSR-6

Special form radioactive material manufactured to a design ~~which~~that had received unilateral approval by the competent authority under the ~~1973, 1973 (As Amended), 1985 or~~ 1985 (as amended 1990~~)~~), 1996, 1996 (revised), 1996 (as amended 2003), 2005 and 2009 Editions of IAEA Safety Series No. 6 and 2012 Edition of IAEA Safety Standards Series No. SSR-6 may continue to be used when in compliance with the mandatory management system in accordance with the applicable requirements of 1;6.3. There must be no new manufacture of ~~such~~ special form radioactive material ~~must~~to a design that had received unilateral approval by the competent authority under the 1985 or 1985 (as amended 1990) Editions of IAEA Safety Series No. 6. No new manufacture of special form radioactive material to a design that had received unilateral approval by the competent authority under the 1996, 1996 (revised), 1996 (as amended 2003), 2005 and 2009 Editions of IAEA Safety Series No. 6, and 2012 Edition of IAEA Safety Standards Series No. SSR-6 must be permitted to commence after 31 December 2025.

— END —