International Civil Aviation Organization

DGP/22-WP/5
8/6/09

WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-SECOND MEETING

Montréal, 5 to 16 October 2009

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2011-2012 Edition

DRAFT AMENDMENTS OF THE TECHNICAL INSTRUCTIONS TO ALIGN TO THE UN RECOMMENDATIONS — PART 2

(Presented by the Secretary)

SUMMARY

This working paper contains draft amendments to Part 2 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 fourth session (Geneva, 12 December 2008). It also reflects amendments agreed by DGP-WG08 (The Hague, 3 to 7 November 2008) and DGP-WG09 (Auckland, New Zealand, 4 to 8 May 2009).

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

Part 2

CLASSIFICATION OF DANGEROUS GOODS

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INTRODUCTORY CHAPTER

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2. CLASSES, DIVISIONS, PACKING GROUPS — DEFINITIONS

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Class 9: Miscellaneous dangerous substances and articles, including environmentally hazardous substances

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3. UN NUMBERS AND PROPER SHIPPING NAMES

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3.5 A mixture or solution composed of a single predominant substance identified by name in Table 3-1 and one or more substances not subject to these Instructions and/or traces of one or more substances identified by name in Table 3-1 must be assigned the UN number and proper shipping name of the predominant substance named in Table 3-1, unless:

a) the mixture or solution is identified by name in Table 3-1; or

b) the name and description of the substance named in Table 3-1 specifically indicates that it applies only to the pure substance; or

c) the hazard class or division, subsidiary risk(s), physical state or packing group of the solution or mixture is different from that of the substance named in Table 3-1; or

d) the hazard characteristics and properties of the mixture or solution necessitate emergency response measures that are different from those required for the substance identified by name in Table 3-1.

[3.6 In those other cases, except the one described in a), the mixture or solution must be treated as a dangerous substance not specifically listed by name in Table 3-1.]

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4. PRECEDENCE OF HAZARD CHARACTERISTICS

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4.2 Apart from radioactive material in excepted packages (where the other hazardous properties take precedence), radioactive material having other hazardous properties must always be classified in Class 7 and the subsidiary risk must also be identified. For radioactive material in excepted packages, Special Provision A130 applies.

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Chapter 1

CLASS 1 — EXPLOSIVES

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1.2 DEFINITIONS

For the purposes of these Instructions, the following definitions apply:

a) ***Explosive substance*** is a solid or liquid substance (or a mixture of substances) which is in itself capable, by chemical reaction, of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic substances are included even when they do not evolve gases.

b) ***Pyrotechnic substance*** is a substance or a mixture of substances designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as the result of non-detonative, self-sustaining, exothermic, chemical reactions.

c) ***Explosive article*** is an article containing one or more explosive substances.

d) ***Phlegmatized*** means that a substance (or "phlegmatizer") has been added to an explosive to enhance its safety in handling and transport. The phlegmatizer renders the explosive insensitive, or less sensitive, to the following actions: heat, shock, impact, percussion or friction. Typical phlegmatizing agents include, but are not limited to: wax, paper, water, polymers (such as chlorofluoropolymers), alcohol and oils (such as petroleum jelly and paraffin).

Note.— Explanations for a number of other terms used in connection with explosives can be found in Attachment 2 to these Instructions.

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Table 2-2. Classification codes

Description of substance or article to be classified	*Compatibility group*	*Classification code*
Primary explosive substance	A	1.1A
. . .		
Substances or articles so packed or designed that any hazardous effects arising from accidental functioning are confined within the package unless the package has been degraded by fire, in which case all blast or projection effects are limited to the extent that they do not significantly hinder or prohibit fire fighting or other emergency response in the immediate vicinity of the package	S	1.4S

Note 1.— Articles of Compatibility Groups D and E may be fitted or packed together with their own means of initiation provided that such means have at least two effective protective features designed to prevent an explosion in the event of accidental functioning of the means of initiation. Such articles and packages must be assigned to Compatibility Groups D or E.

Note 2.— Articles of Compatibility Groups D and E may be packed together with their own means of initiation, which do not have two effective protective features when, in the opinion of the appropriate national authority of the State of Origin, the accidental functioning of the means of initiation does not cause the explosion of an article under normal conditions of transport. Such packages must be assigned to Compatibility Groups D or E.

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Chapter 2

CLASS 2 — GASES

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2.1.3 This class comprises compressed gases; liquefied gases; dissolved gases; refrigerated liquefied gases; mixtures of one or more gases with one or more vapours of substances of other classes; articles charged with a gas; and aerosols. (For aerosols, see 1;3.1).

~~*Note 1.— Carbonated beverages and inflated balls used for sports are not subject to these Instructions.*~~

Note ~~2.~~— "Cryogenic liquid" means the same as "refrigerated liquefied gas".

DGP/22-WP/2, paragraph 3.2.9:

[2.1.4 Pressures of all kinds relating to receptacles (such as test pressure, internal pressure, safety-valve opening pressure) are always indicated in gauge pressure (pressure in excess of atmospheric pressure); however, the vapour pressure of substances is always expressed in absolute pressure.]

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2.2 DIVISIONS

2.2.1 Substances of Class 2 are assigned to one of three divisions based on the primary hazard of the gas during transport.

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b) Division 2.2 — Non-flammable, non-toxic gases.

Gases which:

i) are asphyxiant — gases which dilute or replace the oxygen normally in the atmosphere; or

ii) are oxidizing — gases which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. ~~The oxidizing ability must be determined by tests or by calculation in accordance with methods adopted by ISO (see ISO 10156:1996 and ISO 10156-2:2005)~~; or

Note.— In 2.2.1 b) ii), "gases which cause or contribute to the combustion of other material more than air does" means pure gases or gas mixtures with an oxidizing power greater than 23.5 per cent as determined by a method specified in ISO 10156:1996 or 10156-2:2005.

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2.2.2 Gases of Division 2.2 are not subject to these Instructions if they are transported at a pressure less than 200 kPa at 20°C and are not liquefied or refrigerated liquefied gases.

2.2.3 Gases of Division 2.2 are not subject to these Instructions when contained in the following:

a) foodstuffs, including carbonated beverages (except UN 1950);

b) balls intended for use in sports;

c) [tyres which meet the provisions of Special Provision A59]; or

d) light bulbs, provided they are packaged so that the projectile effects of any rupture of the bulb will be contained within the package.

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2.4 MIXTURES OF GASES

For the classification of gas mixtures into one of the three divisions (including vapours of substance from other classes), the following principles must be used:

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d) Oxidizing ability is determined either by tests or by calculation methods adopted by the International Standards Organization (see the Note in 2.2.1 b) and ISO 10156:1996 and ISO 10156-2:2005).

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Chapter 3

CLASS 3 — FLAMMABLE LIQUIDS

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3.3 DETERMINATION OF FLASH POINT

The following ~~is a list of documents describing~~ methods for determining the flash point of ~~substances in Class 3~~ flammable liquids may be used:

International standards

— ISO 1516
— ISO 1523
— ISO 2719
— ISO 13736
— ISO 3679
— ISO 3680

National standards

Editorial Note.— The following is moved from the end of this paragraph:

~~*United States* (~~American Society for Testing Materials International,~~ 1916 Race Street, Philadelphia, PA 19103)~~ 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, USA 19428-2959

- ASTM D-3828-93, Standard Test Methods for Flash Point by Small Scale Closed Tester
- ASTM D-56-93, Standard Test Method for Flash Point by Tag Closed Tester
- ASTM D3278-96, Standard Test Methods for Flash Point of Liquids by Setaflash Closed-Cup Apparatus
- ASTM D-0093-96, Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester.

~~*France* (~~Association française de normalisation, AFNOR, ~~Tour Europe, 92049 Paris La Défense)~~, 11, rue de Pressensé, 93571 La Plaine Saint-Denis Cedex

- French Standard NF M 07–019
- French Standards NF M 07–011 / NF T 30–050 / NF T 66–009
- French Standard NF M 07–036

~~*Germany* (~~Deutsches Institut für Normung, Burggrafenstrasse 6, D-10787 Berlin~~)~~

- Standard DIN 51755 (flash points below 65°C)

~~Standard DIN EN 22719 (flash points above 5°C)~~
~~Standard DIN 53213 (for varnishes, lacquers and similar viscous liquids with flash points below 65°C)~~

~~*Netherlands*~~

~~ASTM D93-90~~
~~ASTM D3278-89~~
~~ISO 1516~~
~~ISO 1523~~
~~ISO 3679~~
~~ISO 3680~~

~~*Russian Federation* (~~State Committee of the Council of Ministers for Standardization, 113813, GSP, Moscow, M-49 Leninsky Prospect, 9)

- GOST 12.1.044-84

~~*United Kingdom* (British Standards Institution, Customer Services, 389 Chiswick High Road, London, N7 8LB)~~

~~British Standard BS EN 22719~~
~~British Standard BS 2000 Part 170~~

~~*United States* (American Society for Testing Materials, 1916 Race Street, Philadelphia, PA 19103)~~

~~ASTM D-3828-93, Standard Test Methods for Flash Point by Small Scale Closed Tester~~
~~ASTM D-56-93, Standard Test Method for Flash Point by Tag Closed Tester~~
~~TM 3278-96, Standard Test Methods for Flash Point of Liquids by Setaflash Closed-Cup Apparatus~~
ASTM D 0093-96, Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester.

3.4 DETERMINATION INITIAL BOILING POINT

The following methods for determining the initial boiling point of flammable liquids may be used:

International standards

- ISO 3924
- ISO 4626
- ISO 3405

National standards

American Society for Testing Materials International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, USA 19428-2959

- ASTM D86-07a, Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure
- ASTM D1078-05, Standard Test Method for Distillation Range of Volatile Organic Liquids

Further acceptable methods

— Method A.2 as described in Part A of the Annex to Commission Regulation (EC) No 440/2008[1]

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Chapter 4

CLASS 4 — FLAMMABLE SOLIDS; SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION; SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

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4.3 SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION (DIVISION 4.2)

4.3.1 Definitions and properties

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4.3.1.2 Self-heating of a substance~~s, leading to spontaneous combustion, is caused by~~ is a process where the gradual reaction of ~~the~~ that substance with oxygen (in the air) ~~and the~~ generates heat ~~developed not being conducted away sufficiently rapidly to the surroundings. Spontaneous combustion occurs when the rate of heat production exceeds the rate of heat loss and the auto-ignition temperature is reached.~~ If the rate of heat production exceeds the rate of heat loss, then the temperature of the substance will rise which, after an induction time, may lead to self-ignition and combustion.

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Chapter 5

CLASS 5 — OXIDIZING SUBSTANCES; ORGANIC PEROXIDES

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Table 2-7. List of currently assigned organic peroxides in packages

Note.— Peroxides to be transported must fulfil the classification and the control and emergency temperatures (derived from the self-accelerating decomposition temperature (SADT)) as listed.

Organic peroxide	*Concentration (per cent)*	*Diluent type A (per cent)*	*Diluent type B (per cent) (Note 1)*	*Inert solid (per cent)*	*Water (per cent)*	*Control tempera-ture (°C)*	*Emergency tempera-ture (°C)*	*UN generic entry*	*Notes*
. . .									
tert-Amylperoxy-3,5,5-trimethylhexanoate	≤100							FORBIDDEN	~~3~~
. . .									

[1] Commission Regulation (EC) No 440/2008 of 30 May 2008 laying down test methods pursuant to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (Official Journal of the European Union, No. L 142 of 31.05.2008, p.1-739 and No. L 143 of 03.06.2008, p.55).

Organic peroxide	*Concentration (per cent)*	*Diluent type A (per cent)*	*Diluent type B (per cent) (Note 1)*	*Inert solid (per cent)*	*Water (per cent)*	*Control tempera-ture (°C)*	*Emergency tempera-ture (°C)*	*UN generic entry*	*Notes*
Di-(~~2~~-tert-butylperoxyisopropyl) benzene(s)	>42-100			≤57				3106	
Di-(~~2~~-tert-butylperoxyisopropyl) benzene(s)	≤42			≥58				Exempt	29
. . .									
2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane	>90-100							3103	
2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane	>52-~~100~~90	≥10						3105	
Editorial Note.— Remove space before “hexane” below.									
2,5-Dimethyl-2,5-di-(tert-butylperoxy)-hexane	≤77			≥23				3108	

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Chapter 7

CLASS 7 — RADIOACTIVE MATERIAL

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7.1 DEFINITIONS

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7.1.3 Definitions of specific terms

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Fissile ~~material~~ nuclides. Uranium-233, uranium-235, plutonium-239~~,~~ and plutonium-241~~, or any combination of these radionuclides~~. Fissile material is a material containing any of the fissile nuclides. ~~Excepted~~ Excluded from ~~this~~ the definition ~~are~~ of fissile material are:

a) natural uranium or depleted uranium which is unirradiated; and

b) natural uranium or depleted uranium which has been irradiated in thermal reactors only.

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Table 2-12. Basic radionuclides values for individual radionuclides

Radionuclide (atomic number)	*A_1 (TBq)*	*A_2 (TBq)*	*Activity concentration for exempt material (Bq/g)*	*Activity limit for an exempt consignment (Bq)*
. . .				
Krypton (36)				
Kr-79	4×10^0	2×10^0	1×10^3	1×10^5
Kr-81	4 × 101	4 × 101	1 × 104	1 × 107
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7.2.3 Determination of other material characteristics

7.2.3.1 *Low specific activity (LSA) material*

7.2.3.1.1 (Reserved)

7.2.3.1.2 LSA material must be in one of three groups:

a) LSA-I

i) uranium and thorium ores and concentrates of such ores, and other ores containing naturally occurring radionuclides which are intended to be processed for the use of these radionuclides;

ii) natural uranium, depleted uranium, natural thorium, or their compounds or mixtures, ~~providing they~~ that are unirradiated and in solid or liquid form;

iii) radioactive material for which the A_2 value is unlimited, excluding fissile material ~~classified as fissile according to~~ not excepted under 7.2.3.5; or

iv) other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the values for activity concentration specified in 7.2.2.1 to 7.2.2.6, excluding fissile material ~~classified as fissile according to~~ not excepted under 7.2.3.5.

b) LSA-II

i) water with tritium concentration up to 0.8 TBq/L; or

ii) other material in which the activity is distributed throughout and the estimated average specific activity does not exceed 10^{-4} A_2/g for solids and gases, and 10^{-5} A_2/g for liquids.

c) LSA-III — solids (e.g. consolidated wastes, activated materials), excluding powders meeting the requirements of 7.2.3.1.3, in which:

i) the radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.);

ii) the radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble matrix, so that, even under loss of packaging, the loss of radioactive material per package by leaching when placed in water for seven days would not exceed 0.1 A_2; and

iii) the estimated average specific activity of the solid, excluding any shielding material, does not exceed 2×10^{-3} A_2/g.

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7.2.3.4 *Low dispersible radioactive material*

7.2.3.4.1 The design for low dispersible radioactive material requires multilateral approval. Low dispersible radioactive material must be such that the total amount of this radioactive material in a package, taking into account the provisions of 6;7.7.14, must meet the following requirements:

a) The radiation level at 3 m from the unshielded radioactive material does not exceed 10 mSv/h;

b) If subjected to the tests specified in 6;7.19.3 and 6;7.19.4, the airborne release in gaseous and particulate forms of up to 100 µm aerodynamic equivalent diameter would not exceed 100 A_2. A separate specimen may be used for each test; and

c) If subjected to the test specified in 7.2.3.1.4, the activity in the water would not exceed 100 A_2. In the application of this test, the damaging effects of the tests specified in b) above must be taken into account.

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7.2.3.5 *Fissile material*

7.2.3.5.1 Packages containing fissile ~~radionuclides~~ material must be classified under the relevant entry of Table 2-11 ~~for fissile material unless~~, the description of which includes the words "FISSILE" or "fissile-excepted". Classification as "fissile-excepted" is allowed only if one of the conditions a) to d) of this paragraph is met. Only one type of exception is allowed per consignment (see also 6;7.6.2).

a) A mass limit per consignment, provided that the smallest external dimension of each package is not less than 10 cm, such that:

$$\frac{\text{mass of uranium - 235(g)}}{X} + \frac{\text{mass of other fissile material (g)}}{Y} < 1$$

where X and Y are the mass limits defined in Table 2-14, provided that ~~the smallest external dimension of each package is not less than 10 cm and that~~ either:

i) each individual package contains not more than 15 g of fissile ~~material~~ nuclides; for unpackaged material, this quantity limitation must apply to the consignment being carried in or on the conveyance;

ii) the fissile material is a homogeneous hydrogenous solution or mixture where the ratio of fissile nuclides to hydrogen is less than 5 per cent by mass; or

iii) there are not more than 5 g of fissile ~~material~~ nuclides in any 10 L volume of material.

Table 2-14. Consignment mass limits for exceptions from the requirements for packages containing fissile material

Fissile material	*Fissile material mass (g) mixed with substances having an average hydrogen density less than or equal to water*	*Fissile material mass (g) mixed with substances having an average hydrogen density greater than water*
Uranium 235 (X) Other fissile material (Y)	400 250	290 180

~~Neither b~~Beryllium ~~nor deuterium~~ must not be present in quantities exceeding 1 per cent of the applicable consignment mass limits provided in Table 2-14, except ~~for deuterium in natural concentration in hydrogen~~ where the concentration of beryllium in the material does not exceed 1 gram beryllium in any 1 000 grams.

Deuterium must also not be present in quantities exceeding 1 per cent of the applicable consignment mass limits provided in Table 2-14 except where deuterium occurs up to natural concentration in hydrogen.

b) Uranium enriched in uranium-235 to a maximum of 1 per cent by mass, and with a total plutonium and uranium-233 content not exceeding 1 per cent of the mass of uranium-235, provided that the fissile ~~material is~~ nuclides are distributed essentially homogeneously throughout the material. In addition, if uranium-235 is present in metallic, oxide or carbide forms, it must not form a lattice arrangement;

c) Liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2 per cent by mass, with a total plutonium and uranium-233 content not exceeding 0.002 per cent of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2;

d) ~~Packages containing, individually, a total plutonium mass not more than 1 kg, of which not more than 20 per cent by mass may consist of plutonium-239, plutonium-241 or any combination of those radionuclides.~~Plutonium containing not more than 20 per cent of fissile nuclides by mass up to a maximum of 1 kg of plutonium per consignment. Shipments under this exception must be under exclusive use.

7.2.4 Classification of packages

7.2.4.1 The quantity of radioactive material in a package must not exceed the relevant limits for the package type as specified below.

7.2.4.1.1 *Classification as excepted packages*

7.2.4.1.1.1 Packages may be classified as excepted packages if:

a) they are empty packagings having contained radioactive material;

b) they contain instruments or articles in limited quantities as specified in Table 2-15;

c) they contain articles manufactured of natural uranium, depleted uranium or natural thorium; or

d) they contain radioactive material in limited quantities as specified in Table 2-15.

7.2.4.1.1.2 A package containing radioactive material may be classified as an excepted package provided that the radiation level at any point on its external surface does not exceed 5 μSv/h.

7.2.4.1.1.3 Radioactive material which is enclosed in or is included as a component part of an instrument or other manufactured article may be classified under UN 2911 — **Radioactive material, excepted package — instruments** or **articles**~~, provided that~~ only if:

a) the radiation level at 10 cm from any point on the external surface of any unpackaged instrument or article is not greater than 0.1 mSv/h; and

b) each instrument or article bears the marking “RADIOACTIVE” except:

i) radioluminescent time-pieces or devices;

ii) consumer products that either have received regulatory approval according to 1;6.1.4 b) or do not individually exceed the activity limit for an exempt consignment in Table 2-12 (column 5), provided such products are transported in a package that bears the marking “RADIOACTIVE” on an internal surface in such a manner that warning of the presence of radioactive material is visible on opening the package;

c) the active material is completely enclosed by non-active components (a device performing the sole function of containing radioactive material must not be considered to be an instrument or manufactured article); and

d) the limits specified in columns 2 and 3 of Table 2-15 are met for each individual item and each package, respectively.

7.2.4.1.1.4 Radioactive material ~~with an activity~~ in forms other than as specified in 7.2.4.1.1.3 and with an activity not exceeding the limits specified in column 4 of Table 2-15 may be classified under UN 2910 — **Radioactive material, excepted package — limited quantity of material**, provided that:

a) the package retains its radioactive contents under routine conditions of transport; and

b) the package bears the marking “RADIOACTIVE” on an internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package.

7.2.4.1.1.5 An empty packaging which had previously contained radioactive material ~~with an activity not exceeding the limit specified in column 4 of Table 2-15~~ may be classified under UN 2908 — **Radioactive material, excepted package — empty packaging**~~, provided that~~ only if:

a) it is in a well-maintained condition and securely closed;

b) the outer surface of any uranium or thorium in its structure is covered with an inactive sheath made of metal or some other substantial material;

c) the level of internal non-fixed contamination, when averaged over any 300 cm^2, does not exceed:

(i) 400 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters; and

(ii) 40 Bq/cm^2 for all other alpha emitters; and

d) any labels which may have been displayed on it in conformity with 5;3.2.6 are no longer visible.

~~7.2.4.1.2~~7.2.4.1.1.6 Articles manufactured of natural uranium, depleted uranium or natural thorium and articles in which the sole radioactive material is unirradiated natural uranium, unirradiated depleted uranium or unirradiated natural thorium may be classified under UN 2909, **Radioactive material, excepted package — articles manufactured from**

natural uranium or **depleted uranium** or **natural thorium**~~, provided that~~ only if the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

Table 2-15. Activity limits for excepted packages

Physical state of contents	*Instruments or article*		*Materials*
	*Item limits**	*Package limits**	*Package limits**
Solids			
Special form	10^{-2} A_1	A_1	10^{-3} A_1
Other form	10^{-2} A_2	A_2	10^{-3} A_2
Liquids	10^{-3} A_2	10^{-1} A_2	10^{-4} A_2
Gases			
Tritium	2×10^{-2} A_2	2×10^{-1} A_2	2×10^{-2} A_2
Special form	10^{-3} A_1	10^{-2} A_1	10^{-3} A_1
Other forms	10^{-3} A_2	10^{-2} A_2	10^{-3} A_2

* For mixtures of radionuclides, see 7.2.2.4 to 7.2.2.6.

7.2.4.2 *Classification as low specific activity (LSA) material*

7.2.4.2.1 Radioactive material may only be classified as LSA material if the definition of LSA in 7.1.3 and the conditions of 7.2.3.1 ~~and~~, 4;9.2.1 and 7;2.9.2 are met.

7.2.4.3 *Classification as surface contaminated object (SCO)*

7.2.4.3.1 Radioactive material may be classified as SCO if the definition of SCO in 7.1.3 and the conditions of 7.2.3.2 ~~.1 and~~, 4;9.2.1 and 7;2.9.2 are met.

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Chapter 8

CLASS 8 — CORROSIVE SUBSTANCES

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8.2 ASSIGNMENT OF PACKING GROUPS

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8.2.4 In assigning the packing group to a substance in accordance with 8.2.2, account must be taken of human experience in instances of accidental exposure. In the absence of human experience, the packing group must be based on data obtained from experiments in accordance with OECD Guideline~~s~~ for the Testing of Chemicals No. 404, *Acute Dermal Irritation/Corrosion*, ~~1992~~ 2002 or No. 435, *In Vitro Membrane Barrier Test Method for Skin Corrosion*, 2006. A substance which is determined not to be corrosive in accordance with OECD Guideline for the Testing of Chemicals No. 430, *In Vitro Skin Corrosion: Transcutaneous Electrical Resistance Test (TER)*, 2004 or No. 431, *In Vitro Skin Corrosion: Human Skin Model Test*, 2004 may be considered not to be corrosive to skin for the purposes of these Instructions without further testing.

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Chapter 9

CLASS 9 — MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES, INCLUDING ENVIRONMENTALLY HAZARDOUS SUBSTANCES

9.1 DEFINITION

9.1.1 *Class 9 substances and articles (miscellaneous dangerous substances and articles)* are substances and articles which, during air transport, present a danger not covered by other classes.

9.1.2 *Genetically modified micro-organisms (GMMOs) and genetically modified organisms (GMOs)* are micro-organisms and organisms in which genetic material has been purposely altered through genetic engineering in a way that does not occur naturally.

9.2 ASSIGNMENT TO CLASS 9

9.2.1 Class 9 includes, inter alia:

DGP/22-WP/2, paragraph 3.2.11:

[

≠ a) Environmentally hazardous substances (aquatic environment) are those that meet the criteria in 2.9.3 of the UN Model Regulations or that meet criteria in international regulations or national regulations established by the appropriate national authority in ~~a country~~ the State of ~~o~~Origin, transit or destination.

Substances or mixtures dangerous to the aquatic environment not otherwise classified under these Instructions~~, but classified by the shipper as dangerous goods (see Special Provision A97),~~ must be assigned to Packing Group III and designated:]

UN 3077 Environmentally hazardous substance, solid, n.o.s.; or
UN 3082 Environmentally hazardous substance, liquid, n.o.s.

b) Elevated temperature substances (i.e. substances that are transported or offered for transport at temperatures equal to or exceeding 100°C in a liquid state or at temperatures equal to or exceeding 240°C in a solid state (these substances may only be carried under 1;1.1).

[c) GMMOs or GMOs which do not meet the definition of toxic substances (see 6.2) or infectious substances (see 6.3) ~~but which are capable of altering animals, plants or microbiological substances in a way not normally the result of natural reproduction. They~~ must be assigned to UN 3245. GMMOs or GMOs are not subject to these Instructions when authorized for use by the appropriate national authorities of the States of Origin, transit and destination.]

d) Magnetized material: Any material which, when packed for air transport, has a magnetic field strength of 0.159 A/m or more at a distance of 2.1 m from any point on the surface of the assembled package (see also Packing Instruction 902).

Note.— Masses of ferro-magnetic metals such as automobiles, automobile parts, metal fencing, piping and metal construction material, even if not meeting the definition of magnetized material may be subject to the operator's special stowage requirements since they may affect aircraft instruments, particularly the compasses. Additionally, packages or items of material which individually do not meet the definition of magnetized material but cumulatively may do so, may also be subject to the operator's special stowage requirements.

e) Aviation regulated solid or liquid: Any material which has narcotic, noxious or other properties such that, in the event of spillage or leakage on an aircraft, extreme annoyance or discomfort could be caused to crew members so as to prevent the correct performance of assigned duties.

Some examples of articles in Class 9 are:

— Engines, internal combustion;

— Life-saving appliances, self-inflating;

— Battery-powered equipment or vehicle.

Some examples of substances in Class 9 are:

— Blue, brown or white asbestos;

— Carbon dioxide, solid (dry ice);

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— Zinc dithionite.

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