DANGEROUS GOODS PANEL

Dubai, 31 March to 4 April 2003

Agenda Item 2 : Development of recommendations for amendments to the Technical Instructions for incorporation in the 2005/2006 edition

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

(Presented by the Secretary)

SUMMARY

Below are the draft amendments to Part 2 Chapters 3, 4, 5, 6, 7, 8, and 9 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 the first session (Geneva, 11 to 13 December 2002)

Chapter 3

CLASS 3 – FLAMMABLE LIQUIDS

3.1 DEFINITION AND GENERAL PROVISIONS

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3.1.4 Liquid desensitized explosives are explosive substances which are dissolved or suspended in water or other liquid substances, to form homogeneous liquid mixture to suppress their explosive properties (see 2.1.3.5.3). Entries in the Dangerous Goods List (Table 3-1) for liquid desensitized explosives are: UN 1204, UN 2059, UN 3064 ~~and~~ UN 3343, UN 3357 and UN 3379.

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Chapter 4

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

INTRODUCTORY NOTES

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Note 1. – Where the term 'water-reactive' is used in these Instructions, it refers to a substance which, in contact with water, emits flammable gas.

Note 2. – Because of the different properties exhibited by the dangerous goods within Divisions 4.1 and 4.2, it is impractibable to establish a single criterion for classification in either of these divisions. Tests and criteria for assignment to the three divisions of Class 4 are addressed in this chapter and in the Manual of Tests and Criteria, Part III, section 33.

Note 3. – Since organometallic substances can be classified in divisions 4.2 or 4.3 with additional subsidiary risks, depending on their properties, a specific classification flow chart for these substances is given in 2.4.5 of the UN Recommendations on the Transport of Dangerous Goods.

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4.2.4 Division 4.1 — Solid desensitized explosives

4.2.4.1 *Definition*

Solid desensitized explosives are explosive substances which are wetted with water or alcohols or are diluted with other substances to form a homogeneous solid mixture to suppress their explosive properties. Entries in the Dangerous Goods List for solid desensitized explosives are UN Nos. 1310, 1320, 1321, 1322, 1336, 1337, 1344, 1347, 1348, 1349, 1354, 1355, 1356, 1357, 1517, 1571, 2555, 2556, 2557, 2852, 2907, 3317, 3319, 3344 ~~and~~ 3376 and 3380.

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4.2.3.2 *Classification of self-reactive substances*

4.2.3.2.1 Self-reactive substances are classified according to the degree of danger they present.

4.2.3.2.2 Related substances are specifically listed by name in the Dangerous Goods List (Table 3-1). Related substances are UN 2956, UN 3242 and UN 3251.

4.2.3.2.3 Self-reactive substances permitted for transport are listed in 4.2.3.2.4. For each permitted substance listed, ~~Table 2-6 assigns~~ the appropriate generic entry ~~in~~ of the Dangerous Goods List (UN 3221 to 3240) is assigned, and appropriate subsidiary risks and remarks providing relevant information are given. The generic entries specify:

— the self-reactive substance type (B to F);

— the physical state (i.e. liquid/solid); and

— when temperature control is required.

4.2.3.2.4 List of currently assigned self-reactive substances in packages.

The following table (Table 2-6) is reproduced from 2.4.2.3.2.4 in the *UN Recommendations on the Transport of Dangerous Goods* (~~Twelfth~~ Thirteenth revised edition), with irrelevant material removed.

4.2.3.2.5 Classification of self-reactive substances not listed in Table 2-6 and assignment to a generic entry must be made by the appropriate authority of the State of Origin on the basis of a test report. Principles applying to the classification of such substances are provided in 2.4.2.3.3 of the UN Recommendations. The applicable classification procedures, test methods and criteria, and an example of a suitable test report, are given in the current edition of the UN Manual of Tests and Criteria, Part II. The statement of approval must contain the classification and the relevant transport conditions.

4.2.3.2.6 Samples of self-reactive substances not listed in Table 2-6, for which a complete set of test results is not available and which are to be transported for further testing or evaluation, may be assigned to one of the appropriate entries for self-reactive substances type C provided the following conditions are met:

a) the available data indicate that the sample would be no more dangerous than self-reactive substances type B;

b) the sample is packed in a combination packaging consisting of a plastic IP.2 inner packaging with a capacity not exceeding 0.5 L or 0.5 kg which is placed in a wooden box (4C1), plywood box (4D) or fibreboard box (4G) with the maximum net quantity per package not exceeding 1 L or 1 kg; and

c) the available data indicate that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation.

Table 2-6. List of currently assigned self-reactive substances in packages

Note.— Self-reactive substances to be transported must fulfill the classification and the control and emergency temperatures (derived from the SADT) as listed. The classification given in this table is based on the technically pure substance (except where a concentration of less than 100 per cent is specified). For other concentrations, the substances may be classified differently following the procedures in 2.4.2.3.3 and 2.4.2.3.4 of the *UN Recommendations on the Transport of Dangerous Goods*.

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4.5 Classification of organometallic substances

Depending on their properties, organometallic substances may be classified in divisions 4.2 or 4.3, as appropriate, in accordance with the flowchart scheme given in 2.4.5 of the *UN Recommendations on the Transport of Dangerous Goods*.

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Chapter 5

CLASS 5 — OXIDIZING SUBSTANCES; ORGANIC PEROXIDES

Table 2-7. List of currently assigned organic peroxides in packages. Peroxides to be transported must fulfil the classification and the control and emergency temperatures (derived from that 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 (EC)*	*Emergency tempera-ture (EC)*	*UN generic entry*	*Notes*
~~Acetyl benzoyl peroxide~~	~~#45~~	~~$55~~						~~3105~~	
tert-Amyl peroxyacetate	#62	$38						~~3.1e+07~~	
tert-Amylperoxy isopropyl carbonate	#77	$23						3103	
tert-Butyl cumyl peroxide	>42-100							~~3.1e+07~~	
tert-Butyl cumyl peroxide	~~#42~~ #52			~~$58~~ $ 48				~~3.1e+07~~	
~~n-Butyl-4,4-di-(tert-butylperoxy) valerate~~	~~#52~~			~~$48~~				~~3106~~	
n-Butyl-4,4-di-(tert-butylperoxy) valerate	~~#42~~ #52			~~$58~~ $48				3108	
~~tert-Butyl monoperoxyphthalate~~	~~#100~~							~~3102~~	~~3~~
tert-Butyl peroxyacetate	#32	~~$68~~	$68					3109	
~~tert-Butyl peroxyacetate~~	~~#22~~		~~$78~~					~~3109~~	~~25)~~
tert-Butyl peroxybenzoate	>77-100	~~<22~~						3103	
~~tert-Butyl peroxydiethylacetate + tert-Butyl peroxybenzoate~~	~~#33 + #33~~	~~$33~~						~~3105~~	
tert-Butyl peroxyisobutyrate	>52-77		~~>23~~ $23			+15	+20	3111	3
tert-Butyl peroxyisobutyrate	#52		~~>48~~ $48			+15	+20	3115	
tert-Butyl peroxyneodecanoate	#52 as a stable dispersion in water					0	+10	~~3.1e+07~~	

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 (EC)*	*Emergency tempera-ture (EC)*	*UN generic entry*	*Notes*
tert-Butyl peroxyneoheptanoate	#42 as a stable dispersion in water					0	10	3117	
~~3-tert-Butylperoxy-3-phenylphthalide~~	~~#100~~							~~3106~~	
tert-Butyl peroxy-3,5,5- trimethyl-hexanoate	#32	~~$68~~	$68					3109	
~~Dibenzoyl peroxide~~	~~>36-42~~	~~$58~~						~~3107~~	
~~Dibenzyl peroxydicarbonate~~	~~#87~~				~~$13~~	~~+25~~	~~+30~~	~~3112~~	~~3~~
Di-tert-butyl peroxide	~~>32-100~~ >52-100							3107	
1,6-Di-(tert-butylperoxycarbonyloxy) hexane	#72	$28						3103	
1,1-Di-(tert-butylperoxy)cyclohexane	#27	~~$36~~ $25						3107	21
1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane	#77		$23					~~3.1e+07~~	
1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane	#57			$43				~~3.1e+07~~	
Dicumyl peroxide	~~>42-100~~ >52-100			#57				3110	
Dicyclohexyl peroxydicarbonate	>91-100					~~+5~~ +10	~~+10~~ +15	3112	3
Dicyclohexyl peroxydicarbonate	#91				$9	~~+5~~ +10	~~25~~	3114	
Dicyclohexyl peroxydicarbonate	#42 as a stable dispersion					15	20	3119	
Di-(2-ethylhexyl)peroxydicarbonate	~~#42~~ #52 as a stable disper-sion in water (frozen)					–15	–5	~~3.1e+07~~	
~~Diethyl peroxydicarbonate~~	~~#27~~		~~$73~~			~~–10~~	~~0~~	~~3115~~	
~~Diisotridecyl peroxydicarbonate~~	~~#100~~					~~–10~~	~~0~~	~~3115~~	

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 (EC)*	*Emergency tempera-ture (EC)*	*UN generic entry*	*Notes*
~~2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane~~	~~#52~~			~~$48~~				~~3106~~	
~~Diperoxy azelaic acid~~	~~#27~~			~~$73~~		~~+35~~	~~+40~~	~~3116~~	
~~Diperoxy dodecane diacid~~	~~>13-42~~			~~$58~~		~~+40~~	~~+45~~	~~3116~~	
~~Diperoxy dodecane diacid~~	~~#13~~			~~$87~~				~~Exempt~~	~~29~~
~~Distearyl peroxydicarbonate~~	~~#87~~			~~$13~~				~~3106~~	
~~Di-(3,5,5-trimethyl-1,2-dioxolanyl-3)peroxide~~	~~#52 as a paste~~					~~+30~~	~~+35~~	~~3116~~	~~20~~
1-(2-Ethylhexanoylperoxy)-1,3-dimethylbutyl peroxypivalate	#52	$45	$10			-20	-10	3115	
~~3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane~~	~~>52-100~~							~~3102~~	~~3~~
~~3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane~~	~~#52~~	~~$48~~						~~3105~~	
~~3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane~~	~~#52~~			~~$48~~				~~3106~~	
Methyl ethyl ketone peroxide(s)	~~#52~~ see remark 8)	$48						3101	3813
Methyl ethyl ketone peroxide(s)	~~#45~~ see remark 9)	$55						3105	9
Methyl ethyl ketone peroxide(s)	~~#40~~ see remark 10)	$60						3107	10
~~Methyl ethyl ketone peroxide(s)~~	~~#37~~	~~$55~~			~~$8~~			~~3105~~	~~9~~
~~Peroxyacetic acid, type F, stabilized~~	~~#43~~							~~3109~~	~~131619~~
Peroxylauric acid	#100					35	40	3118	
Pinanyl hydroperoxide	~~56-100~~ >56-100							3105	13
Pinanyl hydroperoxide	~~<56~~ #56	~~>44~~ $44						3109	
Polyether poly-tert-butylperoxycarbonate	#52		$23					3107	
~~Tetrahydronaphthyl hydroperoxide~~	~~#100~~							~~3106~~	

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 (EC)*	*Emergency tempera-ture (EC)*	*UN generic entry*	*Notes*
1,1,3,3-Tetramethylbutylperoxy-2 ethylhexanoate	#100					~~20~~ 15	~~25~~ 20	3115	
~~1,1,3,3-Tetramethylbutyl peroxyphenoxyacetate~~	~~#37~~		~~$63~~			~~-10~~	~~0~~	~~3115~~	
1,1,3,3-Tetramethylbutyl peroxypivalate	#77	$23				0	10	3315	

-Notes:

1. Diluent type B may always be replaced by diluent type A. Boiling point diluent type B should be at least 60 E C higher than the SADT of the organic peroxide.
2. Available oxygen #4.7 per cent.
3. "EXPLOSIVE" subsidiary risk label required (see Figure 5-2).
4. Diluent may be replaced by Di-tert-butyl peroxide.
5. Available oxygen #9 per cent.
6. With #9 per cent hydrogen peroxide; available oxygen #10per cent.
7. Only non-metallic packagings allowed.
8. Available oxygen >10 per cent and #10.7 per cent, with or without water.
9. Available oxygen #10 per cent, with or without water.
10. Available oxygen #8.2 per cent, with or without water.
11. See 5.3.2.5.1.
13. "CORROSIVE" subsidiary risk label required (see Figure 5-20).
14. Peroxyacetic acid formulations which fulfil the criteria of 5.3.2.5.
15. Peroxyacetic acid formulations which fulfil the criteria of 5.3.2.5.
16. Peroxyacetic acid formulations which fulfil the criteria of 5.3.2.5.
17. Addition of water to this organic peroxide will decrease its thermal stability.
18. No "CORROSIVE" subsidiary risk label required for concentrations below 80 per cent.
19. Mixtures with hydrogen peroxide, water and acid(s).
20. With diluent type A, with or without water.
21. ~~With $36 per cent, by mass, Ethylbenzene in addition to diluent type A.~~ With $25 per cent diluent type A by mass, and in addition ethylbenzene.
22. ~~With $19 per cent, by mass, Methyl isobutyl ketone in addition to diluent type A.~~ With $19 per cent diluent type A by mass, and in addition methyl isobutyl ketone.
23. With <6 per cent di-tert-butyl peroxide.
24. With #8 per cent 1-isopropylhydroperoxy-4-isopropylhydroxybenzene.
25. Diluent type B with boiling point >110EC.
26. With <0.5 per cent hydroperoxides content.
27. For concentrations more than 56 per cent, "CORROSIVE" subsidiary risk label required (see Figure 5-20).
28. Available active oxygen #7.6 per cent in diluent type A having a 95 per cent boil-off point in the range of 220-260EC.
29. Not subject to the requirements of these Instructions for Division 5.2.
30. ~~Formulations derived from distillation of peroxyacetic acid originating from peroxyacetic acid in concentration of not more than 41per cent with water, total active oxygen (Peroxyacetic acid + H_2O_2) #9.5 per cent, which fulfils the criteria of 2.5.3.3 f) of the *UN Recommendations on the Transport of Dangerous Goods*~~.

Chapter 6

CLASS 6 – TOXIC AND INFECTIOUS SUBSTANCES

INTRODUCTORY NOTES

~~*Note 1 – Genetically modified micro-organisms and organisms which do not meet the definition of an infectious substance should be considered for classification in class 9 and assignment to UN 3245.*~~

Note 1. ~~2.~~ – Toxins from plant, animal or bacterial sources which do not contain any infectious substances or toxins that are not contained in substances which are infectious substances should be considered for classification in division 6.1 and assignment to UN 3172.

6.1 DEFINITIONS

Class 6 is divided into two divisions as follows:

a) Division 6.1 – Toxic substances.

Substances liable either to cause death or injury or to harm human health if swallowed, if inhaled or by skin contact.

Note – In these Instructions 'poisonous' has the same meaning as 'toxic'.

b) Division 6.2 — Infectious substances.

Substances know to contain, or reasonably expected to contain, pathogens. Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsia, parasites, fungi) ~~or recombinant micro-organisms (hybrid or mutant), that are known or reasonably expected to cause infectious disease in animals or humans~~ and other agents such as prions, which can cause disease in humans or animals.

6.2 TOXIC SUBSTANCES

6.2.1 Definitions

For the purposes of these Instructions:

6.2.1.1 *LD_{50} (median lethal dose) for acute oral toxicity* is ~~that~~ the statistically derived single dose of ~~the~~ a substance ~~administered which is most likely~~ that can be expected to cause death within 14 days in ~~half of both male and female~~ 50 per cent of young adult albino rats when administered by the oral route. The LD_{50} value is expressed in terms of mass of test substance per mass of test animal (mg/kg). ~~The number of~~

~~animals tested must be sufficient to give a statistically significant result and be in conformity with good pharmacological practices. The result is expressed in mg/kg body mass.~~

6.2.1.2 *LD_{50} for acute dermal toxicity* is that dose of the substance which, administered by continuous contact for 24 hours with the bare skin of albino rabbits, is most likely to cause death within 14 days in half of the animals tested. The number of animals tested must be sufficient to give a statistically significant result and be in conformity with good pharmacological practices. The result is expressed in mg/kg body mass.

6.2.13 *LD_{50} for acute toxicity on inhalation* is that concentration of vapour, mist or dust which, administered by continuous inhalation for one hour to both male and female young adult albino rats, is most likely to cause death within 14 days in half of the animals tested. A solid substance should be tested if at least 10 per cent (by mass) of its total mass is likely to be dust in a respirable range, e.g. the aerodynamic diameter of that particle-fraction is 10 Fm or less. A liquid substance should be tested if a mist is likely to be generated in a leakage of the transport containment. Both for solid and liquid substances more than 90 per cent (by mass) of a specimen prepared for inhalation toxicity should be in the respirable range as defined above. The result is expressed in mg/L of air for dusts and mists or in mL/m^3 of air (parts per million) for vapours.

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Editorial note: Delete 6.3 and replace with the following new text

6.3 Division 6.2 - Infectious substances

6.3.1 *Definitions*

For the purposes of these Instructions:

6.3.1.1 *Infectious substances* are substances which are known or are reasonably expected to contain pathogens. Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsiae, parasites, fungi) and other agents such as prions, which can cause disease in humans or animals.

6.3.1.2 *Biological products* are those products derived from living organisms which are manufactured and distributed in accordance with the requirements of appropriate national authorities, which may have special licensing requirements, and are used either for prevention, treatment, or diagnosis of disease in humans or animals, or for development, experimental or investigational purposes related thereto. They include, but are not limited to, finished or unfinished products such as vaccines.

6.3.1.3 *Cultures* (laboratory stocks) are the result of a process by which pathogens are amplified or propagated in order to generate high concentrations, thereby increasing the risk of infection when exposure to them occurs. This definition refers to cultures prepared for the intentional generation of pathogens and does not include cultures intended for diagnostic or clinical purposes.

6.3.1.4 *Genetically modified micro-organisms and organisms* are micro-organisms and organisms in which genetic material has been purposely altered through genetic engineering in a way that does not occur naturally.

6.3.1.5 *Medical or clinical wastes* are wastes derived from the medical treatment of animals or humans or from bio-research.

6.3.2 *Classification of infectious substances*

6.3.21 Infectious substances must be classified in Division 6.2 and assigned to UN 2814, UN 2900 or UN 3373 as appropriate..

6.3.2.2 Infectious substances are divided into the following categories.

6.3.2.2.1 Category A: An infectious substance which is transported in a form that, when exposure to it occurs is capable of causing permanent disability, life-threatening or fatal disease to humans or animals. Indicative examples of substances that meet these criteria are given in the table in this paragraph.

NOTE: *An exposure occurs when an infectious substance is released outside of the protective packaging resulting in physical contact with humans or animals.*

(a) Infectious substances meeting these criteria which cause disease in humans or both in humans and animals must be assigned to UN 2814. Infectious substances which cause disease only in animals must be assigned to UN 2900.

(b) Assignments to UN 2814 or UN 2900 must be based on the known medical history and symptoms of the source human or animal, endemic local conditions, or professional judgement concerning individual circumstances of the source human or animal.

***NOTE 1**: The proper shipping name for UN 2814 is* **Infectious substance, affecting humans.** *The proper shipping name for UN 2900 is* **Infectious substance, affecting animals** *only.*

***NOTE 2**: The following table in not exhaustive. Infectious substances, including new or emerging pathogens, which do not appear in the table but which meet the same criteria must be assigned to Category A. In addition, if there is doubt as to whether or not a substance meets the criteria it must be included in Category A.*

***NOTE 3**: In the following table, the micro-organisms written in italics are bacteria, mycoplasma, rickettsia or fungi.*

INDICATIVE EXAMPLES OF INFECTIOUS SUBSTANCES INCLUDED IN CATEGORY A IN ANY FORM UNLESS OTHERWISE INDICATED (6.3.2.2.1 (a))	
UN Number and Proper	**Micro-organism**

Shipping Name	
UN 2814 Infectious substances affecting humans	*Bacillus anthracis (cultures only)* *Brucella abortus (cultures only)* *Brucella melitensis (cultures only)* *Brucella suis (cultures only)* *Burkholderia mallei - Pseudomonas mallei* – Glanders *(cultures only)* *Burkholderia pseudomallei – Pseudomonas pseudomallei (cultures only)* *Chlamydia psittaci* - avian strains (cultures only) *Clostridium botulinum (cultures only)* *Coccidioides immitis (cultures only)* *Coxiella burnetii (cultures only)* Crimean-Congo hemorrhagic fever virus Dengue virus (cultures only) Eastern equine encephalitis virus (cultures only) *Escherichia coli*, verotoxigenic (cultures only) Ebola virus Flexal virus *Francisella tularensis (cultures only)* Guanarito virus Hantaan virus Hantaviruses causing hantavirus pulmonary syndrome Hendra virus Hepatitis B virus (cultures only) Herpes B virus (cultures only) Human immunodeficiency virus (cultures only) Highly pathogenic avian influenza virus (cultures only) Japanese Encephalitis virus (cultures only) Junin virus Kyasanur Forest disease virus Lassa virus Machupo virus Marburg virus Monkeypox virus
UN 2900 Infectious substances affecting animals only	African horse sickness virus African swine fever virus Avian paramyxovirus Type 1 - Newcastle disease virus Bluetongue virus Classical swine fever virus Foot and mouth disease virus Lumpy skin disease virus *Mycoplasma mycoides* - Contagious bovine pleuropneumonia Peste des petits ruminants virus Rinderpest virus

	Sheep-pox virus Goatpox virus Swine vesicular disease virus Vesicular stomatitis virus

6.3.2.2.2 Category B: An infectious substance which does not meet the criteria for inclusion in Category A. Infectious substances in Category B must be assigned to UN 3373 except that cultures as defined in 6.3.1.3 must be assigned to UN 2814 or UN 2900 as appropriate.

Note.- The proper shipping name of UN 3373 is ***Diagnostic specimens*** *or* ***Clinical specimen***s

6.3.2.3 Substances which do not contain infectious substances or substances which are unlikely to cause disease in humans or animals are not subject to these Instructions unless they meet the criteria for inclusion in another class.

6.3.2.4 Blood or blood components which have been collected for the purposes of transfusion or for the preparation of blood products to be used for transfusion or transplantation and any tissues or organs intended for use in transplantation are not subject to these Instructions.

6.3.2.5 Substances for which there is a low probability that infectious substances are present, or where the concentration is at a level naturally encountered, are not subject to these Instructions. Examples are: foodstuffs, water samples, living persons and substances which have been treated so that the pathogens have been neutralized or deactivated.

[6.3.2.6 An alive animal which has been intentionally infected and is known or suspected to contain an infectious substance must only be transported under terms and conditions approved by the appropriate national authority.]

6.3.3 Biological products

6.3.3.1 For the purposes of these Instructions, biological products are divided into the following groups:

(a) Those which are manufactured and packaged in accordance with the requirements of appropriate national authorities and transported for the purposes of final packaging or distribution, and use for personal health care by medical professionals or individuals. Substances in this group are not subject to these Instructions.

(b) Those which do not fall under paragraph (a) and are known or reasonably believed to contain infectious substances and which meet the criteria for inclusion in Category A or Category B. Substances in this group must be assigned to UN 2814, UN 2900 or UN 3373, as appropriate.

NOTE: *Some licensed biological products may present a biohazard only in certain parts of the world. In that case, appropriate national authorities may require these biological products to be in compliance with local requirements for infectious substances or may impose other restrictions.*

6.3.4 ***Genetically modified micro-organisms and organisms***

6.3.4.1 Genetically modified micro-organisms not meeting the definition of infectious substances must be classified according to Chapter 9.

6.3.5 ***Medical or clinical wastes***

6.3.5.1 Medical or clinical wastes containing Category A infectious substances or containing Category B infectious substances in cultures must be assigned to UN 2814 or UN 2900 as appropriate. Medical or clinical wastes containing infectious substances in Catogory B, other than cultures, must be assigned to UN 3291.

6.3.5.2 Medical or clinical wastes which are reasonably believed to have a low probability of containing infectious substances must be assigned to UN 3291.

NOTE: *The proper shipping name for UN 3291 is* ***Clinical waste, unspecified, n.o.s.*** *or* ***(Bio) Medical waste, n.o.s.*** *or* ***Regulated medical waste, n.o.s.***

6.3.5.3 Decontaminated medical or clinical wastes which previously contained infectious substances are not subject to these Instructions unless they meet the criteria for inclusion in another class.

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Chapter 7

CLASS 7 — RADIOACTIVE MATERIAL

7.1 DEFINITION OF CLASS 7

7.1.1 Radioactive material means any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in 7.7.2.1 to 7.7.2.6.

7.1.2 The following radioactive materials are not included in Class 7 for the purposes of these Instructions:

a) radioactive material implanted or incorporated into a person or live animal for diagnosis or treatment;

b) radioactive material in consumer products which have received regulatory approval, following their sale to the end user;

c) natural material and ores containing naturally occurring radionuclides which are either in their natural state, or have only been processed for purposes other than for extraction of the radionuclides not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in 7.7.2.

d) Non-radioactive solid objects with radioactive substances present on any surfaces in quantities not in excess of the limit defined in 7.2.

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7.2 DEFINITION

Package in the case of radioactive material. The packaging with its radioactive contents as presented for transport. The types of packages covered by these Instructions, which are subject to the activity limits and material restrictions of 7.7 and meet the corresponding requirements, are:

a) Excepted package;

b) Industrial package Type 1 (Type IP-1 package);

c) Industrial package Type 2 (Type IP-2 package);

d) Industrial package Type 3 (Type IP-3 package);

e) Type A package;

f) Type B(U) package;

g) Type B(M) package;

h) Type C package.

Packages containing fissile material or uranium hexafluoride are subject to additional requirements.

Note -- For packages for other dangerous goods, see the definition under 1;3.1.1.

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Table 2-10. Multiplication factor for
~~large dimension loads~~ freight containers

*Size of load**	*Multiplication factor*
size of load # 1 m^2	1
1 m^2 < size of load # 5 m^2	2
5 m^2 < size of load # 20 m^2	3
20 m^2 < size of load	10
***** Largest cross-sectional area of the load being measured.	

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7.6.2 Determination of criticality safety index (CSI)

7.6.2.1 The criticality safety index (CSI) for packages containing fissile material must be obtained by dividing the number 50 by the smaller of the two values of N derived in 6;7.10.11 and 6;7.10.12 (i.e. CSI = 50/N). The value of the criticality safety index may be zero, provided that an unlimited number of packages is subcritical (i.e. N is effectively equal to infinity in both cases).

7.6.2.2 The criticality safety index for each ~~consignment~~ overpack or freight container must be determined as the sum of the CSIs of all the packages contained ~~in that consignment~~. The same procedure must be followed for determining the total sum of CSIs [in a consignment or] abroad an aircraft.

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Table 2-12. Basic redionuclides 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)*
Cf-252	~~5×10^{-2}~~ 1×10^{1}	3×10^{-3}	1×10^{1}	1×10^{4}

7.8 LIMITS ON TRANSPORT INDEX, CRITICALITY SAFETY INDEX, RADIATION LEVELS FOR PACKAGES AND OVERPACKS

7.8.1 Except for consignments under exclusive use, the transport index of any package or overpack must not exceed 10, nor must the criticality safety index of any package or overpack exceed 50.

7.8.2 Except for packages or overpacks transported under exclusive use and special arrangement under the conditions specified in 7;2.9.5.3, the maximum radiation level at any point on any external surface of a package or overpack must not exceed 2 mSv/h.

7.8.3 The maximum radiation level at any point on any external surface of a package or overpack under exclusive use must not exceed 10 mSv/h.

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Chapter 8

CLASS 8 — CORROSIVES

8.2 ASSIGNMENT OF PACKING GROUPS

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a) *Packing Group I* is assigned to substances that cause full thickness destruction of intact skin tissue within an observation period of up to 60 minutes starting after an exposure time of 3 minutes or less.

b) *Packing Group II* is assigned to substances that cause full thickness destruction of intact skin tissue within an observation period of up to 14 days starting after an exposure time of more than 3 minutes but not more than 60 minutes.

c) *Packing Group III* is assigned to substances that:

i) cause full thickness destruction of intact skin tissue within an observation period of up to 14 days starting after an exposure time of more than 60 minutes but not more than 4 hours;

ii) are judged not to cause full thickness destruction of intact skin tissue but which exhibit a corrosion rate on steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55EC. For the purposes of testing steel, type ~~P235 (ISO 9328 (II): 1991)~~ **S235JR+CR (1.0037 resp. St 37-2), S275J2G3+CR (1.0144 resp. St 44-3)**, ISO 3574, Unified Numbering System (UNS) G10200 or SAE 1015, ~~or a similar type~~, and for testing aluminium, non-clad types 7075-T6 or AZ5GU-T6, must be used. An acceptable test is prescribed in ~~ASTM G31-72 (Reapproved 1990)~~ the UN *Manual of Tests and Criteria*, Part III, Section 37.

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Part 2 Chapter 9

CLASS 9 – MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES

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. ~~This class includes:~~

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:

a) environmentally hazardous substances; liquid or solid substances pollutant to the aquatic environment and solutions and mixtures of such substances (including preparations and wastes). See 2.9.3 of the *UN Recommendations on the Transport of Dangerous Goods*.

b) elevated temperature substances (i.e. Substances that are transported or offered for transport in a liquid state at temperatures equal to or exceeding 100° C in a liquid state ~~and below their flash point~~, or ~~in a solid state~~ at temperatures equal ~~to~~ or exceeding 240° C (these substances may only be carried under 1;1.1).

c) GMMOs or GMOs which do not meet the definition of 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 authorities of the appropriate national countries 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 materials 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 materials 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);

— Environmentally hazardous substance, liquid/solid, n.o.s.;

— Zinc dithionite.

— END —