ANNEX 7

RESOLUTION MSC.442(99)
(adopted on 24 May 2018)

AMENDMENTS TO THE INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG) CODE

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.122(75), by which it adopted the International Maritime Dangerous Goods Code (hereinafter referred to as "the IMDG Code"), which has become mandatory under chapter VII of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended (hereinafter referred to as "the Convention"),

NOTING ALSO article VIII(b) and regulation VII/1.1 of the Convention concerning amendment procedure for amending the IMDG Code,

HAVING CONSIDERED, at its ninety-ninth session, amendments to the IMDG Code, proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the IMDG Code, the text of which is set out in the annexes to the present resolution;

2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that said amendments shall be deemed to have been accepted on 1 July 2019, unless prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments, the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3 INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2020 upon their acceptance in accordance with paragraph 2 above;

4 AGREES that Contracting Governments to the Convention may apply the aforementioned amendments in whole or in part on a voluntary basis from 1 January 2019;

5 REQUESTS the Secretary-General, for the purposes of article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

6 REQUESTS ALSO the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization which are not Contracting Governments to the Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL MARITIME DANGEROUS GOODS (IMDG) CODE (AMENDMENT 39-18)

Table of Contents

Insert a new line for "2.0.6 Classification of articles as articles containing dangerous goods N.O.S."

Amend the contents for chapter 2.8 to read as follows:

"2.8.1 Definition, general provisions and properties
2.8.2 General classification provisions
2.8.3 Packing group assignment for substances and mixtures
2.8.4 Alternative packing group assignment methods for mixtures: stepwise approach
2.8.5 Substances not accepted for transport"

Amend the subtitle of 4.2.6 to read "Additional provisions for the use of road tank vehicles and road gas elements vehicles".

Amend the title of chapter 5.3 to read "Placarding and marking of cargo transport units and bulk containers".

Amend the subtitle of chapter 5.3.2 to read "Marking".

In the title of chapter 6.1, delete "(other than for class 6.2 substances)".

Amend the title of chapter 6.8 to read "Provisions for road tank vehicles and road gas elements vehicles"

PART 1
GENERAL PROVISIONS, DEFINITIONS AND TRAINING

Chapter 1.1
General provisions

1.1.2 Conventions

1.1.2.2 International Convention for the Prevention of Pollution from Ships (MARPOL)

Annex III

Regulations for the prevention of pollution by harmful substances carried by sea in packaged form

Under the existing heading, a new chapter title **"Chapter 1 – General"** is added before the existing Regulation 1.

A new Regulation 1 is added with the corresponding footnotes as follows:

"**Regulation 1**
Definitions

For the purposes of this Annex:

1 *Harmful substances* are those substances which are identified as marine pollutants in the International Maritime Dangerous Goods Code (IMDG Code)* or which meet the criteria in the appendix of this Annex.

2 *Packaged form* is defined as the forms of containment specified for harmful substances in the IMDG Code.

3 *Audit* means a systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled.

4 *Audit Scheme* means the IMO Member State Audit Scheme established by the Organization and taking into account the guidelines developed by the Organization.†

5 *Code for Implementation* means the IMO Instruments Implementation Code (III Code) adopted by the Organization by resolution A.1070(28).

6 *Audit Standard* means the Code for Implementation.

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* Refer to the IMDG Code (resolution MSC.122(75), as amended.)

† Refer to the Framework and Procedures for the IMO Member State Audit Scheme (resolution A.1067 (28))."

The subsequent regulations are renumbered in this subsection accordingly.

In the renumbered Regulation 2, "Application", existing paragraph 1 with sub-paragraphs 1.1 and 1.2 are deleted. The existing paragraphs 2, 3, 4 and 5 are renumbered accordingly.

The existing Regulations 2 to 8 are renumbered as Regulations 3 to 9.

Before the appendix to Annex III (Criteria for the identification of harmful substances in packaged form) a new chapter 2 is added as follows with the corresponding footnote:

"**Chapter 2 – Verification of compliance with the provisions of this Annex**

Regulation 10
Application

Parties shall use the provisions of the Code for Implementation in the execution of their obligations and responsibilities contained in this Annex.

Regulation 11
Verification of compliance

1 Every Party shall be subject to periodic audits by the Organization in accordance with the audit standard to verify compliance with and implementation of this Annex.

2 The Secretary-General of the Organization shall have responsibility for administering the Audit Scheme, based on the guidelines developed by the Organization.

3 Every Party shall have responsibility for facilitating the conduct of the audit and implementation of a programme of actions to address the findings, based on the guidelines developed by the Organization.*

4 Audit of all Parties shall be:

.1 based on an overall schedule developed by the Secretary-General of the Organization, taking into account the guidelines developed by the Organization; and

.2 conducted at periodic intervals, taking into account the guidelines developed by the Organization.

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* Refer to the Framework and Procedures for the IMO Member State Audit Scheme (resolution A.1067 (28)). "

Appendix to Annex III
Criteria for the identification of harmful substances in packaged form

The chapeau of the appendix is replaced as follows with the corresponding footnotes:

"For the purpose of this Annex, substances, other than radioactive materials,* identified by any one of the following criteria are harmful substances:†

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* Refer to class 7, as defined in chapter 2.7 of the IMDG Code.

† The criteria are based on those developed by the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS), as amended. For definitions of acronyms or terms used in this appendix, refer to the relevant paragraphs of the IMDG Code."

Chapter 1.2
Definitions, units of measurement and abbreviations

1.2.1 Definitions

Amend the following definitions as indicated below:

Animal material: replace "or animal foodstuffs" with "foodstuffs or feedstuffs derived from animals".

GHS: replace "sixth" with "seventh" and replace "ST/SG/AC.10/30/Rev.6" with "ST/SG/AC.10/30/Rev.7".

Liquids: in the footnote, replace "*ECE/TRANS/225 (Sales No. E.14.VIII.1)*" with "*ECE/TRANS/257 (Sales No. E.16.VIII.1)*".

Manual of Tests and Criteria: after "ST/SG/AC.10/11/Rev.6", insert "and Amend.1".

Add the following new definition:

> "*IMO type 9 tank* means a road gas elements vehicle for the transport of compressed gases of class 2 with elements linked to each other by a manifold, permanently attached to a chassis, which is fitted with items of service equipment and structural equipment necessary for the transport of gases. Elements are cylinders, tubes and bundles of cylinders, intended for the transport of gases as defined in 2.2.1.1."

1.2.3 List of abbreviations

In the definition of EmS, add the word "Revised" before the word "Emergency".

Chapter 1.3
Training

1.3.1 Training of shore-side personnel

1.3.1.5 Recommended training needs for shore-side personnel involved in the transport of dangerous goods under the IMDG Code

In the table, in function 3 "Mark, label or placard dangerous goods", in the column for "Specific training requirements", in the first indent, replace "risk" with "hazard".

1.3.1.6 Indicative table describing sections of the IMDG Code or other relevant instruments that may be appropriate to be considered in any training for the transport of dangerous goods

In the table, replace column "Guidelines for packing of cargo transport units" with "CTU Code"

1.3.1.7 Related Codes and publications which may be appropriate for function-specific training

1.3.1.7.2 Add the word "Revised" before the word "Emergency" and delete ", as amended" at the end.

Chapter 1.4
Security provisions

1.4.3 Provisions for high consequence dangerous goods

1.4.3.1.5 Replace "subsidiary risks" with "subsidiary hazards".

1.4.3.2 Specific security provisions for high consequence dangerous goods

1.4.3.2.1 At the end, insert the following note:

> "**Note:** In addition to the security provisions of this Code, competent authorities may implement further security provisions for reasons other than safety of dangerous goods during transport. In order to not impede international and multimodal transport by different explosives security marks, it is recommended that such marks be

formatted consistent with an internationally harmonized standard (e.g. European Union Commission Directive 2008/43/EC)."

Chapter 1.5
General provisions concerning radioactive material

1.5.5 Radioactive material possessing other dangerous properties

1.5.5.1 Replace "subsidiary risk" with "subsidiary hazard".

PART 2
CLASSIFICATION

Chapter 2.0
Introduction

2.0.0 Responsibilities

2.0.0.2 In the second indent, replace "subsidiary risk(s)" with "subsidiary hazard(s)".

2.0.1 Classes, divisions, packing groups

2.0.1.5 At the end of the last sentence, replace "subsidiary risk(s)" with "subsidiary hazard(s)".

2.0.1.6 At the end of the sentence, replace "subsidiary risk(s)" with "subsidiary hazard(s)".

2.0.2 UN numbers and proper shipping names

2.0.2.2 In the second paragraph, replace "subsidiary risk(s)" with "subsidiary hazard(s)".

2.0.2.5.3 Replace "subsidiary risk(s)" with "subsidiary hazard(s)".

2.0.2.10 Replace "subsidiary risk(s)" with "subsidiary hazard(s)".

2.0.3 Classification of substances, mixtures and solutions with multiple hazards (precedence of hazard characteristics)

2.0.3.1 At the end of the first sentence, add "or to assign the appropriate entry for articles containing dangerous goods N.O.S (UN 3537 to 3548, see 2.0.6)".

2.0.4 Transport of samples

2.0.4 Add a new provision 2.0.4.3 as follows:

"**2.0.4.3 Samples of energetic materials for testing purposes**

2.0.4.3.1 Samples of organic substances carrying functional groups listed in tables A6.1 and/or A6.3 in appendix 6 (Screening Procedures) of the Manual of Tests and Criteria may be transported under UN 3224 (self-reactive solid type C) or UN 3223 (self-reactive liquid type C), as applicable, of class 4.1 provided that:

.1 the samples do not contain any:

- known explosives;
- substances showing explosive effects in testing;
- compounds designed with the view of producing a practical explosive or pyrotechnic effect; or
- components consisting of synthetic precursors of intentional explosives;

.2 for mixtures, complexes or salts of inorganic oxidizing substances of class 5.1 with organic material(s), the concentration of the inorganic oxidizing substance is:

- less than 15%, by mass, if assigned to packing group I (high hazard) or II (medium hazard); or
- less than 30%, by mass, if assigned to packing group III (low hazard);

.3 available data do not allow a more precise classification;

.4 the sample is not packed together with other goods; and

.5 the sample is packed in accordance with packing instruction P520 and special packing provisions PP94 or PP95 of 4.1.4.1, as applicable."

2.0.5 Transport of wastes

Add a new provision 2.0.6 as follows:

"**2.0.6 Classification of articles as articles containing dangerous goods N.O.S.**

Note: For articles which do not have an existing proper shipping name and which contain only dangerous goods within the permitted limited quantity amounts specified in column 7a of the Dangerous Goods List, see UN 3363 and special provision 301 of chapter 3.3.

2.0.6.1 Articles containing dangerous goods may be classified as otherwise provided by this Code under the proper shipping name for the dangerous goods they contain or in accordance with this section. For the purposes of this section "article" means machinery, apparatus or other devices containing one or more dangerous goods (or residues thereof) that are an integral element of the article, necessary for its functioning, and that cannot be removed for the purpose of transport. An inner packaging shall not be an article.

2.0.6.2 Such articles may in addition contain batteries. Lithium batteries that are integral to the article shall be of a type proven to meet the testing requirements of the Manual of Tests and Criteria, part III, subsection 38.3, except when pre-production prototype batteries or batteries of a small production run, consisting of not more than 100 batteries, are installed in the

article. Where a lithium battery installed in an article is damaged or defective, the battery shall be removed.

2.0.6.3 This section does not apply to articles for which a more specific proper shipping name already exists in the Dangerous Goods List of chapter 3.2.

2.0.6.4 This section does not apply to dangerous goods of class 1, class 6.2, class 7 or radioactive material contained in articles.

2.0.6.5 Articles containing dangerous goods shall be assigned to the appropriate class determined by the hazards present using, where applicable, the Precedence of Hazards table in 2.0.3.6 for each of the dangerous goods contained in the article. If dangerous goods classified as class 9 are contained within the article, all other dangerous goods present in the article shall be considered to present a higher hazard.

2.0.6.6 Subsidiary hazards shall be representative of the primary hazard posed by the other dangerous goods contained within the article. When only one dangerous good is present in the article, the subsidiary hazard(s), if any, shall be the subsidiary hazard(s) identified in column 4 of the Dangerous Goods List. If the article contains more than one dangerous good and these could react dangerously with one another during transport, each of the dangerous goods shall be enclosed separately (see 4.1.1.6)."

Chapter 2.1
Class 1 – Explosives

2.1.1 Definitions and general provisions

2.1.1.1.3 After "producing a practical", delete the comma.

2.1.1.4 Hazard divisions

In the note under division 1.6, replace "risk" with "hazard".

2.1.2 Compatibility groups and classification codes

2.1.2.2 Compatibility groups and classification codes

In the first column of the table, in the row for compatibility group L, replace "risk" with "hazard".

2.1.3 Classification procedure

2.1.3.4 Exclusion from class 1

2.1.3.4.2.5 In note 2, at the end of the sentence, replace "risk" with "hazard".

2.1.3.5 Assignment of fireworks to hazard divisions

2.1.3.5.1.1 Replace the words "giving a positive result when tested in one of the HSL Flash composition tests in appendix 7 of the Manual of Tests and Criteria" with "containing flash composition (see note 2 of 2.1.3.5.5)".

2.1.3.5.5 Amend note 2 to read as follows:

"**Note 2:** "Flash composition" in this table refers to pyrotechnic substances in powder form or as pyrotechnic units as presented in the fireworks that are used in waterfalls, or to produce an aural effect or used as a bursting charge, or propellant charge unless:

(a) the time taken for the pressure rise in the HSL Flash Composition Test in appendix 7 of the Manual of Tests and Criteria is demonstrated to be more than 6 ms for 0.5 g of pyrotechnic substance; or

(b) the pyrotechnic substance gives a negative "-" result in the US Flash Composition Test in Appendix 7 of the Manual of Tests and Criteria."

In the table, amend the entry for "Waterfall" as follows: for classification 1.1G, amend the entry under "Specification" to read "Containing flash composition regardless of the results of Test Series 6 (see 2.1.3.5.1.1)". For classification 1.3G, amend the entry under "Specification" to read "Not containing flash composition".

Chapter 2.2
Class 2 – Gases

2.2.2.3 Class 2.3 Toxic gases

In the note, replace "risk" with "hazard".

2.2.3 Mixtures of gases

2.2.3.3 In the first sentence, replace "risk" with "hazard".

Chapter 2.3
Class 3 – Flammable liquids

2.3.2 Assignment of packing group

2.3.2.1 Replace "risk" with "hazard".

2.3.2.1.1 Replace "risk" with "hazard".

2.3.2.1.2 Replace "risk(s)" with "hazard(s)" twice.

2.3.2.2 In sub-paragraph .4, replace "30 litre" with "450 litre".

2.3.2.5 Replace provision 2.3.2.5 to read as follows:

"2.3.2.5 Viscous liquids which:

- have a flashpoint of 23°C or above and less than or equal to 60°C;
- are not toxic or corrosive;
- are not environmentally hazardous or are environmentally hazardous transported in single or combination packagings containing a net quantity per single or inner packaging of 5 litres or less, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8;

- contain not more than 20% nitrocellulose provided the nitrocellulose contains not more than 12.6% nitrogen by dry mass; and

- are packed in receptacles of not more than 450 litre capacity,

are not subject to the provisions for the marking, labelling and testing of packages in chapters 4.1, 5.2 and 6.1, if:

.1 in the solvent separation test (see part III, 32.5.1 of the Manual of Tests and Criteria) the height of the separated layer of solvent is less than 3% of the total height; and

.2 the flowtime in the viscosity test (see part III, 32.4.3 of the Manual of Tests and Criteria) with a jet diameter of 6 mm is equal to or greater than:

.1 60 s; or

.2 40 s if the viscous liquid contains not more than 60% of class 3 substances.

The following statement shall be included in the transport document: "Transport in accordance with 2.3.2.5 of the IMDG Code" (see 5.4.1.5.10)."

Chapter 2.4

Class 4 – Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases

2.4.0 Introductory note

In the introductory note, replace "additional subsidiary risk" with "additional subsidiary hazards".

2.4.2.3.2 *Classification of self-reactive substances*

2.4.2.3.2.2 In the second sentence, replace "subsidiary risks" with "subsidiary hazards".

2.4.2.3.2.3 At the end of the first paragraph, add a new sentence to read as follows:

"The formulations listed in packing instruction IBC520 of 4.1.4.2 and in portable tank instruction T23 of 4.2.5.2.6 may also be transported packed in accordance with packing method OP8 of packing instruction P520 of 4.1.4.1, with the same control and emergency temperatures, if applicable.",

and in the table, insert a new entry to read as follows:

3227	PHOSPHOROTHIOIC ACID, O-[(CYANOPHENYL METHYLENE) AZANYL] O,O-DIETHYL ESTER	82-91 (Z isomer)	OP8		(10)

Remarks

In remark (2) after the table, replace "risk" with "hazard".

After remark (9), add a new remark (10) to read as follows:

"(10) This entry applies to the technical mixture in n-butanol within the specified concentration limits of the (Z) isomer."

2.4.2.3.3 *Principles for classification of self-reactive substances*

2.4.2.3.3.2 In sub-paragraphs .2 and .3, replace "risk" with "hazard".

2.4.2.5 Class 4.1 – Polymerizing substances and mixtures (stabilized)

2.4.2.5.2 Add the following new note at the end:

"**Note:** Substances meeting the criteria of a polymerizing substance and also for inclusion in classes 1 to 8 are subject to the requirements of special provision 386 of chapter 3.3."

Chapter 2.5
Class 5 – Oxidizing substances and organic peroxides

2.5.2 Class 5.1 – Oxidizing substances

Note Renumber the existing note as note 1, and add a new note 2 as follows:

"**Note 2**: By exception, solid ammonium nitrate based fertilizers shall be classified in accordance with the procedure as set out in the Manual of Tests and Criteria, part III, section 39."

2.5.3 Class 5.2 – Organic peroxides

2.5.3.2 Classification of organic peroxides

2.5.3.2.3 In the second sentence, replace "risks" with "hazards".

2.5.3.2.4 At the end of the note, add a new sentence to read as follows:

"The formulations listed in packing instruction IBC520 of 4.1.4.2 and in portable tank instruction T23 of 4.2.5.2.6 may also be transported packed in accordance with packing method OP8 of packing instruction P520 of 4.1.4.1, with the same control and emergency temperatures, if applicable."

In the table header, last column, replace "risks" with "hazards". In the table, insert the following new entries:

3109	1-PHENYLETHYL HYDROPEROXIDE	⩽ 38		⩾ 62			OP8			
3116	DI-(4-tert-BUTYLCYCLOHEXYL) PEROXYDICARBONATE	⩽ 42 (as a paste)					OP7	35	40	
3119	DIISOBUTYRYL PEROXIDE	⩽ 42 (as a stable dispersion in water)					OP8	-20	-10	

After the table, in remarks (3), (13), (18) and (27), replace "risk" with "hazard".

2.5.3.3 Principles for classification of organic peroxides

2.5.3.3.2.2 In the first sentence, replace "risk" with "hazard".

2.5.3.3.2.3 Replace "risk" with "hazard".

Chapter 2.6
Class 6 – Toxic and infectious substances

2.6.2 Class 6.1 – Toxic substances

2.6.2.2 Assignment of packing groups to toxic substances

2.6.2.2.1 Replace "risk" with "hazard" three times.

2.6.2.2.4.1 In the note, at the end of the last sentence, replace the wording "(see 2.8.2.3)" with the words "(see 2.8.2.4)".

2.6.2.4 Classification of pesticides

2.6.2.4.1 In the second sentence, replace "risks" with "hazards".

2.6.2.4.3 Replace "risks" with "hazards".

2.6.3 Class 6.2 – Infectious substances

2.6.3.1 Definitions

2.6.3.1.4 In the definition of "Patient specimens", after "*Patient specimens* are" replace "human or animal materials," with "those".

2.6.3.6 Infected animals

2.6.3.6.2 Delete paragraph 2.6.3.6.2.

Chapter 2.8
Class 8 – Corrosive substances

Replace entire chapter 2.8 with the following:

"**Chapter 2.8**

Class 8 – Corrosive substances

2.8.1 Definition, general provisions and properties

2.8.1.1 Definition

2.8.1.1.1 *Corrosive substances* are substances which, by chemical action, will cause irreversible damage to the skin, or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport.

2.8.1.1.2 For substances and mixtures that are corrosive to skin, general classification provisions are provided in section 2.8.2. Skin corrosion refers to the production of irreversible damage to the skin, namely, visible necrosis through the epidermis and into the dermis occurring after exposure to a substance or mixture.

2.8.1.1.3 Liquids and solids which may become liquid during transport, which are judged not to be skin corrosive shall still be considered for their potential to cause corrosion to certain metal surfaces in accordance with the criteria in 2.8.3.3.3.2.

2.8.1.2 Properties

2.8.1.2.1 In cases where particularly severe personal damage is to be expected, a note to that effect is made in the Dangerous Goods List in chapter 3.2 in the wording ''causes (severe) burns to skin, eyes and mucous membranes''.

2.8.1.2.2 Many substances are sufficiently volatile to evolve vapour irritating to the nose and eyes. If so, this fact is mentioned in the Dangerous Goods List in chapter 3.2 in the wording ''vapour irritates mucous membranes''.

2.8.1.2.3 A few substances may produce toxic gases when decomposed by very high temperatures. In these cases the statement ''when involved in a fire, evolves toxic gases'' appears in the Dangerous Goods List in chapter 3.2.

2.8.1.2.4 In addition to direct destructive action in contact with skin or mucous membranes, some substances in this class are toxic or harmful. Poisoning may result if they are swallowed, or if their vapour is inhaled; some of them even may penetrate the skin. Where appropriate, a statement is made to that effect in the Dangerous Goods List in chapter 3.2.

2.8.1.2.5 All substances in this class have a more or less destructive effect on materials such as metals and textiles.

2.8.1.2.5.1 In the Dangerous Goods List, the term ''corrosive to most metals'' means that any metal likely to be present in a ship, or in its cargo, may be attacked by the substance or its vapour.

2.8.1.2.5.2 The term ''corrosive to aluminium, zinc, and tin'' implies that iron or steel is not damaged in contact with the substance.

2.8.1.2.5.3 A few substances in this class can corrode glass, earthenware and other siliceous materials. Where appropriate, this is stated in the Dangerous Goods List in chapter 3.2.

2.8.1.2.6 Many substances in this class only become corrosive after having reacted with water, or with moisture in the air. This fact is indicated in the Dangerous Goods List in chapter 3.2 by the words "in the presence of moisture…". The reaction of water with many substances is accompanied by the liberation of irritating and corrosive gases. Such gases usually become visible as fumes in the air.

2.8.1.2.7 A few substances in this class generate heat in reaction with water or organic materials, including wood, paper, fibres, some cushioning materials and certain fats and oils. Where appropriate, this is indicated in the Dangerous Goods List in chapter 3.2.

2.8.2 General classification provisions

2.8.2.1 Substances and mixtures of class 8 are divided among the three packing groups according to their degree of danger in transport:

.1 packing group I: very dangerous substances and mixtures;

.2 packing group II: substances and mixtures presenting medium danger; and

.3 packing group III: substances and mixtures that present minor danger.

2.8.2.2 Allocation of substances listed in the Dangerous Goods List in chapter 3.2 to the packing groups in class 8 has been made on the basis of experience taking into account such additional factors as inhalation risk (see 2.8.2.4) and reactivity with water (including the formation of dangerous decomposition products).

2.8.2.3 New substances and mixtures can be assigned to packing groups on the basis of the length of time of contact necessary to produce irreversible damage of intact skin tissue in accordance with the criteria in 2.8.3. Alternatively, for mixtures, the criteria in 2.8.4 can be used.

2.8.2.4 A substance or mixture meeting the criteria of class 8 having an inhalation toxicity of dusts and mists (LC_{50}) in the range of packing group I, but toxicity through oral ingestion or dermal contact only in the range of packing group III or less, shall be allocated to class 8 (see note under 2.6.2.2.4.1).

2.8.3 Packing group assignment for substances and mixtures

2.8.3.1 Existing human and animal data including information from single or repeated exposure shall be the first line of evaluation, as they give information directly relevant to effects on the skin.

2.8.3.2 In assigning the packing group in accordance with 2.8.2.3, account shall be taken of human experience in instances of accidental exposure. In the absence of human experience the grouping shall be based on data obtained from experiments in accordance with OECD Test Guideline 404[1] or 435.[2] A substance or mixture which is

[1] OECD Guideline for the testing of chemicals No. 404, Acute Dermal Irritation/Corrosion 2015.

[2] OECD Guideline for the testing of chemicals No. 435, *In Vitro* Membrane Barrier Test Method for Skin Corrosion 2015.

determined not to be corrosive in accordance with OECD Test Guideline 430[3] or 431[4] may be considered not to be corrosive to skin for the purposes of these regulations without further testing.

2.8.3.3 Packing groups are assigned to corrosive substances in accordance with the following criteria (see table 2.8.3.4):

.1 Packing group I is assigned to substances that cause irreversible damage of intact skin tissue within an observation period of up to 60 minutes starting after the exposure time of 3 minutes or less.

.2 Packing group II is assigned to substances that cause irreversible damage of intact skin tissue within an observation period of up to 14 days starting after the exposure time of more than 3 minutes but not more than 60 minutes.

.3 Packing group III is assigned to substances that:

.1 cause irreversible damage of intact skin tissue within an observation period up to 14 days starting after the exposure time of more than 60 minutes but not more than 4 hours; or

.2 are judged not to cause irreversible damage of intact skin tissue but which exhibit a corrosion rate on either steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55°C when tested on both materials. For the purposes of testing steel, type S235JR+CR (1.0037 resp. St 37-2), S275J2G3+CR (1.0144 resp. St 44-3), ISO 3574 or Unified Numbering System (UNS) G10200 or a similar type or SAE 1020, and for testing aluminium, non-clad, types 7075–T6 or AZ5GU-T6 shall be used. An acceptable test is prescribed in the Manual of Tests and Criteria, part III, section 37.
Note: Where an initial test on either steel or aluminium indicates the substance being tested is corrosive, the follow-up test on the other metal is not required.

Table 2.8.3.4: Table summarizing the criteria in 2.8.3.3

Packing Group	Exposure Time	Observation Period	Effect
I	⩽ 3 min	⩽ 60 min	Irreversible damage of intact skin
II	> 3 min ⩽ 1 h	⩽ 14 d	Irreversible damage of intact skin
III	> 1 h ⩽ 4 h	⩽ 14 d	Irreversible damage of intact skin
III	-	-	Corrosion rate on either steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55ºC when tested on both materials

[3] OECD Guideline for the testing of chemicals No. 430, *In Vitro* Skin Corrosion: Transcutaneous Electrical Resistance Test (TER) 2015.

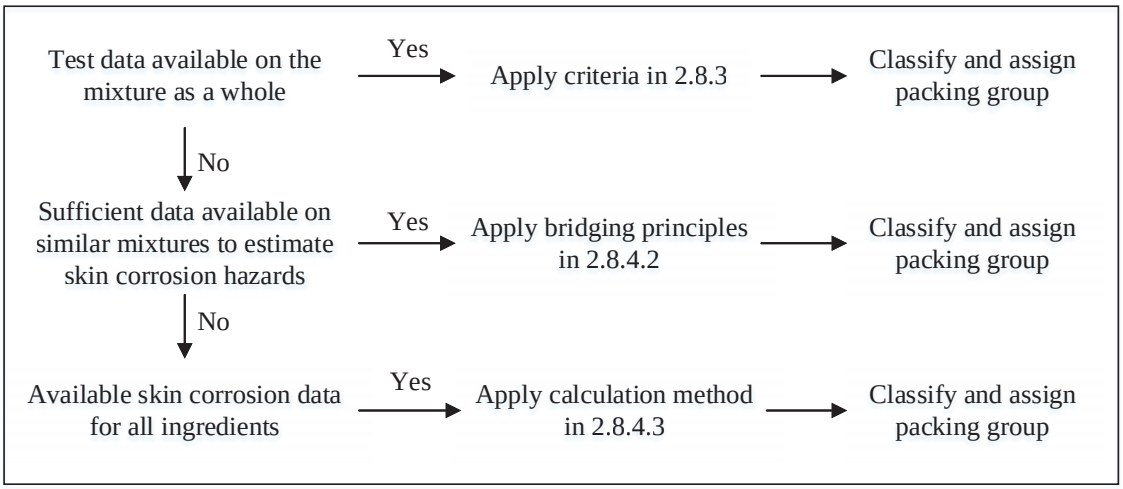
[4] OECD Guideline for the testing of chemicals No. 431, *In Vitro* Skin Corrosion: Human Skin Model Test 2015.

2.8.4 Alternative packing group assignment methods for mixtures: stepwise approach

2.8.4.1 General provisions

2.8.4.1.1 For mixtures it is necessary to obtain or derive information that allows the criteria to be applied to the mixture for the purpose of classification and assignment of packing groups. The approach to classification and assignment of packing groups is tiered, and is dependent upon the amount of information available for the mixture itself, for similar mixtures and/or for its ingredients. The flow chart of figure 2.8.4.1 below outlines the process to be followed:

Figure 2.8.4.1: Stepwise approach to classify and assign packing group of corrosive mixtures



2.8.4.2 Bridging principles

2.8.4.2.1 Where a mixture has not been tested to determine its skin corrosion potential, but there are sufficient data on both the individual ingredients and similar tested mixtures to adequately classify and assign a packing group for the mixture, these data will be used in accordance with the following bridging principles. This ensures that the classification process uses the available data to the greatest extent possible in characterizing the hazards of the mixture.

.1 **Dilution:** If a tested mixture is diluted with a diluent which does not meet the criteria for class 8 and does not affect the packing group of other ingredients, then the new diluted mixture may be assigned to the same packing group as the original tested mixture.

Note: in certain cases, diluting a mixture or substance may lead to an increase in the corrosive properties. If this is the case, this bridging principle cannot be used.

.2 **Batching:** The skin corrosion potential of a tested production batch of a mixture can be assumed to be substantially equivalent to that of another untested production batch of the same commercial product when produced by or under the control of the same manufacturer, unless there is reason to believe there is significant variation such that the skin corrosion potential of the untested batch has changed. If the latter occurs, a new classification is necessary.

.3 **Concentration of mixtures of packing group I:** If a tested mixture meeting the criteria for inclusion in packing group I is concentrated, the more concentrated untested mixture may be assigned to packing group I without additional testing.

.4 **Interpolation within one packing group:** For three mixtures (A, B and C) with identical ingredients, where mixtures A and B have been tested and are in the same skin corrosion packing group, and where untested mixture C has the same class 8 ingredients as mixtures A and B but has concentrations of class 8 ingredients intermediate to the concentrations in mixtures A and B, then mixture C is assumed to be in the same skin corrosion packing group as A and B.

.5 **Substantially similar mixtures:** Given the following:

.1 two mixtures: (A+B) and (C+B);

.2 the concentration of ingredient B is the same in both mixtures;

.3 the concentration of ingredient A in mixture (A+B) equals the concentration of ingredient C in mixture (C+B); and

.4 data on skin corrosion for ingredients A and C are available and substantially equivalent, i.e. they are the same skin corrosion packing group and do not affect the skin corrosion potential of B.

if mixture (A+B) or (C+B) is already classified based on test data, then the other mixture may be assigned to the same packing group.

2.8.4.3 Calculation method based on the classification of the substances

2.8.4.3.1 Where a mixture has not been tested to determine its skin corrosion potential, nor is sufficient data available on similar mixtures, the corrosive properties of the substances in the mixture shall be considered to classify and assign a packing group.

Applying the calculation method is only allowed if there are no synergistic effects that make the mixture more corrosive than the sum of its substances. This restriction applies only if packing group II or III would be assigned to the mixture.

2.8.4.3.2 When using the calculation method, all class 8 ingredients present at a concentration of ≥ 1% shall be taken into account, or < 1% if these ingredients are still relevant for classifying the mixture to be corrosive to skin.

2.8.4.3.3 To determine whether a mixture containing corrosive substances shall be considered a corrosive mixture and to assign a packing group, the calculation method in the flow chart in figure 2.8.4.3 shall be applied.

2.8.4.3.4 When a specific concentration limit (SCL) is assigned to a substance following its entry in the Dangerous Goods List or in a special provision, this limit shall be used instead of the generic concentration limits (GCL). This appears where 1% is used in the first step for the assessment of the packing group I substances, and where 5% is used for the other steps respectively in figure 2.8.4.3.

2.8.4.3.5 For this purpose, the summation formula for each step of the calculation method shall be adapted. This means that, where applicable, the generic concentration limit shall be substituted by the specific concentration limit assigned to the substance(s) (SCL_i), and the adapted formula is a weighted average of the different concentration limits assigned to the different substances in the mixture:

$$\frac{PGx_1}{GCL} + \frac{PGx_2}{SCL_2} + \cdots + \frac{PGx_i}{SCL_i} \geq 1$$

Where:

PGx_i = concentration of substance 1, 2 …i in the mixture, assigned to packing group x (I, II or III)

GCL = generic concentration limit

SCL_i = specific concentration limit assigned to substance i

The criterion for a packing group is fulfilled when the result of the calculation is $\geqslant$ 1. The generic concentration limits to be used for the evaluation in each step of the calculation method are those found in figure 2.8.4.3.

Examples for the application of the above formula can be found in the note below.

Note: *Examples for the application of the above formula*

Example 1: A mixture contains one corrosive substance in a concentration of 5% assigned to packing group I without a specific concentration limit:

Calculation for packing group I: $\frac{9}{9:\ldots;}$ L s➔ *assign to class 8, packing group I.*

Example 2: A mixture contains three substances corrosive to skin; two of them (A and B) have specific concentration limits; for the third one (C) the generic concentration limits applies. The rest of the mixture needs not to be taken into consideration.

Substance X in the mixture and its packing group assignment within class 8	**Concentration (conc) in the mixture in %**	**Specific concentration limit (SCL) for packing group I**	**Specific concentration limit (SCL) for packing group II**	**Specific concentration limit (SCL) for packing group III**
A, assigned to packing group I	3	30%	none	none
B, assigned to packing group I	2	20%	10%	none
C, assigned to packing group III	10	none	none	none

Calculation for packing group I: $\frac{7:\ \text{Æ}";}{74:\ldots;}$ E$\frac{6:\ \text{Æ}»;}{64:\ldots;}$ L rÆ O s

The criterion for packing group I is not fulfilled.

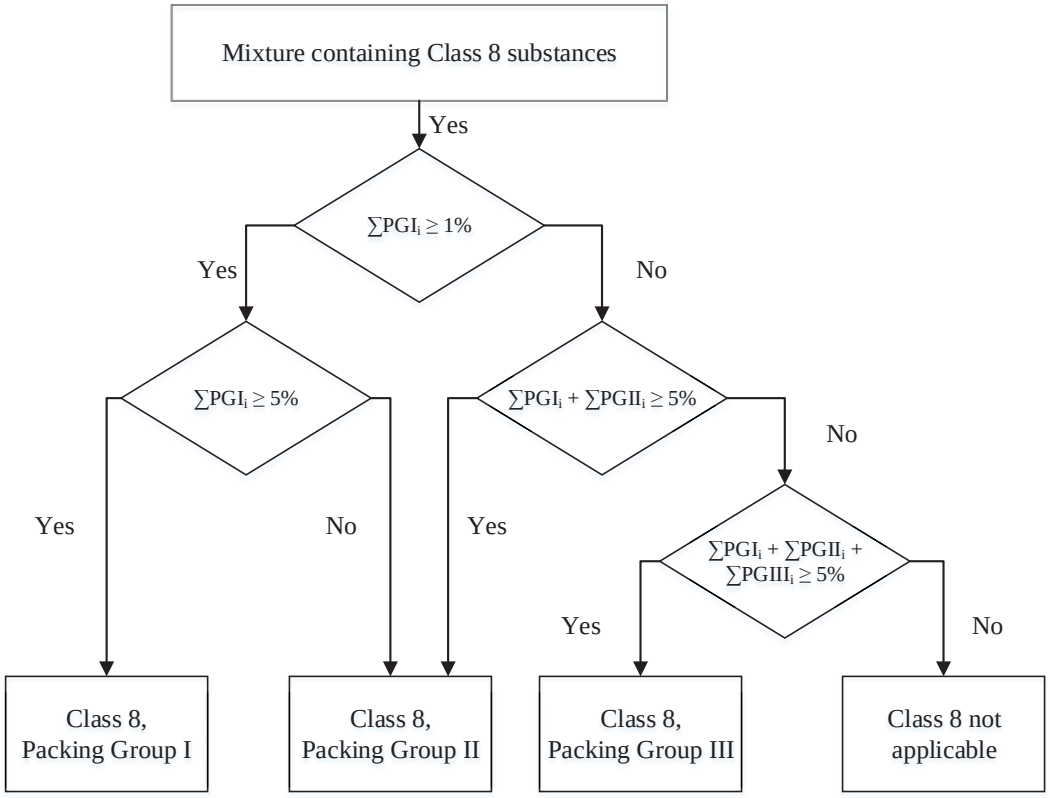
Calculation for packing group II: $\frac{3\ (conc\ A)}{5\ (GCL\ PG\ II)} + \frac{2\ (conc\ B)}{10\ (SCL\ PG\ II)} = 0{,}8 < 1$

The criterion for packing group II is not fulfilled.

Calculation for packing group III: $\frac{3\ (conc\ A)}{5\ (GCL\ PGIII)} + \frac{2\ (conc\ B)}{5\ (GCL\ PG\ III)} + \frac{10\ (conc\ C)}{5\ GCL\ PG\ III)} = 3\ \geq\ 1$

The criterion for packing group III is fulfilled, the mixture shall be assigned to class 8, packing group III.

Figure 2.8.4.3: Calculation method



2.8.5 Substances not accepted for transport

Chemically unstable substances of class 8 shall not be accepted for transport unless the necessary precautions have been taken to prevent the possibility of a dangerous decomposition or polymerization under normal conditions of transport. For the precautions necessary to prevent polymerization, see special provision 386 of chapter 3.3. To this end particular care shall be taken to ensure that receptacles and tanks do not contain any substances liable to promote these reactions.

"

Chapter 2.9

Miscellaneous dangerous substances and articles (class 9) and environmentally hazardous substances

2.9.2 Assignment to class 9

2.9.2.2 Under the heading "Lithium batteries", add the following new entry:

"3536 LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT".

Before the heading "Other substances or articles presenting a danger during transport, but not meeting the definitions of another class", insert the following new sub-division:

"Ammonium nitrate based fertilizers

2071 AMMONIUM NITRATE BASED FERTILIZER

Solid ammonium nitrate based fertilizers shall be classified in accordance with the procedure as set out in the Manual of Tests and Criteria, part III, section 39."

Under the heading "Other substances or articles presenting a danger during transport, but not meeting the definitions of another class", delete entry "2071 AMMONIUM NITRATE BASED FERTILIZER" and add the following new entry at the end of the list:

"3548 ARTICLES CONTAINING MISCELLANEOUS DANGEROUS GOODS N.O.S."

2.9.3 Environmentally hazardous substances (aquatic environment)

2.9.3.4.6.5 *Classification of mixtures with ingredients without any useable information*

2.9.3.4.6.5.1 At the end of the paragraph, delete the words "with the additional statement that: "x percent of the mixture consists of ingredients(s) of unknown hazards to the aquatic environment"".

2.9.4 Lithium batteries

Add the following new sub-paragraphs .6 and .7:

".6 Lithium batteries, containing both primary lithium metal cells and rechargeable lithium ion cells, that are not designed to be externally charged (see special provision 387 of chapter 3.3) shall meet the following conditions:

.1 the rechargeable lithium ion cells can only be charged from the primary lithium metal cells;

.2 overcharge of the rechargeable lithium ion cells is precluded by design;

.3 the battery has been tested as a lithium primary battery; and

.4 component cells of the battery shall be of a type proved to meet the respective testing requirements of the Manual of Tests and Criteria, part III, subsection 38.3.

.7 Manufacturers and subsequent distributors of cells or batteries shall make available the test summary as specified in the Manual of Tests and Criteria, part III, subsection 38.3, paragraph 38.3.5."

PART 3
DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND EXCEPTIONS

Chapter 3.1
General

3.1.1 Scope and general provisions

3.1.1.2 At the end of the last sentence, replace "risks" with "hazards".

3.1.2 Proper shipping names

3.1.2.2 In the paragraph, amend the first sentence to read as follows:

"When a combination of several distinct proper shipping names are listed under a single UN number, and these are separated by "and" or "or" in lower case or are punctuated by commas, only the most appropriate shall be shown in the transport document and package marks.",

and delete the second sentence.

3.1.2.6 Add a new sub-paragraph .2 as follows:

".2 Unless it is already included in capital letters in the name indicated in the Dangerous Goods List, the words "TEMPERATURE CONTROLLED" shall be added as part of the proper shipping name.",

and renumber the existing sub-paragraph .2 as .3.

3.1.2.8 Generic or "not otherwise specified" (N.O.S.) entries

3.1.2.8.1.2 Amend the first sentence to read as follows:

"When a mixture of dangerous goods or articles containing dangerous goods are described by one of the "N.O.S." or "generic" entries to which special provision 274 has been allocated in the Dangerous Goods List, not more than the two constituents which most predominantly contribute to the hazard or hazards of the mixture or of the articles need to be shown, excluding controlled substances when their disclosure is prohibited by national law or international convention.",

and in the second sentence, replace "risk" with "hazard" twice.

3.1.2.8.1.3 Add the following new example at the end of the paragraph:

"UN 3540 ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S. (pyrrolidine)".

3.1.3 Mixtures or solutions

3.1.3.2.3 Replace "risk(s)" with "hazard(s)".

3.1.3.4 Replace "subsidiary risk(s)" with "subsidiary hazard(s)".

3.1.4 Segregation groups

3.1.4.1 Amend the paragraph to read as follows:

"3.1.4.1 For the purpose of segregation, dangerous goods having certain similar chemical properties have been grouped together in segregation groups, see 7.2.5."

3.1.4.4 Amend the headings to read as follows:

1 Acids (SGG1 or SGG1a)
2 Ammonium compounds (SGG2)
3 Bromates (SGG3)
4 Chlorates (SGG4)
5 Chlorites (SGG5)
6 Cyanides (SGG6)
7 Heavy metals and their salts (including their organometallic compounds) (SGG7)
8 Hypochlorites (SGG8)
9 Lead and its compounds (SGG9)
10 Liquid halogenated hydrocarbons (SGG10)
11 Mercury and mercury compounds (SGG11)
12 Nitrites and their mixtures (SGG12)
13 Perchlorates (SGG13)
14 Permanganates (SGG14)
15 Powdered metals (SGG15)
16 Peroxides (SGG16)
17 Azides (SGG17)
18 Alkalis (SGG18)

3.1.4.4 Under "3 Bromates", delete the entry "3213 Ammonium bromate". Under "7 Heavy metals and their salts (including their organometallic compounds)", delete the entries "1366 Diethylzinc" and "1370 Dimethylzinc".

Chapter 3.2
Dangerous Goods List

3.2.1 Structure of the Dangerous Goods List

In the description of column 4, replace "subsidiary risk(s)" with "subsidiary hazard(s)" twice.

In the description of column 15, add "Revised" before the word "Emergency".

In the description of column 16b, insert "the segregation group codes as specified in 7.2.5.2 and" after "contains".

Dangerous Goods List

In the Dangerous Goods List, in the heading of column 4, replace "risk" with "hazard", and amend the following entries:

0004	in column 16b, insert "SGG2"
0005	in column 16a, amend "Category 05" to "Category 03"
0006	in column 16a, amend "Category 04" to "Category 03"
0007	in column 16a, amend "Category 05" to "Category 03"
0033	in column 16a, amend "Category 05" to "Category 03"
0034	in column 16a, amend "Category 04" to "Category 03"
0035	in column 16a, amend "Category 04" to "Category 03"
0037	in column 16a, amend "Category 05" to "Category 03"
0038	in column 16a, amend "Category 04" to "Category 03"
0042	in column 16a, amend "Category 04" to "Category 03"
0043	in column 16a, amend "Category 04" to "Category 03"
0048	in column 16a, amend "Category 04" to "Category 03"
0056	in column 16a, amend "Category 04" to "Category 03"
0059	in column 16a, amend "Category 04" to "Category 03"
0060	in column 16a, amend "Category 04" to "Category 03"
0065	in column 16a, amend "Category 04" to "Category 03"
0099	in column 16a, amend "Category 04" to "Category 03"
0102	in column 16a, amend "Category 04" to "Category 03"
0124	in column 16a, amend "Category 04" to "Category 03" and insert "SW30"
0129	in column 16b, insert "SGG7", "SGG9" and "SGG17"
0130	in column 16b, insert "SGG7" and "SGG9"
0135	in column 16b, insert "SGG7" and "SGG11"
0136	in column 16a, amend "Category 05" to "Category 03"
0137	in column 16a, amend "Category 04" to "Category 03"
0138	in column 16a, amend "Category 04" to "Category 03"
0167	in column 16a, amend "Category 05" to "Category 03"
0168	in column 16a, amend "Category 04" to "Category 03"
0169	in column 16a, amend "Category 04" to "Category 03"
0180	in column 16a, amend "Category 05" to "Category 03"
0181	in column 16a, amend "Category 04" to "Category 03"
0182	in column 16a, amend "Category 04" to "Category 03"
0183	in column 16a, amend "Category 04" to "Category 03"
0186	in column 16a, amend "Category 04" to "Category 03"
0204	in column 16a, amend "Category 05" to "Category 03"
0221	in column 16a, amend "Category 04" to "Category 03"
0222	in column 16b, insert "SGG2"
0224	in column 16b, insert "SGG17"
0242	in column 16a, amend "Category 04" to "Category 03"
0271	in column 16a, amend "Category 04" to "Category 03"
0272	in column 16a, amend "Category 04" to "Category 03"
0275	in column 16a, amend "Category 04" to "Category 03"
0277	in column 16a, amend "Category 04" to "Category 03"
0279	in column 16a, amend "Category 04" to "Category 03"
0280	in column 16a, amend "Category 04" to "Category 03"
0283	in column 16a, amend "Category 04" to "Category 03"
0284	in column 16a, amend "Category 04" to "Category 03"
0285	in column 16a, amend "Category 04" to "Category 03"

0286	in column 16a, amend "Category 04" to "Category 03"
0287	in column 16a, amend "Category 04" to "Category 03"
0290	in column 16a, amend "Category 04" to "Category 03"
0291	in column 16a, amend "Category 05" to "Category 03"
0292	in column 16a, amend "Category 05" to "Category 03"
0293	in column 16a, amend "Category 05" to "Category 03"
0294	in column 16a, amend "Category 05" to "Category 03"
0295	in column 16a, amend "Category 05" to "Category 03"
0296	in column 16a, amend "Category 05" to "Category 03"
0321	in column 16a, amend "Category 04" to "Category 03"
0324	in column 16a, amend "Category 05" to "Category 03"
0326	in column 16a, amend "Category 04" to "Category 03"
0327	in column 16a, amend "Category 04" to "Category 03"
0328	in column 16a, amend "Category 04" to "Category 03"
0329	in column 16a, amend "Category 04" to "Category 03"
0330	in column 16a, amend "Category 05" to "Category 03"
0346	in column 16a, amend "Category 04" to "Category 03"
0348	in column 16a, amend "Category 05" to "Category 03"
0349	in column 6, insert "347"
0367	in column 6, insert "347"
0369	in column 16a, amend "Category 05" to "Category 03"
0371	in column 16a, amend "Category 05" to "Category 03"
0374	in column 16a, amend "Category 04" to "Category 03"
0375	in column 16a, amend "Category 04" to "Category 03"
0381	in column 16a, amend "Category 04" to "Category 03"
0384	in column 6, insert "347"
0402	in column 16b, insert "SGG2"
0408	in column 16a, amend "Category 04" to "Category 03"
0409	in column 16a, amend "Category 04" to "Category 03"
0413	in column 16a, amend "Category 04" to "Category 03"
0414	in column 16a, amend "Category 04" to "Category 03"
0415	in column 16a, amend "Category 04" to "Category 03"
0417	in column 16a, amend "Category 04" to "Category 03"
0426	in column 16a, amend "Category 05" to "Category 03"
0427	in column 16a, amend "Category 05" to "Category 03"
0436	in column 16a, amend "Category 04" to "Category 03"
0437	in column 16a, amend "Category 04" to "Category 03"
0439	in column 16a, amend "Category 04" to "Category 03"
0442	in column 16a, amend "Category 04" to "Category 03"
0443	in column 16a, amend "Category 04" to "Category 03"
0447	in column 16a, amend "Category 04" to "Category 03"
0451	in column 16a, amend "Category 04" to "Category 03"
0457	in column 16a, amend "Category 04" to "Category 03"
0458	in column 16a, amend "Category 04" to "Category 03"
0462	in column 16a, amend "Category 04" to "Category 03"
0463	in column 16a, amend "Category 04" to "Category 03"
0464	in column 16a, amend "Category 04" to "Category 03"
0465	in column 16a, amend "Category 05" to "Category 03"
0466	in column 16a, amend "Category 04" to "Category 03"
0467	in column 16a, amend "Category 04" to "Category 03"
0468	in column 16a, amend "Category 04" to "Category 03"
0469	in column 16a, amend "Category 05" to "Category 03"

0470	in column 16a, amend "Category 04" to "Category 03"
0472	in column 16a, amend "Category 05" to "Category 03"
0481	in column 6, insert "347"
0494	in column 16a, insert "SW30"
0502	in column 16a, amend "Category 04" to "Category 03"
1005	in column 16b, insert "SGG18"
1011	in column 6, insert "392"
1016	in column 6, insert "974"
1032	in column 16b, insert "SG35"
1036	in column 16b, insert "SG35"
1046	in column 6, insert "974"
1049	in column 6, insert "392" and "974"
1052	in column 16b, insert "SGG1a", "SG36" and "SG49"
1061	in column 16b, insert "SG35"
1075	in column 6, insert "392"
1083	in column 16b, insert "SG35"
1099	in column 16b, insert "SGG10"
1100	in column 16b, insert "SGG10"
1106 PG II	in column 16b, insert "SG35"
1106 PG III	in column 16b, insert "SG35"
1107	in column 16b, insert "SGG10"
1125	in column 16b, insert "SG35"
1126	in column 16b, insert "SGG10"
1127	in column 16b, insert "SGG10"
1134	in column 16b, insert "SGG10"
1150	in column 16b, insert "SGG10"
1152	in column 16b, insert "SGG10"
1154	in column 16b, insert "SG35"
1158	in column 16b, insert "SG35"
1160	in column 16b, insert "SGG18"
1163	in column 16b, insert "SGG18"
1182	in column 16b, insert "SGG1", "SG36" and "SG49"
1183	in column 16b, insert "SGG1", "SG36" and "SG49"
1184	in column 16b, insert "SGG10"
1214	in column 16b, insert "SG35"
1221	in column 16b, insert "SG35"
1235	in column 16b, insert "SGG18"
1238	in column 16b, insert "SGG1", "SG36" and "SG49"
1242	in column 16b, insert "SGG1", "SG36" and "SG49"
1244	in column 16b, insert "SGG18"
1250	in column 16b, insert "SGG1", "SG36" and "SG49"
1277	in column 16b, insert "SG35"
1278	in column 16b, insert "SGG10"
1279	in column 16b, insert "SGG10"
1295	in column 16b, insert "SGG1", "SG36" and "SG49"
1296	in column 16b, insert "SG35"
1297 PG I	in column 16b, insert "SG35"
1297 PG II	in column 16b, insert "SG35"

1297 PG III	in column 16b, insert "SG35"
1298	in column 16b, insert "SGG1", "SG36" and "SG49"
1303	in column 16b, insert "SGG10"
1305	in column 16b, insert "SGG1", "SG36" and "SG49"
1309 PG II	in column 16b, insert "SGG15"
1309 PG III	in column 16b, insert "SGG15"
1310	in column 16b, insert "SGG2"
1325 PG II	in column 16b, insert "SG72"
1325 PG III	in column 16b, insert "SG72"
1326	in column 16b, insert "SGG15"
1327	in column 6, insert "973"
1347	in column 16b, insert "SGG7"
1352	in column 16b, insert "SGG15"
1358	in column 16b, insert "SGG15"
1363	in column 6, insert "973"
1364	in column 6, insert "973"
1365	in column 6, insert "973"
1382	in column 16b, insert "SGG18"
1383	in column 16b, insert "SGG15"
1385	in column 16b, insert "SGG18"
1386 (both entries)	in column 6, insert "973"
1389	in column 16b, insert "SGG7" and "SGG11"
1392	in column 16b, insert "SGG7" and "SGG11"
1396 PG II	in column 16b, insert "SGG15"
1396 PG III	in column 16b, insert "SGG15"
1398	in column 16b, insert "SGG15"
1418 PG I	in column 16b, insert "SGG15"
1418 PG II	in column 16b, insert "SGG15"
1418 PG III	in column 16b, insert "SGG15"
1435	in column 16b, insert "SGG7" and "SGG15"
1436 PG I	in column 16b, insert "SGG7" and "SGG15"
1436 PG II	in column 16b, insert "SGG7" and "SGG15"
1436 PG III	in column 16b, insert "SGG7" and "SGG15"
1439	in column 16b, insert "SGG2"
1442	in column 16b, insert "SGG2" and "SGG13"
1444	in column 16b, insert "SGG2"
1445	in column 16b, insert "SGG4"
1447	in column 16b, insert "SGG13"

1448	in column 16b, insert "SGG14"
1449	in column 16b, insert "SGG16"
1450	in column 16b, insert "SGG3"
1452	in column 16b, insert "SGG4"
1453	in column 16b, insert "SGG5"
1455	in column 16b, insert "SGG13"
1456	in column 16b, insert "SGG14"
1457	in column 16b, insert "SGG16"
1458 PG II	in column 16b, insert "SGG4"
1458 PG III	in column 16b, insert "SGG4"
1459 PG II	in column 16b, insert "SGG4"
1459 PG III	in column 16b, insert "SGG4"
1461	in column 16b, insert "SGG4"
1462	in column 16b, insert "SGG5"
1469	in column 16b, insert "SGG7", "SGG9"
1470	in column 16b, insert "SGG7", "SGG9" and "SGG13"
1471 PG II	in column 16b, insert "SGG8"
1471 PG III	in column 16b, insert "SGG8"
1472	in column 16b, insert "SGG16"
1473	in column 16b, insert "SGG3"
1475	in column 16b, insert "SGG13"
1476	in column 16b, insert "SGG16"
1481 PG II	in column 16b, insert "SGG13"
1481 PG III	in column 16b, insert "SGG13"
1482 PG II	in column 16b, insert "SGG14"
1482 PG III	in column 16b, insert "SGG14"
1483 PG II	in column 16b, insert "SGG16"
1483 PG III	in column 16b, insert "SGG16"
1484	in column 16b, insert "SGG3"
1485	in column 16b, insert "SGG4"
1487	in column 16b, insert "SGG12"
1488	in column 16b, insert "SGG12"
1489	in column 16b, insert "SGG13"
1490	in column 16b, insert "SGG14"
1491	in column 16b, insert "SGG16"
1493	in column 16b, insert "SGG7"
1494	in column 16b, insert "SGG3"
1495	in column 16b, insert "SGG4"
1496	in column 16b, insert "SGG5"
1500	in column 16b, insert "SGG12"

1502	in column 16b, insert "SGG13"
1503	in column 16b, insert "SGG14"
1504	in column 16b, insert "SGG16"
1506	in column 16b, insert "SGG4"
1508	in column 16b, insert "SGG13"
1509	in column 16b, insert "SGG16"
1512	in column 16b, insert "SGG2", "SGG7" and "SGG12"
1513	in column 16b, insert "SGG4" and "SGG7"
1514	in column 16b, insert "SGG7"
1515	in column 16b, insert "SGG7" and "SGG14"
1516	in column 16b, insert "SGG7" and "SGG16"
1541	in column 16b, insert "SGG6"
1546	in column 16b, insert "SGG2"
1565	in column 16b, insert "SGG6"
1571	in column 16b, insert "SGG17"
1572	in column 16b, insert "SGG1", "SG36" and "SG49"
1575	in column 16b, insert "SGG6"
1587	in column 16b, insert "SGG6" and "SGG7"
1588 PG I	in column 16b, insert "SGG6"
1588 PG II	in column 16b, insert "SGG6"
1588 PG III	in column 16b, insert "SGG6"
1591	in column 16b, insert "SGG10"
1593	in column 16b, insert "SGG10"
1595	in column 16b, insert "SGG1", "SG36" and "SG49"
1604	in column 16b, insert "SGG18"
1605	in column 16b, insert "SGG10"
1616	in column 16b, insert "SGG7" and "SGG9"
1617	in column 16b, insert "SGG7" and "SGG9"
1618	in column 16b, insert "SGG7" and "SGG9"
1620	in column 16b, insert "SGG6", "SGG7" and "SGG9"
1623	in column 16b, insert "SGG7" and "SGG11"
1624	in column 16b, insert "SGG7" and "SGG11"
1625	in column 16b, insert "SGG7" and "SGG11"
1626	in column 16b, insert "SGG6", "SGG7" and "SGG11"
1627	in column 16b, insert "SGG7" and "SGG11"
1629	in column 16b, insert "SGG7" and "SGG11"
1630	in column 16b, insert "SGG2", "SGG7" and "SGG11"
1631	in column 16b, insert "SGG7" and "SGG11"
1634	in column 16b, insert "SGG7" and "SGG11"
1636	in column 16b, insert "SGG6", "SGG7" and "SGG11"
1637	in column 16b, insert "SGG7" and "SGG11"
1638	in column 16b, insert "SGG7" and "SGG11"
1639	in column 16b, insert "SGG7" and "SGG11"
1640	in column 16b, insert "SGG7" and "SGG11"
1641	in column 16b, insert "SGG7" and "SGG11"
1642	in column 16b, insert "SGG6", "SGG7" and "SGG11"
1643	in column 16b, insert "SGG7" and "SGG11"
1644	in column 16b, insert "SGG7" and "SGG11"
1645	in column 16b, insert "SGG7" and "SGG11"

1646	in column 16b, insert "SGG7" and "SGG11"
1647	in column 16b, insert "SGG10"
1649	in column 16b, insert "SGG7" and "SGG9"
1653	in column 16b, insert "SGG6" and "SGG7"
1669	in column 16b, insert "SGG10"
1674	in column 16b, insert "SGG7"
1679	in column 16b, insert "SGG6"
1680	in column 16b, insert "SGG6"
1683	in column 16b, insert "SGG7"
1684	in column 16b, insert "SGG6" and "SGG7"
1687	in column 16b, insert "SGG17"
1689	in column 16b, insert "SGG6"
1694	in column 16b, insert "SGG6"
1701	in column 16b, insert "SGG10"
1702	in column 16b, insert "SGG10"
1710	in column 16b, insert "SGG10"
1712	in column 16b, insert "SGG7"
1713	in column 16b, insert "SGG6" and "SGG7"
1714	in column 16b, insert "SGG7"
1715	in column 16b, insert "SGG1", "SG36" and "SG49"
1716	in column 16b, insert "SGG1", "SG36" and "SG49"
1717	in column 16b, insert "SGG1", "SG36" and "SG49"
1718	in column 16b, insert "SGG1", "SG36" and "SG49"
1719 PGII	in column 16b, insert "SGG18"
1719 PGIII	in column 16b, insert "SGG18"
1722	in column 16b, insert "SGG1", "SG36" and "SG49"
1723	in column 16b, insert "SGG1", "SGG10, "SG36" and "SG49"
1724	in column 16b, insert "SGG1", "SG36" and "SG49"
1725	in column 16b, insert "SGG1", "SG36" and "SG49"
1726	in column 16b, insert "SGG1", "SG36" and "SG49"
1727	in column 16b, insert "SGG1", "SGG2", "SG36" and "SG49"
1728	in column 16b, insert "SGG1", "SG36" and "SG49"
1729	in column 16b, insert "SGG1", "SG36" and "SG49"
1730	in column 16b, insert "SGG1", "SG36" and "SG49"
1731 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
1731 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
1732	in column 16b, insert "SGG1", "SG36" and "SG49"
1733	in column 16b, insert "SGG1", "SG36" and "SG49"
1736	in column 16b, insert "SGG1", "SG36" and "SG49"
1737	in column 16b, insert "SGG1", "SGG10", "SG36" and "SG49"
1738	in column 16b, insert "SGG1", "SGG10", "SG36" and "SG49"
1739	in column 16b, insert "SGG1", "SG36" and "SG49"
1740 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
1740 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
1742	in column 16b, insert "SGG1", "SG36" and "SG49"
1743	in column 16b, insert "SGG1", "SG36" and "SG49"

1744	in column 16b, insert "SGG1", "SG36" and "SG49"
1745	in column 16b, insert "SGG1", "SG36" and "SG49"
1746	in column 16b, insert "SGG1", "SG36" and "SG49"
1747	in column 16b, insert "SGG1", "SG36" and "SG49"
1748	in column 16b, insert "SGG8"
1750	in column 16b, insert "SGG1", "SG36" and "SG49"
1751	in column 16b, insert "SGG1", "SG36" and "SG49"
1752	in column 16b, insert "SGG1", "SG36" and "SG49"
1753	in column 16b, insert "SGG1", "SG36" and "SG49"
1754	in column 16b, insert "SGG1", "SG36" and "SG49"
1755 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
1755 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
1756	in column 16b, insert "SGG1", "SG36" and "SG49"
1757 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
1757 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
1758	in column 16b, insert "SGG1", "SG36" and "SG49"
1761 PG II	in column 16b, insert "SG35"
1761 PG III	in column 16b, insert "SG35"
1762	in column 16b, insert "SGG1", "SG36" and "SG49"
1763	in column 16b, insert "SGG1", "SG36" and "SG49"
1764	in column 16b, insert "SGG1", "SG36" and "SG49"
1765	in column 16b, insert "SGG1", "SG36" and "SG49"
1766	in column 16b, insert "SGG1", "SG36" and "SG49"
1767	in column 16b, insert "SGG1", "SG36" and "SG49"
1768	in column 16b, insert "SGG1", "SG36" and "SG49"
1769	in column 16b, insert "SGG1", "SG36" and "SG49"
1770	in column 16b, insert "SGG1", "SG36" and "SG49"
1771	in column 16b, insert "SGG1", "SG36" and "SG49"
1773	in column 16b, insert "SGG1", "SG36" and "SG49"
1775	in column 16b, insert "SGG1", "SG36" and "SG49"
1776	in column 16b, insert "SGG1", "SG36" and "SG49"
1777	in column 16b, insert "SGG1a", "SG36" and "SG49"
1778	in column 16b, insert "SGG1", "SG36" and "SG49"
1779	in column 16b, insert "SGG1", "SG36" and "SG49"
1780	in column 16b, insert "SGG1", "SG36" and "SG49"
1781	in column 16b, insert "SGG1", "SG36" and "SG49"
1782	in column 16b, insert "SGG1", "SG36" and "SG49"
1783 PG II	in column 16b, insert "SG35"
1783 PG III	in column 16b, insert "SG35"
1784	in column 16b, insert "SGG1", "SG36" and "SG49"
1786	in column 16b, insert "SGG1a", "SG36" and "SG49"
1787 PG II	in column 16b, insert "SGG1a", "SG36" and "SG49"

1787 PG III	in column 16b, insert "SGG1a", "SG36" and "SG49"
1788 PG II	in column 16b, insert "SGG1a", "SG36" and "SG49"
1788 PG III	in column 16b, insert "SGG1a", "SG36" and "SG49"
1789 PG II	in column 16b, insert "SGG1a", "SG36" and "SG49"
1789 PG III	in column 16b, insert "SGG1a", "SG36" and "SG49"
1790 PG I	in column 16b, insert "SGG1a", "SG36" and "SG49"
1790 PG II	in column 16b, insert "SGG1a", "SG36" and "SG49"
1791 PG II	in column 6, insert "274" and "900"; in column 16b, insert "SGG8"
1791 PG III	in column 6, insert "274" and "900"; in column 16b, insert "SGG8"
1792	in column 16b, insert "SGG1", "SG36" and "SG49"
1793	in column 16b, insert "SGG1", "SG36" and "SG49"
1794	in column 16b, insert "SGG1", "SGG7", "SGG9", "SG36" and "SG49"
1796 PG I	in column 16b, insert "SGG1a", "SG36" and "SG49"
1796 PG II	in column 16b, insert "SGG1a", "SG36" and "SG49"
1798	in column 16b, insert "SGG1a", "SG36" and "SG49"
1799	in column 16b, insert "SGG1", "SG36" and "SG49"
1800	in column 16b, insert "SGG1", "SG36" and "SG49"
1801	in column 16b, insert "SGG1", "SG36" and "SG49"
1802	in column 16b, insert "SGG1a", "SG36" and "SG49"
1803	in column 16b, insert "SGG1", "SG36" and "SG49"
1804	in column 16b, insert "SGG1", "SG36" and "SG49"
1805	in column 16b, insert "SGG1", "SG36" and "SG49"
1806	in column 16b, insert "SGG1", "SG36" and "SG49"
1807	in column 16b, insert "SGG1", "SG36" and "SG49"
1808	in column 16b, insert "SGG1", "SG36" and "SG49"
1809	in column 16b, insert "SGG1", "SG36" and "SG49"
1810	in column 16b, insert "SGG1", "SG36" and "SG49"
1811	in column 16b, insert "SGG1", "SG36" and "SG49"
1813	in column 16b, insert "SGG18"
1814 PG II	in column 16b, insert "SGG18"
1814 PG III	in column 16b, insert "SGG18"
1815	in column 16b, insert "SGG1", "SG36" and "SG49"
1816	in column 16b, insert "SGG1", "SG36" and "SG49"
1817	in column 16b, insert "SGG1", "SG36" and "SG49"
1818	in column 16b, insert "SGG1", "SG36" and "SG49"
1819 PG II	in column 16b, insert "SGG18"
1819 PG III	in column 16b, insert "SGG18"

1823	in column 16b, insert "SGG18"
1824 PG II	in column 16b, insert "SGG18"
1824 PG III	in column 16b, insert "SGG18"
1825	in column 16b, insert "SGG18"
1826 PG I	in column 16b, insert "SGG1a", "SG36" and "SG49"
1826 PG II	in column 16b, insert "SGG1a", "SG36" and "SG49"
1827	in column 16b, insert "SGG1", "SG36" and "SG49"
1828	in column 16b, insert "SGG1", "SG36" and "SG49"
1829	in column 16b, insert "SGG1", "SG36" and "SG49"
1830	in column 16b, insert "SGG1a", "SG36" and "SG49"
1831	in column 16b, insert "SGG1a", "SG36" and "SG49"
1832	in column 16b, insert "SGG1a", "SG36" and "SG49"
1833	in column 16b, insert "SGG1", "SG36" and "SG49"
1834	in column 16b, insert "SGG1", "SG36" and "SG49"
1835 PG II	in column 16b, insert "SGG2" and "SGG18"
1835 PG III	in column 16b, insert "SGG2" and "SGG18"
1836	in column 16b, insert "SGG1", "SG36" and "SG49"
1837	in column 16b, insert "SGG1", "SG36" and "SG49"
1838	in column 16b, insert "SGG1", "SGG7", "SG36" and "SG49"
1839	in column 16b, insert "SGG1", "SG36" and "SG49"
1840	in column 16b, insert "SGG1", "SGG7", "SG36" and "SG49"
1843	in column 16b, insert "SGG2"
1846	in column 16b, insert "SGG10"
1847	in column 16b, insert "SGG18"
1848	in column 16b, insert "SGG1", "SG36" and "SG49"
1849	in column 16b, insert "SGG18"
1854	in column 16b, insert "SGG15"
1856	in column 6, insert "973"
1872	in column 16b, insert "SGG7" and "SGG9"
1873	in column 16b, insert "SGG1a", "SG36" and "SG49"
1887	in column 16b, insert "SGG10"
1888	in column 16b, insert "SGG10"
1889	in column 16b, insert "SGG6"
1891	in column 16b, insert "SGG10"
1894	in column 16b, insert "SGG7" and "SGG11"
1895	in column 16b, insert "SGG7" and "SGG11"
1897	in column 16b, insert "SGG10"
1898	in column 16b, insert "SGG1", "SG36" and "SG49"
1902	in column 16b, insert "SGG1", "SG36" and "SG49"
1905	in column 16b, insert "SGG1", "SG36" and "SG49"
1906	in column 16b, insert "SGG1a", "SG36" and "SG49"
1907	in column 16b, insert "SGG18"
1908 PGII	in column 6, insert "274" and "352"; in column 16b, insert "SGG5"
1908 PGIII	in column 6, insert "274" and "352"; in column 16b, insert "SGG5"

1922	in column 16b, insert "SGG18"
1931	in column 16b, insert "SGG7"
1935 PG I	in column 16b, insert "SGG6"
1935 PG II	in column 16b, insert "SGG6"
1935 PG III	in column 16b, insert "SGG6"
1938 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
1938 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
1939	in column 16b, insert "SGG1", "SG36" and "SG49"
1940	in column 16b, insert "SGG1", "SG36" and "SG49"
1942	in column 16b, insert "SGG2"
1945	in column 6, add "293"
1954	in column 6, insert "392"
1965	in column 6, insert "392"
1969	in column 6, insert "392"
1971	in column 6, insert "392" and "974"
1978	in column 6, insert "392"
1991	in column 16b, insert "SGG10"
2008 PG I	in column 16b, insert "SGG15"
2008 PG II	in column 16b, insert "SGG15"
2008 PG III	in column 16b, insert "SGG15"
2009	in column 16b, insert "SGG15"
2014	in column 16b, insert "SGG16"
2015	in column 16b, insert "SGG16"
2024 PG I	in column 16b, insert "SGG7" and "SGG11"
2024 PG II	in column 16b, insert "SGG7" and "SGG11"
2024 PG III	in column 16b, insert "SGG7" and "SGG11"
2025 PG I	in column 16b, insert "SGG7" and "SGG11"
2025 PG II	in column 16b, insert "SGG7" and "SGG11"
2025 PG III	in column 16b, insert "SGG7" and "SGG11"
2026 PG I	in column 16b, insert "SGG7" and "SGG11"
2026 PG II	in column 16b, insert "SGG7" and "SGG11"
2026 PG III	in column 16b, insert "SGG7" and "SGG11"
2029	in column 16b, insert "SGG18"
2030 PG I	in column 16b, insert "SGG18"

2030 PG II	in column 16b, insert "SGG18"
2030 PG III	in column 16b, insert "SGG18"
2031 PG I	in column 16b, insert "SGG1a", "SG36" and "SG49"
2031 PG II (both entries)	in column 16b, insert "SGG1a", "SG36" and "SG49"
2032	in column 16b, insert "SGG1a", "SG36" and "SG49"
2033	in column 16b, insert "SGG18"
2051	in column 16b, insert "SG35"
2067	in column 6, delete "186"; in column 16b, insert "SGG2"
2071	in column 6, delete "186"; in column 16b, insert "SGG2"
2073	in column 16b, insert "SGG2" and "SGG18"
2079	in column 16b, insert "SGG18"
2205	in column 16b, insert "SGG6"
2208	in column 16b, insert "SGG8"
2214	in column 16b, insert "SGG1", "SG36" and "SG49"
2215 (both entries)	in column 16b, insert "SGG1", "SG36" and "SG49"
2216	in column 6, insert "973"
2217	in column 6, remove "117" and insert "973"
2218	in column 16b, insert "SGG1", "SG36" and "SG49"
2225	in column 16b, insert "SGG1"
2226	in column 16b, insert "SGG1", "SG36" and "SG49"
2234	in column 16b, insert "SGG10"
2238	in column 16b, insert "SGG10"
2240	in column 16b, insert "SGG1a", "SG36" and "SG49"
2248	in column 16b, insert "SG35"
2258	in column 16b, insert "SG35"
2259	in column 16b, insert "SGG18"
2260	in column 16b, insert "SG35"
2262	in column 16b, insert "SGG1", "SG36" and "SG49"
2264	in column 16b, insert "SG35"
2266	in column 16b, insert "SG35"
2267	in column 16b, insert "SGG1", "SG36" and "SG49"
2269	in column 16b, insert "SG35"
2270	in column 16b, insert "SGG18"
2276	in column 16b, insert "SG35"
2279	in column 16b, insert "SGG10"
2280 (both entries)	in column 16b, insert "SG35"
2289	in column 16b, insert "SG35"
2291	in column 16b, insert "SGG7" and "SGG9"
2305	in column 16b, insert "SGG1", "SG36" and "SG49"
2308	in column 16b, insert "SGG1a", "SG36" and "SG49"
2316	in column 16b, insert "SGG6"
2317	in column 16b, insert "SGG6"
2318	in column 16b, insert "SGG18"
2320	in column 16b, insert "SGG18"
2321	in column 16b, insert "SGG10"

2322	in column 16b, insert "SGG10"
2326	in column 16b, insert "SG35"
2327	in column 16b, insert "SG35"
2331	in column 16b, insert "SGG1", "SGG7", "SG36" and "SG49"
2334	in column 16b, insert "SG35"
2339	in column 16b, insert "SGG10"
2341	in column 16b, insert "SGG10"
2342	in column 16b, insert "SGG10"
2343	in column 16b, insert "SGG10"
2344 PG II	in column 16b, insert "SGG10"
2344 PG III	in column 16b, insert "SGG10"
2353	in column 16b, insert "SGG1", "SG36" and "SG49"
2356	in column 16b, insert "SGG10"
2357	in column 16b, insert "SG35"
2359	in column 16b, insert "SG35"
2361	in column 16b, insert "SG35"
2362	in column 16b, insert "SGG10"
2379	in column 16b, insert "SGG18"
2382	in column 16b, insert "SGG18"
2383	in column 16b, insert "SG35"
2386	in column 16b, insert "SGG18"
2387	in column 16b, insert "SGG10"
2388	in column 16b, insert "SGG10"
2390	in column 16b, insert "SGG10"
2391	in column 16b, insert "SGG10"
2392	in column 16b, insert "SGG10"
2395	in column 16b, insert "SGG1", "SG36" and "SG49"
2399	in column 16b, insert "SGG18"
2401	in column 16b, insert "SGG18"
2407	in column 16b, insert "SGG1", "SG36" and "SG49"
2426	in column 16b, insert "SGG2"
2427 PG II	in column 16b, insert "SGG4"
2427 PG III	in column 16b, insert "SGG4"
2428 PG II	in column 16b, insert "SGG4"
2428 PG III	in column 16b, insert "SGG4"
2429 PG II	in column 16b, insert "SGG4"
2429 PG III	in column 16b, insert "SGG4"
2434	in column 16b, insert "SGG1", "SG36" and "SG49"
2435	in column 16b, insert "SGG1", "SG36" and "SG49"
2437	in column 16b, insert "SGG1", "SG36" and "SG49"
2438	in column 16b, insert "SGG1", "SG36" and "SG49"
2439	in column 2, remove the hyphen to read "SODIUM HYDROGENDIFLUORIDE"; in column 16b, insert "SGG1", "SG36" and "SG49"

2440	in column 16b, insert "SGG1", "SG36" and "SG49"
2441	in column 16b, insert "SGG7"
2442	in column 16b, insert "SGG1", "SG36" and "SG49"
2443	in column 16b, insert "SGG1", "SG36" and "SG49"
2444	in column 16b, insert "SGG1", "SG36" and "SG49"
2456	in column 16b, insert "SGG10"
2466	in column 16b, insert "SGG16"
2469	in column 16b, insert "SGG3" and "SGG7"
2475	in column 16b, insert "SGG1", "SG36" and "SG49"
2491	in column 16b, insert "SGG18"
2495	in column 16b, insert "SGG1", "SG36" and "SG49"
2496	in column 16b, insert "SGG1", "SG36" and "SG49"
2502	in column 16b, insert "SGG1", "SG36" and "SG49"
2503	in column 16b, insert "SGG1", "SG36" and "SG49"
2504	in column 16b, insert "SGG10"
2505	in column 16b, insert "SGG2"
2506	in column 16b, insert "SGG1", "SGG2", "SG36" and "SG49"
2507	in column 16b, insert "SGG1", "SG36" and "SG49"
2508	in column 16b, insert "SGG1", "SG36" and "SG49"
2509	in column 16b, insert "SGG1", "SG36" and "SG49"
2511	in column 16b, insert "SGG1", "SG36" and "SG49"
2513	in column 16b, insert "SGG1", "SG49"
2515	in column 16b, insert "SGG10"
2526	in column 16b, insert "SG35"
2531	in column 16b, insert "SGG1", "SG36" and "SG49"
2545	in column 16b, insert "SGG15"
2546 PG I	in column 16b, insert "SGG7" and "SGG15"
2546 PG II	in column 16b, insert "SGG7" and "SGG15"
2546 PG III	in column 16b, insert "SGG7" and "SGG15"
2547	in column 16b, insert "SGG16"
2554	in column 16b, insert "SGG10"
2556	in column 16a, add "SW1" and "H2"
2564 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
2564 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
2565	in column 16b, insert "SG35"
2571	in column 16b, insert "SGG1", "SG36" and "SG49"
2573	in column 16b, insert "SGG4"
2576	in column 16b, insert "SGG1", "SG36" and "SG49"
2577	in column 16b, insert "SGG1", "SG36" and "SG49"
2578	in column 16b, insert "SGG1", "SG36" and "SG49"
2579	in column 16b, insert "SGG18"
2580	in column 16b, insert "SGG1", "SG36" and "SG49"
2581	in column 16b, insert "SGG1", "SG36" and "SG49"
2582	in column 16b, insert "SGG1", "SG36" and "SG49"
2583	in column 16b, insert "SGG1", "SG36" and "SG49"
2584	in column 16b, insert "SGG1", "SG36" and "SG49"
2585	in column 16b, insert "SGG1", "SG36" and "SG49"

2586	in column 16b, insert "SGG1", "SG36" and "SG49"
2604	in column 16b, insert "SGG1", "SG36" and "SG49"
2610	in column 16b, insert "SG35"
2619	in column 16b, insert "SG35"
2626	in column 16b, insert "SGG1" and "SG36"
2627	in column 16b, insert "SGG12"
2642	in column 16b, insert "SGG1", "SG36" and "SG49"
2644	in column 16b, insert "SGG10"
2646	in column 16b, insert "SGG10"
2664	in column 16b, insert "SGG10"
2670	in column 16b, insert "SGG1", "SG36" and "SG49"
2671	in column 16b, insert "SGG18"
2672	in column 16b, insert "SGG18"
2677 PG II	in column 16b, insert "SGG18"
2677 PG III	in column 16b, insert "SGG18"
2678	in column 16b, insert "SGG18"
2679 PG II	in column 16b, insert "SGG18"
2679 PG III	in column 16b, insert "SGG18"
2680	in column 16b, insert "SGG18"
2681 PG II	in column 16b, insert "SGG18"
2681 PG III	in column 16b, insert "SGG18"
2682	in column 16b, insert "SGG18"
2683	in column 16b, insert "SGG2" and "SGG18"
2684	in column 16b, insert "SG35"
2685	in column 16b, insert "SG35"
2686	in column 16b, insert "SG35"
2687	in column 16b, insert "SGG2"
2688	in column 16b, insert "SGG10"
2691	in column 16b, insert "SGG1" and "SG49"
2692	in column 16b, insert "SGG1", "SG36" and "SG49"
2698	in column 16b, insert "SGG1", "SG36" and "SG49"; in column 6, insert "973"
2699	in column 16b, insert "SGG1", "SG36" and "SG49"
2714	in column 16b, insert "SGG7"
2719	in column 16b, insert "SGG3"
2721	in column 16b, insert "SGG4"
2723	in column 16b, insert "SGG4"
2726	in column 16b, insert "SGG12"
2733 PG I	in column 16b, insert "SGG18"
2733 PG II	in column 16b, insert "SGG18"
2733 PG III	in column 16b, insert "SGG18"
2734 PG I	in column 16b, insert "SGG18"

2734 PG II	in column 16b, insert "SGG18"
2735 PG I	in column 16b, insert "SGG18"
2735 PG II	in column 16b, insert "SGG18"
2735 PG III	in column 16b, insert "SGG18"
2739	in column 16b, insert "SGG1", "SG36" and "SG49"
2740	in column 16b, insert "SGG1", "SG36" and "SG49"
2741	in column 16b, insert "SGG8"
2742	in column 16b, insert "SGG1", "SG36" and "SG49"
2743	in column 16b, insert "SGG1", "SG36" and "SG49"
2744	in column 16b, insert "SGG1", "SG36" and "SG49"
2745	in column 16b, insert "SGG1", "SG36" and "SG49"
2746	in column 16b, insert "SGG1", "SG36" and "SG49"
2748	in column 16b, insert "SGG1", "SG36" and "SG49"
2751	in column 16b, insert "SGG1", "SG36" and "SG49"
2777 PG I	in column 16b, insert "SGG7" and "SGG11"
2777 PG II	in column 16b, insert "SGG7" and "SGG11"
2777 PG III	in column 16b, insert "SGG7" and "SGG11"
2778 PG I	in column 16b, insert "SGG7" and "SGG11"
2778 PG II	in column 16b, insert "SGG7" and "SGG11"
2789	in column 16b, insert "SGG1", "SG36" and "SG49"
2790 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
2790 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
2794	in column 16b, insert "SGG1", "SG36" and "SG49"
2795	in column 16b, insert "SGG18"
2796	in column 16b, insert "SGG1a", "SG36" and "SG49"
2797	in column 16b, insert "SGG18"
2798	in column 16b, insert "SGG1", "SG36" and "SG49"
2799	in column 16b, insert "SGG1", "SG36" and "SG49"
2800	in column 6, delete "29"
2802	in column 16b, insert "SGG1", "SG36" and "SG49"
2809	in column 16b, insert "SGG7" and "SGG11"
2815	in column 16b, insert "SG35"
2817 PG II	in column 16b, insert "SGG1", "SGG2", "SG36" and "SG49"
2817 PG III	in column 16b, insert "SGG1", "SGG2", "SG36" and "SG49"
2818 PG II	in column 16b, insert "SGG2" and "SGG18"
2818 PG III	in column 16b, insert "SGG2" and "SGG18"
2819	in column 16b, insert "SGG1", "SG36" and "SG49"

2820	in column 16b, insert "SGG1", "SG36" and "SG49"
2823	in column 16b, insert "SGG1", "SG36" and "SG49"
2826	in column 16b, insert "SGG1", "SG36" and "SG49"
2829	in column 16b, insert "SGG1", "SG36" and "SG49"
2831	in column 16b, insert "SGG10"
2834	in column 16b, insert "SGG1", "SG36" and "SG49"
2841	in column 16b, insert "SG35"
2850	in column 17, at the end, add "1-dodecene is not marine pollutant."
2851	in column 16b, insert "SGG1", "SG36" and "SG49"
2854	in column 16b, insert "SGG2"
2855	in column 16b, insert "SGG7"
2859	in column 16b, insert "SGG2"
2861	in column 16b, insert "SGG2"
2863	in column 16b, insert "SGG2"
2865	in column 16b, insert "SGG1", "SG35", "SG36" and "SG49"
2869 PG II	in column 16b, insert "SGG1", "SGG7", "SG36" and "SG49"
2869 PG III	in column 16b, insert "SGG1", "SGG7", "SG36" and "SG49"
2872 PG II	in column 16b, insert "SGG10"
2872 PG III	in column 16b, insert "SGG10"
2878	in column 16b, insert "SGG7" and "SGG15"
2879	in column 16b, insert "SGG1", "SG36" and "SG49"
2880 PG II	in column 16b, insert "SGG8"
2880 PG III	in column 16b, insert "SGG8"
2881 PG I	in column 16b, insert "SGG7" and "SGG15"
2881 PG II	in column 16b, insert "SGG7" and "SGG15"
2881 PG III	in column 16b, insert "SGG7" and "SGG15"
2945	in column 16b, insert "SG35"
2949	in column 16b, insert "SGG18"
2950	in column 16b, insert "SGG15"
2967	in column 16b, insert "SGG1", "SG36" and "SG49"
2977	in column 16b, insert "SG17", "SG76" and "SG78"
2978	in column 16b, insert "SG17", "SG76" and "SG78"
2985	in column 16b, insert "SGG1", "SG36" and "SG49"
2986	in column 16b, insert "SGG1", "SG36" and "SG49"
2987	in column 16b, insert "SGG1", "SG36" and "SG49"
2988	in column 16b, insert "SGG1", "SG36" and "SG49"
2989 PG II	in column 16b, insert "SGG7" and "SGG9"
2989 PG III	in column 16b, insert "SGG7" and "SGG9"
3011 PG I	in column 16b, insert "SGG7" and "SGG11"

3011 PG II	in column 16b, insert "SGG7" and "SGG11"
3011 PG III	in column 16b, insert "SGG7" and "SGG11"
3012 PG I	in column 16b, insert "SGG7" and "SGG11"
3012 PG II	in column 16b, insert "SGG7" and "SGG11"
3012 PG III	in column 16b, insert "SGG7" and "SGG11"
3028	in column 16b, insert "SGG18"
3055	in column 16b, insert "SG35"
3073	in column 16b, insert "SGG18"
3078	in column 16b, insert "SGG15"
3089 PG II	in column 16b, insert "SGG7" and "SGG15"
3089 PG III	in column 16b, insert "SGG7" and "SGG15"
3090	in column 6, insert "387"; in column 8, insert "P911", "LP905" and "LP906"
3091	in column 6, insert "387"; in column 8, insert "P911", "LP905" and "LP906"
3101	in column 16b, insert "SG72"
3102	in column 16b, insert "SG72"
3103	in column 16b, insert "SG72"
3104	in column 16b, insert "SG72"
3106	in column 16b, insert "SG72"
3108	in column 16b, insert "SG72"
3110	in column 16b, insert "SG72"
3111	in column 16b, insert "SG72"
3112	in column 16b, insert "SG72"
3113	in column 16b, insert "SG72"
3114	in column 16b, insert "SG72"
3115	in column 16b, insert "SG72"
3116	in column 16b, insert "SG72"
3117	in column 16b, insert "SG72"
3118	in column 16b, insert "SG72"
3119	in column 16b, insert "SG72"
3120	in column 16b, insert "SG72"
3149	in column 16b, insert "SGG16"
3166	in column 6, delete "312", delete "380", delete "385" and insert "388"
3170 PG II	in column 16b, insert "SGG15"
3170 PG III	in column 16b, insert "SGG15"
3171	in column 6, delete "240" and insert "388"
3174	in column 16b, insert "SGG7"
3181 PG II	in column 16b, insert "SGG7"
3181 PG III	in column 16b, insert "SGG7"
3189 PG II	in column 16b, insert "SGG7" and "SGG15"

3189 PG III	in column 16b, insert "SGG7" and "SGG15"
3211 PGII	in column 16b, insert "SGG13"
3211 PGIII	in column 16b, insert "SGG13"
3212	in column 16b, insert "SGG8"
3213 PG II	in column 16b, insert "SGG3"
3213 PG III	in column 16b, insert "SGG3"
3214	in column 16b, insert "SGG14"
3219 PG II	in column 16b, insert "SGG12"
3219 PG III	in column 16b, insert "SGG12"
3223	in column 9, add "PP94 PP95"
3224	in column 9, add "PP94 PP95"
3246	in column 16b, insert "SGG1", "SG36" and "SG49"
3250	in column 16b, insert "SGG1", "SG36" and "SG49"
3253	in column 16b, insert "SGG18"
3255	in column 16b, insert "SGG8"
3259 PG I	in column 16b, insert "SGG18"
3259 PG II	in column 16b, insert "SGG18"
3259 PG III	in column 16b, insert "SGG18"
3260 PG I	in column 16b, insert "SGG1", "SG36" and "SG49"
3260 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
3260 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
3261 PG I	in column 16b, insert "SGG1", "SG36" and "SG49"
3261 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
3261 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
3262 PG I	in column 16b, insert "SGG18"
3262 PG II	in column 16b, insert "SGG18"
3262 PG III	in column 16b, insert "SGG18"
3263 PG I	in column 16b, insert "SGG18"
3263 PG II	in column 16b, insert "SGG18"
3263 PG III	in column 16b, insert "SGG18"

3264 PG I	in column 16b, insert "SGG1", "SG36" and "SG49"
3264 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
3264 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
3265 PG I	in column 16b, insert "SGG1", "SG36" and "SG49"
3265 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
3265 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
3266 PG I	in column 16b, insert "SGG18"
3266 PG II	in column 16b, insert "SGG18"
3266 PG III	in column 16b, insert "SGG18"
3267 PG I	in column 16b, insert "SGG18"
3267 PG II	in column 16b, insert "SGG18"
3267 PG III	in column 16b, insert "SGG18"
3277	in column 16b, insert "SGG1", "SG36" and "SG49"
3293	in column 16b, insert "SGG18"
3302	in column 2, at the end of the designation, add ", STABILIZED"; in column 6, add "386"
3316 PG II	in column 5, delete "II"
3316 PG III	delete this entire entry
3318	in column 16b, insert "SGG18"
3320 PG II	in column 16b, insert "SGG18"
3320 PG III	in column 16b, insert "SGG18"
3332	in column 15, replace "S-S" with "S-S"
3333	in column 15, replace "S-S" with "S-S"
3360	in column 6, insert "973"
3361	in column 16b, insert "SGG1", "SG36" and "SG49"
3362	in column 16b, insert "SGG1", "SG36" and "SG49"
3375	in column 16b, insert "SGG2"
3377	in column 16b, insert "SGG16"
3378 PG II	in column 16b, insert "SGG16"
3378 PG III	in column 16b, insert "SGG16"
3401	in column 16b, insert "SGG7" and "SGG11"
3402	in column 16b, insert "SGG7" and "SGG11"
3405 PG II	in column 16b, insert "SGG4"

3405 PG III	in column 16b, insert "SGG4"
3406 PG II	in column 16b, insert "SGG13"
3406 PG III	in column 16b, insert "SGG13"
3407 PG II	in column 16b, insert "SGG4"
3407 PG III	in column 16b, insert "SGG4"
3408 PG II	in column 16b, insert "SGG7", "SGG9" and "SGG13"
3408 PG III	in column 16b, insert "SGG7", "SGG9" and "SGG13"
3412 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
3412 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
3413 PG I	in column 16b, insert "SGG6"
3413 PG II	in column 16b, insert "SGG6"
3413 PG III	in column 16b, insert "SGG6"
3414 PG I	in column 16b, insert "SGG6"
3414 PG II	in column 16b, insert "SGG6"
3414 PG III	in column 16b, insert "SGG6"
3419	in column 16b, insert "SGG1", "SG36" and "SG49"
3420	in column 16b, insert "SGG1", "SG36" and "SG49"
3421 PG II	in column 16b, insert "SGG1", "SG36" and "SG49"
3421 PG III	in column 16b, insert "SGG1", "SG36" and "SG49"
3423	in column 16b, insert "SGG2" and "SGG18"
3424 PG II	in column 16b, insert "SGG2"
3424 PG III	in column 16b, insert "SGG2"
3425	in column 16b, insert "SGG1", "SG36" and "SG49"
3449	in column 16b, insert "SGG6"
3453	in column 16b, insert "SGG1", "SG36" and "SG49"
3456	in column 16b, insert "SGG1", "SG36" and "SG49"
3463	in column 16b, insert "SGG1", "SG36" and "SG49"
3472	in column 16b, insert "SGG1", "SG36" and "SG49"
3480	in column 6, insert "387"; in column 8, insert "P911", "LP905" and "LP906"
3481	in column 6, insert "387"; in column 8, insert "P911", "LP905" and "LP906"
3483	in column 16b, insert "SGG7" and "SGG9"
3484	in column 16b, insert "SGG18"
3485	in column 16b, insert "SGG8"
3486	in column 16b, insert "SGG8"

3487 PG II	in column 16b, insert "SGG8"
3487 PG III	in column 16b, insert "SGG8"
3496	in column 17, replace the sentence by "Nickel-metal hydride cells or batteries packed with or contained in equipment and nickel-metal hydride button are not subject to the provisions of this Code."
3498	in column 16b, insert "SGG1", "SG36" and "SG49"
3507	in column 16b, insert "SG77"

Add the following new entries to the Dangerous Goods List:

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16a)	(16b)	(17)
3535	TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.	6.1	4.1	I	274	0	E5	P002	-	IBC99	-	-	T6	TP33	F-A, S-G	Category B	-	Toxic if swallowed, by skin contact or by dust inhalation.
3535	TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.	6.1	4.1	II	274	500 g	E4	P002	-	IBC08	B4 B21	-	T3	TP33	F-A, S-G	Category B	-	See entry above.
3536	LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT lithium ion batteries or lithium metal batteries	9		-	389	0	E0	-	-	-	-	-	-	-	F-A, S-I	Category A	-	Cargo transport unit containing lithium metal or lithium ion batteries which is designed to serve as mobile power supply unit.
3537	ARTICLES CONTAINING FLAMMABLE GAS, N.O.S.	2.1	See 2.0.6.6	-	274 391	0	E0	P006 LP03	-	-	-	-	-	-	F-D, S-U	Category D SW2	-	-
3538	ARTICLES CONTAINING NON-FLAMMABLE, NON-TOXIC GAS, N.O.S.	2.2	See 2.0.6.6	-	274 391	0	E0	P006 LP03	-	-	-	-	-	-	F-C,S-V	Category A	-	-
3539	ARTICLES CONTAINING TOXIC GAS, N.O.S.	2.3	See 2.0.6.6	-	274 391	0	E0	-	-	-	-	-	-	-	F-C, S-U	-	-	-
3540	ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S.	3	See 2.0.6.6	-	274 391	0	E0	P006 LP03	-	-	-	-	-	-	F-E, S-D	Category B	-	-
3541	ARTICLES CONTAINING FLAMMABLE SOLID, N.O.S.	4.1	See 2.0.6.6	-	274 391	0	E0	P006 LP03	-	-	-	-	-	-	F-A, S-G	Category B	-	-
3542	ARTICLES CONTAINING A SUBSTANCE LIABLE TO SPONTANEOUS COMBUSTION, N.O.S.	4.2	See 2.0.6.6	-	274 391	0	E0	-	-	-	-	-	-	-	*	-	-	* F-G, S-M for pyrophoric substances, F-A, S-J for self-heating substances.
3543	ARTICLES CONTAINING A SUBSTANCE WHICH EMITS FLAMMABLE GAS IN CONTACT WITH WATER, N.O.S.	4.3	See 2.0.6.6	-	274 391	0	E0	-	-	-	-	-	-	-	F-G, S-N	-	-	-
3544	ARTICLES CONTAINING OXIDIZING SUBSTANCE, N.O.S.	5.1	See 2.0.6.6	-	274 391	0	E0	-	-	-	-	-	-	-	F-A, S-Q	-	-	-

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16a)	(16b)	(17)
3545	ARTICLES CONTAINING ORGANIC PEROXIDE, N.O.S.	5.2	See 2.0.6.6	-	274 391	0	E0	-	-	-	-	-	-	-	F-J, S-R	-	-	-
3546	ARTICLES CONTAINING TOXIC SUBSTANCE, N.O.S.	6.1	See 2.0.6.6	-	274 391	0	E0	P006 LP03	-	-	-	-	-	-	F-A, S-A	Category B SW2 *	-	Toxic if swallowed, by skin contact or by dust inhalation. *When competent authority approval is required by SP391, the stowage and handling will be specified by the competent authority.
3547	ARTICLES CONTAINING CORROSIVE SUBSTANCE, N.O.S.	8	See 2.0.6.6	-	274 391	0	E0	P006 LP03	-	-	-	-	-	-	F-A, S-B	Category B SW2	-	Causes burns to skin, eyes and mucous membranes.
3548	ARTICLES CONTAINING MISCELLANEOUS DANGEROUS GOODS, N.O.S.	9	See 2.0.6.6	-	274 391	0	E0	P006 LP03	-	-	-	-	-	-	F-A, S-P	Category A	-	-

Chapter 3.3
Special provisions applicable to certain substances, materials or articles

3.3.1 In the third sentence, replace "such as "Damaged Lithium Batteries"" with "such as "LITHIUM BATTERIES FOR DISPOSAL"".

SP 29 Amend to read as follows:

"29 The packages, including bales, are exempt from labelling provided that they are marked with the appropriate class (e.g. "class 4.2")."

SP 63 In the introductory text, replace "risks" with "hazard(s)". In .5 replace "risk" with "hazard". In .7 replace "risk" with "hazard" and replace "risk(s)" with "hazard(s)".

SP 122 Replace "risk(s)" with "hazard(s)".

SP 133 Replace "risk" with "hazard".

SP 172 Replace "risk(s)" with "hazard(s)". In .1 and .2, replace "risk" with "hazard". In .3, replace "risk(s)" with "hazard(s)".

SP 181 Replace "risk" with "hazard".

SP 186 is deleted.

SP 188 In sub-paragraph .3, replace "2.9.4.1 and 2.9.4.5" with "2.9.4.1, 2.9.4.5, 2.9.4.6 if applicable and 2.9.4.7"

In sub-paragraph .4, replace "protection against contact with conductive materials" with "protection against contact with electrically conductive material". At the end of .4, replace "." with ";".

In sub-paragraph .5, at the end, add the following two new sentences:

"When packages are placed in an overpack, the lithium battery mark shall either be clearly visible or be reproduced on the outside of the overpack and the overpack shall be marked with the word "OVERPACK". The lettering of the "OVERPACK" mark shall be at least 12 mm high;"

In sub-paragraph .6, rename the existing note as note 1 and add the following new note 2:

"**Note 2:** Packages containing lithium batteries packed in conformity with the provisions of part 4, chapter 11, packing instructions 965 or 968, Section IB of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air that bear the mark as shown in 5.2.1.10 (lithium battery mark) and the label shown in 5.2.2.2.2, Model No. 9A shall be deemed to meet the provisions of this special provision."

In the first paragraph after sub-paragraph .8, at the end, add the following sentence:

"As used in this special provision "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation."

SP 193 Amend to read as follows:

"193 This entry may only be used for ammonium nitrate based compound fertilizers. They shall be classified in accordance with the procedure as set out in the Manual of Tests and Criteria, part III, section 39. "

SP 204 Replace "risk" with "hazard" twice and add the word "hazard" between "subsidiary" and "label" in the last sentence.

SP 240 is deleted.

SP 251 In the first paragraph, replace the last sentence with:

"Such kits shall only contain dangerous goods that are permitted as:

.1 excepted quantities not exceeding the quantity indicated by the Code in column 7b of the Dangerous Goods List of chapter 3.2, provided that the net quantity per inner packaging and net quantity per package are as prescribed in 3.5.1.2 and 3.5.1.3; or

.2 limited quantities as indicated in column 7a of the Dangerous Goods List of chapter 3.2, provided that the net quantity per inner packaging does not exceed 250 ml or 250 g."

In the second paragraph, delete the last sentence.

In the third paragraph, insert a new first sentence to read as follows:

"For the purposes of completion of the dangerous goods transport document as set out in 5.4.1.4.1, the packing group shown on the document shall be the most stringent packing group assigned to any individual substance in the kit."

SP 271 Replace "risk" with "hazard".

SP 290 In sub-paragraph .2, replace "risk" with "hazard".

SP 293 In sub-paragraph .2, after "Safety matches are", insert "matches that".

SP 296 Replace "risk" with "hazard".

SP 301 At the beginning, replace "substance" with "goods". Amend the fifth and sixth sentences to read as follows:

"If the machinery or apparatus contains more than one item of dangerous goods, the individual dangerous goods shall be enclosed to prevent them reacting dangerously with one another during transport (see 4.1.1.6). When it is required to ensure liquid dangerous goods remain in their intended orientation, orientation arrows shall be displayed on at least two opposite vertical sides with the arrows pointing in the correct direction in accordance with 5.2.1.7.1."

Delete the last sentence.

SP 307 Amend to read as follows:

"307 This entry may only be used for ammonium nitrate based fertilizers. They shall be classified in accordance with the procedure as set out in the Manual of Tests and Criteria, part III, section 39."

SP 308 Amend to read as follows:

"308* Stabilization of fish meal shall be achieved to prevent spontaneous combustion by effective application of ethoxyquin, BHT (butylated hydroxytoluene) or tocopherols (also used in a blend with rosemary extract) at the time of production. The said application shall occur within twelve months prior to shipment. Fish scrap or fish meal shall contain at least 50 ppm (mg/kg) of ethoxyquin, 100 ppm (mg/kg) of BHT or 250 ppm (mg/kg) of tocopherol based antioxidant at the time of shipment.",

and add a corresponding footnote * as follows:

"* For the transport of fish meal in bulk, see the IMSBC Code."

SP 310 In the first paragraph, replace "cells and batteries" with "cells or batteries", twice, and add "or LP905 of 4.1.4.3, as applicable" at the end.

SP 312 is deleted.

SP 362 In sub-paragraph .2 and .3, replace "risk" with "hazard".

SP 363 Add the following new introductory sentence:

"This entry may only be used when the conditions of this special provision are met. No other provisions of this Code apply, except for special provision 972, chapter 5.4, part 7 and columns 16a and 16b of the Dangerous Goods List."

Replace the existing sub-paragraph .7 with the following:

".7 The engine or machinery, including the means of containment containing dangerous goods, shall be in compliance with the construction requirements specified by the competent authority.

.8 Any valves or openings (e.g. venting devices) shall be closed during transport.

.9 The engines or machinery shall be oriented to prevent inadvertent leakage of dangerous goods and secured by means capable of restraining the engines or machinery to prevent any movement during transport which would change the orientation or cause them to be damaged.

.10 For UN 3528 and UN 3530:

- where the engine or machinery contains more than 60 L of liquid fuel and has a capacity of not more than 450 L, the labelling requirements of 5.2.2 shall apply;

- where the engine or machinery contains more than 60 L of liquid fuel and has a capacity of more than 450 L but not more than 3,000 L, it shall be labelled on two opposing sides in accordance with 5.2.2;

- where the engine or machinery contains more than 60 L of liquid fuel and has a capacity of more than 3,000 L, it shall be placarded on two opposing sides in accordance with 5.3.1.1.2; and

- in addition to the above requirements, for UN 3530, where the engine or machinery contains more than 60 L of liquid fuel and the capacity does not exceed 3,000 L, the marking requirements of 5.2.1.6 apply; and where the engine or machinery contains more than 60 L of liquid fuel and the capacity exceeds 3,000 L, the marking requirements of 5.3.2.3.2 apply.

.11 For UN 3529:

- where the fuel tank of the engine or machinery has a water capacity of not more than 450 L, the labelling requirements of 5.2.2 shall apply;

- where the fuel tank of the engine or machinery has a water capacity of more than 450 L but not more than 1,000 L, it shall be labelled on two opposing sides in accordance with 5.2.2; and

- where the fuel tank of the engine or machinery has a water capacity of more than 1,000 L, it shall be placarded on two opposing sides in accordance with 5.3.1.1.2.

.12 The transport document shall contain the following additional statement "Transport in accordance with special provision 363".

.13 The requirements specified in packing instruction P005 of 4.1.4.1 shall be met."

SP 369 In the first paragraph, replace "risks" with "hazards". In the third paragraph, replace "risk" with "hazard".

SP 376 Amend the text after the third paragraph to read as follows:

"Cells and batteries shall be packed in accordance with packing instructions P908 of 4.1.4.1 or LP904 of 4.1.4.3, as applicable.

Cells and batteries identified as damaged or defective and liable to rapidly disassemble, dangerously react, produce a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours under normal conditions of transport shall be packed and transported in accordance with packing instruction P911 of 4.1.4.1 or LP906 of 4.1.4.3, as applicable. Alternative packing and/or transport conditions may be authorized by the competent authority.

Packages shall be marked "DAMAGED/DEFECTIVE" in addition to the proper shipping name, as stated in 5.2.1.

The transport document shall include the following statement "Transport in accordance with special provision 376".

If applicable, a copy of the competent authority approval shall accompany the transport."

SP 377 At the end, add a new paragraph as follows:

"The transport document shall include the following statement: "Transport in accordance with special provision 377"."

SP 380 is deleted.

SP 384 Delete the note.

SP 385 is deleted.

SP 907 Replace the terms "which must exceed 100 mg/kg" with "see special provision 308".

SP 943 Replace "subsidiary risk" with "subsidiary hazard".

SP 945 is deleted.

SP 959 Replace "subsidiary risk(s)" with "subsidiary hazard(s)".

SP 961 In sub-paragraph .1, replace "2.9.4.1 does" with "2.9.4.1 and 2.9.4.7 do".

SP 962 In sub-paragraph .4, replace "2.9.4.1 does" with "2.9.4.1 and 2.9.4.7 do".

SP 963 Replace the first sentence with the following:

"Nickel-metal hydride cells or batteries packed with or contained in equipment and nickel-metal hydride button cells are not subject to the provisions of this Code."

SP 972 Replace "2.9.4.1 does" with "2.9.4.1 and 2.9.4.7 do".

Add the following new special provisions:

"387 Lithium batteries in conformity with 2.9.4.6 containing both primary lithium metal cells and rechargeable lithium ion cells shall be assigned to UN 3090 or 3091 as appropriate. When such batteries are transported in accordance with special provision 188, the total lithium content of all lithium metal cells contained in the battery shall not exceed 1.5 g and the total capacity of all lithium ion cells contained in the battery shall not exceed 10 Wh.".

"388 UN 3166 entries apply to vehicles powered by flammable liquid or gas internal combustion engines or fuel cells.

Vehicles powered by a fuel cell engine shall be assigned to the entries UN 3166 VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED, as appropriate. These entries include hybrid electric vehicles powered by both a fuel cell and an internal combustion engine with wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the battery(ies) installed.

Other vehicles which contain an internal combustion engine shall be assigned to the entries UN 3166 VEHICLE, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FLAMMABLE LIQUID POWERED, as appropriate. These entries include hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the battery(ies) installed.
If a vehicle is powered by a flammable liquid and a flammable gas internal combustion engine, it shall be assigned to UN 3166 VEHICLE, FLAMMABLE GAS POWERED.

Entry UN 3171 only applies to vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries and equipment powered by wet batteries or sodium batteries transported with these batteries installed.

For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are cars, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, trucks, locomotives, bicycles (pedal cycles with a motor) and other vehicles of this type (e.g. self-balancing vehicles or vehicles not equipped with at least one seating position), wheelchairs, lawn tractors, self-propelled farming and construction equipment, boats and aircraft. This includes vehicles transported in a packaging. In this case some parts of the vehicle may be detached from its frame to fit into the packaging.

Examples of equipment are lawnmowers, cleaning machines or model boats and model aircraft. Equipment powered by lithium metal batteries or lithium ion batteries shall be assigned to the entries UN 3091 LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT or UN 3091 LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT or UN 3481 LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or UN 3481 LITHIUM ION BATTERIES PACKED WITH EQUIPMENT, as appropriate.

Dangerous goods, such as batteries, airbags, fire extinguishers, compressed gas accumulators, safety devices and other integral components of the vehicle that are necessary for the operation of the vehicle or for the safety of its operator or passengers, shall be securely installed in the vehicle and are not otherwise subject to this Code."

"389 This entry only applies to lithium ion batteries or lithium metal batteries installed in a cargo transport unit and designed only to provide power external to the cargo transport unit. The lithium batteries shall meet the requirements of 2.9.4.1 to .7 and contain the necessary systems to prevent overcharge and overdischarge between the batteries.

The batteries shall be securely attached to the interior structure of the cargo transport unit (e.g. by means of placement in racks, cabinets, etc.) in such a manner as to prevent short circuits, accidental operation, and significant movement relative to the cargo transport unit under the shocks, loadings and vibrations normally incident to transport. Dangerous goods necessary for the safe and proper operation of the cargo transport unit (e.g. fire-extinguishing systems and air-conditioning systems), shall be properly secured to or installed in the cargo transport unit and are not otherwise subject to this Code.

Dangerous goods not necessary for the safe and proper operation of the cargo transport unit shall not be transported within the cargo transport unit.

The batteries inside the cargo transport unit are not subject to marking or labelling requirements. The cargo transport unit shall display the UN number in accordance with 5.3.2.1.2 and be placarded on two opposing sides in accordance with 5.3.1.1.2."

"391 Articles containing dangerous goods of class 2.3, or class 4.2, or class 4.3, or class 5.1, or class 5.2 or class 6.1 for substances of inhalation toxicity requiring packing group I and articles containing more than one of the hazards listed in 2.0.3.4.2 to 2.0.3.4.4 shall be transported under conditions approved by the competent authority."

"392 For the transport of fuel gas containment systems designed and approved to be fitted in motor vehicles containing this gas, the provisions of subsection 4.1.4.1 and chapter 6.2 of this Code need not be applied when transported for disposal, recycling, repair, inspection, maintenance or from where they are manufactured to a vehicle assembly plant, provided the following conditions are met:

.1 the fuel gas containment systems shall meet the requirements of the standards or regulations for fuel tanks for vehicles, as applicable. Examples of applicable standards and regulations are:

LPG tanks	
ECE Regulation No. 67 Revision 2	Uniform provisions concerning: I. Approval of specific equipment of vehicles of category M and N using liquefied petroleum gases in their propulsion system; II. Approval of vehicles of category M and N fitted with specific equipment for the use of liquefied petroleum gases in their propulsion system with regard to the installation of such equipment
ECE Regulation No. 115	Uniform provisions concerning the approval of: I. Specific LPG (liquefied petroleum gases) retrofit systems to be installed in motor vehicles for the use of LPG in their propulsion systems; II. Specific CNG (compressed natural gas) retrofit systems to be installed in motor vehicles for the use of CNG in their propulsion system
CNG tanks	
ECE Regulation No. 110	Uniform provisions concerning: I. Specific components of motor vehicles using compressed natural gas (CNG) and/or liquefied natural gas (LNG) in their propulsion system; II. Vehicles with regard to the installation of specific components of an approved type for the use of compressed natural gas (CNG) and/or liquefied natural gas (LNG) in their propulsion system
ECE Regulation No. 115	(Uniform provisions concerning the approval of I. Specific LPG (liquefied petroleum gases) retrofit systems to be installed in motor vehicles for the use of LPG in their propulsion systems; II. Specific CNG (compressed natural gas) retrofit systems to be installed in motor vehicles for the use of CNG in their propulsion system)

ISO 11439:2013	Gas cylinders – High pressure cylinders for the onboard storage of natural gas as a fuel for automotive vehicles
ISO 15500-Series	ISO 15500: Road vehicles – Compressed natural gas (CNG) fuel system components – several parts as applicable
ANSI NGV 2	Compressed natural gas vehicle fuel containers
CSA B51 Part 2: 2014	Boiler, pressure vessel, and pressure piping code Part 2 Requirements for high-pressure cylinders for onboard storage of fuels for automotive vehicles
Hydrogen pressure tanks	
Global Technical Regulation (GTR) No. 13	Global technical regulation on hydrogen and fuel cell vehicles (ECE/TRANS/180/Add.13)
ISO/TS 15869:2009	Gaseous hydrogen and hydrogen blends – Land vehicle fuel tanks
Regulation (EC) No.79/2009	Regulation (EC) No. 79/2009 of the European Parliament and of the Council of 14 January 2009 on type approval of hydrogen-powered motor vehicles, and amending Directive 2007/46/EC
Regulation (EU) No. 406/2010	Commission Regulation (EU) No. 406/2010 of 26 April 2010 implementing Regulation (EC) No. 79/2009 of the European Parliament and of the Council on type-approval of hydrogen-powered motor vehicles
ECE Regulation No. 134	Hydrogen and fuel cell vehicles (HFCV)
CSA B51 Part 2: 2014	Boiler, pressure vessel, and pressure piping code Part 2 Requirements for high-pressure cylinders for onboard storage of fuels for automotive vehicles

Gas tanks designed and constructed in accordance with previous versions of relevant standards or regulations for gas tanks for motor vehicles, which were applicable at the time of the certification of the vehicles for which the gas tanks were designed and constructed may continue to be transported;

.2 the fuel gas containment systems shall be leakproof and shall not exhibit any signs of external damage which may affect their safety;

Note 1: Criteria may be found in standard ISO 11623:2015 *Transportable gas cylinders – Periodic inspection and testing of composite gas cylinders* (or ISO 19078:2013 *Gas cylinders – Inspection of the cylinder installation, and requalification of high pressure cylinders for the onboard storage of natural gas as a fuel for automotive vehicles*).

Note 2: If the fuel gas containment systems are not leakproof or are overfilled or if they exhibit damage that could affect their safety (e.g. in case of a safety-related recall), they shall only be carried in salvage pressure receptacles in conformity with this Code.

.3 if a fuel gas containment system is equipped with two valves or more integrated in line, the two valves shall be closed as to be gastight under normal conditions of transport. If only one valve exists or only one valve works, all openings with the exception of the opening of

the pressure relief device shall be closed as to be gastight under normal conditions of transport;

.4 fuel gas containment systems shall be transported in such a way as to prevent obstruction of the pressure relief device or any damage to the valves and any other pressurised part of the fuel gas containment systems and unintentional release of the gas under normal conditions of transport. The fuel gas containment system shall be secured in order to prevent slipping, rolling or vertical movement;

.5 valves shall be protected by one of the methods described in 4.1.6.1.8.1 to 4.1.6.1.8.5;

.6 except for the case of fuel gas containment systems removed for disposal, recycling, repair, inspection or maintenance, they shall be filled with not more than 20% of their nominal filling ratio or nominal working pressure, as applicable;

.7 notwithstanding the provisions of chapter 5.2, when fuel gas containment systems are consigned in a handling device, markings and labels may be affixed to the handling device; and

.8 notwithstanding the provisions of 5.4.1.5, the information on the total quantity of dangerous goods may be replaced by the following information:

.1 the number of fuel gas containment systems; and

.2 in the case of liquefied gases the total net mass (kg) of gas of each fuel gas containment system and, in the case of compressed gases, the total water capacity (l) of each fuel gas containment system followed by the nominal working pressure.

Examples for information in the transport document:

Example 1: "UN 1971 natural gas, compressed, 2.1, 1 fuel gas containment system of 50 l in total, 200 bar".

Example 2: "UN 1965 hydrocarbon gas mixture, liquefied, n.o.s., 2.1, 3 fuel gas containment systems, each of 15 kg net mass of gas"."

"973 Packages, with the exception of bales, shall also display the proper shipping name and the UN number of the substance that they contain in accordance with 5.2.1. In any case, the packages, including bales, are exempt from class marking provided that they are loaded in a cargo transport unit and that they contain goods to which only one UN number has been assigned. The cargo transport units in which the packages, including bales, are loaded shall display any relevant labels, placards and marks in accordance with chapter 5.3."

"974 These substances may be transported in IMO type 9 tanks."

Chapter 3.4
Dangerous goods packed in limited quantities

3.4.6 Documentation

3.4.6.1 Replace the words "dangerous goods declaration" with "dangerous goods transport document".

Chapter 3.5
Dangerous goods packed in excepted quantities

3.5.6 Documentation

3.5.6.1 Replace the words "dangerous goods declaration" with "dangerous goods transport document".

PART 4
PACKING AND TANK PROVISIONS

Chapter 4.1
Use of packagings, including intermediate bulk containers (IBCs) and large packagings

4.1.4 List of packing instructions

4.1.4.1 Packing instructions concerning the use of packagings (except IBCs and large packagings)

P001 Under "Composite packagings", in the first line, replace "Plastics receptacle in steel or aluminium drum (6HA1, 6HB1)" with "Plastics receptacle in steel, aluminium or plastics drum (6HA1, 6HB1, 6HH1)". In the second line, replace "Plastics receptacle in fibre, plastics or plywood drum (6HG1, 6HH1, 6HD1)" with "Plastics receptacle in fibre or plywood drum (6HG1, 6HD1)".

P101 Replace "The S tate's distinguishing sign for motor vehicles in international traffic" with "The distinguishing sign used on vehicles in international road traffic*".

Table note * reads as follows:

"* 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."

P200 In paragraph (3) (e), in the first paragraph, replace "liquid phase" with "liquefied gas". In sub-paragraph (i), replace "liquid component" with "liquefied gas". In sub-paragraph (iv), replace "liquid component" with "liquefied gas". In sub-paragraph (v), replace "liquid component" with "liquefied gas". In the last paragraph, replace "liquid component" with "liquid phase". In the header of column 4 of tables 1, 2 and 3, replace "risk" with "hazard".

P203 In paragraph (7), replace "risk" with "hazard".

P206 In paragraph (3), in the first paragraph, replace "liquid phase" with "liquefied gas". In sub-paragraph (a), replace "liquid component" with "liquefied gas". In sub-paragraph (d), replace "liquid component" with "liquefied gas". In sub-paragraph (e), replace "liquid component" with "liquefied gas". In the last paragraph, replace "liquid component" with "liquid phase".

P208 In the header of column 4 of table 1, replace "risk" with "hazard".

P403 In special packing provisions PP31, delete ", except for solid fused material".

P410 Replace the table note (4) with the following:

"For packing group II substances, these packagings may only be used when transported in a closed cargo transport unit."

P520 In additional provision 4, replace "risk" with "hazard". Furthermore, add the following new special packing provisions PP94 and PP95:

"PP94 Very small amounts of energetic samples of section 2.0.4.3 may be carried under UN 3223 or UN 3224, as appropriate, provided that:

.1 only combination packaging with outer packaging comprising boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2) are used;

.2 the samples are carried in microtiter plates or multi-titer plates made of plastics, glass, porcelain or stoneware as inner packaging;

.3 the maximum amount per individual inner cavity does not exceed 0.01 g for solids or 0.01 ml for liquids;

.4 the maximum net quantity per outer packaging is 20 g for solids or 20 ml for liquids, or in the case of mixed packing the sum of grams and millilitres does not exceed 20; and

.5 when dry ice or liquid nitrogen is optionally used as a coolant for quality control measures, the requirements of 5.5.3 are complied with. Interior supports shall be provided to secure the inner packagings in their original position. The inner and outer packagings shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.

PP95 Small amounts of energetic samples of section 2.0.4.3 may be carried under UN 3223 or UN 3224, as appropriate, provided that:

.1 the outer packaging consist only of corrugated fibreboard of type 4G having minimum dimensions of 60 cm (length) by 40.5 cm (width) by 30 cm (height) and minimum wall thickness of 1.3 cm;

.2 the individual substance is contained in an inner packaging of glass or plastics of maximum capacity 30 ml placed in an expandable polyethylene foam matrix of at least 130 mm thickness having a density of 18 ± 1 g/l;

.3 within the foam carrier, inner packagings are segregated from each other by a minimum distance of 40 mm and from the wall of the outer packaging by a

minimum distance of 70 mm. The package may contain up to two layers of such foam matrices, each carrying up to 28 inner packagings;

.4 the maximum content of each inner packaging does not exceed 1 g for solids or 1 ml for liquids;

.5 the maximum net quantity per outer packaging is 56 g for solids or 56 ml for liquids, or in the case of mixed packing the sum of grams and millilitres does not exceed 56; and

.6 when dry ice or liquid nitrogen is optionally used as a coolant for quality control measures, the requirements of 5.5.3 are complied with. Interior supports shall be provided to secure the inner packagings in their original position. The inner and outer packagings shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost."

P620 In additional provision 3, at the end, delete "and temperatures in the range -40°C to +55°C" and add the following new sentence: "This primary receptacle or secondary packaging shall also be capable of withstanding temperatures in the range -40°C to +55°C.".

P801 In additional provision 2, replace "non-conductive" with "electrically non-conductive".

P901 Under "Additional requirement", delete "not exceed either 250 ml or 250 g and shall".

P902 In the paragraph under "Unpackaged articles:", amend the end of the sentence to read "when moved to, from, or between where they are manufactured and an assembly plant including intermediate handling locations.".

P903 Before the introductory sentence that starts with "The following packagings…", insert a new sentence to read "For the purpose of this packing instruction, "equipment" means apparatus for which the lithium cells or batteries will provide electrical power for its operation.". In paragraph (3), delete the last sentence.

P906 In paragraph (2), in the introductory sentence and in sub-paragraph (b), replace "devices" with "articles" three times.

P907 At the beginning, add a new box with the following sentence:

"This instruction applies to UN 3363."

P908 In paragraphs (2) and (4), replace "non-conductive" with "electrically non-conductive".

P909 In paragraphs (1)(c) and (2)(b), in the fourth indent of additional requirement 2 and in additional requirement 3, replace "non-conductive" with "electrically non-conductive".

P910 In the introductory sentence, replace "cells and batteries" with "cells or batteries" twice.

In paragraphs (1)(c), (1)(d), (2)(c), and fourth indent of the additional requirements, replace "non-conductive" with "electrically non-conductive".

Insert the following new packing instructions:

P006	**PACKING INSTRUCTION**	**P006**

This instruction applies to UN Nos. 3537, 3538, 3540, 3541, 3546, 3547 and 3548.

(1) The following packagings are authorized, provided that the general provisions of **4.1.1** and **4.1.3** are met:
drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);
boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); and
jerricans (3A2, 3B2, 3H2).
Packagings shall conform to the packing group II performance level.

(2) In addition, for robust articles the following packagings are authorized:
Strong outer packagings constructed of suitable material and of adequate strength and design in relation to the packaging capacity and its intended use. The packagings shall meet the provisions of 4.1.1.1, 4.1.1.2, 4.1.1.8 and 4.1.3 in order to achieve a level of protection that is at least equivalent to that provided by chapter 6.1. Articles may be transported unpackaged or on pallets when the dangerous goods are afforded equivalent protection by the article in which they are contained.

(3) Additionally, the following conditions shall be met:
(a) receptacles within articles containing liquids or solids shall be constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging;
(b) receptacles containing liquids with closures shall be packed with their closures correctly oriented. The receptacles shall in addition conform to the internal pressure test provisions of 6.1.5.5;
(c) receptacles that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastic materials, shall be properly secured. Any leakage of the contents shall not substantially impair the protective properties of the article or of the outer packaging;
(d) receptacles within articles containing gases shall meet the requirements of section 4.1.6 and chapter 6.2 as appropriate or be capable of providing an equivalent level of protection to packing instructions P200 or P208; and
(e) where there is no receptacle within the article, the article shall fully enclose the dangerous substances and prevent their release under normal conditions of transport.

(4) Articles shall be packed to prevent movement and inadvertent operation during normal conditions of transport.

P911	**PACKING INSTRUCTION**	**P911**

This instruction applies to damaged or defective cells and batteries of UN Nos. 3090, 3091, 3480 and 3481 liable to rapidly disassemble, dangerously react, produce a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours under normal conditions of transport.

The following packagings are authorized, provided that the general provisions of **4.1.1** and **4.1.3** are met:

For cells and batteries and equipment containing cells and batteries:

drums (1A2, 1B2, 1N2, 1H2, 1D, 1G);

boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); and

jerricans (3A2, 3B2, 3H2).

The packagings shall conform to the packing group I performance level.

P911	PACKING INSTRUCTION	P911

(1) The packaging shall be capable of meeting the following additional performance requirements in case of rapid disassembly, dangerous reaction, production of a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours of the cells or batteries:

(a) the outside surface temperature of the completed package shall not have a temperature of more than 100°C. A momentary spike in temperature up to 200°C is acceptable;

(b) no flame shall occur outside the package;

(c) no projectiles shall exit the package;

(d) the structural integrity of the package shall be maintained; and

(e) the packagings shall have a gas management system (e.g. filter system, air circulation, containment for gas, gas tight packaging, etc.), as appropriate.

(2) The additional packaging performance requirements shall be verified by a test as specified by the competent authority.[a]

A verification report shall be available on request. As a minimum requirement, the cell or battery name, the cell or battery number, the mass, type, energy content of the cells or batteries, the packaging identification and the test data according to the verification method as specified by the competent authority shall be listed in the verification report.

(3) When dry ice or liquid nitrogen is used as a coolant, the requirements of section 5.5.3 shall apply. The inner packaging and outer packaging shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.

Additional requirement:

Cells or batteries shall be protected against short circuit.

[a] *The following criteria, as relevant, may be considered to assess the performance of the packaging:*

(a) the assessment shall be done under a quality management system (as described, e.g. in section 2.9.4.5) allowing for the traceability of tests results, reference data and characterization models used;

(b) the list of hazards expected in case of thermal runaway for the cell or battery type, in the condition it is transported (e.g. usage of an inner packaging, state of charge (SOC), use of sufficient non-combustible, electrically non-conductive and absorbent cushioning material, etc.), shall be clearly identified and quantified; the reference list of possible hazards for lithium cells or batteries (rapidly disassemble, dangerously react, produce a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours) can be used for this purpose. The quantification of these hazards shall rely on available scientific literature;

(c) the mitigating effects of the packaging shall be identified and characterized, based on the nature of the protections provided and the construction material properties. A list of technical characteristics and drawings shall be used to support this assessment (Density [$kg \cdot m^{-3}$], specific heat capacity [$J \cdot kg^{-1} \cdot K^{-1}$], heating value [$kJ \cdot kg^{-1}$], thermal conductivity [$W \cdot m^{-1} \cdot K^{-1}$], melting temperature and flammability temperature [K], heat transfer coefficient of the outer packaging [$W \cdot m^{-2} \cdot K^{-1}$], …);

(d) the test and any supporting calculations shall assess the result of a thermal runaway of the cell or battery inside the packaging in the normal conditions of transport;

(e) in case the SOC of the cell or battery is not known, the assessment used shall be done with the highest possible SOC corresponding to the cell or battery use conditions;

P911	PACKING INSTRUCTION	P911

(f) the surrounding conditions in which the packaging may be used and transported shall be described (including for possible consequences of gas or smoke emissions on the environment, such as ventilation or other methods) according to the gas management system of the packaging;

(g) the tests or the model calculation shall consider the worst case scenario for the thermal runaway triggering and propagation inside the cell or battery: this scenario includes the worst possible failure in the normal transport condition, the maximum heat and flame emissions for the possible propagation of the reaction; and

(h) these scenarios shall be assessed over a period long enough to allow all the possible consequences to occur (e.g. 24 hours).

4.1.4.2 Packing instructions concerning the use of IBCs

IBC 08 In the special packing provisions of B21, add a new substance of UN 3535 in the first sentence, to read "For substances, UN Nos. 1374, 2590 and 3535 in IBCs other than…"

IBC520 In the third line, after "4.1.7.2 are met.", insert a new sentence to read as follows:

"The formulations listed below may also be transported packed in accordance with packing method OP8 of packing instruction P520 of 4.1.4.1, with the same control and emergency temperatures, if applicable."

For UN 3109, in the entry "tert-Butyl hydroperoxide, not more than 72% with water", add a new line under the column "Type of IBC" and "quantity" to read:

"31HA1""1000"

Add the following new entries to packing instruction IBC520:

UN No.	*Organic peroxide*	*Type of IBC*	*Maximum quantity (litres)*	*Control temperature*	*Emergency Temperature*
3109	2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane, not more than 52% in diluent type A	31HA1	1000		
3109	3,6,9-Triethyl-3,6,9-trimethyl-1,4,7-triperoxonane, not more than 27% in diluent type A	31HA1	1000		
3119	tert-Amyl peroxy-2-ethylhexanoate, not more than 62% in diluent type A	31HA1	1000	+15°C	+20°C

4.1.4.3 Packing instructions concerning the use of large packagings

LP902 Under "Packaged articles", replace "Packagings conforming to the packing group III performance level." with:

"Rigid large packagings conforming to the packing group III performance level, made of:

steel (50A);
aluminium (50B);
metal other than steel or aluminium (50N);
rigid plastics (50H);
natural wood (50C);
plywood (50D);
reconstituted wood (50F); and
rigid fibreboard (50G)."

In the paragraph under "Unpackaged articles:", amend the end of the sentence to read "when moved to, from or between where they are manufactured and an assembly plant including intermediate handling locations.".

LP903 Replace the second sentence with the following:

"The following large packagings are authorized for a single battery and for a single item of equipment containing cells or batteries, provided that the general provisions of 4.1.1 and 4.1.3 are met:"

LP904 Replace the first sentence with the following:

"This instruction applies to single damaged or defective batteries and to single items of equipment containing damaged or defective cells or batteries of UN Nos. 3090, 3091, 3480 and 3481."

Replace the second sentence with the following:

"The following large packagings are authorized for a single damaged or defective battery and for a single item of equipment containing damaged or defective cells or batteries, provided the general provisions of 4.1.1 and 4.1.3 are met."

In the third sentence, replace "containing batteries" with "containing cells and batteries". Before "steel (50A)", insert the following new line: "Rigid large packagings conforming to the packing group II performance level, made of:". After "plywood (50D)", delete "Packagings shall conform to the packing group II performance level."

Amend the beginning of the first sentence of paragraph .1 to read as follows:

"The damaged or defective battery or equipment containing such cells or batteries shall be ...".

In .2, amend the beginning of the sentence to read "The inner packaging". Replace "non-conductive" with "electrically non-conductive".

In .4, after "movement of the battery" add "or the equipment". Replace "non-conductive" with "electrically non-conductive". In the last sentence, after "For leaking batteries", add "and cells,"

In the additional requirement, after "Batteries", add "and cells".

Insert the following new packing instructions:

LP03	**PACKING INSTRUCTION**	**LP03**
This instruction applies to UN Nos. 3537, 3538, 3540, 3541, 3546, 3547 and 3548.		
(1) The following large packagings are authorized, provided that the general provisions of **4.1.1** and **4.1.3** are met: Rigid large packagings conforming to the packing group II performance level, made of: steel (50A); aluminium (50B); metal other than steel or aluminium (50N); rigid plastics (50H); natural wood (50C); plywood (50D); reconstituted wood (50F); and rigid fibreboard (50G).		
(2) Additionally, the following conditions shall be met: (a) receptacles within articles containing liquids or solids shall be constructed of suitable materials and secured in the article in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the article itself or the outer packaging; (b) receptacles containing liquids with closures shall be packed with their closures correctly oriented. The receptacles shall in addition conform to the internal pressure test provisions of 6.1.5.5; (c) receptacles that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastics materials shall be properly secured. Any leakage of the contents shall not substantially impair the protective properties of the article or of the outer packaging; (d) receptacles within articles containing gases shall meet the requirements of section 4.1.6 and chapter 6.2 as appropriate or be capable of providing an equivalent level of protection as packing instructions P200 or P208; and (e) where there is no receptacle within the article, the article shall fully enclose the dangerous substances and prevent their release under normal conditions of transport.		
(3) Articles shall be packed to prevent movement and inadvertent operation during normal conditions of transport.		

LP905	**PACKING INSTRUCTION**	**LP905**
This instruction applies to UN Nos. 3090, 3091, 3480 and 3481 production runs consisting of not more than 100 cells and batteries and to pre-production prototypes of cells and batteries when these prototypes are transported for testing.		
The following large packagings are authorized for a single battery and for a single item of equipment containing cells or batteries, provided that the general provisions of **4.1.1** and **4.1.3** are met:		
(1) For a single battery: rigid large packagings conforming to the packing group II performance level, made of: steel (50A); aluminium (50B);		

metal other than steel or aluminium (50N);
rigid plastics (50H);
natural wood (50C);
plywood (50D);
reconstituted wood (50F); and
rigid fibreboard (50G).

Large packagings shall also meet the following requirements:

(a) a battery of different size, shape or mass may be packed in an outer packaging of a tested design type listed above provided the total gross mass of the package does not exceed the gross mass for which the design type has been tested;

(b) the battery shall be packed in an inner packaging and placed inside the outer packaging;

(c) the inner packaging shall be completely surrounded by sufficient non-combustible and electrically non-conductive thermal insulation material to protect against a dangerous evolution of heat;

(d) appropriate measures shall be taken to minimize the effects of vibration and shocks and prevent movement of the battery within the package that may lead to damage and a dangerous condition during transport. When cushioning material is used to meet this requirement it shall be non-combustible and electrically non-conductive; and

(e) non-combustibility shall be assessed according to a standard recognized in the country where the large packaging is designed or manufactured.

(2) For a single item of equipment:

rigid large packagings conforming to the packing group II performance level, made of:
steel (50A);
aluminium (50B);
metal other than steel or aluminium (50N);
rigid plastics (50H);
natural wood (50C);
plywood (50D);
reconstituted wood (50F); and
rigid fibreboard (50G).

Large packagings shall also meet the following requirements:

(a) a single item of equipment of different size, shape or mass may be packed in an outer packaging of a tested design type listed above provided the total gross mass of the package does not exceed the gross mass for which the design type has been tested;

(b) the equipment shall be constructed or packed in such a manner as to prevent accidental operation during transport;

(c) appropriate measures shall be taken to minimize the effects of vibration and shocks and prevent movement of the equipment within the package that may lead to damage and a dangerous condition during transport. When cushioning material is used to meet this requirement, it shall be non-combustible and electrically non-conductive; and

(d) non-combustibility shall be assessed according to a standard recognized in the country where the large packaging is designed or manufactured.

Additional requirement:

Cells and batteries shall be protected against short circuit.

LP906	PACKING INSTRUCTION	LP906

This instruction applies to damaged or defective batteries of UN Nos. 3090, 3091, 3480 and 3481 liable to rapidly disassemble, dangerously react, produce a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours under normal conditions of transport.

The following large packagings are authorized, provided that the general provisions of **4.1.1** and **4.1.3** are met:

For a single battery and for a single item of equipment containing cells or batteries:
Rigid large packagings conforming to the packing group I performance level, made of:

steel (50A);
aluminium (50B);
metal other than steel or aluminium (50N);
rigid plastics (50H);
plywood (50D); and
rigid fibreboard (50G).

(1) The large packaging shall be capable of meeting the following additional performance requirements in case of rapid disassembly, dangerous reaction, production of a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours of the battery:

(a) the outside surface temperature of the completed package shall not have a temperature of more than 100 °C. A momentary spike in temperature up to 200°C is acceptable;

(b) no flame shall occur outside the package;

(c) no projectiles shall exit the package;

(d) the structural integrity of the package shall be maintained; and

(e) the large packagings shall have a gas management system (e.g. filter system, air circulation, containment for gas, gas tight packaging etc.), as appropriate.

(2) The additional large packaging performance requirements shall be verified by a test as specified by the competent authority.[a]

A verification report shall be available on request. As a minimum requirement, the battery name, the battery number, the mass, type, energy content of the batteries, the large packaging identification and the test data according to the verification method as specified by the competent authority shall be listed in the verification report.

(3) When dry ice or liquid nitrogen is used as a coolant, the requirements of section 5.5.3 shall apply. The inner packaging and outer packaging shall maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.

Additional requirement:

Batteries shall be protected against short circuit.

[a] *The following criteria, as relevant, may be considered to assess the performance of the large packaging*:

(a) the assessment shall be done under a quality management system (as described e.g. in section 2.9.4.5) allowing for the traceability of tests results, reference data and characterization models used;

(b) the list of hazards expected in case of thermal runaway for the battery type, in the condition it is transported (e.g. usage of an inner packaging, state of charge (SOC), use of sufficient non-combustible, electrically non-conductive and absorbent cushioning material etc.), shall be clearly identified and quantified; the reference list of possible hazards for lithium batteries

LP906	PACKING INSTRUCTION	LP906

(rapidly disassemble, dangerously react, produce a flame or a dangerous evolution of heat or a dangerous emission of toxic, corrosive or flammable gases or vapours) can be used for this purpose. The quantification of these hazards shall rely on available scientific literature;

(c) the mitigating effects of the large packaging shall be identified and characterized, based on the nature of the protections provided and the construction material properties. A list of technical characteristics and drawings shall be used to support this assessment (Density [kg·m³], specific heat capacity [$J \cdot kg^{-1} \cdot K^{-1}$], heating value [$kJ \cdot kg^{-1}$], thermal conductivity [$W \cdot m^{1} \cdot K^{1}$], melting temperature and flammability temperature [K], heat transfer coefficient of the outer packaging [$W \cdot m^{-2} \cdot K^{-1}$], …);

(d) the test and any supporting calculations shall assess the result of a thermal run-away of the battery inside the large packaging in the normal conditions of transport;

(e) in case the SOC of the battery is not known, the assessment used shall be done with the highest possible SOC corresponding to the battery use conditions;

(f) the surrounding conditions in which the large packaging may be used and transported shall be described (including for possible consequences of gas or smoke emissions on the environment, such as ventilation or other methods) according to the gas management system of the large packaging;

(g) the tests or the model calculation shall consider the worst case scenario for the thermal runaway triggering and propagation inside the battery: this scenario includes the worst possible failure in the normal transport condition, the maximum heat and flame emissions for the possible propagation of the reaction; and

(h) these scenarios shall be assessed over a period long enough to allow all the possible consequences to occur (e.g. 24 hours).

4.1.6 Special packing provisions for goods of class 2

4.1.6.1.4 In the third sentence, replace "risk" with "hazard".

4.1.9 Special packing provisions for radioactive material

4.1.9.1 General

4.1.9.1.5 Replace "risk" with "hazard" twice.

Chapter 4.2
Use of portable tanks and multiple-element gas containers (MEGCs)

4.2.0 Transitional provisions

4.2.0.1 In the note, after the definition for IMO type 8 tank, insert IMO type 9 tank definition as follows:

> "IMO type 9 tank means a road gas elements vehicle for the transport of compressed gases of class 2 with elements linked to each other by a manifold, permanently attached to a chassis, which is fitted with items of service equipment and structural equipment necessary for the transport of gases. Elements are cylinders, tubes and bundles of cylinders, intended for the transport of gases as defined in 2.2.1.1."

4.2.1 General provisions for the use of portable tanks for the transport of substances of class 1 and classes 3 to 9

4.2.1.19 Additional provisions applicable to the transport of solid substances transported above their melting point

4.2.1.19.1 Replace "risk" with "hazard".

4.2.5.2 Portable tank instructions

T23 In the first box, at the end, add a new sentence to read as follows:

"The formulations listed below may also be transported packed in accordance with packing method OP8 of packing instruction P520 of 4.1.4.1, with the same control and emergency temperatures, if applicable."

In footnote [§], replace risk" with "hazard".

4.2.5.3 Portable tank special provisions

TP10 Add the following new sentence at the end:

"A portable tank may be offered for transport after the date of expiry of the last lining inspection for a period not to exceed three months beyond the date of expiry of the last testing, after emptying but before cleaning, for purposes of performing the next required test or inspection prior to refilling."

4.2.6 Amend title of 4.2.6 to read "Additional provisions for the use of road tank vehicles and road gas elements vehicles"

4.2.6.1 Replace paragraph 4.2.6.1 with the following:

"4.2.6.1 The tank of a road tank vehicle or the elements of a road gas elements vehicle shall be attached to the vehicle during normal operations of filling, discharge and transport. IMO type 4 tanks shall be attached to the chassis when transported on board ships. Road tank vehicles and road gas elements vehicles shall not be filled or discharged while they remain on board. A road tank vehicle or road gas elements vehicle shall be driven on board on its own wheels and be fitted with permanent tie-down attachments for securing on board the ship."

4.2.6.2 Replace the words "Road tank vehicles shall comply" with "Road tank vehicles and road gas elements vehicles shall comply" and add the following new paragraph:

"4.2.6.3 Substances permitted to be transported in IMO type 9 tanks are assigned special provision 974."

PART 5
CONSIGNMENT PROCEDURES

Chapter 5.1
General provisions

5.1.1 Application and general provisions

At the end, add the following note:

"**Note:** In accordance with the GHS, a GHS pictogram not required by this Code should only appear in transport as part of a complete GHS label and not independently (see GHS 1.4.10.4.4)."

5.1.4 Mixed packing

Replace "risk" with "hazard" twice.

5.1.5 General provisions for class 7

5.1.5.4.2 Replace the existing paragraph with the following:

"5.1.5.4.2 The documentation requirements of 5.4.1 and 5.4.5 do not apply to excepted packages of radioactive material of class 7, except that:

.1 the UN number preceded by the letters "UN" and the name and address of the consignor and the consignee and, if relevant, the identification mark for each competent authority certificate of approval (see 5.4.1.5.7.1.7.) shall be shown on a special transport document such as a bill of lading, air waybill or other similar document complying with the requirements of 5.4.1.2.1 to 5.4.1.2.4; and

.2 the requirements of 5.4.1.6.2 and, if relevant, those of 5.4.1.5.7.1.7, 5.4.1.5.7.3 and 5.4.1.5.7.4 shall apply."

Chapter 5.2
Marking and labelling of packages including IBCs

5.2.1 Marking of packages including IBCs

5.2.1.3 After "Salvage packagings", add "including large salvage packagings".

5.2.1.7.1 Replace the first four lines with the following:

"Except as provided in 5.2.1.7.2:

- combination packagings having inner packagings containing liquid dangerous goods;

- single packagings fitted with vents;

- cryogenic receptacles intended for the transport of refrigerated liquefied gases; and

- machinery or apparatus containing liquid dangerous goods when it is required to ensure the liquid dangerous goods remain in their intended orientation (see special provision 301 of chapter 3.3),"

5.2.2 Labelling of packages including IBCs

5.2.2.1.1 Replace "risks" with "hazards" and "risk" with "hazard".

5.2.2.1.2 Replace "risk" with "hazard" 6 times.

5.2.2.1.2.1 Delete the entry of "Batteries, wet, non-spillable 2800 8 Class 8‡" and the corresponding footnote.

5.2.2.1.3 Replace "risk" with "hazard" 3 times.

5.2.2.1.3.1 Replace "risk" with "hazard" twice.

5.2.2.1.4 Replace "risk(s)" with "hazard(s)" 2 times and "risk" with "hazard" twice.

5.2.2.1.5 Replace "risks" with "hazards".

5.2.2.1.6.3 Replace "risk" with "hazard".

5.2.2.1.9 Replace "risk" with "hazard".

5.2.2.1.10 Replace "risk" with "hazard" four times.

5.2.2.1.11 Replace "risk" with "hazard".

5.2.2.1.13 Add a new subsection 5.2.2.1.13 as follows:

"5.2.2.1.13 Labels for articles containing dangerous goods transported as UN Nos. 3537, 3538, 3539, 3540, 3541, 3542, 3543, 3544, 3545, 3546, 3547 and 3548

.1 Packages containing articles or articles transported unpackaged shall bear labels according to 5.2.2.1.2 reflecting the hazards established according to 2.0.6. If the article contains one or more lithium battery with, for lithium metal batteries, an aggregate lithium content of 2 g or less, and for lithium ion batteries, a Watt-hour rating of 100Wh or less, the lithium battery mark (5.2.1.10.2) shall be affixed to the package or unpackaged article. If the article contains one or more lithium batteries with, for lithium metal batteries, an aggregate lithium content of more than 2 g and for lithium ion batteries, a Watt-hour rating of more than 100Wh, the lithium battery label (5.2.2.2.2 No. 9A) shall be affixed to the package or unpackaged article.

.2 When it is required to ensure articles containing liquid dangerous goods remain in their intended orientation, orientation marks meeting 5.2.1.7.1 shall be affixed and visible on at least two opposite vertical sides of the package or of the unpackaged article where possible, with the arrows pointing in the correct upright direction."

5.2.2.2 Provisions for labels

5.2.2.2.1.1.2 Replace the first three sentences with the following:

> "The label shall be in the form of a square set at an angle of 45 degrees (diamond-shaped). The minimum dimensions shall be 100 mm x 100 mm. There shall be a line inside the edge forming the diamond which shall be parallel and approximately 5 mm from the outside of that line to the edge of the label."

5.2.2.2.1.1.3 In the first sentence, after "the dimensions may be reduced," add "proportionally". Delete the second and third sentences ("The line inside the edge shall remain 5 mm to the edge of the label. The minimum width of the line inside the edge shall remain 2 mm.").

5.2.2.2.1.2 In the first sentence, insert "*Gas cylinders – Precautionary labels*" after "ISO 7225:2005" and delete it in the second sentence.

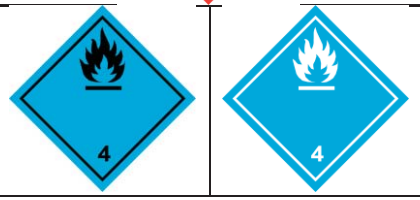
5.2.2.2.1.5 Replace "risk" with "hazard".

5.2.2.2.2 Replace existing 5.2.2.2.2 with the following:

> "5.2.2.2.2 Specimen labels
>
> **Note**: Labels shall satisfy the provisions below and conform, in terms of colour, symbols and general format, to the models shown in 5.2.2.2.2. Corresponding models required for other modes of transport, with minor variations which do not affect the obvious meaning of the label, are also acceptable.

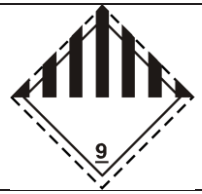
Label model No.	Class, Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 1: Explosive substances or articles						
1	Divisions 1.1, 1.2, 1.3	Exploding bomb: black	Orange	1 (black)		** Place for division – to be left blank if explosive is the subsidiary hazard * Place for compatibility group – to be left blank if explosive is the subsidiary hazard
1.4	Division 1.4	1.4: black Numerals shall be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group
1.5	Division 1.5	1.5: black Numerals shall be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group
1.6	Division 1.6	1.6: black Numerals shall be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm × 100 mm)	Orange	1 (black)		* Place for compatibility group

Label model No.	Class, Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 2: Gases						
2.1	Class 2.1: Flammable gases (except as provided for in 5.2.2.2.1.6.4)	Flame: black or white	Red	2 (black or white)		-
2.2	Class 2.2: Non-flammable, non-toxic gases	Gas cylinder: black or white	Green	2 (black or white)		-
2.3	Class 2.3: Toxic gases	Skull and crossbones: black	White	2 (black)		-

Label model No.	Class, Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 3: Flammable liquids						
3	-	Flame: black or white	Red	3 (black or white)		-
Class 4: Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases						
4.1	Class 4.1: Flammable solids, self-reactive substances, solid desensitized explosives and polymerizing substances	Flame: black	White with 7 vertical red stripes	4 (black)		-
4.2	Class 4.2: Substances liable to spontaneous combustion	Flame: black	Upper half white, lower half red	4 (black)		-
4.3	Class 4.3: Substances which, in contact with water emit flammable gases	Flame: black or white	Blue	4 (black or white)		-

Label model No.	Class, Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 5: Oxidizing substances and organic peroxides						
5.1	Class 5.1: Oxidizing substances	Flame over circle: black	Yellow	5.1 (black)		-
5.2	Class 5.2: Organic peroxides	Flame: black or white	Upper half red, lower half yellow	5.2 (black)		-
Class 6: Toxic substances and infectious substances						
6.1	Class 6.1: Toxic substances	Skull and crossbones: black	White	6 (black)		-
6.2	Class 6.2: Infectious substances	Three crescents superimposed on a circle: black	White	6 (black)		The lower half of the label may bear the inscriptions: "INFECTIOUS SUBSTANCE" and "In the case of damage or leakage immediately notify Public Health Authority" in black colour

Label model No.	Class, Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 7: Radioactive material						
7A	Category I	Trefoil: black	White	7 (black)		Text (mandatory), black in lower half of label: "RADIOACTIVE" "CONTENTS ..." "ACTIVITY ..." One red vertical bar shall follow the word: "RADIOACTIVE"
7B	Category II	Trefoil: black	Upper half yellow with white border, lower half white	7 (black)		Text (mandatory), black in lower half of label: "RADIOACTIVE" "CONTENTS ..." "ACTIVITY ..." In a black outlined box: "TRANSPORT INDEX"; Two red vertical bars shall follow the word: "RADIOACTIVE"
7C	Category III	Trefoil: black	Upper half yellow with white border, lower half white	7 (black)		Text (mandatory), black in lower half of label: "RADIOACTIVE" "CONTENTS ..." "ACTIVITY ..." In a black outlined box: "TRANSPORT INDEX". Three red vertical bars shall follow the word: "RADIOACTIVE"
7E	Fissile material	-	White	7 (black)		Text (mandatory): black in upper half of label: "FISSILE"; In a black outlined box in the lower half of label: "CRITICALITY SAFETY INDEX"

Label model No.	Class, Division or Category	Symbol and symbol colour	Background	Figure in bottom corner (and figure colour)	Specimen labels	Note
Class 8: Corrosive substances						
8	-	Liquids, spilling from two glass vessels and attacking a hand and a metal: black	Upper half white, lower half black with white border	8 (white)		-
Class 9: Miscellaneous dangerous substances and articles, including environmentally hazardous substances						
9	-	7 vertical stripes in upper half: black	White	9 underlined (black)		-
9A	-	7 vertical stripes in upper half: black; battery group, one broken and emitting flame in lower half: black	White	9 underlined (black)		-

"

Chapter 5.3
Placarding and marking of cargo transport units

Amend the title of chapter 5.3 to read "Placarding and marking of cargo transport units and bulk containers".

5.3.1 Placarding

5.3.1.1.1 Replace sub-paragraphs .1 to .3 with the following:

".1 Enlarged labels (placards) and marks and signs shall be affixed to the exterior surfaces of a cargo transport unit or bulk container to provide a warning that the contents of the unit or bulk container are dangerous goods and present hazards, unless the labels and/or marks affixed to the packages are clearly visible from the exterior of the cargo transport unit or bulk container.

.2 The methods of placarding and marking as required in 5.3.1.1.4 and 5.3.2 on cargo transport units and bulk containers shall be such that this information will still be identifiable on cargo transport units and bulk containers surviving at least three months' immersion in the sea. In considering suitable marking methods, account shall be taken of the ease with which the surface of the cargo transport unit or bulk container can be marked.

.3 All placards, orange panels, marks and signs shall be removed from cargo transport units and bulk containers or masked as soon as both the dangerous goods or their residues which led to the application of those placards, orange panels, marks or signs are discharged."

5.3.1.1.2 In the first sentence, replace "risks" with "hazards" and after "transport units" add "and bulk containers". In the second sentence, replace "risk" with "hazard" and after "transport unit" add "and bulk container". In sub-paragraph .2, replace "risk" with "hazard".

5.3.1.1.3 In the first sentence, replace "risks" with "hazards" and "risk" with "hazard". In the second sentence, replace "risk" with "hazard" twice, and after "transport units" add "and bulk containers".

5.3.1.1.4.1 Replace paragraph 5.3.1.1.4.1 with the following:

"5.3.1.1.4.1 A cargo transport unit or bulk container containing dangerous goods or residues of dangerous goods shall clearly display placards as follows:

.1 *a freight container, semi-trailer, a closed or sheeted bulk container or portable tank*: one on each side and one on each end of the unit. Portable tanks having a capacity of not more than 3,000 L may be placarded or, alternatively, may be labelled instead, on only two opposite sides;

.2 *a railway wagon*: at least on each side;

.3 *a multiple-compartment tank containing more than one dangerous substance or their residues*: along each side at the positions of the relevant compartments. If all compartments are required to display the same placards, these placards need to be displayed only once along each side of the cargo transport unit;

.4 *a flexible bulk container*: in at least two opposing positions; and

.5 *any other cargo transport unit*: at least on both sides and on the back of the unit."

5.3.1.2.1 At the end, delete the note.

5.3.2 Marking of cargo transport units

Amend the title of chapter 5.3.2 to read "Marking".

5.3.2.3.1 After "transport units", add "or bulk containers".

5.3.2.3.2 After "cargo transport units", add "and bulk containers".

Chapter 5.4
Documentation

5.4.1 Dangerous goods transport information

5.4.1.4 Information required on the dangerous goods transport document

5.4.1.4.1.4 Replace "risk" with "hazard".

5.4.1.5 Information required in addition to the dangerous goods description

5.4.1.5.3 In the heading and the following sentence, after "salvage packagings", add "including large salvage packagings".

5.4.1.5.5 Replace the paragraph as follows:

"For self-reactive substances, organic peroxides and polymerizing substances which require temperature control during transport, the control and emergency temperatures (see 7.3.7.2) shall be indicated on the dangerous goods transport document, as follows:

"Control temperature: … °C Emergency temperature: … °C". "

5.4.1.5.5.1 Replace "risk" with "hazard".

5.4.1.5.9 Explosives

5.4.1.5.9.1 Replace "distinguishing sign for motor vehicles in international traffic" with "distinguishing sign used on vehicles in international road traffic*", and add the corresponding footnote * to read as follows:

"* 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.",

5.4.1.5.9.2 Replace "distinguishing sign for motor vehicles in international traffic" with "distinguishing sign used on vehicles in international road traffic*", and add the corresponding footnote * to read as follows:

"* 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.",

5.4.1.5.9.3 Replace "distinguishing sign for motor vehicles in international traffic" with "distinguishing sign used on vehicles in international road traffic*", and add the corresponding footnote * to read as follows:

"* 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.",

5.4.1.5.15 In the second paragraph, replace "the distinguishing sign for motor vehicles in international traffic" with "the distinguishing sign used on vehicles in international road traffic*", with footnote * reading as follows:

"* 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.",

and renumber subsequent footnotes accordingly.

5.4.3 Documentation required aboard the ship

Replace the provisions of 5.4.3 with the following:

"5.4.3 Documentation required aboard the ship

5.4.3.1 Each ship carrying dangerous goods and marine pollutants shall have a special list, manifest[5] or stowage plan setting out, in accordance with regulation VII/ 4.2 of SOLAS, as amended, and with regulation 4.2 of Annex III of MARPOL, the dangerous goods (except dangerous goods in excepted packages of class 7) and marine pollutants and the location thereof. This special list or manifest shall be based on the documentation and certification required in this Code. It shall contain in addition to the information in 5.4.1.4, 5.4.1.5 and, for UN 3359, in 5.5.2.4.1.1, the stowage location and the total quantity of dangerous goods and marine pollutants. A detailed stowage plan, which identifies by class and sets out the location of all dangerous goods and marine pollutants, may be used in place of such special list or manifest.

5.4.3.2 Each ship carrying excepted packages of class 7 shall have a special list, manifest or stowage plan setting out these excepted packages and the location thereof. This special list or manifest shall be based upon the documents listed in 5.1.5.4.2.1.

5.4.3.3 A copy of the documents according to 5.4.3.1 and, if applicable, 5.4.3.2 shall be made available before departure to the person or organization designated by the port State authority.",

and add the corresponding footnote as follows:

"[5] Refer to Amendments to the Annex to the Convention on Facilitation of International Maritime Traffic, 1965 (resolution FAL.10(35), adopted on 16 January 2009)."

The existing 5.4.3.2 is renumbered to 5.4.3.4 and the existing 5.4.3.2.1 is renumbered to 5.4.3.4.1.

5.4.3.2.1.3 Add the word "*Revised*" before the words *"Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS Guide)".*

5.4.5 Multimodal Dangerous Goods Form

5.4.5.1 Replace the existing text under 5.4.5.1 as follows:

> "5.4.5.1 This form meets the requirements of SOLAS, chapter VII, regulation 4, MARPOL, Annex III, regulation 4 and the provisions of this chapter. The information required by the provisions of this chapter is mandatory; however, the layout of this form is not mandatory.
>
> This form may be used as a combined dangerous goods transport document and container packing certificate for multimodal carriage of dangerous goods.",

and delete the existing text under the title of "MULTIMODAL DANGEROUS GOODS FORM".

In the section for "Documentary Aspects of the International Transport of Dangerous Goods Container/Vehicle Packing Certificate", replace the existing sentence:

> "If the consignments include goods of class 1, other than division 1.4, the container is structurally serviceable."

with the following:

> "If the consignments include goods of class 1, other than division 1.4, the container/vehicle is structurally serviceable.";

replace the existing sentence:

> "When solid carbon dioxide (CO2 – dry ice) is used for cooling purposes, the vehicle or freight container is externally marked in accordance with 5.5.3.6."

with the following:

> "When substances presenting a risk of asphyxiation are used for cooling or conditioning purposes (such as dry ice (UN 1845) or nitrogen, refrigerated liquid (UN 1977) or argon, refrigerated liquid (UN 1951)), the container/vehicle is externally marked in accordance with 5.5.3.6"; and

replace the existing sentence:

> "When this Dangerous Goods Form is used as a container/vehicle packing certificate only, not a combined document, a dangerous goods Declaration signed by the shipper or supplier must have been issued/received to cover each dangerous goods consignment packed in the container.",

with the following:

> "When this Dangerous Goods Form is used as a container/vehicle packing certificate only, not a combined document, a dangerous goods Declaration signed by the shipper or supplier must have been issued/received to cover each dangerous goods consignment packed in the container/vehicle.".

In the note, replace "The container" with "The container/vehicle".

Chapter 5.5
Special provisions

5.5.2 Special provisions applicable to fumigated cargo transport units (UN 3359)

Add a footnote "*" at the end of the heading, as follows:

> * *Refer to the Revised Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo transport units (MSC.1/Circ.1361)*

5.5.2.5 Additional provisions

Delete the paragraph 5.5.2.5.1 and renumber the remaining paragraphs accordingly.

PART 6
CONSTRUCTION AND TESTING OF PACKAGINGS, INTERMEDIATE BULK CONTAINERS (IBCs), LARGE PACKAGINGS, PORTABLE TANKS, MULTIPLE-ELEMENT GAS CONTAINERS (MEGCs) AND ROAD TANK VEHICLES

Chapter 6.1
Provisions for the construction and testing of packagings (other than for class 6.2 substances)

In the heading of the chapter, delete "(other than for class 6.2 substances)".

6.1.1 Applicability and general provisions

6.1.1.1 Applicability

6.1.1.1.2 (i) Replace "(subsidiary risks)" with "(subsidiary hazards)" and add a new sub-paragraph .5 to read as follows:

> ".5 Packagings for class 6.2 infectious substances of Category A."

6.1.3 Marking

6.1.3.1 (f) Replace the words "indicated by the distinguishing sign for motor vehicles in international traffic" with "indicated by the distinguishing sign used on vehicles in international road traffic*".

6.1.3.8 (h) Replace the words "indicated by the distinguishing sign for motor vehicles in international traffic" with "indicated by the distinguishing sign used on vehicles in international road traffic*", and add the corresponding footnote * to read as follows:

"* 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."

6.1.5.7 Test report

6.1.5.7.1 Under sub-paragraph .8, add the following sentence at the end:

"For plastics packagings subject to the internal pressure test in 6.1.5.5, the temperature of the water used."

Chapter 6.2
Provisions for the construction and testing of pressure receptacles, aerosol dispensers, small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas

6.2.1 General provisions

6.2.1.6 Periodic inspection and test

6.2.1.6.1.4 Replace the existing note 2 with the following:

"**Note 2:** For seamless steel cylinders and tubes the check of 6.2.1.6.1.2 and hydraulic pressure test of 6.2.1.6.1.4 may be replaced by a procedure conforming to ISO 16148:2016 *Gas cylinders – Refillable seamless steel gas cylinders and tubes – Acoustic emission examination (AT) and follow-up ultrasonic examination (UT) for periodic inspection and testing*"

In note 3, replace the words "The hydraulic pressure test may be replaced" with "The check of 6.2.1.6.1.2 and the hydraulic pressure test of 6.2.1.6.1.4 may be replaced".

6.2.2 Provisions for UN pressure receptacles

6.2.2.1 Design, construction and initial inspection and test

6.2.2.1.1 In the table, for "ISO 11118:1999", in the column "Applicable for manufacture", replace "Until further notice" with "Until 31 December 2020".

In the table, after "ISO 11118:1999", insert a new line to read as follows:

ISO 11118:2015	Gas cylinders – Non-refillable metallic gas cylinders – Specification and test methods	Until further notice

6.2.2.1.2 In the table, for "ISO 11120:1999", in the column "Applicable for manufacture", replace "Until further notice" with "Until 31 December 2022".

In the table, after "ISO 11120:1999", insert a new line to read as follows:

ISO 11120:2015	Gas cylinders – Refillable seamless steel tubes of water capacity between 150 l and 3 000 l – Design, construction and testing	Until further notice

Insert a new paragraph 6.2.2.1.8 to read as follows:

"6.2.2.1.8 The following standards apply for the design, construction and initial inspection and test of UN pressure drums, except that inspection requirements related to the conformity assessment system and approval shall be in accordance with 6.2.2.5:

Reference	Title	Applicable for Manufacture
ISO 21172-1:2015	Gas cylinders – Welded steel pressure drums up to 3,000 litres capacity for the transport of gases – Design and construction – Part 1: Capacities up to 1,000 litres ***NOTE:*** *Irrespective of section 6.3.3.4 of this standard, welded steel gas pressure drums with dished ends convex to pressure may be used for the transport of corrosive substances provided all applicable requirements of this Code are met.*	Until further notice
ISO 4706: 2008	Gas cylinders – Refillable welded steel cylinders – Test pressure 60 bar and below	Until further notice
ISO 18172-1:2007	Gas cylinders – Refillable welded stainless steel cylinders – Part 1: Test pressure 6 MPa and below	Until further notice

"

6.2.2.3 Service equipment

In the first table, for "ISO 13340:2001", in the column "Applicable for manufacture", replace "Until further notice" with "Until 31 December 2020".

In the first table, insert the following rows at the end:

ISO 14246:2014	Gas cylinders – Cylinder valves – Manufacturing tests and examination	Until further notice
ISO 17871:2015	Gas cylinders – Quick-release cylinders valves – Specification and type testing	Until further notice

6.2.2.4 Periodic inspection and test

Amend the end of the introductory sentence to read "…testing of UN cylinders and their closures:". Move the last row of the table into a new table, after the existing one, with the same headings and a new introductory sentence to read "The following standard applies to the periodic inspection and testing of UN metal hydride storage systems:"

In the table, for "ISO 11623:2002", in column "Applicable", replace "Until further notice" with "Until 31 December 2020". After the row for "ISO 11623:2002", insert the following new row:

ISO 11623:2015	Gas cylinders – Composite construction – Periodic inspection and testing	Until further notice

At the end of the first table, insert the following row:

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

6.2.2.7 Marking of refillable UN pressure receptacles

6.2.2.7.2 (c) Replace "indicated by the distinguishing signs of motor vehicles in international traffic" with "the distinguishing sign used on vehicles in international road traffic*"".

6.2.2.7.4 Under sub-paragraph (m), insert a new note to read as follows:

> "**Note:** Information on marks that may be used for identifying threads for cylinders is given in ISO/TR 11364, *Gas cylinders – Compilation of national and international valve stem/gas cylinder neck threads and their identification and marking system*."

6.2.2.7.4 (n) Replace "indicated by the distinguishing signs of motor vehicles in international traffic" with "the distinguishing sign used on vehicles in international road traffic*"".

6.2.2.7.7 (a) Replace "indicated by the distinguishing signs of motor vehicles in international traffic" with "the distinguishing sign used on vehicles in international road traffic*"", and add the corresponding footnote * to read as follows:

> "* 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."

6.2.2.9 Marking of UN metal hydride storage systems

6.2.2.9.2 In (c) and (h), replace "indicated by the distinguishing signs of motor vehicles in international traffic" with "the distinguishing sign used on vehicles in international road traffic*""

6.2.2.9.4 (a) Replace "indicated by the distinguishing signs of motor vehicles in international traffic" with "the distinguishing sign used on vehicles in international road traffic*", and add the corresponding footnote * to read as follows:

"* 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."

Chapter 6.3
Provisions for the construction and testing of packagings for class 6.2 infectious substances of category A

6.3.4 Marking

6.3.4.2 (e) Replace "indicated by the distinguishing sign for motor vehicles in international traffic" with "the distinguishing sign used on vehicles in international road traffic*", and add the corresponding footnote * to read as follows:

"* 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."

Chapter 6.4
Provisions for the construction, testing and approval of packages and radioactive material

6.4.23 Applications for approval and approvals for radioactive material transport

6.4.23.11 In paragraph (a), replace "the international vehicle registration identification code*" with "the distinguishing sign used on vehicles in international road traffic*", and amend the footnote * to read as follows:

"* 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.".

Chapter 6.5
Provisions for the construction and testing of intermediate bulk containers (IBCs)

6.5.2 Marking

6.5.2.1 Primary marking

6.5.2.1.1.5 Replace "indicated by the distinguishing sign for motor vehicles in international traffic" with "indicated by the distinguishing sign used on vehicles in international road traffic*"., and add the corresponding footnote * to read as follows:

"* 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."

6.5.6.9 Drop test

6.5.6.9.3 Amend the last paragraph to read as follows:

"The same IBC or a different IBC of the same design may be used for each drop."

6.5.6.14 Test report

6.5.6.14.1.8 At the end of the sub-paragraph, add the following sentence: "For rigid plastics and composite IBCs subject to the hydraulic pressure test in 6.5.6.8, the temperature of the water used;".

Chapter 6.6
Provisions for the construction and testing of large packagings

6.6.3 Marking

6.6.3.1 Primary marking

6.6.3.1 (e) Replace indicated by the distinguishing sign for motor vehicles in international traffic" with "indicated by the distinguishing sign used on vehicles in international road traffic*", and add the corresponding footnote * to read as follows:

"* 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.".

Chapter 6.7
Provisions for the design, construction, inspection and testing of portable tanks and multiple-element gas containers (MEGCs)

6.7.2 Provisions for the design, construction, inspection and testing of portable tanks intended for the transport of substances of class 1 and classes 3 to 9

6.7.2.18.1 In the fifth sentence, replace "i.e. the distinguishing sign for use in international traffic as prescribed by the Convention on Road Traffic, Vienna 1968" with "indicated by the distinguishing sign used on vehicles in international road traffic*".

6.7.3.14.1 In the fifth sentence, replace "i.e. the distinguishing sign for use in international traffic as prescribed by the Convention on Road Traffic, Vienna 1968" with "indicated by the distinguishing sign used on vehicles in international road traffic*".

6.7.4.13.1 In the fifth sentence, replace "i.e. the distinguishing sign for use in international traffic as prescribed by the Convention on Road Traffic, Vienna 1968" with "indicated by the distinguishing sign used on vehicles in international road traffic*".

6.7.5.11.1 In the fifth sentence, replace "i.e. the distinguishing sign for use in international traffic as prescribed by the Convention on Road Traffic, Vienna 1968" with "indicated by the distinguishing sign used on vehicles in international road traffic*".

Add the following corresponding footnote*:

"* 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."

Chapter 6.8
Provisions for road tank vehicles

Amend title of chapter 6.8 to read "Provisions for road tank vehicles and road gas elements vehicles".

6.8.1.1 Amend provision 6.8.1.1 to read as follows:

"**6.8.1.1 Tank and elements support frameworks, fitting and tie-down attachments***

6.8.1.1.1 Road tank vehicles and road gas elements vehicles shall be designed and manufactured with supports to provide a secure base during transport and with suitable tie-down attachments. The tie-down attachments shall be located on the tank or elements support, or vehicle structure in such a manner that the suspension system is not left in free play."

6.8.3 Amend the title of 6.8.3 to read "Road tank vehicles and road gas elements vehicles for short international voyages"

6.8.3.4 Add a new provision 6.8.3.4 as follows:

"6.8.3.4 **Road gas elements vehicles for compressed gases of class 2 (IMO Type 9)**

6.8.3.4.1 **General provisions**

6.8.3.4.1.1 An IMO type 9 tank shall comply with the provisions of 6.8.3.4.2 and 6.8.3.4.3.

6.8.3.4.1.2 An IMO type 9 tank shall not be offered for transport by sea in a condition that would lead to venting during the voyage under normal conditions of transport.

6.8.3.4.2 Design and construction

6.8.3.4.2.1 An IMO type 9 tank shall comply with the provisions of 6.7.5 with the exception that the horizontal forces at right angles to the direction of travel shall be the MPGM multiplied by the acceleration due to gravity (g)*; and that the inspection and testing shall be in accordance with the competent authority where the road gas elements vehicle is approved.

* For calculation purposes, $g = 9.81\ m/s^2$.

6.8.3.4.2.2 If the landing legs of an IMO type 9 tank are to be used as support structures, the loads specified in 6.7.5.2.8 shall be taken into account in their design and method of attachment. Any bending stress induced in the shell or the elements as a result of this manner of support shall also be included in the design calculations.

6.8.3.4.2.3 Securing arrangements (tie-down attachments) shall be fitted to the road gas elements vehicle support structure and the towing vehicle of an IMO type 9 tank. Semi-trailers unaccompanied by a towing vehicle shall be accepted for shipment only if the trailer supports and the securing arrangements and the position of stowage are agreed by the competent authority for sea transport, unless the approved Cargo Securing Manual includes this arrangement.

6.8.3.4.3 Approval, testing and marking

6.8.3.4.3.1 IMO type 9 tanks shall be approved for road transport by the competent authority for road transport.

6.8.3.4.3.2 The competent authority for sea transport shall issue additionally, in respect of an IMO type 9 tank, a certificate attesting compliance with the relevant design, construction and equipment provisions of this chapter and, where appropriate, the special provisions for the gases listed in the Dangerous Goods List. The certificate shall list the gases allowed to be transported.

6.8.3.4.3.3 An IMO type 9 tank shall be periodically tested and inspected in accordance with the provisions of the competent authority for road transport where the road gas elements vehicle is approved.

6.8.3.4.3.4 An IMO type 9 tank shall be marked in accordance with 6.7.5.13, as applicable. However, where the marking required by the competent authority for road transport is substantially in agreement with that of 6.7.5.13.1, it will be sufficient to endorse the metal plate attached to the IMO type 9 tank with "IMO 9".

"

Chapter 6.9
Provisions for the design, construction, inspection and testing of bulk containers

6.9.5 Requirements for the design, construction, inspection and testing of flexible bulk containers BK3

6.9.5.5 Marking

6.9.5.5.1 (e) Replace "indicated by the distinguishing signs for motor vehicles in international traffic" with "the distinguishing signs used on vehicles in international road traffic*", and add the following corresponding footnote *:

"* 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."

PART 7
PROVISIONS CONCERNING TRANSPORT OPERATIONS

Chapter 7.1
General stowage provisions

7.1.3 Stowage categories

7.1.3.1 Stowage categories for class 1

In the 3rd column for Stowage category 02, Stowage category 03, Stowage category 04 and Stowage category 05, replace "7.1.4.4.5" with "7.1.4.4.6", respectively.

7.1.4 Special stowage provisions

Renumber paragraphs 7.1.4.4.5 and 7.1.4.4.5.1 as 7.1.4.4.6 and 7.1.4.4.6.1, respectively. Renumber paragraph 7.1.4.4.6 as 7.1.4.4.7.

Add a new paragraph 7.1.4.4.5 as follows:

"7.1.4.4.5 *Transport to or from offshore oil platforms, mobile offshore drilling units and other offshore installations*

Notwithstanding the stowage category indicated in column 16a of the Dangerous Goods List, UN 0124 JET PERFORATING GUNS, CHARGED, and UN 0494 JET PERFORATING GUNS, CHARGED, transported to or from offshore oil platforms, mobile offshore drilling units and other offshore installations may be stowed on deck in offshore well tool pallets, cradles or baskets provided that:

.1 initiation devices shall be segregated from each other and from any jet perforating guns in accordance with the provisions of 7.2.7, and from any other dangerous goods in accordance with the provisions of 7.2.4 and 7.6.3.2, unless otherwise approved by the competent authority;

.2 jet perforating guns shall be securely held in place during transport;

.3 each shaped charge affixed to any gun shall not contain more than 112 g of explosives;

.4 each shaped charge, if not completely enclosed in glass or metal, shall be fully protected by a metal cover following installation in the gun;

.5 both ends of jet perforating guns shall be protected by means of steel end caps allowing for pressure release in the event of fire;

.6 the total explosive content shall not exceed 95 kg per well tool pallet, cradle or basket; and

.7 where more than one well tool pallet, cradle or basket is stowed "on deck", a minimum horizontal distance of 3 m shall be observed between them."

7.1.4.6 After 7.1.4.6.1, insert a new provision of 7.1.4.7 as follows:

"**7.1.4.7 Stowage of stabilized dangerous goods**

Substances, for which the word "STABILIZED" is added as part of the proper shipping name of the substances in accordance with 3.1.2.6, Stowage Category D and SW1 shall apply."

7.1.5 Stowage codes

Add a new SW30 as follows:

"SW30 For special stowage provisions, see 7.1.4.4.5."

Chapter 7.2
General segregation provisions

7.2.2 Definitions

7.2.2.2 In sub-paragraph .2, replace "risk" with "hazard".

7.2.3 Segregation provisions

7.2.3.3 Replace "risk" with "hazard", twice.

7.2.3.4 Replace "risk" with "hazard", replace "risks" with "hazards", and replace the sentence "segregation as for class 5.1, but "separated from" class 7." with "SG6 (segregation as for class 5.1), and SG19 (stow "separated from" class 7).".

7.2.4 Segregation table

7.2.4 In the third paragraph, replace "risk" with "hazard".

7.2.5 Segregation groups

7.2.5.1 Amend existing paragraph 7.2.5.1 to read as follows:

"7.2.5.1 For the purpose of segregation, dangerous goods having certain similar chemical properties have been grouped together in segregation groups as listed in 7.2.5.2. The entries allocated to these segregation groups are listed in 3.1.4.4 and are identified by a segregation group code in column 16b of the Dangerous Goods List."

7.2.5.2 Replace paragraph 7.2.5.2 with the following:

"7.2.5.2 The segregation group codes given in column 16b of the Dangerous Goods List are as specified below:

Segregation Group Code	Segregation Group	Description
SGG1	1	acids
SGG1a	1, entries marked *	* identifies strong acids
SGG2	2	ammonium compounds
SGG3	3	bromates
SGG4	4	chlorates
SGG5	5	chlorites
SGG6	6	cyanides
SGG7	7	heavy metals and their salts (including their organometallic compounds)
SGG8	8	hypochlorites
SGG9	9	lead and its compounds
SGG10	10	liquid halogenated hydrocarbons
SGG11	11	mercury and mercury compounds
SGG12	12	nitrites and their mixtures
SGG13	13	perchlorates
SGG14	14	permanganates
SGG15	15	powdered metals
SGG16	16	peroxides
SGG17	17	azides
SGG18	18	alkalis

7.2.6 Special segregation provisions and exemptions

7.2.6.1 Replace "risk" with "hazard".

7.2.6.2 Under "For example", replace the sentence "segregation as for class 3, but "away from" classes 4.1 and 8." with "SG5 ("segregation as for class 3)", "SG8 (stow "away from" class 4.1)" and "SG13 (stow "away from class 8)"".

7.2.6.3 In provision .2, replace the last sentence to read "Substances within the same table 7.2.6.3.1, 7.2.6.3.2 or 7.2.6.3.3 are compatible with one another.". After .2, add a new provision .3 as follows:

".3 to substances within the table 7.2.6.3.4, except that due regard shall continue to be taken of the dangerous reactions specified in the provisions of 7.2.6.1.1 to 7.2.6.1.4."

In tables 7.2.6.3.1, 7.2.6.3.2 and 7.2.6.3.3, in the title of column 4, replace "subsidiary risk(s)" with "subsidiary hazard(s)", respectively.

7.2.6.3.3 After the existing table 7.2.6.3.3, insert a new table 7.2.6.3.4 as follows:

"Table 7.2.6.3.4

UN*	Proper Shipping Name	Class	Subsidiary Hazard(s)	Packing group
3101	ORGANIC PEROXIDE TYPE B, LIQUID	5.2	1 and/or 8	-
3102	ORGANIC PEROXIDE TYPE B, SOLID	5.2	1 and/or 8	-
3103	ORGANIC PEROXIDE TYPE C, LIQUID	5.2	None or 8	-
3104	ORGANIC PEROXIDE TYPE C, SOLID	5.2	None or 8	-
3105	ORGANIC PEROXIDE TYPE D, LIQUID	5.2	None or 8	-
3106	ORGANIC PEROXIDE TYPE D, SOLID	5.2	None or 8	-

UN*	Proper Shipping Name	Class	Subsidiary Hazard(s)	Packing group
3107	ORGANIC PEROXIDE TYPE E, LIQUID	5.2	None or 8	-
3108	ORGANIC PEROXIDE TYPE E, SOLID	5.2	None or 8	-
3109	ORGANIC PEROXIDE TYPE F, LIQUID	5.2	None or 8	-
3110	ORGANIC PEROXIDE TYPE F, SOLID	5.2	None or 8	-
3111	ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED	5.2	1 and/or 8	-
3112	ORGANIC PEROXIDE TYPE B, SOLID, TEMPERATURE CONTROLLED	5.2	1 and/or 8	-
3113	ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED	5.2	None or 8	-
3114	ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED	5.2	None or 8	-
3115	ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED	5.2	None or 8	-
3116	ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED	5.2	None or 8	-
3117	ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED	5.2	None or 8	-
3118	ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED	5.2	None or 8	-
3119	ORGANIC PEROXIDE TYPE F, LIQUID, TEMPERATURE CONTROLLED	5.2	None or 8	-
3120	ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED	5.2	None or 8	-
1325	FLAMMABLE SOLID, ORGANIC, N.O.S. with a technical name as listed in 2.5.3.2.4 under "exempt"	4.1	None	II, III

* Except for substances with the technical name PEROXYACETIC ACID

"

7.2.6.4 Renumber the exiting paragraph 7.2.6.4 as new paragraph 7.2.6.5. Insert a new paragraph 7.2.6.4 as follows:

"7.2.6.4 Notwithstanding table 7.2.6.3.2.4, due regard shall continue to be taken of the dangerous reactions specified in the provisions of 7.2.6.1.1 to 7.2.6.1.4."

7.2.8 Segregation codes

7.2.8 In the entry for SG1, replace the description as follows:

"For packages carrying a subsidiary hazard label of class 1, segregation as for class 1, division 1.3. However, in relation to goods of class 1, segregation as for the primary hazard.",

and amend the description of the following SG codes in 7.2.8 to include the corresponding SGG code for the segregation groups as follows:

Segregation Code	Description
SG20	Stow "away from" SGG1 – acids.
SG21	Stow "away from" SGG18 – alkalis.
SG24	Stow "away from" SGG17 – azides.
SG28	Stow "away from" SGG2 – ammonium compounds and explosives containing ammonium compounds or salts.
SG30	Stow "away from" SGG7 – heavy metals and their salts.
SG31	Stow "away from" SGG9 – lead and its compounds.

Segregation Code	Description
SG32	Stow "away from" SGG10 – liquid halogenated hydrocarbons.
SG33	Stow "away from" SGG15 – powdered metals.
SG34	When containing ammonium compounds, "away from" SGG4 – chlorates or SGG13 – perchlorates and explosives containing chlorates or perchlorates.
SG35	Stow "separated from" SGG1 – acids.
SG36	Stow "separated from" SGG18 – alkalis.
SG38	Stow "separated from" SGG2 – ammonium compounds.
SG39	Stow "separated from" SGG2 – ammonium compounds other than AMMONIUM PERSULPHATE (UN 1444).
SG40	Stow "separated from" SGG2 – ammonium compounds other than mixtures of ammonium persulphates and/or potassium persulphates and/or sodium persulphates.
SG42	Stow "separated from" SGG3 – bromates.
SG45	Stow "separated from" SGG4 – chlorates.
SG47	Stow "separated from" SGG5 – chlorites.
SG49	Stow "separated from" SGG6 – cyanides.
SG51	Stow "separated from" SGG8 – hypochlorites.
SG54	Stow "separated from" SGG11 – mercury and mercury compounds.
SG56	Stow "separated from" SGG12 – nitrites.
SG58	Stow "separated from" SGG13 – perchlorates.
SG59	Stow "separated from" SGG14 – permanganates.
SG60	Stow "separated from" SGG16 – peroxides.
SG61	Stow "separated from" SGG15 – powdered metals.
SG70	For arsenic sulphides, "separated from" SGG1 – acids.
SG75	Stow "separated from" SGG1a – strong acids.

Add three new segregation codes as follows:

SG76	Segregation as for class 7.
SG77	Segregation as for class 8. However, in relation to class 7, no segregation needs to be applied.
SG78	Stow "separated longitudinally by an intervening complete compartment or hold from" division 1.1, 1.2, and 1.5.

Annex

In the examples of the Annex, paragraphs 1.1, 3.2 and 4.2, replace "risk" with "hazard".

Chapter 7.3
Consigning operations concerning the packing and use of cargo transport units (CTUs) and related provisions

7.3.4 Segregation provisions within cargo transport units

7.3.4.2.1 Replace "risk" with "hazard".

7.3.4.2.2.3 Replace "risk" with "hazard".

7.3.7 Cargo transport units under temperature control

Replace the existing provisions of 7.3.7 with the following:

"**7.3.7 Cargo transport units under temperature control**

7.3.7.1 Preamble

7.3.7.1.1 If the temperature of certain substances (such as organic peroxides and polymerizing or self-reactive substances) exceeds a value which is typical of the substance as packaged for transport, a self-accelerating decomposition or polymerization possibly of explosive violence, may result. To prevent such decomposition or polymerization, it is necessary to control the temperature of such substances during transport. Other substances not requiring temperature control for safety reasons may be transported under controlled temperature conditions for commercial reasons.

7.3.7.1.2 The provisions for the temperature control of certain specified substances are based on the assumption that the temperature in the immediate surroundings of the cargo does not exceed 55°C during transport and attains this value for a relatively short time only during each period of 24 h.

7.3.7.2 General provisions

7.3.7.2.1 Where a number of packages containing self-reactive substances, organic peroxides and polymerizing substances are loaded in a closed cargo transport unit, the total quantity of substance, the type and number of packages and the stacking arrangement shall not create an explosion hazard.

7.3.7.2.2 These provisions apply to certain self-reactive substances when required by 2.4.2.3.4, and certain organic peroxides when required by 2.5.3.4.1 and certain polymerizing substances when required by 2.4.2.5.2 or special provision 386 of chapter 3.3 which may only be transported under conditions where the temperature is controlled.

7.3.7.2.3 These provisions also apply to the transport of substances for which:

.1 the proper shipping name as indicated in column 2 of the Dangerous Goods List of chapter 3.2 or according to 3.1.2.6 contains the word "STABILIZED"; and

.2 the self-accelerating decomposition temperature (SADT) or the self-accelerating polymerization temperature (SAPT)[5] determined for the substance (with or without chemical stabilization) as offered for transport is:

.1 50°C or less for single packagings and IBCs; or

.2 45°C or less for portable tanks.

[5] The SAPT shall be determined in accordance with the test procedures established for the SADT for self reactive substances in accordance with part II, section 28 of the Manual of Tests and Criteria.

When chemical inhibition is not used to stabilize a reactive substance which may generate dangerous amounts of heat and gas, or vapour, under normal transport conditions, these substances need to be transported under temperature control. These provisions do not apply to substances which are stabilized by the addition of chemical inhibitors such that the SADT or the SAPT is greater than that prescribed in paragraphs 7.3.7.2.3.2.1 or 7.3.7.2.3.2.2.

7.3.7.2.4 In addition, if a self-reactive substance or organic peroxide or a substance the proper shipping name of which contains the word "STABILIZED" and which is not normally required to be transported under temperature control is transported under conditions where the temperature may exceed 55°C, it may require temperature control.

7.3.7.2.5 The "control temperature" is the maximum temperature at which the substance can be safely transported. In the event of loss of temperature control, it may be necessary to implement emergency procedures. The "emergency temperature" is the temperature at which such procedures shall be implemented.

7.3.7.2.6 Derivation of control and emergency temperatures

Type of receptacle	SADT[a] /SAPT[a]	Control temperature	Emergency temperature
Single packagings and IBCs	20°C or less over 20°C to 35°C over 35°C	20°C below SADT/SAPT 15°C below SADT/SAPT 10°C below SADT/SAPT	10°C below SADT/SAPT 10°C below SADT/SAPT 5°C below SADT/SAPT
Portable tanks	≤ 45°C	10°C below SADT/SAPT	5°C below SADT/SAPT

[a] i.e. the SADT/SAPT of the substance as packed for transport.

7.3.7.2.7 The control and emergency temperatures are derived using the table in 7.3.7.2.6 from the self-accelerating decomposition temperature (SADT) or from the self-accelerating polymerization temperature (SAPT) which are defined as the lowest temperatures at which self-accelerating decomposition or self-accelerating polymerization may occur with a substance in the packaging, IBC or portable tank as used in transport. An SADT or SAPT shall be determined in order to decide if a substance shall be subjected to temperature control during transport. Provisions for the determination of the SADT and SAPT are given in 2.4.2.3.4, 2.5.3.4.2 and 2.4.2.5.2 for self-reactive substances, organic peroxides and polymerizing substances and mixtures, respectively.

7.3.7.2.8 Control and emergency temperatures, where appropriate, are provided for currently assigned self-reactive substances in 2.4.2.3.2.3 and for currently assigned organic peroxide formulations in 2.5.3.2.4.

7.3.7.2.9 The actual transport temperature may be lower than the control temperature but shall be selected so as to avoid dangerous separation of phases.

7.3.7.3 Transport under temperature control

7.3.7.3.1 Prior to the use of cargo transport unit, the refrigeration system shall be subjected to a thorough inspection and a test to ensure that all parts are functioning properly.

7.3.7.3.2 Refrigerant gas shall only be replaced in accordance with the manufacturer's operating instructions for the refrigeration system. Prior to filling replacement refrigerant gas, a certificate of analysis from the supplier shall be obtained and checked to confirm that the gas meets refrigeration system specifications. In addition, if concerns about the integrity of the supplier and/or the refrigerant gas supply chain give rise to suspicion of contamination of the gas, the replacement refrigerant gas shall be checked for possible contamination prior to use. If the refrigerant gas is found to be contaminated, it shall not be used, the cylinder shall be plainly marked "CONTAMINATED", the cylinder shall be sealed and sent for recycling or disposal, and notification shall be given to the refrigerant gas supplier and authorized distributor and competent authority(ies) of the countries in which the supplier and distributor reside, as appropriate. The date of last refrigerant replacement shall be included in the maintenance record of the refrigeration system.

Note: Contamination can be checked by using flame halide lamp tests, gas sniffer tube tests or gas chromatography. Replacement refrigerant gas cylinders may be marked with the test result and the date of testing.

7.3.7.3.3 When a cargo transport unit is to be filled with packages containing substances having different control temperatures, all packages shall be pre-cooled to avoid exceeding the lowest control temperature.

7.3.7.3.3.1 In the event that non-temperature-controlled substances are transported in the same cargo transport unit as temperature controlled substances, the package(s) containing substances that require refrigeration shall be stowed in such a way as to be readily accessible from the door(s) of the cargo transport unit.

7.3.7.3.3.2 If substances with different control temperatures are loaded in the cargo transport unit, the substances with the lowest control temperature shall be stowed in the most readily accessible position from the doors of the cargo transport unit.

7.3.7.3.3.3 The door(s) shall be capable of being opened readily in case of emergency so that the package(s) can be removed. The carrier shall be informed about the location of the different substances within the unit. The cargo shall be secured to prevent packages from falling when the door(s) is (are) opened. The packages shall be securely stowed so as to allow for adequate air circulation throughout the cargo.

7.3.7.3.4 The master shall be provided with operating instructions for the refrigeration system, procedures to be followed in the event of loss of control and instructions for regular monitoring of operating temperatures. Spare parts shall be carried for the systems described in 7.3.7.4.2.3, 7.3.7.4.2.4 and 7.3.7.4.2.5 so that they are available for emergency use should the refrigeration system malfunction during transport.

7.3.7.3.5 In cases where it may not be possible to carry specific substances according to the general provisions, full details of the proposed method of shipment shall be submitted to the competent authority concerned for approval.

7.3.7.4 Methods of temperature control

7.3.7.4.1 The suitability of a particular means of temperature control for transport depends on a number of factors. Among those to be considered are:

.1 the control temperature(s) of the substance(s) to be transported;

.2 the difference between the control temperature and the anticipated ambient temperature conditions;

.3 the effectiveness of the thermal insulation of the cargo transport unit. The overall heat transfer coefficient shall not be more than 0.4 W/(m^2·K) for cargo transport units and 0.6 W/(m^2·K) for tanks; and

.4 the duration of the voyage.

7.3.7.4.2 Suitable methods for preventing the control temperature being exceeded are, in order of increasing capability:

.1 thermal insulation, provided that the initial temperature of the substance is sufficiently below the control temperature;

.2 thermal insulation with a cooling method, provided that:

- an adequate quantity of non-flammable coolant (such as liquid nitrogen or solid carbon dioxide), allowing a reasonable margin for delay, is carried;
- liquid oxygen or air is not used as a coolant;
- there is a uniform cooling effect even when most of the coolant has been consumed; and
- the need to ventilate the cargo transport unit before entering is clearly indicated by a warning on the door(s) (see 5.5.3);

.3 single mechanical refrigeration, provided that the unit is thermally insulated and, for substances with a flashpoint lower than the sum of the emergency temperature plus 5°C, explosion proof electrical fittings are used within the cooling compartment to prevent ignition of flammable vapours from the substances;

.4 combined mechanical refrigeration system and cooling method, provided that:

- the two systems are independent of one another; and
- the provisions of 7.3.7.4.2.2 and 7.3.7.4.2.3 are met;

.5 dual mechanical refrigeration system, provided that:

- apart from the integral power supply unit, the two systems are independent of one another;

- each system alone is capable of maintaining adequate temperature control; and

- for substances with a flashpoint lower than the sum of the emergency temperature plus 5°C, explosion proof electrical fittings are used within the coolant compartment to prevent ignition of flammable vapours from the substances.

7.3.7.4.3 The refrigeration equipment and its controls shall be readily and safely accessible and all electrical connections weatherproof. Inside the cargo transport unit, the temperature shall be measured continuously. The measurement shall be taken in the air space of the unit, using two measuring devices independent of each other. The type and place of the measuring devices shall be selected so that their results are representative of the actual temperature in the cargo. At least one of the two measurements shall be recorded in such a manner that temperature changes are easily detectable. The temperature shall be checked every four to six hours and logged.

7.3.7.4.4 If substances are transported with a control temperature less than +25°C, the cargo transport unit shall be equipped with a visible and audible alarm effectively set at no higher than the control temperature. The alarms shall work independently from the power supply of the refrigeration system.

7.3.7.4.5 If an electrical supply is necessary for the cargo transport unit to operate the refrigeration or heating equipment, it shall be ensured that the correct connecting plugs are fitted. For under deck stowage, plugs shall, as a minimum, be of an IP 55 enclosure in accordance with IEC Publication 60529, [6] with the specification for electrical equipment of temperature class T4 and explosion group IIB. However, when stowed on deck, these plugs shall be of an IP 56 enclosure in accordance with IEC Publication 60529.[6]

7.3.7.5 Special provisions for self-reactive substances, organic peroxides and polymerizing substances

7.3.7.5.1 For self-reactive substances (class 4.1) identified by UN Nos. 3231 and 3232 and organic peroxides (class 5.2) identified by UN Nos. 3111 and 3112, one of the following methods of temperature control described in 7.3.7.4.2 shall be used:

.1 the methods referred to under 7.3.7.4.2.4 or 7.3.7.4.2.5; or

.2 the method referred to under 7.3.7.4.2.3 when the maximum ambient temperature to be expected during transport is at least 10°C below the control temperature.

7.3.7.5.2 For self-reactive substances (class 4.1) identified by UN Nos. 3233 to 3240, organic peroxides (class 5.2) identified by UN Nos. 3113 to 3120 and

[6] Reference is made to the Recommendations published by the International Electrotechnical Commission (IEC) and, in particular, to publication 60529 Classification of Degrees of Protection provided by Enclosures.

polymerizing substances identified by UN Nos. 3533 and 3534 or for those substances where the words "TEMPERATURE CONTROLLED" are added as part of the proper shipping name in accordance with 3.1.2.6.2, one of the following methods shall be used:

.1 the methods referred to under 7.3.7.4.2.4 or 7.3.7.4.2.5;

.2 the method referred to under 7.3.7.4.2.3 when the maximum ambient temperature to be expected during transport does not exceed the control temperature by more than 10°C; or

.3 for short international voyages only (see 1.2.1), the methods referred to under 7.3.7.4.2.1 and 7.3.7.4.2.2 when the maximum ambient temperature to be expected during transport is at least 10°C below the control temperature.

7.3.7.6 Special provisions for flammable gases or liquids having a flashpoint less than 23°C c.c. transported under temperature control

7.3.7.6.1 When flammable gases or liquids having a flashpoint less than 23°C c.c. are packed or loaded in a cargo transport unit equipped with a refrigerating or heating system, the cooling or heating equipment shall comply with 7.3.7.4.

7.3.7.6.2 When flammable liquids having a flashpoint less than 23°C c.c. and not requiring temperature control for safety reasons are transported under temperature control conditions for commercial reasons, explosion proof electrical fittings are required except when the substances are pre-cooled to and transported at a control temperature of at least 10°C below the flashpoint. In case of failure of a non-explosion proof refrigerating system, the system shall be disconnected from the power supply. It shall not be reconnected if the temperature has risen to a temperature less than 10°C below the flashpoint.

7.3.7.6.3 When flammable gases not requiring temperature control for safety reasons are transported under temperature control conditions for commercial reasons, explosion proof electrical fittings are required.

7.3.7.7 Special provisions for vehicles transported on ships

Insulated, refrigerated and mechanically refrigerated vehicles shall conform to the provisions of 7.3.7.4 and 7.3.7.5 as appropriate. In addition, the refrigerating appliance of a mechanically refrigerated vehicle shall be capable of operating independently of the engine used to propel the vehicle.

7.3.7.8 Approval

The competent authority may approve that less stringent means of temperature control may be used or that artificial refrigeration may be dispensed with under conditions of transport such as short international voyages or low ambient temperatures.

"

Chapter 7.4
Stowage and segregation on containerships

7.4.2 Stowage requirements

7.4.2.4.1 Replace "risk" with "hazard", twice.

7.4.2.3.2 Replace the existing paragraph with the following:

"7.4.2.3.2 A container with flammable gases or flammable liquids having a flashpoint of less than 23°C c.c. transported on deck shall be stowed at least 2.4 m horizontally and projected vertically away from any potential source of ignition."

Chapter 7.6
Stowage and segregation on general cargo ships

7.6.2 Stowage and handling provisions

7.6.2.3.1 Replace "risk" with "hazard", twice.

7.6.3 Segregation provisions

7.6.3.1.2 Replace "risk" with "hazard".

Chapter 7.7
Shipborne barges on barge-carrying ships

7.7.3 Barge loading

7.7.3.6 Replace "risk" with "hazard".

7.7.3.7.3 Replace "risk" with "hazard".

Chapter 7.8
Special requirements in the event of an incident and fire precautions involving dangerous goods

7.8.1 General

7.8.1.1 Add "*Revised*" before *"Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS Guide)".*

7.8.4 Special provisions for incidents involving radioactive material

7.8.4.4 Add "*Revised*" before *"Emergency Response Procedures for Ships Carrying Dangerous Goods (EmS Guide)".*

Chapter 7.9
Exemptions, approvals and certificates

7.9.3 Contact information for the main designated national competent authorities

Updated the following contact information for national competent authority regarding the IMDG Code:

AZERBAIJAN	Ministry of Emergency Situations of the Republic of Azerbaijan State Agency for Safe Working in Industry and Mountain-Mine Control 26 Najafgulu Rafiyev Street Baku Khatai Region AZ 1025 Azerbaijan Telephone: +994 12 512 1501 Telefax: +994 12 512 2501 Email: dag-meden@fhn.gov.az
CHILE	Dirección General del Territorio Marítimo y de Marina Mercante Empcontra Milton Pizarro Barrella Dirección de Seguridad y Operaciones Marítimas Departamento Policía Marítima y Prevención de Riesgos División Cargas Peligrosas Subida Cementerio No.300, Playa Ancha Valparaíso 2520000 Chile Telephone: +56 32 220 8607 +56 32 220 8656 Email: mpizarrob@directemar.cl mmunoza@directemar.cl gsage@directemar.cl Website: http://www.directemar.cl
ECUADOR	SUBSECRETARIA DE PUERTOS Y TRANSPORTE MARITIMO Y FLUVIAL ING. IVAN SOLORZANO VILLACIS EXPERTO EN INFRAESTRUCTURA PORTUARIA CDLA. LOS CEIBOS - AV. DEL BOMBERO Y LEPOLDO CARRERA - EDIF. "GRACE" EP-PETROECUADOR - 1ER PISO GUAYAQUIL GUAYAS Ecuador Telephone: +593 4259 2080 Email: isolorzano@mtop.gob.ec Website: http://www.obraspublicas.gob.ec SUBSECRETARIA DE PUERTOS Y TRANSPORTE MARITIMO Y FLUVIAL (SPTMF) Ing. Richard Villacís Jefe de Contaminación Av. del Bombero y Leopoldo Carrera – Cdla. Ceibos. Edif. EP-Petroecuador. 1er piso Guayaquil Ecuador Telephone: +593 6272 3008 Email: rvillacis@mtop.gob.ec Website: https://www.obraspublicas.gob.ec

	Superintendencia del Terminal Petrolero de "El Salitral" (SUINSA) CPNV(SP) Raúl Aguirre Baldeón Superintendente Terminal Petrolero de el Salitral Guayaquil Ecuador Telephone: +593 4550 4901 Telefax: +593 4250 4901 Ext. 102/109 Email: suinsa_operaciones@mtop.gob.ec suinsa_radio@mtop.gob.ec raguirreb2000@hotmail.com Superintendencia del Terminal Petrolero de la Libertad (SUINLI) CPNV(SP) Roberto Ruiz Johns Superintendente Terminal Petrolero de la Libertad La Libertad Ecuador Telephone: +593 4278 5785 Telefax: +593 4278 5781 Email: suinli_operaciones@mtop.gob.ec suinli_radio@mtop.gob.ec rruiz@mtop.gob.ec
FAROES (THE)	SjÓvinnustÝrið Faroese Maritime Authority P.O. Box 26 Á Hálsi 1, P.O. Box 26 Sørvágur FO-380 Faroes, DenmarkInni á StØð, P. O. Box 26 FO-375 Miðvágur, Faroe Islands Telephone: +298 35 5600 Telefax: +298 35 5601 Email: fma@fma.fo Website: https://www.fma.fo
FRANCE	Ministère de la Transition Ecologique et Solidaire Adjoint au Chef de la mission transport de matières dangereuses Mr Pierre DUFOUR MTES – DGPR – Mission Transport de matières dangereuses (MTMD) Tour Séquoia - Pièce 23-39 92055 Paris La Défense Cedex France Telephone: +33 1 4081 1496 Telefax: +33 1 4081 8641 Email: pierre.dufour@developpement-durable.gouv.fr *Organizations authorized for packagings, large packagings and intermediate bulk containers (IBCs)*[7]

	1 Association des Contrôleurs Indépendants (ACI) 22, rue de l'Est 92100 Boulogne-Billancourt France 2 APAVE 191, rue de Vaugirard 75738 Paris Cedex 15 France 3 Association pour la Sécurité des Appareils à Pression (ASAP) Continental Square – BP 16757 95727 Roissy-Charles de Gaulle Cedex France 4 Bureau de Vérifications Techniques (BVT) ZAC de la Cerisaie – 31, rue de Montjean 94266 Fresnes Cedex France 5 Bureau Veritas 67-71, rue du Château 92200 Neuilly-sur-Seine France 6 Centre Français de l'Emballage Agréé (CeFEA) 5, rue Janssen 75019 Paris France 7 Laboratoire d'Études et de Recherches des Emballages Métalliques (LEREM) Marches de l'Oise – 100, rue Louis-Blanc 60160 Montataire France 8 Laboratoire National de métrologie et d'Essais (LNE) 1, rue Gaston-Boissier 75724 Paris Cedex 15 France *Organizations authorized for pressure receptacles*[7] 1 Association des Contrôleurs Indépendants (ACI) (Voir coordonnées ci-dessus) 2 APAVE (Voir coordonnées ci-dessus) 3 Association pour la Sécurité des Appareils à Pression (ASAP) (Voir coordonnées ci-dessus) 4 Bureau Veritas (Voir coordonnées ci-dessus)

	Organizations authorized for tanks and multiple-element gas containers (MEGCs)[7] 1 Association des Contrôleurs Indépendants (ACI) (Voir coordonnées ci-dessus) 2 APAVE (Voir coordonnées ci-dessus) 3 Bureau Veritas (Voir coordonnées ci-dessus)
GERMANY	Ministry of Transport and digital Infrastructure Division G 24 - Transport of Dangerous Goods Robert-Schuman-Platz 1 Telephone: +49 (0) 228 300 2551 Email : ref-g24@bmvi.bund.de
ICELAND	Icelandic Transport Authority (ICETRA) Armuli 2 Reykjavik 108 Iceland Telephone: +354 480 6000 Email: samgongustofa@samgongustofa.is
IRAN (ISLAMIC REPUBLIC OF)	Ports and Maritime Organization PMO. No.1. Shahidi St. Haghani Exp'way Vanak Sq. Tehran 1518663111 Iran (Islamic Republic of) Telephone: +98 21 8493 2081/2 Email: info@pmo.ir
ITALY	Comando Generale del Corpo delle Capitanerie di Porto Lt. Cdr. (IT.C.G.) Giuseppe Notte Ufficio II - Merci Pericolose Via dell'Arte, 16 Roma 00144 Italy Telephone: +39 06 5908 4267 +39 06 5908 4652 Telefax: +39 06 5908 4630 Email: cgcp@pec.mit.gov.it segreteria.reparto6@mit.gov.it Website: http://www.guardiacostiera.gov.it

[7] Contact competent authority for further details of areas of authorization.

JAPAN	Inspection and Measurement Division Maritime Bureau Ministry of Land, Infrastructure, Transport and Tourism 2-1-3 Kasumigaseki, Chiyoda-ku Tokyo Japan Telephone: +81 3 5253 8639 Telefax: +81 3 5253 1644 Email: hqt-MRB_KSK@ml.mlit.go.jp Packaging Testing and Certification Institute Nippon Hakuyohin Kentei Kyokai (HK) (The Ship Equipment Inspection Society of Japan) 3-32, Kioi-Cho, Chiyoda-ku Tokyo Japan Telephone: +81 3 3261 6611 Telefax: +81 3 3261 6979 Packagings, IBCs and large packagings in conformity with the IMDG Code will be marked "J", "J/JG" or "J/HK".
MEXICO	*Stowage, segregation, labelling and documentation of goods* Coordinación General de Puertos y Marina Mercante Secretaría de Comunicación y Transportes Boulevard Adolfo López Mateos No. 1990 Col. Los Alpes Tlacopac, Del. Álvaro Obregón, C.P. 01010 México, Distrito Federal Telephone: +52 55 5723 9300 Email: coordgral.cgpmm@sct.gob.mx Coordinador General: Ruiz de Teresa Guillermo Raúl *Receipt and processing of notifications in the event of a package falling overboard* Secretaría de Marina Eje 2 Oriente, Tramo Heroica Escuela Naval Militar No. 861 Colonia Los Cipreses, C.P. 04830 México, Distrito Federal Telephone: +52 55 5624 6500 (extention: 6388) Email: ayjemg@semar.gob.mx Jefe del Estado Mayor General de la Armada de México: Vicealmirante C.G. DEM Joaquín Zetina Angulo *Laboratory testing of packagings containing dangerous goods* Entidad Mexicana de Acreditación, A.C. Mariano Escobedo, No.564 Col. Nueva Anzures, Delegación Miguel Hidalgo C.P. 11590, Ciudad de México México Telephone: +52 55 9148 4300 Email: Maribel.lopez@ema.org.mx Directora Ejecutiva: Mtra. María Isabel López Martínez

MONGOLIA	Maritime Administration of Mongolia Division of Ship Registration and Regulation Government Building 11 Sambuu's street 11 Chingeltei district Ulaanbaatar 211238 Mongolia Telephone: +976 51 261 490 Telefax: +976 11 310 642 Email: info@monmarad.gov.mn operation@mngship.org Website: http://monmarad.gov.mn
PERU	Dirección General de Capitanías y Guardacostas (DICAPI) Jirón Constitución No.150 Callao Peru Telephone: +51 1209 9300 Anexo: 6757/6792 Email: jefemercanciaspeligrosas@dicapi.mil.pe
PORTUGAL	Direção-Geral de Recursos Naturais, Segurança e Serviços Marítimos (DGRM) Avenida Brasília Lisboa 1449-030 Portugal Telephone: +351 213 035 700 Telefax: +351 213 035 702 Email: dgrm@dgrm.mm.gov.pt
SINGAPORE	Maritime and Port Authority of Singapore Operations Divison, Assistant Director (Marine Environment & Safety) Capt Charles Alexandar De Souza #19-00 Tanjong Pagar Complex 7B Keppel Road, Singapore 089055 Telephone: +65 6325 2420 Telefax: +65 6325 2454 Email: Charles_Alexandar_De_Souza@mpa.gov.sg
TURKEY	Ministry of Transport Maritime Affairs and Communications Directorate General for Regulation of Dangerous Goods and Combined Transport GMK Bulvarı No:128A/7 Maltepe/Ankara 06570 Turkey Telephone: +90 312 232 3850 +90 312 232 1249 Fax: +90 312 231 5189 Email: dangerousgoods@udhb.gov.tr

	Packing, Testing and Certification Turkish Standards Institution (TSE) 100. Yıl Bulvarı No:99 Kat:2 Ostim/Ankara Turkey Telephone: +90 312 592 5000/5039 Fax: +90 312 592 5005 Email: oalper@tse.org.tr Türk Loydu Vakfı İktisadi İşletmesi Tersaneler Caddesi 26, 34944 Turkey Telephone: +90 216 581 3700 Fax: +90 216 581 3800 Email: info@turkloydu.org
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UNITED STATES	US Department of Transportation Pipeline and Hazardous Materials Safety Administration International Program Coordinator 1200 New Jersey Ave S.E. Washington, D.C. 20590 United States Telephone: +1 202 366 8553 Telefax: +1 202 366 7435 Email: infocntr@dot.gov United States Coast Guard – Commandant (CG-ENG-5) U.S. Coast Guard, Stop 7509 Attn: Chief, Hazardous Materials Division 2703 Martin Luther King Jr. Ave. SE Washington, D.C. 20593-7509 United States Telephone: +1 202 372 1420 Email: hazmatstandards@uscg.mil

Appendix A
List of generic and N.O.S. proper shipping names

In the List of generic and N.O.S. proper shipping names, header, column 2, replace "risk" with "hazard".

In the table, for class 2.1, under "General entries", after 3510, add the following new entry:

2.1	See 2.0.6.6	3537	ARTICLES CONTAINING FLAMMABLE GAS, N.O.S.

In the table, for class 2.2, under "General entries", after 3511, add the following new entry:

2.2	See 2.0.6.6	3538	ARTICLES CONTAINING NON-FLAMMABLE, NON-TOXIC GAS, N.O.S.

In the table, for class 2.3, under "General entries", after 3512, add the following new entry:

2.3	See 2.0.6.6	3539	ARTICLES CONTAINING TOXIC GAS, N.O.S.

In the table, for class 3, under "General entries", after 3526, add the following new entry:

3	See 2.0.6.6	3540	ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S.

In the table, for class 4.1, under "General entries", after 3534, add the following new entry:

4.1	See 2.0.6.6	3541	ARTICLES CONTAINING FLAMMABLE SOLID, N.O.S

In the table, for class 4.2, under "General entries", after 3200, add the following new entry:

4.2	See 2.0.6.6	3542	ARTICLES CONTAINING A SUBSTANCE LIABLE TO SPONTANEOUS COMBUSTION, N.O.S.

In the table, for class 4.3, under "General entries", after 2813, add the following new entry:

4.3	See 2.0.6.6	3543	ARTICLES CONTAINING A SUBSTANCE WHICH EMITS FLAMMABLE GAS IN CONTACT WITH WATER, N.O.S.

In the table, for class 5.1, under "General entries", after 3139, add the following new entry:

5.1	See 2.0.6.6	3544	ARTICLES CONTAINING OXIDIZING SUBSTANCE, N.O.S.

In the table, for class 5.2, after "Specific entries", add a new section "General entries" with the following new entry:

5.2	See 2.0.6.6	3545	ARTICLES CONTAINING ORGANIC PEROXIDE, N.O.S.

In the table, for class 6.1, under "General entries", after 3489, add the following new entry:

6.1	4.1	3535	TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.

In the table, for class 6.1, under "General entries", after 3462, add the following new entry:

6.1	See 2.0.6.6	3546	ARTICLES CONTAINING TOXIC SUBSTANCE, N.O.S.

In the table, for class 8, under "General entries", after 3267, add the following new entry:

8	See 2.0.6.6	3547	ARTICLES CONTAINING CORROSIVE SUBSTANCE, N.O.S.

In the table, for class 9, under "General entries", after 3335, add the following new entry:

9	See 2.0.6.6	3548	ARTICLES CONTAINING MISCELLANEOUS DANGEROUS GOODS, N.O.S

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For the entry "2-DIMETHYLAMINOETHYL ACRYLATE", in the column "Substance, material or article", add ", STABILIZED" at the end.

Insert the following new entries in alphabetical order:

Substance, material or article	***MP***	***Class***	***UN No.***
ARTICLES CONTAINING FLAMMABLE GAS, N.O.S.	-	2.1	3537
ARTICLES CONTAINING NON-FLAMMABLE, NON-TOXIC GAS, N.O.S.	-	2.2	3538
ARTICLES CONTAINING TOXIC GAS, N.O.S.	-	2.3	3539
ARTICLES CONTAINING FLAMMABLE LIQUID, N.O.S.	-	3	3540
ARTICLES CONTAINING FLAMMABLE SOLID, N.O.S.	-	4.1	3541
ARTICLES CONTAINING A SUBSTANCE LIABLE TO SPONTANEOUS COMBUSTION, N.O.S.	-	4.2	3542
ARTICLES CONTAINING A SUBSTANCE WHICH EMITS FLAMMABLE GAS IN CONTACT WITH WATER, N.O.S.	-	4.3	3543
ARTICLES CONTAINING OXIDIZING SUBSTANCE, N.O.S.	-	5.1	3544
ARTICLES CONTAINING ORGANIC PEROXIDE, N.O.S.	-	5.2	3545
ARTICLES CONTAINING TOXIC SUBSTANCE, N.O.S.	-	6.1	3546
ARTICLES CONTAINING CORROSIVE SUBSTANCE, N.O.S.	-	8	3547
ARTICLES CONTAINING MISCELLANEOUS DANGEROUS GOODS, N.O.S.	-	9	3548
DI-(4-tert-butylcyclohexyl) peroxydicarbonate, *see*	-	5.2	3116
Diisobutyryl peroxide, *see*	-	5.2	3119
1-dodecene, *see*	-	3	2850
LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT lithium ion batteries or lithium metal batteries	-	9	3536
1-Phenylethyl hydroperoxide, *see*	-	5.2	3109
Phosphorothioic acid, o-[(cyanophenyl methylene) azanyl] o,o-diethyl ester, *see*	-	4.1	3227
TOXIC SOLID, FLAMMABLE, INORGANIC, N.O.S.	-	6.1	3535

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